SIEMENS

TELEPERM M

OS 265-3
Operator Communication and Monitoring System

Design Phase

Description

Order No. C79000-P9076-C086-04
Volume 2/2

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OS 265-3 Design Phase

OS 265 Operator Communication and Monitoring System

Description C79000-T8076-C328-04

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1 Data Carrier and Handling

OS 265 is a main memory system which permanently holds all programs and data required for process and design operation in the main memory (MEM). The hard disk is merely used for storing programs and data which are not currently being used, for buffering user-related logs which are to be printed and for filing retrievable historic curve data. All data and programs can be copied from a magnetic tape cassette to the hard disk and vice versa.

1.1 Data Carrier

- **Magnetic tape cassettes**

The magnetic tape cassette drive is a backup facility for the hard disk, and can be used for storing curve files, image or shadow data, as well as for loading new software versions or text files in foreign languages.

Empty magnetic tape cassette for the MK 80-Q magnetic tape cassette drive:
Order No. 6AY2903-2AC00 (60 MB)

System software
Magnetic tape cassette containing the ONLINE and OFFLINE operating software with system text programs, basic data and text file in German language:
Order No. 6DS5013-3AA

Versions in foreign languages
Magnetic tape cassette containing

- text file in a foreign language
- shadow data used for converting existing data into the foreign language
- basic data in a foreign language

English	Order No. 6DS5014-3AA
Spanish	Order No. 6DS5014-3AB
French	Order No. 6DS5014-3AC

- **Hard disk structure**

All software required is supplied on magnetic tape cassette and has also been loaded on the built-in FP 27-E (144 MB) or FP 41-E (300 MB) hard disk.

The hard disk features the following logic structure:

Logic device on hard disk PLSK No.	Contents	Name on magnetic tape cassette	Storage space required (MB) FP 27-E	Storage space required (MB) FP 41-E
0	OFFLINE program system	OFLINE	10	10
1	ONLINE program system	ONLINE	10	10
2	Image data	BILDAT	7	7
3	ONLINE shadow data	MIDAT1	1	1
4	OFFLINE shadow data	MIDAT2	1	1
5	System test program, main memory dump	SYSTES	8	8
6	Text file	FRETEX	1	1
7	Curve file area 1	KURVE1	20	45
8	Curve file area 2	KURVE2	20	45
9	Curve file area 3	KURVE3	20	45
10	Curve file area 4	KURVE4	20	45
11	Curve file area 5	KURVE5	20	45
12	Logs and system information	PROSYS	5	5
13	Reserve		1	26

1.2 Switching on the System

The OS 265 performs automatic initialization from the hard disk after the system has been switched on. Depending on the keyswitch position, the OFFLINE or ONLINE system is loaded from the hard disk into the SICOMP M26 main memory:

Position:	1	(V)	
Position	2	(V+E)	Loading the ONLINE system (operating phase)
Position	3	(V+E+P)	
Position:	5	(OS)	Loading the OFFLINE system (design phase)

Position (V) is selected in a system without a keyswitch. Since design mode requires position (V + E + P), the design phase cannot be selected in such a system.

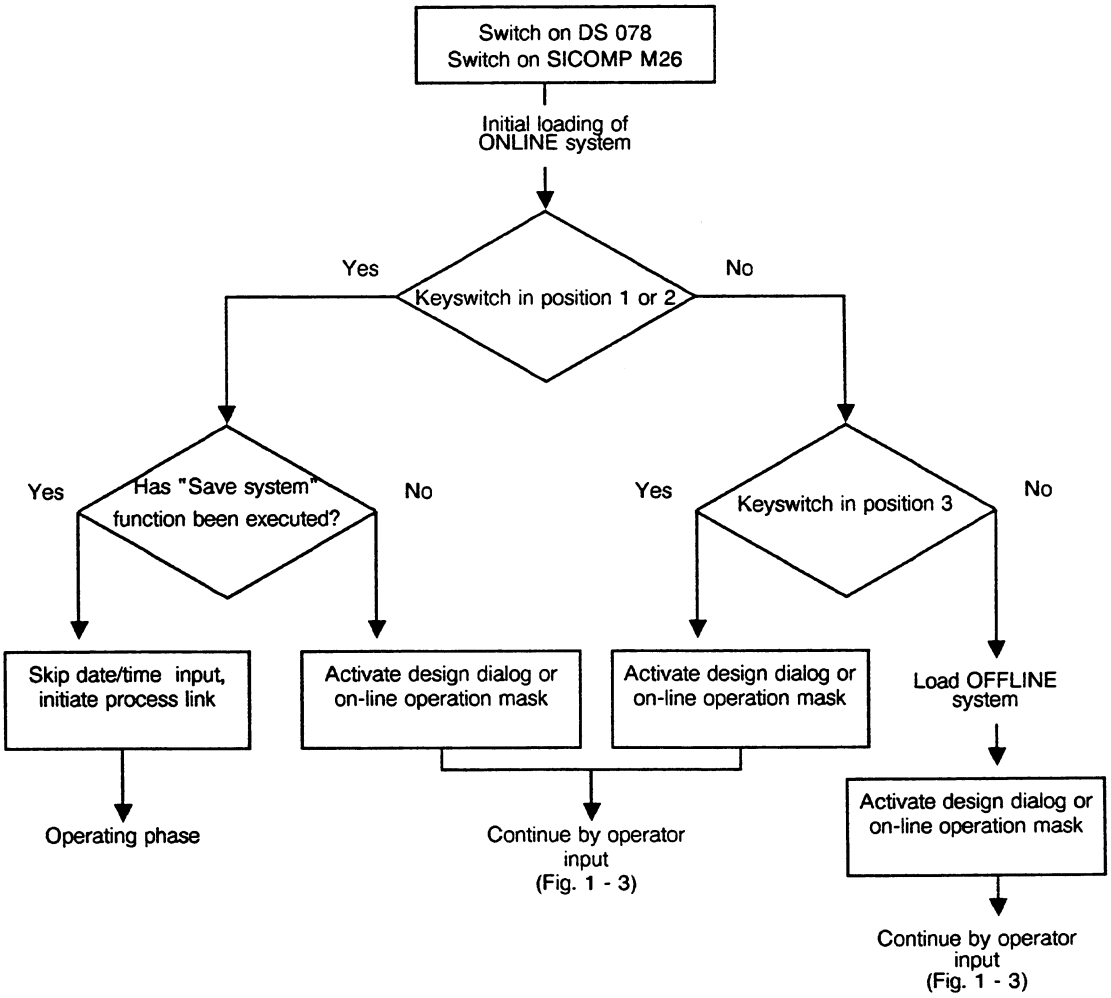


Fig. 1-1 System initialization

The system texts are re-stored from the text file (PLSK6) to the programs after each restart of ONLINE or OFFLINE. The message "TEXTS RESTORED" is displayed if re-storing has been performed successfully. "TEXTS: TRANSFER FAULT" is displayed if the transfer has not been successful.

Both systems, ONLINE and OFFLINE, display a selection mask after startup which can be used for activating the required system. This mask also enables the user to re-store the system programs. The keyswitch position is also significant here (see Fig. 1-3).

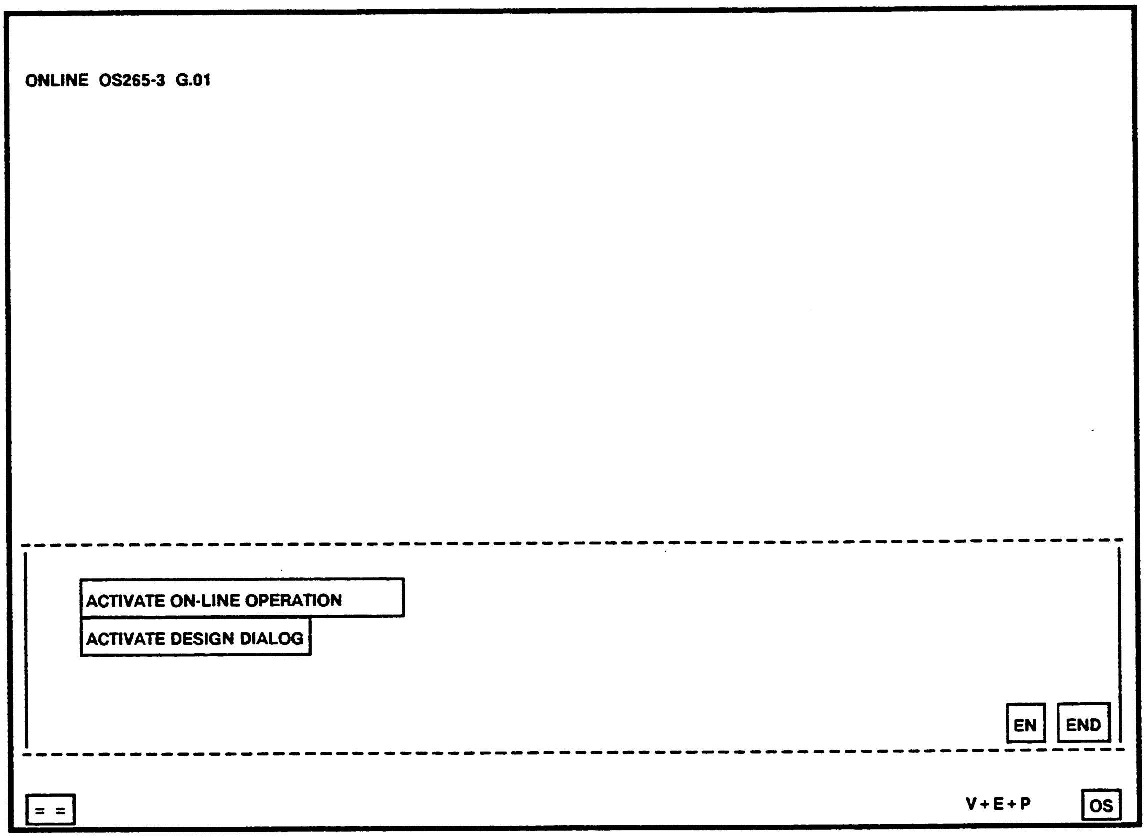


Fig. 1-2 Mask "activate on-line operation phase/design phase"

All programs and data required during operation are resident in the main memory.

The hard disk is only accessed for

- system initialization
- storing created data
- shadow mode
- text editing
- buffering and reading user-related logs
- storage and retrieval of historic curve values.

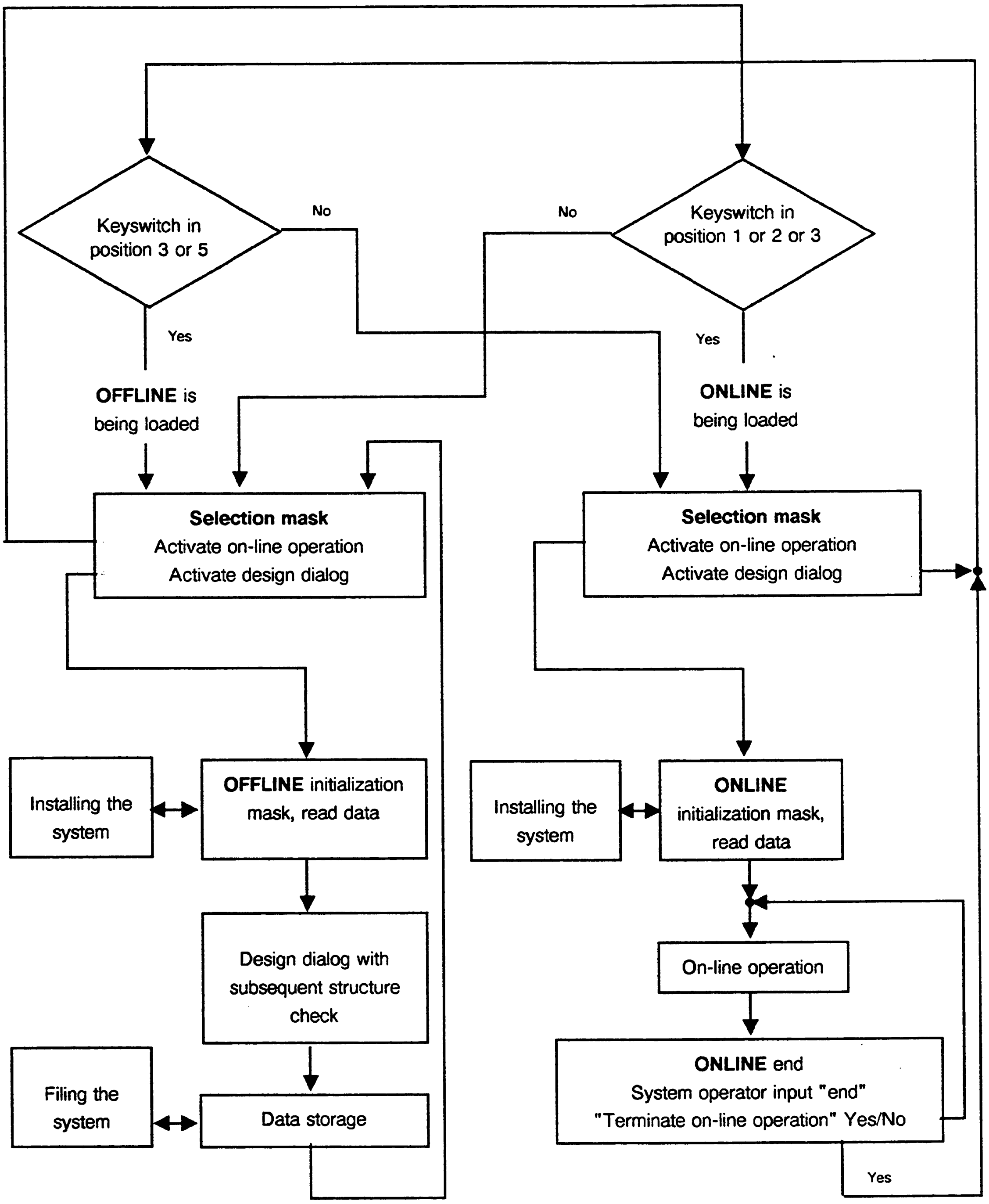
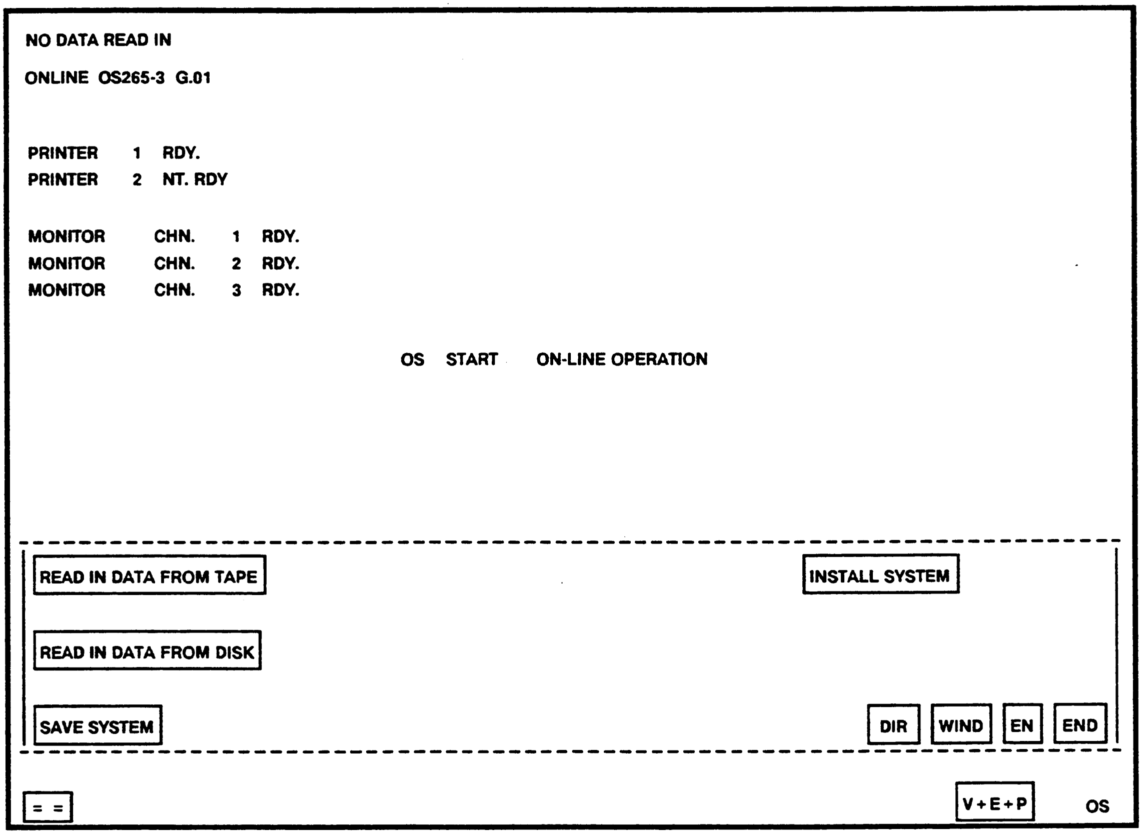


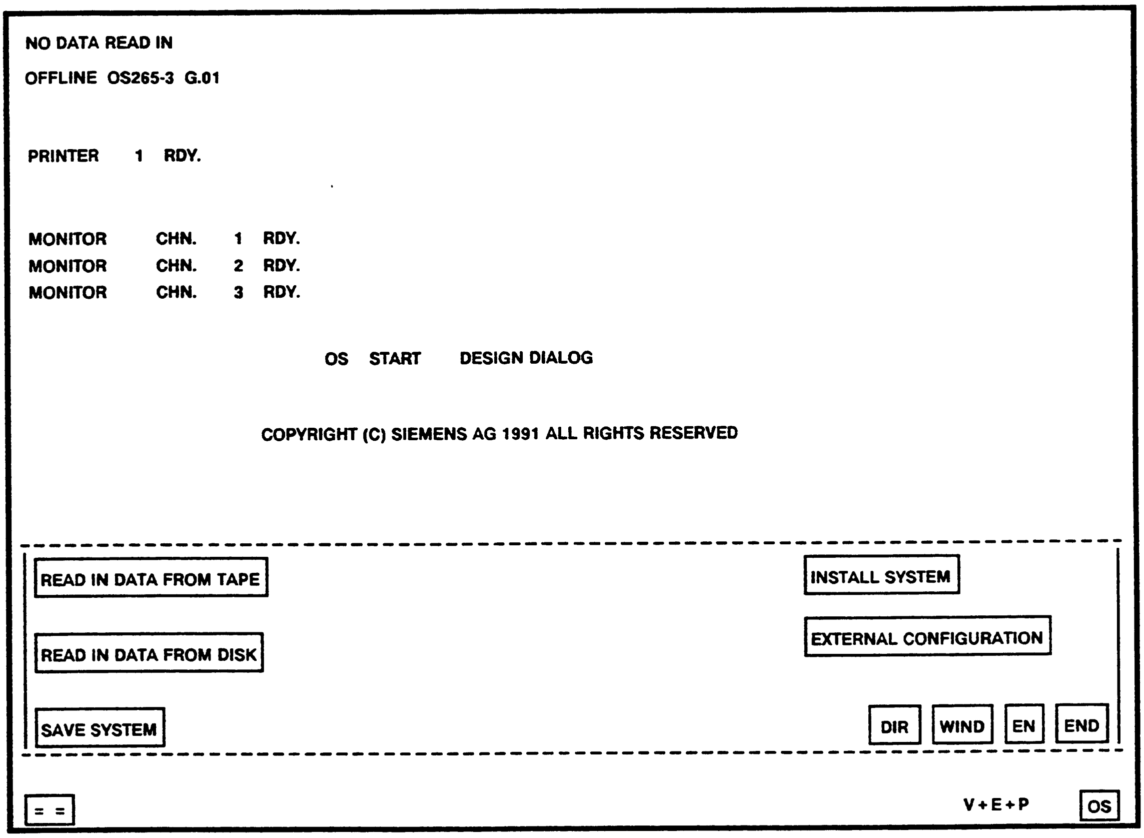
Fig. 1-3 Handling after system initialization

The required system (ONLINE for operating phase or OFFLINE for user data design) can be selected and activated in the selection mask (Fig. 1-2). A program system displays the related initialization mask after it has been activated (Figs. 1-4, 1-5).



```
NO DATA READ IN

ONLINE  OS265-3  G.01


PRINTER    1   RDY.
PRINTER    2   NT. RDY

MONITOR      CHN.     1    RDY.
MONITOR      CHN.     2    RDY.
MONITOR      CHN.     3    RDY.

                                       OS    START       ON-LINE OPERATION
```

Fig. 1-4 ONLINE system initialization mask



```
NO DATA READ IN
OFFLINE  OS265-3  G.01

PRINTER    1   RDY.

MONITOR     CHN.    1   RDY.
MONITOR     CHN.    2   RDY.
MONITOR     CHN.    3   RDY.

                        OS   START     DESIGN DIALOG

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```

Fig. 1-5 OFFLINE system initialization mask

The two system programs feature the following data and program transfer functions:

OFFLINE:
- Read data
- Store data
- Install system programs
- File system programs
- Save system

ONLINE:
- Read data
- Install system programs
- Save system

1.3 Loading and Saving Data and Programs

The magnetic tape cassette drive is a backup facility for the hard disk, and can be used for storing curve files, image or shadow data, as well as for loading new software versions or text files in foreign languages.

Data transfer between tape unit and main memory are always routed via the hard disk.

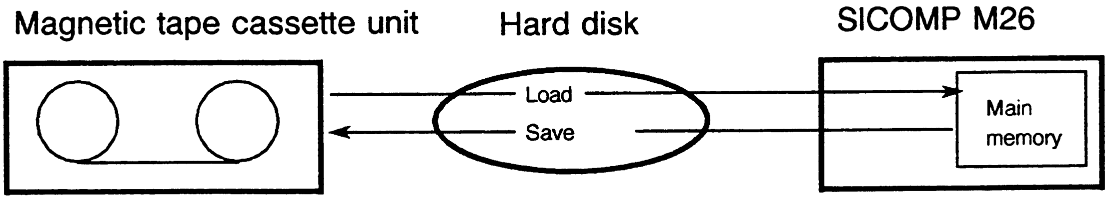


Fig. 1-6 Data and program transfers

Each transfer between hard disk and tape unit is logged on a printer. Examples of this process are described in Chapter 1.3.5

Note: READ DATA or STORE DATA is delayed by approximately 20 seconds per keyswitch position change. The keyswitch position should therefore not be changed while data is being read or stored.

1.3.1 Reading Data - Installing/Saving/Storing the System

Once the OFFLINE or ONLINE system has been activated, a menu field is displayed which enables the user to read data, and to save or install the system.

- **Reading data**

Operating phase:
The user-related data must be loaded from the hard disk or magnetic tape cassette into the main memory before the operating phase can be started.

Design dialog:
Data can be read for the design dialog if existing data is to be extended or modified. The dialog must be continued by selecting the END key if "new design" is selected instead of "continued design".

Note: Before the OS 265 is delivered, "SAVE SYSTEM" is performed in the OFFLINE system with read basic data. The OFFLINE system and the basic data are subsequently stored in PLSK0. The basic data is available after the next OFFLINE initialization without additional loading.

READ DATA FROM THE TAPE

In this context, "data" always means image data.
A cassette must be inserted which already contains image data. First, the transfer from tape to hard disk is performed and the protective request ("overwrite hard disk") displayed. The function is aborted if the request is answered by NO; entering YES copies new data onto the logic device "BILDAT". Subsequently, the function "READ DATA FROM DISK" is performed automatically.

READ DATA FROM DISK

This function transfers image data from the hard disk to the main memory. Existing image data in the main memory is overwritten. The mask displayed during the transfer shows the creation date of the data (ISSUE:). The read process is indicated graphically by several asterisks which disappear after reading has been completed. The function can then be terminated by selecting END.

SAVE SYSTEM

This function saves (after a protective request) the image of the entire main memory (i.e. programs **and** data) onto the corresponding logic device (PLSK0 for OFFLINE, PLSK1 for ONLINE). The old contents of the logic device are overwritten. This has the following effect:

The yellow message "NO DATA READ IN" is **not** displayed on the message line after the corresponding program (keyswitch V or V+E, Fig. 1-1) has been started. Reading data can be omitted or performed (e.g. with modified data).

Advantage: initialization is shorter by the time required for reading the data..

- **Installing the system**

READ IN OS SYSTEM

This function enables the logic devices 0 to 6 to be copied from tape to disk. Copying can be performed either individually or together.

This can be required for
- loading new software versions
- loading different image data
- loading shadow data
- loading different text files (e.g. in a foreign language)

The mask READ IN OS SYSTEM/STORE OS SYSTEM is displayed after the INSTALL SYSTEM key has been selected.
Selecting READ SINGLE copies specific logic devices (e.g. only OFLINE, only ONLINE, or OFLINE and BILDAT, etc.) from the tape to the hard disk. Selection is performed by a YES/NO inquiry dialog (example: DISPLAY DATA? YES/NO).

Selecting READ ALL sequentially copies the logic devices 1-6 in the OFFLINE system or the logic devices 0, 2-6 in the ONLINE system from the tape to the hard disk. The currently active copy process is displayed on the message line (OFFLINE, ONLINE, DISPLAY DATA, etc.)

Note: The ONLINE system (PLSK1) can only be transferred in OFFLINE mode from magnetic tape cassette to hard disk.
The OFFLINE system (PLSK0) can only be transferred in ONLINE mode from magnetic tape cassette to hard disk.

STORE OS SYSTEM

This function only copies the first seven logic devices (PLSK0-7) from the hard disk to the tape (duration approximately 8 minutes).

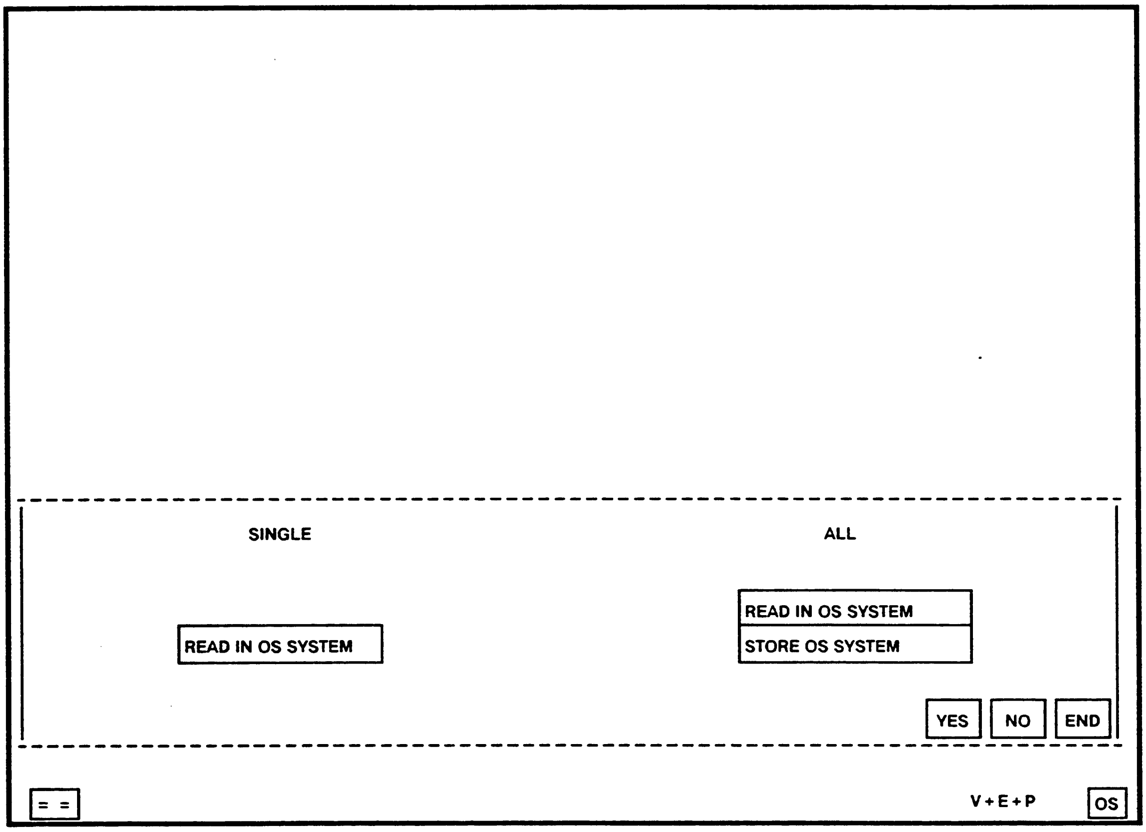


Fig. 1-7 Mask "Read in OS system/store OS system"

EXTERNAL CONFIGURATION

This function can be used to transfer data from or to PROGRAF OS. In this case, the data must be read from the disk into the main memory.

When data are transferred from PROGRAF OS, a configuration check is automatically initiated immediately after the transfer.

⚠ **Important:**

If faults occur during the configuration check, the OFFLINE system must be reloaded from the disk. Cf. Chap. 1.2, Switching on the system.

See the PROGRAF OS User's Manual (Order No. C79000-G8076-C342), Chap. 10 for further details.

1.3.2 Storing Data - Saving/Filing the System

- **Storing data**

Data can only be stored on hard disk or tape after the configuration check has been passed. The configuration check is performed if the protective request "STRUCTURE CHECK?" is answered by YES after the END key has been selected in the configuration selection menu field.

The data should be stored on hard disk and/or tape after the configuration check has been passed. The data in the main memory will be lost when the ONLINE system is loaded or the OS is switched off.

Storage is only permitted if the message "STRUCTURE CHECK O.K." is displayed at the end of the configuration check. If an error message is displayed, either the Service Department must be notified or the last data issue be used.

Note: Data which has not been stored will be lost and a restart is necessary if the terminal is switched off and back on during configuration. This means that the configuration check must be executed and data be stored on hard disk or tape before the system can be switched off.

STORE DATA ON TAPE

This function is the reverse process of READ IN DATA. The image data is transferred from the main memory to the hard disk and then to the magnetic tape. Existing data on hard disk and magnetic tape cassette will be overwritten.

STORE DATA ON DISK

The image data is transferred from the main memory to the hard disk after a positive answer has been given to the protective request. The current time and date are stored as creation date ("Issue"). The storage process is visualized in the same manner as the reading process.
Note: In this process, PLSK5-SYSTES is deleted and prepared for the MEM dump.

- **Saving the system**

Selecting the SAVE SYSTEM key stores the image data and the OFFLINE system in PLSK0 on the hard disk after the configuration check has been passed. The image data will be directly available after the next initialization into the design phase, and need not be read again.

Note: The OFFLINE system and the basic data have been stored in this PLSK0 before the system is delivered. This logic device is overwritten if the SAVE SYSTEM function is activated after the configuration check. The basic data (if new image data has been designed) has disappeared from the hard disk. The basic data should therefore be saved onto a magnetic tape cassette.

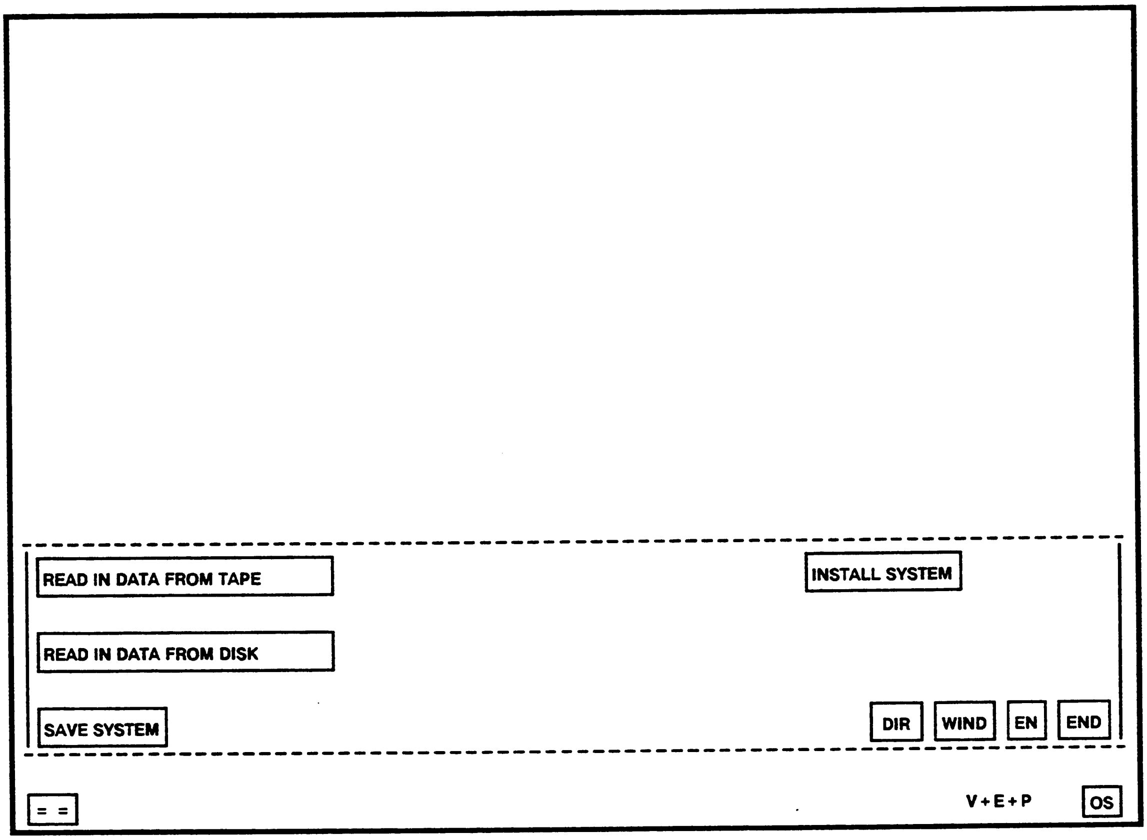


Fig. 1-8 Mask after the configuration check

- **Filing the system**

Selecting the STORE SYSTEM key activates the corresponding mask (Fig. 1-9).

STORE OS SYSTEM

This is the reverse process of READ IN OS SYSTEM. The logic devices 0 to 6 on the hard disk can - individually or together - be copied from the hard disk to the magnetic tape cassette.

This function is useful for:

- backup copies of the software versions and/or image data
- saving shadow data
- saving edited texts
- data exchange between different OS systems.

Existing data is overwritten without previous warning.

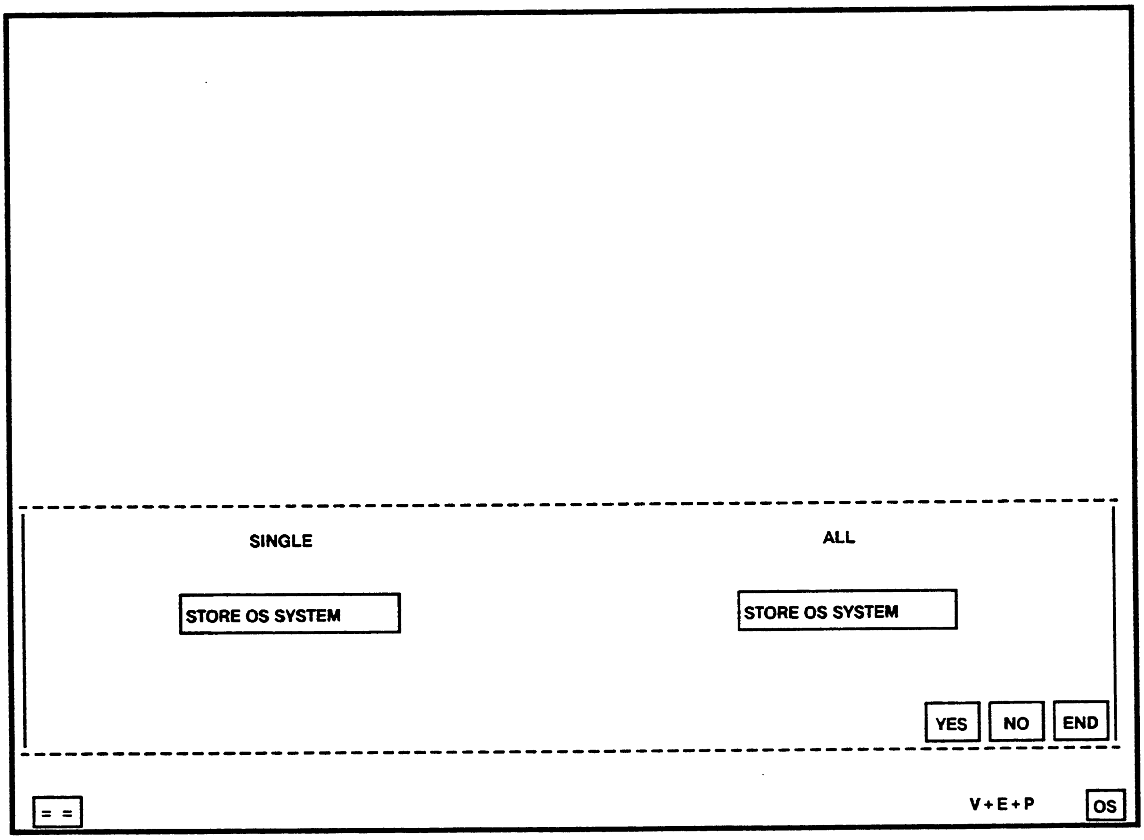


Fig. 1-9 Mask "Store OS system"

1.3.3 DIR / WIND / EN

DIR

Selecting DIR prints the directory of a magnetic tape cassette if a printer has been connected.

Note: The DIR function does not indicate defective logic devices on the magnetic tape cassette (due to, for example, an error which might have occurred when the data was saved onto cassette).

WIND

Selecting this key rewinds the magnetic tape cassette without reading or writing. This function is used for equalizing mechanical stress of the tape. The WIND function should be activated once prior to each write process (e.g. "store data on tape"). Magnetic tape cassettes which are stored for a long time should be rewound once or twice a year.

EN **END**

Data transfer via or to the hard disk overwrites the addressed logic device on the hard disk. In order to avoid inadvertent data loss, the protective request "DISK OCCUPIED, OVERWRITE BY OPERATING EN KEY" is displayed when a transfer is initiated. Selecting the EN key starts the activated function; selecting END aborts it immediately.

1.3.4 Handling Sequences

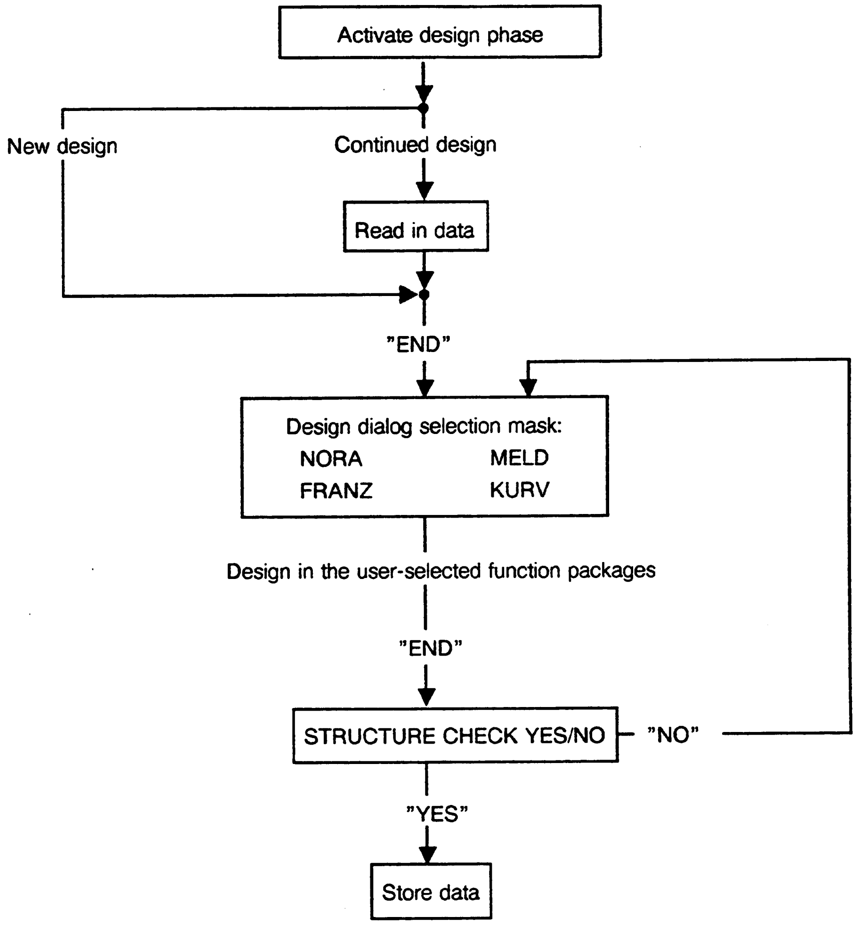
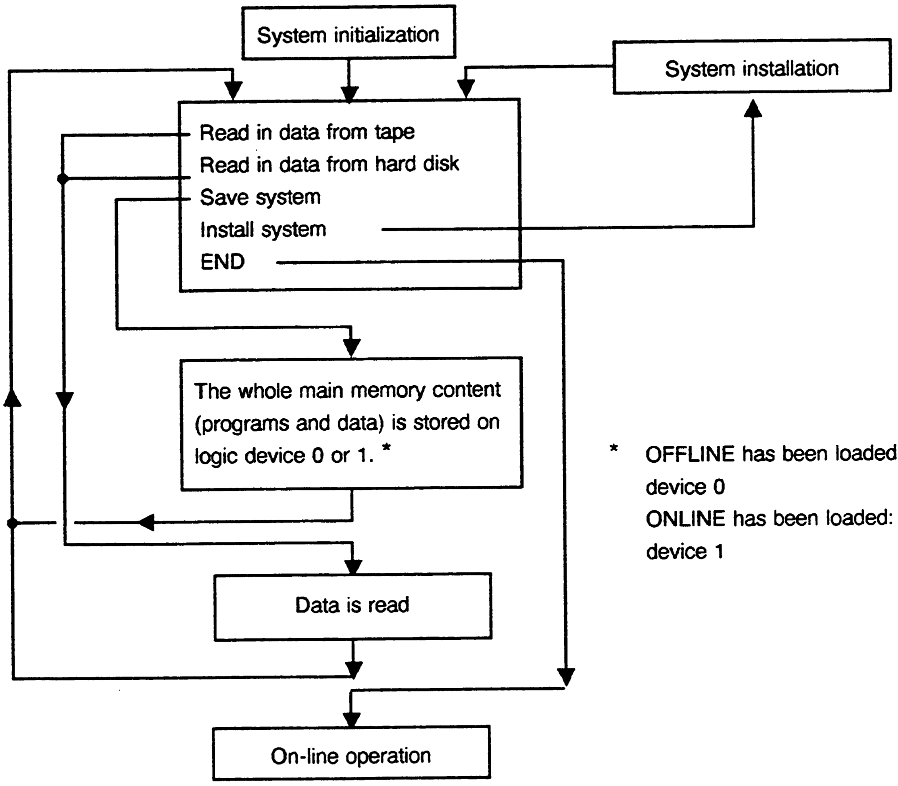
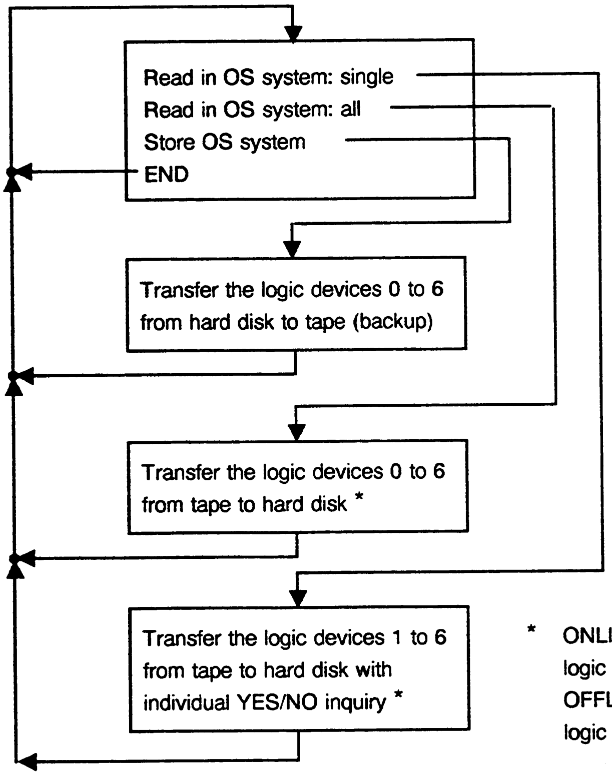


Fig. 1-10 Design dialog



* OFFLINE has been loaded: logic device 0
ONLINE has been loaded: logic device 1

Fig. 1-11 Read data



* ONLINE has been loaded: logic devices 0, 2-6
OFFLINE has been loaded: logic devices 1-6

Fig. 1-12 System installation

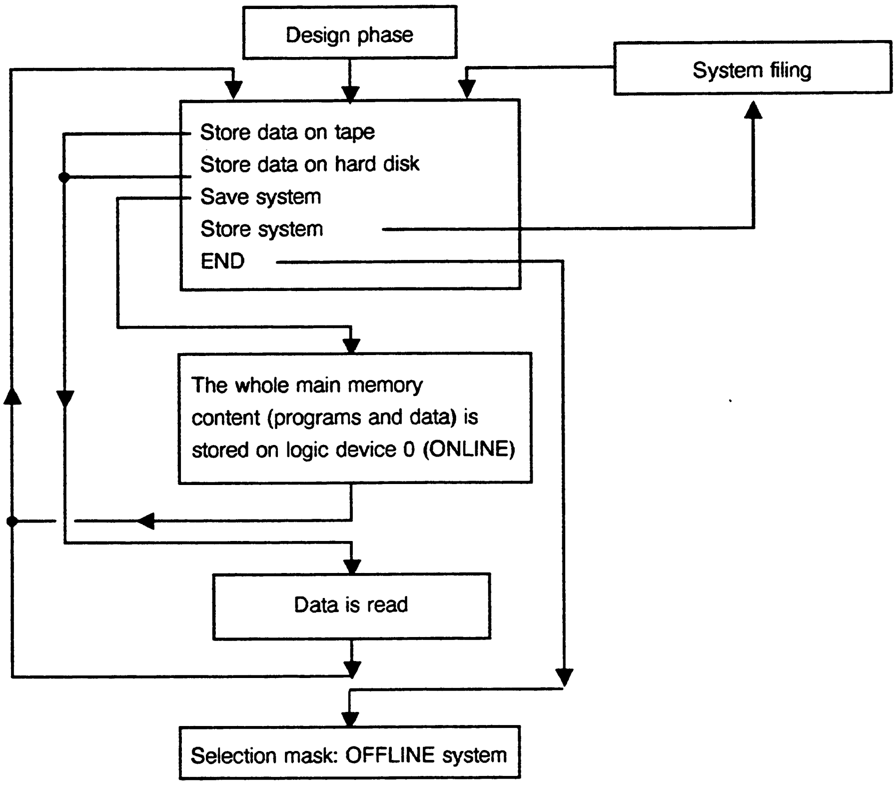


Fig. 1-13 Store data

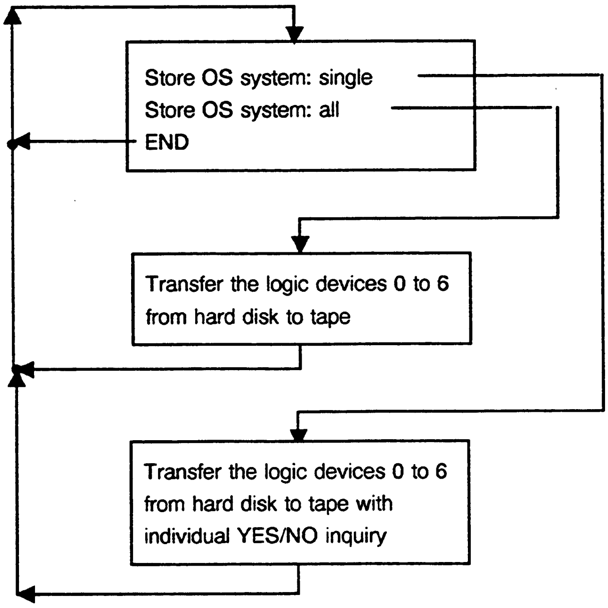


Fig. 1-14 System filing

1.3.5 Logging

Each data transfer between hard disk and magnetic tape cassette is logged on a printer. Every logging process consists of several parts:

- initiating the copy program

- initiating the copy function
- execution or error message

- termination message from the copy program if the function has been completed successfully.

1.3.5.1 Logging Examples

The following examples are used for explaining the various logs.

Transfer hard disk → magnetic tape cassette

Example 1: transfer of image data

```
99 MCSAVE        V 3.02 !
99 MCSAVE:   DEV PLSK 2.  0   VOL BILDAT   OWNER    GWKTPL
99 MCSAVE:   DEV PLSK 2.  0   VOL BILDAT   TO SECTION   1 COPIED.
99 MCSAVE:   !
```

Line 1:	Initiating the copy program (program number 99, name MCSAVE, version V2.02).
Line 2:	Initiating the copy function, specifying the disk number (PLSK2.0) and the name of the logic device (BILDAT, see table in Chapter 1.1).
Line 3:	Execution message (TO SECTION 1 COPIED); means "COPIED TO MAGNETIC TAPE CASSETTE" here.
Line 4:	Termination message from the copy program.

DEV = DEVICE,
VOL = VOLUME.

The text "OWNER XXXXXX" has no meaning here.

Example 2: Log of the function "STORE OS SYSTEM"

```
99 MCSAVE:   DEV PLSK 0.   0 VOL   OFLINE     OWNER               .
99 MCSAVE:   DEV PLSK 0.   0 VOL   OFLINE     TO SECTION   1 COPIED.
99 MCSAVE:   !
99 MCSAVE:   DEV PLSK 1.   0 VOL   ONLINE     OWNER               .
99 MCSAVE:   DEV PLSK 1.   0 VOL   ONLINE     TO SECTION   1 COPIED.
99 MCSAVE:   !
99 MCSAVE:   DEV PLSK 2.   0 VOL   BILDAT     OWNER               .
99 MCSAVE:   DEV PLSK 2.   0 VOL   BILDAT     TO SECTION   1 COPIED.
99 MCSAVE:   !
99 MCSAVE:   DEV PLSK 3.   0 VOL   MIDAT1     OWNER               .
99 MCSAVE:   DEV PLSK 3.   0 VOL   MIDAT1     TO SECTION   1 COPIED.
99 MCSAVE:   !
99 MCSAVE:   DEV PLSK 4.   0 VOL   MIDAT2     OWNER               .
99 MCSAVE:   DEV PLSK 4.   0 VOL   MIDAT2     TO SECTION   1 COPIED.
99 MCSAVE:   !
99 MCSAVE:   DEV PLSK 5.   0 VOL   SYSTES     OWNER               .
99 MCSAVE:   DEV PLSK 5.   0 VOL   SYSTES     TO SECTION   1 COPIED.
99 MCSAVE:   !
99 MCSAVE:   DEV PLSK 6.   0 VOL   FRETEX     OWNER               .
99 MCSAVE:   DEV PLSK 6.   0 VOL   FRETEX     TO SECTION   1 COPIED.
99 MCSAVE:   !
99 MCSAVE:   !
```

Line 1: Initiating PLSK0 copying

Line 2: Copy confirmation

Line 3: Acknowledgement from the copy program for magnetic tape stop

Line 4 - 21 etc. for PLSK 1-6

Last line: Termination message from the copy program

Transfer magnetic tape cassette → hard disk:

Example 1: Image data transfer

```
99 MCSAVE        V 3.02 !
99 MCSAVE:  DEV PLSK  2.  0 VOL   BILDAT      OWNER GWKTPL
99 MCSAVE:  DEV PLSK  2.  0 VOL   BILDAT      FROM SECTION        1 COPIED
99 MCSAVE:  !
```

Line 1:	Initiating the copy program.
Line 2:	Initiating the copy function, specifying the disk number (PLSK2.0) and the name of the logic device (BILDAT).
Line 3:	Execution message (FROM SECTION 1 COPIED); means "COPIED FROM MAGNETIC TAPE CASSETTE" here.
Line 4:	Termination message from the copy program.

Example 2: Transfer of image data (the OFFLINE and the ONLINE system have been stored on the cassette before the image data).

```
99 MCSAVE       V 3.02  !
99 MCSAVE:  DEV    PLSK   2.   0 VOL BILDAT  OWNER GWKTPL
99 MCSAVE:  VOL    OFLINE IGNORED.
99 MCSAVE:  VOL    ONLINE IGNORED.
99 MCSAVE:  DEV    PLSK   2.   0 VOL BILDAT  FROM SECTION       1    COPIED
99 MCSAVE:  !
```

Line 1:	Initiating the copy program.
Line 2:	Initiating the copy function.
Line 3:	Logic device OFLINE has been found and ignored, since only image data is to be copied.
Line 4:	Logic device ONLINE has been found and ignored, since only image data is to be copied.
Line 5:	Execution message (COPIED)
Line 6:	Termination message from the copy program

Log of the DIR function:

```
SIEMENS SYSTEMSOFTWARE AMBOSS MCSAVE  V 3.02  89.06.15   12.41   PAGE 1

DIR MKSK1 ALL TO DRUA;

DEV MKSK 1.  0   BACKUP ON 89.06.15  11.53  SECTION 1              MCSAVE
VOL OFLINE   OWNER    GWKTPS         DATE 89.05.24    CAP 16384 SEC / 10 MBYTE

DEV MKSK 1.  0   BACKUP ON 89.06.15  11.56  SECTION 1    MCSAVE
VOL ONLINE   OWNER    GWKTPS         DATE 89.05.24    CAP 16384 SEC / 10 MBYTE

DEV MKSK 1.  0   BACKUP ON 89.06.15  12.00  SECTION 1    MCSAVE
VOL BILDAT   OWNER    EMAJ4PCK       DATE 89.06.15    CAP 14384 SEC /  7 MBYTE

DEV MKSK 1.  0   BACKUP ON 89.06.15  12.06  SECTION 1    MCSAVE
VOL MIDAT1   OWNER                   DATE 89.06.15    CAP  2048 SEC /  1 MBYTE

DEV MKSK 1.  0   BACKUP ON 89.06.15  12.13  SECTION 1    MCSAVE
VOL MIDAT2   OWNER                   DATE 89.06.15    CAP  2048 SEC /  1 MBYTE

DEV MKSK 1    0  BACKUP ON 89.06.15  12.19  SECTION 1    MCSAVE
VOL SYSTES   OWNER                   DATE 89.05.22    CAP 16384 SEC /  8 MBYTE

DEV MKSK 1.  0   BACKUP ON 89.06.15  12.27  SECTION 1    MCSAVE
VOL FRETEX   OWNER                   DATE 89.01.24    CAP  2048 SEC /  1 MBYTE

  99 MCSAVE:  !
  99 MCSAVE   V 3.02  !
```

Line 1:	MCSAVE header line
Line 2:	Function: output magnetic tape cassette directory to printer
Line 3:	Logic device name DEV MKSK1, exact date to the minute when creating a backup copy; number within a backup copy.
Line 4:	OFLINE data carrier name; owner name; date of formatting
Line 5-16:	Five additional logic devices with the same specifications as described for lines 3 and 4.
Line 17, 18:	Termination message from MCSAVE and version.

1.3.5.2 Error Messages During Transfer

No magnetic tape cassette inserted:

```
99  MCSAVE    V 3.02  !
99  MCSAVE:   DEV PLSK 0.   0 VOL OFLINE OWNER GWKQPA
99  MCSAVE:   DEV MKSK 1.   0 NOT READY.
```

MKSK 1.0 = magnetic tape cassette drive

Magnetic tape cassette is write protected:

```
99  MCSAVE    V 3.02 !
99  MCSAVE:   DEV PLSK 2.   0 VOL BILDAT OWNER GWKTPL
99  MCSAVE:   DEV MKSK 1.   0 WRITE PROTECTED.
```

Magnetic tape cassette has been removed during transfer:

```
99  MCSAVE    V 3.02  !
99  MCSAVE:   DEV PLSK 0.   0 VOL OFLINE OWNER GWKQPA
99  MCSAVE:   DEV MKSK 1.   0 NOT READY.
99  MCSAVE:   DEV MKSK 1.   0 NOT READY.
```

Image data is to be copied (line 2) but cannot be found on the cassette inserted (line 5). Only the ONLINE and OFFLINE system have been found (lines 3 and 4):

```
99  MCSAVE    V 3.02  !
99  MCSAVE:   DEV PLSK 2.   0 VOL BILDAT OWNER GWKTPL
99  MCSAVE:   VOL OFLINE IGNORED.
99  MCSAVE:   VOL ONLINE IGNORED.
99  MCSAVE:   DEV MKSK 1.   0: END OF DATA.
```

The following error message is issued if an attempt is made to transfer the OFFLINE system from cassette to hard disk while the OFFLINE system is active (cf. Chapter 1.3.1):

```
99  MCSAVE    V 3.02  !
99  MCSAVE:   DEV PLSK 0.   0 VOL OFLINE OWNER GWKQPA
99  MCSAVE:   DEV PLSK 0.   0: FILES OPEN.
```

If incorrect data is transferred from magnetic tape cassette to hard disk (for example, if the magnetic tape cassette has been removed during transfer and an attempt is made to copy the incomplete data to the hard disk), one of the following messages will be issued, depending on the location of the fault (in the label or the data proper):

```
99  MCSAVE    V 3.02  !
99  MCSAVE:   DEV PLSK 1.   0 VOL ONLINE OWNER GWKQPA
99  MCSAVE:   INCORRECT DATA ON CARTRIDGE

99  MCSAVE    V 3.02  !
99  MCSAVE:   DEV PLSK 1.   0 VOL ONLINE OWNER GWKQPA
99  MCSAVE:   DEV PLSK 1.   0 SECTOR 2900 READ/WRITE ERROR.
```

In the last two cases, the data on the magnetic tape cassette is invalid and can no longer be copied to hard disk. These faults should not occur if the magnetic tape cassette unit is always used according to the instructions. The magnetic tape cassette must never be removed from the unit whilst the drive is busy (green LED ON).

In addition to the above printouts, the message "DEVICE NOT READY OR DATA NOT AVAILABLE" is also displayed on the terminal.

1.4 Versions in Foreign Languages

As mentioned in Chapter 1.1, the magnetic tape cassettes for versions in foreign languages contain several logic devices (cf. individual product information):

- text file in foreign language
- shadow data for translating existing data into the foreign language (up to 6 logic devices)
- basic data in the foreign language

Two different initial situations can be distinguished when using these magnetic tape cassettes:

1. No user data has been created in the German system - the user starts "from scratch".

If this is the case, conversion to a foreign language requires the following steps when initializing the OS 265 system:

- Switch on OS 265 and select the OFFLINE system.
- Insert the magnetic tape cassette for the foreign language.
- Select system installation.
- Select the function "READ IN OS SYSTEM: SINGLE" and read DISPLAY DATA and SYSTEM TEXTS; then select the END key.
- Execute the function "READ IN DATA FROM DISK", then select the END key.
- Remove the magnetic tape cassette.

The magnetic tape cassette is no longer required for further OS 265 system start-ups, as all the information is now stored on hard disk.

If this procedure has been followed during the first start-up, the user starts configuration with basic data and texts in the foreign language, i.e. the shadow data on the magnetic tape cassette is not required.

2. User data has already been created in the German system.

If this is the case, the basic data in the foreign language cannot be used as all user data would then be lost. The shadow data provided on the magnetic tape cassette must be used in this case. Initialization then requires the following steps:

- Switch on OS 265 and select the OFFLINE system.
- Insert the magnetic tape cassette for the foreign language.
- Select system installation.

- Select the function "READ IN OS SYSTEM: SINGLE" and read SHADOW DATA OFFLINE 1 and SYSTEM TEXTS; then select the END key.
- Execute the function "READ IN DATA FROM DISK", then select the END key.
- Remove the magnetic tape cassette.
- Place the keyswitch (if there is one) in position "V + E + P".
- Select the functions "AUTOMATIC DESIGN", "AUTOMATIC DESIGN: FAST RUN" and reply with "YES" to the inquiry "START AUTOMATIC RUN". This converts the basic data into a foreign language.
- Wait for the message "END AUTOMATIC RUN" to be displayed.
- Select the END key and perform the configuration check. Then execute the function "STORE DATA ON DISK" and transfer the data available to the hard disk. If required, the function "STORE DATA ON TAPE" can be activated to create a backup copy on a magnetic tape cassette. Then select the END key.

This procedure may be repeated if required. It must be performed for each shadow data sequence contained on the magnetic tape cassette supplied (cf. respective product information). The magnetic tape cassette is not required for future start-ups.

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2 Basic Design Concept

All OS 265 functions are contained in a software package, and installed on the FP27-E hard disk. Two modes, ONLINE mode (for operating phase and process link) and OFFLINE mode (for design phase), must be distinguished.

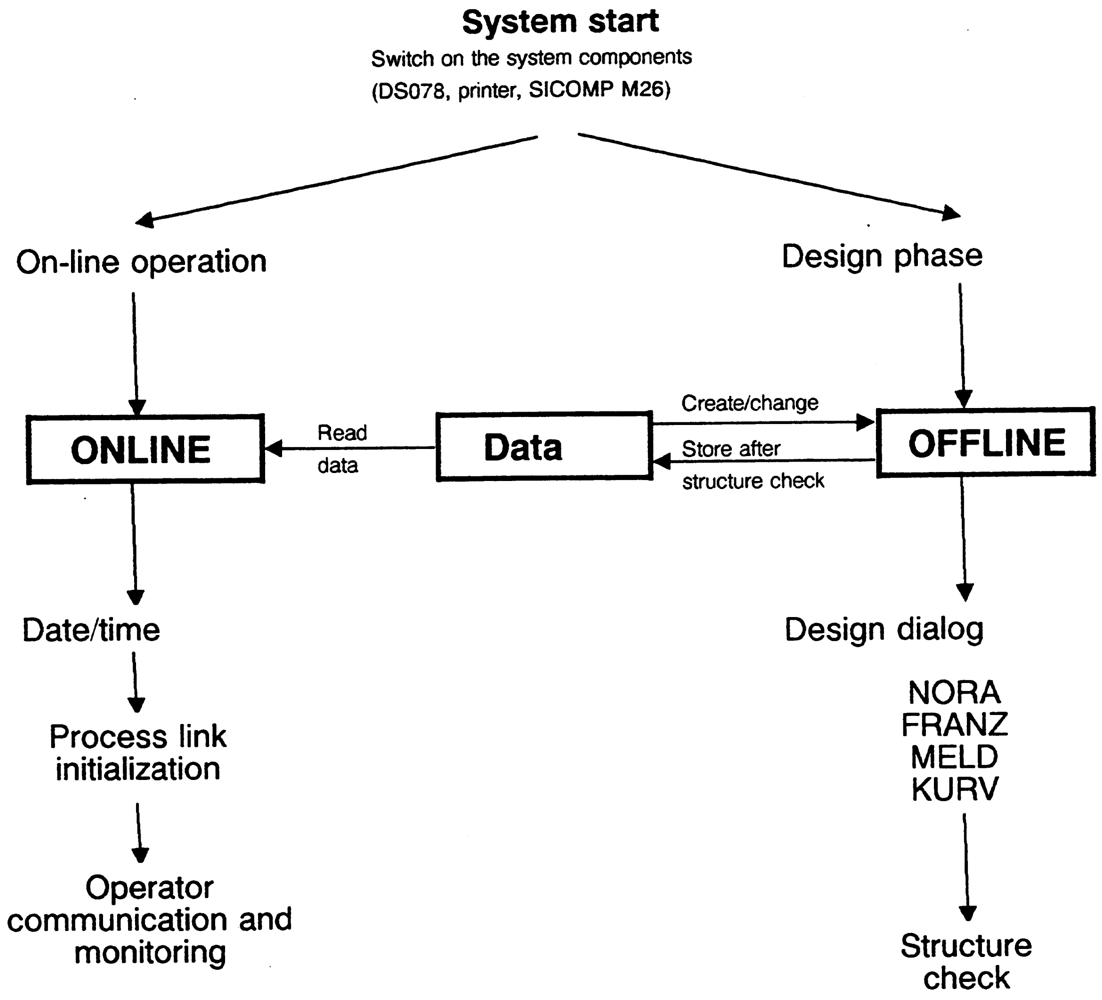


Fig. 2-1 System configuration

Design and modification of the process images for system representation (user-related data) is only possible in the OS 265 OFFLINE system.

Once the initial OFFLINE mask has been opened, data can be read according to the requirements (new or continued design). Selecting the END key activates design dialog and displays the selection mask for the NORA, FRANZ, MELD and KURV function packages.

The designer's work is supported by menus, key sets, annotations and messages issued by the OS. The light pen can be used for all operator inputs. Letters, numbers and special characters may also be entered via an alphanumeric keyboard.

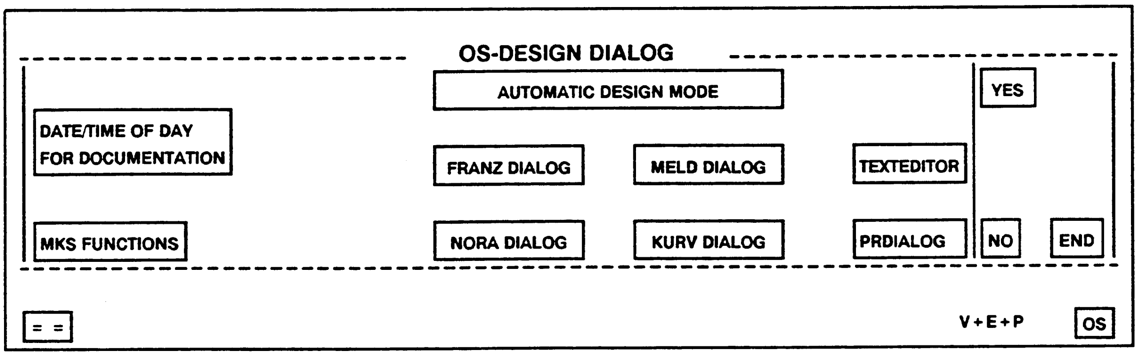


Fig. 2-2 OS design dialog menu field

DATE/TIME OF DAY FOR DOCUMENTATION	Specification of the date and time used for logging (documentation updating) configured data.
MKS FUNCTIONS	Interpretation of MKS messages for NORA/FRANZ or MELD. Dialogs used for MKS bit classification and for MKS-controlled display updating.
AUTOMATIC DESIGN MODE	This function key activates automatic (re-)configuration (Chapter 2.5).
FRANZ DIALOG	Design dialog for a free representation of the system images (Chapter 5).
NORA DIALOG	Standardized display of the system images. Design in form mode (Chapter 4.2).
MELD DIALOG	Dialog for of message text configuration (Chapter 7).
KURV DIALOG	Curve group design (Chapter 8).
TEXT EDITOR	Editing/modifying system texts (Chapter 3).
PRDIALOG	This key can only be used after a coded input has been performed by System Service.

2.1 Operator Tools and Screen Functions

Only one process terminal connected to the OS 265 operating channel 1 is required for design. All other operating channels are inactive during this phase.

2.1.1 Operator Tools

Light pen and alphanumeric keyboard can be used in any required combination for operator inputs. The light pen can always be used for all entries by selecting keys in a virtual menu field (DIAVID) which is displayed on the screen.

Serial entries, such as

- in form mode (NORA, FRANZ (MKS processing), KURV and MELD)
- in text editor mode
- in the design field when the alphanumeric DIAVID menu field is displayed
- in the echo line (e.g. specifying the image level number)

can be performed much quicker via the alphanumeric keyboard.
Functions which can be entered via the alphanumeric keyboard are described together with the DIAVID menu fields (Chapter 2.3).

An alphanumeric keyboard is required for device parametrization of the DS 078.

2.1.2 Screen Layout

The screen is subdivided into 34 semi-graphic symbol lines and 80 symbol columns. Each symbol consists of 9x12 pixels.

Message line:	In the design phase, the first line of the alarm area is subdivided into two fields. The first field reaches from the first column to column 20 and contains the RIGHT/WRONG display which confirms light pen inputs. Operator prompts, system messages and internal error messages are displayed in the second field, which consists of the rest of the line.
Work area:	The work area is used as a design field in which all image-related information is created. This area can always be scrolled if a large-size image has been selected.
Command area:	Menu fields are displayed in the command areas. All inputs via virtual menu fields are displayed in the last line of the command area, the echo line.

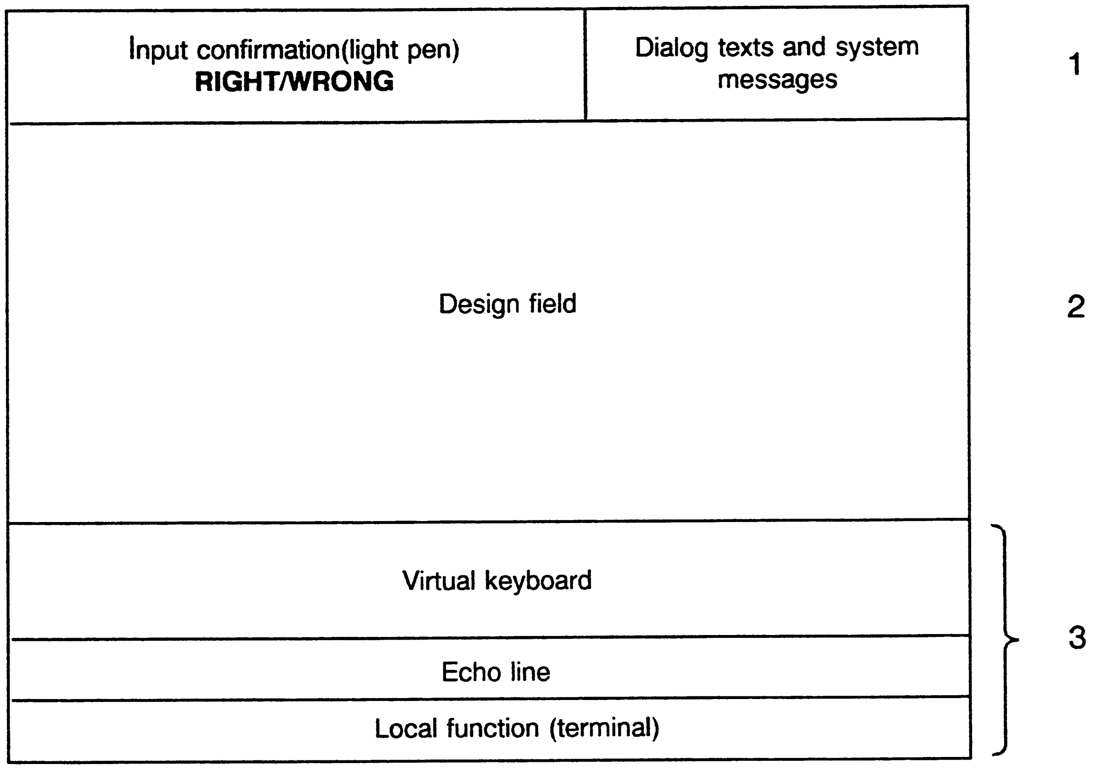


Fig. 2-3 Screen layout in the design phase

1	Message line
2	Work area
3	Command area

Local functions

Messages and/or function keys which are solely related to the process terminal functions are issued in lines 33 and 34. These functions include:

- device-related indications
- VDU control keys (scrolling large-size images)
- keyswitch position display

Selecting the " = = " key toggles the keyswitch position display on or off.

A green background of V, E, P, or OS indicates the selected keyswitch position.

V	(1)	means viewing
E	(2)	means input (operator-process communication, corresponds to PROTECTION 2)
P	(3)	means parametrization (corresponds to PROTECTION 3)
OS	(5)	is the keyswitch position for design dialog.

Scroll keys permit the work area to be moved as a window across the process display of a large-size image.

←←	Fast scrolling to the left-hand side	Fast motion: 12 lines or columns per second
↑↑	Fast scrolling to the top	
↓↓	Fast scrolling to the bottom	
→→	Fast scrolling to the right-hand side	
←	Scrolling to the left-hand side	Slow motion: 6 lines or columns per second
↑	Scrolling to the top	
↓	Scrolling to the bottom	
→	Scrolling to the right-hand side	

2.1.3 Operation Indication and Parametrization of the DS 078 Unit

State after turning on the power

The DS 078 process terminal is in its initial state after the power has been switched on. The initial state depends on the parameter settings contained in the non-volatile memory (EEPROM). The unit executes the selftest routines before it assumes the initial state if selftest has been selected.

A malfunction is displayed for several seconds on the message line (line 33) of the monitor. The operating level (NIL dots) is displayed subsequently.

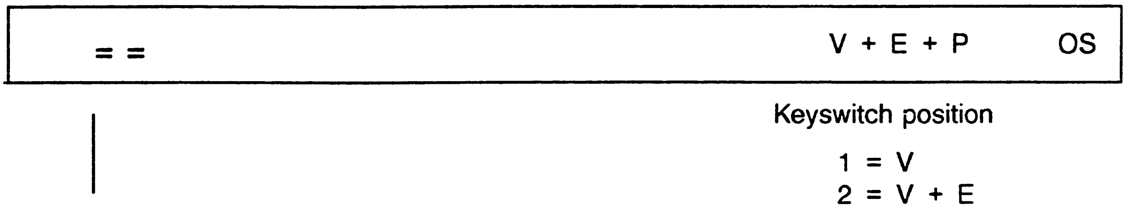
The user is informed of the device state by merely watching the message line.

- The unit is ok if the operating level is displayed directly.
- The unit is defective if error messages are displayed first.

- **Initial state**

The terminal is in its initial state once the selftest has been passed:

- lines 1 - 32 are filled with NIL dots
- lines 33 is black
- lines 34 (see Fig.) contains local messages



Select key set *)

Keyswitch position

1 = V
2 = V + E
3 = V + E + P
4 = not used
5 = OS

*) Light pen selection

- **Selftest error messages** (in line 33)

Display	Meaning
EEP	EEPROM checksum
DPM	Communication between main and slave processor (I/O processor) is disturbed.
PAG	PAGE register for RAM
RAM	RAM main memory
TEF	EPROM checksum for terminal processor
INT	Interrupt controller
GSS	Device interfaces keyboard/AUX/etc.
IOP	I/O processor and environment RAM (DPM) / EPROM
IOF	EPROM checksum for I/O processor
ZSS	Host interface
GRA	Full graphics controller and environment; pixel memory / character generator
BWG	Full graphics image refresh memory
LIG	Light pen controller and environment
SEM	Semi-graphics controller; image refresh memory / character generator
BWS	Semi-graphics image refresh memory

- **Parametrization mode**

Parametrization mode provides the user with masks for entering DS 078 device settings. Access to this mode requires an alphanumeric keyboard to be connected to the VDU. The following operator inputs via the alphanumeric keyboard are required:

- Press the SHIFT and P (red P) keys simultaneously
- Enter a code word (default value "0078")

The initial setting mask is then displayed. Parametrization mode should not be activated during the design dialog. The OS cannot return from parametrization mode to the design phase; a restart is required and designed data which has not been stored will be lost.

The DS 078 functions
- screen saving and
- VK mode
can also be selected by parametrization.

The individual parameter input masks have the following meaning:

Mask	Contents	Meaning
G-EINST	Basic settings - image brightness - blanking - central unblanking - keyboard parameters - selftest - code word	User-selectable device features
BED-G.	Operating device setting - Operating unit - Operating mode - Touch screen calibration and test - Mouse speed	Operating unit features which can be selected by the user
LG-EINST	Light pen settings - cable length compensation and light pen test	User-selectable device features
SS-EINST	Interface setting - computer interface - serial I/O interface - keyboard	Firmly defined interface parameters (cannot be selected by the user)
TEST	- Firmware version - device configuration - error messages from initialization test	Enables the system engineer to check firmware version, revision level, device configuration and malfunctions

Cf. OS 265-3/-6 and DS 078 Operating Instructions

Note: If you have selected the test display mask and want to leave the parametrization mode without storing the modifications, press the SHIFT key + F2.

- **Indications during operation**

Various messages can be displayed for several seconds during operation. The terminal remains operational.

Display	Meaning	Note
DISPL.EDGE	Margin reached during scrolling	Change scroll direction
HC-NONEXIS	No hard copy unit connected	
HC FINISH	Image has been accepted by hard copy unit	
HC BUSY	Hard copy unit is busy	Wait for image output
HC STARTED	Image is being accepted by hard copy unit	
HC ERROR	Faulty reaction of hard copy unit	Hard copy unit defective
PK ERROR	Process communication keyboard interface error	

2.2 Operator Dialog

The dialog between designer and system is performed in the following manner:

- The system provides a menu field with a valid selection of alternative keys. This structure prevents incorrect operator input by illegal combinations.
- Additional texts are displayed on the message line which describe the designer's task for the next step or indicate incorrect operator inputs.
- All positions selected in the work area are marked by a blinking cursor after they have been selected.
- The first character of a selected key blinks and the message RIGHT or WRONG (for incorrect input) is displayed in the first third of the message line when a key in the menu field is selected.
- Each dialog step can be terminated by selecting either the abort key or a different function.

2.3 DIAVID Menu Fields

These menu fields, which are repeatedly displayed during a dialog, are used for entering figures, characters or symbols. An option which is not required can be skipped by selecting the END key. An error message is issued if a mandatory input has been skipped.

2.3.1 DIAVID Function Keys

General notes:

- The required function must be selected first, followed by the character or the position.

- A selected function blinks if position or character input is expected.

- A selected position or the next input position in the work area are marked by the cursor.

- Control functions which should not be activated simultaneously are mutually interlocking. Exception: The SE mode can only be de-activated by explicitly selecting the SE-OFF key

Explanation of the menu keys:

Colour keys

The top keys in the second control field from the left are used for selecting the foreground colours, whilst the bottom keys select the background colours.
The keys are displayed in matching colours:

WT - white
GN - green
BL - blue
OR - orange
YE - yellow
RD - red
CY - cyan
BK - black

The selected key combinations are displayed in the vertical pattern of the + characters. These fields cannot be used for inputs.

CC: Change colour

Using this function, the foreground and background colours of the characters/symbols displayed on the screen can be altered. The desired colour combination is selected first, then the image positions where colours are to be changed. The CC function may be combined with the RE function. The CC function and the BL function (blinking) are mutually exclusive.

CC key - change colour mode ON
OFF key - change colour mode OFF.

RE: Repeated entry

In this mode, the desired character is selected first, followed by two positions from the same line or the same column of the selected fields (operator-accessible positions in the graphics area). The selected character is entered in all fields from the first to the second position. A character cannot be selected if RE and CC mode are used together; this combination only permits colour change.

RE key - repeated entry ON
OFF key - repeated entry OFF.

BL: Blinking

This function is used to display characters which are to be represented in blinking mode; displayed characters are changed to a steady mode. The BL function may be used on its own or in RE or SE (serial entry) mode.

BL key - blinking ON
OFF key - blinking OFF.

RRS: Reset in RE mode

In RE mode, the character in the position selected first is restored and the position deselected.

>: Move cursor one position to the right

The cursor is moved one position to the right. This key can only be used in SE mode.
All the fields of this key possess the same function.

<: Move cursor one position to the left

The cursor is moved one position to the left. This key can only be used in SE mode.
All the fields of this key possess the same function.

SE: Serial entry

If this key is selected, RE mode is switched off, colour representation is reset (foreground colour white, background colour black), and blinking representation stops. Once the cursor has been positioned, the input field may be filled by continuously selecting the desired characters. The colour may be changed as required and, using the BL function, the characters may be displayed in blinking or steady mode. The cursor is positioned over the next input position once a character has been selected (cf. > key function).
After the SE key has been selected, the cursor is positioned at the beginning of the command line; entries in the command line are, however, not interpreted.

SE key - serial entry mode ON
OFF key - serial entry mode OFF.

BLANC key

This key appears together with the upper case letters. A blank is selected and displayed as a rectangular character in the background colour when a field of this key is selected.

→ : Tabulator key

This key is only expedient in form mode. Selecting the tab key positions the cursor to the next input field of the form.

NIL key

A nil dot character is displayed when this key is selected. Nil dots on the screen are ignored whilst the image is transferred. Only nil dots which have been designed as symbols are accepted.

SAN: Alphanumeric characters

Alphanumeric characters consist of upper case letters, figures and special characters. All the SAN key fields possess the same function.

S 0: Standard symbols

Standard symbols are the symbols contained in the standard symbol set. All the S 0 key fields possess the same function.

S 1: First symbol page

This key set consists of the first page of the downloaded symbol set. All the S 1 key fields possess the same function.

S 2: Second symbol page

This key set consists of the second page of the downloaded symbol set. All the S 2 key fields possess the same function.

-K-: Clear menu field

The menu field is cleared and the complete image displayed when this key is selected. The menu field is re-displayed when the light pen is used to select any screen position. All the -K- key fields possess the same function.

T ↑↓-Move menu field

The menu field is moved and the area which was hidden by the menu field displayed. All the K ↑↓ key fields possess the same function.

END: Terminate DIAVID mode

The menu field is cleared and the full image displayed when this key is selected. The DIAVID dialog is then terminated.

In serial entry mode, all alphanumeric characters displayed on the screen may also be entered via the alphanumeric keyboard. In addition, the following keys are active:

← - Cursor to the right

→ - Cursor to the left

DÜZ , DÜM - Terminate DIAVID

↵ (Return key) - Terminate DIAVID

TAB (Tabulator) - as → virtual key (tabulator key)

CTRL + @ (ü) - NIL dot

2.3.2 DIAVID Numeric Menu Field

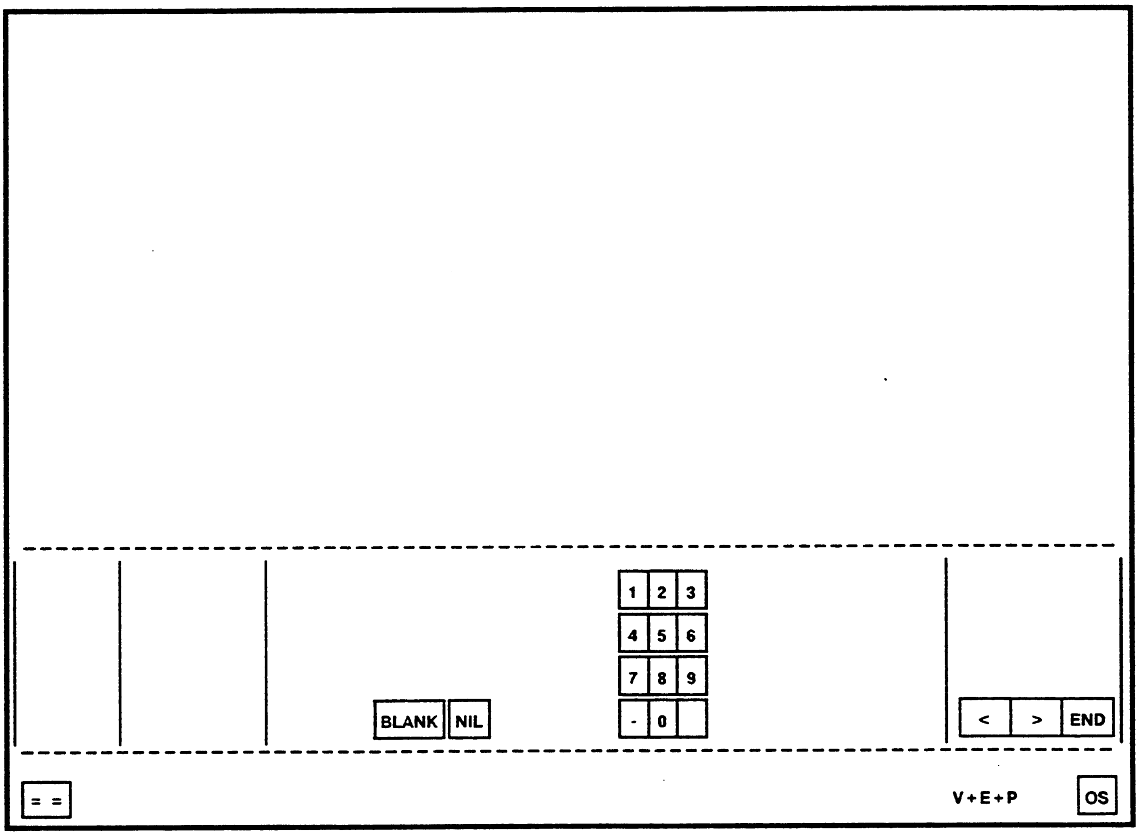


Fig. 2-4 DIAVID numeric menu field

Serial mode has already been switched on when this menu field is displayed, and the echo line is fixed.

This menu field is displayed whenever an image or level number is to be entered.

2.3.3 DIAVID Alphanumeric Menu Field

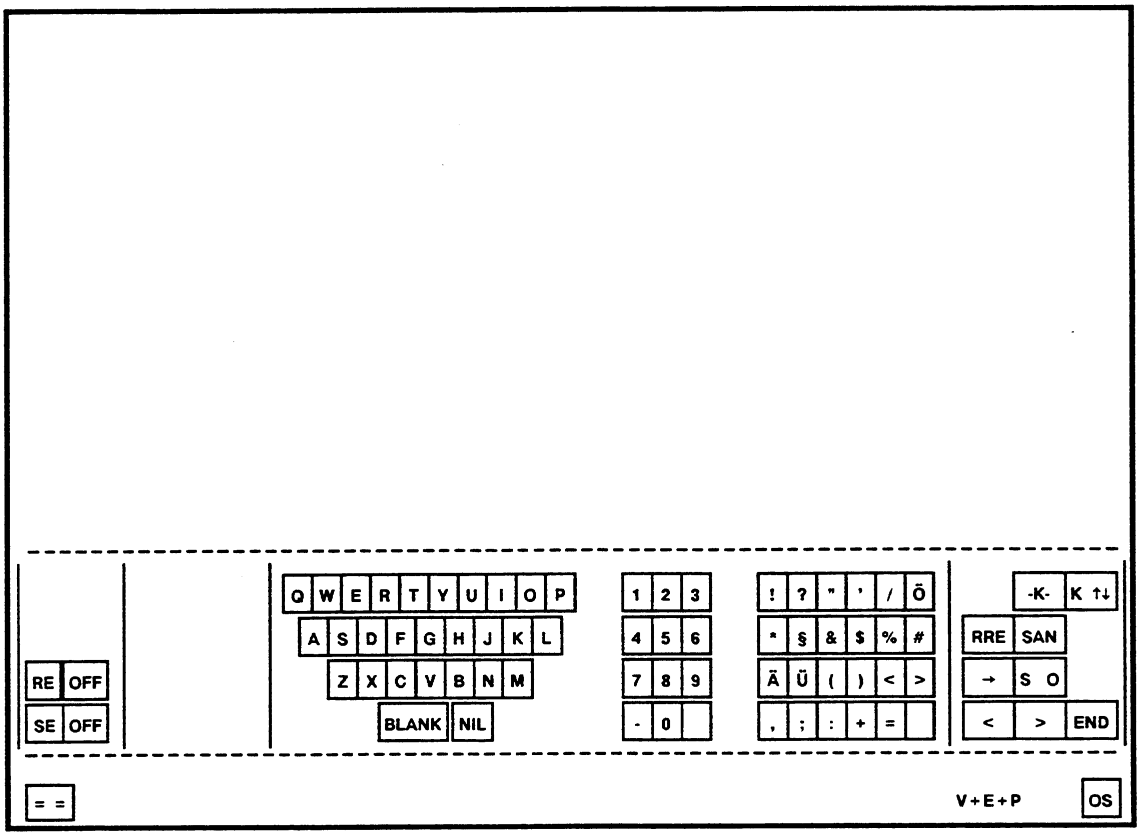


Fig. 2-5 DIAVID alphanumeric menu field

Serial mode has already been switched on when this menu field is displayed, and the echo line is fixed.

This menu field is displayed whenever a variable name has to be entered whilst a variable or a control field is being introduced into a process display.

2.3.4 DIAVID Symbol Menu Field

Selecting the SAN, S0, S1 or S2 key in the displayed DIAVID menu field displays the symbol memory contents.

Standard symbols in PROMs	SAN	- 64 alphanumeric symbols (characters)
	S0	- 32 symbols
128 freely configurable characters (user-related symbols)	S1	- 64 symbols
	S2	- 64 symbols

Standard symbol default setting (e.g. German or international keyboard assignment) is performed in the DS 078 parametrization mode (Chapter 2.1.3).

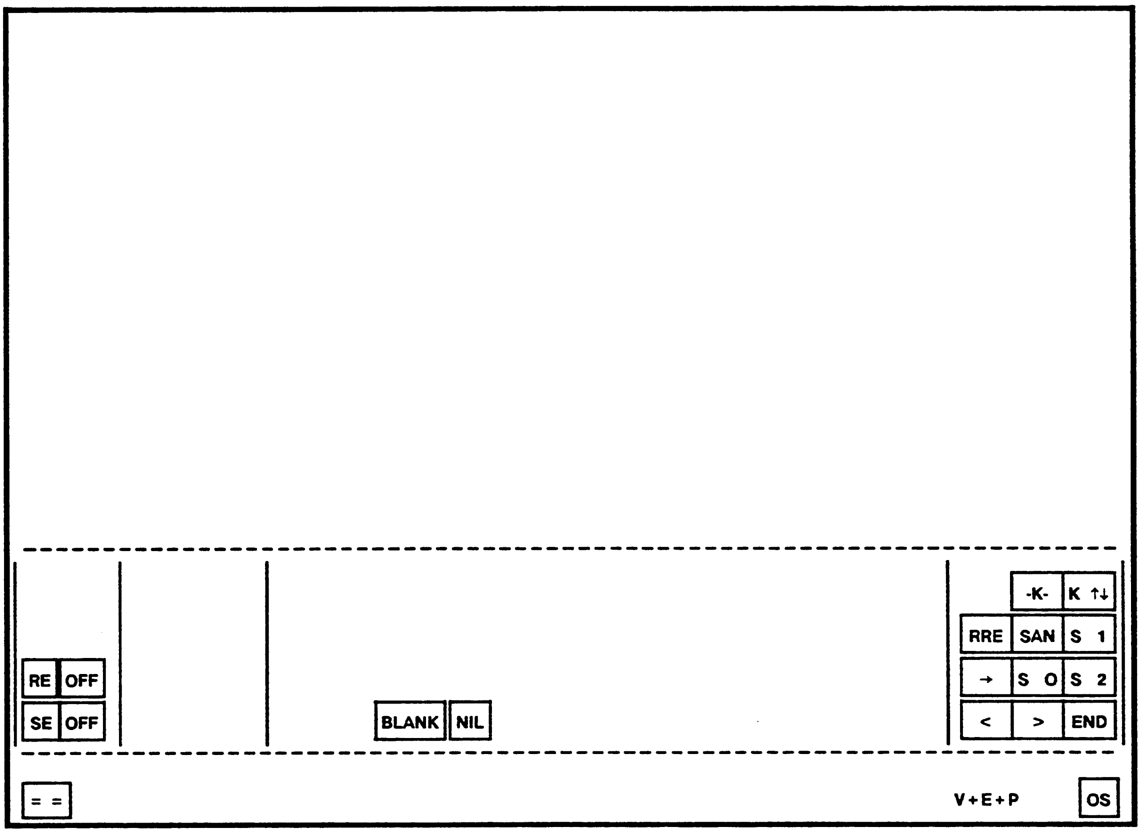


Fig. 2-6 DIAVID symbol menu field

This alphanumeric design menu field provides the full range of functions. The following menu field with fixed standard functions is displayed when the S0 key is selected. The first or second half of the customized symbols of the selected symbol set is displayed in the menu field when the S1 or S2 key, respectively, is selected.

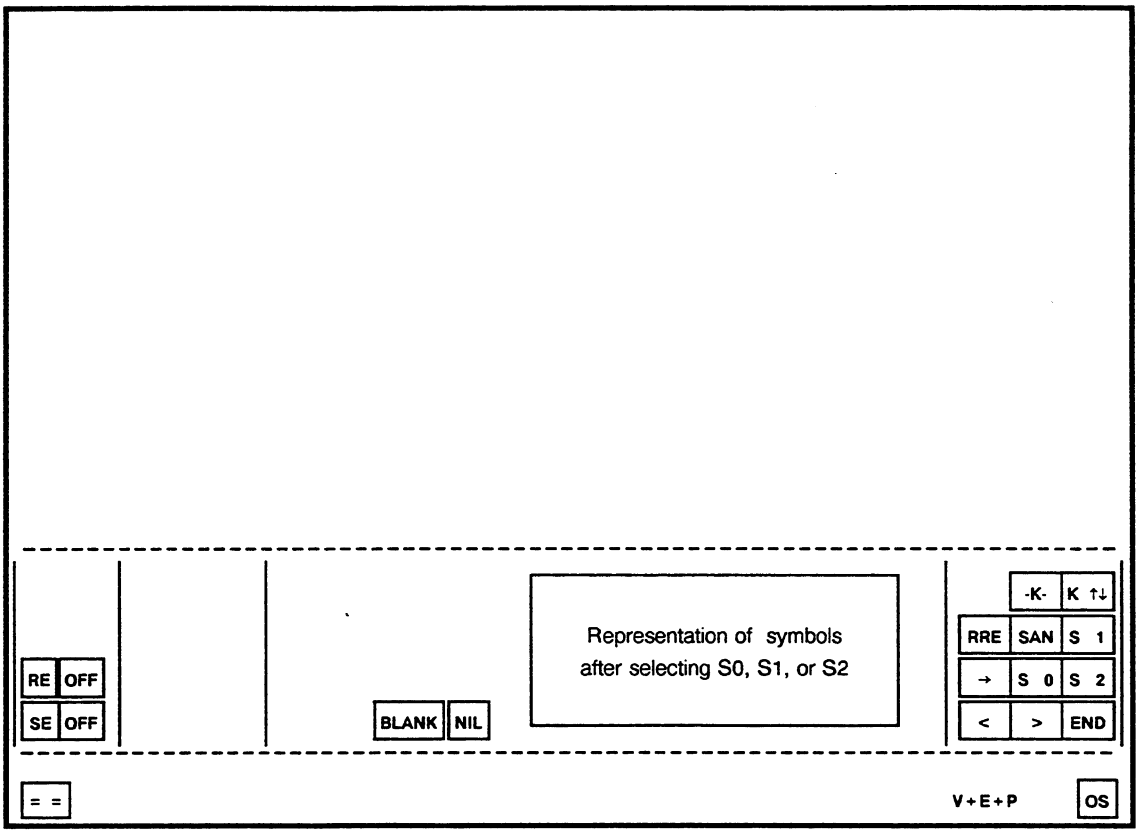


Fig. 2-7 DIAVID symbol menu field after S0, S1 or S2 have been selected

All static images and segments can be designed using the four different design phase menu fields. Access to the individual symbols of the required symbol set is enabled by downloading a symbol set prior to creating an image. To download the required symbol set:

- display the whole symbol set in the symbol design phase and select the END key there;
- select the set number.

Characters can be entered into the design field in three different ways:

1. Select the character/symbol in the menu field and place it in the design field.

2. Select serial entry mode (SE), position the cursor in the design field and select the characters/symbols to be entered in the menu field.

3. Select repeated entry mode (RE) first, then select the character/symbol which is to be entered repeatedly in the design field, and select start and end position in the design field.

A blinking cursor is displayed to mark the currently used position in the design field.

In a large size image, the position currently being used is also displayed in the command line and marked by the mnemonic name "LD" (large size image). The first position indicates the line number, the second the column number.

After scrolling has been terminated, the left-hand top corner of the image is displayed as a scrolling position in the command line and marked by "RP" (scroll position).

2.4 Basic Selections

The automation system has already been set for all data delivered for TELEPERM M. All other parameters are set to default values:

- Time/date	in national representation, foreground colour green, background colour black, non-blinking.
- Cycle time	2 seconds

The basic selection menu field is selected in the FRANZ dialog starting menu.

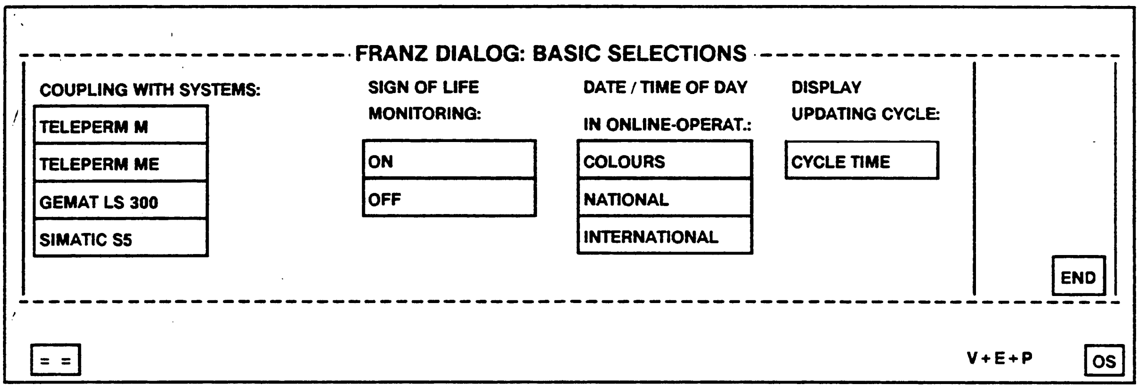


Fig. 2-8 Menu field "FRANZ DIALOG: BASIC SELECTIONS"

Date/time specifications for the operating phase

COLOURS

Selecting this key displays the variable representation menu field. This menu field is used for selecting the representation of the date display:

- foreground colour / background colour
- blinking / not blinking

Selecting the END key re-displays the basic selection menu.

NATIONAL or **INTERNATIONAL**

These keys select national or international representation of the date.

Cycle time for operating phase updating

Only multiples of seconds are permitted as cycle time for the updating cycle. The cycle time applies for all images of the whole ONLINE system, not just for one image. If this time is too short, the response time after an operator input will be longer (the system only deals with updating, and cycles are omitted if overcapacity has been reached). During image design, the user must specify whether an updating cycle is only to be applied for a specific image (ENTER IMAGE-RELATED UPDATING CYCLE).

Updating 100 variables per image every 2 seconds may be used as a guidance value.

CYCLE TIME

After this key has been selected, the cycle time can be entered via the DIAVID numeric menu field. Selecting the END key re-displays the BASIC SELECTIONS menu field. The default cycle time of 2 seconds is assumed if no value is entered.

Automation system selection

A total of four different automation systems can be connected using the appropriate communication software for the automation system. The selected automation system also defines the length of variable names:

TELEPERM M : BA.TA.BLOCKNO

TELEPERM ME: BA.TA.BLOCKNO.CHANNELNO

GEMAT LS 300: up to 20 characters

SIMATIC S5 : not yet defined

TELEPERM M

TELEPERM ME

GEMAT LS 300

SIMATIC S5

The message RIGHT appears briefly in the first third of the message line, and the message AUTOMATION SYSTEM ALREADY DESIGNED is displayed.

These keys are without significance for the user. The default value has already been set when the unit is delivered, and cannot be altered.

Heartbeat monitoring in the operating phase

ON

OFF

The heartbeat monitoring function of the devices connected to the bus (in operating phase) can be activated or de-activated by selecting the appropriate key.

The message RIGHT appears briefly, and the message SIGN OF LIFE MONITORING ON/OFF is displayed when one of these keys is selected.

Logging the basic selections

The selections made in this menu can be logged on a printer when the functions keys LOG and BASIC SELECTIONS are selected in the FRANZ menu field.

2.5 Automatic Design

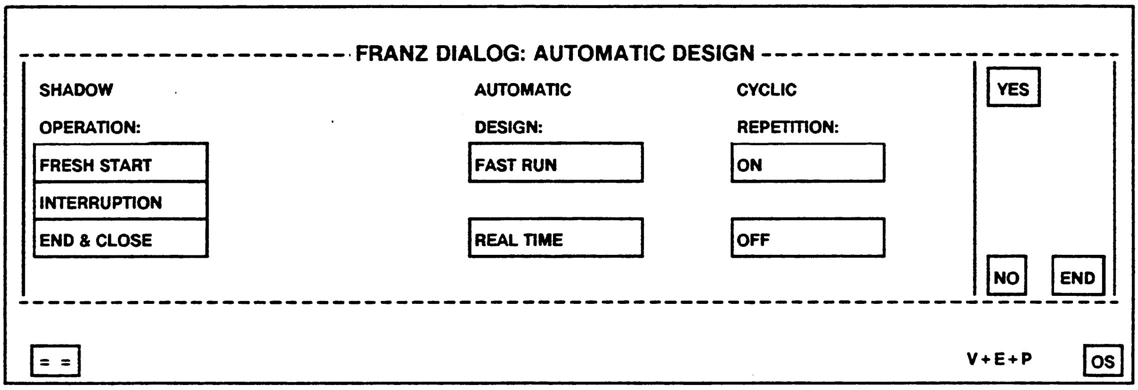


Fig. 2-9 Menu field "FRANZ DIALOG: AUTOMATIC DESIGN"

The functions of this menu field enable new system functions to be introduced into an existing user system without modifying the user-related data.

This function also allows parallel configuration and design using several systems. All the images created on different OS systems and stored on different magnetic tape cassettes can be set up in a common OS system if all operating sequences, which have been recorded during creation, are executed in the target OS.

Selecting the YES/NO keys provides a reply to dialog inquiries. Selecting the END key re-displays the DESIGN DIALOG menu field.

Some comments regarding safe application of the shadow mode

1. Shadow mode is started in the first design dialog mask (automatic design, new beginning of shadow mode) and must be terminated or interrupted in the same mask. If shadow mode has not been terminated or interrupted before a configuration check is initiated (exiting the design dialog), the shadow file will be worthless (note the inquiry "structure check YES/NO?").

2. All image sections (control fields, segments, status displays) or symbol sets must either be stored under the same number in the source and the target system or be created in shadow mode.

3. Image sections (control fields, segments, status displays) may only be accessed by the number. Scrolling is not allowed (cf. item 2).

4. Double configuration of images (process displays, key sets, overview) is not permitted. An existing image must first be deleted before it can be newly designed.

5. The OS assigns a number if a symbol set has been designed in shadow mode. In order to load the correct number in the target system, DISPLAY FULL SET and END must be selected to exit the symbol set.

6. If doubts exist regarding the configuration version of control fields or process displays in the target system, variables or keys should be deleted and properly re-inserted when an image is modified (insert segment). Two digital values can be inserted accidentally above one another in the target system if this is not observed.

7. The number assigned in the source system is used for accessing image sections which have been created in shadow mode. This number is automatically converted in the target system, and correct access ensured.

8. No logging functions may be initiated in shadow mode.

9. The user must ensure that images which have been created in different OS systems possess different image numbers. It must also be remembered that the same output data will be accessed by images which have been created in parallel. These restrictions only concern the overview display and those images whose numbers must be entered explicitly in the design phase. This means that all images created as a supply - except symbol sets - may be created in shadow mode, used in different images and introduced in a common system, regardless of the allocated number.

10. The keyswitch must be set to position 3 (V + E + P) in order to enable shadow data, which access the "primary dialog", to be read correctly.

11. The text editor cannot be used in shadow mode.

2.5.1 Shadow Mode

All operator inputs can be stored on a separate hard disk in this mode.

FRESH START

The inquiry "OVERWRITE SHADOW DATA ? ENTER YES/NO" is displayed when this key is selected. If YES is entered, the subsequent operator input sequence is recorded without taking into consideration any operator input sequence which might already exist on the hard disk. Existing operator input sequences will be overwritten and shadow mode activated. The message SHADOW MODE is displayed and the initial menu field appears on the screen.
The menu field remains on the display if NO is entered.

END&CLOSE

Selecting this key terminates the shadow mode irrevocably. No further operator input sequence can ever be added. The initial menu field is displayed and the message SHADOW MODE TERMINATED issued.

INTERRUPTION

This key can only be selected in shadow mode. Once it has been selected, shadow mode is switched on automatically after the automatic design change has been terminated. An interrupted shadow mode data sequence can be continued. The initial menu field is displayed and the message SHADOW OPERATION INTERRUPTED issued when this key is selected.

2.5.2 Automatic Design

If this mode is selected, the operator input sequence stored on the hard disk is transferred to the target data in the same manner as if this data had been used directly for design.

The shadow data must first be copied from tape to hard disk using the function "INSTALL SYSTEM: SINGLE" if the shadow data only exists on a magnetic tape cassette.

FAST RUN

The operator input sequence is executed without any delays, i.e. without the pauses which occurred during generation.

REAL TIME

The operator input sequence is executed, including the pauses which occurred during generation (up to one minute). This mode should be used normally. The inquiry "START AUTOMATIC RUN? ENTER YES/NO" is displayed is issued in both functions.
Execution is activated and the message "AUTOMATIC RUN" displayed if YES is entered.
The menu field remains on the display if NO is selected.

Stop and continuation in automatic execution

Automatic execution is stopped when any key is selected using the light pen, and is continued by the next operator input. Automatic execution can be aborted as follows:

a) Touch any position on the screen during automatic execution
b) Touch the text: automatic execution →
c) Shadow mode is aborted once a defined data state has been reached.

2.5.3 Cyclic Repetition

The keys CYCLIC REPETITION: ON/OFF are used as presets for automatic design changes.

ON

If the ON key has been selected, execution recommences with the same operator input sequence once the automatic execution has come to an end. The user must verify whether the operator input sequence can be repeated cyclically when this option is selected. This means, for example, that a newly designed image may not be re-designed unless it has previously been deleted.

Note: Since cyclic repetition cannot be de-activated whilst shadow mode is active, the OS must be switched off in order to terminate automatic execution. Data cannot be saved.

OFF

The OFF key only cancels the default selection. Cyclic repetition cannot be switched off during automatic execution.

Default setting is: cyclic repetition is switched off.

2.6 Block and Parameter Types

The following AS 220/AS 230/AS 235 standard blocks can be accessed in OS 265:

- Output block for binary values	A
- Operator communication block	B
- Switchover block	C
- Proportional counter module	DZ
- Individual open-loop controller for switches	EG
- Individual open-loop controller for motors	EK, EM
- Individual open-loop controller for valves	EU, EV
- Window block	F
- Window block (new)	FN
- Subgroup control block	G
- Subgroup control block	GK
- Measured data monitoring block	M
- Motor/valve/actuator control	MSB
- Closed-loop controller	R
- Single-channel closed-loop controller	RE
- Single-channel closed-loop controller	RK
- Closed-loop controller block with W/WN + Y/YN display	RN
- Closed-loop controller (configurable)	RSKB
- Operator communication block	S
- Trend block	T
- Partial subgroup or preselector controller	TVB
- Ratio block	V

In an AS 220 system, configuration is performed by specifying the external parameter number; in an AS 230/AS 235 system by specifying the external or internal parameter number.

Non-operator-accessible standard blocks (e.g. SUM, DIV) and configurable user-related blocks (TML blocks) can be accessed in AS 215/AS 220, AS 230/AS 235 automation systems or in SIMATIC S5-150U/S5-155U. Configuration is performed by specifying the internal parameter number.

Table of data and parameter types

Data type in AS 220	Data type in AS 230/235	Parameter type in OS 265	OS 265 access to
	PB	EB	Binary input
	EBV	EB	Binary input
EB	EB	EB	Binary input
AB	AB	AB	Binary output
VB		VB	Bit pattern
	PA	EA	Analog input (2 W)
	EAV	EA	Analog input (2 W)
EA	EA	EA	Analog input (2 W)
AA	AA	AA	Analog output (2 W)
VA		VA	Bit pattern
	PAD	EA 1)	Analog input (2 W)
	EAD	EA 1)	Analog input (2 W)
	AAD	AA 1)	Analog output (2 W)
I	I	I	Integer value (1 byte)
	ID	ID	Integer value(2 bytes)
S 2	S 2	S 2	S 2 - character string
S 4	S 4	S 4	S 4 - character string
S 16	S 16	S 16	S16- character string
	S n		
	PGT	ID	Time value (without seconds)
	GTV	ID	Time value (incl. seconds)
	GTV	EB	Time value status (running/elapsed)
	AT	ID	Time value (incl. seconds)
	AT	EB	Time value status (running/elapsed)
VB	EBV	VB	Status word
	GA	2)	Direct access is not possible
	GB	2)	Direct access is not possible
	GM	2)	Direct access is not possible
	GT	2)	Direct access is not possible
	FC	2)	Direct access is not possible
	FA	2)	Direct access is not possible
	FSA	2)	Direct access is not possible
	FB	2)	Direct access is not possible

1) Access to a double-precision analog value (3 W) is only possible with single precision (2 W).

2) Access to analog, binary and character fields is only possible by interconnecting these values with other blocks (e.g. operator-accessible standard blocks, AKS, BKS, MKS or ZKS) using the parameter types specified.

2.6.1 Read Parameters

- In an AS 220, AS 230 or AS 235 system, parameters can be read from operator-accessible standard blocks by specifying the external or internal parameters (parameter number and parameter type).

- In the AS 215/AS 230/AS 235 or S5-150U/S5-155U systems, parameters can be read from the non-operator-accessible standard blocks or from the configurable user blocks (TML blocks) by specifying the internal parameters (parameter number and parameter type).

- Parameters from analog, binary or character fields cannot be read.

2.6.2 Write Parameters

- In an AS 220, AS 230 or AS 235 system, only the operator-accessible standard blocks allow parameters to be written with a "complete operator control log" via "operator-controllable inputs", by specifying the external or internal parameters (parameter number and parameter type).

- Parameters can be written to other operator-accessible inputs or outputs of AS 220 or AS 215/AS 230/AS 235 standard blocks or to inputs or outputs of non-operator-accessible AS 215/AS 230/AS 235 standard blocks by specifying the internal parameters (parameter number and parameter type). Only a "reduced operator control log" will be generated in this case.

- Parameters can be written to inputs or outputs of configurable AS 215/AS 230/AS 235 or S5-150U/S5-155U user blocks (TML blocks) by specifying the internal parameters (parameter number and parameter type).

  If the user block contains an S16 string (block name), the generated operator control log is identical to the log of the operator-accessible standard blocks. The "reduced operator control log" is generated if this string is not contained.

  For a complete operator control log, the S2 and S4 strings must be stored in the user block at a specified distance from the writing parameter.

  For analog values (AV):
  internal parameter number S2 = internal parameter no. AV + 2
  internal parameter number S4 = internal parameter no. AV + 3

  For binary values (BV):
  internal parameter number S2 = internal parameter no. BV + 1

  (See Chapter 2.2 in Volume 1 for examples of operator control logs)

- Parameters cannot be written to analog, binary or character fields.

- The value entered for binary value parametrization (incremental, decremental or absolute value adjustment) is compared with the input limits specified in the AS. The entered value is only transferred to the AS if it lies inside these limits.

  This check is only performed if the binary value has been configured with readable limits. The check is omitted if "configurable limits" has been configured.

2.7 Main Memory Size

The OS 265 system with SICOMP M26 hardware features a main memory with 2048 or 4096 k words which is subdivided into system and data memory.

The system memory, which contains the ORG M operating system, utilities, NORA, FRANZ, MELD and KURV programs and the associated basic data sets requires a certain amount of space in the memory. The difference between the physical memory size and the system memory is thus the data memory available to the user. The size of the available data memory is shown in the BASIC SELECTIONS log.

2.7.1 External Storage of Static Elements

External storage of static elements means that static elements ("icons"), which remain stored in the SICOMP M26 main memory, are also stored in the DS 078 RAM extension module. External storage is used in the OS 265 operating phase, i.e. in on line mode, and accelerates image selection. The static elements of the configured data (symbol sets, segments, status displays, key sets, process display background elements) are stored in the DS 078 RAM extension module during process link initialization. Window background images are not stored externally. Only dynamic elements (binary values, bars, strings, addresses for the static elements in the DS 078) need then be transferred from SICOMP M26 to DS 078 when a process display is selected in on line mode.

External storage of static elements is performed in the following sequence:

- Symbol sets
- Segments
- Status displays
- Key sets
- Process display background elements.

The process display background elements are transferred to the external storage device in the same sequence as is used for logging the image numbers in the "level number" printout. The user may thus influence the sequence within the transfer by allocating the numbers accordingly. This may be useful if the memory space in the DS 078 RAM extension module is insufficient for the configured images (see Chapter 2.7.2). The user can then achieve a swift image selection by assigning high numbers to images which are to be stored externally (see logging: level number log).

2.7.2 Calculation of Memory Requirements

The data memory available (VDS) in the SICOMP M26 main memory is subdivided into the FRANZ, NORA, MELD and KURV data memory areas (DS). The individual areas are adapted to requirements without any firm limits, due to the structure of the data and the dynamic main memory management:

$$VDS = DS_{FRANZ} + DS_{NORA} + DS_{MELD} + DS_{KURV} + DS_{WASTE}$$

Depending on the application, either one or several components of this equation can be zero.

Memory available:

- SICOMP M 26, 4 MB main memory: approximately 1177 KW
  8 MB main memory: approximately 3225 KW
- DS 078 (external storage of static elements): : approximately 900 KW

The data memory available is shown in the BASIC SELECTIONS log.

With a given number of process displays (FRANZ), standardized displays (NORA), messages (MELD) and curves (KURV), the memory space available in the SICOMP M26 main memory can be calculated as follows:

$DS_{FRANZ} = f \cdot 1.7$ KW (user-related log/process display)

$DS_{FRANZ} = w \cdot 0.5$ KW for a window with 1/6 to 1/8 of the work area)

$$DS_{NORA} = n \cdot 0.15 \text{ KW} + t \cdot 0.021 \text{ KW} + s \cdot \frac{617 + i \cdot (396 + j \cdot 6)}{1024} \text{ KW} + g \cdot \frac{677 + i \cdot 385}{1024} \text{ KW}$$

$$DS_{MELD} = \frac{b \cdot 31 + x \cdot 66}{1024} \text{ KW} + \frac{m \cdot 44 + z \cdot 31 + y \cdot 8}{1024} \text{ KW}$$

Rough formula for calculating the MELD memory requirement:

$$DS_{MELD} = 0.033 \cdot (b + z) \text{ KW}$$

$$\left.\begin{array}{l} DS_{KURV} = k \cdot 0.48 \text{ KW (for curve field type A)} \\ DS_{KURV} = k \cdot 0.34 \text{ KW (for curve field type B)} \\ DS_{KURV} = k \cdot 0.29 \text{ KW (for curve field type C)} \end{array}\right\} \text{filing in main memory only}$$

$DS = k \cdot 0.27$ KW (for A, B, C) for filing on hard disk

The above formulae only provide approximate values; precise calculation is discussed in the KURV description

DS_{WASTE} = max. 10 KW waste (unavailable data memory)

Abbreviation: 1 kW = 1 kwords = 2 kBytes

f = Number of individual FRANZ images with 1.7 kW taken as an average value (large size images are converted into a corresponding number of individual displays). User-related logs must be regarded as individual FRANZ displays or large-size images. This is a typical value; the real value depends on the image content and may be smaller or larger, depending on the configuration efficiency (possibility of re-using identical image elements in several images).

w = Number of windows with 1/6 to 1/8 of the work area. The memory requirements per window must be increased accordingly if a larger window format has been selected.

n = Number of NORA loops for all operator-accessible blocks (see Table in Chapter 2.6) except trend blocks (T) and open-loop control blocks (G, GK and S). The value of 0.15 kW per loop has been calculated.

t = Number of trend blocks which can be configured for the loop displays of all operator-accessible blocks with analog displays. The value of 0.021 kW per trend has been calculated.

s = Number of S blocks with i steps and j phases each. The constants in the equation have been calculated.

g = Number of G/GK blocks with i steps each (number of steps of input and output chain). The constants in the equation have been calculated.

b = Number of the operator-accessible blocks for which messages have been configured. x is the number of associated reference lists; the constants in the equation have been calculated.

m = Number of MKS blocks for which a total of z messages (each for 1 MKS bit) have been configured. y is the number of associated comment lists; the constants in the equation have been calculated.

k = Number of curves. The value of 0.48 kW per curve for curve type A with 480 values of historical data in the main memory is an estimated approximate value. The same applies for formulae types B and C.

The following formulae are used for calculating the memory requirements for the external storage of image elements in the DS 078 RAM extension module:

$$DS_{NORA} = \frac{2990 \cdot B + 43 \cdot G + 36 \cdot K}{1024} KW +$$

$$s \cdot \frac{i \cdot (396 + 6 \cdot j)}{1024} KW + g \cdot \frac{385 \cdot i}{1024} KW$$

DS_{FRANZ} = f · 1 KW (user-related log/process display)

DS_{KURV} = 24 KW (constant)

DS_{MELD} = 0 (no memory requirements for MELD).

The parameters are:

B = Number of NORA area displays

G = Number of NORA group displays

K = Number of NORA loop displays

f = Number of FRANZ individual displays (see above)

s, g, i, j, = Number of S and G blocks with i steps and j phases (see above).

Note for memory requirement calculation:

The implementation of a specific structure in the OS 265 system depends on the calculation of the SICOMP M26 main memory requirements.

If the memory requirements in the DS 078 RAM extension module are estimated, it is possible to determine whether the configured NORA and FRANZ images stored in the SICOMP main memory can be transferred completely to the DS 078 memory.

2.7.3 Quantities

The quantities listed in the table below have been calculated using the above-mentioned formulae. They are intended to give a general idea of the limits to be expected.

The values for process displays, user-related logs and windows (FRANZ) depend to a large extent on the configuration, and may vary to higher or lower values.

The main memory space (SICOMP M26) available to the user is specified in the basic selections log.

Approximately 200 kW memory space is available in the DS 078.

Minimum quantities

The min. number of blocks to be planned is ≥16. If the number of blocks planned is less than 16, on-line coupling is not possible.

Maximum quantities

The following table specifies the memory requirements of each function package taking maximum quantities into consideration:

OS 265 - 3	DS 078 icon memory	SICOMP M26 main memory
NORA	2304 loops (= 128 KW)	2304 loops (= 346 KW)
FRANZ - Individual displays	900 images (= 900 KW)	1900 images (= 3230 KW) including 900 background images stored in the DS 078
- Logs including	450 images (= 900 KW)	950 images with 2 individual displays each (= 3230 KW) background images stored in the DS
- Windows	- -	6450 windows (= 3225 KW) (window of 1/6 - 1/8 of the work area)
MELD	- -	1800 messages (= 60 KW)
KURV	24 KW (constant)	2000 curves *) (= 960 KW)

*) Depending on the number of different measuring points, telegrams and configured curve groups.

Examples of quantities

The following tables present examples of quantities for the OS 265-3 system including memory requirement specifications. The free memory space is not used completely.

Heavy loading:

OS 265 - 3	DS 078 icon memory	SICOMP M26 main memory
NORA	2304 loops (= 128 KW)	2304 loops (= 346 KW)
FRANZ		
- Individual displays	400 images (= 400 KW)	400 images (= 680 KW)
- Logs	50 images (= 50 KW)	50 images (= 85 KW)
- Windows	- -	1000 windows (= 500 KW) (window of 1/6 - 1/8 of the work area)
MELD	- -	1800 messages (= 60 KW)
KURV	24 KW	2000 curves (= 960 KW)

Total = 2631 KW

Average loading:

OS 265 - 3	DS 078 icon memory	SICOMP M26 main memory
NORA	1200 loops (= 67 KW)	1200 loops (= 180 KW)
FRANZ		
- Individual displays	150 images (= 150 KW)	150 images (= 255 KW)
- Logs	20 images (= 20 KW)	20 images (= 34 KW)
- Windows	- -	500 windows (= 250 KW) (window of 1/6 - 1/8 of the work area)
MELD	- -	1500 messages (= 50 KW)
KURV	24 KW	1000 curves (= 480 KW)

Total = 1199 KW

For the purposes of simplification, a possible "waste" of up to 10 kW in the data memory has not been taken into consideration in these tables.

2.8 Status Word Processing

Only operator-controllable standard function blocks possess a status word. A status word, which is generated by the individual block algorithms (PROGRAM) in the AS, contains block-related information, such as alarm, warning, automatic mode, manual mode etc. Since these programs cannot be accessed by the user, the status word assignment (generation) cannot be influenced. The status word structures of the operator-controllable standard function blocks are shown on the following pages.

The AS system subroutine "STAT", which performs cyclic checks, issues a status message to the CS 275 bus system if it detects a status change. The OS receives the current status word and performs old/new comparison (edge evaluation). Another variable (e.g. colour change of a binary value) or a status display alternative (ZA) derived from the status word are triggered as a result of the comparison. In this case, status word and variable must be from the same block.

Parametrization of status displays (ZA) via the status word has the advantage that a high number of ZA alternatives can be stored (only two alternatives are possible with parametrization via a binary value), and that updating can be performed sporadically. Compared with cyclic updating, sporadic updating causes a much lower bus load.

The status word ("individual status word" in OS systems) can be used for controlling ZAs and variables inserted in process displays, log images or windows.

Parametrization of ZAs for the area overview is performed under program control via the group status words (SZW). The group status word is generated by the communication software. The status words of all MKZ in the area display are logically ORed to yield the group status word. The status word bits accepted in the group status word depend on the individual block type. The status bit routing is explained in the following tables.

If, for example, a status word bit has been interconnected with the A bit in the group status word, an A will be displayed next to the area name in the area overview when this bit is set. The signals A (alarm), W (warning), S (external fault) and M (message) must be acknowledged. These signals are first blinking; they only change to a steady display after all messages and faults of this type have been acknowledged. The signals F (tolerance fault) and B (service request) need not be acknowledged.

Notes regarding status interpretation:

If a status word or a group status word is accessed, the inquiry for the bit position range is next. The bit position range is the range containing the relevant bits which are to be interpreted in a specific application.

The following example illustrates the definition of the (OS) bit position range and the determination of the alternative numbers. Only those bits which cause a change in the status display are taken into account when the bit position range is defined (e.g. bits 10, 11, and 14). The bit position range in this example is bits 10-14. Irrelevant bits are marked by "x". The bit with the highest number in the bit position range has the lowest significance (see example) in a status or group status word derived from the status of operator-accessible standard blocks.

Important:

Bit number input always refers to the bit numbering structure of the OS system. Whilst bit numbering in an AS system runs from 15 to 0, bit numbering in an OS system is from 1 to 16; i.e. AS bit 0 corresponds to OS bit 16, etc. The sum of OS bit and AS bit is always 16.
The acknowledgement bit is only taken into account if another bit, relevant in terms of acknowledgement, changes as well.

Example:

Binary value	x	x	x	x	2^4	2^3	2^2	2^1	2^0	x	x	Decimal value	Number of alternative
Decimal value	x	x	x	x	16	8	4	2	1	x	x		
AS bit no.	10	9	8	7	6	5	4	3	2	1	0		
OS bit no.	6	7	8	9	10	11	12	13	14	15	16		
	X	X	X	X	0	0	X	X	0	X	X	0	1
	X	X	X	X	0	0	X	X	1	X	X	1	2
	X	X	X	X	0	1	X	X	0	X	X	8	9
	X	X	X	X	0	1	X	X	1	X	X	9	10
	X	X	X	X	1	0	X	X	0	X	X	16	17
	X	X	X	X	1	0	X	X	1	X	X	17	18
	X	X	X	X	1	1	X	X	0	X	X	24	25
	X	X	X	X	1	1	X	X	1	X	X	25	26

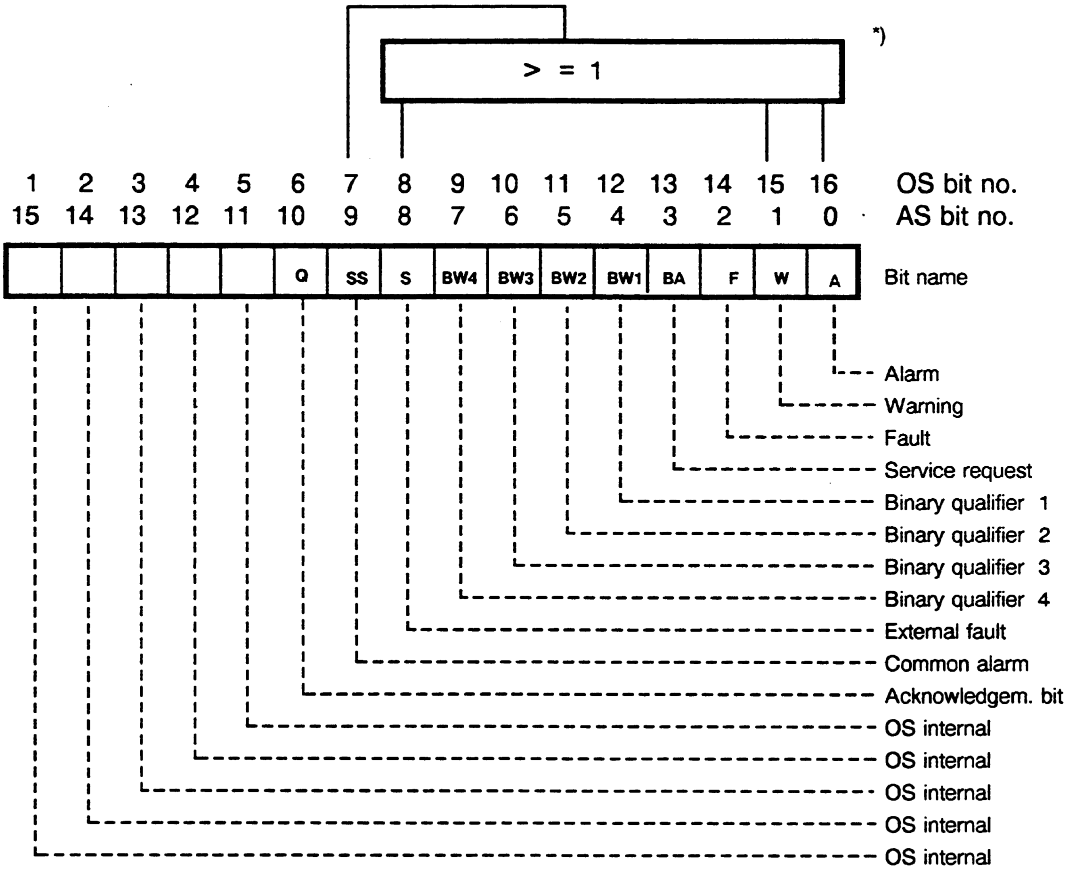
If only one bit in the bit position range is accessed (e.g. bit no. 13), the bit position range is to be specified by 13-13. This yields the alternative numbers 1 and 2.

Bits no. 6 to 16 can be used for user-related interpretation of the status word or group status word derived from the AS block status. Bits 1 to 5 are used for internal purposes in the OS and are not permitted for user-related configuration.

Bit position range 16-16 must be specified if only binary block parameters are to be accessed.

2.8.1 TML Block Status Word

While the status words of standard function blocks have block-related structures, a uniform structure has been defined for status words of TML blocks on OS level. Although any combination of set and reset TML status bits is possible in the AS, each bit position in the OS has a fixed meaning and triggers a specific reaction. The following diagram shows the general status word structure of TML blocks.



The OS system derives the following reactions from the individual bit states in the TML status word:

OS bit	16 ->	Code A	(alarm)	in AO (Q)
OS bit	15 ->	Code W	(warning)	in AO (Q)
OS bit	14 ->	Code F	(tolerance fault)	in AO (NQ)
OS bit	13 ->	Code B	(service request)	in AO (NQ)
OS bit	12 ->	Programmable - no reaction		in AO (NQ)
OS bit	11 ->	Programmable - no reaction		in AO (NQ)
OS bit	10 ->	Programmable - no reaction		in AO (NQ)
OS bit	9 ->	Code M	(messages)	in AO (Q)
OS bit	8 ->	Code S	(external fault)	in AO (Q)
OS bit	7 ->	Common alarm - set by the AS in the event of A, W, or S		
OS bit	6 ->	Acknowledgement bit - set by the OS after QS input		

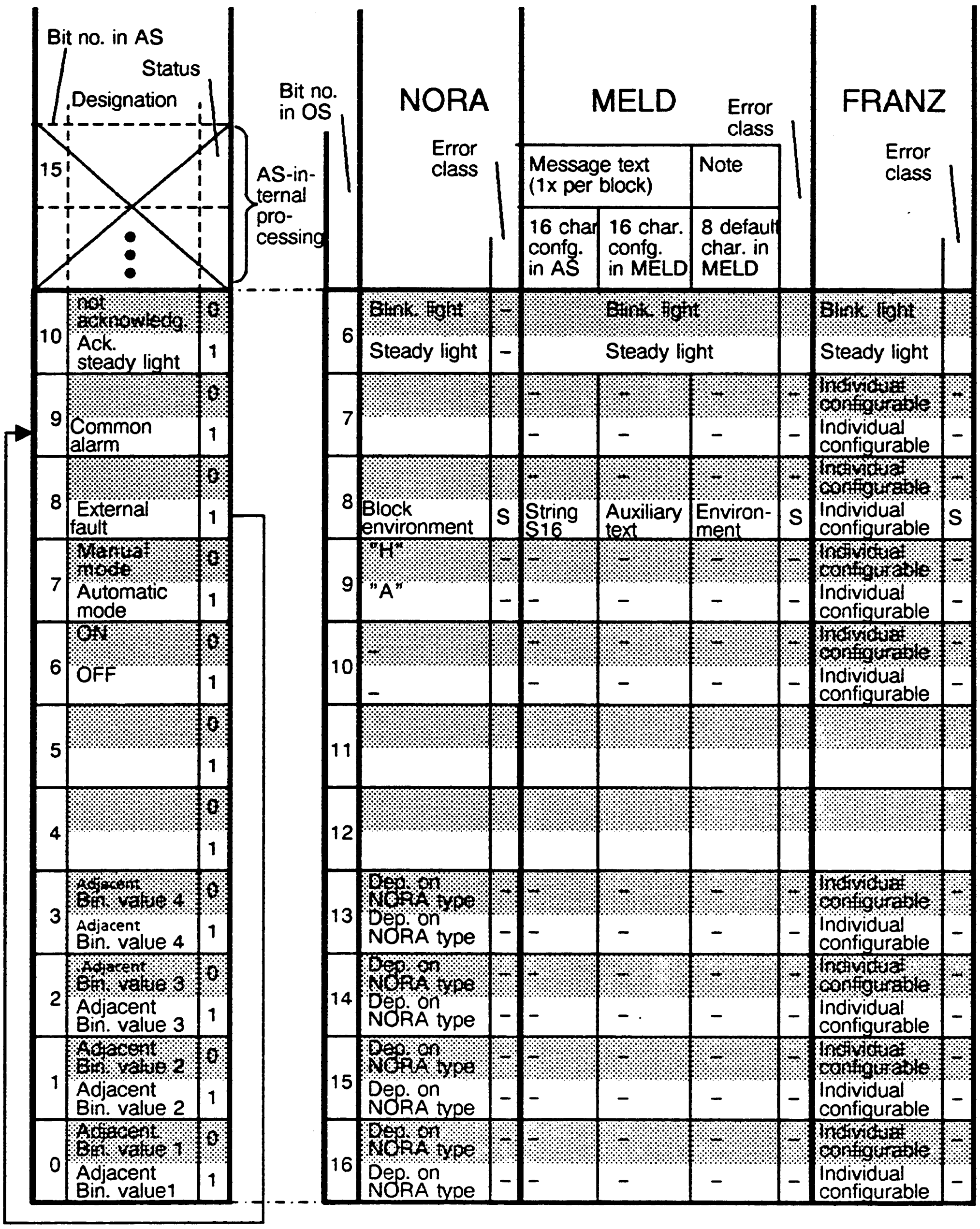
AO = area overview
Q = must be acknowledged
NQ = no acknowledgement required
M also see page 5-118

*) See the AS 230/AS 235 Descriptions (Status word assignment with user function blocks) for further information on compulsory acknowledgement and requirments in bit 9 "SS".

2.8.2 Status Word Assignment of Operator-accessible Blocks

A-block

Status word in AS **Interpretation in OS**



Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD			Error class	FRANZ	Error class
						Message text (1x per block)		Note			
						16 char confg. in AS	16 char. confg. in MELD	8 default char. in MELD			
15 …	AS-internal processing										
10	not acknowledg.	0	6	Blink. light	–	Blink. light				Blink. light	
	Ack. steady light	1		Steady light	–	Steady light				Steady light	
9		0	7			–	–	–	–	Individual configurable	–
	Common alarm	1				–	–	–	–	Individual configurable	–
8		0	8			–	–	–	–	Individual configurable	–
	External fault	1		Block environment	S	String S16	Auxiliary text	Environment	S	Individual configurable	S
7	Manual mode	0	9	"H"	–	–	–	–	–	Individual configurable	–
	Automatic mode	1		"A"	–	–	–	–	–	Individual configurable	–
6	ON	0	10	–		–	–	–	–	Individual configurable	–
	OFF	1		–		–	–	–	–	Individual configurable	–
5		0	11								
		1									
4		0	12								
		1									
3	Adjacent Bin. value 4	0	13	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
	Adjacent Bin. value 4	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	–
2	Adjacent Bin. value 3	0	14	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
	Adjacent Bin. value 3	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	–
1	Adjacent Bin. value 2	0	15	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
	Adjacent Bin. value 2	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	–
0	Adjacent Bin. value 1	0	16	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
	Adjacent Bin. value1	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	–

Fig. 2-10 Status word for the A block

B Block

Status word in AS / Interpretation in OS

Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD: Message text (1 per block): 16 char confg. in AS	MELD: Message text (1 per block): 16 char. confg. in MELD	MELD: Note: 8 Default char. in MELD	MELD: Error class	FRANZ	Error class
15 ⋮			AS-internal processing								
10	Not acknowledg.	0	6	Blink. light	–	Blink. light				Blink. light	
	Ack. Steady light	1		Steady light	–	Steady light				Steady light	
9		0	7			–	–	–	–	Individual configurable	–
	Common alarm	1				–	–	–	–	Individual configurable	–
8		0	8			–	–	–	–	Individual configurable	–
	External fault	1		Block Environment	S	S16 string	Auxiliary text	Environment	S	Individual configurable	S
7	BF1 Binary function	0	9	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
	BF1 Binary function	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	–
6	BF 2 Binary function	0	10	Dep. on NORA type		–	–	–	–	Individual configurable	–
	BF2 Binary function	1		Dep. on NORA type		–	–	–	–	Individual configurable	–
5		0	11								
		1									
4		0	12								
		1									
3		0	13								
		1									
2		0	14								
		1									
1		0	15								
		1									
0		0	16								
		1									

Fig. 2-11 Status word for the B block

C block

Status word in AS / Interpretation in OS

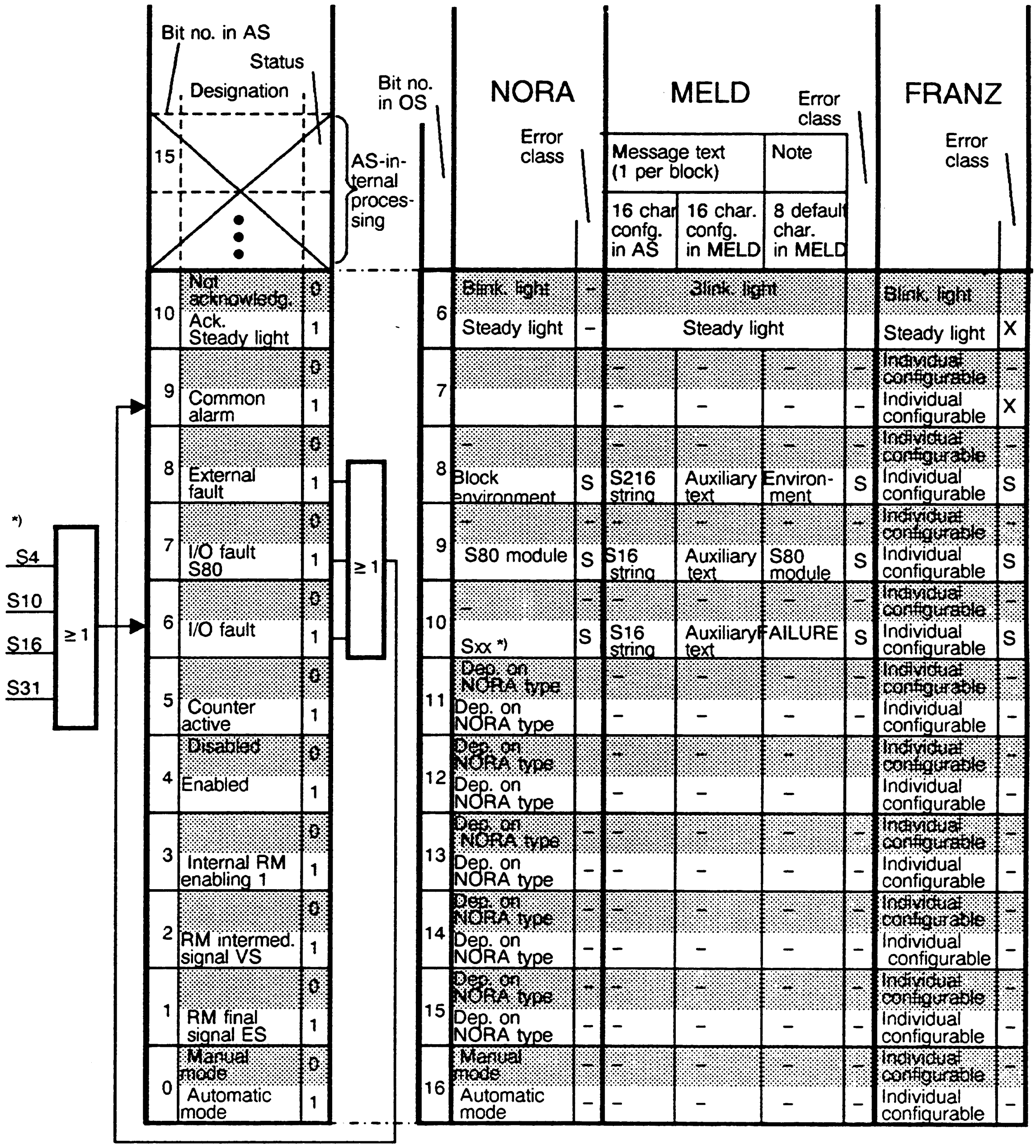
Bit no. in AS	Designation	Status	Bit no. in OS	NORA	NORA Error class	MELD Message text (1per Block) 16 char confg. in AS	MELD Message text (1per Block) 16 char. confg. in MELD	MELD Note 8 Default char. in MELD	MELD Error class	FRANZ	FRANZ Error class
15 …	AS-internal processing										
10	Not acknowledg.	0	6	Blink. light		Blinking light				Blink. light	
	Ack. Steady light	1		Steady light		Steady light				Steady light	
9		0	7								
		1									
8		0	8								
		1									
7		0	9								
		1									
6		0	10								
		1									
5		0	11								
		1									
4		0	12								
		1									
3		0	13								
		1									
2		0	14		–	–	–	–	–	Individual configurable	
	A3 output value	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	
1		0	15		–	–	–	–	–		
	A2 output value	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	
0		0	16		–	–	–	–	–	Individual configurable	
	A1 output value	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	

Fig. 2-12 Status word for the C block

DZ block

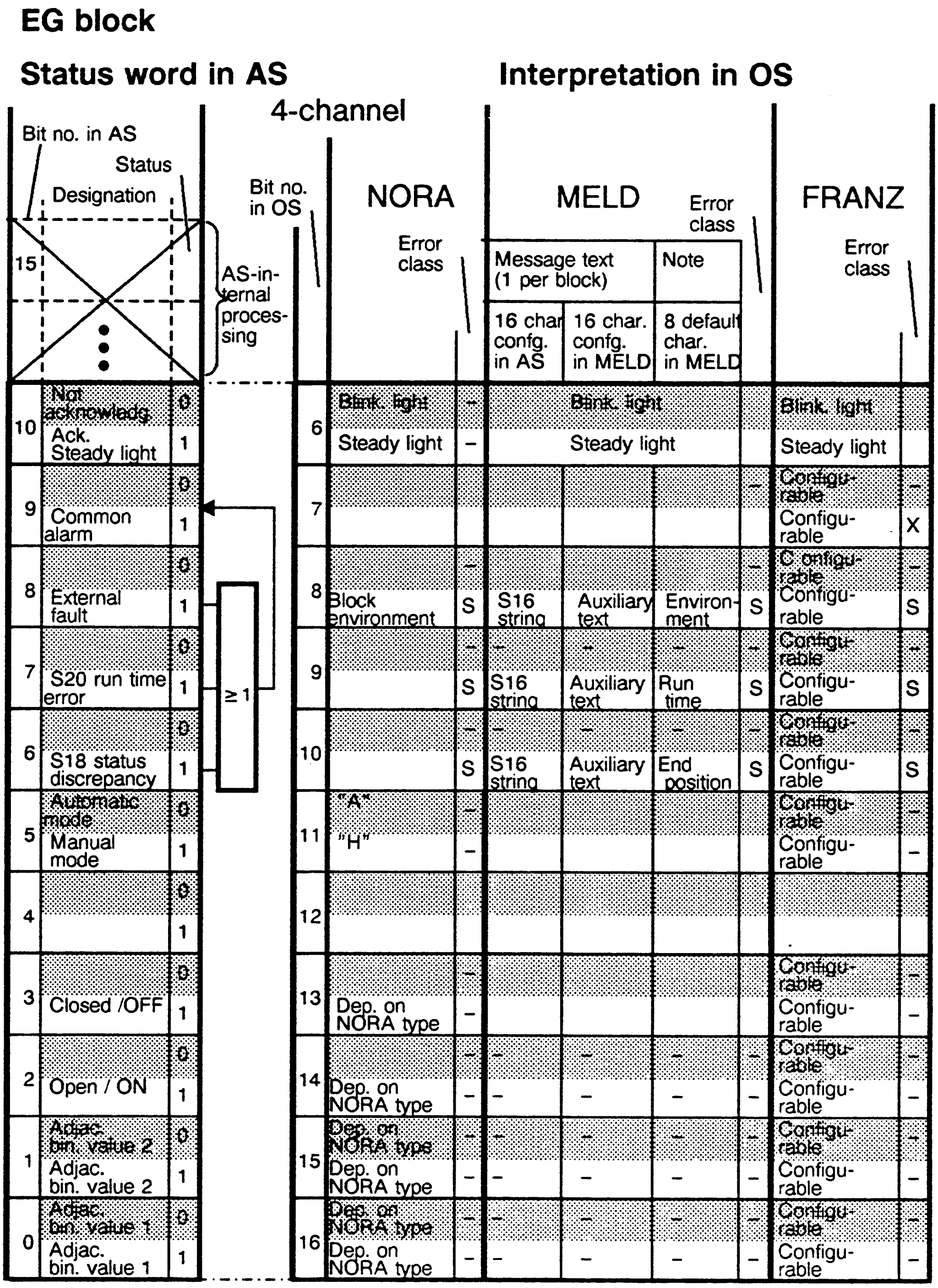
Status word in AS

Interpretation in OS



Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD: Message text (1 per block)		Note	Error class	FRANZ	Error class
						16 char confg. in AS	16 char. confg. in MELD	8 default char. in MELD			
10	Not acknowledg.	0	6	Blink. light	–	Blink. light				Blink. light	
10	Ack. Steady light	1	6	Steady light	–	Steady light				Steady light	X
9		0	7			–	–	–	–	Individual configurable	–
9	Common alarm	1	7			–	–	–	–	Individual configurable	X
8		0	8	–		–	–	–	–	Individual configurable	–
8	External fault	1	8	Block environment	S	S216 string	Auxiliary text	Environ-ment	S	Individual configurable	S
7		0	9	–	–	–	–	–	–	Individual configurable	–
7	I/O fault S80	1	9	S80 module	S	S16 string	Auxiliary text	S80 module	S	Individual configurable	S
6		0	10	–	–	–	–	–	–	Individual configurable	–
6	I/O fault	1	10	Sxx *)	S	S16 string	Auxiliary text	FAILURE	S	Individual configurable	S
5		0	11	Dep. on NORA type		–	–	–	–	Individual configurable	–
5	Counter active	1	11	Dep. on NORA type		–	–	–	–	Individual configurable	-
4	Disabled	0	12	Dep. on NORA type		–	–	–		Individual configurable	–
4	Enabled	1	12	Dep. on NORA type		–	–	–		Individual configurable	–
3		0	13	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
3	Internal RM enabling 1	1	13	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
2		0	14	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
2	RM intermed. signal VS	1	14	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
1		0	15	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
1	RM final signal ES	1	15	Dep. on NORA type	–	–	–	–	–	Individual configurable	–
0	Manual mode	0	16	Manual mode	–	–	–	–	–	Individual configurable	–
0	Automatic mode	1	16	Automatic mode	–	–	–	–	–	Individual configurable	–

Fig. 2-13 Status word for the DZ block

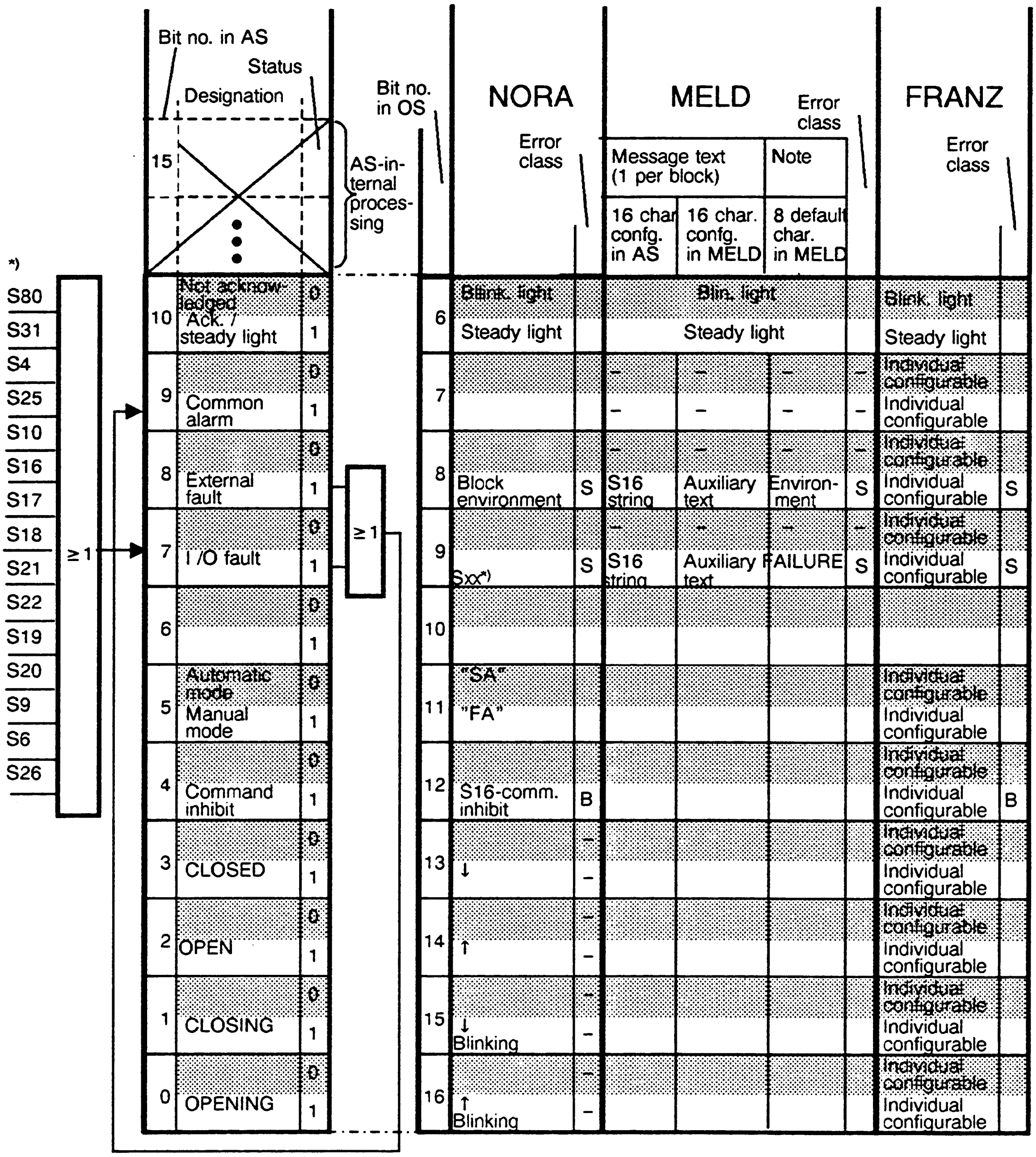


Bit no. in AS	Designation	Status	Bit no. in OS	NORA	NORA Error class	MELD Message text (1 per block): 16 char confg. in AS	MELD Message text (1 per block): 16 char. confg. in MELD	MELD Note: 8 default char. in MELD	MELD Error class	FRANZ	FRANZ Error class
15 … 11											
10	Not acknowledg.	0	6	Blink. light	–	Blink. light				Blink. light	
	Ack. Steady light	1		Steady light	–	Steady light				Steady light	
9		0	7						–	Configurable	–
	Common alarm	1								Configurable	X
8		0	8		–				–	Configurable	–
	External fault	1		Block environment	S	S16 string	Auxiliary text	Environment	S	Configurable	S
7		0	9		–	–	–	–	–	Configurable	–
	S20 run time error	1			S	S16 string	Auxiliary text	Run time	S	Configurable	S
6		0	10		–	–	–	–	–	Configurable	–
	S18 status discrepancy	1			S	S16 string	Auxiliary text	End position	S	Configurable	S
5	Automatic mode	0	11	"A"	–					Configurable	–
	Manual mode	1		"H"	–					Configurable	–
4		0	12								
		1									
3		0	13		–					Configurable	–
	Closed /OFF	1		Dep. on NORA type	–					Configurable	–
2		0	14		–	–	–	–	–	Configurable	–
	Open / ON	1		Dep. on NORA type	–	–	–	–	–	Configurable	–
1	Adjac. bin. value 2	0	15	Dep. on NORA type	–	–	–	–	–	Configurable	–
	Adjac. bin. value 2	1		Dep. on NORA type	–	–	–	–	–	Configurable	–
0	Adjac. bin. value 1	0	16	Dep. on NORA type	–	–	–	–	–	Configurable	–
	Adjac. bin. value 1	1		Dep. on NORA type	–	–	–	–	–	Configurable	–

Fig. 2-14 Status word for the EG block

EK block

Status word in AS **Interpretation in OS**

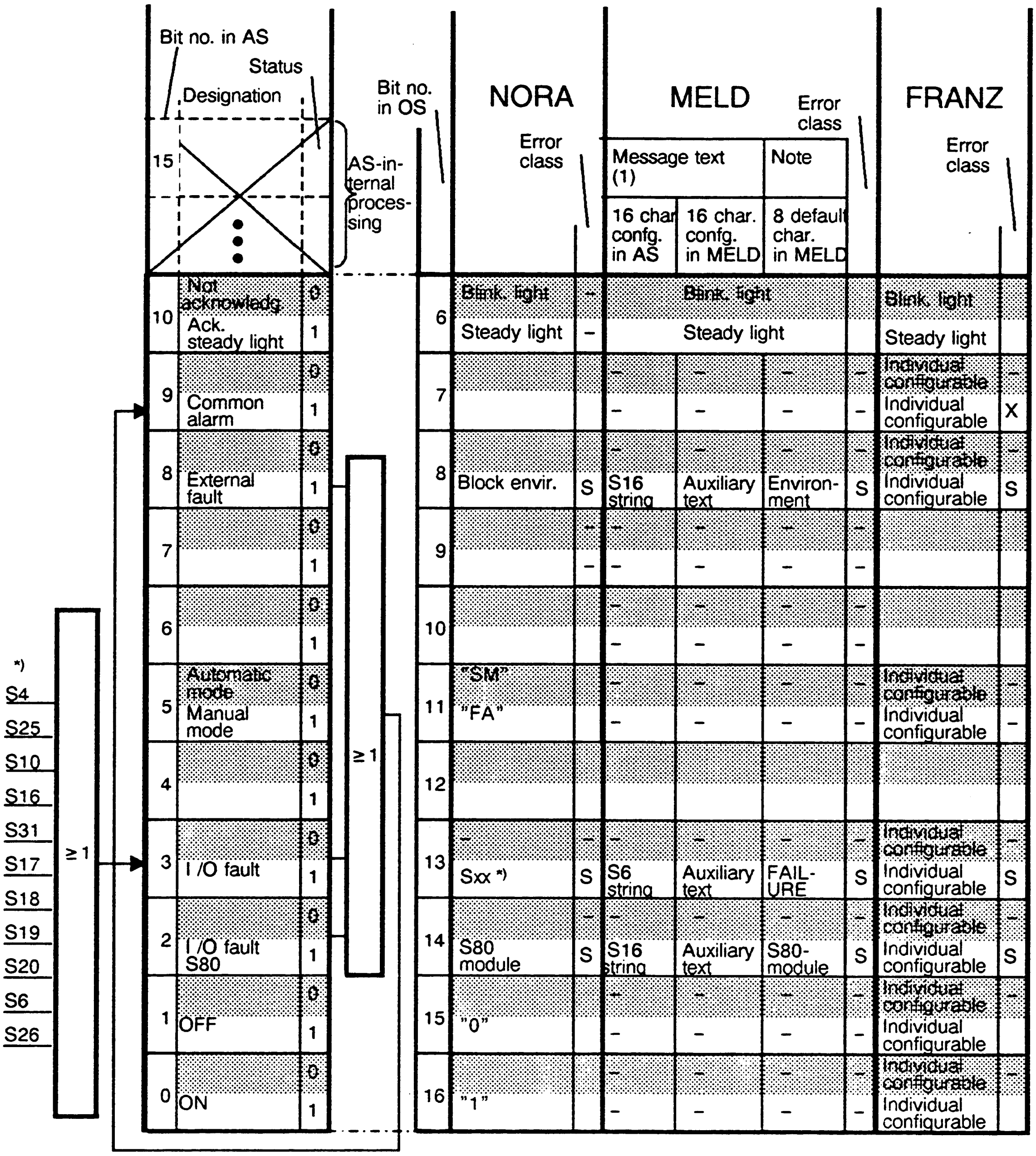


Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD Message text (1 per block) 16 char confg. in AS	MELD Message text (1 per block) 16 char. confg. in MELD	MELD Note 8 default char. in MELD	MELD Error class	FRANZ	Error class
15 …	AS-internal processing										
10	Not acknowledged	0	6	Blink. light		Blin. light				Blink. light	
	Ack. / steady light	1		Steady light		Steady light				Steady light	
9		0	7			–	–	–	–	Individual configurable	
	Common alarm	1				–	–	–	–	Individual configurable	
8		0	8			–	–	–	–	Individual configurable	
	External fault	1		Block environment	S	S16 string	Auxiliary text	Environment	S	Individual configurable	S
7		0	9			–	–	–	–	Individual configurable	
	I /O fault	1		Sxx*)	S	S16 string	Auxiliary text	FAILURE	S	Individual configurable	S
6		0	10								
		1									
5	Automatic mode	0	11	"SA"						Individual configurable	
	Manual mode	1		"FA"						Individual configurable	
4		0	12							Individual configurable	
	Command inhibit	1		S16-comm. inhibit	B					Individual configurable	B
3		0	13		–					Individual configurable	
	CLOSED	1		↓	–					Individual configurable	
2		0	14		–					Individual configurable	
	OPEN	1		↑	–					Individual configurable	
1		0	15		–					Individual configurable	
	CLOSING	1		↓ Blinking	–					Individual configurable	
0		0	16		–					Individual configurable	
	OPENING	1		↑ Blinking	–					Individual configurable	

Fig. 2-15 Status word for the EK block

EM block

Status word in AS **Interpretation in OS**

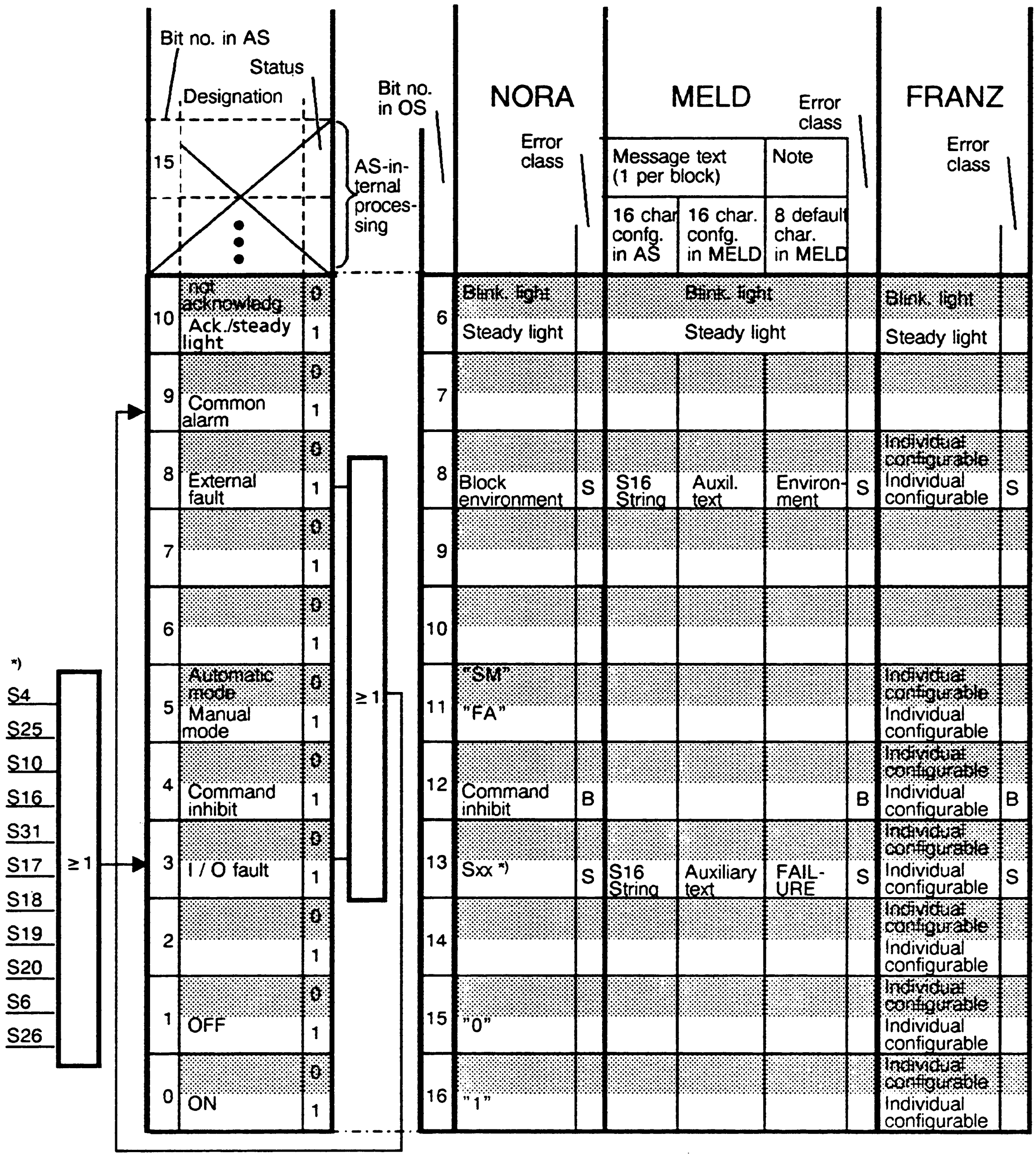


Bit no. in AS	Designation	Status	Bit no. in OS	NORA	NORA Error class	MELD Message text (1) 16 char confg. in AS	MELD Message text (1) 16 char. confg. in MELD	MELD Note 8 default char. in MELD	MELD Error class	FRANZ	FRANZ Error class
15 …											
10	Not acknowledg	0	6	Blink. light	–	Blink. light				Blink. light	
	Ack. steady light	1		Steady light	–	Steady light				Steady light	
9		0	7			–	–	–	–	Individual configurable	–
	Common alarm	1				–	–	–	–	Individual configurable	X
8		0	8			–	–	–	–	Individual configurable	–
	External fault	1		Block envir.	S	S16 string	Auxiliary text	Environment	S	Individual configurable	S
7		0	9		–	–	–	–	–		
		1			–	–	–	–	–		
6		0	10			–	–	–	–		
		1				–	–	–	–		
5	Automatic mode	0	11	"SM"		–	–	–	–	Individual configurable	–
	Manual mode	1		"FA"		–	–	–	–	Individual configurable	–
4		0	12								
		1									
3		0	13	–	–	–	–	–	–	Individual configurable	–
	I /O fault	1		Sxx *)	S	S6 string	Auxiliary text	FAILURE	S	Individual configurable	S
2		0	14		–	–	–	–	–	Individual configurable	–
	I /O fault S80	1		S80 module	S	S16 string	Auxiliary text	S80-module	S	Individual configurable	S
1		0	15			–	–	–	–	Individual configurable	–
	OFF	1		"0"		–	–	–	–	Individual configurable	
0		0	16			–	–	–	–	Individual configurable	–
	ON	1		"1"		–	–	–	–	Individual configurable	

Fig. 2-16 Status word for the EM block

EU block

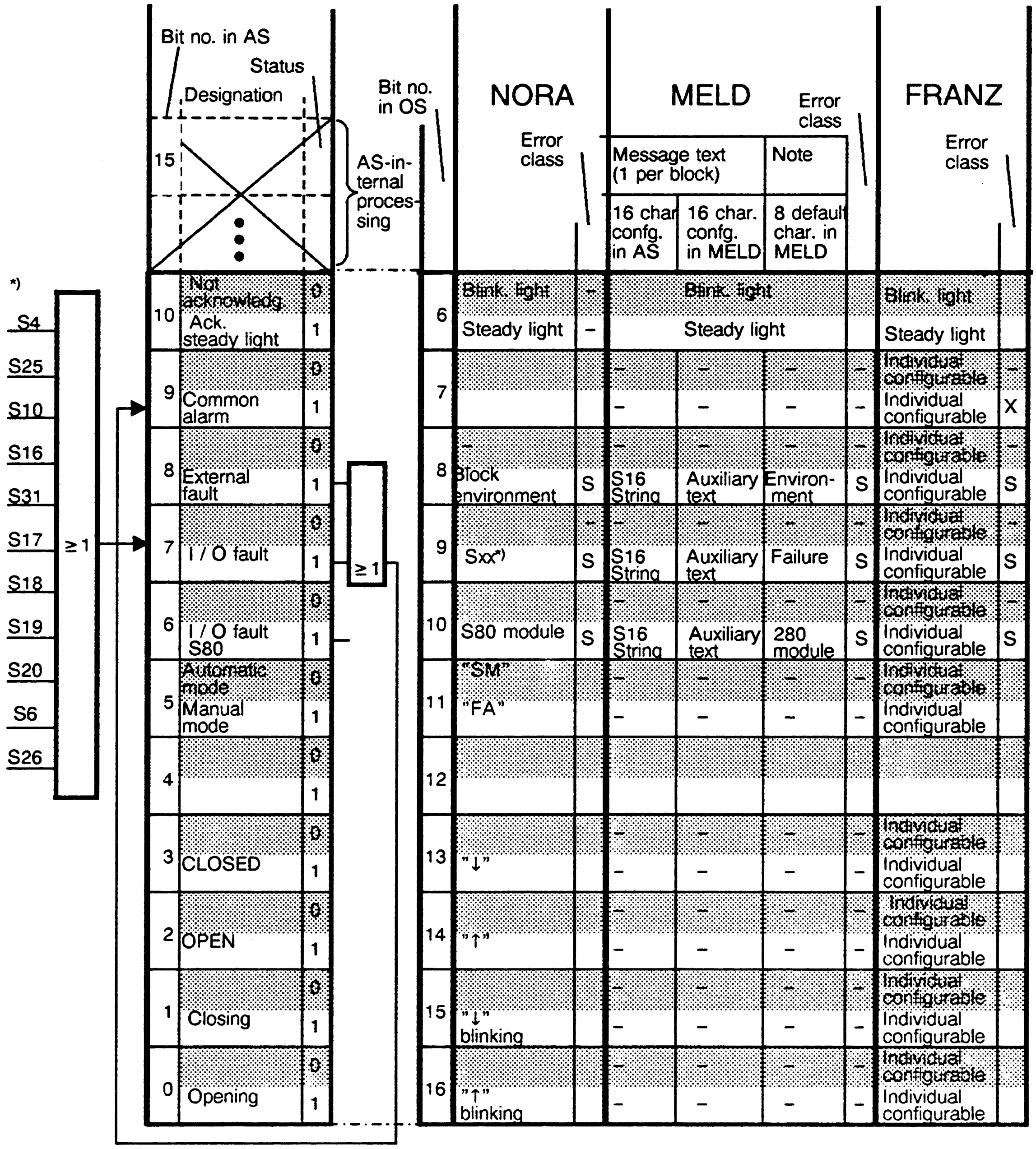
Status word in AS **Interpretation in OS**



Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD: Message text (1 per block): 16 char confg. in AS	MELD: Message text (1 per block): 16 char. confg. in MELD	MELD: Note: 8 default char. in MELD	Error class	FRANZ	Error class
15											
10	not acknowledg.	0	6	Blink. light		Blink. light				Blink. light	
	Ack./steady light	1		Steady light		Steady light				Steady light	
9		0	7								
	Common alarm	1									
8		0	8							Individual configurable	
	External fault	1		Block environment	S	S16 String	Auxil. text	Environ-ment	S	Individual configurable	S
7		0	9								
		1									
6		0	10								
		1									
5	Automatic mode	0	11	"SM"						Individual configurable	
	Manual mode	1		"FA"						Individual configurable	
4		0	12							Individual configurable	
	Command inhibit	1		Command inhibit	B				B	Individual configurable	B
3		0	13							Individual configurable	
	I / O fault	1		Sxx *)	S	S16 String	Auxiliary text	FAIL-URE	S	Individual configurable	S
2		0	14							Individual configurable	
		1								Individual configurable	
1		0	15							Individual configurable	
	OFF	1		"0"						Individual configurable	
0		0	16							Individual configurable	
	ON	1		"1"						Individual configurable	

Fig. 2-17 Status word for the EU block

EV block

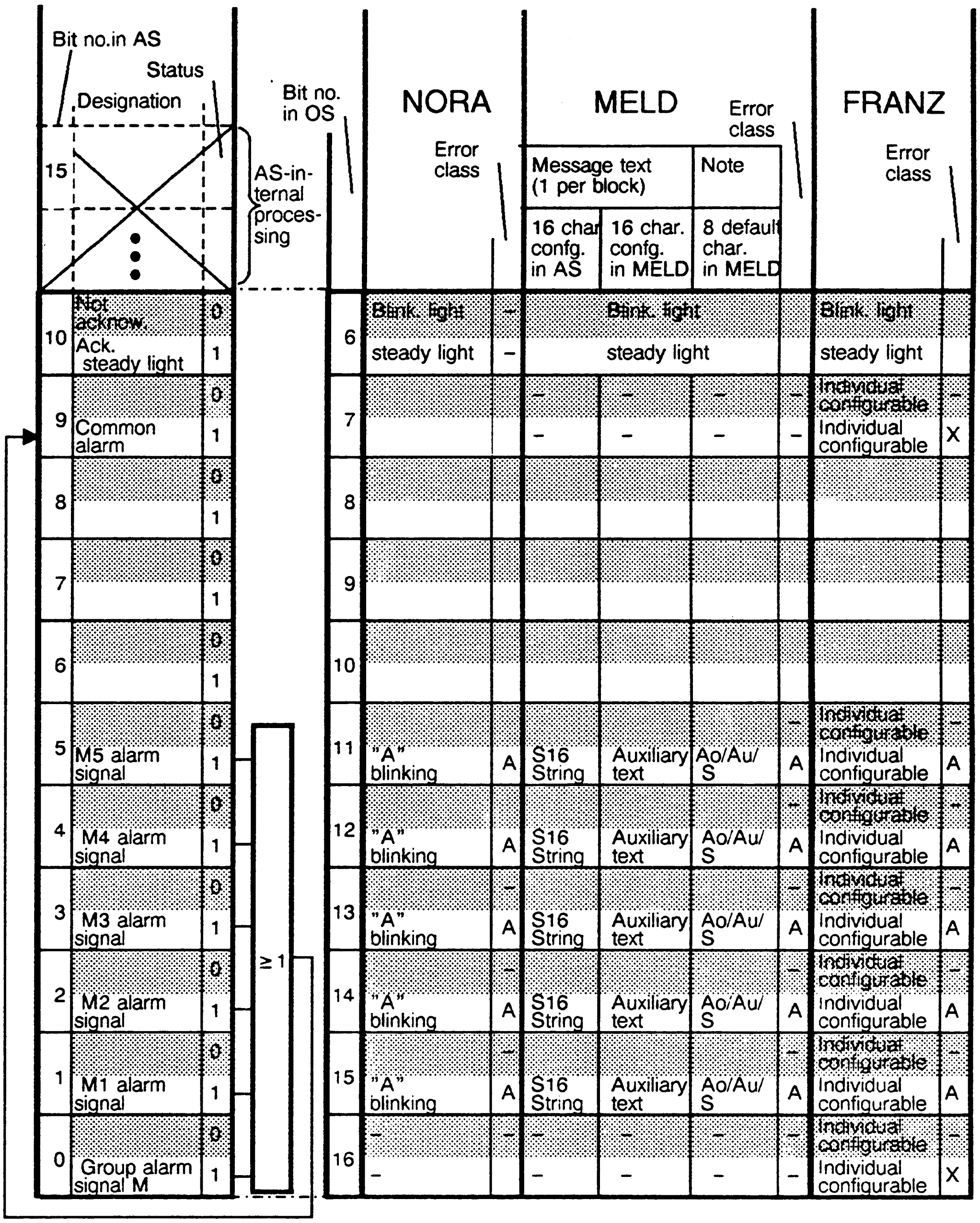


Status word in AS			Interpretation in OS								
Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD: Message text (1 per block): 16 char confg. in AS	MELD: Message text (1 per block): 16 char. confg. in MELD	MELD: Note: 8 default char. in MELD	Error class	FRANZ	Error class
15											
10	Not acknowledg.	0	6	Blink. light	-	Blink. light				Blink. light	
	Ack. steady light	1		Steady light	-	Steady light				Steady light	
9		0	7			-	-	-	-	Individual configurable	-
	Common alarm	1				-	-	-	-	Individual configurable	X
8		0	8	-		-	-	-	-	Individual configurable	-
	External fault	1		Block environment	S	S16 String	Auxiliary text	Environment	S	Individual configurable	S
7		0	9		-	-	-	-	-	Individual configurable	-
	I / O fault	1		Sxx*)	S	S16 String	Auxiliary text	Failure	S	Individual configurable	S
6		0	10			-	-	-	-	Individual configurable	-
	I / O fault S80	1		S80 module	S	S16 String	Auxiliary text	280 module	S	Individual configurable	S
5	Automatic mode	0	11	"SM"		-	-	-	-	Individual configurable	
	Manual mode	1		"FA"		-	-	-	-	Individual configurable	
4		0	12								
		1									
3		0	13			-	-	-	-	Individual configurable	
	CLOSED	1		"↓"		-	-	-	-	Individual configurable	
2		0	14			-	-	-	-	Individual configurable	
	OPEN	1		"↑"		-	-	-	-	Individual configurable	
1		0	15			-	-	-	-	Individual configurable	
	Closing	1		"↓" blinking		-	-	-	-	Individual configurable	
0		0	16			-	-	-	-	Individual configurable	
	Opening	1		"↑" blinking		-	-	-	-	Individual configurable	

Fig. 2-18 Status word for the EV block

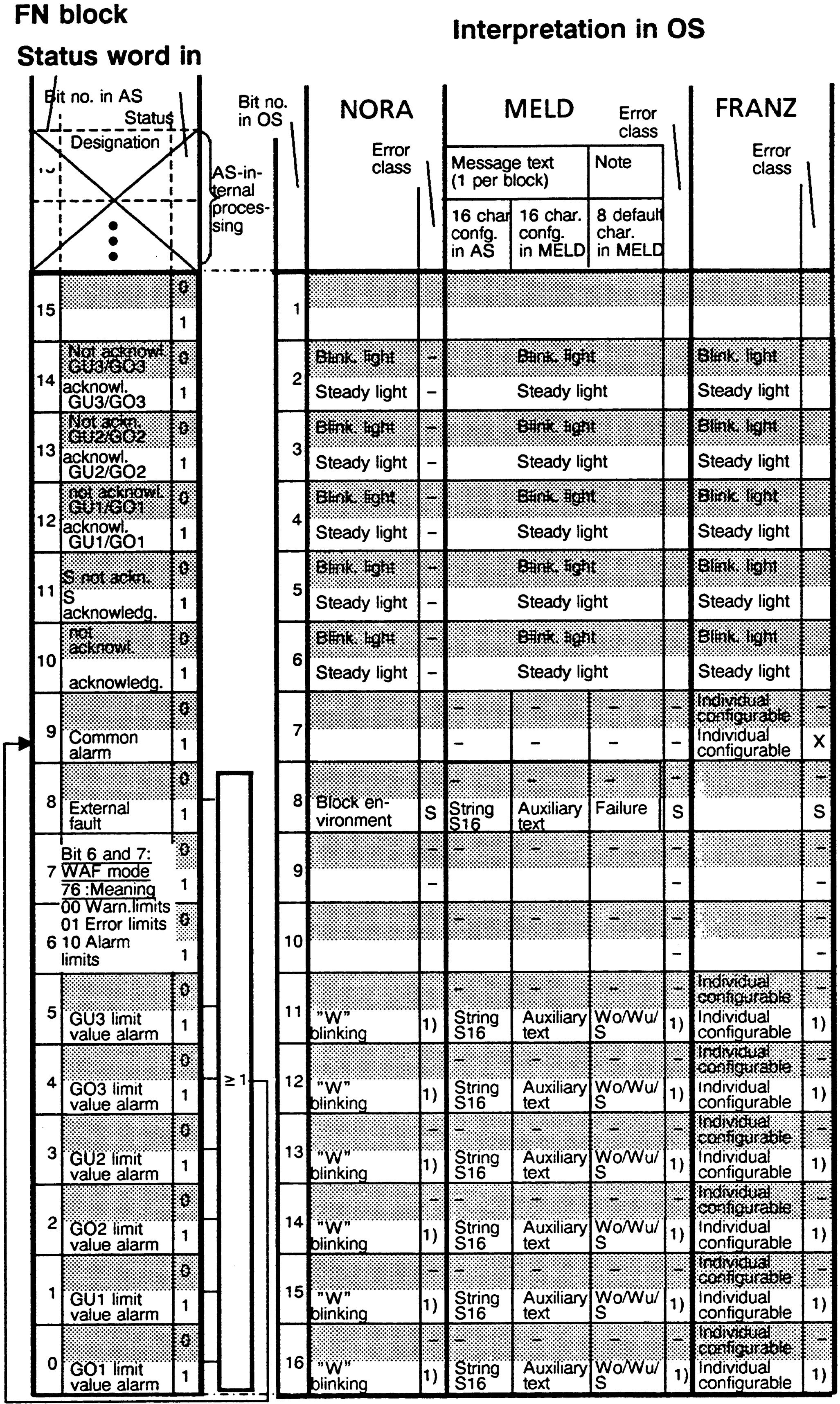
F block

Status word in AS **Interpretation in OS**



Bit no.in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD			Error class	FRANZ	Error class
						Message text (1 per block)		Note			
						16 char confg. in AS	16 char. confg. in MELD	8 default char. in MELD			
15 …	AS-internal processing										
10	Not acknow.	0	6	Blink. light	–	Blink. light				Blink. light	
	Ack. steady light	1		steady light	–	steady light				steady light	
9		0	7			–	–	–	–	Individual configurable	–
	Common alarm	1				–	–	–	–	Individual configurable	X
8		0	8								
		1									
7		0	9								
		1									
6		0	10								
		1									
5		0	11						–	Individual configurable	–
	M5 alarm signal	1		"A" blinking	A	S16 String	Auxiliary text	Ao/Au/S	A	Individual configurable	A
4		0	12						–	Individual configurable	–
	M4 alarm signal	1		"A" blinking	A	S16 String	Auxiliary text	Ao/Au/S	A	Individual configurable	A
3		0	13		–				–	Individual configurable	–
	M3 alarm signal	1		"A" blinking	A	S16 String	Auxiliary text	Ao/Au/S	A	Individual configurable	A
2		0	14		–				–	Individual configurable	–
	M2 alarm signal	1		"A" blinking	A	S16 String	Auxiliary text	Ao/Au/S	A	Individual configurable	A
1		0	15		–				–	Individual configurable	–
	M1 alarm signal	1		"A" blinking	A	S16 String	Auxiliary text	Ao/Au/S	A	Individual configurable	A
0		0	16	–	–	–	–	–	–	Individual configurable	–
	Group alarm signal M	1		–		–	–	–	–	Individual configurable	X

Fig. 2-19 Status word for the F block



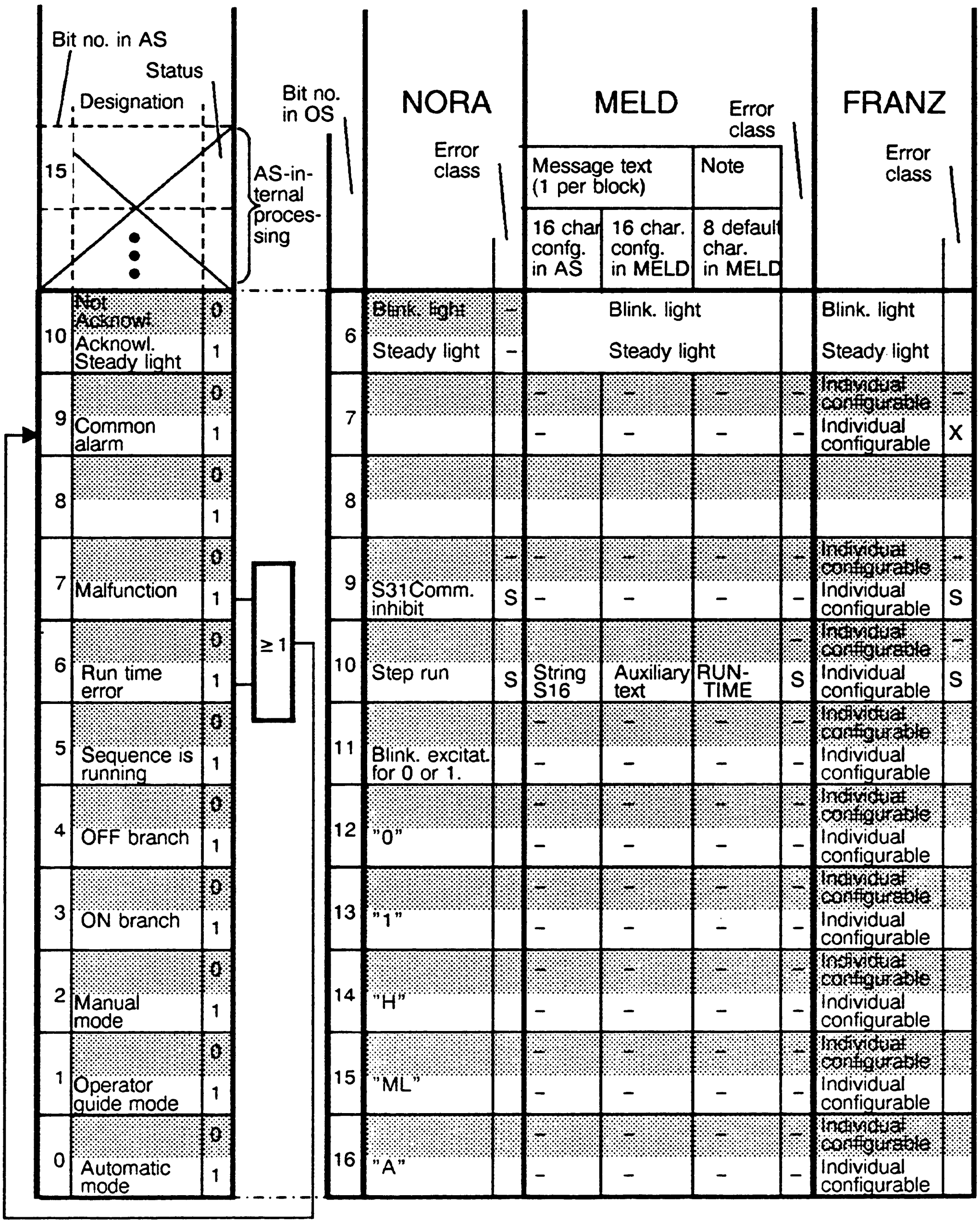
FN block Status word in / **Interpretation in OS**

Bit no. in AS	Designation	Status	Bit no. in OS	NORA	NORA Error class	MELD Message text (1 per block): 16 char confg. in AS	MELD Message text (1 per block): 16 char. confg. in MELD	MELD Note: 8 default char. in MELD	MELD Error class	FRANZ	FRANZ Error class
15		0	1								
		1									
14	Not acknowl. GU3/GO3	0	2	Blink. light	–	Blink. light				Blink. light	
	acknowl. GU3/GO3	1		Steady light	–	Steady light				Steady light	
13	Not ackn. GU2/GO2	0	3	Blink. light	–	Blink. light				Blink. light	
	acknowl. GU2/GO2	1		Steady light	–	Steady light				Steady light	
12	not acknowl. GU1/GO1	0	4	Blink. light	–	Blink. light				Blink. light	
	acknowl. GU1/GO1	1		Steady light	–	Steady light				Steady light	
11	S not ackn.	0	5	Blink. light	–	Blink. light				Blink. light	
	S acknowledg.	1		Steady light	–	Steady light				Steady light	
10	not acknowl.	0	6	Blink. light	–	Blink. light				Blink. light	
	acknowledg.	1		Steady light	–	Steady light				Steady light	
9		0	7			–	–	–	–	Individual configurable	–
	Common alarm	1				–	–	–	–	Individual configurable	X
8		0	8			–	–	–	–		–
	External fault	1		Block environment	S	String S16	Auxiliary text	Failure	S		S
7	Bit 6 and 7: WAF mode 76 :Meaning 00 Warn.limits 01 Error limits 10 Alarm limits	0	9		–	–	–	–	–		–
		1			–				–		–
6		0	10			–	–	–	–		–
		1							–		–
5		0	11			–	–	–	–	Individual configurable	–
	GU3 limit value alarm	1		"W" blinking	1)	String S16	Auxiliary text	Wo/Wu/S	1)	Individual configurable	1)
4		0	12			–	–	–	–	Individual configurable	–
	GO3 limit value alarm	1		"W" blinking	1)	String S16	Auxiliary text	Wo/Wu/S	1)	Individual configurable	1)
3		0	13		–	–	–	–	–	Individual configurable	–
	GU2 limit value alarm	1		"W" blinking	1)	String S16	Auxiliary text	Wo/Wu/S	1)	Individual configurable	1)
2		0	14		–	–	–	–	–	Individual configurable	–
	GO2 limit value alarm	1		"W" blinking	1)	String S16	Auxiliary text	Wo/Wu/S	1)	Individual configurable	1)
1		0	15		–	–	–	–	–	Individual configurable	–
	GU1 limit value alarm	1		"W" blinking	1)	String S16	Auxiliary text	Wo/Wu/S	1)	Individual configurable	1)
0		0	16		–	–	–	–	–	Individual configurable	–
	GO1 limit value alarm	1		"W" blinking	1)	String S16	Auxiliary text	Wo/Wu/S	1)	Individual configurable	1)

1) Depends on WAF mode

Fig. 2-20 Status word for the FN block

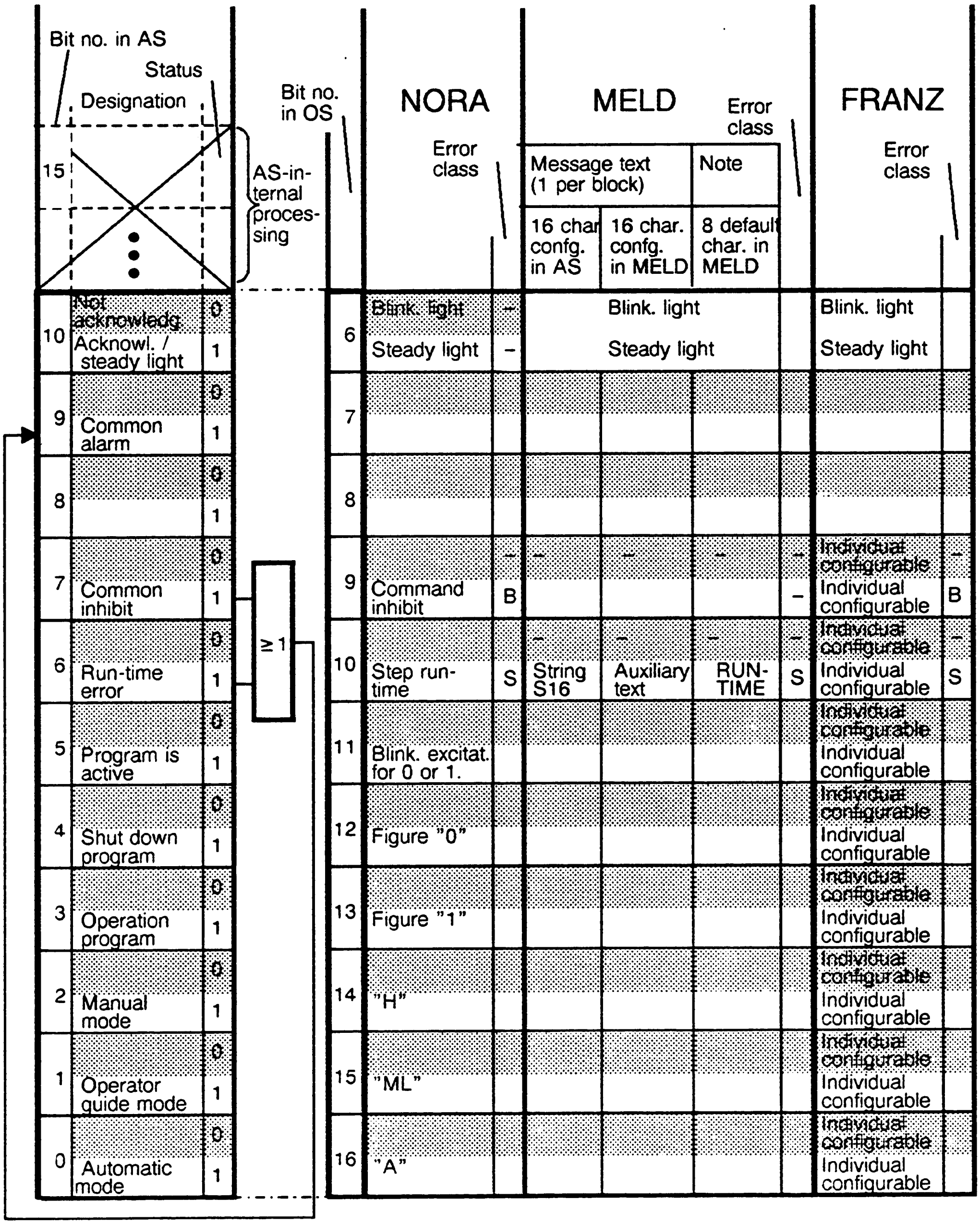
G block



Status word in AS Bit no. in AS	Designation	Status	Bit no. in OS	NORA	NORA Error class	MELD Message text (1 per block) 16 char confg. in AS	MELD Message text (1 per block) 16 char. confg. in MELD	MELD Note 8 default char. in MELD	MELD Error class	FRANZ	FRANZ Error class
15 … 11											
10	Not Acknowl.	0	6	Blink. light	–	Blink. light				Blink. light	
	Acknowl. Steady light	1		Steady light	–	Steady light				Steady light	
9		0	7			–	–	–	–	Individual configurable	–
	Common alarm	1				–	–	–	–	Individual configurable	X
8		0	8								
		1									
7		0	9		–	–	–	–	–	Individual configurable	–
	Malfunction	1		S31Comm. inhibit	S	–	–	–	–	Individual configurable	S
6		0	10						–	Individual configurable	–
	Run time error	1		Step run	S	String S16	Auxiliary text	RUN-TIME	S	Individual configurable	S
5		0	11			–	–	–	–	Individual configurable	
	Sequence is running	1		Blink. excitat. for 0 or 1.		–	–	–	–	Individual configurable	
4		0	12			–	–	–	–	Individual configurable	
	OFF branch	1		"0"		–	–	–	–	Individual configurable	
3		0	13			–	–	–	–	Individual configurable	
	ON branch	1		"1"		–	–	–	–	Individual configurable	
2		0	14			–	–	–	–	Individual configurable	
	Manual mode	1		"H"		–	–	–	–	Individual configurable	
1		0	15			–	–	–	–	Individual configurable	
	Operator guide mode	1		"ML"		–	–	–	–	Individual configurable	
0		0	16			–	–	–	–	Individual configurable	
	Automatic mode	1		"A"		–	–	–	–	Individual configurable	

Fig.2-21 Status word for the G block

GK block



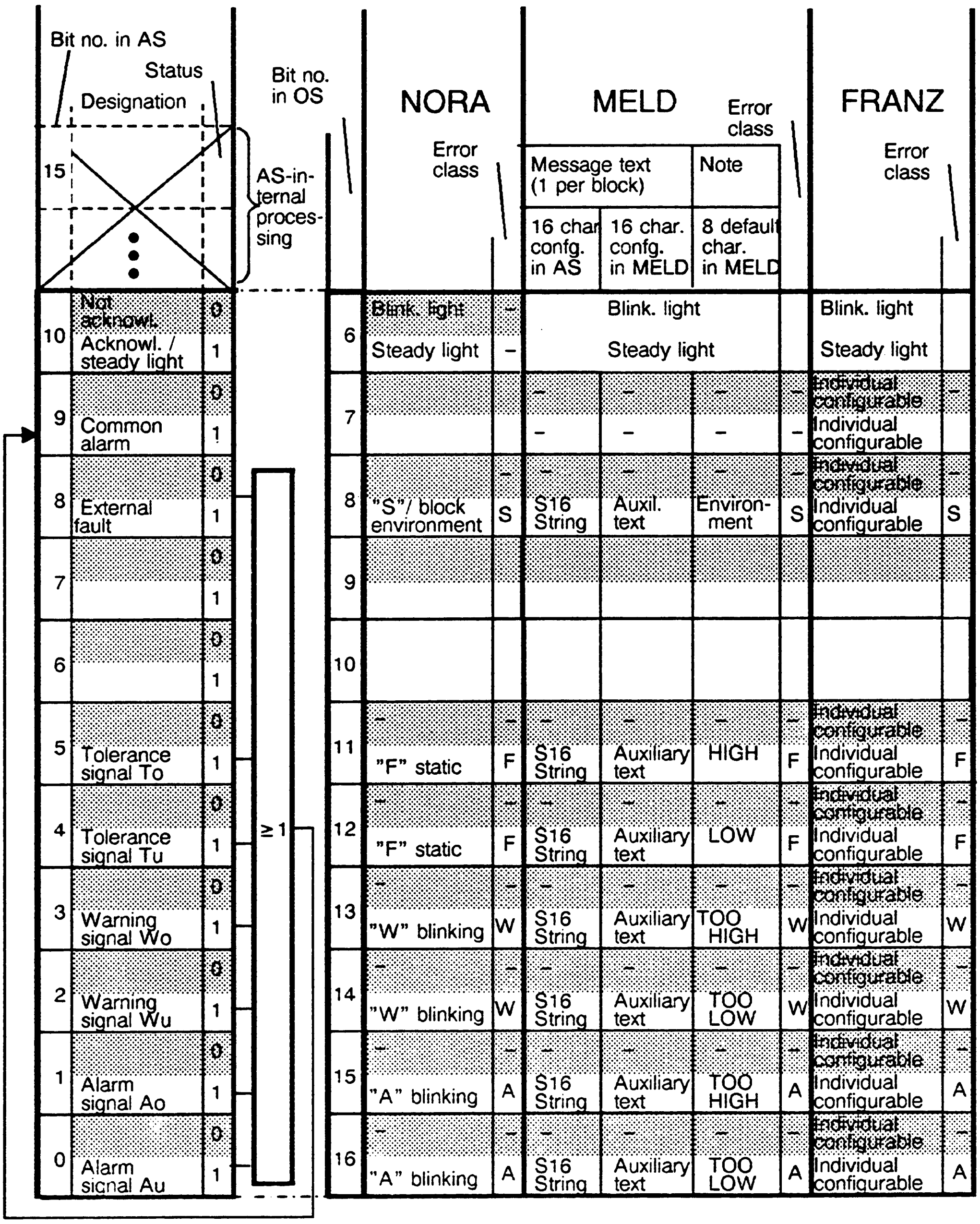
Bit no. in AS	Designation	Status	Bit no. in OS	NORA		MELD				FRANZ	
					Error class	Message text (1 per block)		Note	Error class		Error class
						16 char confg. in AS	16 char. confg. in MELD	8 default char. in MELD			
15 …			AS-internal processing								
10	Not acknowledg	0	6	Blink. light	–	Blink. light				Blink. light	
	Acknowl. / steady light	1		Steady light	–	Steady light				Steady light	
9		0	7								
	Common alarm	1									
8		0	8								
		1									
7		0	9		–	–	–	–	–	Individual configurable	–
	Common inhibit	1		Command inhibit	B				–	Individual configurable	B
6		0	10		–	–	–	–	–	Individual configurable	–
	Run-time error	1		Step run-time	S	String S16	Auxiliary text	RUN-TIME	S	Individual configurable	S
5		0	11							Individual configurable	
	Program is active	1		Blink. excitat. for 0 or 1.						Individual configurable	
4		0	12							Individual configurable	
	Shut down program	1		Figure "0"						Individual configurable	
3		0	13							Individual configurable	
	Operation program	1		Figure "1"						Individual configurable	
2		0	14							Individual configurable	
	Manual mode	1		"H"						Individual configurable	
1		0	15							Individual configurable	
	Operator guide mode	1		"ML"						Individual configurable	
0		0	16							Individual configurable	
	Automatic mode	1		"A"						Individual configurable	

Fig. 2-22 Status word for the GK block

M block

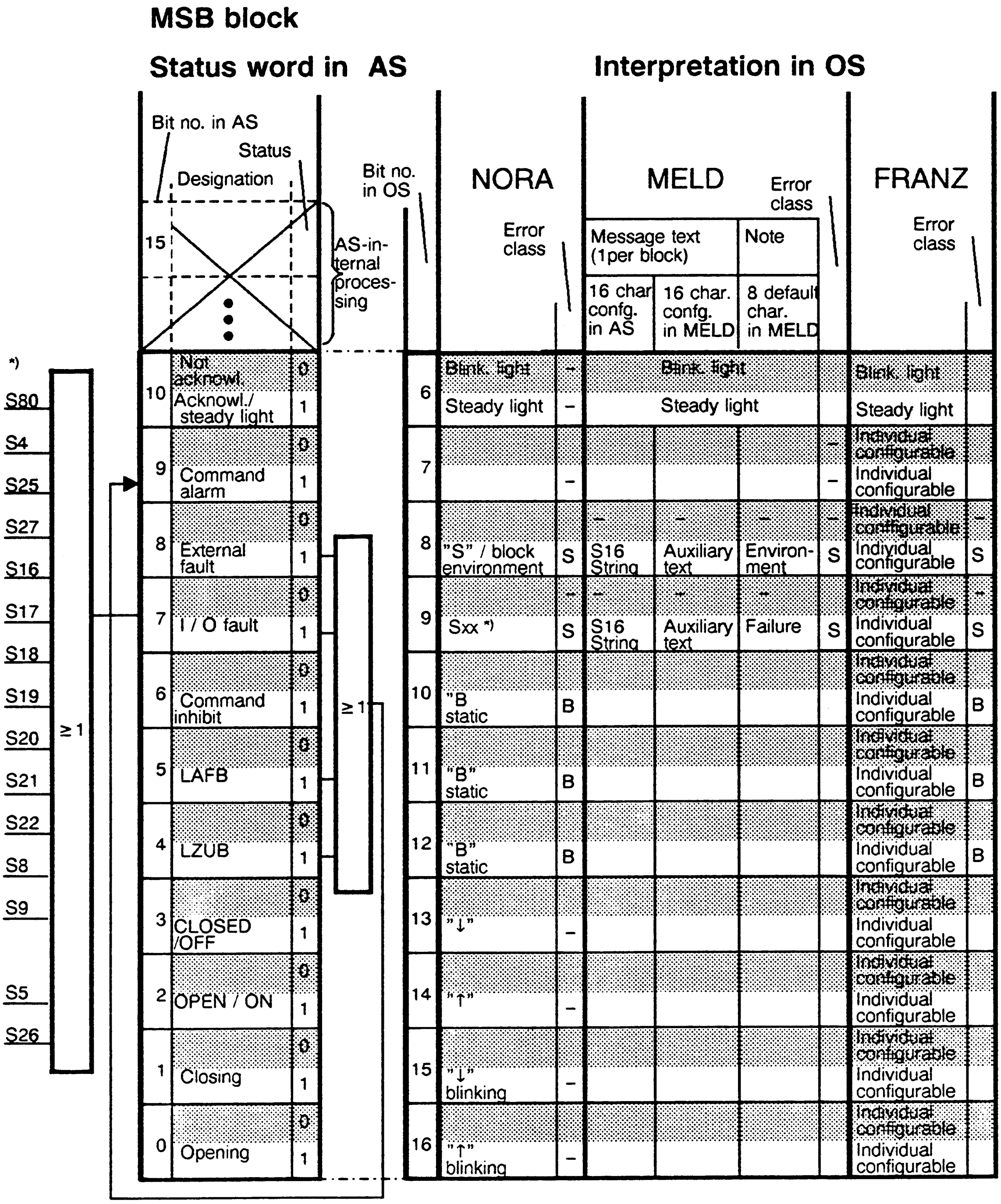
Status word in AS

Interpretation in OS



Bit no. in AS	Designation	Status	Bit no. in OS	NORA		MELD				FRANZ	
					Error class	Message text (1 per block)		Note	Error class		Error class
						16 char confg. in AS	16 char. confg. in MELD	8 default char. in MELD			
15 ⋮			AS-internal processing								
10	Not acknowl.	0	6	Blink. light	–	Blink. light				Blink. light	
	Acknowl. / steady light	1		Steady light	–	Steady light				Steady light	
9		0	7			–	–	–	–	Individual configurable	–
	Common alarm	1				–	–	–	–	Individual configurable	
8		0	8	–	–	–	–	–	–	Individual configurable	–
	External fault	1		"S"/ block environment	S	S16 String	Auxil. text	Environment	S	Individual configurable	S
7		0	9								
		1									
6		0	10								
		1									
5		0	11	–	–	–	–	–	–	Individual configurable	–
	Tolerance signal To	1		"F" static	F	S16 String	Auxiliary text	HIGH	F	Individual configurable	F
4		0	12	–	–	–	–	–	–	Individual configurable	–
	Tolerance signal Tu	1		"F" static	F	S16 String	Auxiliary text	LOW	F	Individual configurable	F
3		0	13	–	–	–	–	–	–	Individual configurable	–
	Warning signal Wo	1		"W" blinking	W	S16 String	Auxiliary text	TOO HIGH	W	Individual configurable	W
2		0	14	–	–	–	–	–	–	Individual configurable	–
	Warning signal Wu	1		"W" blinking	W	S16 String	Auxiliary text	TOO LOW	W	Individual configurable	W
1		0	15	–	–	–	–	–	–	Individual configurable	–
	Alarm signal Ao	1		"A" blinking	A	S16 String	Auxiliary text	TOO HIGH	A	Individual configurable	A
0		0	16	–	–	–	–	–	–	Individual configurable	–
	Alarm signal Au	1		"A" blinking	A	S16 String	Auxiliary text	TOO LOW	A	Individual configurable	A

Fig. 2-23 Status word for the M block

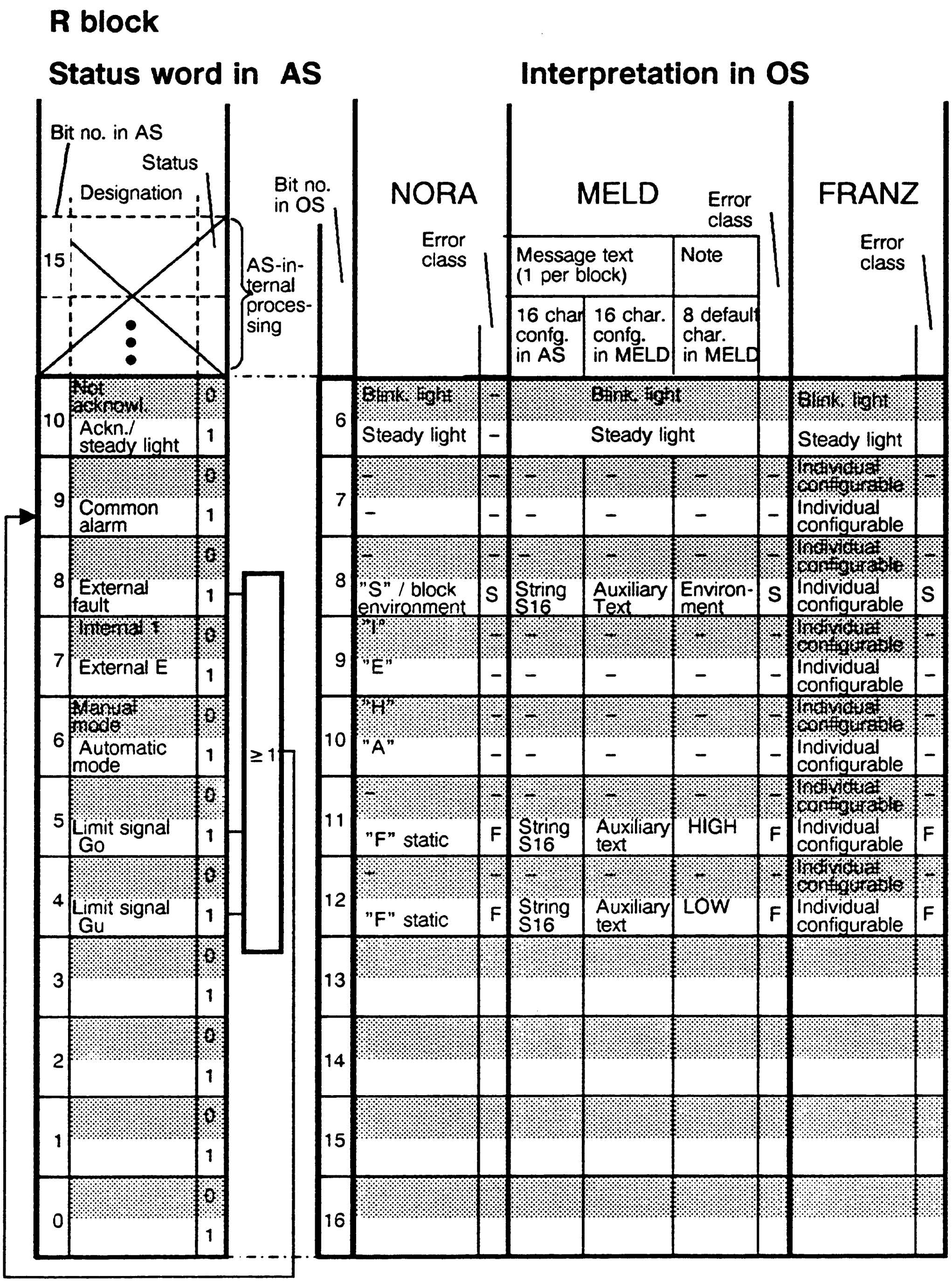


MSB block

Status word in AS **Interpretation in OS**

Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD: Message text (1per block)		Note	Error class	FRANZ	Error class
						16 char confg. in AS	16 char. confg. in MELD	8 default char. in MELD			
15 ⋮			AS-internal processing								
10	Not acknowl.	0	6	Blink. light	–	Blink. light				Blink. light	
	Acknowl./ steady light	1		Steady light	–	Steady light				Steady light	
9		0	7						–	Individual configurable	
	Command alarm	1			–				–	Individual configurable	
8		0	8			–	–	–	–	Individual configurable	–
	External fault	1		"S" / block environment	S	S16 String	Auxiliary text	Environ- ment	S	Individual configurable	S
7		0	9		–	–	–	–		Individual configurable	–
	I / O fault	1		Sxx *)	S	S16 String	Auxiliary text	Failure	S	Individual configurable	S
6		0	10							Individual configurable	
	Command inhibit	1		"B static	B					Individual configurable	B
5		0	11							Individual configurable	
	LAFB	1		"B" static	B					Individual configurable	B
4		0	12							Individual configurable	
	LZUB	1		"B" static	B					Individual configurable	B
3		0	13							Individual configurable	
	CLOSED /OFF	1		"↓"	–					Individual configurable	
2		0	14							Individual configurable	
	OPEN / ON	1		"↑"	–					Individual configurable	
1		0	15							Individual configurable	
	Closing	1		"↓" blinking	–					Individual configurable	
0		0	16							Individual configurable	
	Opening	1		"↑" blinking	–					Individual configurable	

Fig. 2-24 Status word for the MSB block



R block

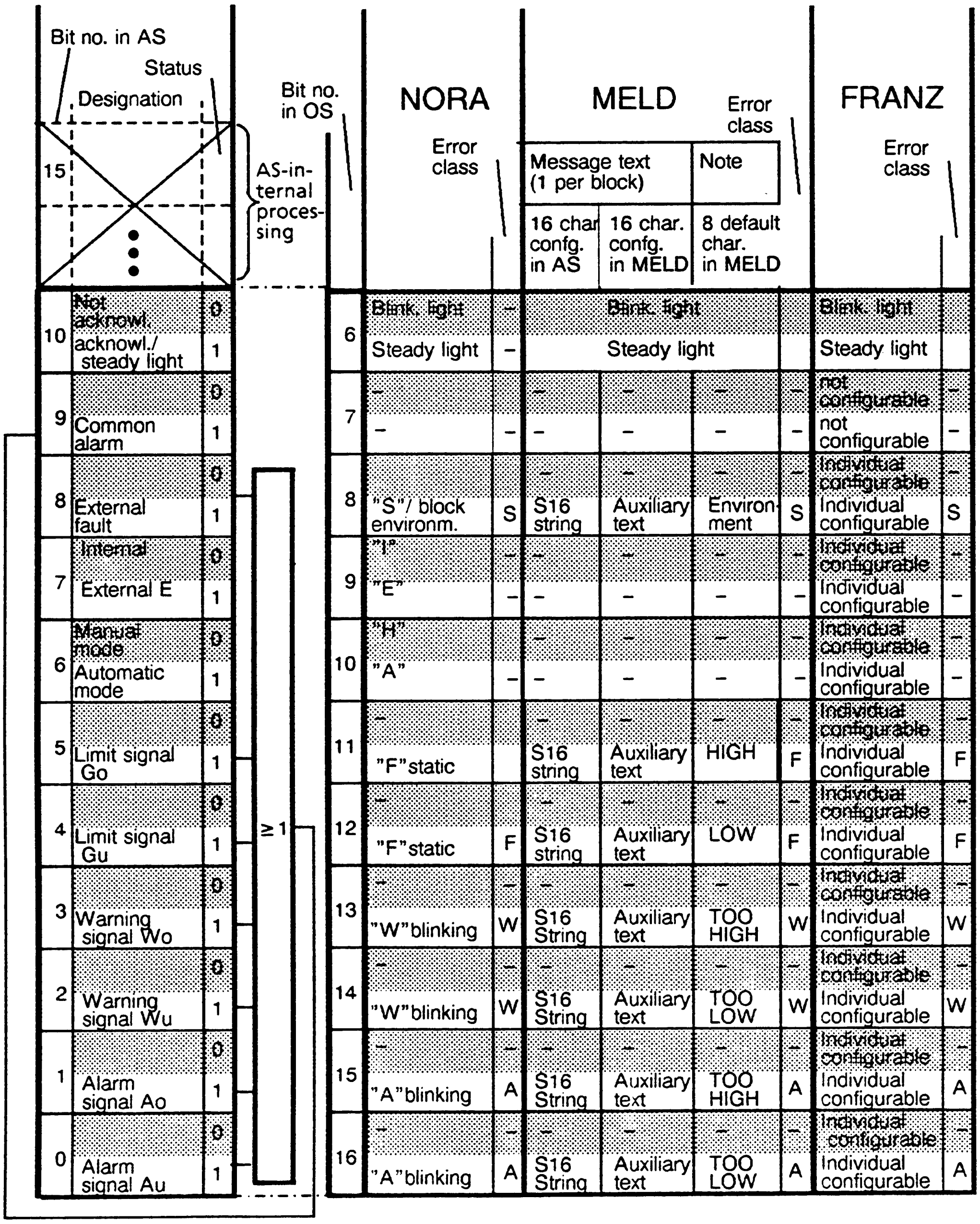
Status word in AS **Interpretation in OS**

Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD Message text (1 per block): 16 char confg. in AS	MELD Message text (1 per block): 16 char. confg. in MELD	MELD Note: 8 default char. in MELD	Error class	FRANZ	Error class
15 … 11	AS-internal processing										
10	Not acknowl.	0	6	Blink. light	–	Blink. light				Blink. light	
	Ackn./ steady light	1		Steady light	–	Steady light				Steady light	
9		0	7	–	–	–	–	–	–	Individual configurable	–
	Common alarm	1		–	–	–	–	–	–	Individual configurable	
8		0	8	–	–	–	–	–	–	Individual configurable	–
	External fault	1		"S" / block environment	S	String S16	Auxiliary Text	Environ-ment	S	Individual configurable	S
7	Internal 1	0	9	"I"	–	–	–	–	–	Individual configurable	–
	External E	1		"E"	–	–	–	–	–	Individual configurable	–
6	Manual mode	0	10	"H"	–	–	–	–	–	Individual configurable	–
	Automatic mode	1		"A"	–	–	–	–	–	Individual configurable	–
5		0	11	–	–	–	–	–	–	Individual configurable	–
	Limit signal Go	1		"F" static	F	String S16	Auxiliary text	HIGH	F	Individual configurable	F
4		0	12	–	–	–	–	–	–	Individual configurable	–
	Limit signal Gu	1		"F" static	F	String S16	Auxiliary text	LOW	F	Individual configurable	F
3		0	13								
		1									
2		0	14								
		1									
1		0	15								
		1									
0		0	16								
		1									

Fig. 2-25 Status word for the R block

R- / M block

Status word in AS **Interpretation in OS**



Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD Message text (1 per block) 16 char confg. in AS	16 char. confg. in MELD	Note 8 default char. in MELD	Error class	FRANZ	Error class
15 … 11	AS-internal processing										
10	Not acknowl.	0	6	Blink. light	–	Blink. light				Blink. light	
	acknowl./ steady light	1		Steady light	–	Steady light				Steady light	
9		0	7	–		–	–	–	–	not configurable	–
	Common alarm	1		–	–	–	–	–	–	not configurable	–
8		0	8			–	–	–	–	Individual configurable	–
	External fault	1		"S"/ block environm.	S	S16 string	Auxiliary text	Environment	S	Individual configurable	S
7	Internal	0	9	"I"	–	–	–	–	–	Individual configurable	–
	External E	1		"E"	–	–	–	–	–	Individual configurable	–
6	Manual mode	0	10	"H"		–	–	–	–	Individual configurable	–
	Automatic mode	1		"A"	–	–	–	–	–	Individual configurable	–
5		0	11	–		–	–	–	–	Individual configurable	–
	Limit signal Go	1		"F"static		S16 string	Auxiliary text	HIGH	F	Individual configurable	F
4		0	12	–		–	–	–	–	Individual configurable	–
	Limit signal Gu	1		"F"static	F	S16 string	Auxiliary text	LOW	F	Individual configurable	F
3		0	13	–	–	–	–	–	–	Individual configurable	–
	Warning signal Wo	1		"W"blinking	W	S16 String	Auxiliary text	TOO HIGH	W	Individual configurable	W
2		0	14	–	–	–	–	–	–	Individual configurable	–
	Warning signal Wu	1		"W"blinking	W	S16 String	Auxiliary text	TOO LOW	W	Individual configurable	W
1		0	15	–	–	–	–	–	–	Individual configurable	–
	Alarm signal Ao	1		"A"blinking	A	S16 String	Auxiliary text	TOO HIGH	A	Individual configurable	A
0		0	16	–	–	–	–	–	–	Individual configurable	–
	Alarm signal Au	1		"A"blinking	A	S16 String	Auxiliary text	TOO LOW	A	Individual configurable	A

Fig. 2-26 Status word for the R/M block (warning/ alarm / status interconnection WAS)

RE block

Status word in AS **Interpretation in OS**

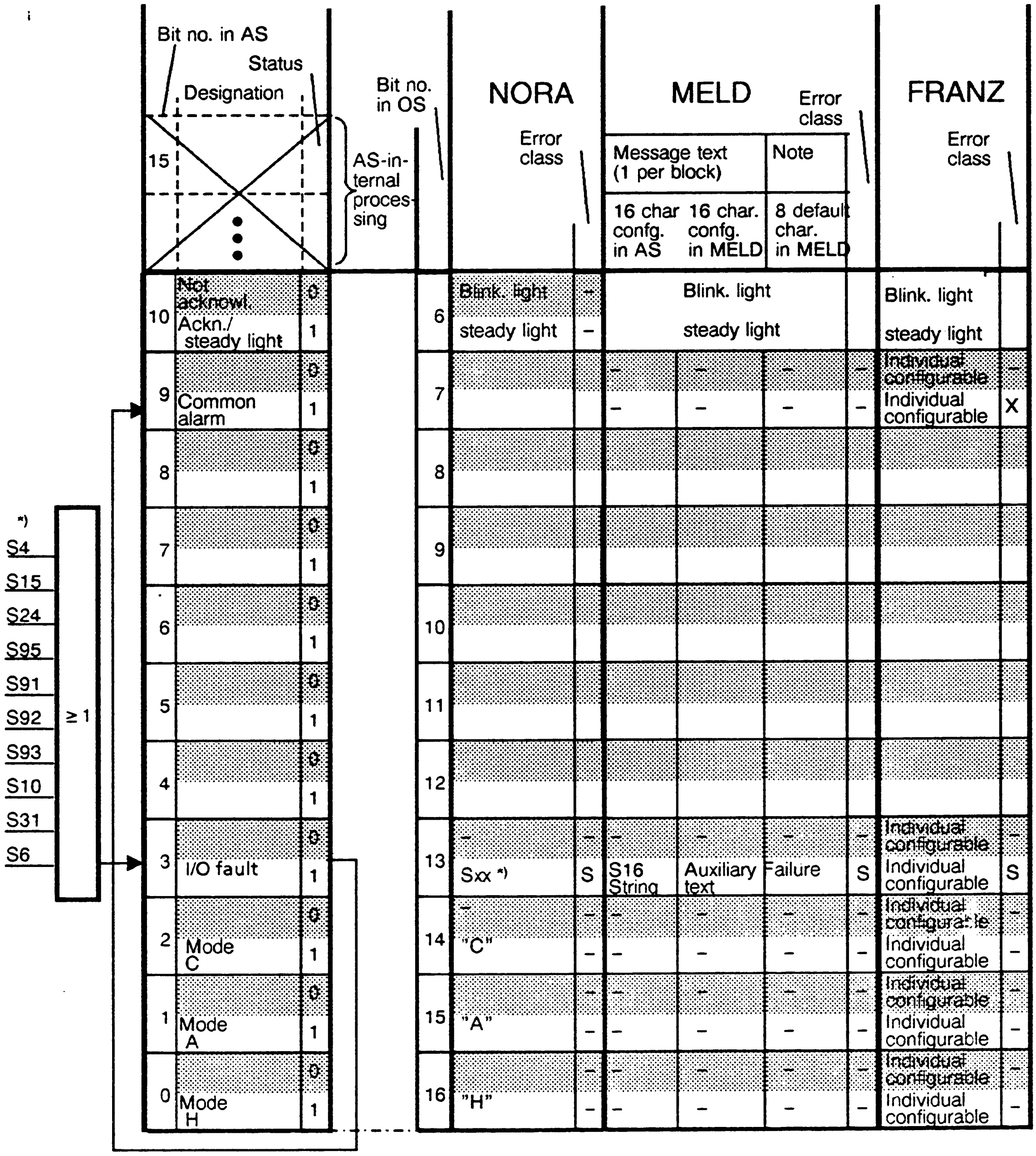
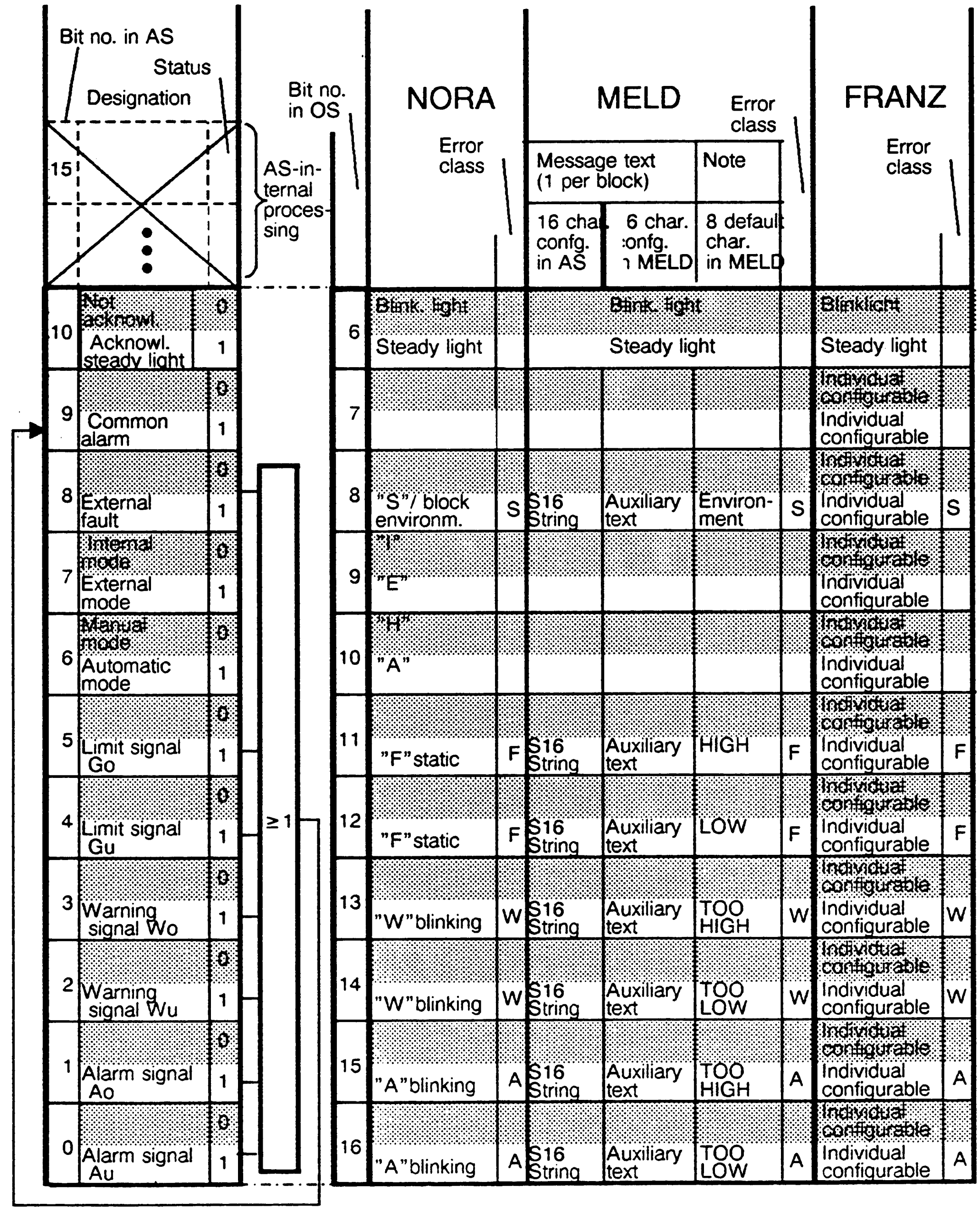


Fig.2-27 Status word for the RE block

RI block

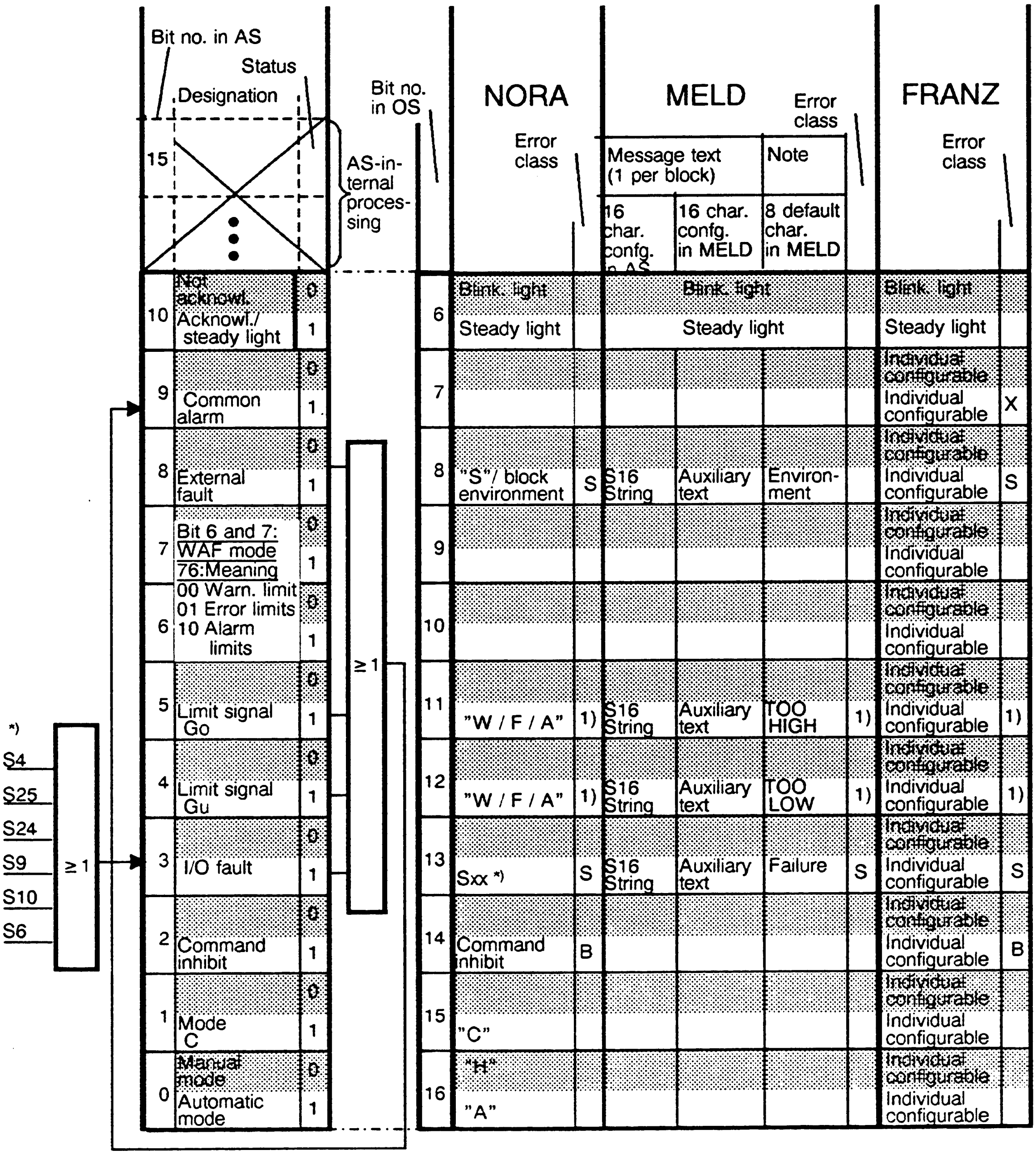


Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD Message text (1 per block): 16 cha confg. in AS	6 char. onfg. n MELD	Note: 8 defaul char. in MELD	Error class	FRANZ	Error class
15 … 11											
10	Not acknowl.	0	6	Blink. light		Blink. light				Blinklicht	
	Acknowl. steady light	1		Steady light		Steady light				Steady light	
9		0	7							Individual configurable	
	Common alarm	1								Individual configurable	
8		0	8							Individual configurable	
	External fault	1		"S"/ block environm.	S	S16 String	Auxiliary text	Environment	S	Individual configurable	S
7	Internal mode	0	9	"I"						Individual configurable	
	External mode	1		"E"						Individual configurable	
6	Manual mode	0	10	"H"						Individual configurable	
	Automatic mode	1		"A"						Individual configurable	
5		0	11							Individual configurable	
	Limit signal Go	1		"F"static	F	S16 String	Auxiliary text	HIGH	F	Individual configurable	F
4		0	12							Individual configurable	
	Limit signal Gu	1		"F"static	F	S16 String	Auxiliary text	LOW	F	Individual configurable	F
3		0	13							Individual configurable	
	Warning signal Wo	1		"W"blinking	W	S16 String	Auxiliary text	TOO HIGH	W	Individual configurable	W
2		0	14							Individual configurable	
	Warning signal Wu	1		"W"blinking	W	S16 String	Auxiliary text	TOO LOW	W	Individual configurable	W
1		0	15							Individual configurable	
	Alarm signal Ao	1		"A"blinking	A	S16 String	Auxiliary text	TOO HIGH	A	Individual configurable	A
0		0	16							Individual configurable	
	Alarm signal Au	1		"A"blinking	A	S16 String	Auxiliary text	TOO LOW	A	Individual configurable	A

Fig. 2-28 Status word for the RI block

RK block

Status word in AS **Interpretation in OS**



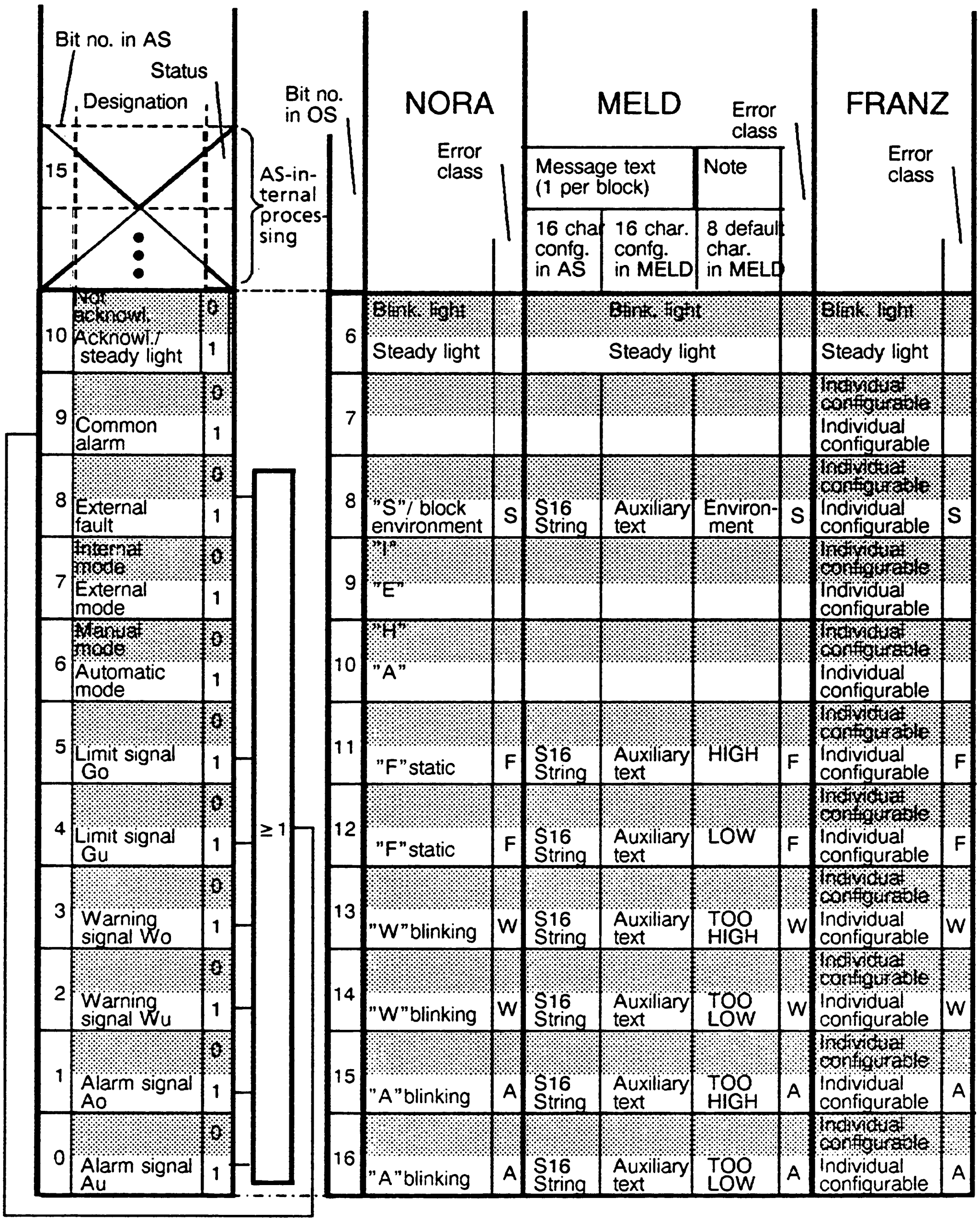
Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD: Message text (1 per block): 16 char. confg. in AS	16 char. confg. in MELD	Note: 8 default char. in MELD	Error class	FRANZ	Error class
15 … 11	AS-internal processing										
10	Not acknowl.	0	6	Blink. light		Blink. light				Blink. light	
	Acknowl./ steady light	1		Steady light		Steady light				Steady light	
9		0	7							Individual configurable	
	Common alarm	1								Individual configurable	X
8		0	8							Individual configurable	
	External fault	1		"S"/ block environment	S	S16 String	Auxiliary text	Environment		Individual configurable	S
7	Bit 6 and 7: WAF mode 76:Meaning	0	9							Individual configurable	
		1								Individual configurable	
6	00 Warn. limit 01 Error limits 10 Alarm limits	0	10							Individual configurable	
		1								Individual configurable	
5		0	11							Individual configurable	
	Limit signal Go	1		"W / F / A"	1)	S16 String	Auxiliary text	TOO HIGH	1)	Individual configurable	1)
4		0	12							Individual configurable	
	Limit signal Gu	1		"W / F / A"	1)	S16 String	Auxiliary text	TOO LOW	1)	Individual configurable	1)
3		0	13							Individual configurable	
	I/O fault	1		Sxx *)	S	S16 String	Auxiliary text	Failure	S	Individual configurable	S
2		0	14							Individual configurable	
	Command inhibit	1		Command inhibit	B					Individual configurable	B
1		0	15							Individual configurable	
	Mode C	1		"C"						Individual configurable	
0	Manual mode	0	16	"H"						Individual configurable	
	Automatic mode	1		"A"						Individual configurable	

1)Depends on WAF mode

Fig. 2-29 Status word for the RK block

RN block

Status word in AS **Interpretation in OS**

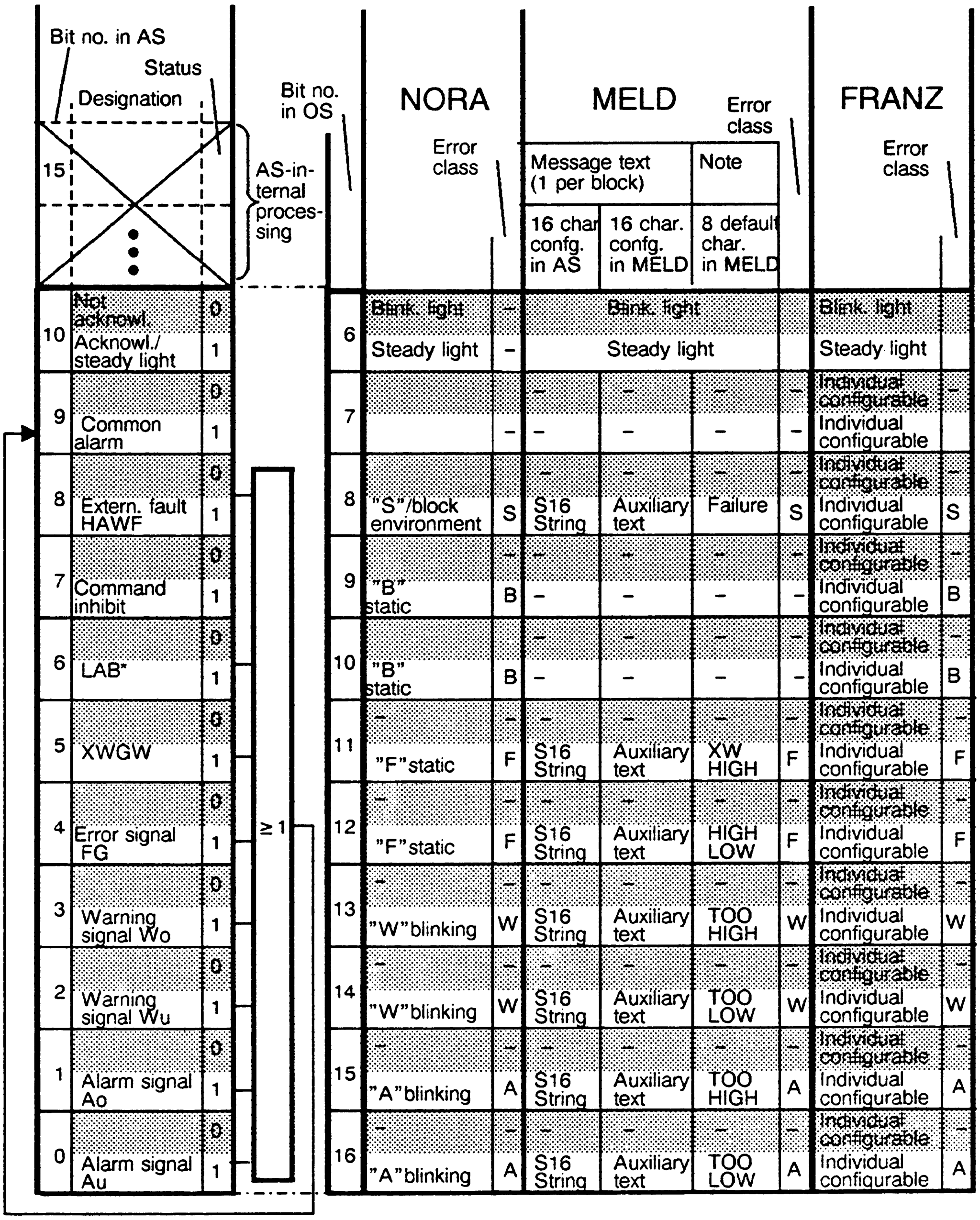


Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD: Message text (1 per block): 16 char confg. in AS	MELD: Message text (1 per block): 16 char. confg. in MELD	MELD: Note: 8 default char. in MELD	MELD Error class	FRANZ	FRANZ Error class
15 ⋮			AS-internal processing								
10	Not acknowl.	0	6	Blink. light		Blink. light				Blink. light	
	Acknowl./ steady light	1		Steady light		Steady light				Steady light	
9		0	7							Individual configurable	
	Common alarm	1								Individual configurable	
8		0	8							Individual configurable	
	External fault	1		"S"/ block environment	S	S16 String	Auxiliary text	Environment	S	Individual configurable	S
7	Internal mode	0	9	"I"						Individual configurable	
	External mode	1		"E"						Individual configurable	
6	Manual mode	0	10	"H"						Individual configurable	
	Automatic mode	1		"A"						Individual configurable	
5		0	11							Individual configurable	
	Limit signal Go	1		"F"static	F	S16 String	Auxiliary text	HIGH	F	Individual configurable	F
4		0	12							Individual configurable	
	Limit signal Gu	1		"F"static	F	S16 String	Auxiliary text	LOW	F	Individual configurable	F
3		0	13							Individual configurable	
	Warning signal Wo	1		"W"blinking	W	S16 String	Auxiliary text	TOO HIGH	W	Individual configurable	W
2		0	14							Individual configurable	
	Warning signal Wu	1		"W"blinking	W	S16 String	Auxiliary text	TOO LOW	W	Individual configurable	W
1		0	15							Individual configurable	
	Alarm signal Ao	1		"A"blinking	A	S16 String	Auxiliary text	TOO HIGH	A	Individual configurable	A
0		0	16							Individual configurable	
	Alarm signal Au	1		"A"blinking	A	S16 String	Auxiliary text	TOO LOW	A	Individual configurable	A

Fig.2-30 Status word for the RN block

RSKB block

Status word in AS **Interpretation in OS**



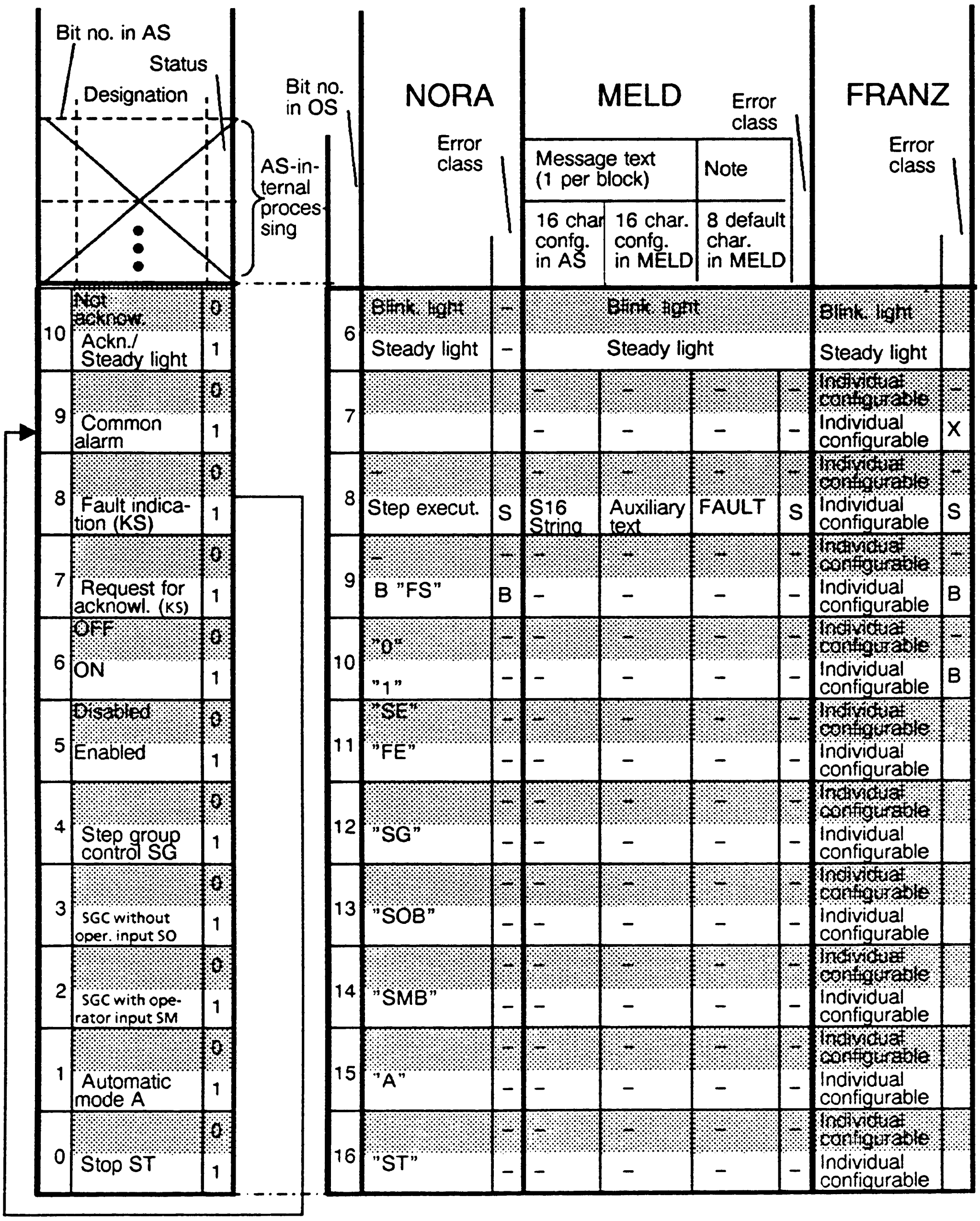
Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD Message text (1 per block) 16 char confg. in AS	MELD Message text (1 per block) 16 char. confg. in MELD	MELD Note 8 default char. in MELD	MELD Error class	FRANZ	Error class
10	Not acknowl.	0	6	Blink. light	–	Blink. light				Blink. light	
	Acknowl./ steady light	1		Steady light	–	Steady light				Steady light	
9		0	7			–	–	–	–	Individual configurable	–
	Common alarm	1			–	–	–	–	–	Individual configurable	
8		0	8			–	–	–	–	Individual configurable	–
	Extern. fault HAWF	1		"S"/block environment	S	S16 String	Auxiliary text	Failure	S	Individual configurable	S
7		0	9		–	–	–	–	–	Individual configurable	–
	Command inhibit	1		"B" static	B	–	–	–	–	Individual configurable	B
6		0	10			–	–	–	–	Individual configurable	–
	LAB*	1		"B" static	B	–	–	–	–	Individual configurable	B
5		0	11	–	–	–	–	–	–	Individual configurable	–
	XWGW	1		"F"static	F	S16 String	Auxiliary text	XW HIGH	F	Individual configurable	F
4		0	12	–	–	–	–	–	–	Individual configurable	–
	Error signal FG	1		"F"static	F	S16 String	Auxiliary text	HIGH LOW	F	Individual configurable	F
3		0	13	–	–	–	–	–	–	Individual configurable	–
	Warning signal Wo	1		"W"blinking	W	S16 String	Auxiliary text	TOO HIGH	W	Individual configurable	W
2		0	14	–	–	–	–	–	–	Individual configurable	–
	Warning signal Wu	1		"W"blinking	W	S16 String	Auxiliary text	TOO LOW	W	Individual configurable	W
1		0	15	–	–	–	–	–	–	Individual configurable	–
	Alarm signal Ao	1		"A"blinking	A	S16 String	Auxiliary text	TOO HIGH	A	Individual configurable	A
0		0	16	–	–	–	–	–	–	Individual configurable	–
	Alarm signal Au	1		"A"blinking	A	S16 String	Auxiliary text	TOO LOW	A	Individual configurable	A

Fig.2-31 Status word for the RSKB block

S block

Status word in AS

Interpretation in OS

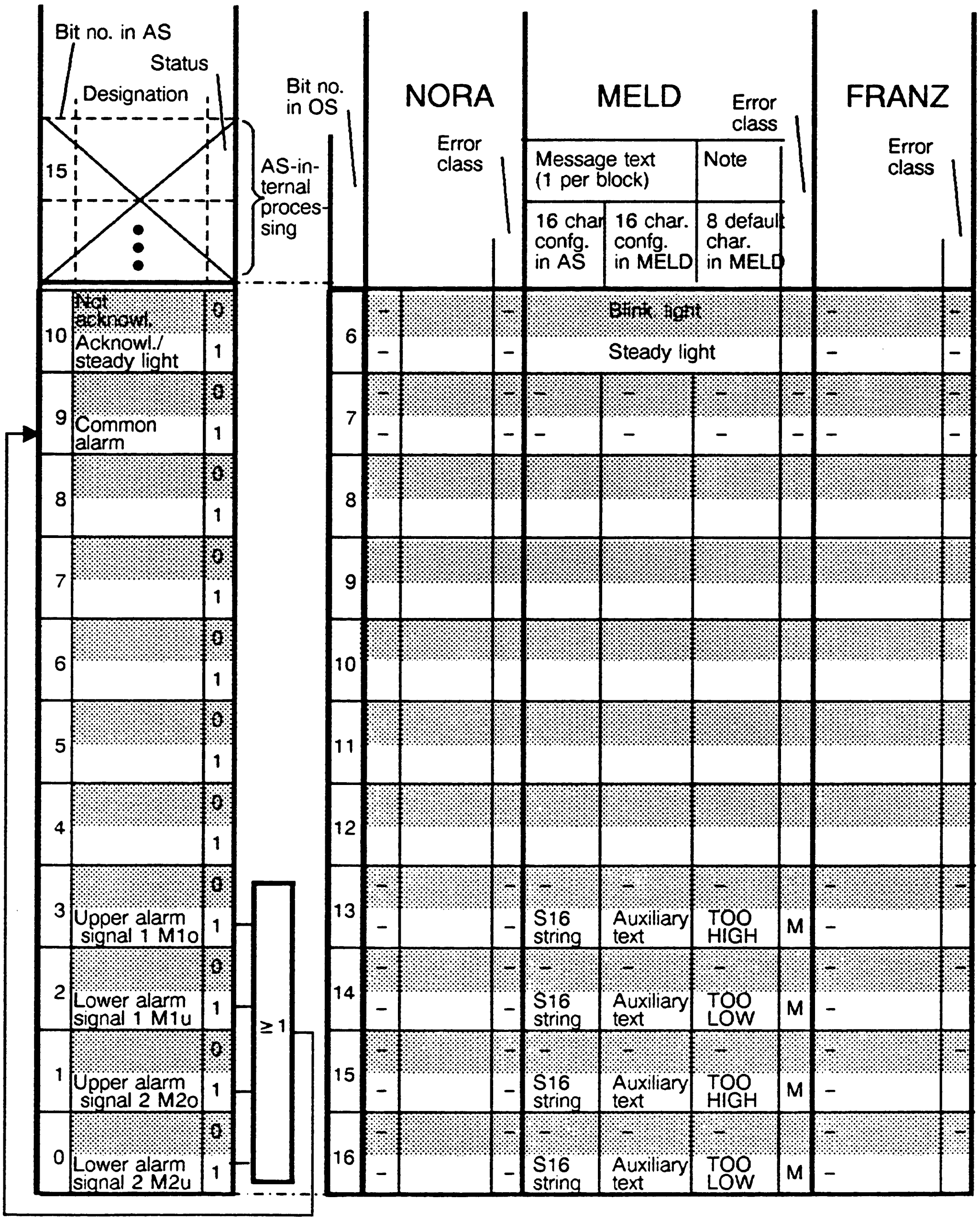


Bit no. in AS	Designation	Status	Bit no. in OS	NORA	NORA Error class	MELD Message text (1 per block): 16 char confg. in AS	MELD Message text (1 per block): 16 char. confg. in MELD	MELD Note: 8 default char. in MELD	MELD Error class	FRANZ	FRANZ Error class
10	Not acknow.	0	6	Blink. light	–	Blink. light				Blink. light	
	Ackn./ Steady light	1		Steady light	–	Steady light				Steady light	
9		0	7			–	–	–	–	Individual configurable	–
	Common alarm	1				–	–	–	–	Individual configurable	X
8		0	8	–		–	–	–	–	Individual configurable	–
	Fault indication (KS)	1		Step execut.	S	S16 String	Auxiliary text	FAULT	S	Individual configurable	S
7		0	9	–	–	–	–	–	–	Individual configurable	–
	Request for acknowl. (KS)	1		B "FS"	B	–	–	–	–	Individual configurable	B
6	OFF	0	10	"0"	–	–	–	–	–	Individual configurable	–
	ON	1		"1"	–	–	–	–	–	Individual configurable	B
5	Disabled	0	11	"SE"	–	–	–	–	–	Individual configurable	
	Enabled	1		"FE"	–	–	–	–	–	Individual configurable	
4		0	12		–	–	–	–	–	Individual configurable	
	Step group control SG	1		"SG"	–	–	–	–	–	Individual configurable	
3		0	13		–	–	–	–	–	Individual configurable	
	SGC without oper. input SO	1		"SOB"	–	–	–	–	–	Individual configurable	
2		0	14		–	–	–	–	–	Individual configurable	
	SGC with operator input SM	1		"SMB"	–	–	–	–	–	Individual configurable	
1		0	15		–	–	–	–	–	Individual configurable	
	Automatic mode A	1		"A"	–	–	–	–	–	Individual configurable	
0		0	16		–	–	–	–	–	Individual configurable	
	Stop ST	1		"ST"	–	–	–	–	–	Individual configurable	

Fig.2-32 Status word for the S block

T block

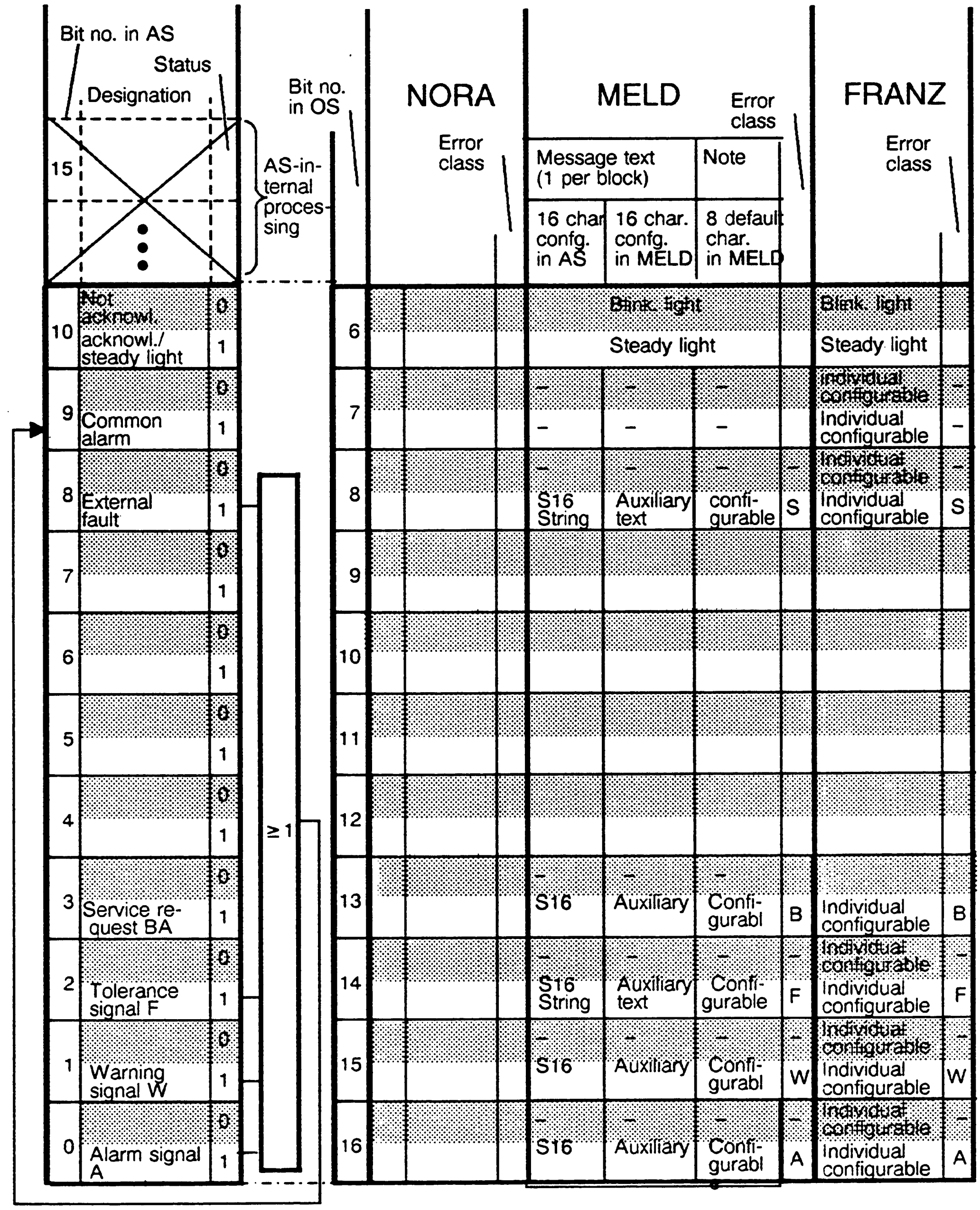
Status word in AS **Interpretation in OS**



Bit no. in AS	Designation	Status	Bit no. in OS	NORA	NORA Error class	MELD Message text (1 per block): 16 char confg. in AS	MELD Message text (1 per block): 16 char. confg. in MELD	MELD Note: 8 default char. in MELD	MELD Error class	FRANZ	FRANZ Error class
15 … 11	AS-internal processing										
10	Not acknowl.	0	6	–	–	Blink light				–	–
	Acknowl./ steady light	1		–	–	Steady light				–	–
9		0	7	–	–	–	–	–	–	–	–
	Common alarm	1		–	–	–	–	–	–	–	–
8		0	8								
		1									
7		0	9								
		1									
6		0	10								
		1									
5		0	11								
		1									
4		0	12								
		1									
3		0	13	–	–	–	–	–	–	–	–
	Upper alarm signal 1 M1o	1		–	–	S16 string	Auxiliary text	TOO HIGH	M	–	
2		0	14	–	–	–	–	–	–	–	–
	Lower alarm signal 1 M1u	1		–	–	S16 string	Auxiliary text	TOO LOW	M	–	
1		0	15	–	–	–	–	–	–	–	–
	Upper alarm signal 2 M2o	1		–	–	S16 string	Auxiliary text	TOO HIGH	M	–	
0		0	16	–	–	–	–	–	–	–	–
	Lower alarm signal 2 M2u	1		–	–	S16 string	Auxiliary text	TOO LOW	M	–	

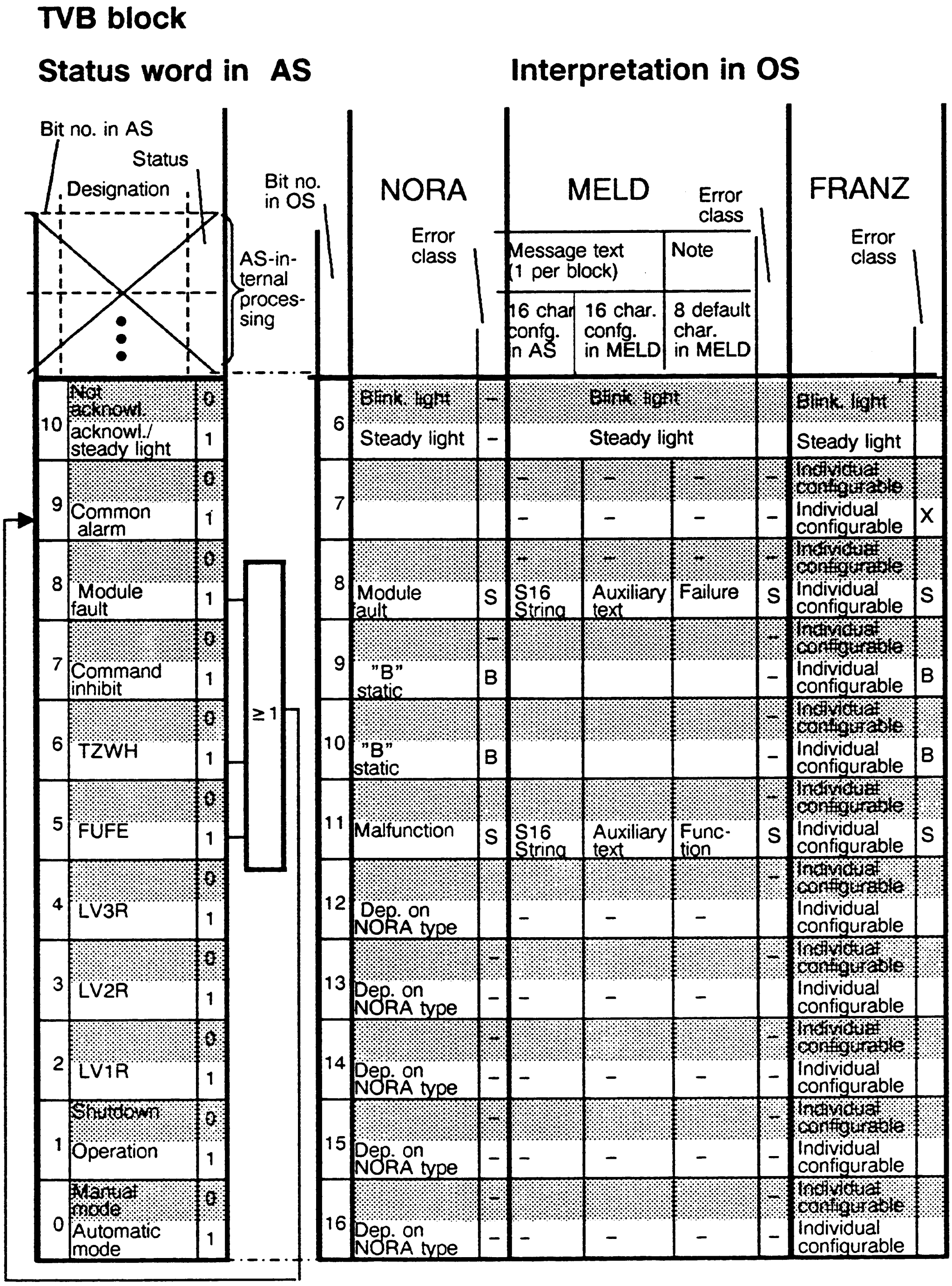
Fig.2-33 Status word for the T block

TML- / SKS- / MKS block



Status word in AS			Interpretation in OS							
Bit no. in AS	Designation	Status	Bit no. in OS	NORA Error class	MELD Message text (1 per block) 16 char confg. in AS	MELD Message text (1 per block) 16 char. confg. in MELD	MELD Note 8 default char. in MELD	MELD Error class	FRANZ	FRANZ Error class
15 …	AS-internal processing									
10	Not acknowl.	0	6		Blink. light				Blink. light	
	acknowl./ steady light	1			Steady light				Steady light	
9		0	7		–	–	–		individual configurable	–
	Common alarm	1			–	–	–		Individual configurable	–
8		0	8		–	–	–	–	individual configurable	–
	External fault	1			S16 String	Auxiliary text	confi-gurable	S	Individual configurable	S
7		0	9							
		1								
6		0	10							
		1								
5		0	11							
		1								
4		0	12							
		1								
3		0	13		–	–	–			
	Service request BA	1			S16	Auxiliary	Confi-gurabl	B	Individual configurable	B
2		0	14		–	–	–	–	individual configurable	–
	Tolerance signal F	1			S16 String	Auxiliary text	Confi-gurable	F	Individual configurable	F
1		0	15		–	–	–	–	individual configurable	–
	Warning signal W	1			S16	Auxiliary	Confi-gurabl	W	Individual configurable	W
0		0	16		–	–	–	–	individual configurable	–
	Alarm signal A	1			S16	Auxiliary	Confi-gurabl	A	Individual configurable	A

Fig.2-34 Status word for the TML-, SKS- and MKS block

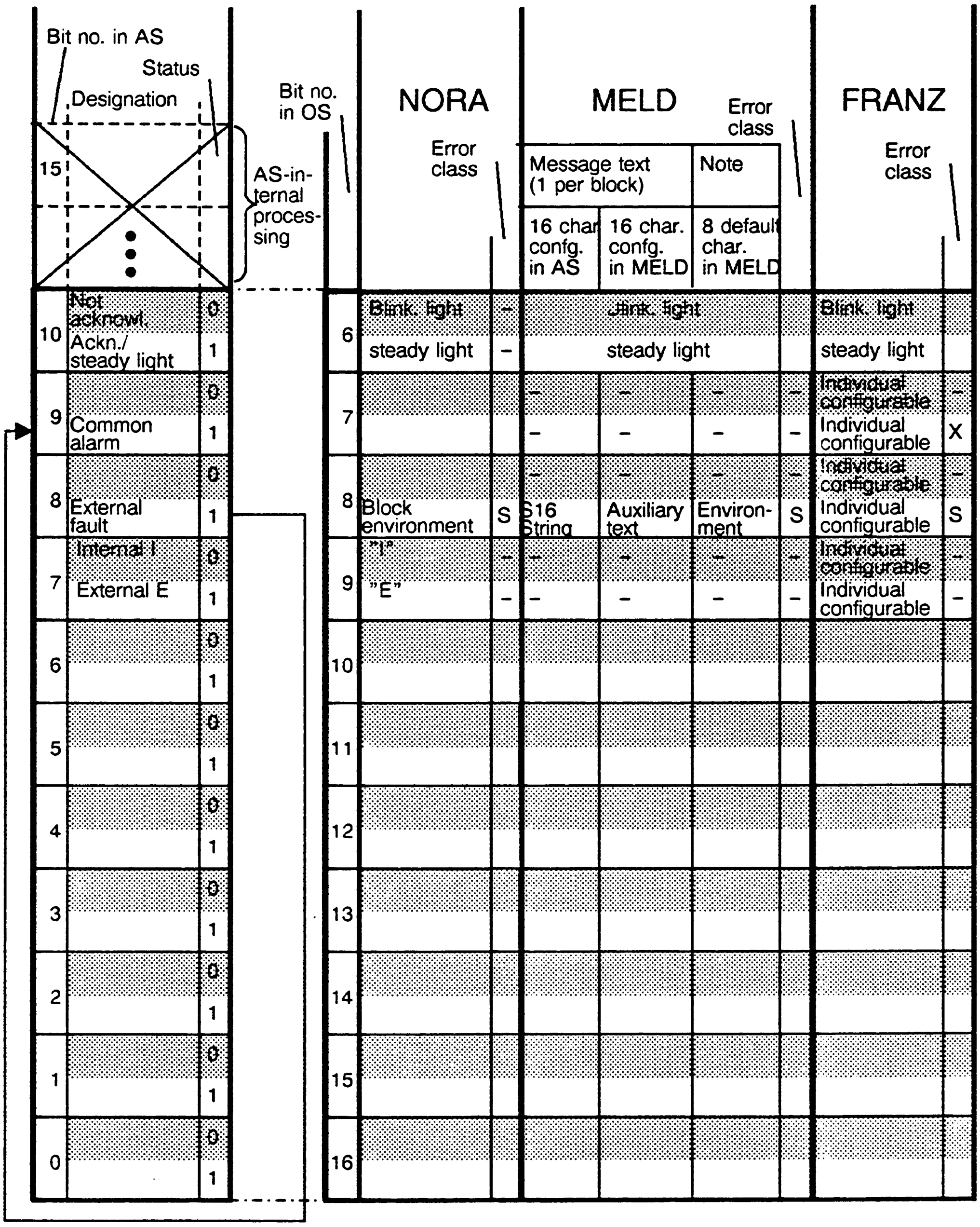


Bit no. in AS	Designation	Status	Bit no. in OS	NORA	Error class	MELD: Message text (1 per block)		Note	MELD Error class	FRANZ	Error class
						16 char confg. in AS	16 char. confg. in MELD	8 default char. in MELD			
10	Not acknowl.	0	6	Blink. light	–	Blink. light				Blink. light	
	acknowl./ steady light	1		Steady light	–	Steady light				Steady light	
9		0	7			–	–	–	–	Individual configurable	
	Common alarm	1				–	–	–	–	Individual configurable	X
8		0	8			–	–	–	–	Individual configurable	
	Module fault	1		Module fault	S	S16 String	Auxiliary text	Failure	S	Individual configurable	S
7		0	9		–				–	Individual configurable	
	Command inhibit	1		"B" static	B				–	Individual configurable	B
6		0	10						–	Individual configurable	
	TZWH	1		"B" static	B				–	Individual configurable	B
5		0	11						–	Individual configurable	
	FUFE	1		Malfunction	S	S16 String	Auxiliary text	Function	S	Individual configurable	S
4		0	12						–	Individual configurable	
	LV3R	1		Dep. on NORA type		–	–	–		Individual configurable	
3		0	13		–				–	Individual configurable	
	LV2R	1		Dep. on NORA type	–	–	–	–		Individual configurable	
2		0	14		–				–	Individual configurable	
	LV1R	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	
1	Shutdown	0	15		–				–	Individual configurable	
	Operation	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	
0	Manual mode	0	16		–				–	Individual configurable	
	Automatic mode	1		Dep. on NORA type	–	–	–	–	–	Individual configurable	

Fig.2-35 Status word for the TVB block

V block

Status word in AS **Interpretation in OS**



Bit no. in AS	Designation	Status	Bit no. in OS	NORA	NORA Error class	MELD Message text (1 per block) 16 char confg. in AS	MELD Message text (1 per block) 16 char. confg. in MELD	MELD Note 8 default char. in MELD	MELD Error class	FRANZ	FRANZ Error class
15 …											
10	Not acknowl.	0	6	Blink. light	–	Blink. light				Blink. light	
	Ackn./ steady light	1		steady light	–	steady light				steady light	
9		0	7			–	–	–	–	Individual configurable	–
	Common alarm	1				–	–	–	–	Individual configurable	X
8		0	8			–	–	–	–	Individual configurable	–
	External fault	1		Block environment	S	S16 String	Auxiliary text	Environment	S	Individual configurable	S
7	Internal I	0	9	"I"	–	–	–	–	–	Individual configurable	–
	External E	1		"E"	–	–	–	–	–	Individual configurable	–
6		0	10								
		1									
5		0	11								
		1									
4		0	12								
		1									
3		0	13								
		1									
2		0	14								
		1									
1		0	15								
		1									
0		0	16								
		1									

Fig.2-36 Status word for the V block

2.8.3 Status Assignments of the Common Displays in the Area Overview

Block type	Bit number of the common displays in the area overview								
	1	2	3	4	5	6	7	8	9
A					S		X		M
B					S		X		M
C					S		X		M
DZ					S		X		M
EG					S		X		M
EK					S	B	X		M
EM					S		X		M
EU					S	B	X		M
EV					S		X		M
F	A						X		M
FN 2)	A	W	F		S		X		M
G					S		X		M
GK					S	B	X		M
M	A	W	F		S		X		M
MSB					S	B	X		M
R 1)	(A)	(W)	F		S		X		M
RE					S		X		M
RI	A	W	F		S		X		M
RK 2)	A	W	F		S	B	X		M
RN	A	W	F		S		X		M
RSKB	A	W	F		S	B	X		M
S					S	B	X		M
T							X		M
TML/SKS/ MKS 3)	A	W	F		S	B	X		M
TVB					S	B	X		M
V					S		X		M

A = alarm
W = warning
F = fault
S = I&C fault alarm
B = Service request
X = code inhibited/enabled for the area
M = MELD

1) The R block only supplies F.
A and W of the M block are only transferred in the R block status word when the R block is interconnected with an M block (WAS).

2) A W F are set alternatively according to the block mode in the automation system.

3) In the OS, a status word is assigned to the TML, SKS and MKS blocks.

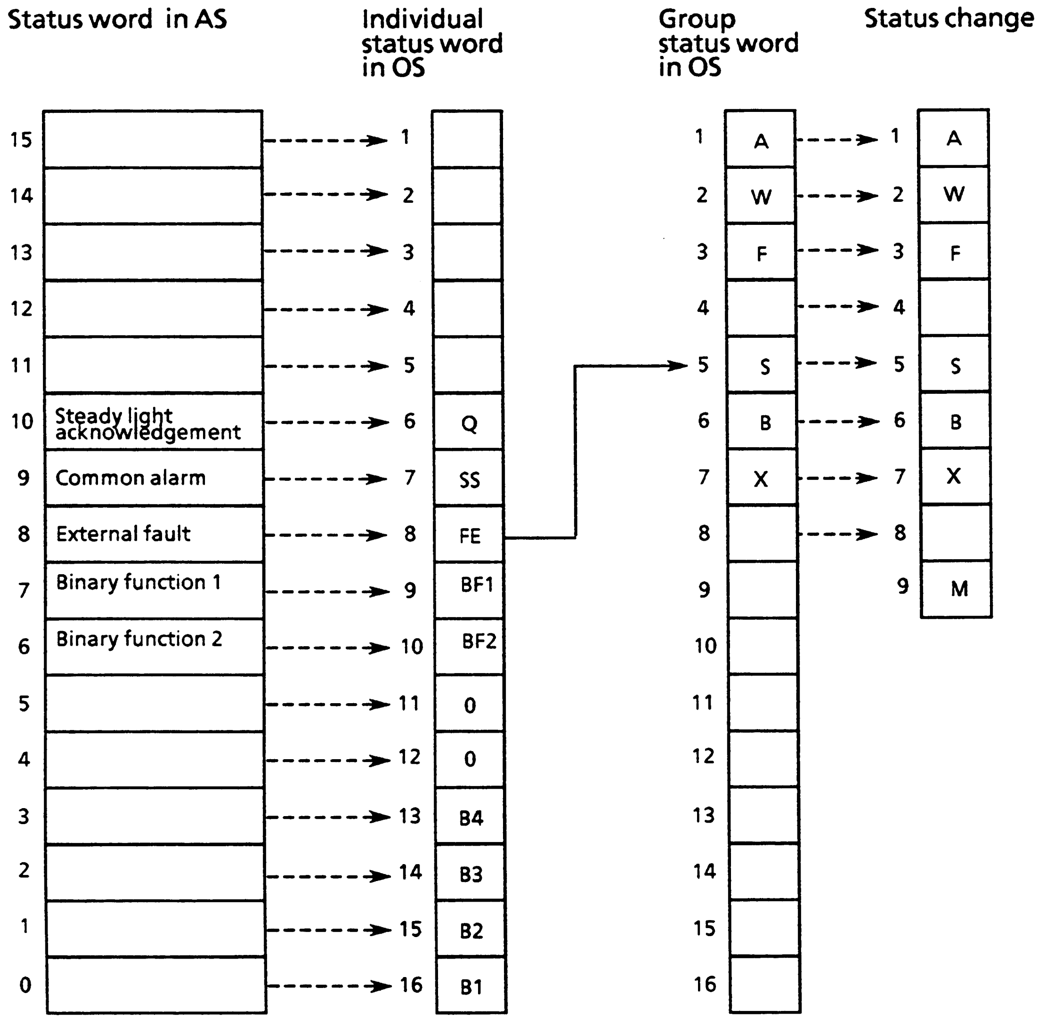


Fig. 2-37 Status word assignment and status routing: A block

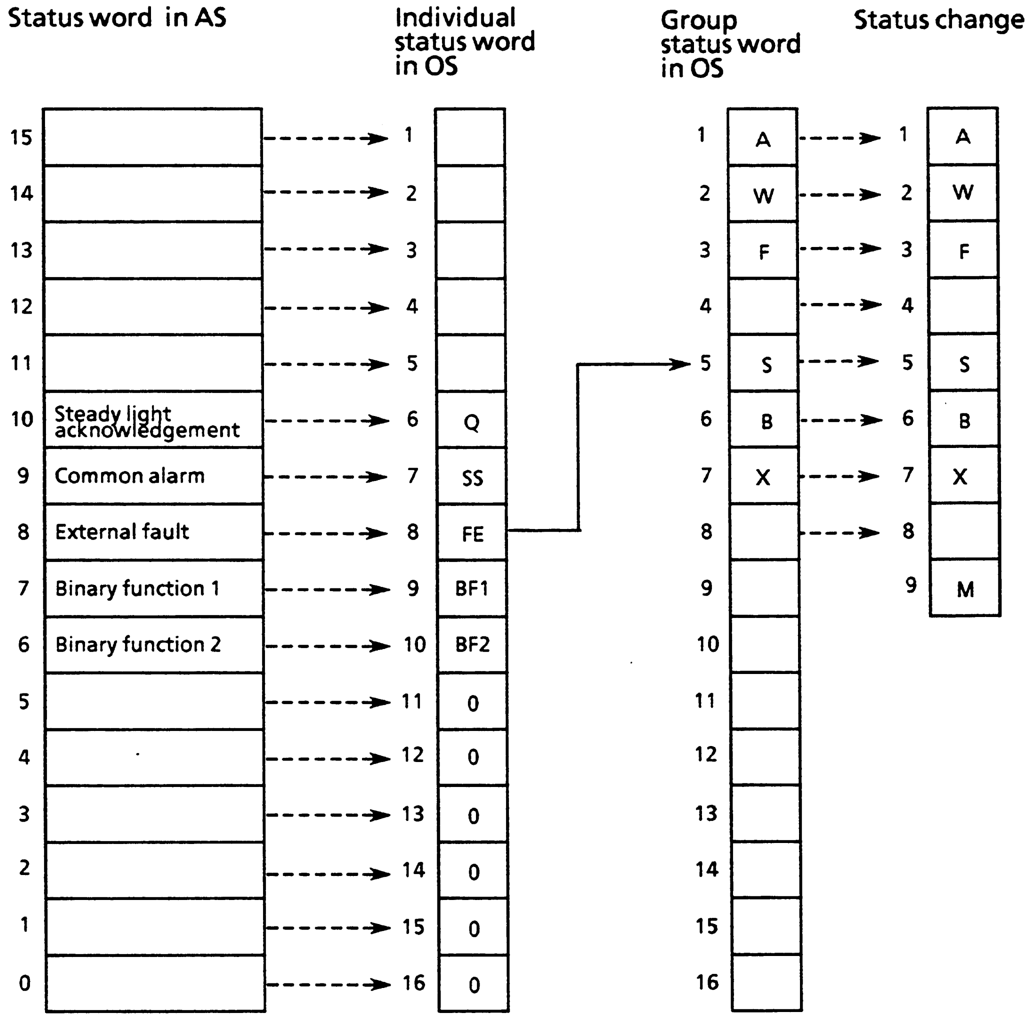


Fig. 2-38 Status word assignment and status routing: B block

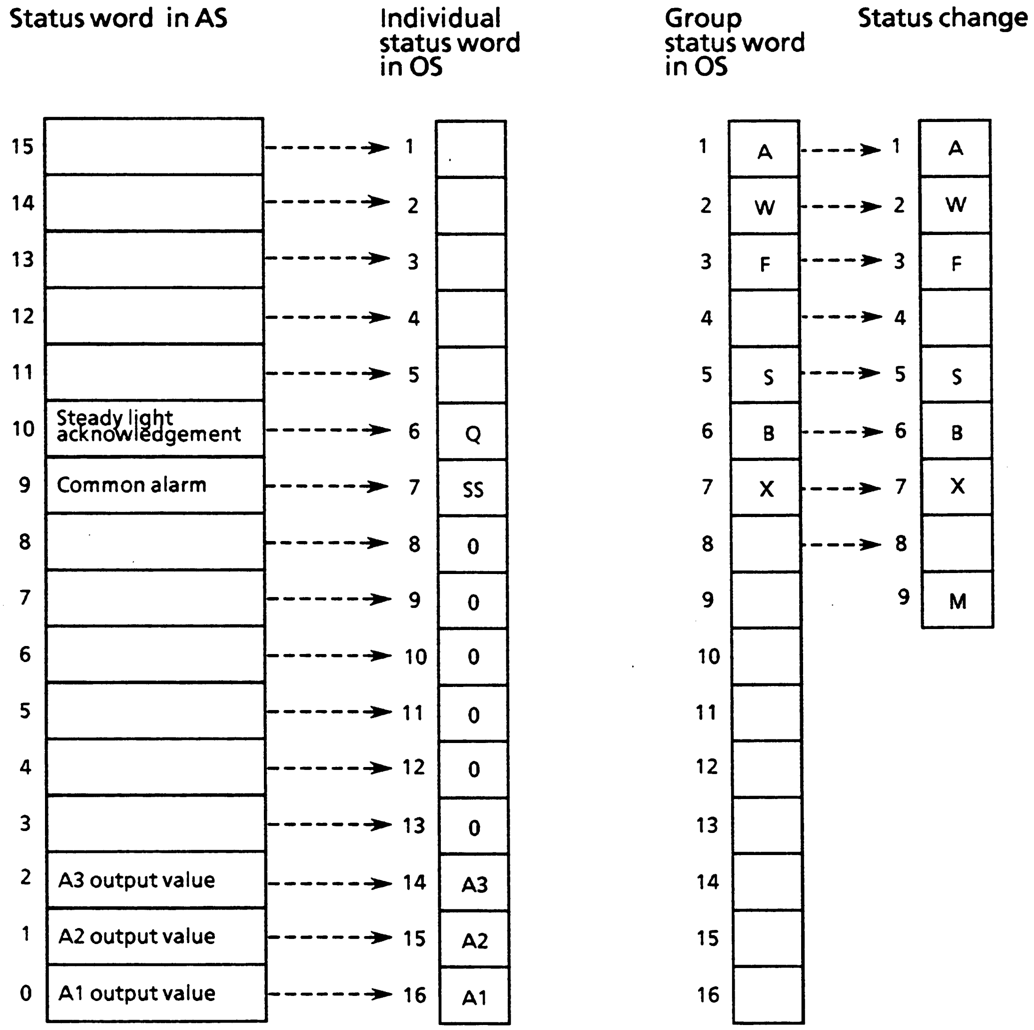


Fig. 2-39 Status word assignment and status routing: C block

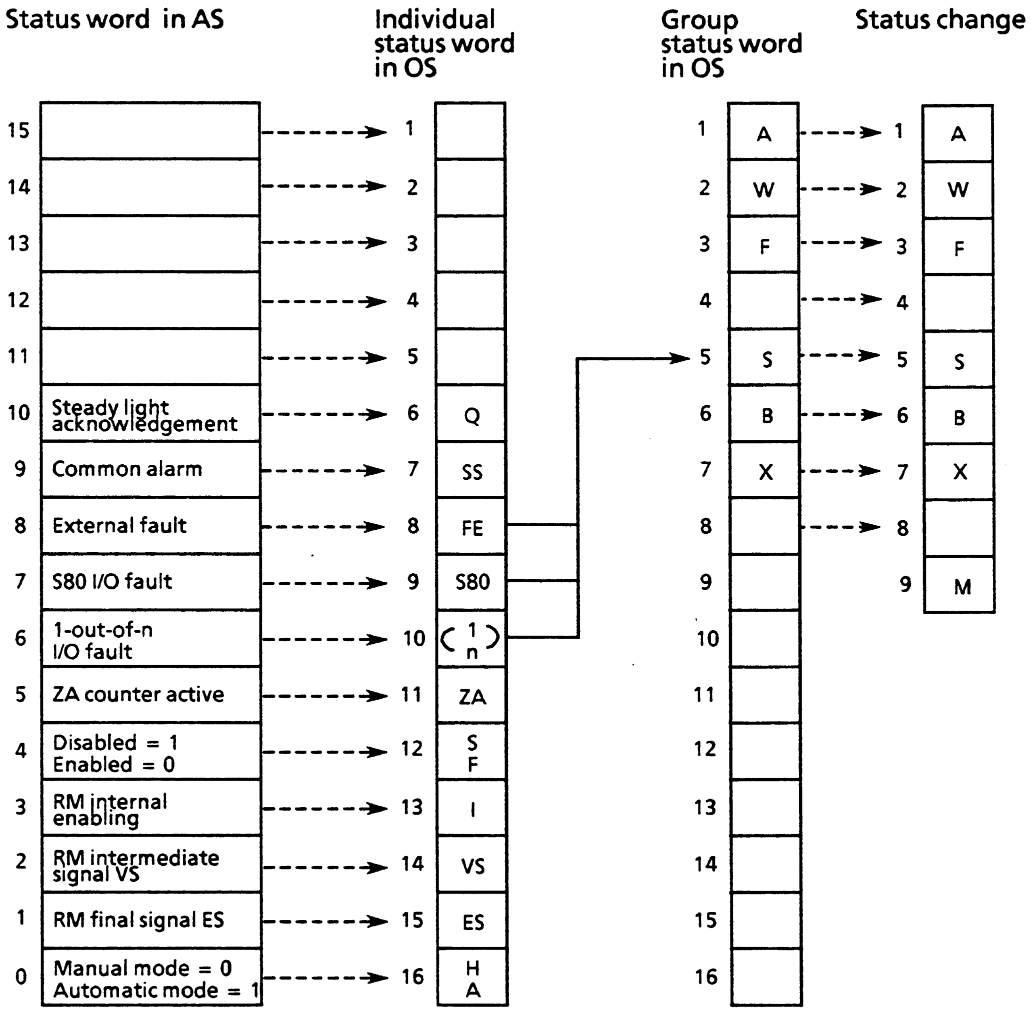


Fig. 2-40 Status word assignment and status routing: DZ block

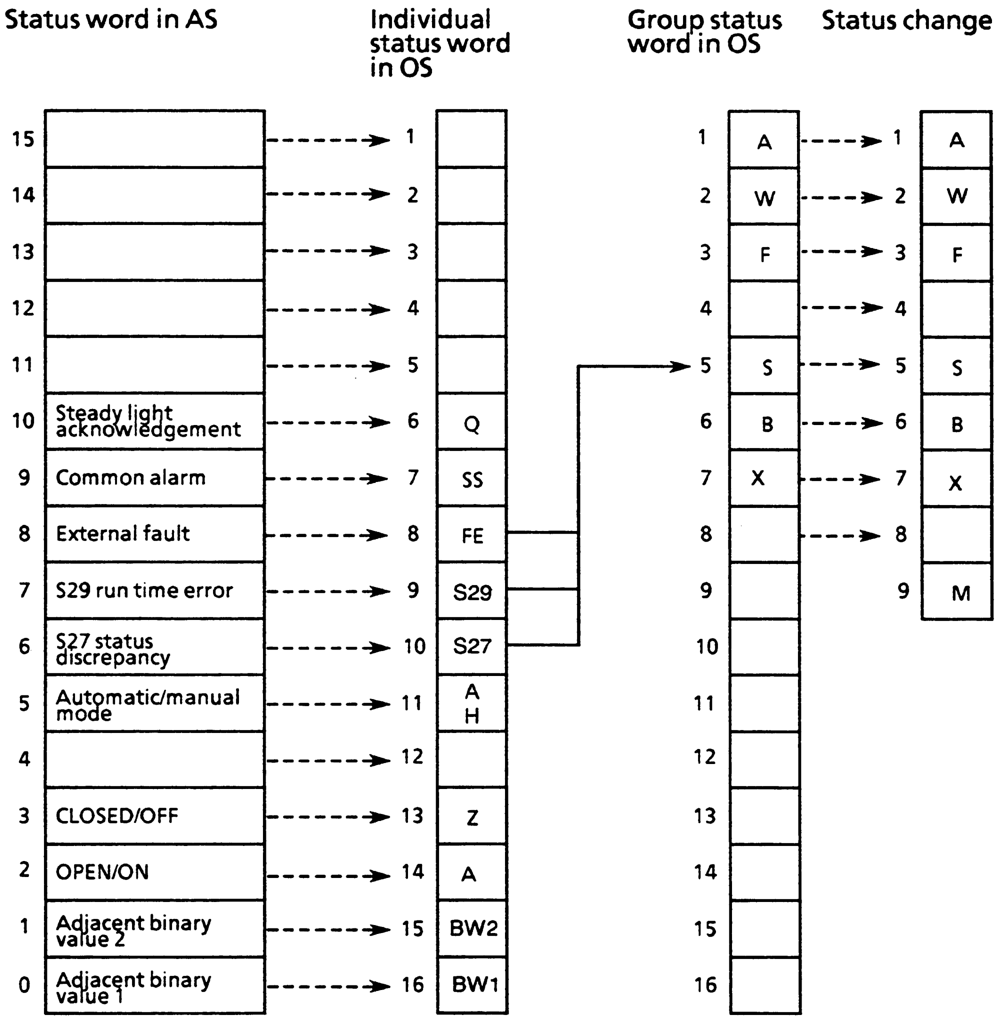


Fig. 2-41 Status word assignment and status routing: EG block

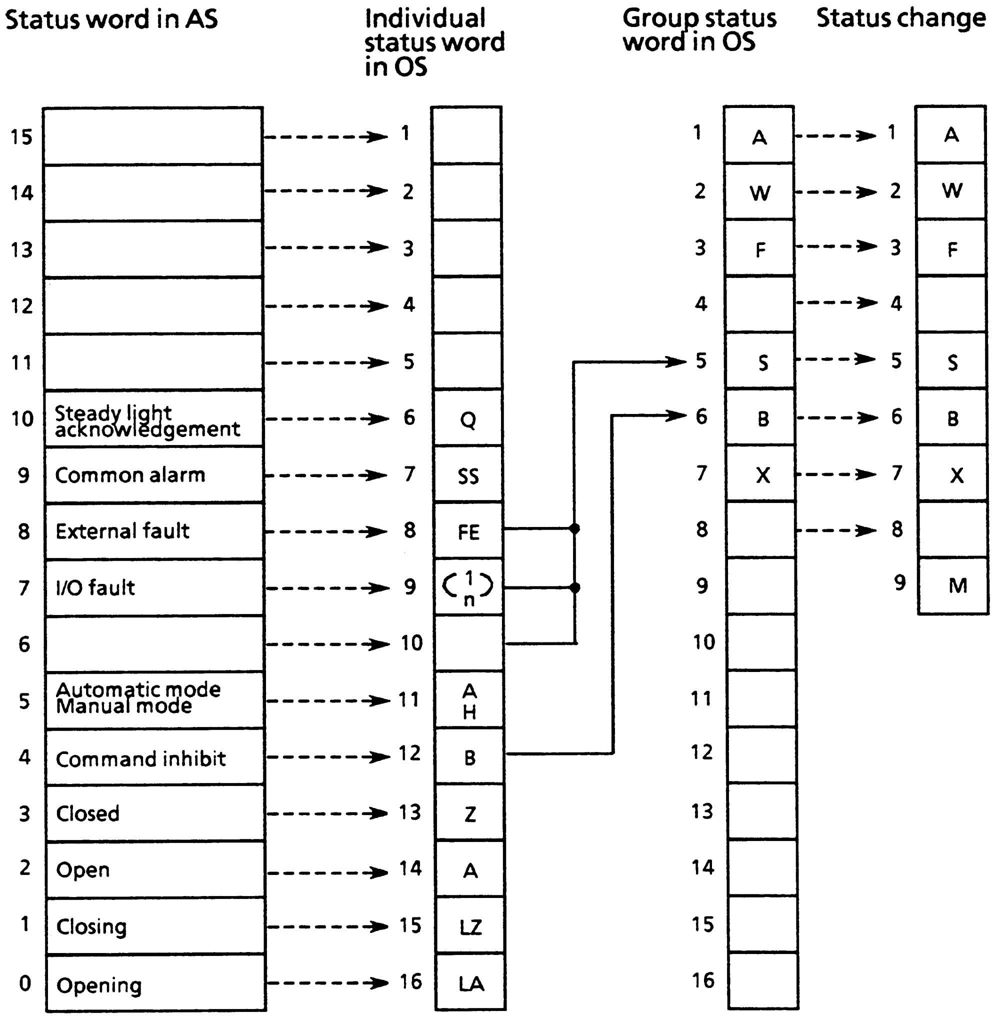


Fig. 2-42 Status word assignment and status routing: EK block

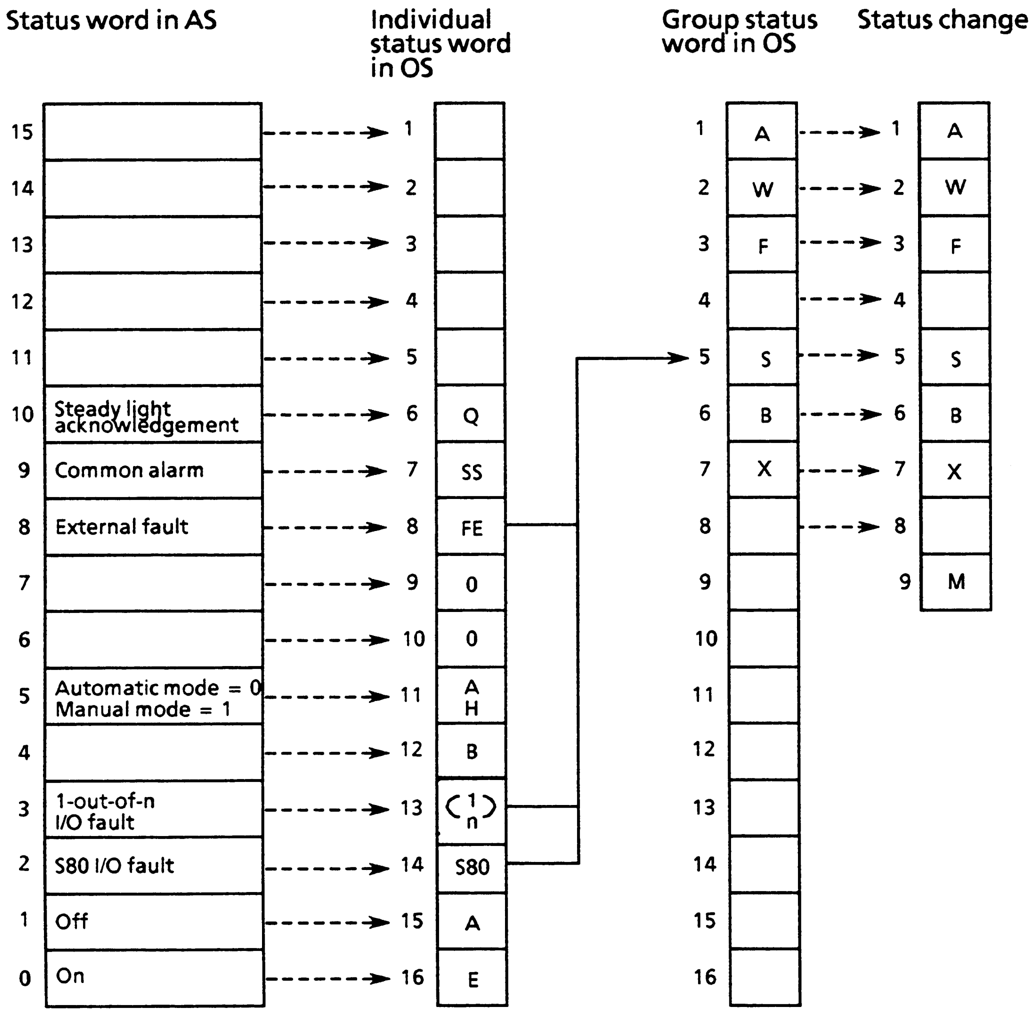


Fig. 2-43 Status word assignment and status routing: EM block

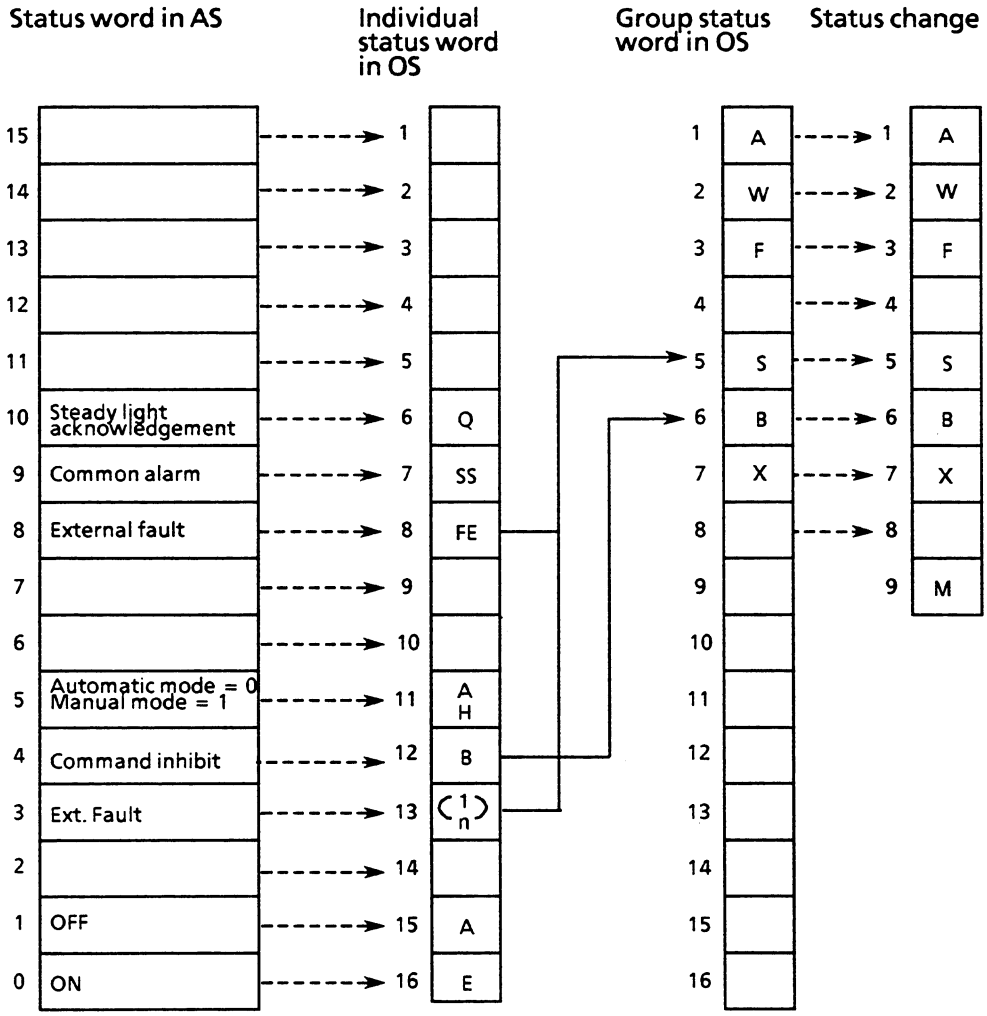


Fig. 2-44 Status word assignment and status routing: EU block

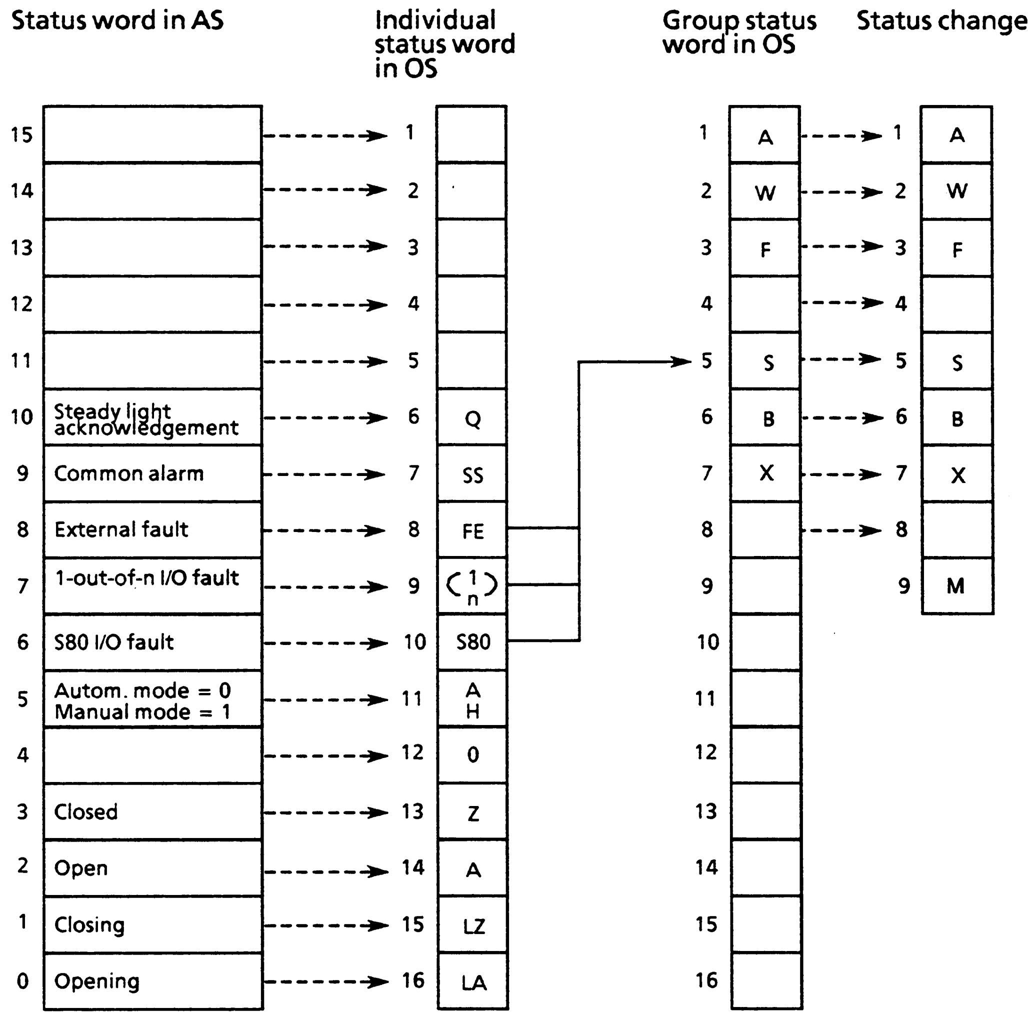


Fig. 2-45 Status word assignment and status routing: EV block

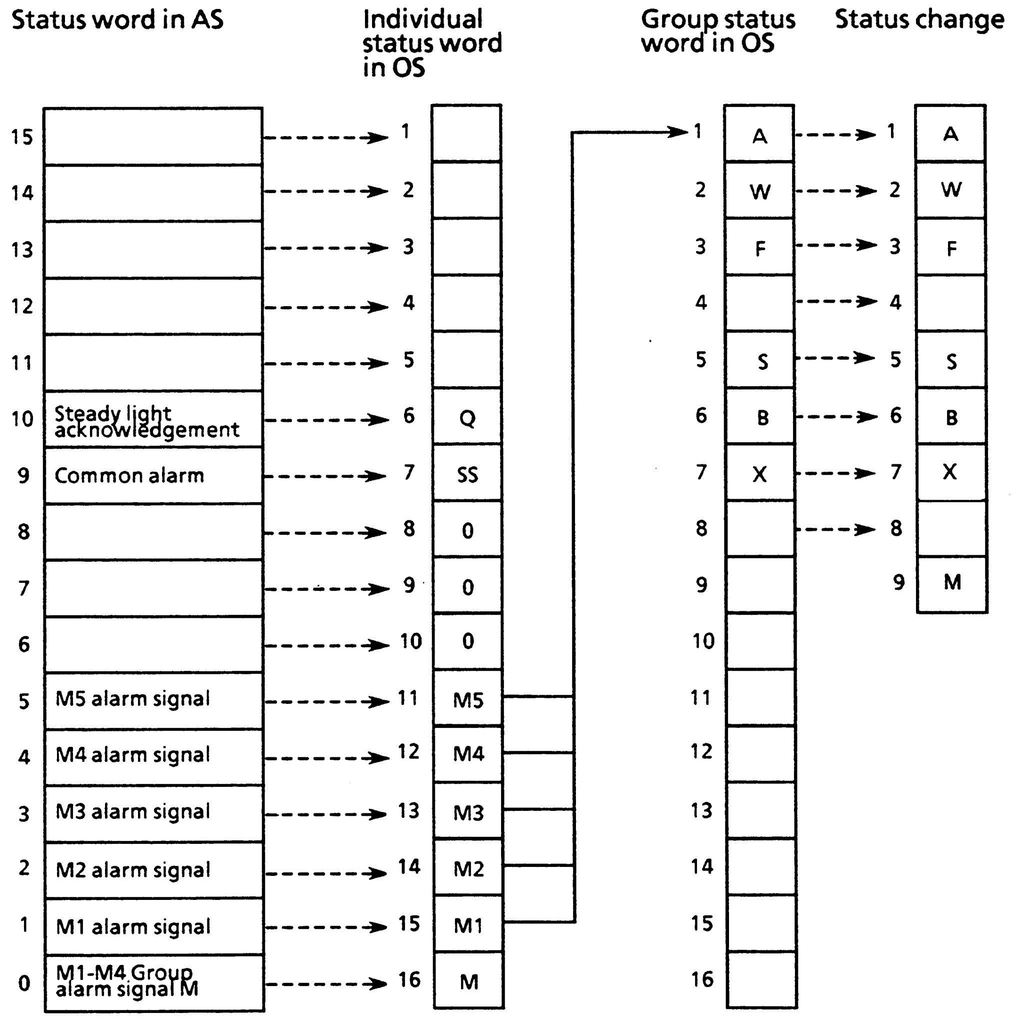
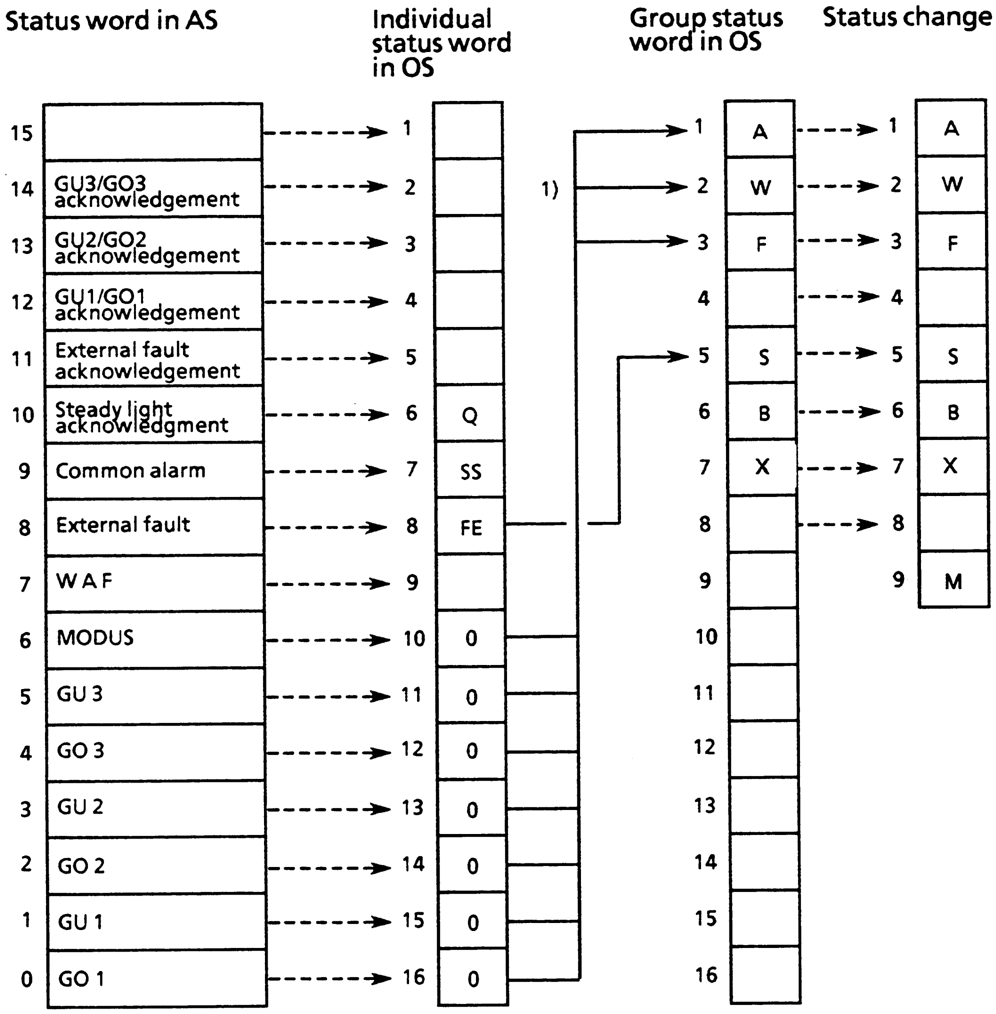


Fig. 2-46 Status word assignment and status routing: F block



1) Depends on WAF mode

Fig. 2-47 Status word assignment and status routing: FN block

]

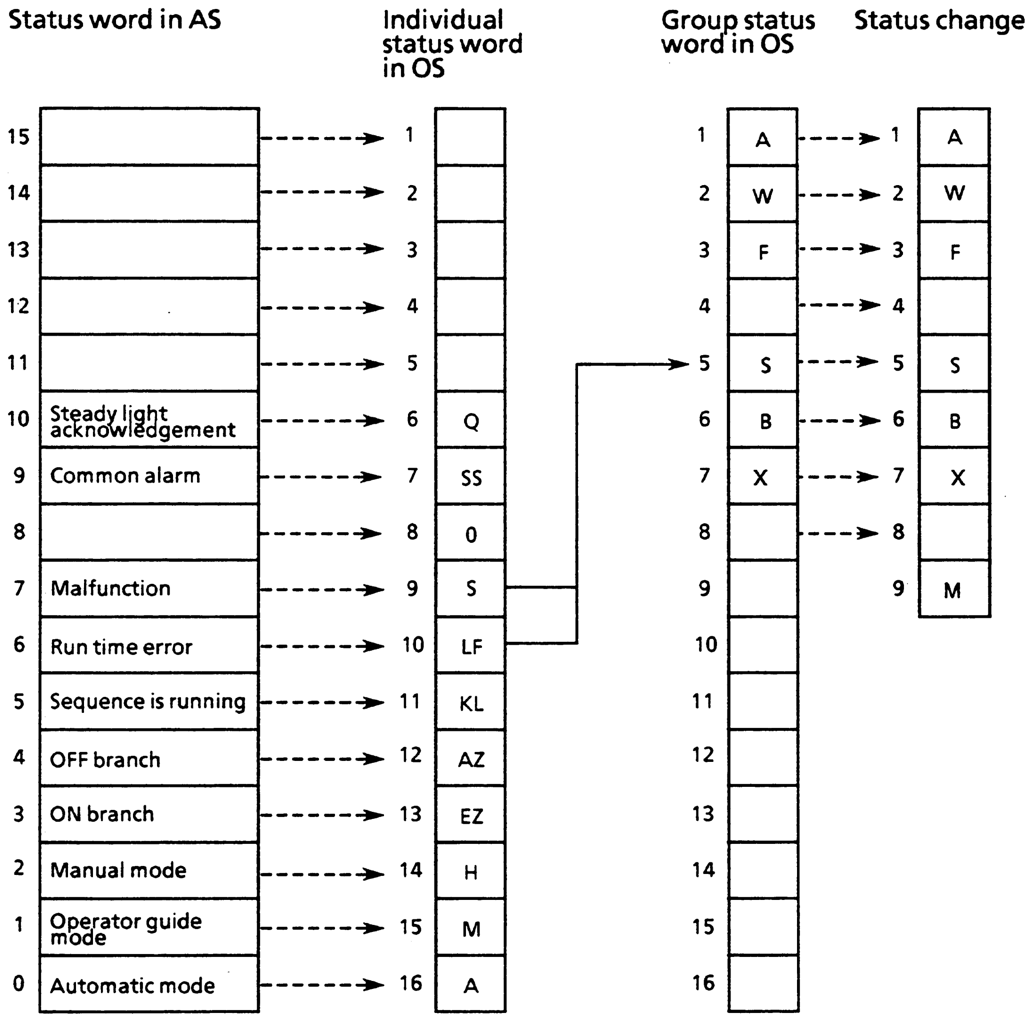


Fig. 2-48 Status word assignment and status routing: G block

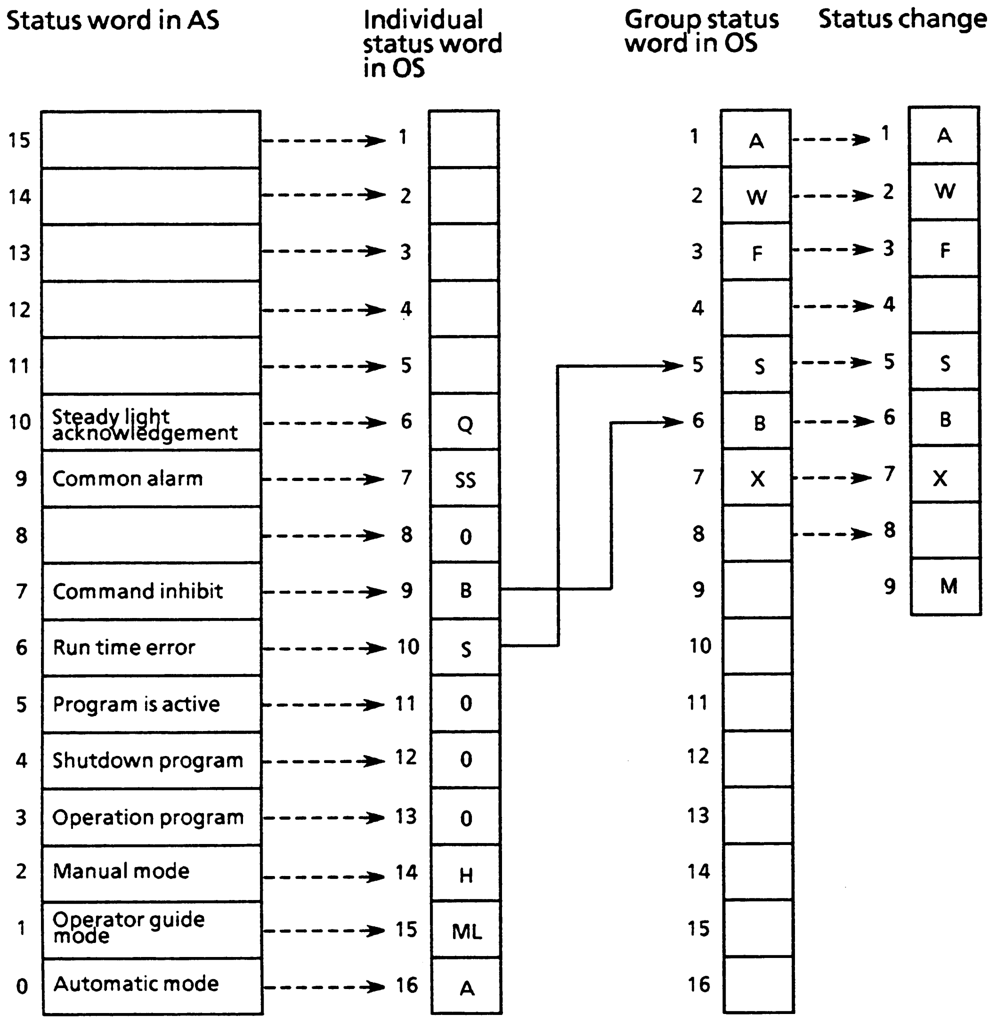


Fig. 2-49 Status word assignment and status routing: GK block

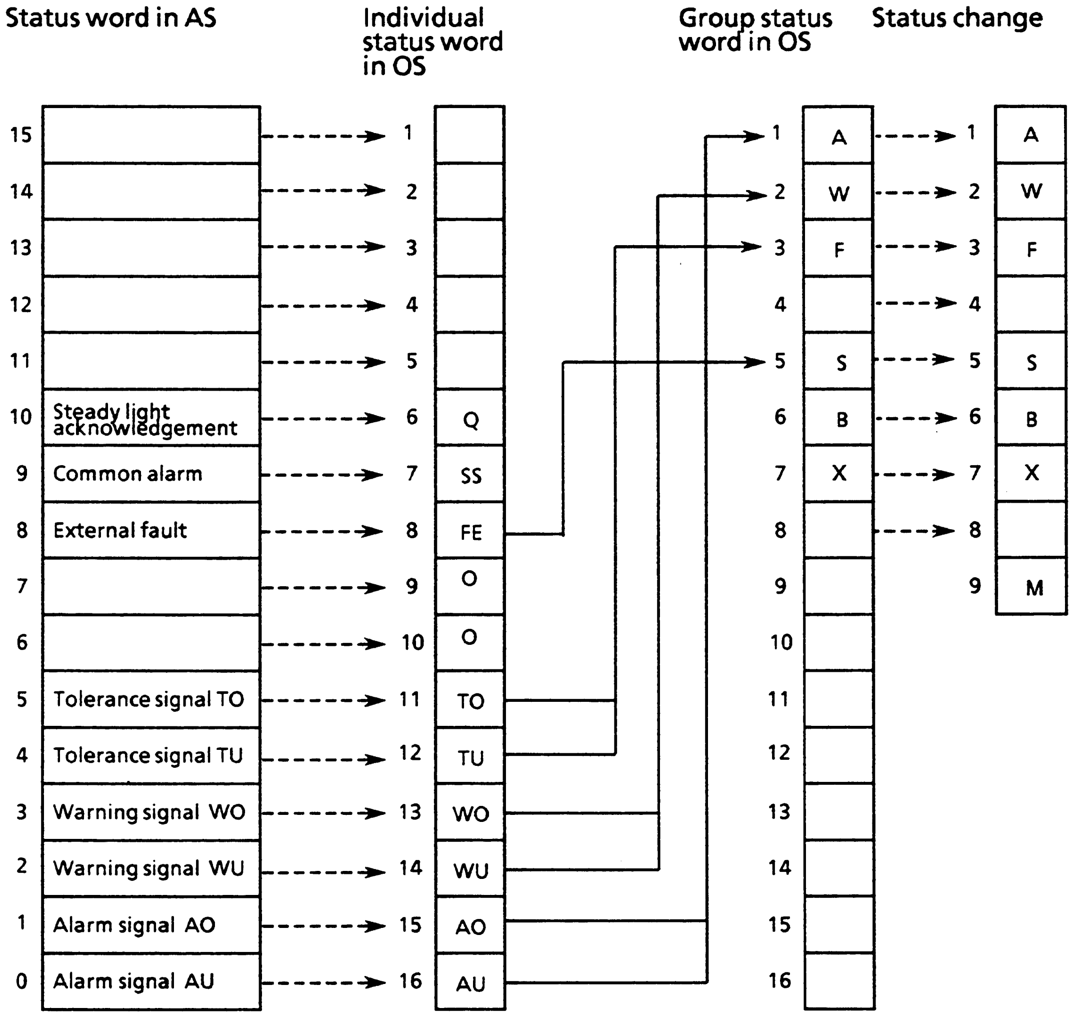


Fig. 2-50 Status word assignment and status routing: M block

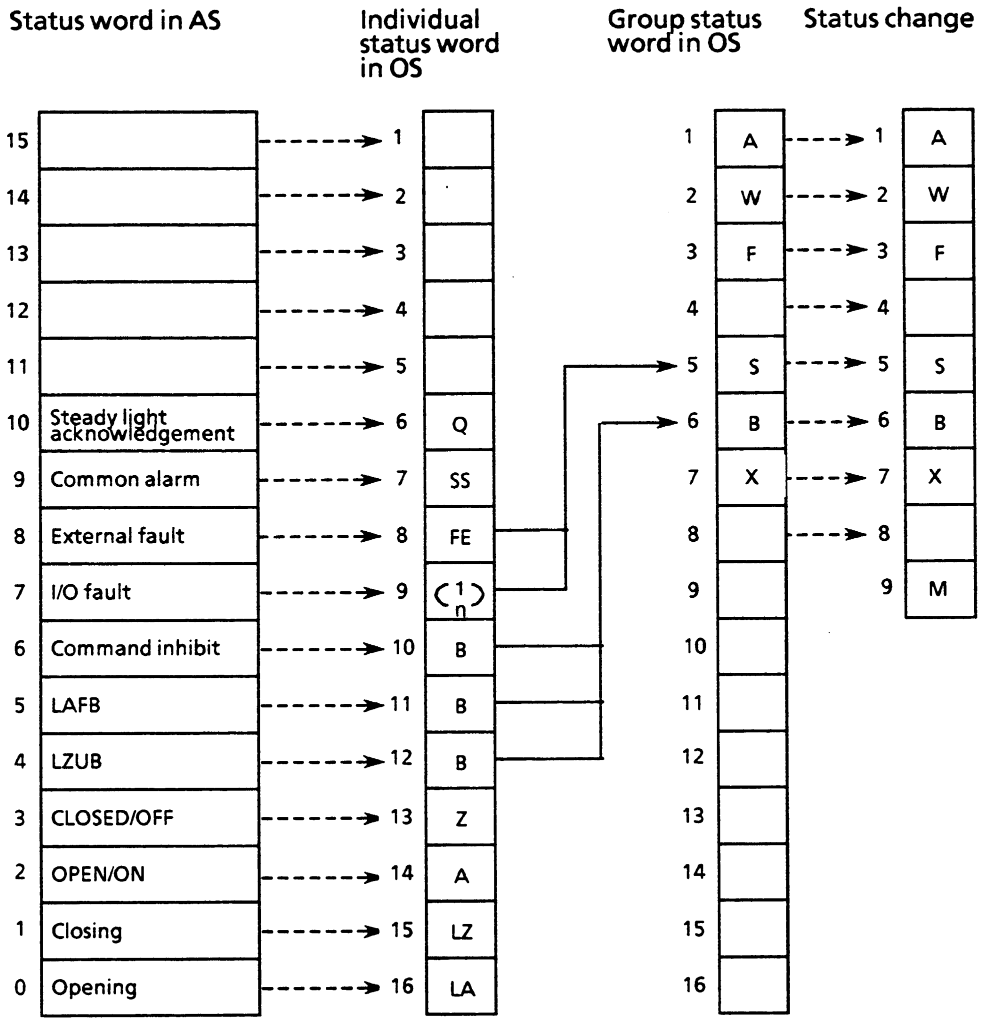


Fig. 2-51 Status word assignment and status routing: MSB block

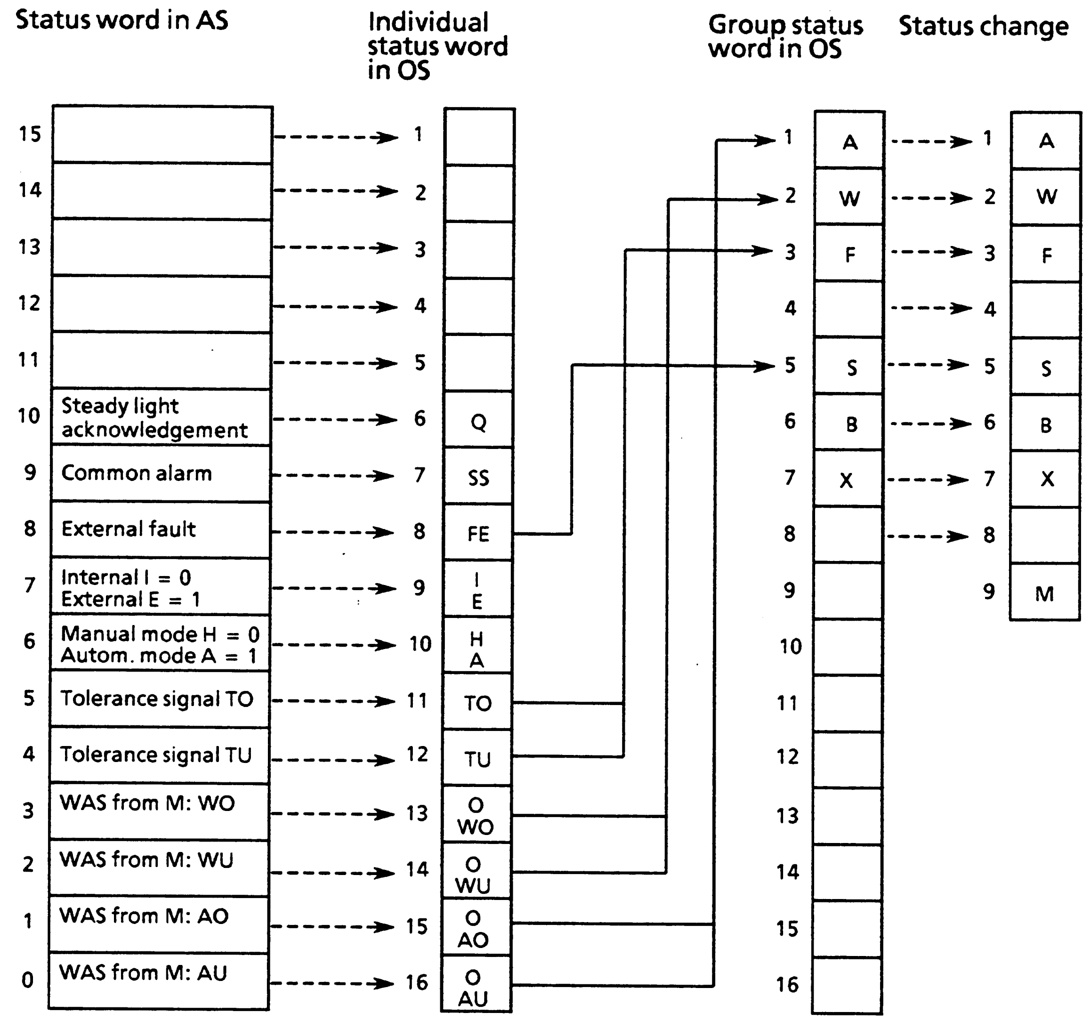


Fig. 2-52 Status word assignment and status routing: R block

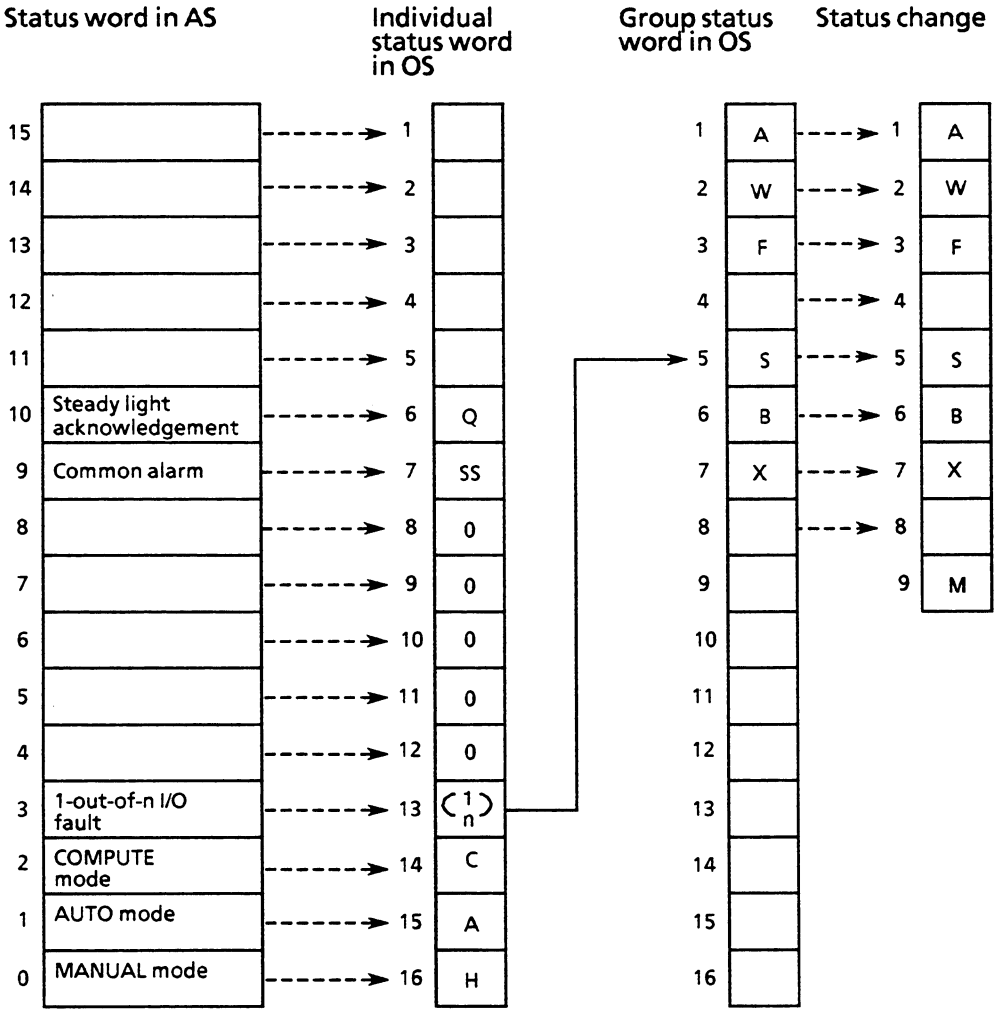


Fig. 2-53 Status word assignment and status routing: RE block

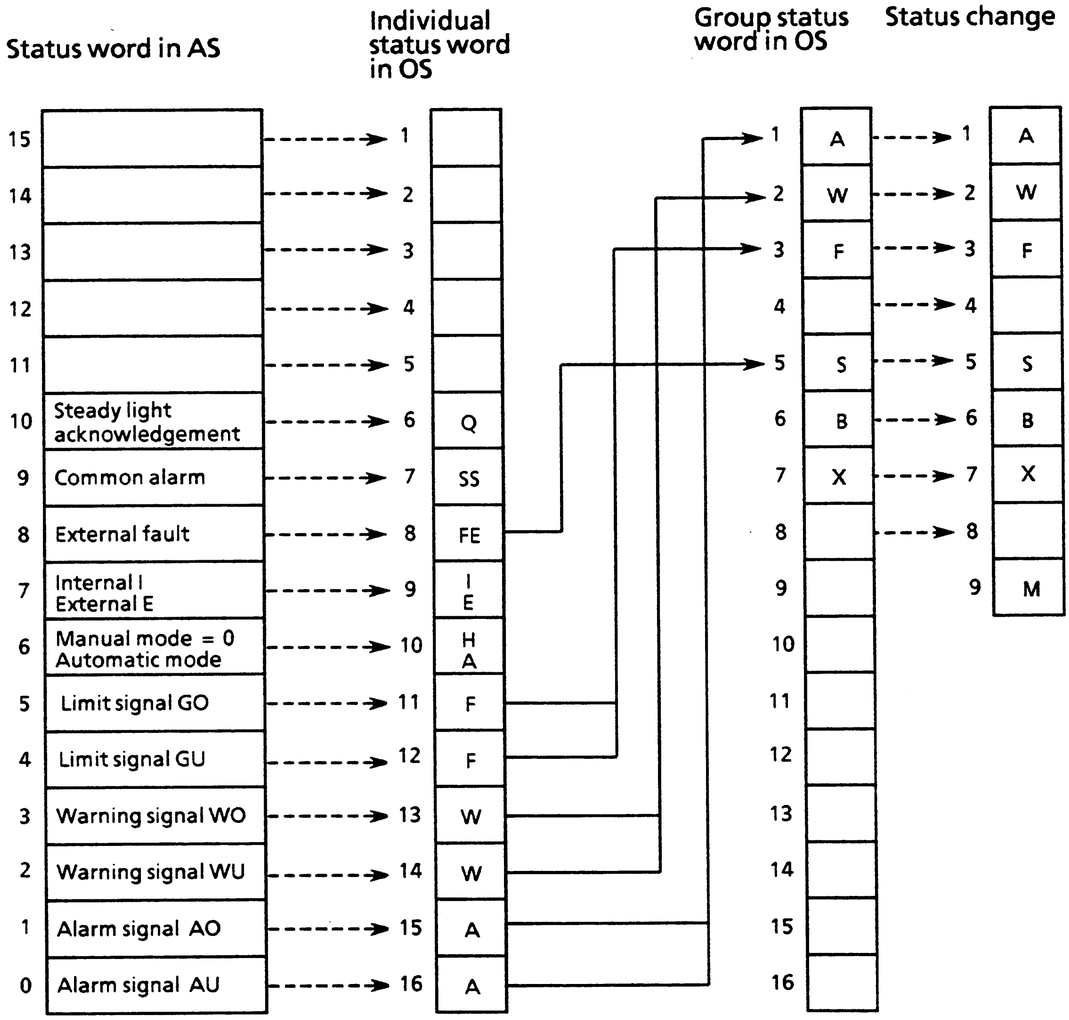
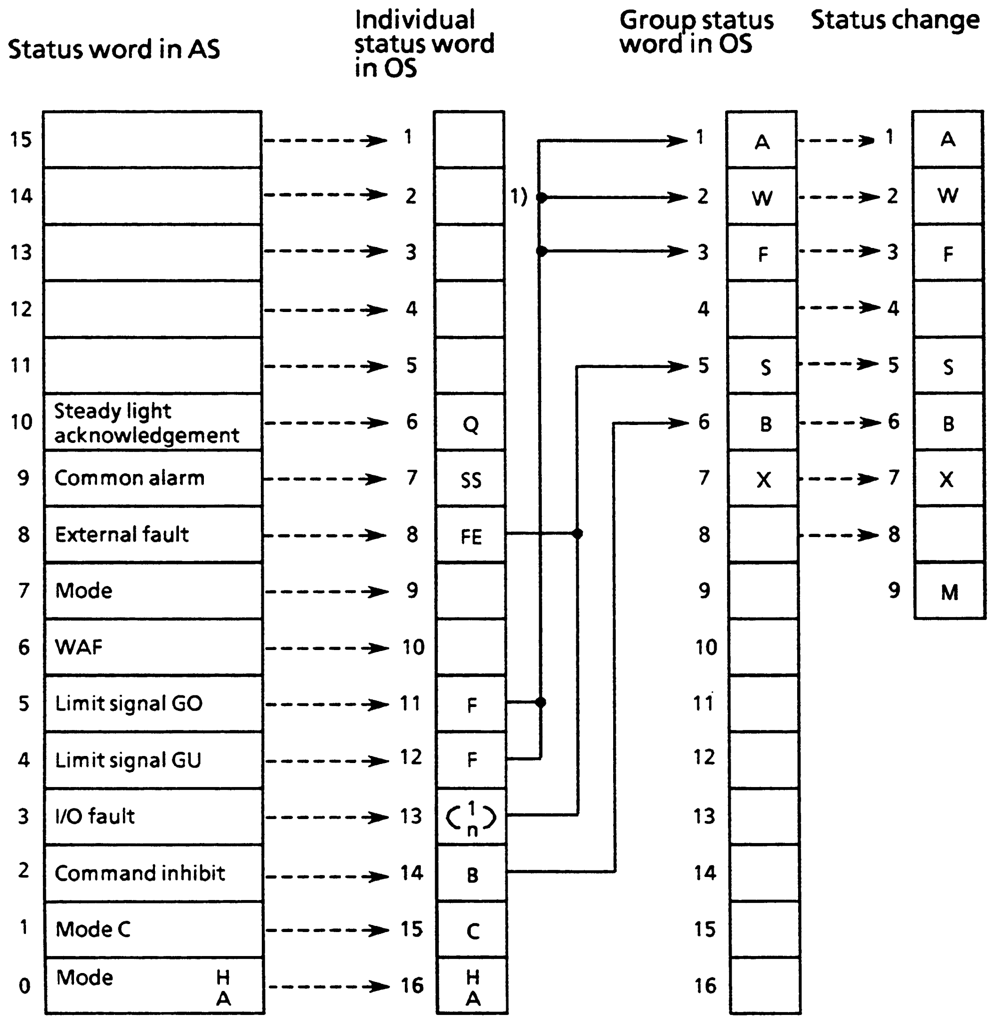


Fig. 2-54 Status word assignment and status routing: RI block



1) Depends on WAF mode

Fig. 2-55 Status word assignment and status routing: RK block

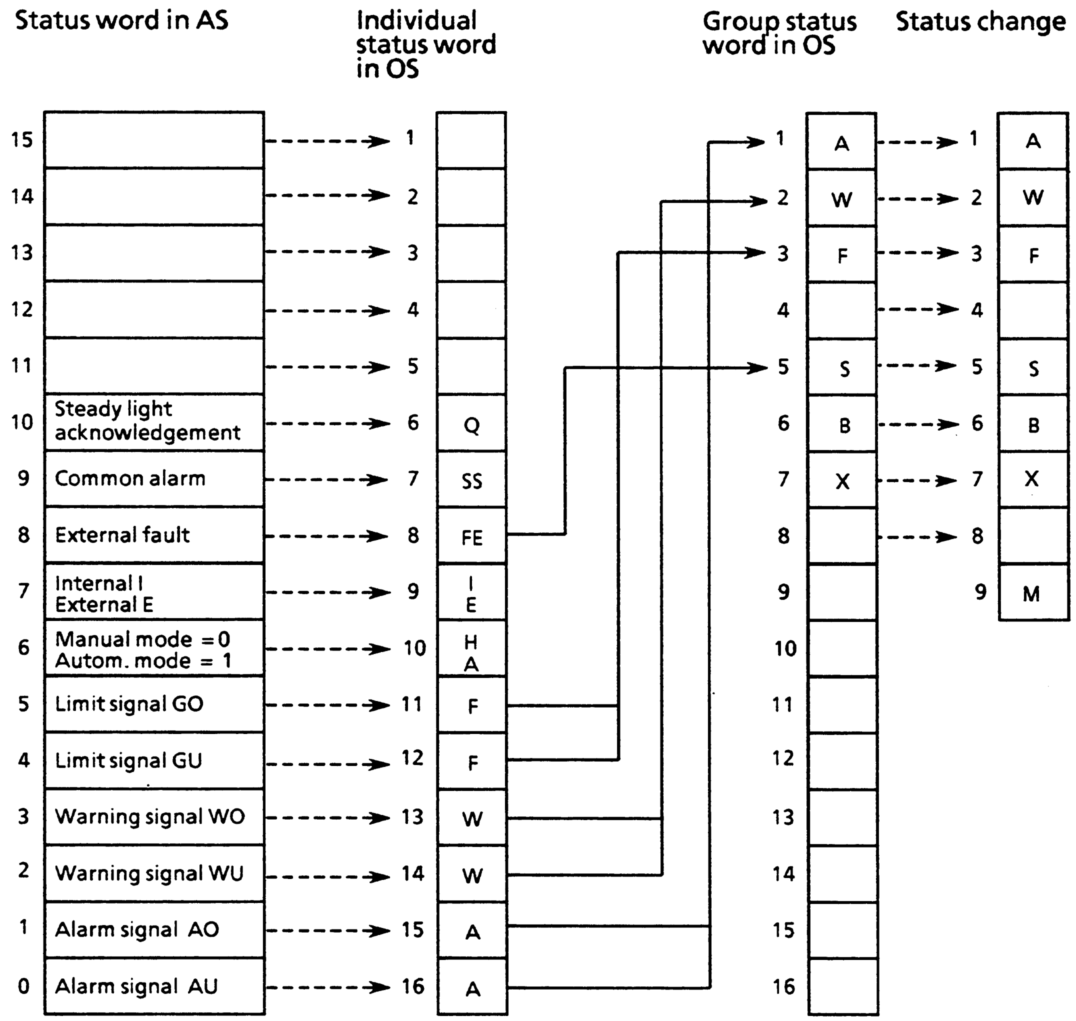


Fig. 2-56 Status word assignment and status routing: RN block

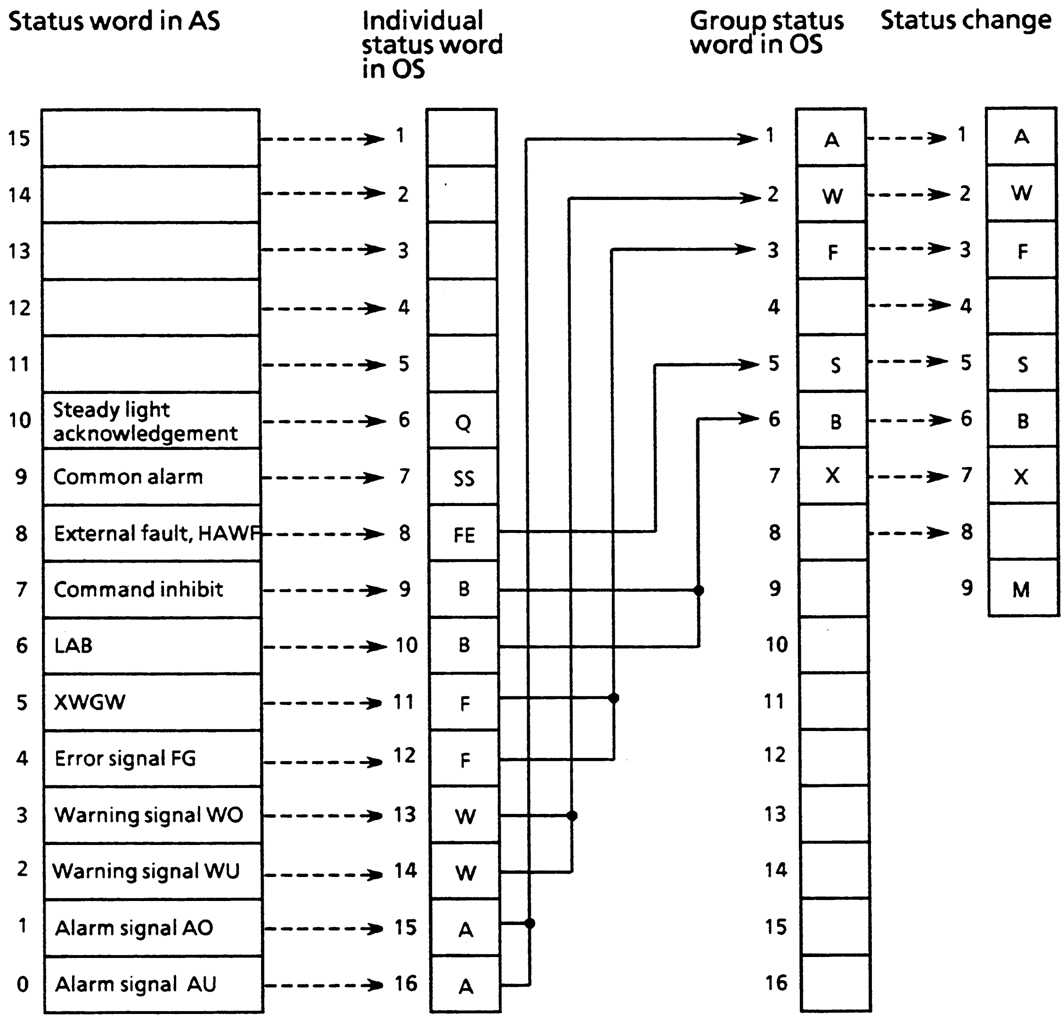


Fig. 2-57 Status word assignment and status routing: RSKB block

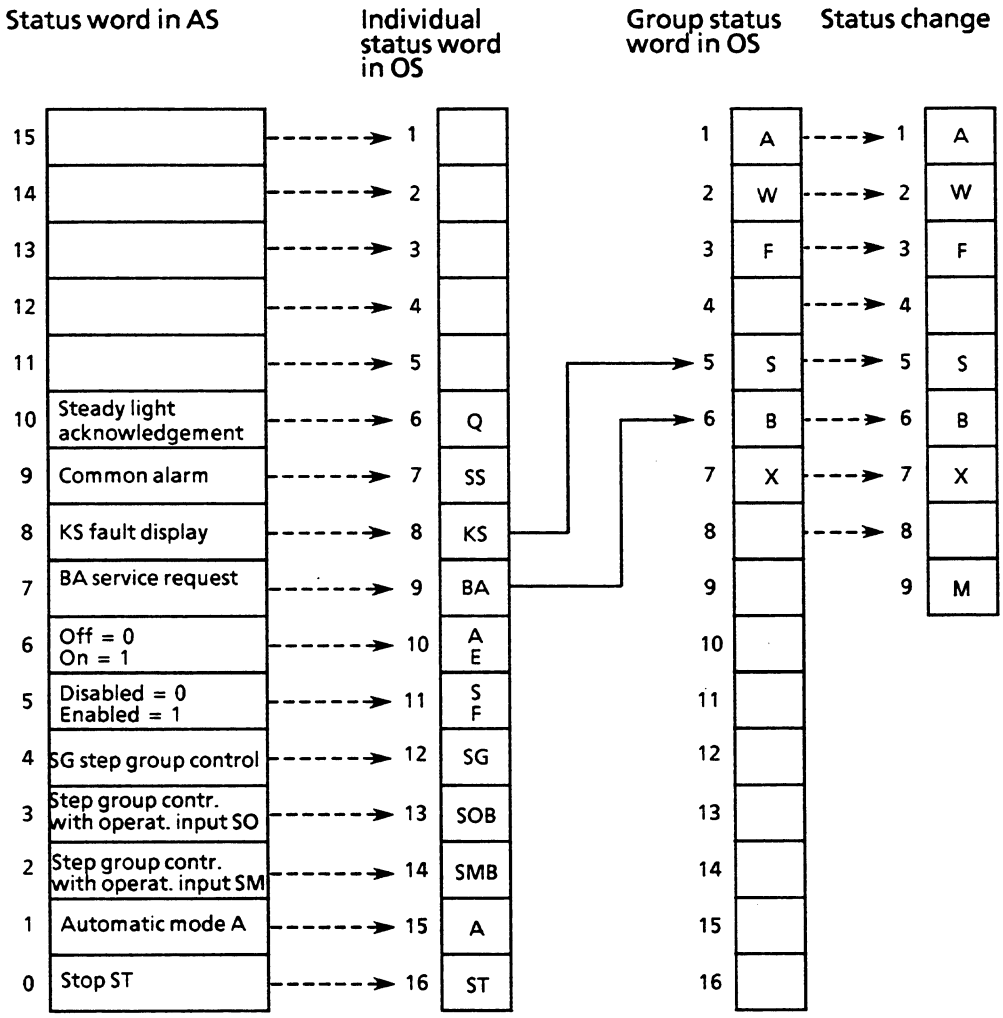
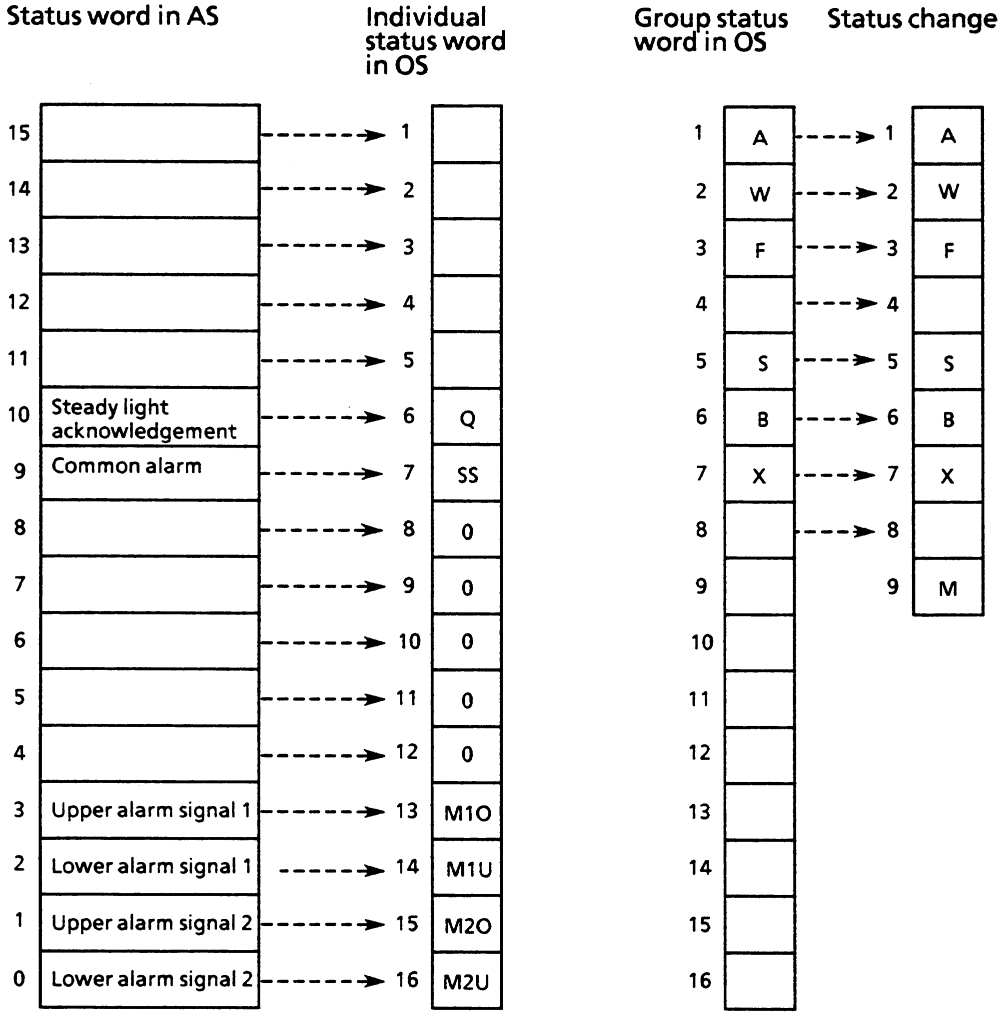


Fig. 2-58 Status word assignment and status routing: S block



Status word in AS		Individual status word in OS		Group status word in OS		Status change	
15		1		1	A	1	A
14		2		2	W	2	W
13		3		3	F	3	F
12		4		4		4	
11		5		5	S	5	S
10	Steady light acknowledgement	6	Q	6	B	6	B
9	Common alarm	7	SS	7	X	7	X
8		8	0	8		8	
7		9	0	9		9	M
6		10	0	10			
5		11	0	11			
4		12	0	12			
3	Upper alarm signal 1	13	M1O	13			
2	Lower alarm signal 1	14	M1U	14			
1	Upper alarm signal 2	15	M2O	15			
0	Lower alarm signal 2	16	M2U	16			

Fig. 2-59 Status word assignment and status routing: T block

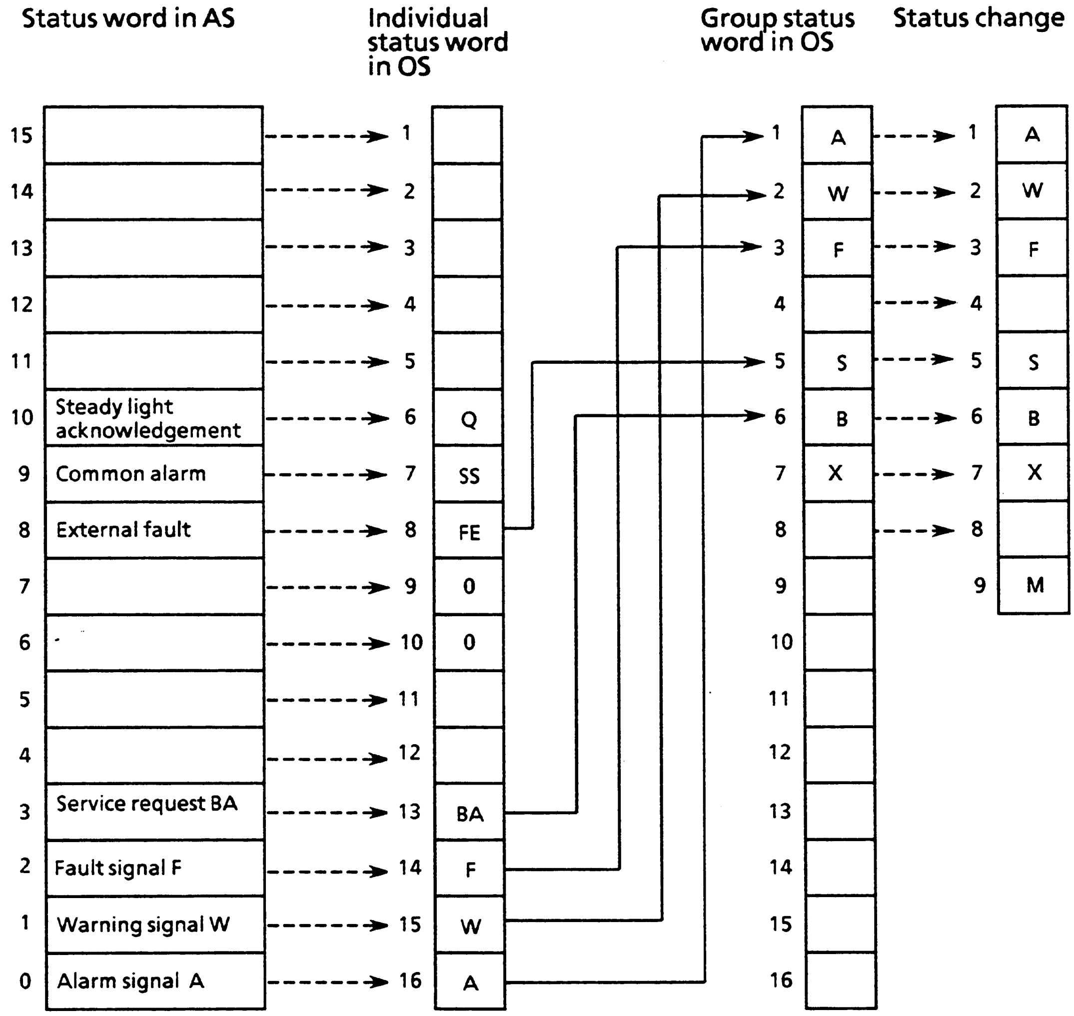


Fig. 2-60 Status word assignment and status routing: TML, SKS, MKS block

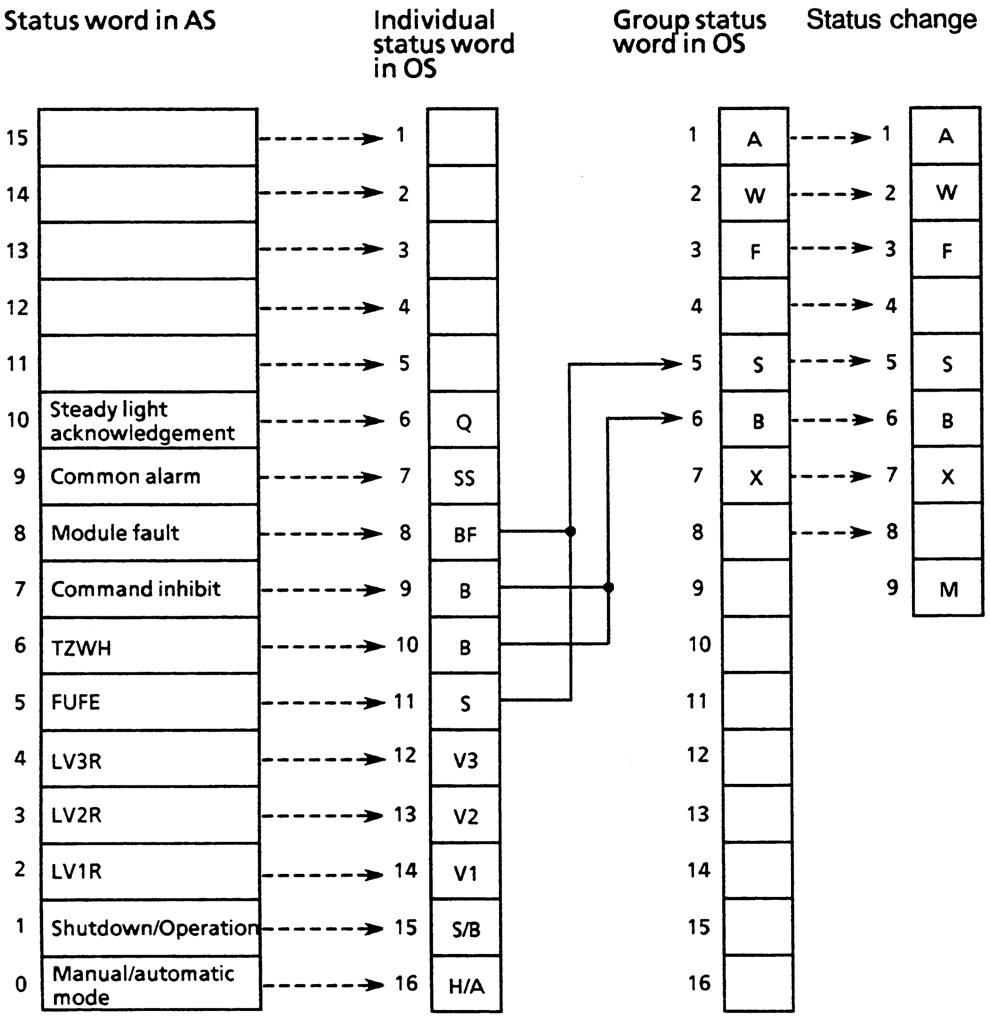


Fig. 2-61 Status word assignment and status routing: TVB block

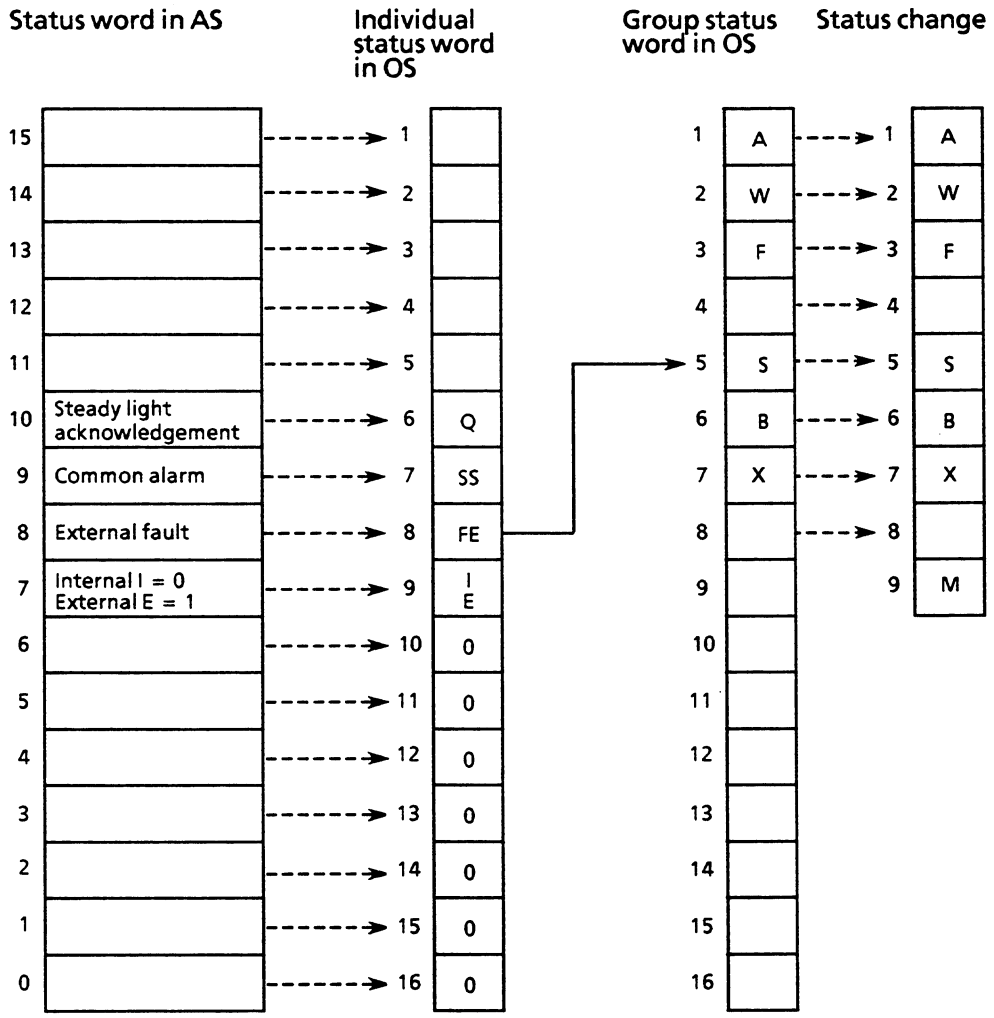


Fig. 2-62 Status word assignment and status routing: V block

Contents Chapter 3

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3 Text Editor

The text editor is used for creating, correcting and printing system texts (design phase and operating phase) with a fixed length which are contained in the system programs and which have not been created in the design dialog.

Certain texts which appear on the screen or in the sample text may not be edited. These are:

Measuring point identification : MKZ
Name of the AS blocks : MKS, BKS, AKS, ...
Time units : S, MIN, HR
AS variable names : EA, AA... ID

These texts are also used in composite texts and should not be modified there either.

The QF function texts (QF fault criteria) are not edited either.

3.1 Brief Description

The text editor uses several text files which are always present on the hard disk. Overwriting these files is only possible during system installation using the function "read in system texts from the magnetic tape cassette". The system function "system texts to magnetic tape cassette" is used for storing the text files onto a magnetic tape cassette.

The following files are on the hard disk:

- File with German texts
  This file contains primary texts which cannot be modified (only on source code level).

- File with texts in foreign languages
  The structure of this text file is identical to the primary text file. The texts in this file can be modified within the current text length using the text editor. During system initialization, the programs are supplied with texts from this file.

- File with German annotations
  This text file supplies annotations in German to the texts, which are used when logging the texts. The annotation file can only be modified on source code level and not by the user.

- File with annotations if foreign languages
  This file, which contains explanations regarding the abbreviations, only exists in English.

- File with text length.

Each text in the OS 262 system is identified by a consecutive text number. Selecting the text number displays the associated text which can then be edited using a light pen or the VDU keyboard. The edited text in the foreign language and the appertaining German text from the primary text file are displayed together. In addition, any other pair of texts can be displayed (useful with similar texts and for copying). The scroll function PAGING facilitates quick information from the text file. Edited texts are accepted into the text file after a memory key has been selected. Auxiliary functions are provided for moving the cursor, clearing the input line, inserting and deleting characters and copying texts.

Edited texts can be printed individually or in blocks (from ... to).

3.2 Menu Field Structure

Input and display fields for the function "retrieve texts"

These fields are located in the upper half of the work area.

The RETRIEVE key is used for selecting a text. The text number is selected via the numeric menu field and displayed in the command line. The required text (in German and foreign language) appears in the field for "retrieve texts" once the EXECUTE function has been selected. The number of the displayed text is shown to the right of the key.

The keys "↑" and "↓" are used for scrolling in the text file. The previous or next text is displayed, respectively. A text number need not be entered.

Input and display fields for the function "edit texts"

These fields are located in the lower half of the work area.

The EDIT key is used for selecting a text. The text number is selected via the numeric menu field and displayed in the command line. The required text (in German and foreign language) appears in the field for "edit texts" once the EXECUTE function has been selected. The number of the displayed text is shown to the right of the key.

The keys "↑" and "↓" are used for scrolling in the text file. The previous or next text is displayed, respectively. A text number need not be entered.

Input and display fields for the function "print texts"

These fields (START and ABORT LOG) are located in the command area. The text number is selected via the numeric menu field and displayed in the command line. Printout is started by selecting the EXECUTE key. The number of the text printed and the end text number are displayed in the message line.

Input keys for changes in the edit line

Menu fields used for writing in the edit line are located in the command area: keys for characters, special characters and figures.

The STORE LINE key is used for storing the edited line into the text file.

The CLEAR FROM CURSOR key is used for clearing the edit line from the cursor position. The line is then filled up to the end with NIL dots.

The COPY key starts the copy function, the RESET COPY key cancels the copy function.

Input keys for the manipulation of individual characters

The CLEAR key can be used for deleting the character at which the cursor is positioned. The INSERT key shifts the edit line from the cursor position by one character to the right; the new position is filled with a NIL dot.

The BASIC SETTING key is used for cancelling the selected functions; the EXECUTE key starts the RETRIEVE, EDIT and PRINT functions.

The "<" and ">" keys move the cursor inside the edit line. Selecting the END key terminates editing; the system returns to the OS DESIGN DIALOG menu field.

Note: The text editor cannot be used in shadow mode.

Keyboard inputs

The following keys of the connected keyboard are active:

Key:	Function:
Letter (with/without SHIFT)	Upper case letters
Figures	Figures
Special characters	Special characters (only from the text editor set)
Numeric keypad	Figures
EFG	Insert character
AFG	Remove character
DÜZ	Execute
DÜ/ DÜM	Terminate text editor
←	Move cursor to the left
→	Move cursor to the right
↖	Move cursor to start of line
↑	Scroll forwards in the edit line
↓	Scroll backwards in the edit line
↵ (RETURN key)	Store text
SHIFT + = -	Delete edit line from cursor position
CTRL + = -	Delete edit line from start

Characters specific to certain languages (such as Ä,Ü, etc.) are considered as special characters and occupy space in the special character set. The SHIFT key must be pressed when these characters are entered via the keyboard as they will otherwise not be accepted.

3.3 Functions

The text editor contains functions which facilitate easy and quick text editing. These functions can be grouped as follows:

Display text

This function provides information regarding texts which have already been edited. The original text (from the primary text file) and the associated text from the foreign language file are displayed in an information field when the text number is entered and the EXECUTE key is selected. Scrolling allows the adjacent texts to be displayed without entering new text numbers.

The function "display text" can also be advantageous for editing similar texts, as the same text can be displayed and used for displaying the original version of the text in a foreign language. A text display remains unchanged until it is re-displayed (through scrolling, for example), even if this text has already be modified in the foreign language text file. The displayed foreign language text can be copied to the edit line using the copy function.

Edit text

All texts of the OS system which can be edited are stored in the text file for foreign languages. The text editor can retrieve a text from its text number, by which a text is clearly identifiable. The text number input can be omitted in continuous editing, the text editor retrieves the text automatically. The text number is displayed on the screen.

The full length of the text to be edited is displayed, the remaining part of the screen after the text is filled up with NIL dots if necessary.

Editing is supported by several auxiliary functions:

- Select a text by its text number
- Write in the edit line
- Clear the whole edit line or from the cursor position
- Store the edit line
- Move the cursor
- Insert/delete characters
- Copy text segments
- Use light pen or VDU keyboard for inputs

Select a text by its text number

Each text in the text file can be selected from its number. A form for selecting the text number appears in the command line after the retrieve or edit function has been selected. The number is entered via the numeric keypad; the function is only executed after the EXECUTE key on the screen has been selected or the DÜZ key on the keyboard pressed.

In the command line, the following keys are active:

0 - 9 - numeric keys
BLANC - blank
CTRL@ - NIL dot
\- - hyphen (sets the cursor position to the start of the 2nd numeric field during printout)
<, >, - keys for moving the cursor position

Blancs and NIL dots may only be entered after the text number has been selected.

Write in the edit line

All characters from the menu field in the command area or the same characters on the VDU keyboard can be used for writing in the edit line. The text editor ensures that the serial input is displayed consecutively in the edit line, moves the cursor and monitors the text length input to check that it does not exceed the maximum permitted.

Clear the edit line

The edit line may be cleared either from the cursor position or from the start of line. The cleared section is filled with NIL dots up to the maximum text length.

Store the edit line

After editing, the edit line can be saved in the foreign language text file either by selecting the STORE key or by pressing the "↵" key. A text which has been stored under the same text number will be overwritten. The text file remains unchanged if the modified edit line is not saved.
The text editor displays the next text after a text has been stored.

Move the cursor

The text editor keys or the VDU keyboard can be used for moving the cursor in the edit line. The cursor position is significant for character output and for the functions "insert/delete character" and "delete line from cursor position". The cursor cannot be used for entering the text number in the command line; the next input position blinks here.

Insert/delete character

A character may be inserted into or deleted from any position of the edit line. Appropriate keys can be found on both the text editor menu field and the VDU keyboard.

Copy text segments

The copy function enables similar texts to be edited. Both the foreign language display line of the function "retrieve texts" and the (foreign language) edit line can be used as source, the text is always copied to the edit line. Start and end position of the text segment to be copied must be selected as well as the target position in the edit line. The text segment selected to be copied also remains after scrolling if it is copied from the edit line to the edit line.

Use light pen or VDU keyboard for inputs

Both the text editor menu field and the VDU keyboard can be used for editing texts. Upper case letters are always generated, regardless of the SHIFT key selection. Entering the text number in the command line and initiating several text editor function (see Chapter 3.4 "Input") can also be performed via the keyboard.

Print text

Texts from the foreign language text file may be logged on the connected printer. A single text, consecutive text elements or all text elements can be selected for printing. The required start text number is entered using the numeric keypad after the key START LOG has been selected to initiate the print function. A single text is printed after the EXECUTE key has been selected. If an end text number is required, the character "-" must be entered before the second text number. The specified text is checked for the maximum number which is determined in the text file.

The text number of the currently printed text is displayed in the message line as well as the end text number. Other text editor functions may be used while the text is being printed. The printout can be stopped at any point by selecting the ABORT key. The print buffer content will be output before the printer stops.

Printout is aborted when the editor is exited (END or DÜ/DÜZ key).

3.4 Operator Input

General comments

- A selected function blinks if further input is expected.
- A selected character blinks in the menu field.
- Any mix of operator inputs via text editor menu field and VDU keyboard is possible.
- Once the text number has been entered, the function is only executed after the EXECUTE key has been selected.
- The main function of a control function consisting of several function steps must be selected first.
- Control functions which may not be activated simultaneously mutually deactivate one another when selected. Editing is resumed directly at the cursor position when an editing character (not equal zero) is selected and the execution of a selected function has not yet been initiated by the EXECUTE key.
- Selecting the BASIC SETTING key resets functions and changes blinking positions to a steady representation.

Retrieve text

- Select the RETRIEVE key.
  The prompt LIST TEXT NO... is displayed in the command line.
- Use the numeric keypad for entering the required text number.
- Select the EXECUTE key to display the selected text.

Edit text

- Select the EDIT key.
  The prompt EDIT TEXT NO... is displayed in the command line.
- Use the numeric keypad for entering the required text number.
- Select the EXECUTE key to display the selected text.
- All texts displayed may be edited; a particular edit enabling is not required.
- All letter and special character keys may be used for entries in the edit line; numeric keys may only be used if a text number input is not expected.

- The cursor keys (< and >), the keys for character manipulation (INSERT/DELETE) and the key for deleting the edit line from the cursor position can also be used for editing text.

  The BASIC SETTING key places the cursor at the start of the edit line.

  If the VDU keyboard is used, the additional function "clear line from start of line" (CTRL + =- keys) is available.

Copy text

- Select the COPY key.
  The foreign language line of the retrieve function is made operator-accessible.
- Select 1st and 2nd position in the source line.
- Select 3rd position (store position) in the edit line.

  The selected copy positions can be cancelled by selecting the RESET COPY key. The selected positions are reset and the function de-activated.

Note:
The PAGING function does not alter the selected positions.

Print text

- Select the START LOG key.
  The prompt LOG TEXT NO.:... appears in the command line.
- Use the numeric keypad for entering the required text number.

  Only the text specified by the text number will be printed if a text number is entered.
  If more than one text is to be printed, the start text number must be entered first, followed by the character "-" and the end text number. Only one text with the start text number is printed if the end text number is not specified.
- Select the EXECUTE key to start printout.

The procedure is similar when the VDU keyboard is used; only the main function (START LOG) must be selected via the screen.

3.5 Messages

General comments

According to the period of time for which they are effective, the messages appearing in the message line are subdivided into three different categories:

- Long-term messages
- Short-term messages
- Permanent messages

Long-term messages can be interrupted and overwritten by short-term messages for approximately 2 seconds.

Permanent messages only refer to the logging functions and appear from column 20 in the message line.

Short-term messages

Message	Cause
POSITION WRONG	The selected screen position is not valid as an input position.
NOT ALLOWED	This key may not be selected. Only figures and "-" (for LOG) are allowed for entries in the command line. The cursor can only be positioned inside the maximum length of the edit line.
LINE FULL	The end of the edit line has been reached.
FIELD FULL	The command buffer for text number input is full.
END	The text editor function is terminated.

Long-term messages

Message	Cause
OPERATE	This message is displayed after the start, after a function has been selected.
ENTER POSITION	A position must be selected when copying texts.
ENTER CHARACTER !	Prompt for entering a character in the edit line.
ENTER TEXT NO. !	Prompt for entering the text number after the function has been selected.
PRINTER NT. READY	The printer has not been switched on if this message appears immediately after the the printout has been started. If the message appears after approximately one minute (access to the text editor is not possible during this time), the printer has been switched off line. Access to the text editor is possible once this message has been issued.

Permanent messages

Message	Cause
LOG ABORTED	Printout has been aborted.
LOG END	Printout has been completed and terminated.
LOG: Text No. - Text No.	Printout is running. The first text number is the number of the text currently being printed, the second number is the end text number.

3.6 Screen Fields

Figures 3-1 to 3-4 show the text editor screen fields.

Fig. 3-1 - Initial state of input and display fields
Fig. 3-2 - Input and display fields after the retrieve function has been selected
Fig. 3-3 - Input and display fields after the log function has been selected
Fig. 3-4 - Input and display fields during printout of the texts

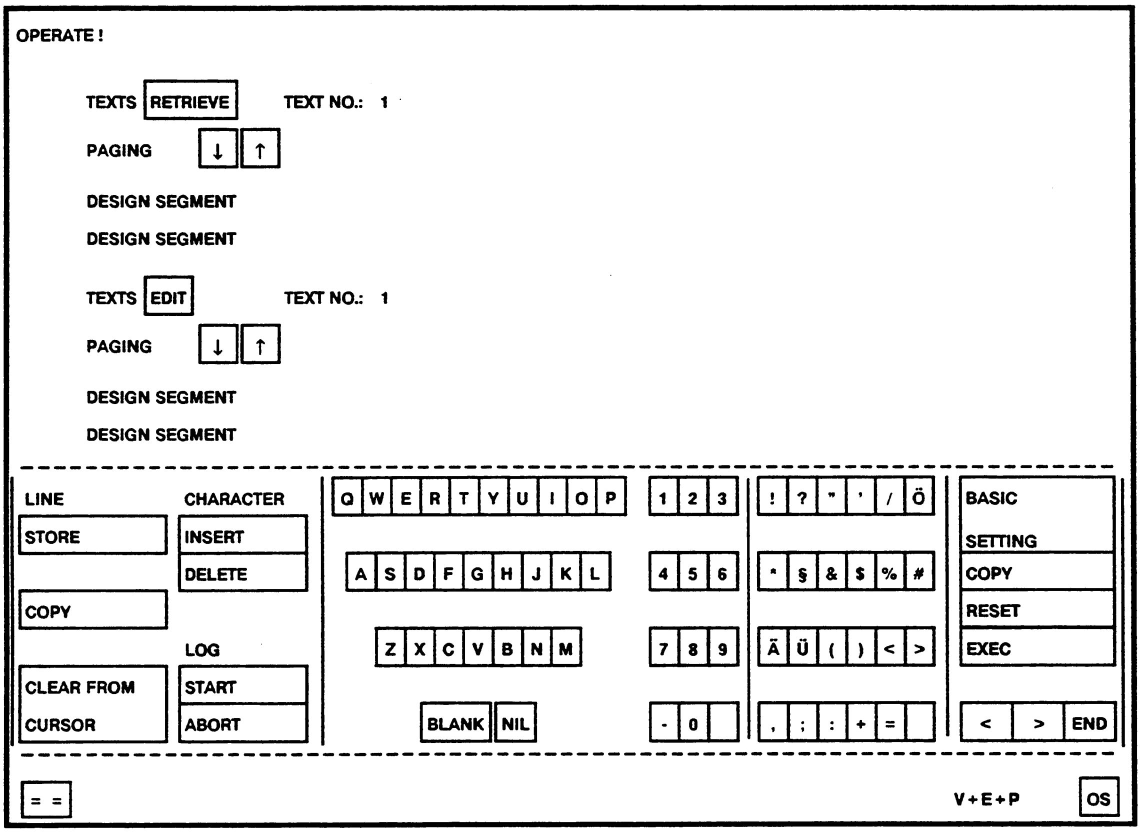
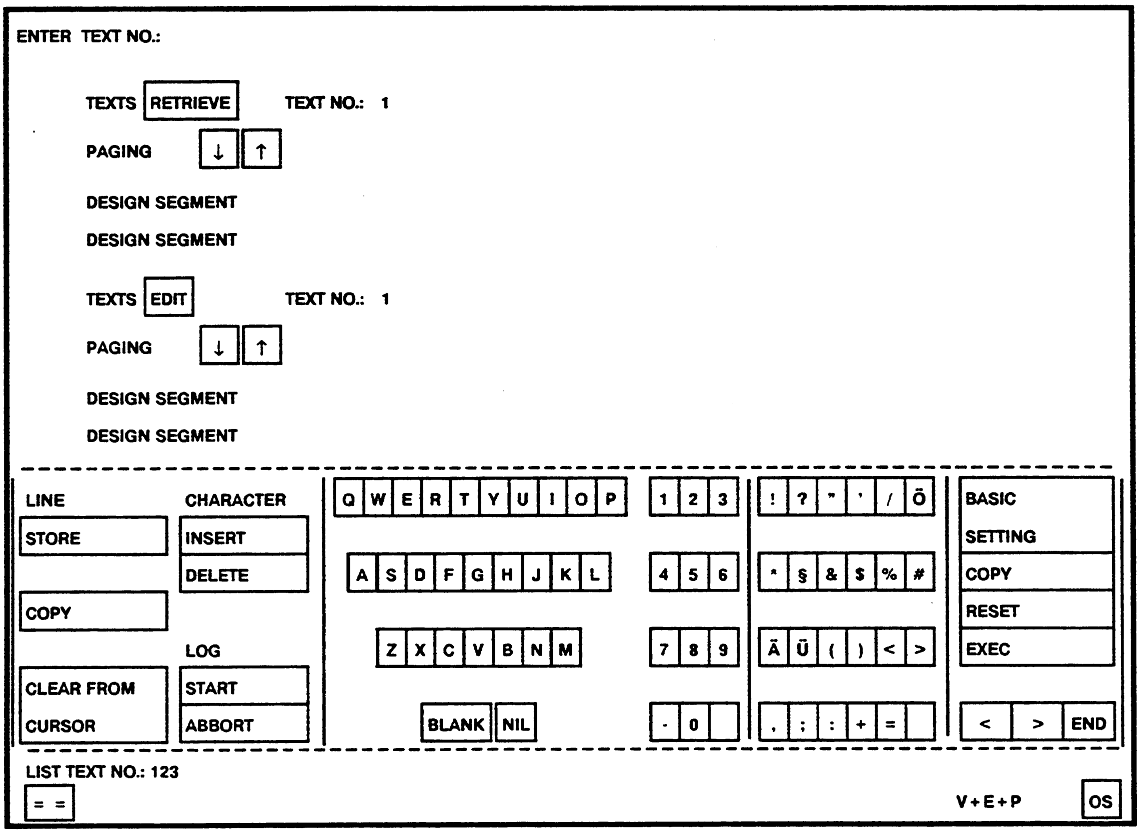


Fig. 3-1 Text editor - initial state of input and display fields



ENTER TEXT NO.:

TEXTS RETRIEVE TEXT NO.: 1

PAGING ↓ ↑

DESIGN SEGMENT

DESIGN SEGMENT

TEXTS EDIT TEXT NO.: 1

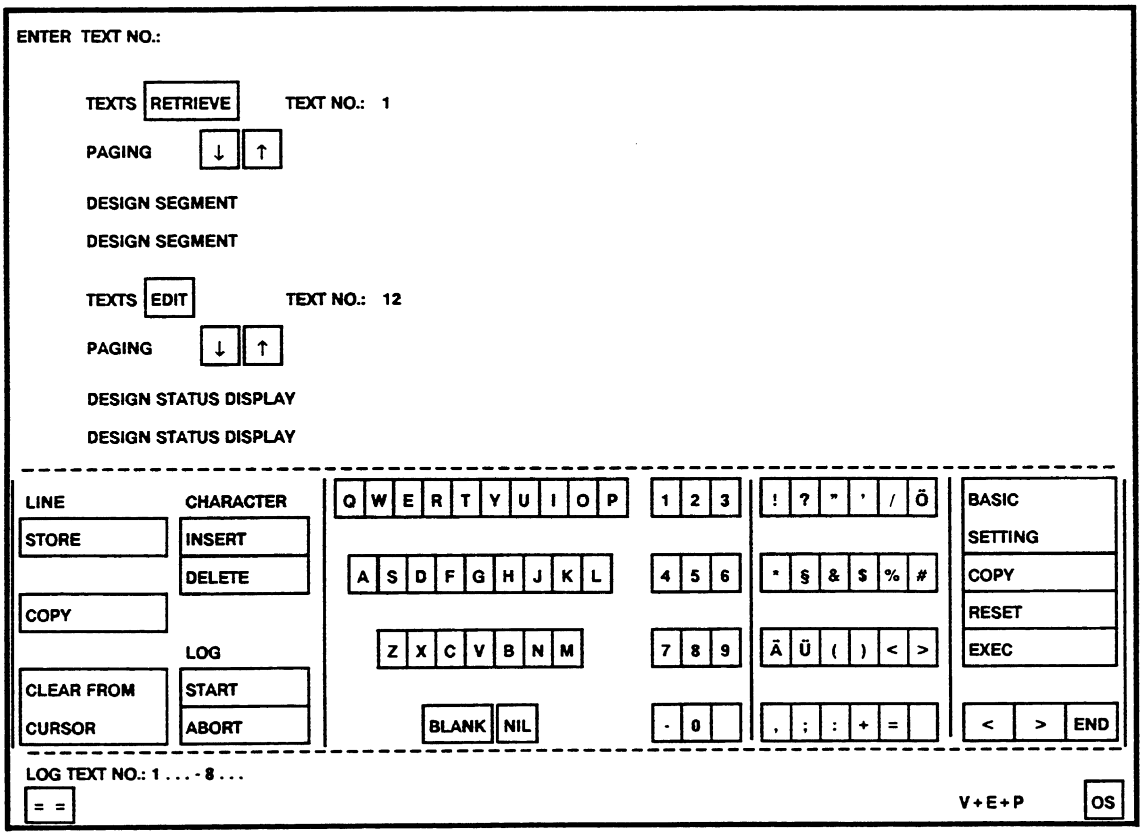
PAGING ↓ ↑

DESIGN SEGMENT

DESIGN SEGMENT

LIST TEXT NO.: 123

Fig. 3-2 Text editor - input and display fields after the retrieve function has been selected



ENTER TEXT NO.:

TEXTS RETRIEVE TEXT NO.: 1

PAGING ↓ ↑

DESIGN SEGMENT

DESIGN SEGMENT

TEXTS EDIT TEXT NO.: 12

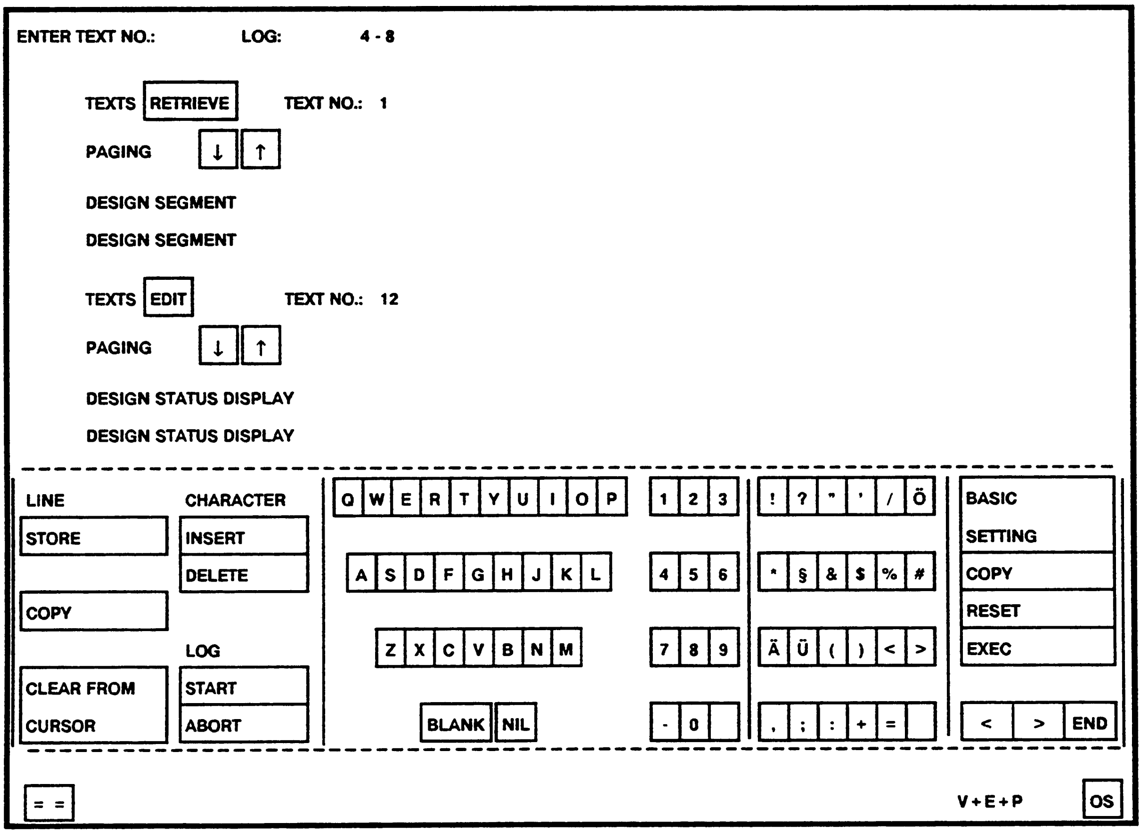
PAGING ↓ ↑

DESIGN STATUS DISPLAY

DESIGN STATUS DISPLAY

LOG TEXT NO.: 1 . . . - 8 . . .

Fig. 3-3 Text editor - input and display fields after the log function has been selected



ENTER TEXT NO.: LOG: 4 - 8

TEXTS RETRIEVE TEXT NO.: 1

PAGING ↓ ↑

DESIGN SEGMENT

DESIGN SEGMENT

TEXTS EDIT TEXT NO.: 12

PAGING ↓ ↑

DESIGN STATUS DISPLAY

DESIGN STATUS DISPLAY

Fig. 3-4 Text editor - input and display fields during printout of the texts

3.7 Logging Functions

The editor logging functions comprises issuing a cover sheet (Fig. 3-5) and the text printout with additional annotations (Fig. 3-6).

The cover sheet provides information regarding the language used for the texts (see table), the printed version, the date of the associated editing session and the date of the printout.

The editor determines the date automatically.

The cover sheet is printed if

- the editor has been started (selected)
- the version number has been increased.

The language specified on the cover sheet depends on the language code in the FTEXT file header. The language code cannot be modified through operator input.

```
                    O S   2 6 5
                     T E X T S


          LANGUAGE     :  ENGLISH
          VERSION      :  V 1. 002
          EDITED       :  07.01.1992
          OUTPUT       :  15.06.1992
```

Fig. 3-5 Text printout, cover sheet

PAGE: 1 WINDOW TEXT NO: 1

TEXT: 1 LENGTH: 22	DESIGN SEGMENT DESIGN SEGMENT
TEXT: 2 LENGTH: 24	ENTER SEGMENT EXTENSION ENTER SEGMENT EXTENSION
TEXT: 3 LENGTH: 20	ENTER SEGMENT NUMBER ENTER SEGMENT NUMBER
TEXT: 4 LENGTH: 30	ENTER SEGMENT DESIGN ENTER SEGMENT DESIGN
TEXT: 5 LENGTH: 24	IDENTIFY SEGMENT IDENTIFY SEGMENT
TEXT: 6 LENGTH: 32	DELETE SEGMENT? ENTER YES/NO DELETE SEGMENT? ENTER YES/NO
TEXT: 7 LENGTH: 22	ENTER KEYSET NUMBER ENTER KEYSET NUMBER
TEXT: 8 LENGTH: 24	DESIGN KEYSET DESIGN KEYSET

END OF LOG

Fig. 3-6 Text printout

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4 NORA Design

The standardized displays (NORAs) consist of control fields which have been created using FRANZ resources. These control fields are provided to the user as a preconfigured NORA data set. Each NORA is assigned to a specific standard block type in the AS. The configuration procedure discussed below automatically arranges the NORA displays in three different hierarchy levels.

Basis: Preconfigured NORA data set with a fixed representation of the display hierarchy:

- Overview display (area overview containing 12 areas)
- Area display (group overview containing 24 groups)
- Group display (loop overview containing 8 loops)
- Loop display

The user must supplement the NORA data set with system-related data which includes:

- Area name
- Group name in the area display
- Group display arrangement by defining a process-related adjacent group
- Loop arrangement in the individual groups
- Block-related data, such as measuring point identification (MKZ) and NORA representation number (including TREND allocation).

A measuring point identification consists of:

- Bus number
- Device number
- Block type
- Block number

Design is simplified by screen forms which are provided for entering the system-related NORA data. A form and a key set are provided for each design phase in NORA form mode. The displayed form can be filled in using the configuration dialog.

The individual design levels have a hierarchical structure (Fig. 4-1). The form for the next lower hierarchy level is displayed when a configured name or the associated number is entered by light pen selection. Selecting the END key displays the next higher hierarchy level.

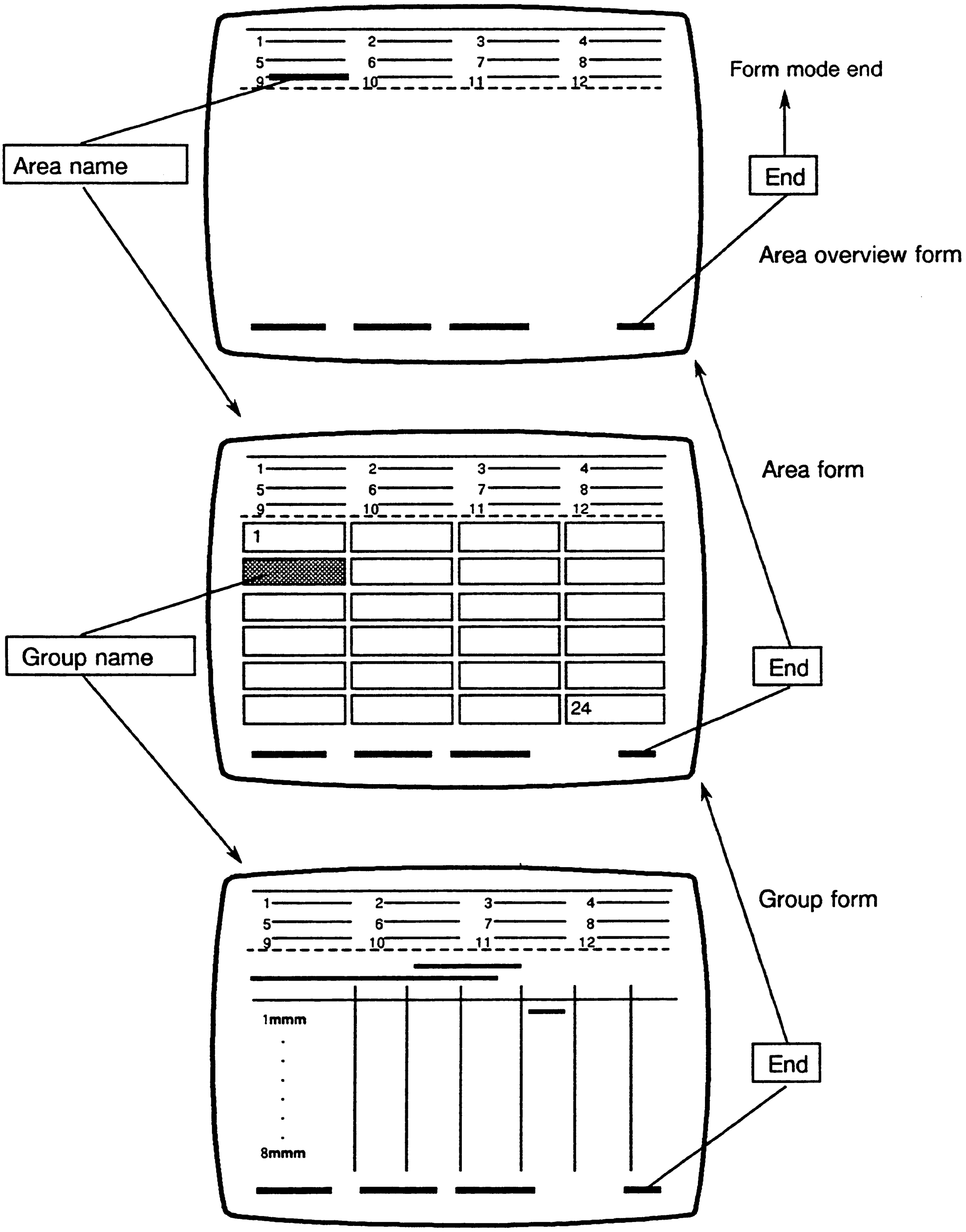


Fig. 4-1 Hierarchical structure of the individual design levels

4.1 Symbol Set

Symbol set 1 has been used for creating all available NORAs. The symbols contained in this set may not be modified or deleted as this can cause mutilation of existing NORAs.

If for any reason further symbols need to be created and, for this purpose, an already existing symbol modified (overwritten), a thorough check is required to ensure that these symbols have not been used in existing NORAs (status display/segment/key set).

The user may create his own symbol sets for freely configurable displays (FRANZ). Cf. Chapter 5.3, symbol design.

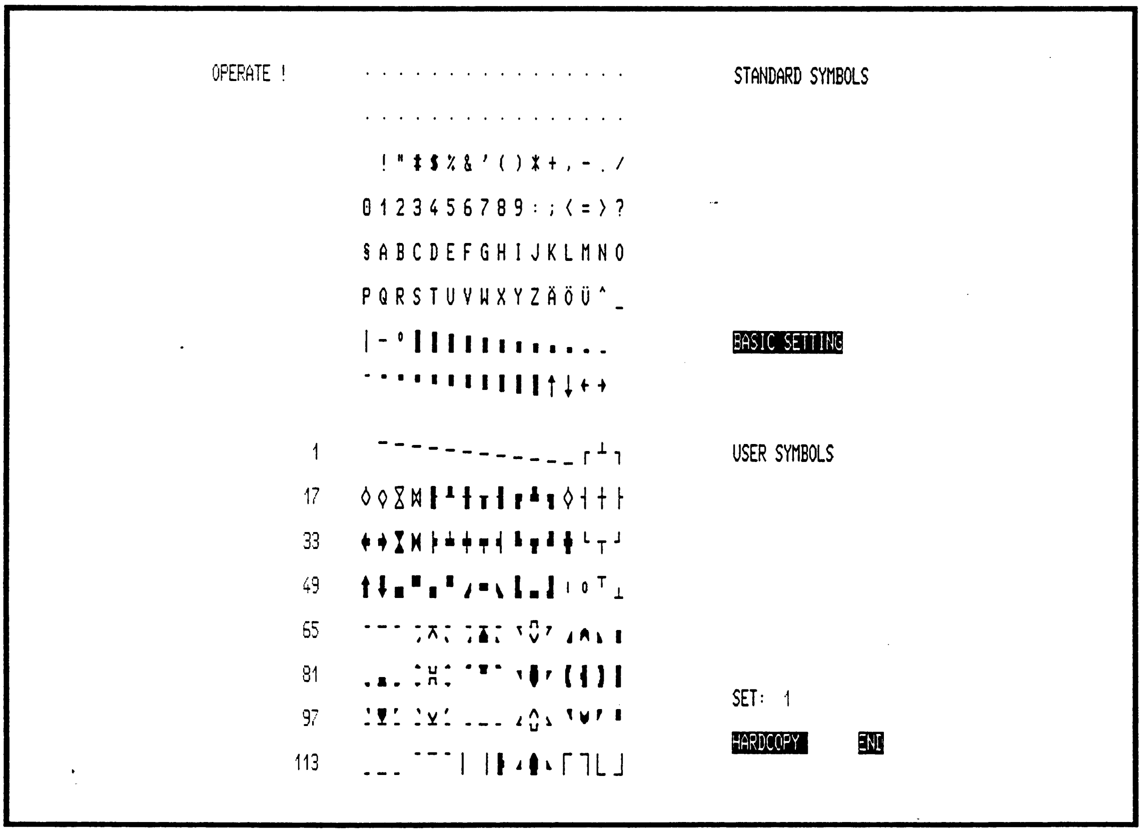


Fig. 4-2 Symbol set 1

4.2 NORA Design

Selecting the virtual key NORA DIALOG (Fig. 4-3) starts NORA form mode. First the screen is filled with white NIL dots and the message NORA START displayed. Once the initialization run has been terminated (after approximately 30 seconds), the area overview menu appears in screen area 1 and the CREATE/CHANGE, HC, PRINT and END keys are displayed (Fig. 4-4). This key set is displayed in each menu. Selecting the CREATE/CHANGE key enables values to be entered via the DIAVID menu field into the displayed form. Selecting the HC or PRINT keys produces a hard copy of the screen content. Selecting END terminates NORA form mode and/or returns to the next higher hierarchy level.

Example:

Group display is displayed
END key
↓
Area display is displayed
END key
↓
Only area overview is displayed
END key
↓
End of the configuration program

The message "CREATING DISPLAY DATA ZZ" is displayed in the message line whilst the design entries are accepted into the data. The decrementing counter output (ZZ) shows which area, group or loop is currently being processed.

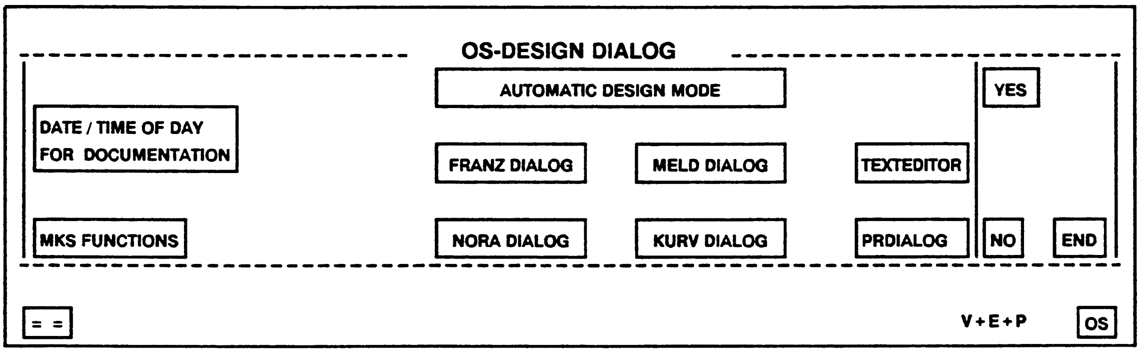


Fig. 4-3 Menu field for design system selection

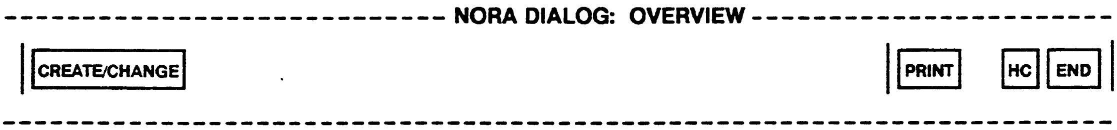


Fig. 4-4 Menu field for overview design

4.2.1 Area Overview

The system overview of the preconfigured NORA data set is structured into 12 areas (area overview).

The DIAVID menu field required for configuration is displayed when the CREATE/CHANGE key is selected (Fig. 4-5) in the area form. This key set is used for entering the plant area names after the area number in the overview display. The cursor, which is initially at the beginning of the first input field, can be positioned at any input field column using the light pen. The input fields are filled in by selecting the appropriate character keys.

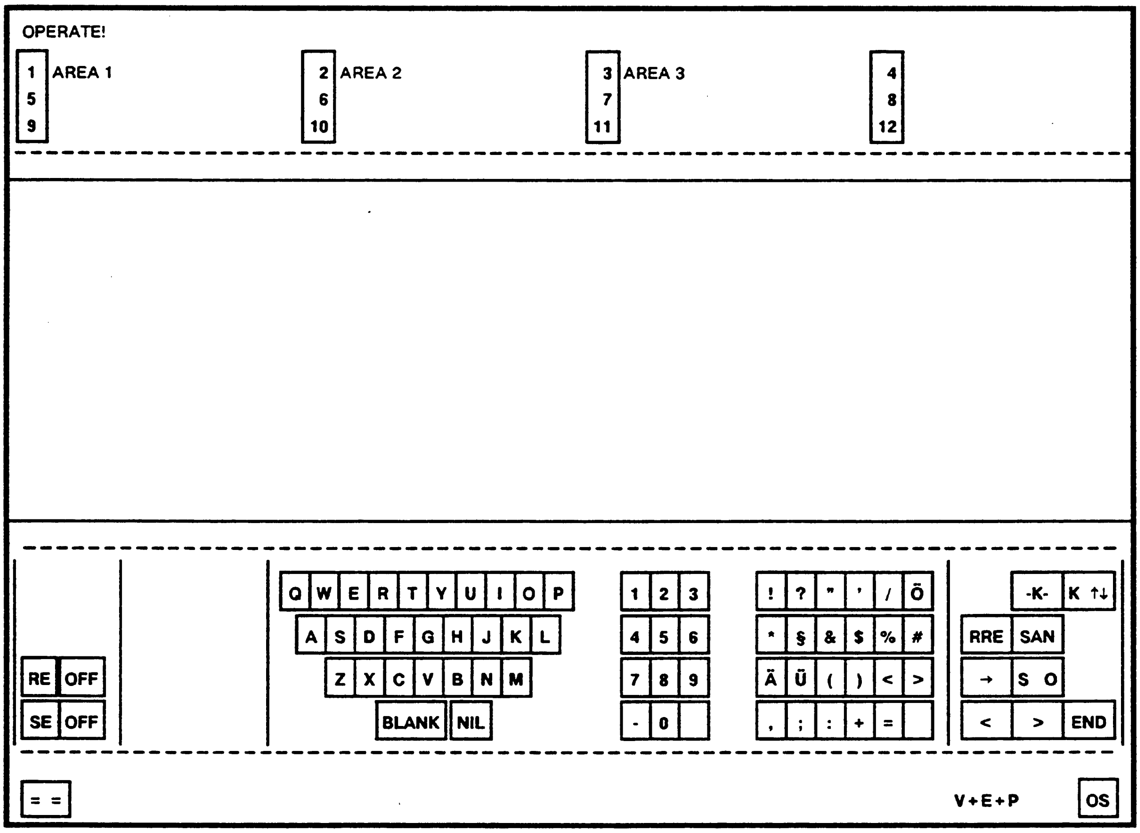


Fig. 4-5 Design in the area overview

Up to 10 characters from the displayed character set are permitted. Newly designed names are displayed in white. An area name together with the whole area and all groups and loops configured within this area are deleted if the input field corresponding to the area name is filled completely with blanks. (Entering NIL dots is insufficient for this function). An existing or incorrect area name may be overwritten and thus altered; the configured groups and loops remain.

Selecting the END key in the DIAVID menu field terminates overview configuration. A colour change from white to green shows that the names have been accepted into the data. The CREATE/CHANGE menu field is displayed in the command area (Fig. 4-6).

No operator inputs are possible when the message CREATING DISPLAY DATA is displayed. The counter ZZ is decremented after each key and input field processing.

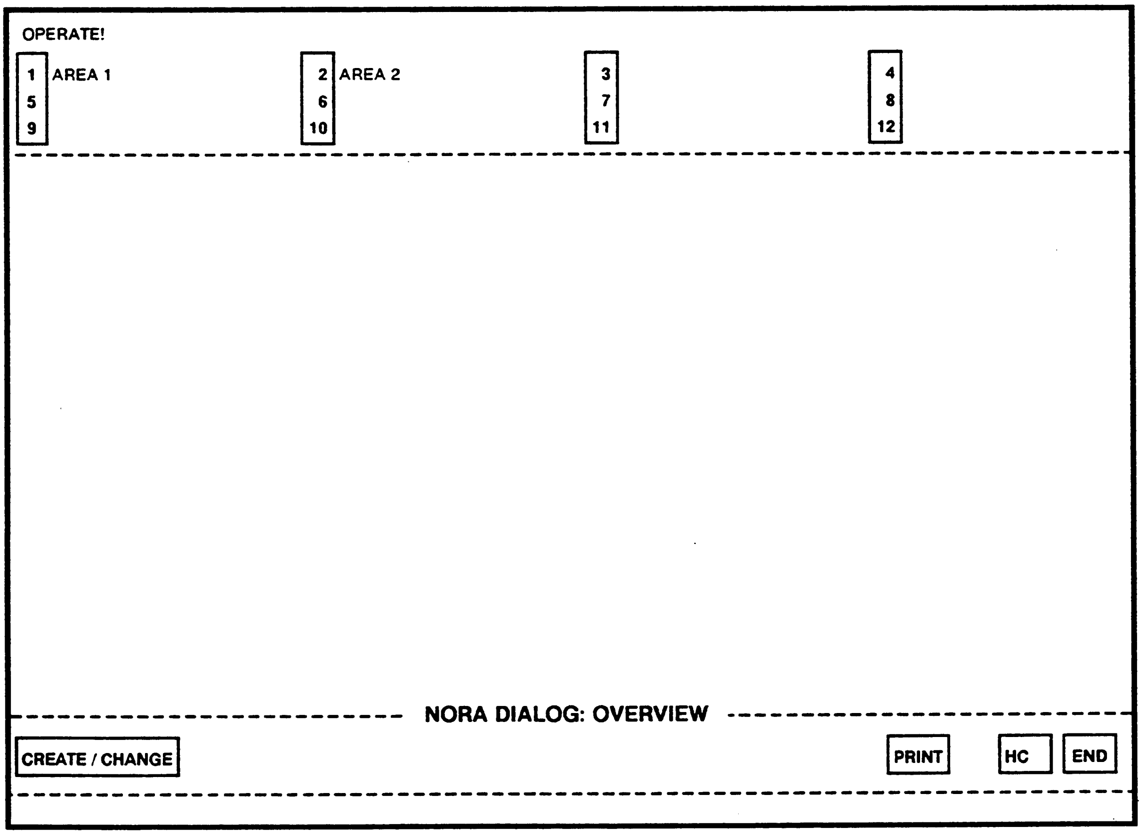


Fig. 4-6 Area name design has been terminated

4.2.2 Area Form

The menu related to a configured area is displayed when the corresponding area number key in the work area is selected (Fig. 4-7). The selected area is marked in the area overview by a change in the colour (from green to white) of the area name. The DIAVID menu field is displayed when the CREATE/CHANGE key is selected.

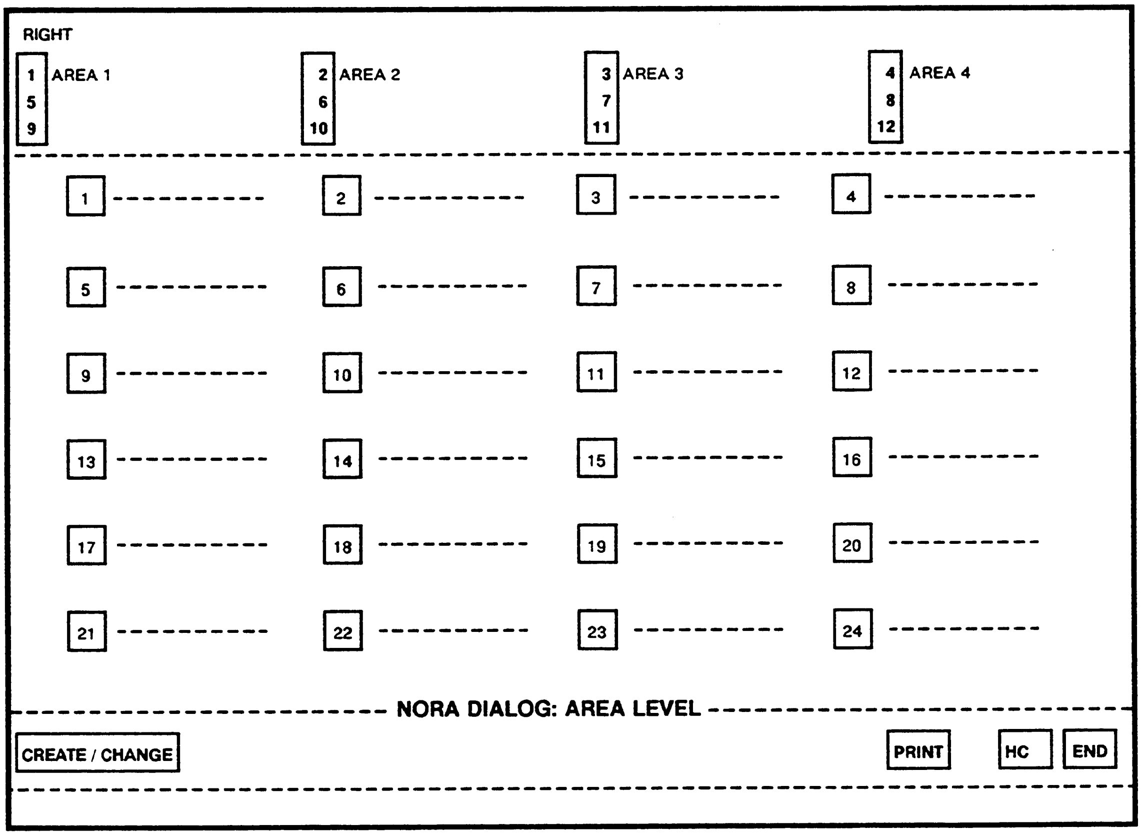


Fig. 4-7 Area menu

The name of a group to be configured can be entered after the cursor has been placed at a position in the input field below the group number displayed in the form (a flash appears when the light pen touches the screen).

Up to 18 characters from the character set displayed are permitted. Selecting the END key in the DIAVID menu field terminates configuration and accepts the group name into the data. A colour change from white to green indicates that the individual input fields have been processed (Fig. 4-8).

Note: Filling the whole input field with blanks deletes a configured group including all loops contained in this group. Group name, group display level number and the level numbers of the loop displays related to this group are deleted. (Entering NIL dots is insufficient for this function).

Group and loops configured within this group remain if the whole length of the group name input field is overwritten with NIL dots; although this group may not be selected any longer in a NORA dialog.

A group name may be overwritten and thus changed; the loops contained in this group are not deleted.

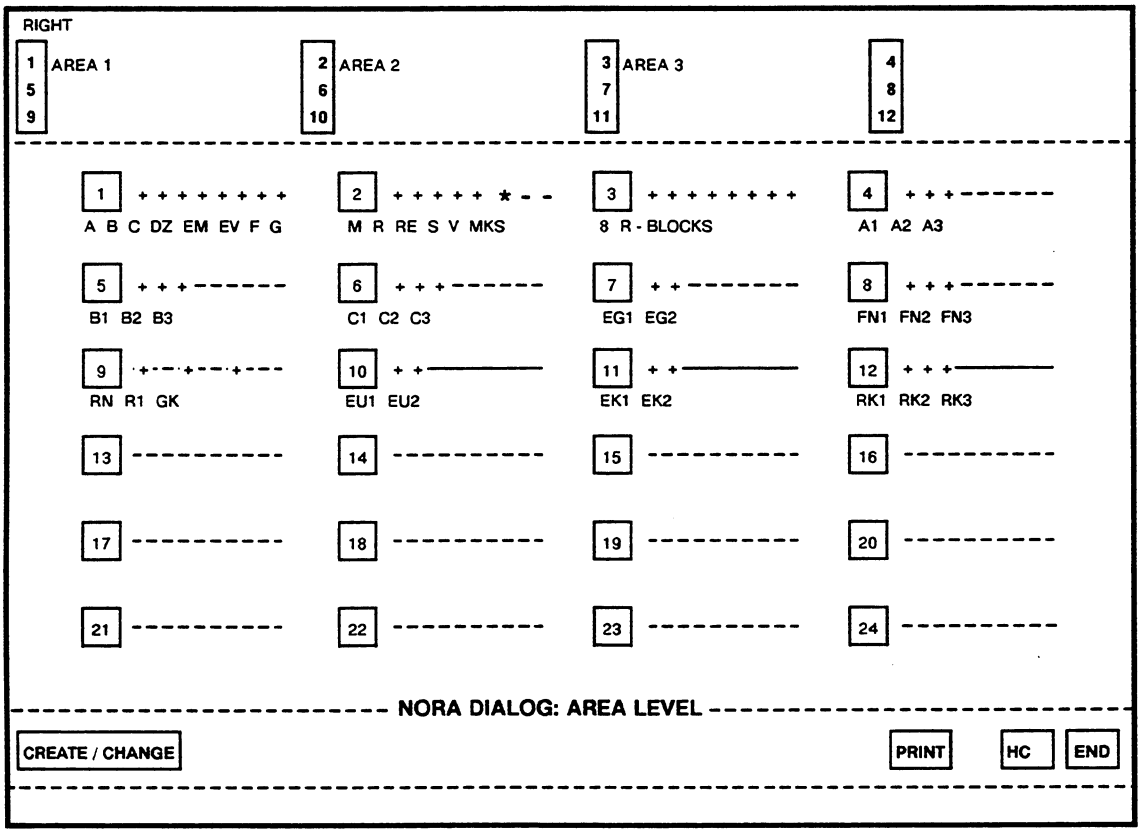
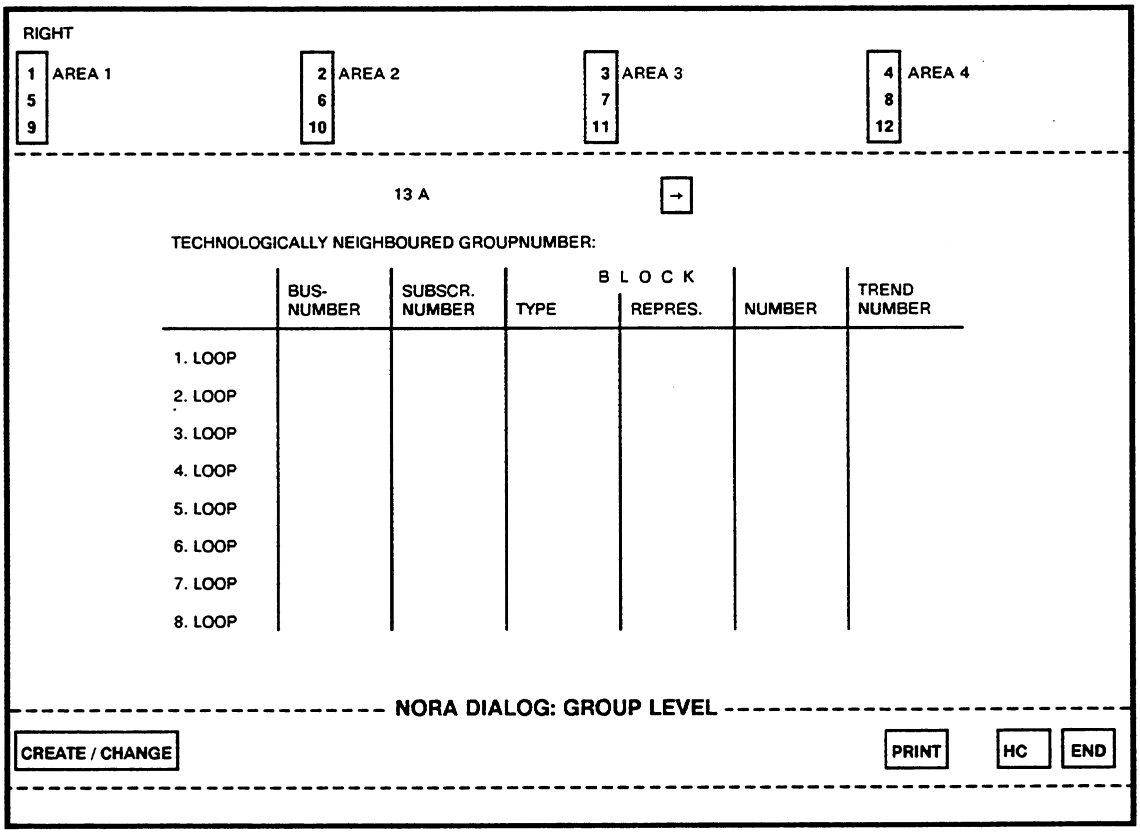


Fig. 4-8 Configured group names in the area display

4.2.3 Group Form

This menu is displayed once a group number or a group name have been selected using the light pen (Fig. 4-9).

After the DIAVID menu field has been displayed selecting the CREATE/CHANGE key, the cursor is displayed in the input field for the number of the TECHNOLOGICALLY NEIGHBOURED GROUP. The number to be entered in this field (1 to 24) identifies the group which can be selected in the operating phase using the arrow key in the group display. One of the existing group numbers may be selected.



RIGHT

1 5 9 AREA 1
2 6 10 AREA 2
3 7 11 AREA 3
4 8 12 AREA 4

13 A →

TECHNOLOGICALLY NEIGHBOURED GROUPNUMBER:

			BLOCK			
	BUS-NUMBER	SUBSCR. NUMBER	TYPE	REPRES.	NUMBER	TREND NUMBER
1. LOOP						
2. LOOP						
3. LOOP						
4. LOOP						
5. LOOP						
6. LOOP						
7. LOOP						
8. LOOP						

NORA DIALOG: GROUP LEVEL

CREATE / CHANGE PRINT HC END

Fig. 4-9 Group form

The entries for the individual loops (1 to 8) are performed subsequently.

• BUS NUMBER	Figures between 0 and 7
• SUBSCR. NUMBER	Figures between 0 and 99
• BLOCK TYPE	Up to four alphanumeric characters

The TREND block may only be configured together with certain operator-accessible blocks (B, M, R, RE, and V). Only the block number (numeric value of up to 4 digits) of the T block is therefore specified in the last column of the group form. Specifying "T" as a block type is illegal.

Note: A configured loop and the level number of this loop are deleted when the input field in this column is filled with blanks or NIL dots. The group name is retained in the area form, however, and the group can be selected in a NORA dialog (an empty group form is displayed).
A planned loop cannot be modified via the FRANZ function of the MKZ editor (see Chapter 5.11).

• BLOCK REPRES.	The block is represented by four numeric characters (e.g. 1000, 1001, see standardized display summary, 4.0). A left-justified entry of a single figure is filled up with zeros to the end of the field (up to 4 numeric characters, thus 1 becomes 1000, for example).
• BLOCK NUMBER	4 alphanumeric characters

The entries are checked and, if found to be correct, stored in the data after the END key has been selected in the DIAVID menu field. A black F on a red background is displayed next to the input field concerned if a fault has been detected.

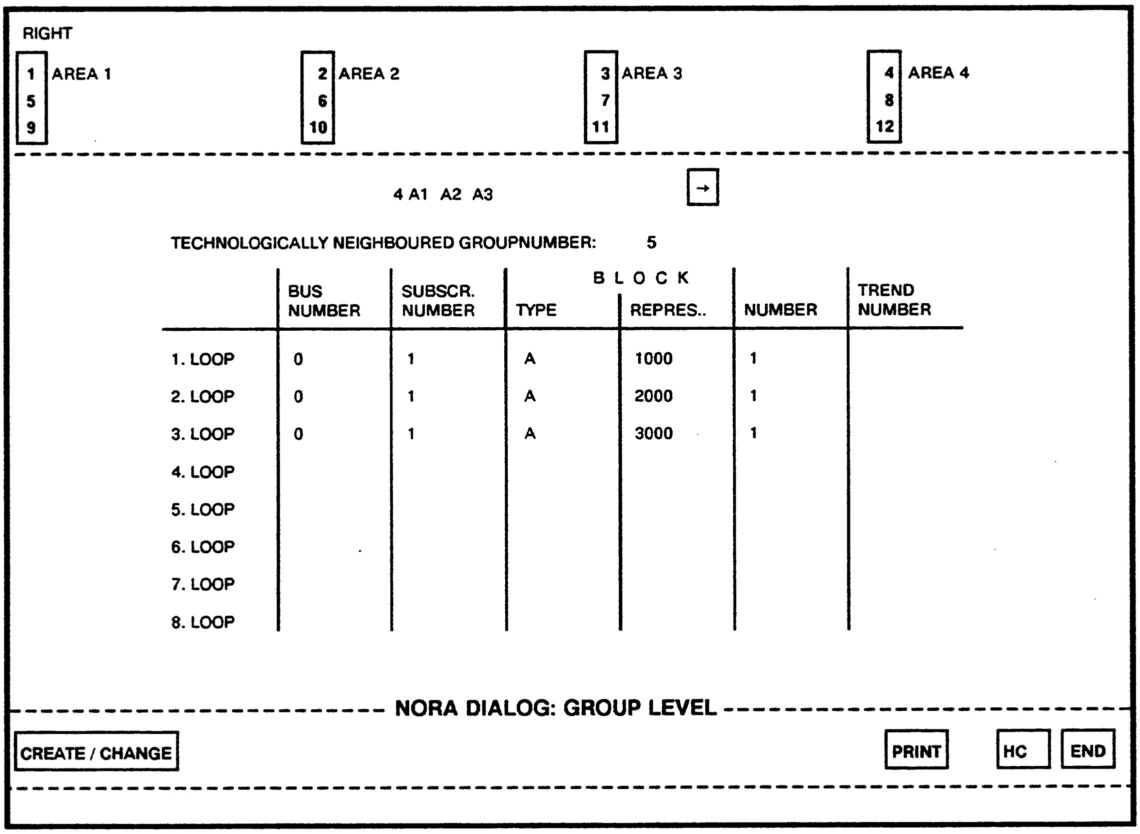
An error message is issued if

- a non-numerical character or a non-existing group number has been entered in the TECHNOLOGICALLY NEIGHBOURED GROUPNUMBER field;
- a non-numerical character has been entered as bus or device number;
- a non-numerical character has been entered as TREND number;
- a block of a non-existing type or a block which has yet to be configured has been entered (e.g S, G block).

The loop concerned is not accepted into the data or deleted from the data if an error message occurs.

For each configured loop, a status display (e.g. " + " for the R block; "*" for the MKS block) and a key are displayed in the area display above the group name (Figs. 4-10 and 4-11). This key can be used in the operating phase to directly select the corresponding loop in the area display.

4.2.4 Configuring S, G or GK Blocks



TECHNOLOGICALLY NEIGHBOURED GROUPNUMBER: 5

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	BLOCK REPRES..	NUMBER	TREND NUMBER
1. LOOP	0	1	A	1000	1	
2. LOOP	0	1	A	2000	1	
3. LOOP	0	1	A	3000	1	
4. LOOP						
5. LOOP						
6. LOOP						
7. LOOP						
8. LOOP						

Fig. 4-10 Configured loops in the group form

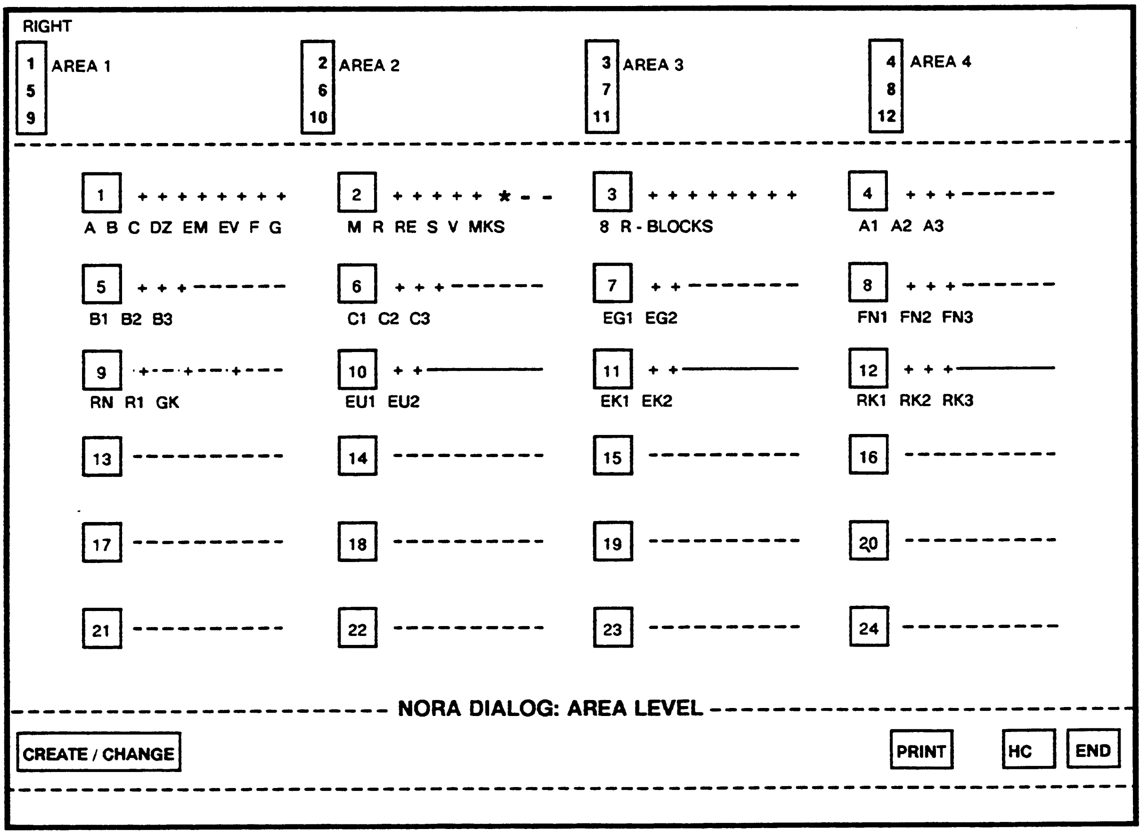


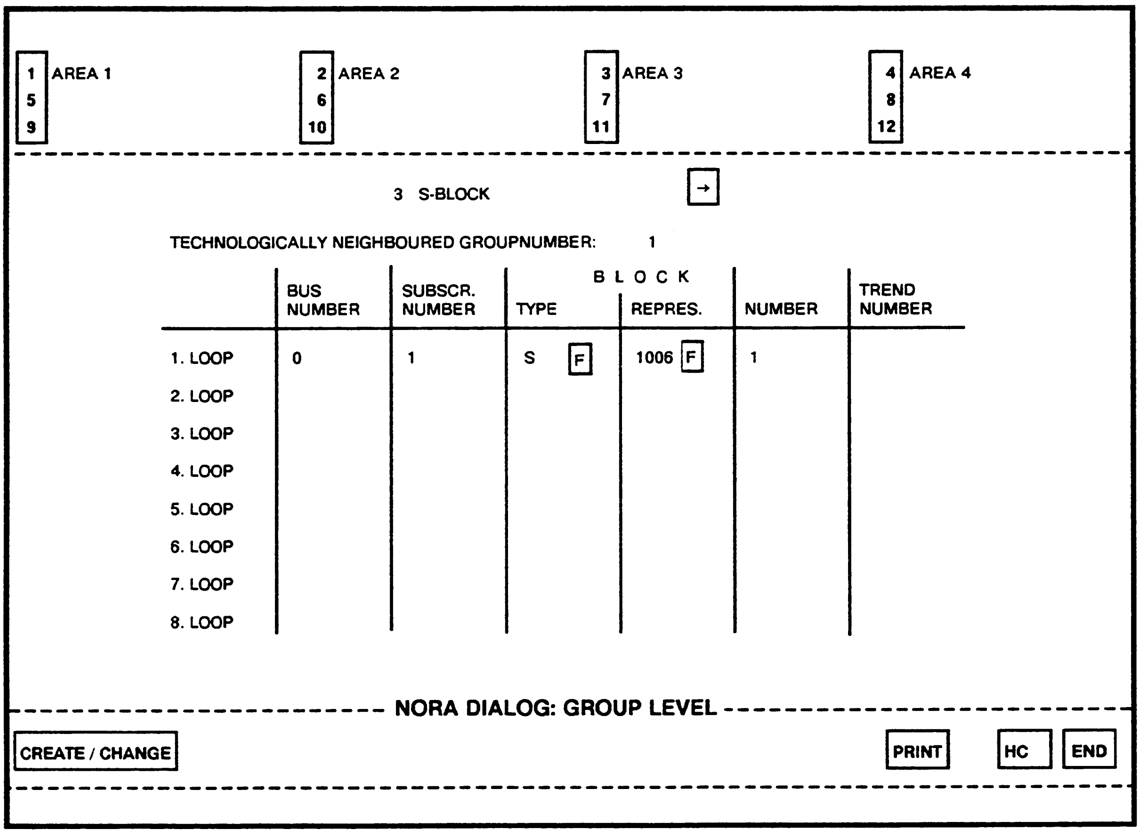
Fig. 4-11 Status displays in the area display

Special rules apply for entering S, G or GK blocks into the group form. These blocks are created in an extended configuration dialog. The data sets contain "exemplary" blocks in representation 1000. These blocks may not be included in the group form and are merely used as a pattern for the S, G or GK blocks to be configured. A new representation number (1001 ... 1999) must be selected when such a block is configured in a group form. The representation number 1000 may not be specified for these blocks.

Once a block has been configured in the group form, the system checks whether this block, which is identified by its block type and representation, exists in the data. A red F is displayed next to block type and representation if a block cannot be found in the data.

Block type and representation are marked by a red F if a new representation is entered for an S, G or GK block.

Note: Configuration of G and GK blocks must start with the ON sequence.



3 S-BLOCK

TECHNOLOGICALLY NEIGHBOURED GROUPNUMBER: 1

	BUS NUMBER	SUBSCR. NUMBER	BLOCK			TREND NUMBER
			TYPE	REPRES.	NUMBER	
1. LOOP	0	1	S F	1006 F	1	
2. LOOP						
3. LOOP						
4. LOOP						
5. LOOP						
6. LOOP						
7. LOOP						
8. LOOP						

Fig. 4-12 S block not yet in data transmissions

This block is not yet contained in the data. The subsequent configuration in the S, G or GK form is initiated by selecting the type name "S", "G" or "GK" in the group form using the light pen.

As the new block is now stored in the data, the F marks disappear once the configuration has been terminated.

When the type name "S" is selected using the light pen, the system recognizes the exemplary block, rejects the block configuration, and displays the message "REPRESENT. WRONG".

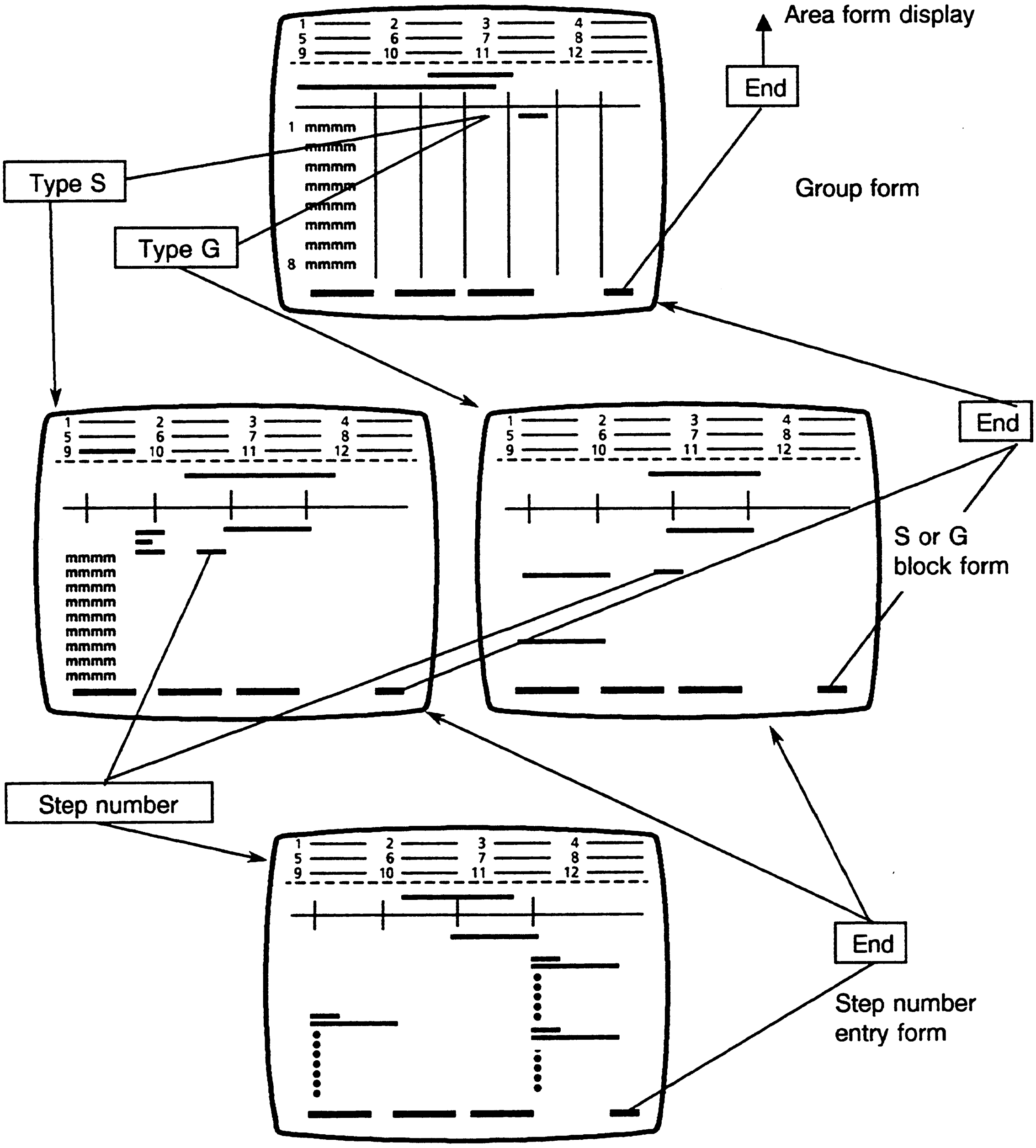
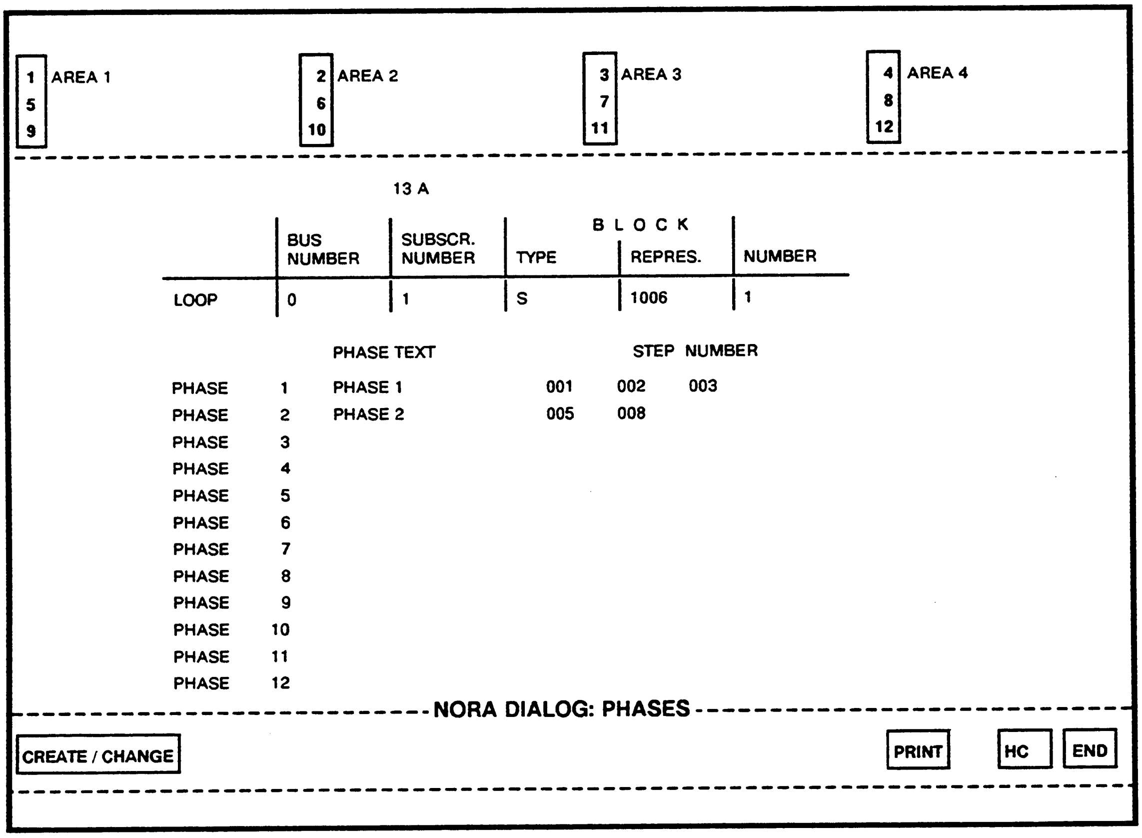


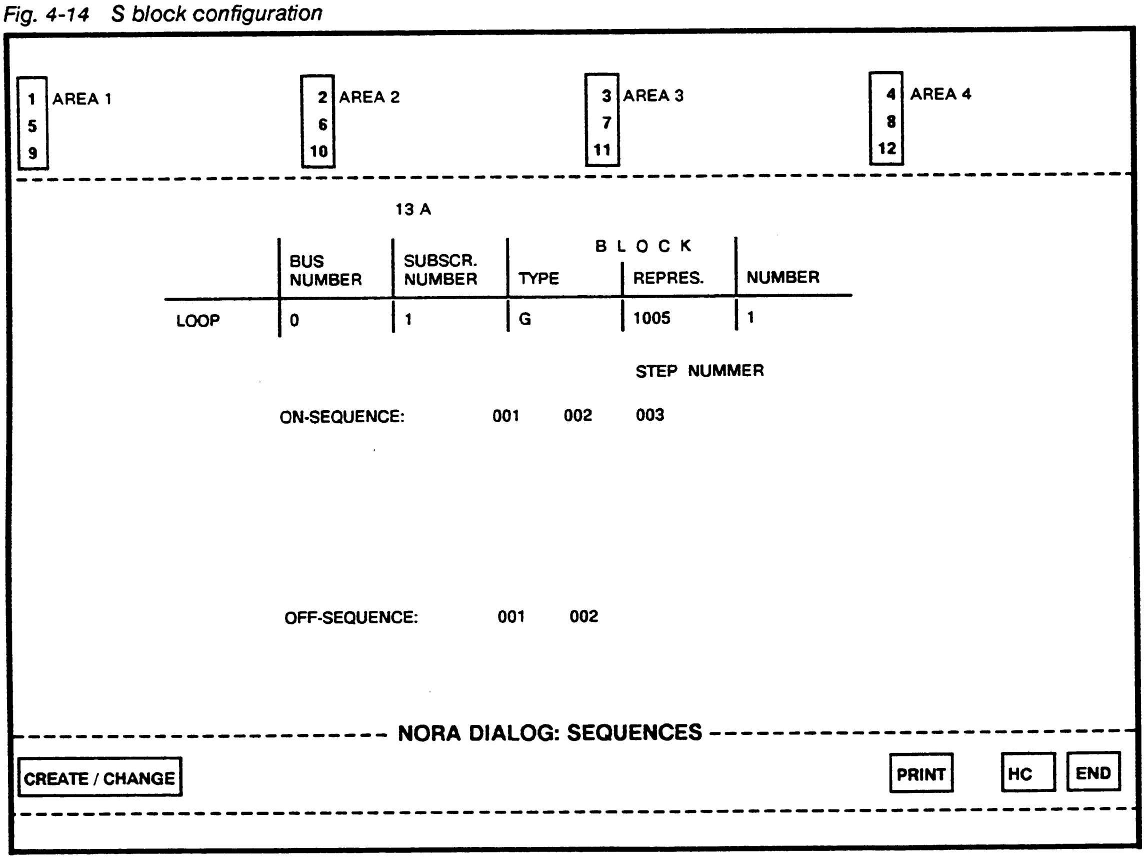
Fig. 4-13 S, G blocks, form selection



	BUS NUMBER	SUBSCR. NUMBER	BLOCK		
			TYPE	REPRES.	NUMBER
LOOP	0	1	S	1006	1

		PHASE TEXT	STEP NUMBER		
PHASE	1	PHASE 1	001	002	003
PHASE	2	PHASE 2	005	008	
PHASE	3				
PHASE	4				
PHASE	5				
PHASE	6				
PHASE	7				
PHASE	8				
PHASE	9				
PHASE	10				
PHASE	11				
PHASE	12				

Fig. 4-14 S block configuration



	BUS NUMBER	SUBSCR. NUMBER	BLOCK		
			TYPE	REPRES.	NUMBER
LOOP	0	1	G	1005	1

	STEP NUMMER		
ON-SEQUENCE:	001	002	003
OFF-SEQUENCE:	001	002	

Fig. 4-15 G or GK block configuration

The examples in Chapter 4.2.5 explain the exact configuration sequence required for S, G and GK blocks.

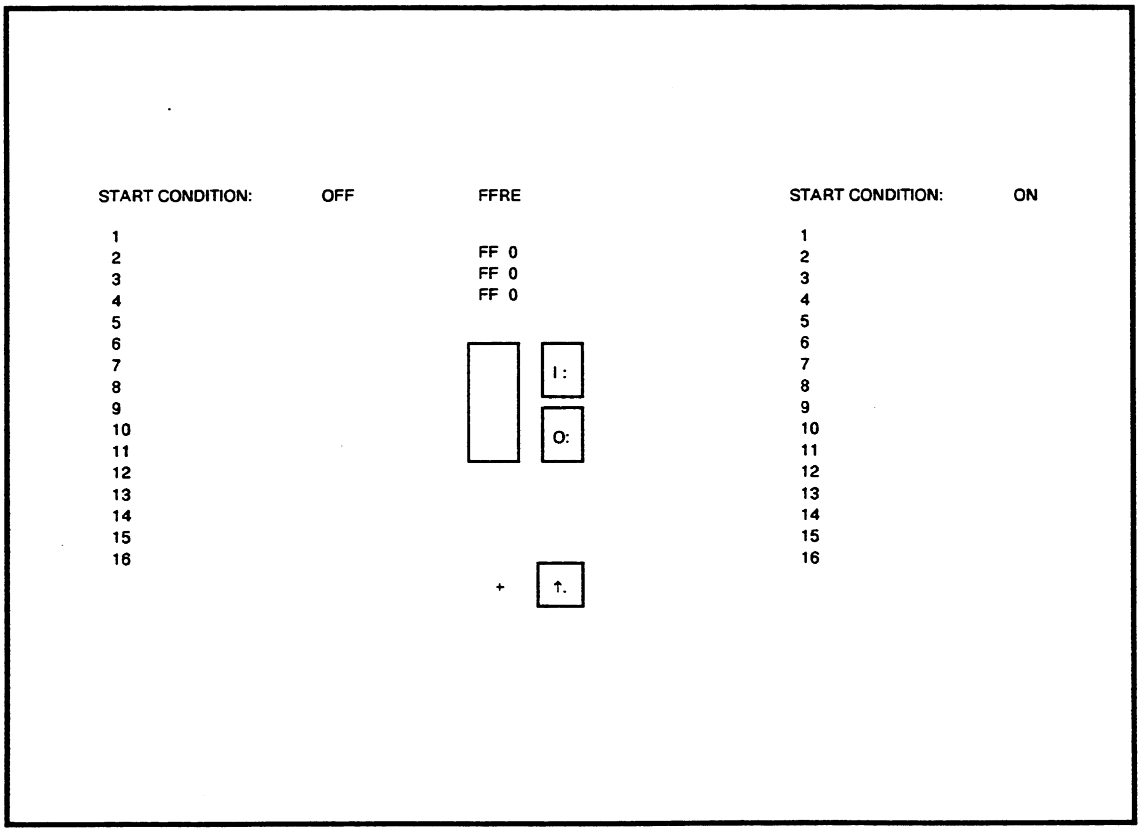
Clearing a configured S, G or GK block

All phase texts must be deleted from the S block configuration form (Fig. 4-14) in order to clear an S block. Clearing a G or GK block requires deletion of all step numbers (Fig. 4-15). A block is only cleared if it has only been entered in one loop. It remains unchanged and is redisplayed in the form if it has been entered in more than one loops.

4.2.4.1 GK Block Start Conditions

Control field 159, which contains the general operator input parameters for the GK block, exists in the OS 262/OS 265 basic data set as a preconfigured control field for GK blocks.

This control field can be extended by the start conditions.



```
START CONDITION:     OFF         FFRE          START CONDITION:     ON
1                                              1
2                                FF 0          2
3                                FF 0          3
4                                FF 0          4
5                                              5
6                                              6
7                                      I:      7
8                                              8
9                                              9
10                                     O:      10
11                                             11
12                                             12
13                                             13
14                                             14
15                                             15
16                                             16
                                 +     ↑.
```

Fig. 4-16 Control field 159 for GK block start conditions

The following procedure is required:

- Status display

The status displays 190 and 248 which are contained in the basic data can be used for start condition representation.

Status display 190 consists of 2 alternatives:

Alternative 1 = 0
Alternative 2 = 1

and is interconnected with the low-order bit of the corresponding start condition.

Status display 248 consists of 4 alternatives:

Alternative 1 = blank
Alternative 2 = blank
Alternative 3 = 0
Alternative 4 = 1

and is interconnected with the two bits of the corresponding start condition.

The low-order bit of the corresponding start condition indicates the start condition status.

0 = OFF
1 = ON

The high-order bit of the corresponding start condition indicates the validity of the start condition:

0 = invalid
1 = valid

- Link with AS 230

Start condition ON 1 ... 16

			Cond.	Status display 248		Status display 190
Parameter	110	INTERN ID	1	Bit	15-16	16-16
Parameter	110	INTERN ID	2	Bit	13-14	14-14
Parameter	110	INTERN ID	3	Bit	11-12	12-12
Parameter	110	INTERN ID	4	Bit	09-10	10-10
Parameter	111	INTERN ID	5	Bit	15-16	16-16
Parameter	111	INTERN ID	6	Bit	13-14	14-14
Parameter	111	INTERN ID	7	Bit	11-12	12-12
Parameter	111	INTERN ID	8	Bit	09-10	10-10
Parameter	112	INTERN ID	9	Bit	15-16	16-16
Parameter	112	INTERN ID	10	Bit	13-14	14-14
Parameter	112	INTERN ID	11	Bit	11-12	12-12
Parameter	112	INTERN ID	12	Bit	09-10	10-10
Parameter	113	INTERN ID	13	Bit	15-16	16-16
Parameter	113	INTERN ID	14	Bit	13-14	14-14
Parameter	113	INTERN ID	15	Bit	11-12	12-12
Parameter	113	INTERN ID	16	Bit	09-10	10-10

Start condition OFF 1 ... 16

			Cond.	Status display 248		Status display 190
Parameter	106	INTERN ID	1	Bit	15-16	16-16
Parameter	106	INTERN ID	2	Bit	13-14	14-14
Parameter	106	INTERN ID	3	Bit	11-12	12-12
Parameter	106	INTERN ID	4	Bit	09-10	10-10
Parameter	107	INTERN ID	5	Bit	15-16	16-16
Parameter	107	INTERN ID	6	Bit	13-14	14-14
Parameter	107	INTERN ID	7	Bit	11-12	12-12
Parameter	107	INTERN ID	8	Bit	09-10	10-10
Parameter	108	INTERN ID	9	Bit	15-16	16-16
Parameter	108	INTERN ID	10	Bit	13-14	14-14
Parameter	108	INTERN ID	11	Bit	11-12	12-12
Parameter	108	INTERN ID	12	Bit	09-10	10-10
Parameter	109	INTERN ID	13	Bit	15-16	16-16
Parameter	109	INTERN ID	14	Bit	13-14	14-14
Parameter	109	INTERN ID	15	Bit	11-12	12-12
Parameter	109	INTERN ID	16	Bit	09-10	10-10

- Link with AS 220

Start conditions ON

1 ... 4	parameter no.	15	EXT VB
5 ... 8	parameter no.	16	EXT VB
9 ... 12	parameter no.	17	EXT VB
13 ... 16	parameter no.	18	EXT VB

Start conditions OFF

1 ... 4	parameter no.	11	EXT VB
5 ... 8	parameter no.	12	EXT VB
9 ... 12	parameter no.	13	EXT VB
13 ... 16	parameter no.	14	EXT VB

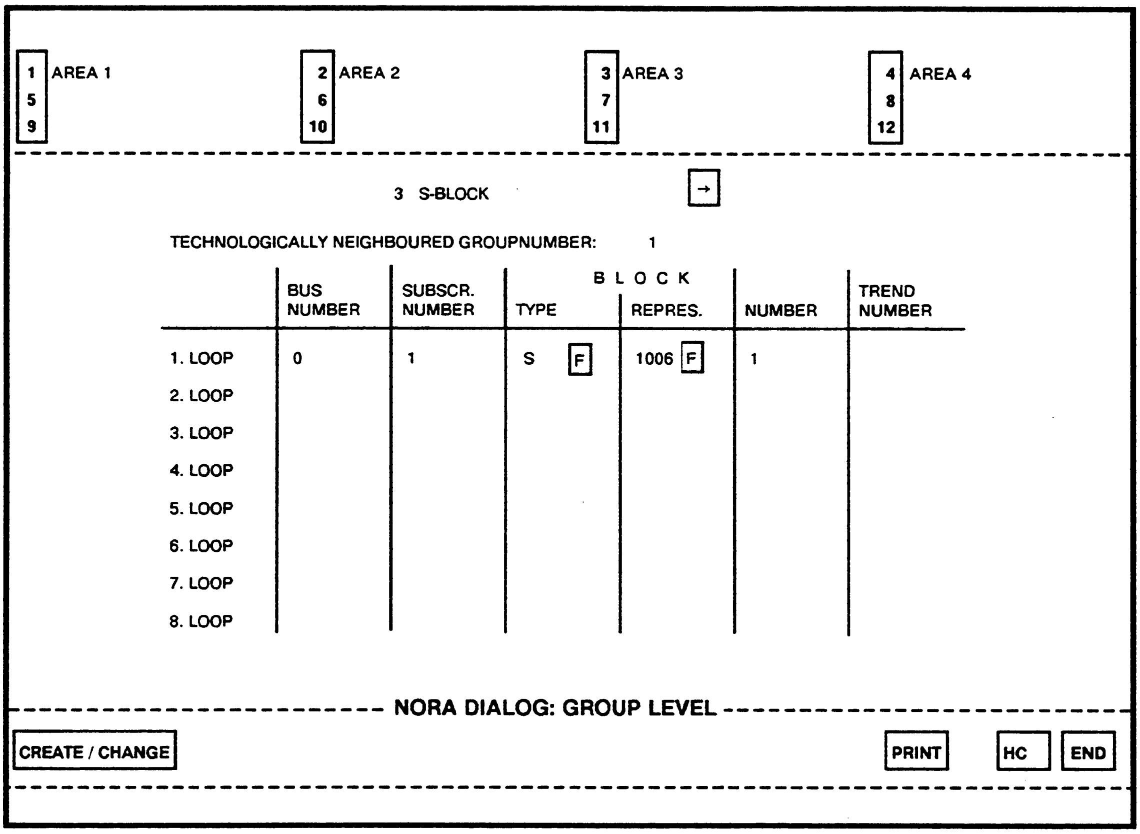
The binary interconnection is performed in the same manner as in the AS 230 system.

Using the following procedure reduces configuration work:

First use the above-mentioned parameters to supplement the control field 159 by the status displays 190 or 248. These displays indicate the status of the individual conditions (satisfied/not satisfied). Subsequently, a separate process display is created for each GK block, and control field 159 is inserted in this process display and interconnected with the block. The static texts related to the conditions are then entered into the process display. Loop display and group display of the GK block are called up (in FRANZ), and the process display number and start conditions are stored as an image selector key in variable 23 (individual NORA description, GK block, Chapter 4.3.2). As the block-related texts are stored in the individual process displays, this procedure requires the control field 159 to be created once only.

As different addresses are used, separate control fields containing the start conditions must be created for AS 220 and AS 230/AS 235 if GK blocks are to be configured for AS 220 and AS 230/AS 235.

4.2.5 Examples of a Configuration Sequence for S, G or GK Blocks



3 S-BLOCK

TECHNOLOGICALLY NEIGHBOURED GROUPNUMBER: 1

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	BLOCK REPRES.	NUMBER	TREND NUMBER
1. LOOP	0	1	S F	1006 F	1	
2. LOOP						
3. LOOP						
4. LOOP						
5. LOOP						
6. LOOP						
7. LOOP						
8. LOOP						

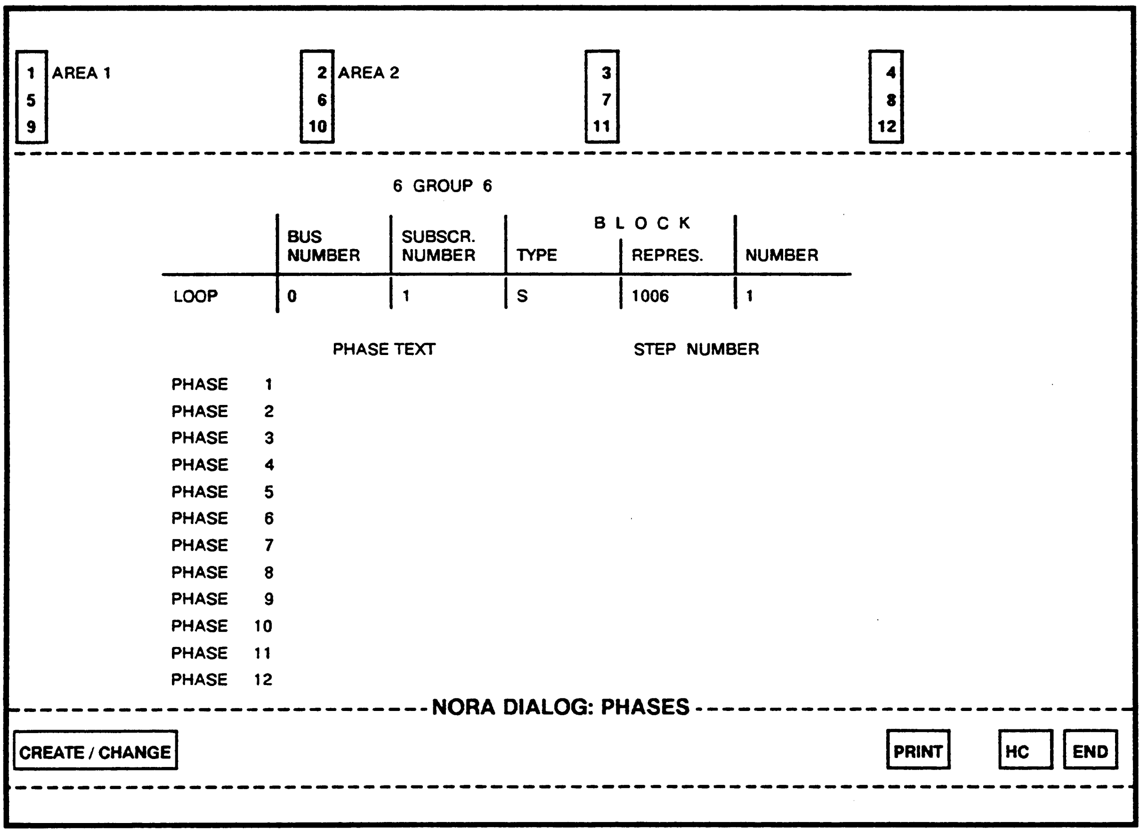
NORA DIALOG: GROUP LEVEL

Fig. 4-17

Once a block has been configured in the group form, a red F is displayed next to block type and representation if a block cannot be found in the data. The loops marked by "F" will be deleted if these blocks (S, G or GK block) are not configured before the END key is selected to exit the group form.

Fig. 4-18 is displayed for S block configuration if block type "S" is selected using the light pen.

4.2.5.1 S Block



1 5 9 AREA 1

2 6 10 AREA 2

3 7 11

4 8 12

6 GROUP 6

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	REPRES.	NUMBER
LOOP	0	1	S	1006	1

PHASE TEXT STEP NUMBER

PHASE 1
PHASE 2
PHASE 3
PHASE 4
PHASE 5
PHASE 6
PHASE 7
PHASE 8
PHASE 9
PHASE 10
PHASE 11
PHASE 12

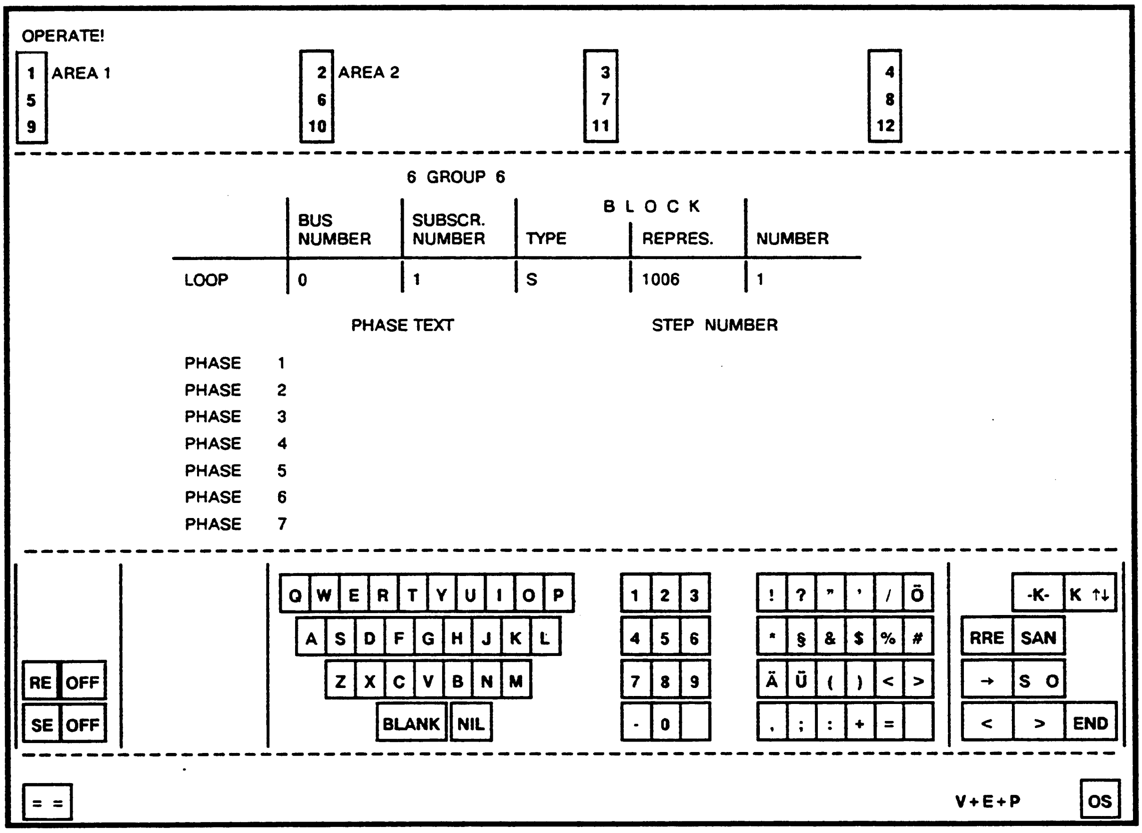
NORA DIALOG: PHASES

Fig. 4-18

This form is used for configuring the S block. The configured data is displayed if this block already exists (cf. Fig. 4-22).

Selecting the CREATE/CHANGE key displays the DIAVID menu field (Fig. 4-19).

Selecting the END key re-displays the group form, even if no configuration parameters have been entered (Fig. 4-17).



6 GROUP 6

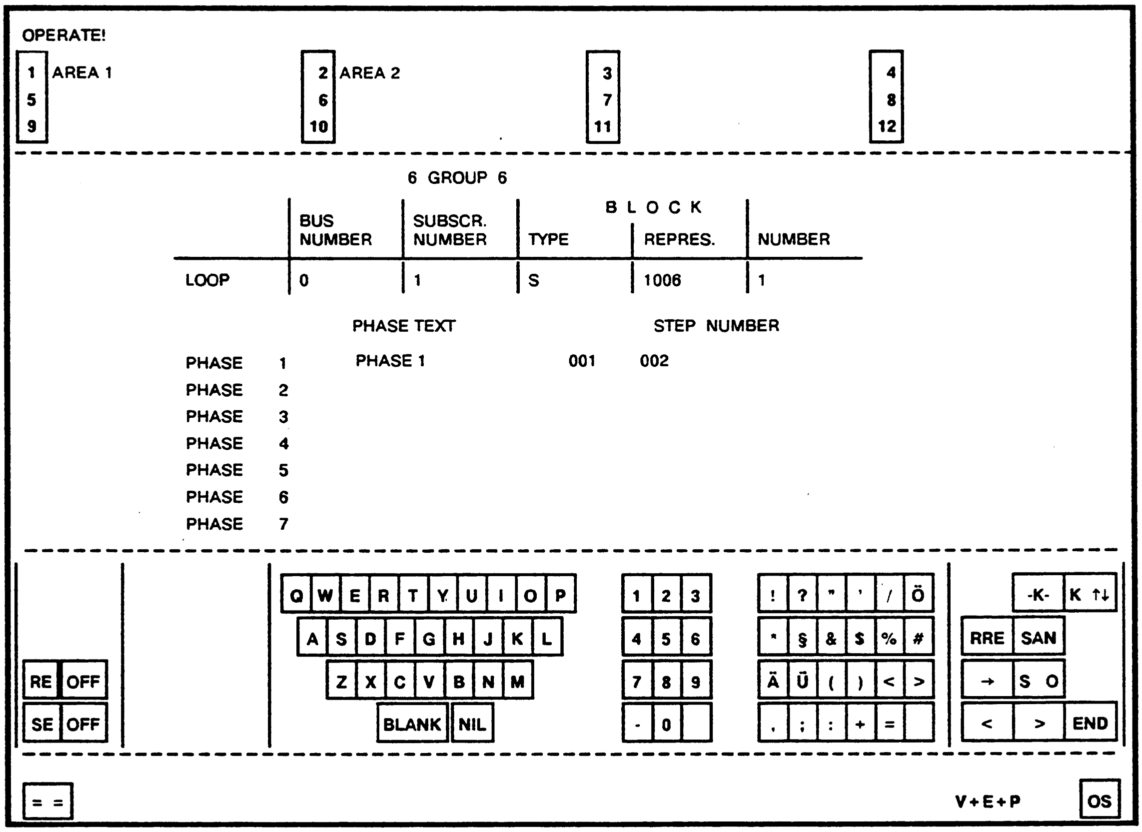
	BUS NUMBER	SUBSCR. NUMBER	BLOCK		
			TYPE	REPRES.	NUMBER
LOOP	0	1	S	1006	1

	PHASE TEXT	STEP NUMBER
PHASE 1		
PHASE 2		
PHASE 3		
PHASE 4		
PHASE 5		
PHASE 6		
PHASE 7		

Fig. 4-19

Using the menu field, a phase text of up to 6 alphanumeric characters and, in the same line, the step numbers (numeric value 1-999) can be entered for each phase. Each number between 1 and 999 may only be used once as a step number. A step number is only recognized if a related phase text has been configured.

The "K ↑↓ " key in the DIAVID menu field moves the menu field to the upper screen area and enables configuration in the lower part.



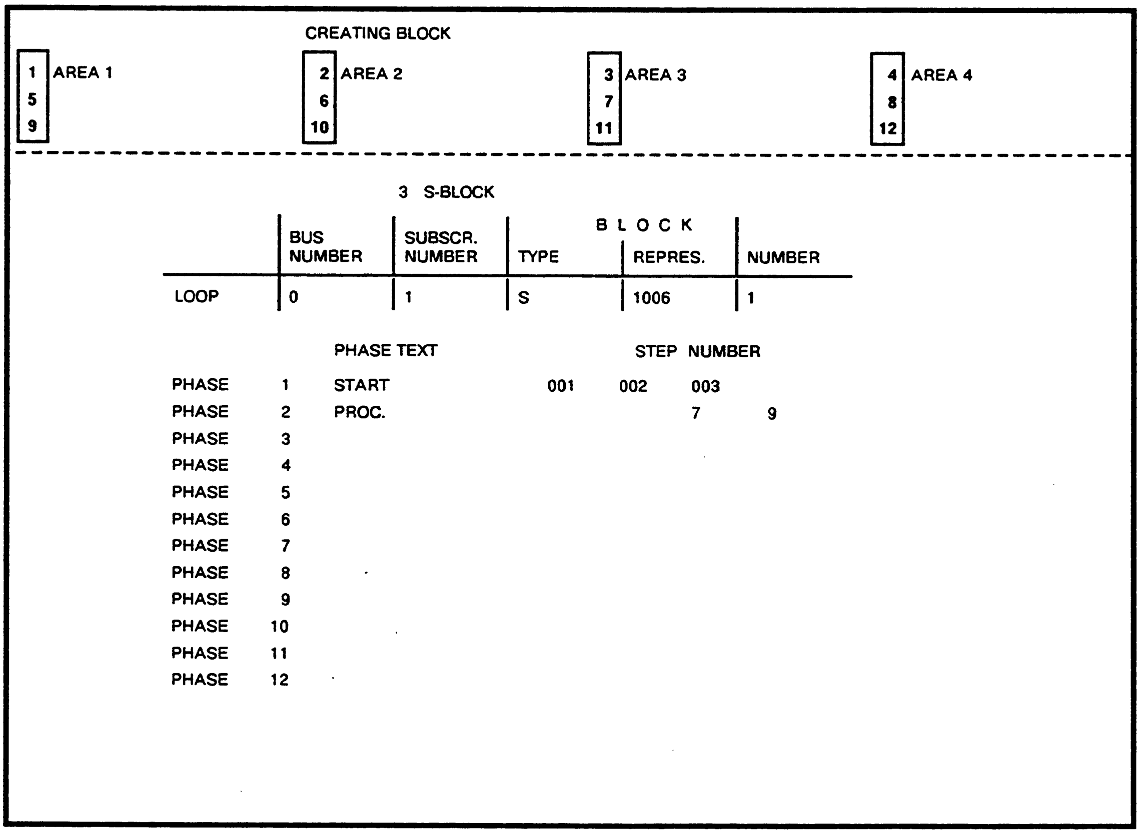
6 GROUP 6

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	BLOCK REPRES.	BLOCK NUMBER
LOOP	0	1	S	1006	1

	PHASE TEXT	STEP NUMBER	
PHASE 1	PHASE 1	001	002
PHASE 2			
PHASE 3			
PHASE 4			
PHASE 5			
PHASE 6			
PHASE 7			

Fig. 4-20

Phase text and step number have already been configured in this image. The form is interpreted and stored in the data after configuration has been terminated by selecting the END key (Fig. 4-21).



CREATING BLOCK

1 AREA 1	2 AREA 2	3 AREA 3	4 AREA 4
5	6	7	8
9	10	11	12

3 S-BLOCK

	BUS NUMBER	SUBSCR. NUMBER	BLOCK		
			TYPE	REPRES.	NUMBER
LOOP	0	1	S	1006	1

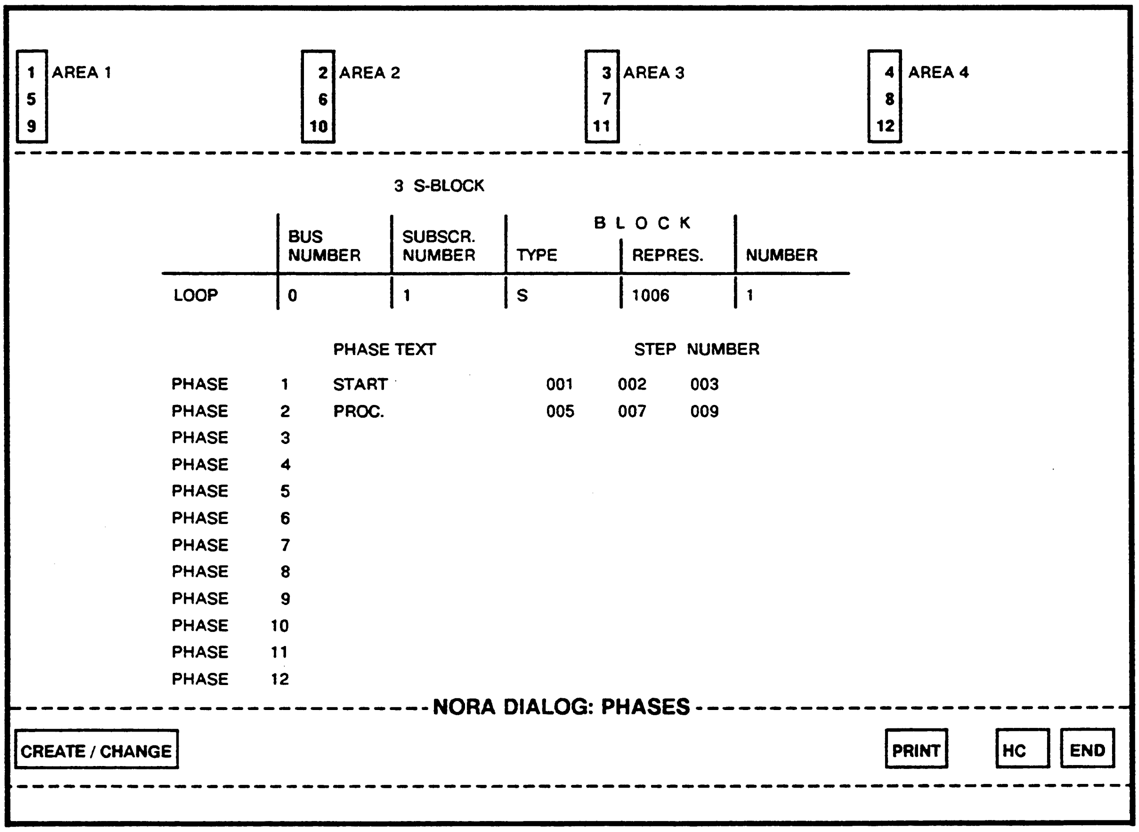
		PHASE TEXT	STEP NUMBER			
PHASE	1	START	001	002	003	
PHASE	2	PROC.			7	9
PHASE	3					
PHASE	4					
PHASE	5					
PHASE	6					
PHASE	7					
PHASE	8					
PHASE	9					
PHASE	10					
PHASE	11					
PHASE	12					

Fig. 4-21

The phase text lines are compressed and the step numbers checked when the form contents is interpreted. If an incorrect step number is detected, it is marked by a red "F", and the form content is not stored in the data (Fig. 4-24).

If configuration is faultless, the block is derived from the exemplary block and, together with the configured texts, stored in the data.

The whole phase text block of each step number is accepted in the data. The phase text line which contains the step number concerned is displayed in white.



3 S-BLOCK

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	BLOCK REPRES.	BLOCK NUMBER
LOOP	0	1	S	1006	1

		PHASE TEXT	STEP NUMBER		
PHASE	1	START	001	002	003
PHASE	2	PROC.	005	007	009
PHASE	3				
PHASE	4				
PHASE	5				
PHASE	6				
PHASE	7				
PHASE	8				
PHASE	9				
PHASE	10				
PHASE	11				
PHASE	12				

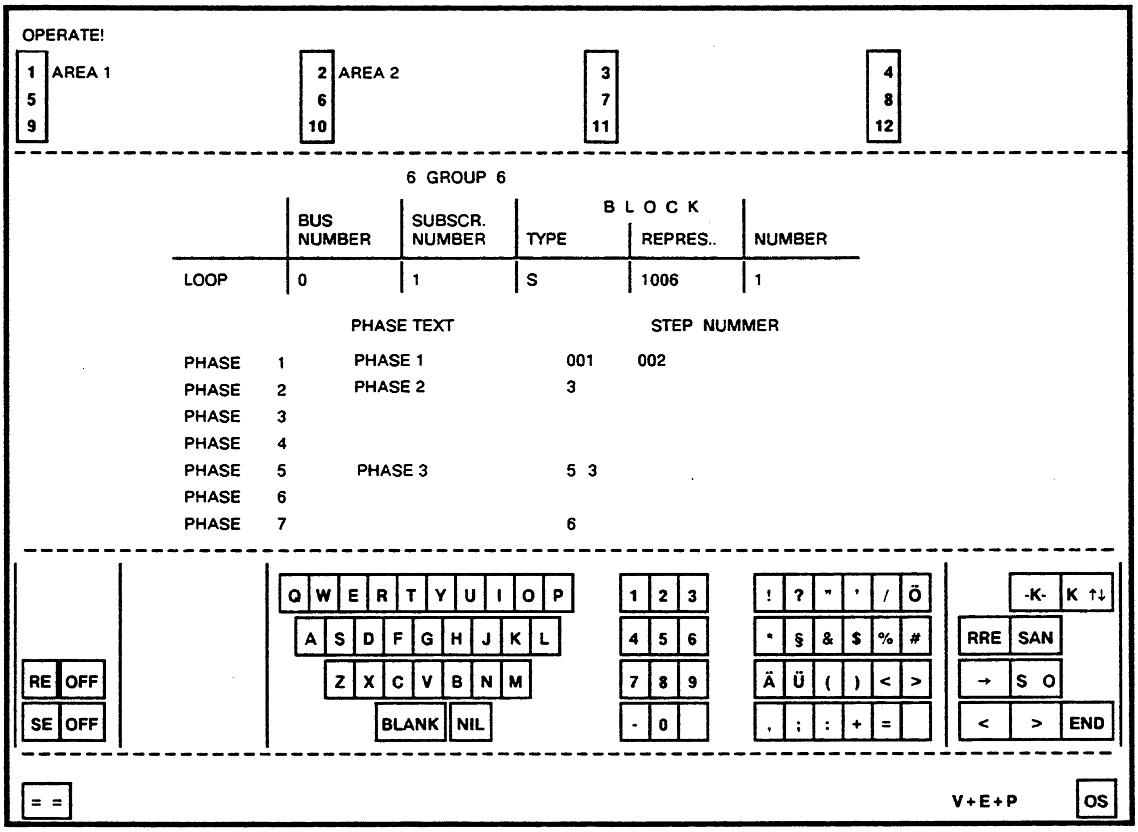
NORA DIALOG: PHASES

Fig. 4-22

The S block stored in the data can be modified, extended or deleted by repeated configuration. All phase text lines must be overwritten by blanks in order to delete the block.

The group form is re-displayed when the END key is selected. A newly configured block is entered in the loop (Fig. 4-31).

Fig. 4-26, which is used for configuring the texts related to conditions and commands, is displayed by selecting a configured step number using the light pen.



OPERATE!

6 GROUP 6

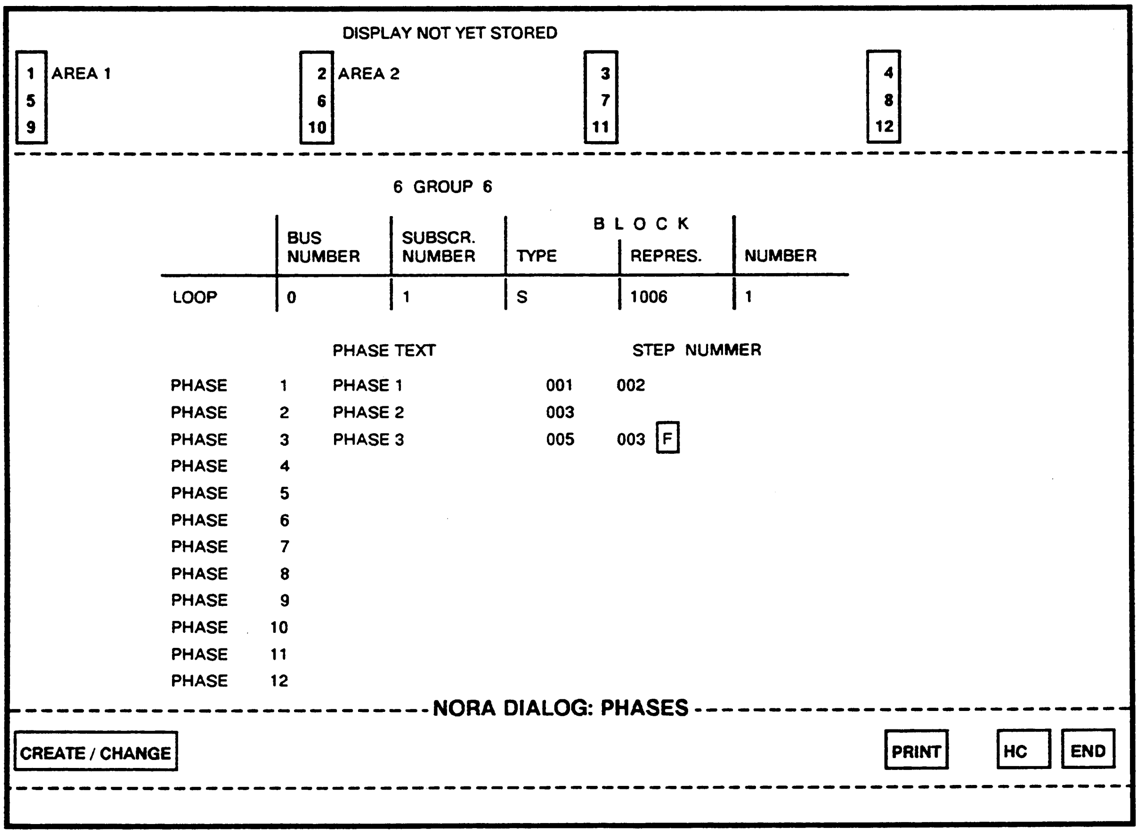
	BUS NUMBER	SUBSCR. NUMBER	BLOCK		NUMBER
			TYPE	REPRES..	
LOOP	0	1	S	1006	1

		PHASE TEXT	STEP NUMMER	
PHASE	1	PHASE 1	001	002
PHASE	2	PHASE 2	3	
PHASE	3			
PHASE	4			
PHASE	5	PHASE 3	5 3	
PHASE	6			
PHASE	7		6	

Fig. 4-23

Step number 3 is used twice in this form. The second "3" is marked by a red "F" when the form content is interpreted (Fig. 4-24).

Step number 6 has been entered into a line without phase text, and will be lost during interpretation (Fig. 4-24).



DISPLAY NOT YET STORED

6 GROUP 6

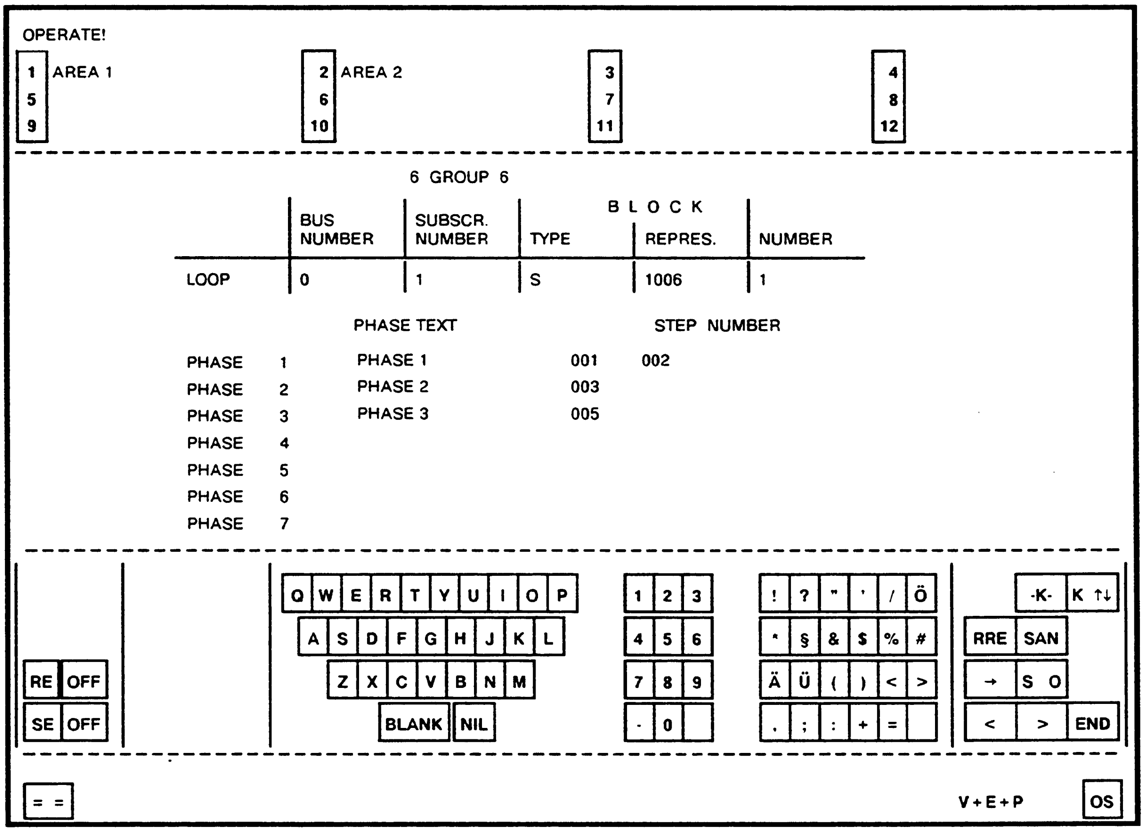
	BUS NUMBER	SUBSCR. NUMBER	BLOCK		
			TYPE	REPRES.	NUMBER
LOOP	0	1	S	1006	1

		PHASE TEXT	STEP NUMMER	
PHASE	1	PHASE 1	001	002
PHASE	2	PHASE 2	003	
PHASE	3	PHASE 3	005	003 F
PHASE	4			
PHASE	5			
PHASE	6			
PHASE	7			
PHASE	8			
PHASE	9			
PHASE	10			
PHASE	11			
PHASE	12			

Fig. 4-24

The phase text lines are compressed and the incorrect step number is marked by a red "F".

The configured texts have not been accepted in the data. Incorrect entries must be corrected by repeating the configuration (Fig. 4-25).



OPERATE!

6 GROUP 6

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	REPRES.	NUMBER
LOOP	0	1	S	1006	1

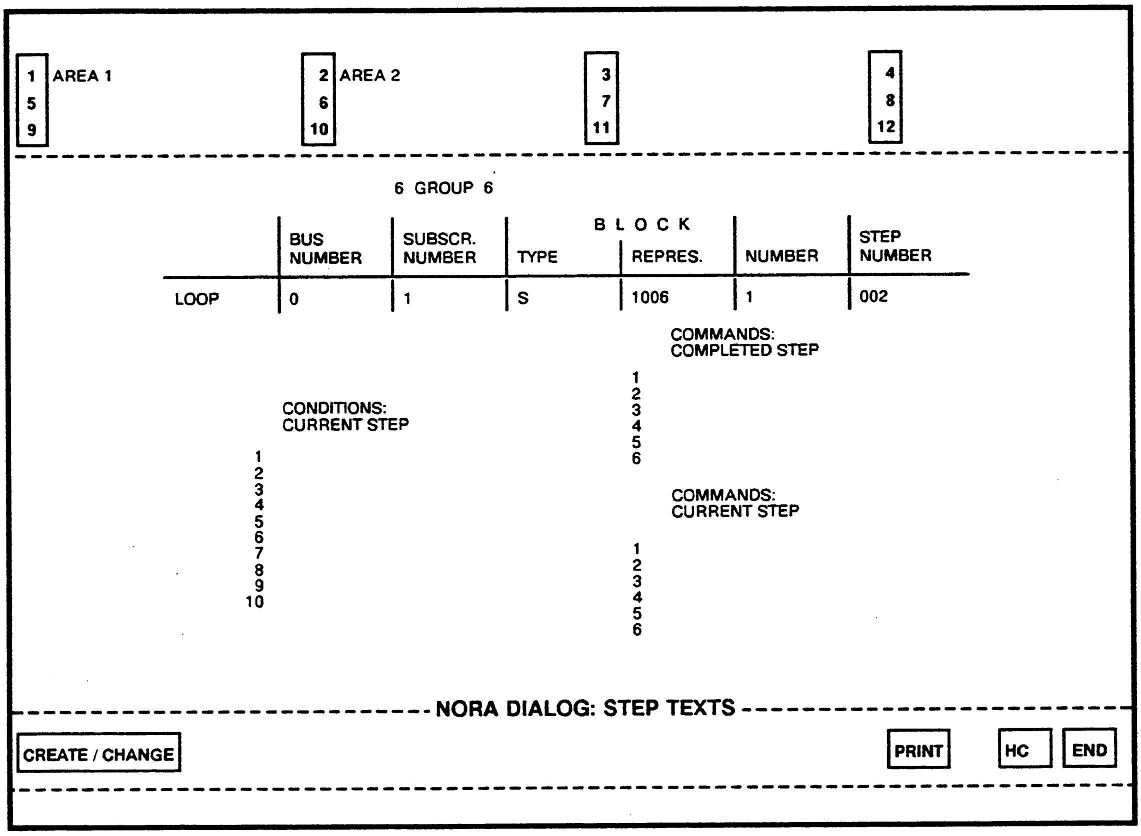
	PHASE TEXT	STEP NUMBER	
PHASE 1	PHASE 1	001	002
PHASE 2	PHASE 2	003	
PHASE 3	PHASE 3	005	
PHASE 4			
PHASE 5			
PHASE 6			
PHASE 7			

Fig. 4-25

The incorrect step number must be deleted or changed to a valid number. It is also possible to correct the first step number 3 (Fig. 2-24).

The correct data is accepted once configuration has been terminated (Figs. 4-21, 4-22).

Select a step number to enter the form provided for configuring step texts (Fig. 4-26).



	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	 REPRES.	 NUMBER	STEP NUMBER
LOOP	0	1	S	1006	1	002

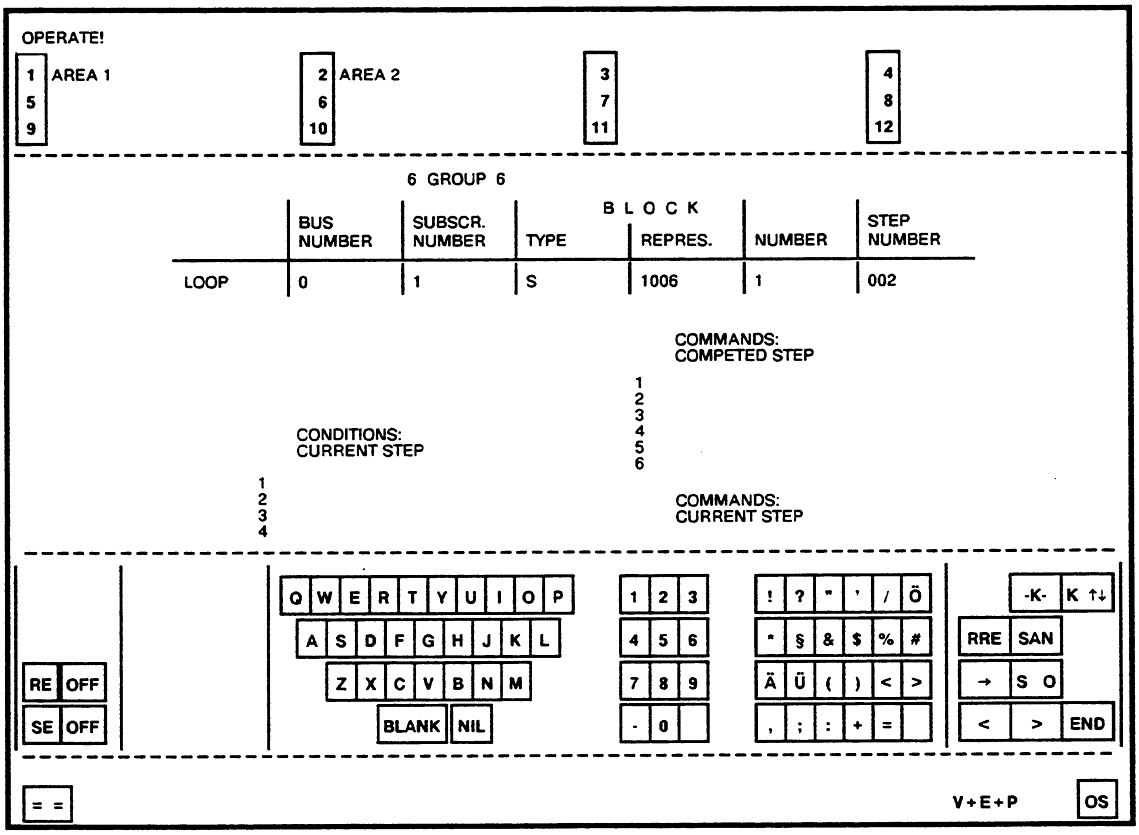
Fig. 4-26

Alphanumeric texts related to conditions and commands can be configured in this form.

The texts for the G or GK block are configured in the same manner. Existing texts related to the block concerned are displayed in the form (Fig. 4-30).

Selecting the CREATE/CHANGE key displays the DIAVID menu field (Fig. 4-27).

Selecting the END key re-displays Fig. 4-22 (Fig. 4-37 for G or GK block), even if no configuration parameters have been entered.



6 GROUP 6

			BLOCK			
	BUS NUMBER	SUBSCR. NUMBER	TYPE	REPRES.	NUMBER	STEP NUMBER
LOOP	0	1	S	1006	1	002

COMMANDS:
COMPETED STEP
1
2
3
4
5
6

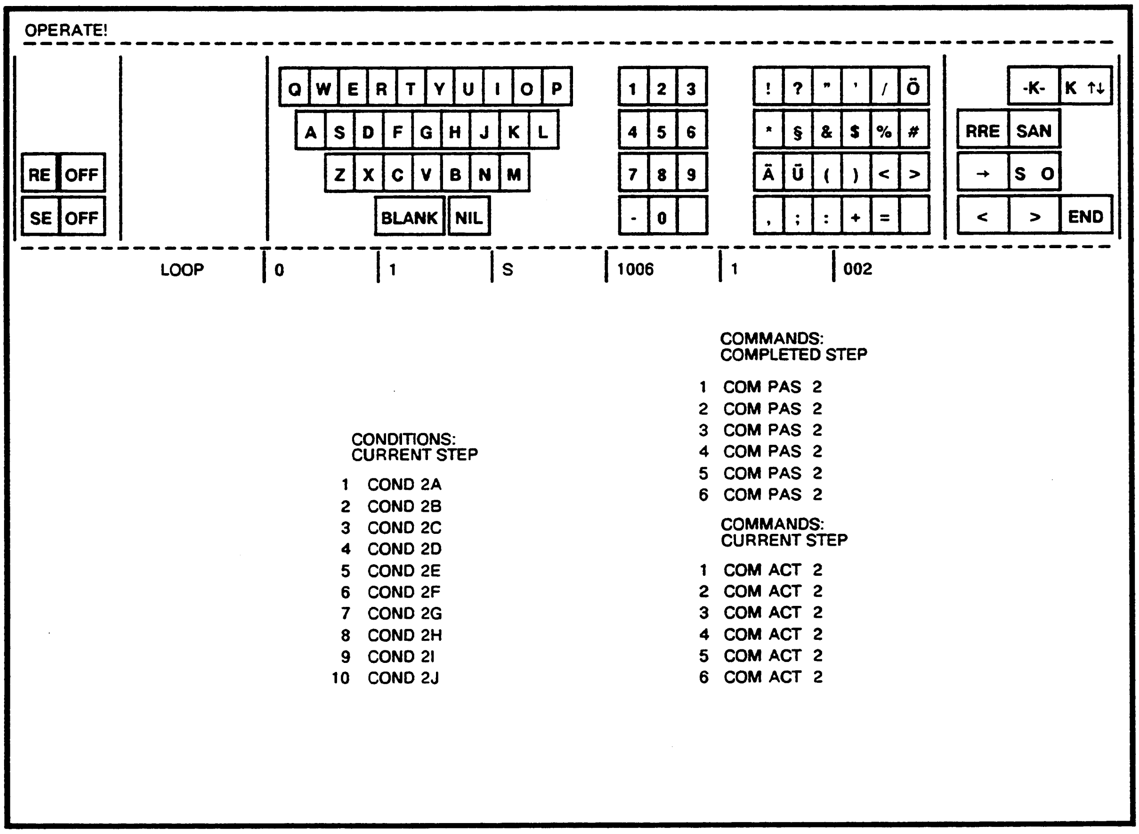
CONDITIONS:
CURRENT STEP
1
2
3
4

COMMANDS:
CURRENT STEP

Fig. 4-27

Using the menu field, the fields for conditions and the commands "current step" and "set step" can be filled with alphanumeric texts.

Selecting the "K ↑↓ " key (move menu field) enables configuration in the lower part of the screen (Fig. 4-28).



LOOP | 0 | 1 | S | 1006 | 1 | 002

CONDITIONS:
CURRENT STEP

1 COND 2A
2 COND 2B
3 COND 2C
4 COND 2D
5 COND 2E
6 COND 2F
7 COND 2G
8 COND 2H
9 COND 2I
10 COND 2J

COMMANDS:
COMPLETED STEP

1 COM PAS 2
2 COM PAS 2
3 COM PAS 2
4 COM PAS 2
5 COM PAS 2
6 COM PAS 2

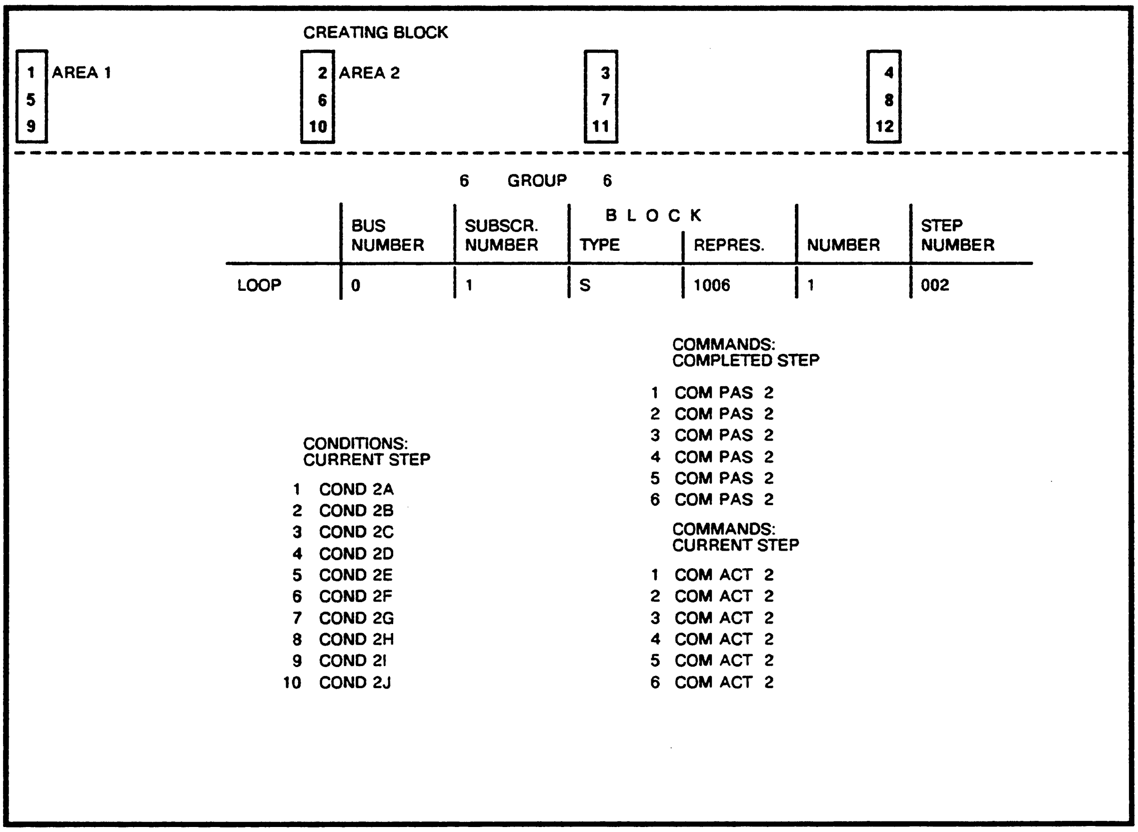
COMMANDS:
CURRENT STEP

1 COM ACT 2
2 COM ACT 2
3 COM ACT 2
4 COM ACT 2
5 COM ACT 2
6 COM ACT 2

Fig. 4-28

All fields have been configured in this image.

Selecting the END key in the DIAVID menu field terminates configuration and accepts the form content into the data (Fig. 4-29).

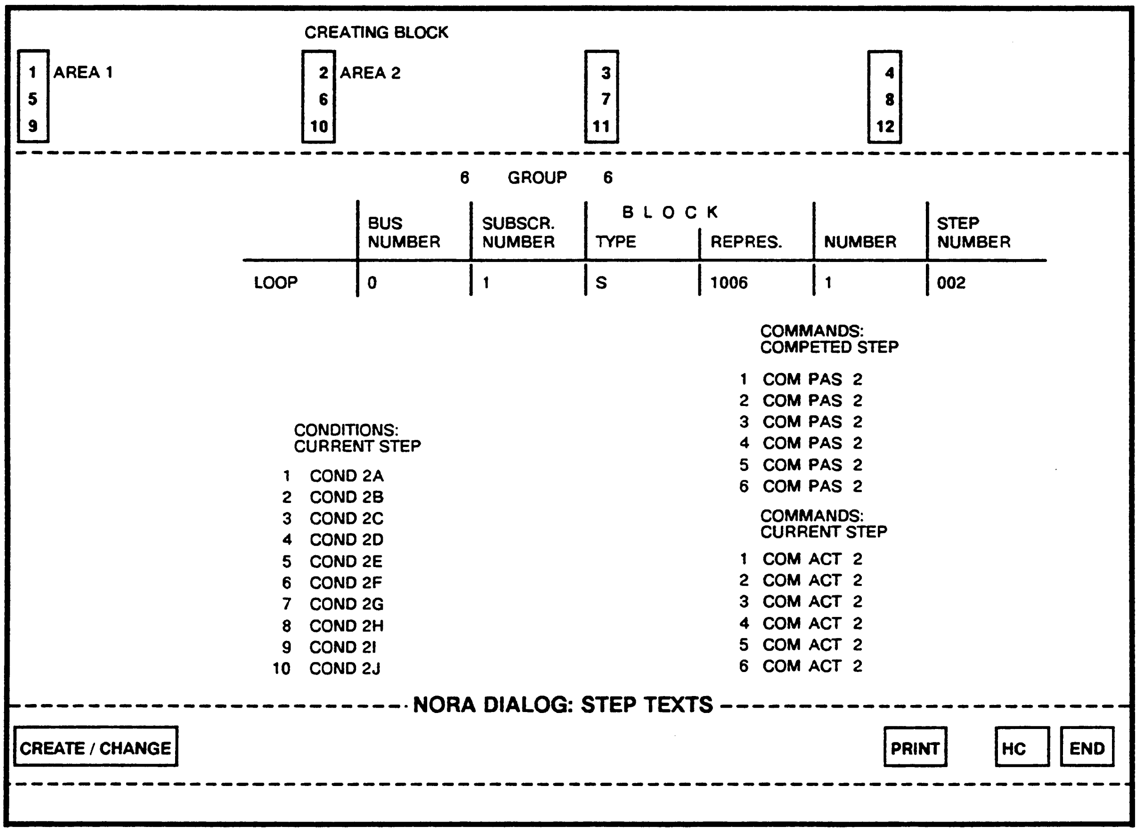


```
                              CREATING BLOCK
 1  AREA 1                    2  AREA 2                3                    4
 5                            6                        7                    8
 9                           10                       11                   12
-------------------------------------------------------------------------------
                                        6    GROUP    6

                        | BUS      | SUBSCR.  |    B L O C K        |          | STEP
                        | NUMBER   | NUMBER   | TYPE    | REPRES.   | NUMBER   | NUMBER
                 ---------------------------------------------------------------------
                 LOOP   | 0        | 1        | S       | 1006      | 1        | 002

                                                       COMMANDS:
                                                       COMPLETED STEP
                                                     1 COM PAS 2
                                                     2 COM PAS 2
                        CONDITIONS:                  3 COM PAS 2
                        CURRENT STEP                 4 COM PAS 2
                      1 COND 2A                      5 COM PAS 2
                      2 COND 2B                      6 COM PAS 2
                      3 COND 2C                        COMMANDS:
                      4 COND 2D                        CURRENT STEP
                      5 COND 2E                      1 COM ACT 2
                      6 COND 2F                      2 COM ACT 2
                      7 COND 2G                      3 COM ACT 2
                      8 COND 2H                      4 COM ACT 2
                      9 COND 2I                      5 COM ACT 2
                     10 COND 2J                      6 COM ACT 2
```

Fig. 4-29

The configured texts are accepted into the data related to the S, G or GK block.

The system also stores "empty" texts in the data if this form is used for the first-time configuration of a block. The configured texts are briefly removed for this purpose.



CREATING BLOCK

6 GROUP 6

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	BLOCK REPRES.	NUMBER	STEP NUMBER
LOOP	0	1	S	1006	1	002

COMMANDS:
COMPETED STEP

1 COM PAS 2
2 COM PAS 2
3 COM PAS 2
4 COM PAS 2
5 COM PAS 2
6 COM PAS 2

CONDITIONS:
CURRENT STEP

1 COND 2A
2 COND 2B
3 COND 2C
4 COND 2D
5 COND 2E
6 COND 2F
7 COND 2G
8 COND 2H
9 COND 2I
10 COND 2J

COMMANDS:
CURRENT STEP

1 COM ACT 2
2 COM ACT 2
3 COM ACT 2
4 COM ACT 2
5 COM ACT 2
6 COM ACT 2

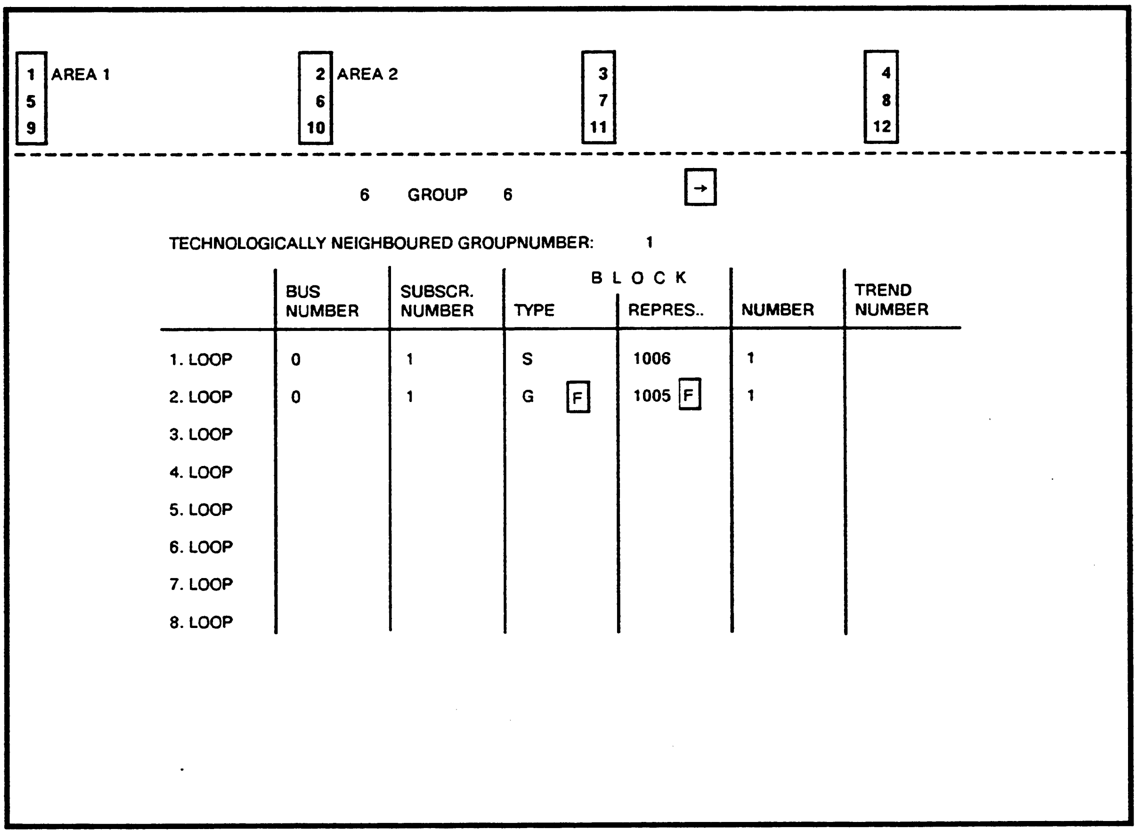
NORA DIALOG: STEP TEXTS

Fig. 4-30

Fig. 4-22 or Fig. 4-37 for the G or GK block is re-displayed when the END key is selected.

Re-configuration enables the displayed texts to be supplemented or modified.

Deleting the step number clears the corresponding text (Fig. 4-22; Fig. 4-37 for G or GK block).



1 AREA 1 2 AREA 2 3 4
5 6 7 8
9 10 11 12

6 GROUP 6 →

TECHNOLOGICALLY NEIGHBOURED GROUPNUMBER: 1

	BUS NUMBER	SUBSCR. NUMBER	BLOCK			TREND NUMBER
			TYPE	REPRES..	NUMBER	
1. LOOP	0	1	S	1006	1	
2. LOOP	0	1	G F	1005 F	1	
3. LOOP						
4. LOOP						
5. LOOP						
6. LOOP						
7. LOOP						
8. LOOP						

Fig. 4-31

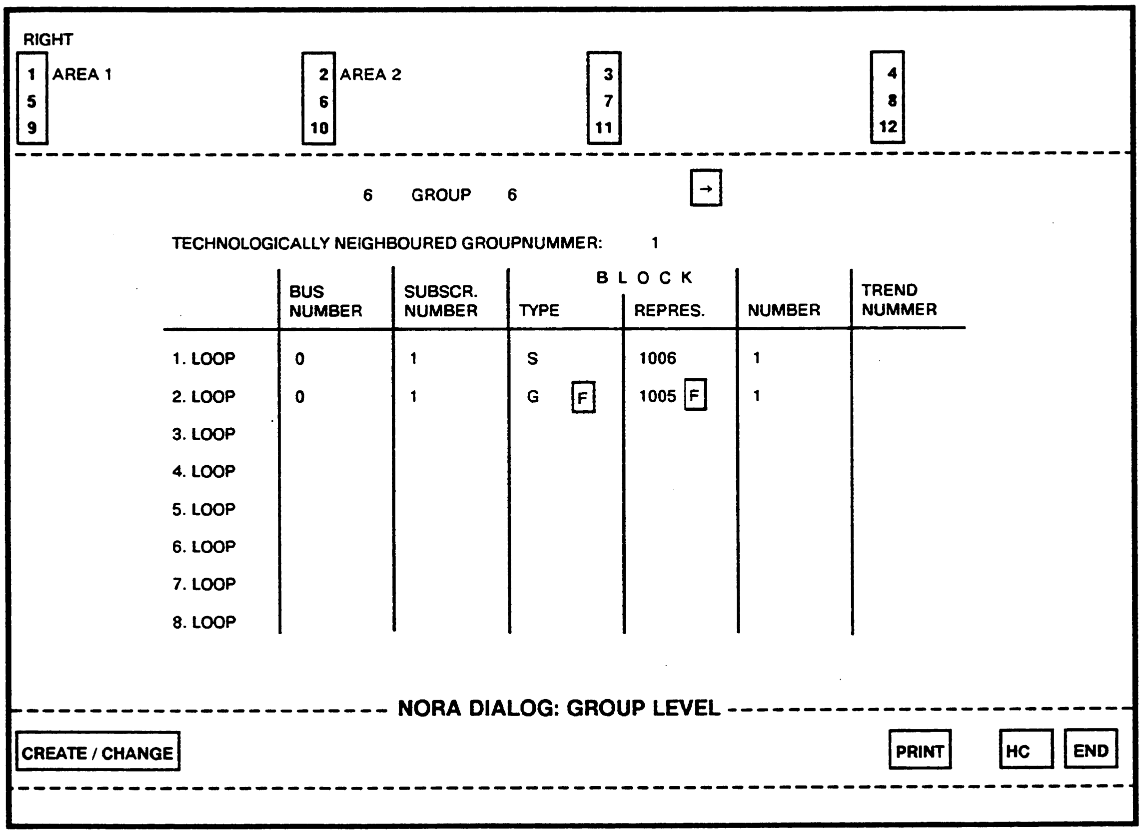
The block is entered into the loop after configuration has been terminated. The red "F" marks disappear since the block now exists in the data (Fig. 4-32).

4.2.5.2 G or GK Block

GK blocks are configured in the same manner as G blocks. Configuring a process display with the start conditions of the GK block is performed in FRANZ dialog (see Chapter 4.2.4.1).

Configuration of a G block is described on the following pages.

Note: Configuration of G and GK blocks must start with the ON sequence.



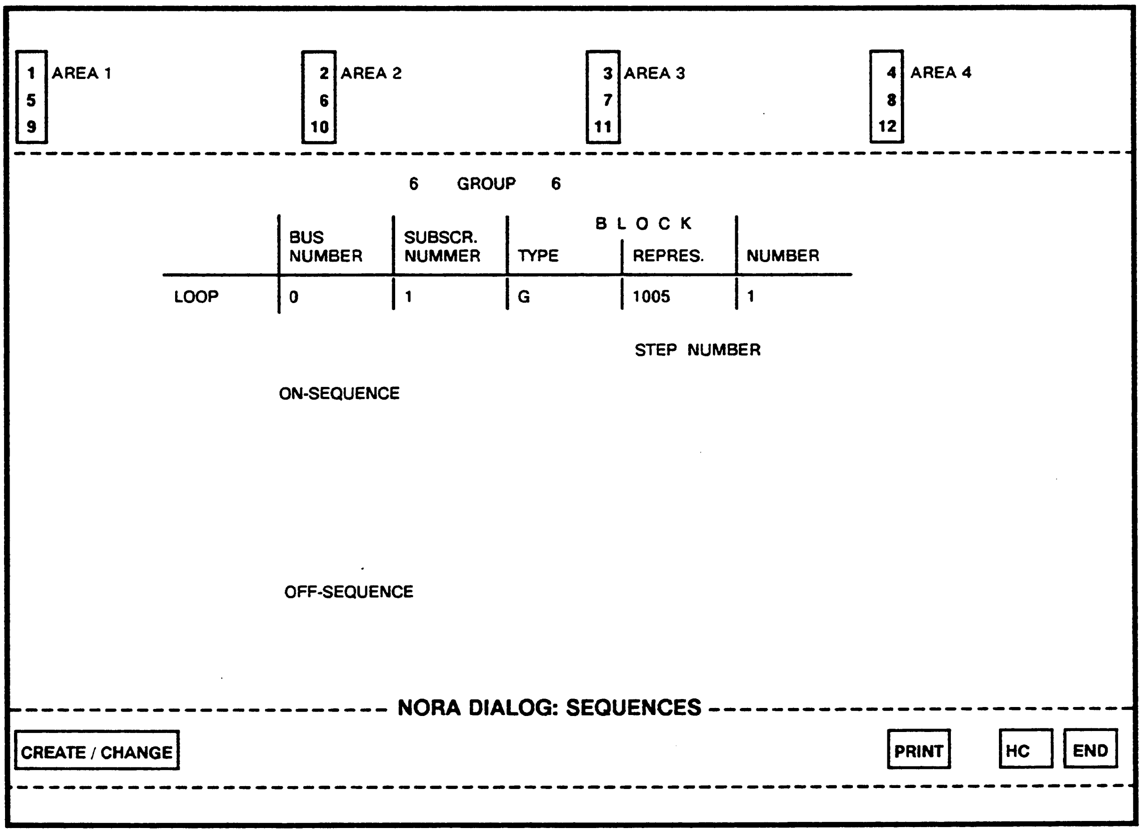
6 GROUP 6

TECHNOLOGICALLY NEIGHBOURED GROUPNUMMER: 1

			BLOCK			
	BUS NUMBER	SUBSCR. NUMBER	TYPE	REPRES.	NUMBER	TREND NUMMER
1. LOOP	0	1	S	1006	1	
2. LOOP	0	1	G F	1005 F	1	
3. LOOP						
4. LOOP						
5. LOOP						
6. LOOP						
7. LOOP						
8. LOOP						

Fig. 4-32

The type name "G" must be parametrized for configuring the G block. Fig. 4-33 is displayed.



6 GROUP 6

	BUS NUMBER	SUBSCR. NUMMER	BLOCK		
			TYPE	REPRES.	NUMBER
LOOP	0	1	G	1005	1

STEP NUMBER

ON-SEQUENCE

OFF-SEQUENCE

NORA DIALOG: SEQUENCES

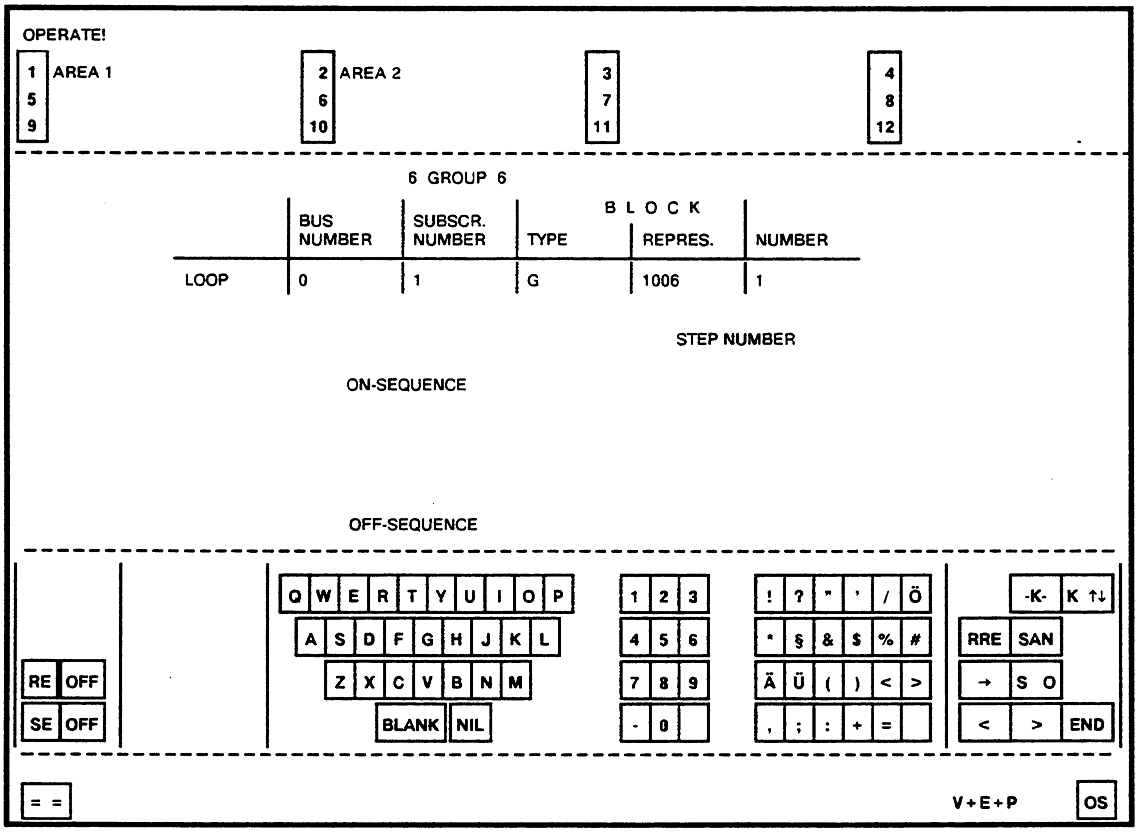
Fig. 4-33

A G block is configured in this form.

Selecting the CREATE/CHANGE key displays the DIAVID menu field (Fig. 4-34).

The step numbers are displayed in the form if the block has already been configured (cf. Fig. 4-37).

Selecting the END key without previous configuration re-displays Fig. 4-32.



OPERATE!

AREA 1

AREA 2

6 GROUP 6

			BLOCK		
	BUS NUMBER	SUBSCR. NUMBER	TYPE	REPRES.	NUMBER
LOOP	0	1	G	1006	1

STEP NUMBER

ON-SEQUENCE

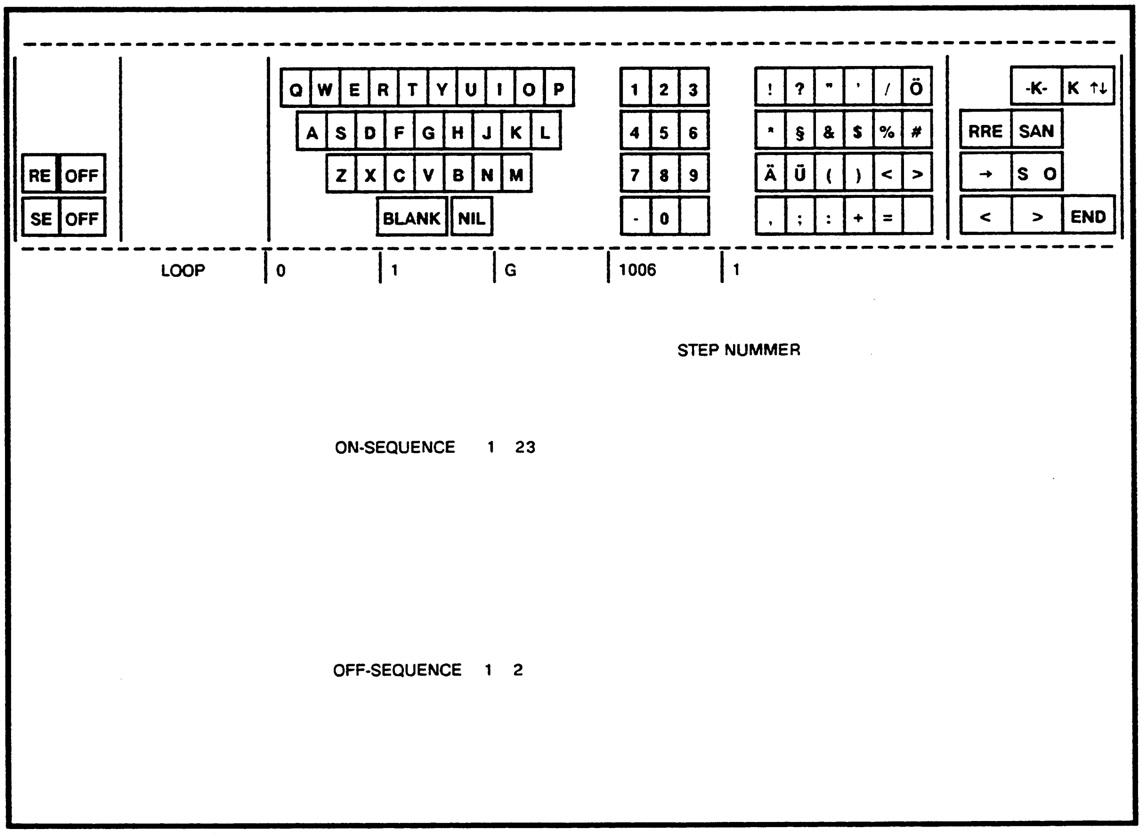
OFF-SEQUENCE

Fig. 4-34

This form is solely used for entering step numbers.

Each number between 1 and 999 may only be used once in a sequence as a step number.

Selecting the "K ↑↓ " key enables configuration in the lower part of the screen (Fig. 4-35).



LOOP | 0 | 1 | G | 1006 | 1

STEP NUMMER

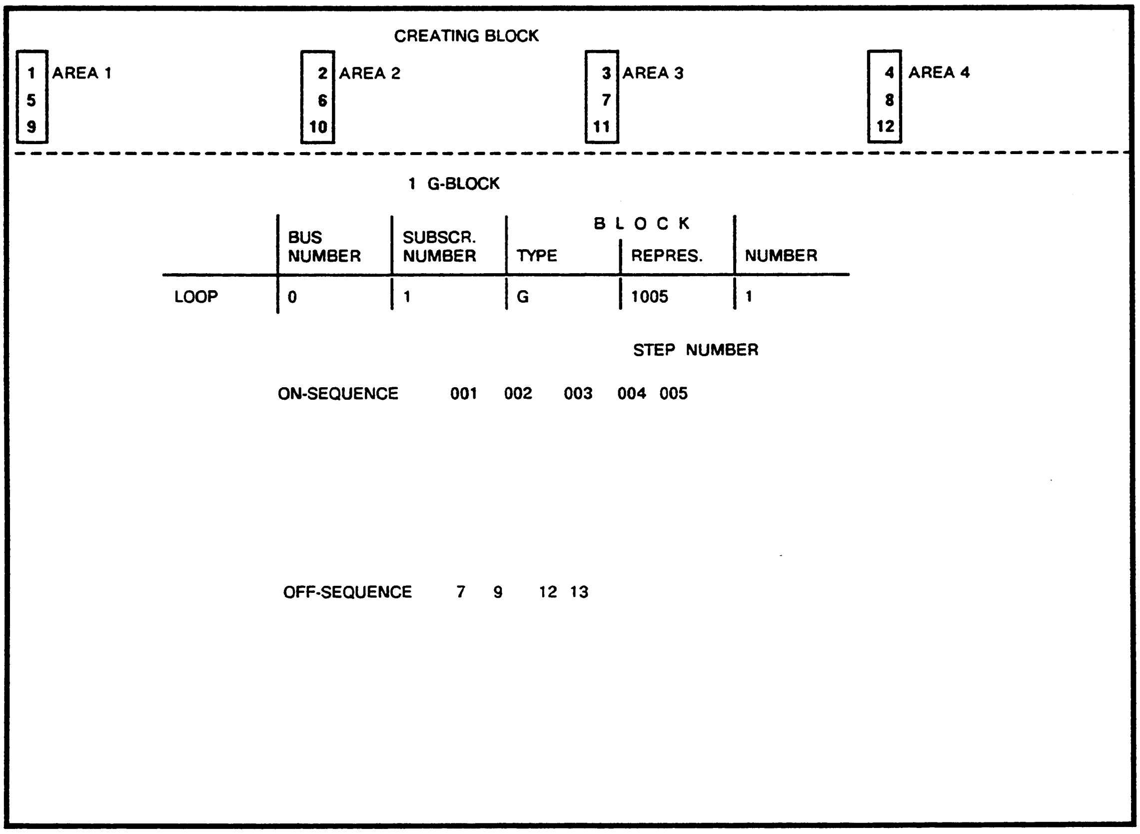
ON-SEQUENCE 1 23

OFF-SEQUENCE 1 2

Fig. 4-35

The step numbers for the ON and OFF sequence are entered in this form.

Selecting the END key in the DIAVID menu field terminates configuration. The entered step numbers are interpreted (Fig. 4-36).



CREATING BLOCK

1 5 9 AREA 1	2 6 10 AREA 2	3 7 11 AREA 3	4 8 12 AREA 4

1 G-BLOCK

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	REPRES.	NUMBER
LOOP	0	1	G	1005	1

STEP NUMBER

ON-SEQUENCE 001 002 003 004 005

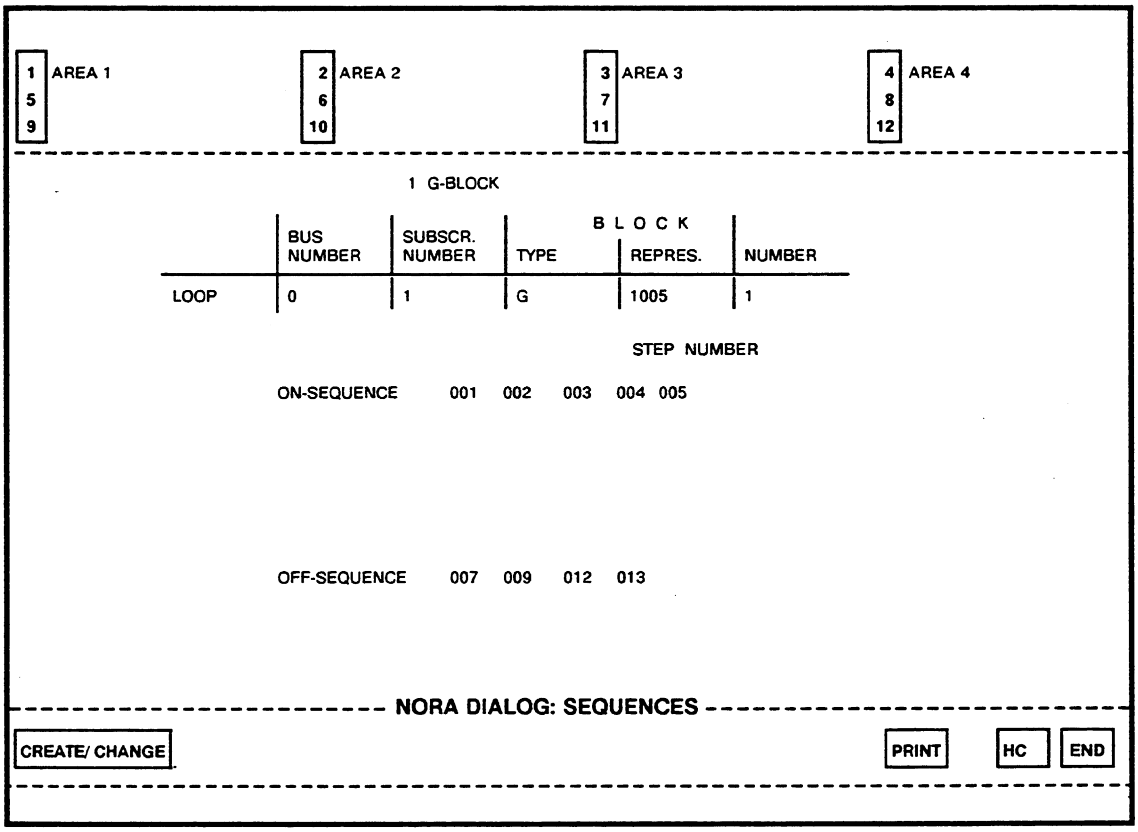
OFF-SEQUENCE 7 9 12 13

Fig. 4-36

The step numbers of the ON and OFF sequence are checked.

Incorrect step numbers are marked by a red "F". The data remains unchanged.

If configuration is faultless, the block is derived from the exemplary block and stored in the data.



1 G-BLOCK

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	REPRES.	NUMBER
LOOP	0	1	G	1005	1

STEP NUMBER

ON-SEQUENCE 001 002 003 004 005

OFF-SEQUENCE 007 009 012 013

NORA DIALOG: SEQUENCES

Fig. 4-37

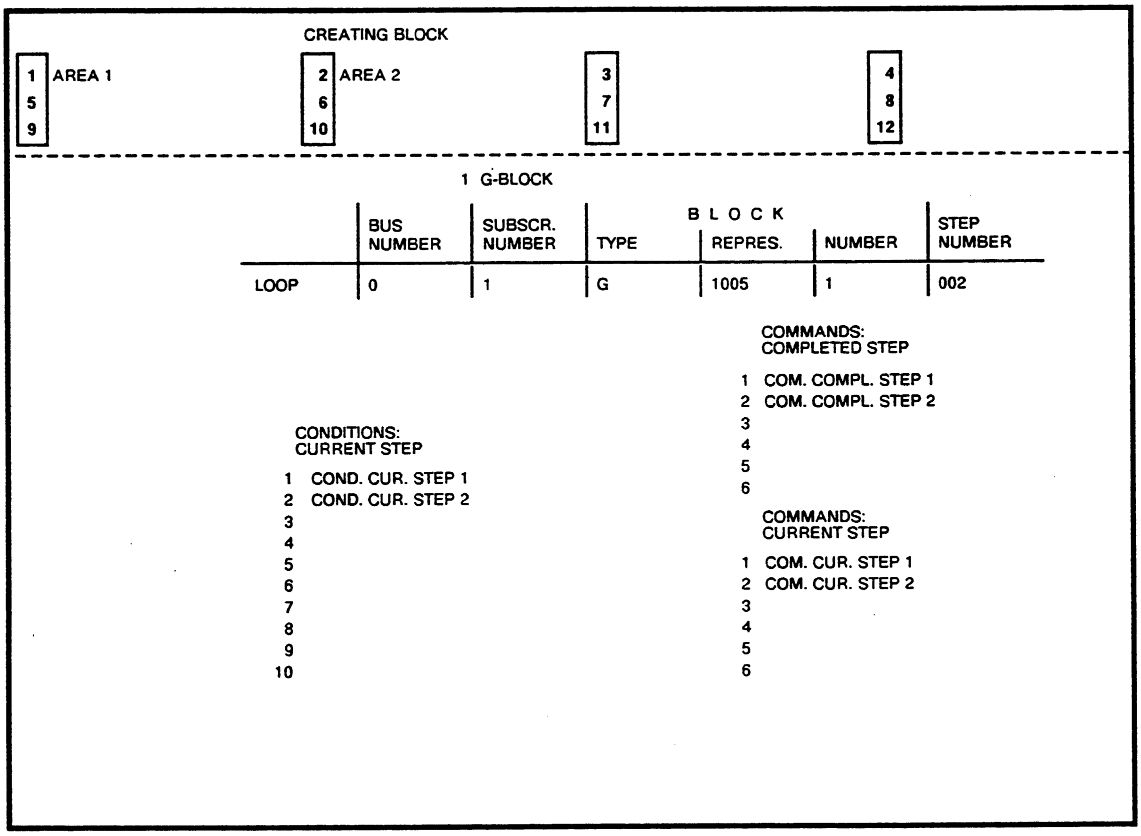
Re-configuration enables step numbers to be deleted or additional numbers to be inserted.

The block is removed from the data once all step numbers of the ON and OFF sequence have been deleted.

Configured step numbers will be lost if the texts related to conditions and commands have not been completely configured before the END key is selected and the form exited.

Fig. 4-38 is displayed by selecting the individual step numbers using the light pen.

The group form is re-displayed when the END key is selected after all texts have been configured (Fig. 4-39).



CREATING BLOCK

1 AREA 1	2 AREA 2	3	4
5	6	7	8
9	10	11	12

1 G-BLOCK

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	REPRES.	NUMBER	STEP NUMBER
LOOP	0	1	G	1005	1	002

COMMANDS:
COMPLETED STEP

1 COM. COMPL. STEP 1
2 COM. COMPL. STEP 2
3
4
5
6

CONDITIONS:
CURRENT STEP

1 COND. CUR. STEP 1
2 COND. CUR. STEP 2
3
4
5
6
7
8
9
10

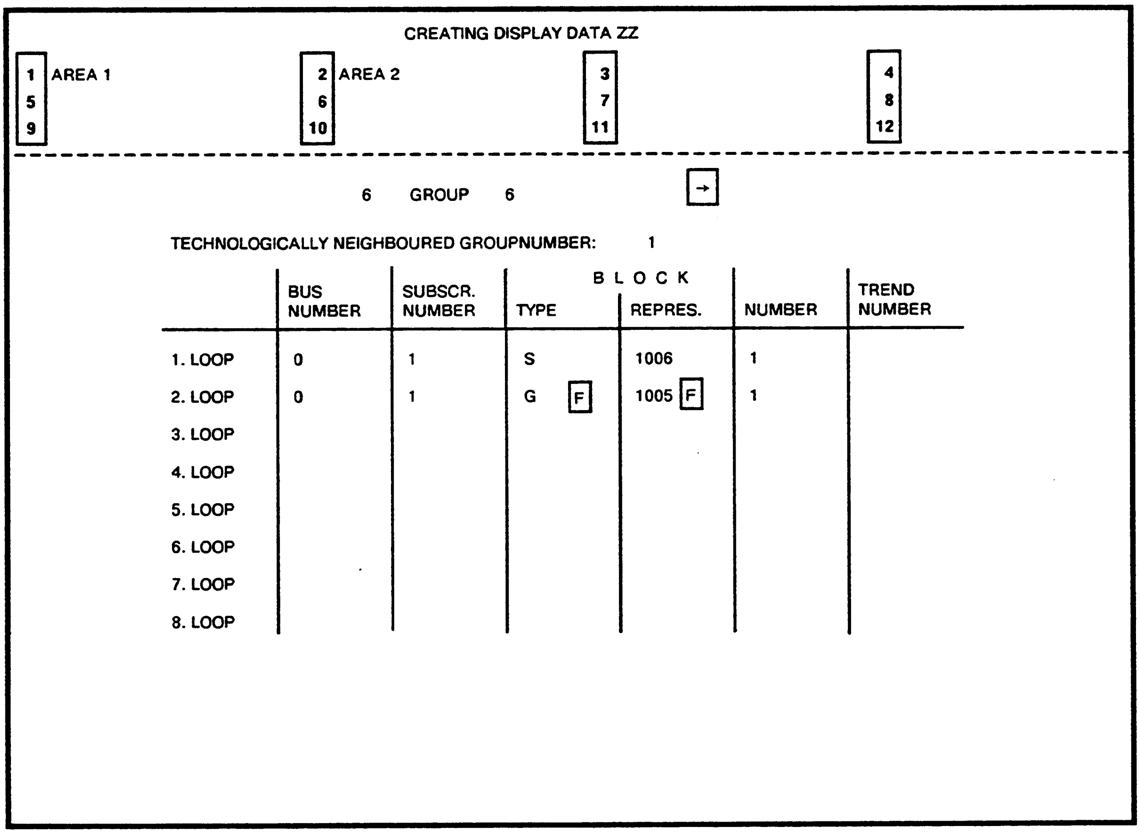
COMMANDS:
CURRENT STEP

1 COM. CUR. STEP 1
2 COM. CUR. STEP 2
3
4
5
6

Fig. 4-38

This form is used for configuring step-related condition and command texts.

Configuration corresponds to the procedure for the S block (cf. Fig. 4-26).



CREATING DISPLAY DATA ZZ

1 AREA 1
5
9

2 AREA 2
6
10

3
7
11

4
8
12

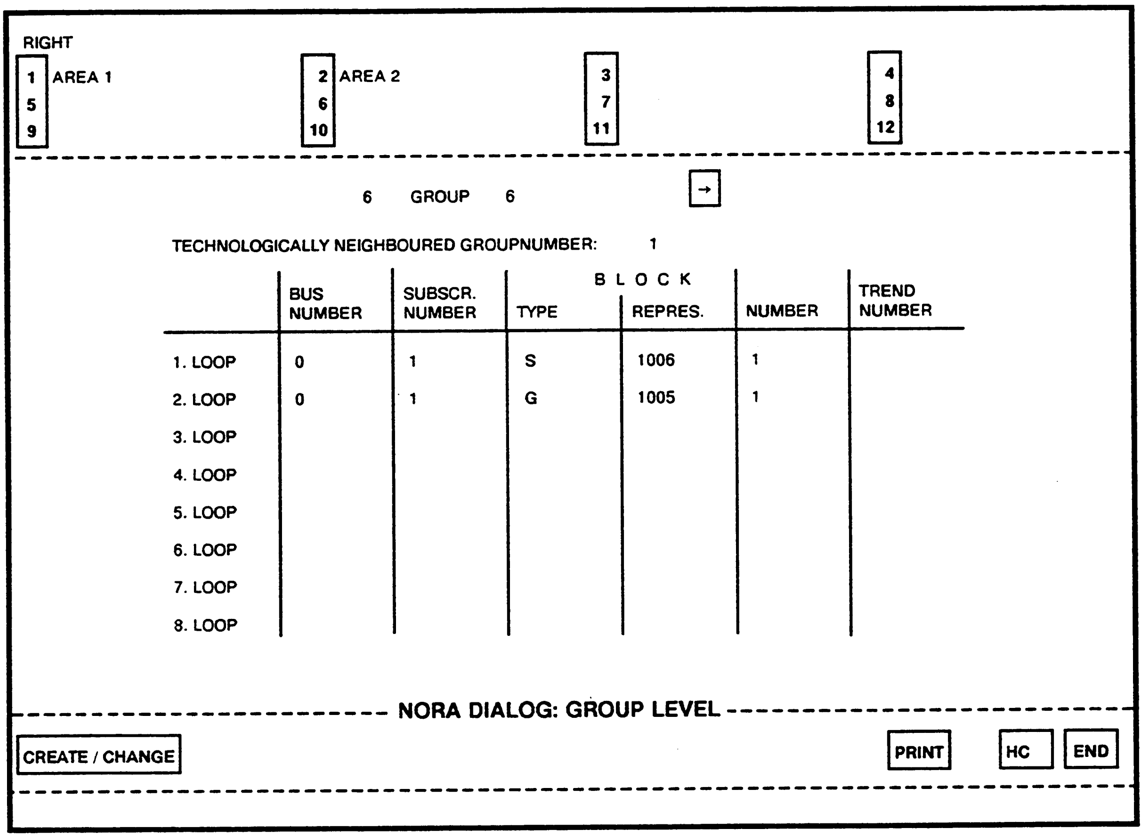
6 GROUP 6 →

TECHNOLOGICALLY NEIGHBOURED GROUPNUMBER: 1

	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	BLOCK REPRES.	BLOCK NUMBER	TREND NUMBER
1. LOOP	0	1	S	1006	1	
2. LOOP	0	1	G F	1005 F	1	
3. LOOP						
4. LOOP						
5. LOOP						
6. LOOP						
7. LOOP						
8. LOOP						

Fig. 4-39

The G block is entered into the loop after configuration has been terminated. The red "F" marks disappear since the block now exists in the data (Fig. 4-40).



RIGHT

1 AREA 1
5
9

2 AREA 2
6
10

3
7
11

4
8
12

6 GROUP 6 →

TECHNOLOGICALLY NEIGHBOURED GROUPNUMBER: 1

	BUS NUMBER	SUBSCR. NUMBER	BLOCK			TREND NUMBER
			TYPE	REPRES.	NUMBER	
1. LOOP	0	1	S	1006	1	
2. LOOP	0	1	G	1005	1	
3. LOOP						
4. LOOP						
5. LOOP						
6. LOOP						
7. LOOP						
8. LOOP						

NORA DIALOG: GROUP LEVEL

Fig. 4-40

The system stores all configured blocks in the data.

Selecting the END key displays the area form. The configured loops are marked in this form (Fig. 4-41).

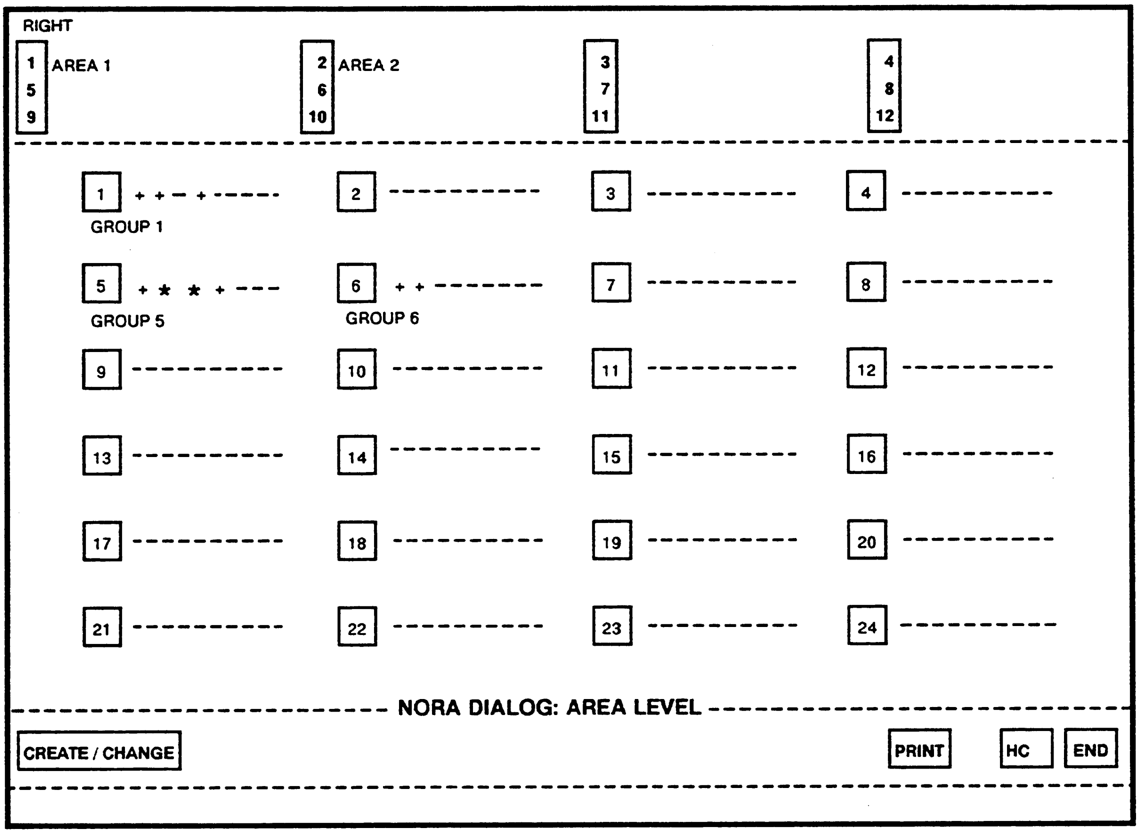


Fig. 4-41 Status displays for three configured groups in area 1

4.2.6 Creating User-Related NORAs

"Creating user-related NORAs" means both supplementing existing NORAs by designing additional representations of a standard function block as well as creating new NORAs for TML blocks.

Separate NORAs which are to be created for the NORA function package must be designed as control fields, using the FRANZ function package (cf. Chapter 5.7.7). Hierarchy level (area, group, loop), image number (1 to 49) and the block type to be accessed by the control field in the AS must be specified in the design menu field "FRANZ DIALOG: NORA CONTROL FIELD". The type "TML" must always be used for all TML blocks.

Up to 45 different representations may be designed for each NORA. If, for example, two representations of the same block type already exist in the basic data, representation number 3 should be selected.

The function "CHARACTER OF BLOCK" is only used as a documentation aid for characterizing the response of a function block inside the automation system. If, for example, a NORA for a TML block is to be created, and this block responds in similar fashion to a closed-loop controller (R block), a character specification "R" should be entered. This entry is, however, optional.

The function "TML/NOT OP. BLOCK" can be used for designing a NORA which accesses a "programmed" block (TML block) or a non-operator-accessible block rather than a standard block in the AS.

Creating user-specific NORA is quite a time-consuming task, since it requires the design of all the necessary variable fields and associated key sets, in addition to the NORAs for the individual hierarchy levels (area, group, loop). The control field variables are:

- area display:	1 symbol;
- group display:	10 columns * 23 lines;
- loop display:	79 columns * 23 lines.

Only one segment (static image elements) can be inserted into a control field. The segment dimensions should correspond to the dimensions of the control field.

The control field logs of existing NORAs may be used as an aid when creating user-specific NORAs.

4.3 NORA Data Records

4.3.1 Summary of the Standardized Displays

Representation of the operator-accessible standardized display parameters which can be displayed is defined for each individual block, and contained in the pre-configured basic data records (control fields). The individual NORAs are described by tables; reference to the groups and loop displays is made by numbers:

- Column "No."
  The number identifies the image element in the group and/or loop display which is described in the other columns.

- Column "Description"
  The description explains the process-related meaning of the corresponding image element.

- Column "Source"
  The source specifies the variable from which the representation(s) of the corresponding image element has (have) been derived.

- Column "Representation"
  Representation includes format (size in lines and columns) and colour (background and foreground colour) of the corresponding image element.

- Column "Operator input"
  Operator input to an operator-accessible variable is initiated by the selected key in the group or loop display and executed using the special NORA key set specified by the key set number. A complete description of the NORA key sets (e.g. the assignment between keys and parameters) can be found in the list of the NORA key sets.

- Column "Comment"
  The comments contain additional information regarding the individual image elements (e.g. the bar display limits or the status display number). A complete description of the status displays (e.g. the assignment between the individual alternatives and the source bit combinations) can be found in the list of status displays.

Table: NORA summary

Block type	Represen-tation	Standardized display function	Page
A	1	Output block as valve	4 - 51
A	2	Output block as switch	4 - 52
A	3	Output block as message field	4 - 53
AKS	1		4 - 56
AKS	2		4 - 57
B	1	Operator communication block with W and X display	4 - 59
B	2	Operator communication block with Xw display	4 - 61
B	3	Operator communication block as setpoint setter	4 - 63
C	1	Changeover block with preselector 1-out-of-2	4 - 66
C	2	Changeover block with preselector 1-out-of-3 or 2-out-of-3	4 - 67
C	3	Changeover block as manual-automatic selector	4 - 68
DZ	1	Proportioning counter as up counter	4 - 70
EG	1	Individual open-loop controller as switch	4 - 74
	2	Individual open-loop controller as valve	4 - 75
EK	1, (2)	Individual open-loop controller for valves without (with) position indicator	4 - 76
EM	1	Individual open-loop controller for motors without (with) motor current indicator	4 - 81
EU	1, (2)		4 - 84
EV	1	Individual open-loop controller for valves without position indicator	4 - 89
F	1	Window block for monitoring up to 5 measuring values	4 - 92
FN	1	Window block for monitoring up to 5 measuring values; including limit value monitoring of the first 3 values as WARNING	4 - 98
	2	Window block for monitoring up to 5 measuring values; including limit value monitoring of the first 3 values as FAULT	4 - 102
	3	Window block for monitoring up to 5 measuring values; including limit value monitoring of the first 3 values as ALARM	4 - 106
G . G	1001 . 1999	Subgroup control block for sequence cascades in power engineering (power plants)	4 - 110

Block type	Represen-tation	Standardized display function	Page
GK	1001 : 1999	Subgroup control block for sequence cascades. Co-ordination and monitoring of sequence control during operation and shutdown.	4 - 114
M	1	Measured value monitoring block	4 - 118
MKS	1	Signal linking transmitter block	4 - 123 4 - 125
MSB	1	Operator communication block for motors; with motor status indicator	4 - 126
	2	Operator communication block for valves; with valve status indicator	4 - 128
	3	Operator communication block for actuators; with STOP key, status indicator and additional position indicator	4 - 130
R	1	Closed-loop control block with W and X display	4 - 132
RE	1	Single-channel closed-loop control block with W and X display	4 - 136
RI		Single-channel closed-loop control block with setpoint, actual value and control increment display	4 - 139
RK	1	Single-channel closed-loop control block with W + X display as WARNING	4 - 144
	2	Single-channel closed-loop control block with W + X display as FAULT	4 - 147
	3	Single-channel closed-loop control block with W + X display as ALARM	4 - 150
RN	1	Closed-loop control block with W/WN + Y/YN display	4 - 153
RSKB	1, (2)	Closed-loop control block with W and X display with (without) control parameters in the loop display	4 - 157
S S	1001 . 1999	Operator communication block for sequence cascades in process engineering	4 - 166
T	-	Trend block	4 - 170
TVB	1	Operator communication and monitoring block of a partial controller configured on the binary arithmetic module 6DS1717	4 - 182
	2, (3)	Operator communication and monitoring block of a 1-out-of-2 preselector control with 1 (2) pushbuttons configured on the binary arithmetic module 6DS1717	4 - 184
	4	Operator communication and monitoring block of a 1-out-of-3 preselector control with 3 pushbuttons configured on the binary arithmetic module 6DS1717	4 - 186
V	1	Ratio block	4 - 189

4.3.2 Individual Descriptions of the Standardized Displays

- **Standardized displays for the A block**

Application:

- Representation 1 of the A block is used for controlling a valve (open, close) and for indicating the current valve state (open, opening, closed, closing, intermediate position).
- Representation 2 of the A block is used for controlling a switch (switch on, switch off) and for indicating the current switch state (on, off).
- Representation 3 of the A block is used as a message field for displaying up to four programmable message texts.

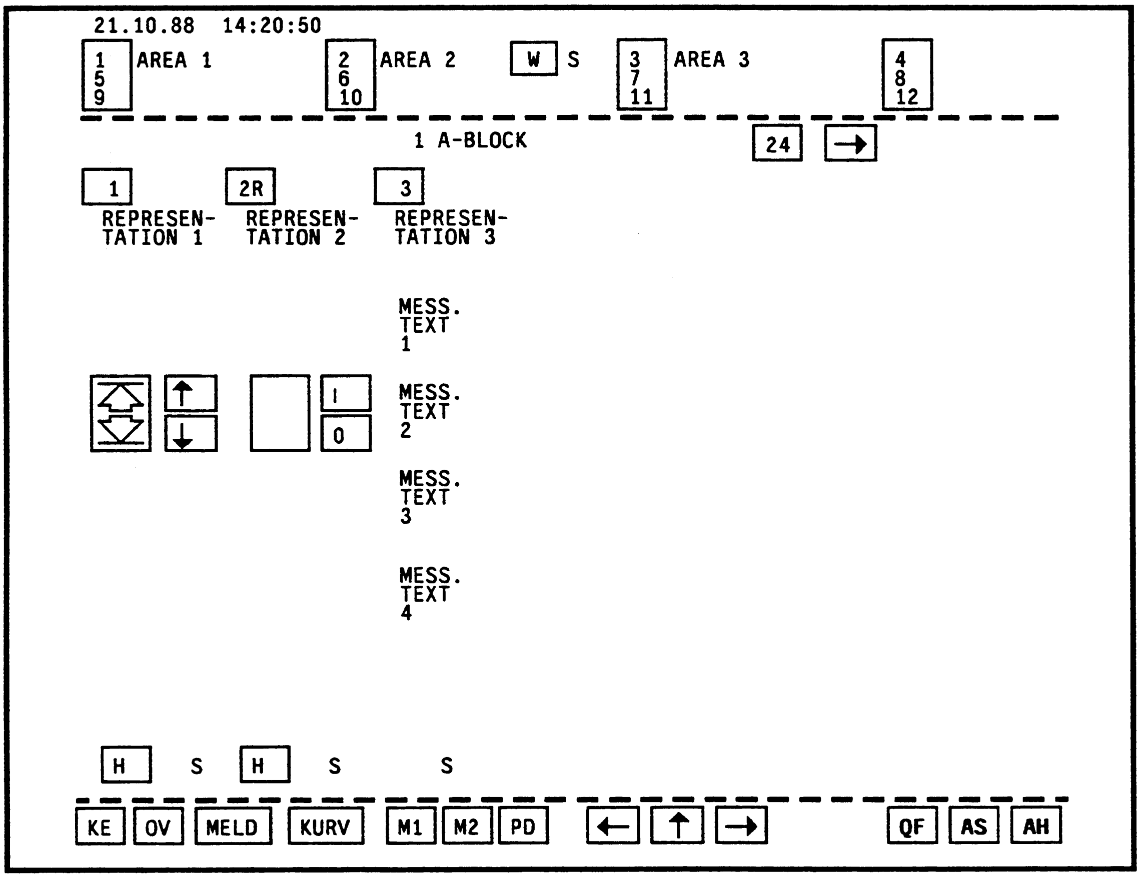


Fig. 4.3-1 Loop display with the three representations of the A block

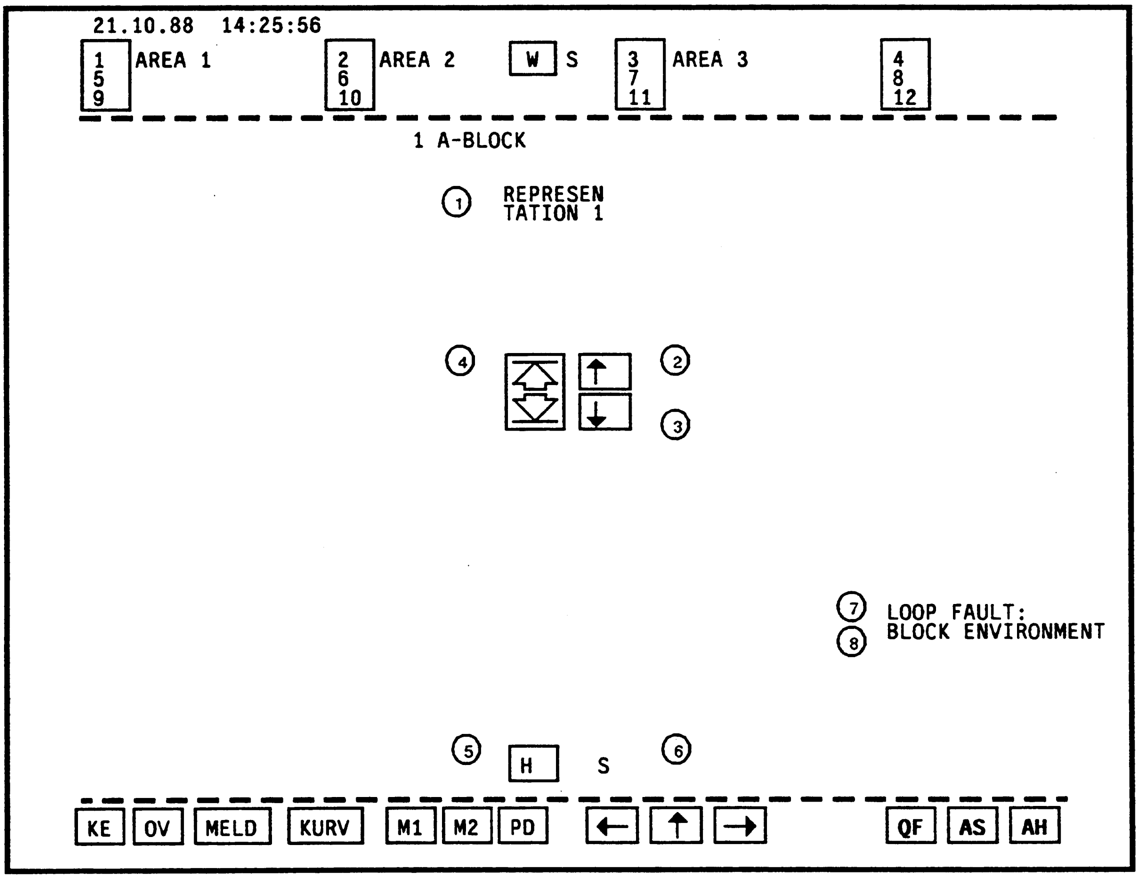


Fig. 4.3-2 Loop display for the A block controlling a valve (representation 1)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	24 S16	8 + 8	gn	bk			
2	Key OPEN	Status	2	bk	gn	"↑"	16.0.0.0	Status display 20
3	Key CLOSE	Status	2	bk	gn	"↓"	17.0.0.0	Status display 21
4	Status display OPEN OPENING INTERMEDIATE POSITION CLOSED CLOSING	Status	 3x3 3x3 3x3 3x3 3x3	 bk bk bk bk bk	 gn gn gn wh wh			Status display 22
5	Mode MANUAL AUTOMATIC	Status	 2 2	 bk bk	 wh gn	 "H" "A"	 11.0.0.0 11.0.0.0	Status display 23
6	Blinking mark I&C fault	Status	1	ye	bk			Status display 10
7	LOOP FAULT	Segment	14	gn	bk			
8	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24

Legend of Fig. 4.3-2

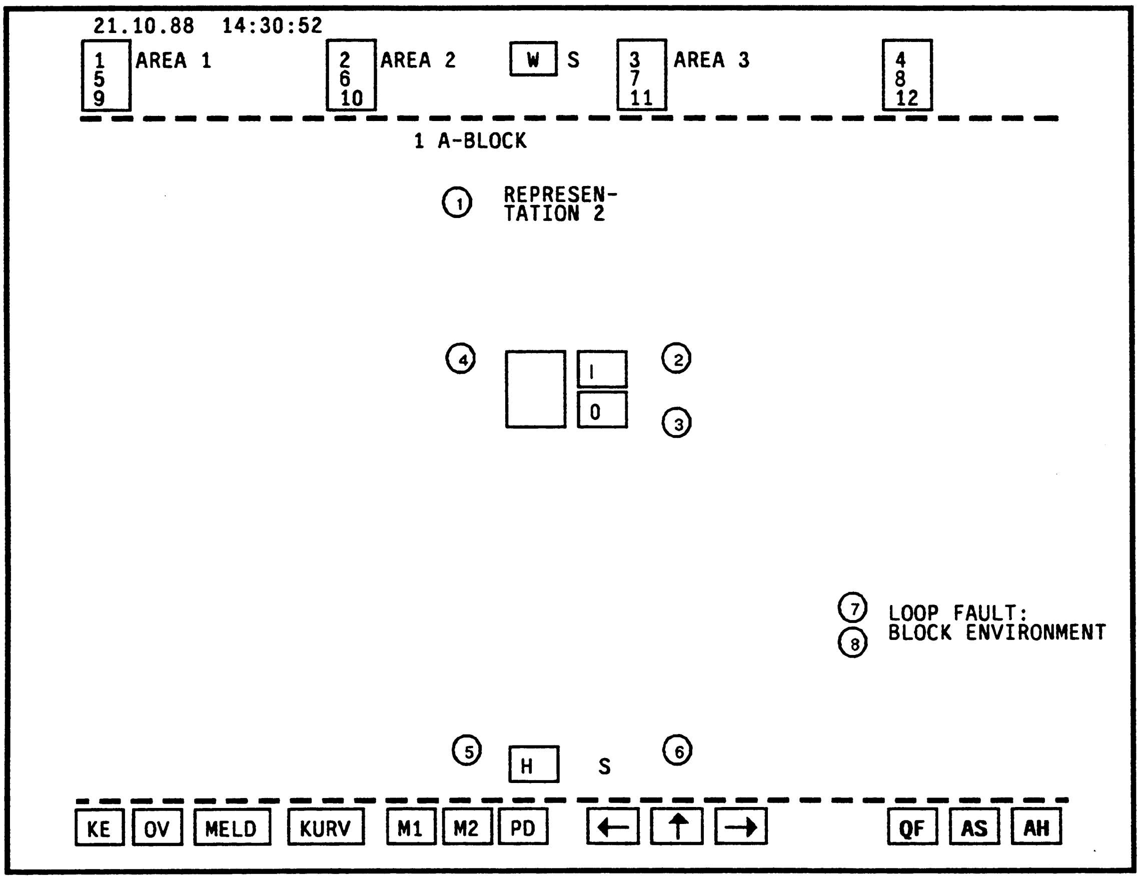


Fig. 4.3-3 Loop display for the A block controlling a switch (representation 2)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	24 S16	8+8	gn	bk			
2	Key SWITCH ON	Status	2	bk	gn	"I"	20.5.0.0	Status display 60
3	Key SWITCH OFF	Status	2	bk	gn	"0"	21.3.0.0	Status display 61
4	Status display ON OFF	Status	3x3 3x3	bk bk	gn wh			Status display 26
5	Mode MANUAL AUTOMATIC	Status	 2 2	 bk bk	 wh wh	 "H" "A"	 11.0.0.0 11.0.0.0	Status display 23
6	Blinking mark I&C fault	Status		ye	bk			Status display 10
7	LOOP FAULT	Segment	14	gn	bk			
8	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24

Legend of Fig. 4.3-3

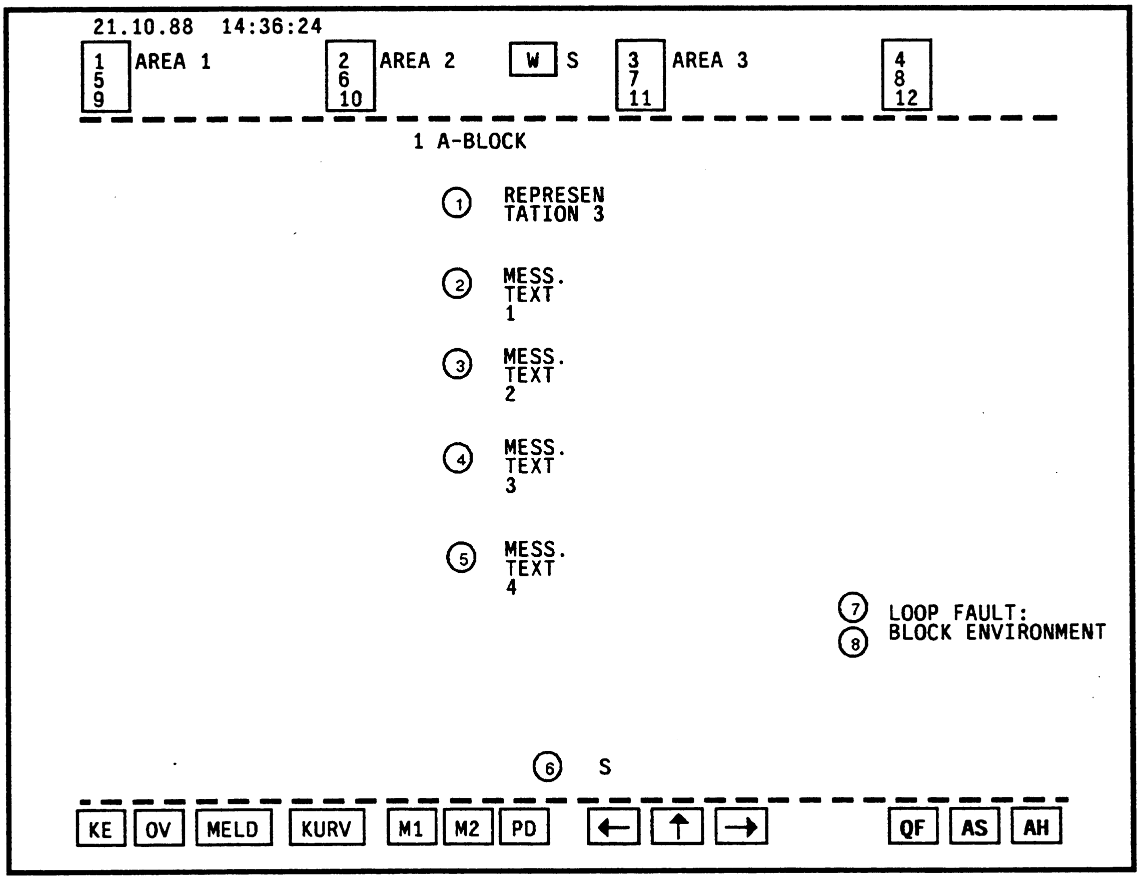


Fig. 4.3-4 Loop display for the A block used as a message field (representation 3)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	24 S16	8+8	gn	bk			
2	Operating state message 1	Status	6+6+6	gn	bk			FRANZ DIALOG (Status display)
3	Operating state message 2	Status	6+6+6	gn	bk			FRANZ DIALOG (Status display)
4	Operating state message 3	Status	6+6+6	gn	bk			FRANZ DIALOG (Status display)
5	Operating state message 4	Status	6+6+6	gn	bk			FRANZ DIALOG (Status display)
6	Blinking mark I&C fault	Status	1	ye	bk			Status display 10
7	LOOP FAULT	Segment	14	gn	bk			
8	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24

Legend of Fig. 4.3-4

- **Standardized displays for the AKS block**

Application:

- Representation 1 of the AKS block is used for on line communication with the AS 220 if the values have been collected in representation 2.

- Representation 2 of the AKS block contains all 28 parameters of the AKS message. This facilitates direct collection of these parameters using the AKS block defined as NORA.

Notes:

In various applications of the KURV function package in the OS 265, process variables or arithmetic values need to be displayed as curves. If these values come from AS 230 GA areas or from non-operator-accessible function blocks in the AS 220, they cannot be read directly by the OS 265 and therefore cannot be directly configured for KURV (MKZ collection). It is thus necessary to define a "substitute" function (e.g. FN) in the AS, and interconnect the desired values with this substitute, which is then used for MKZ collection.

Three new control fields for the AKS block (NORA, representation 2) have been added to the OS 262 basic data in order to avoid this "deviation". The control fields on area and group level are identical to representation 1. Since the control field on loop level contains all 28 parameters of the AKS message, the above-mentioned parameters can be directly collected via the AKS block defined as NORA (without a "substitute").

- Marking in a NORA group consisting of AKS blocks can be improved if the individual block numbers are integrated in the group names. This provides an allocation to the AKS block in the AS.

- Representation 1 should be entered in the OS 265 NORA function package after the configuration of these blocks has been terminated, since OS 265 cannot read the AKS block parameters from AS 220. This prevents I&C alarms occurring during the operating phase when these standardized displays are selected. Representation 2 can always be entered during the design phase if alteration configurations are necessary.

- An error message is not displayed when representation 2 of the AKS loop display is selected from the AS 220. An error message appears once during start-up (KOPANZ S 447).

- The AKS block cannot be configured in FRANZ.

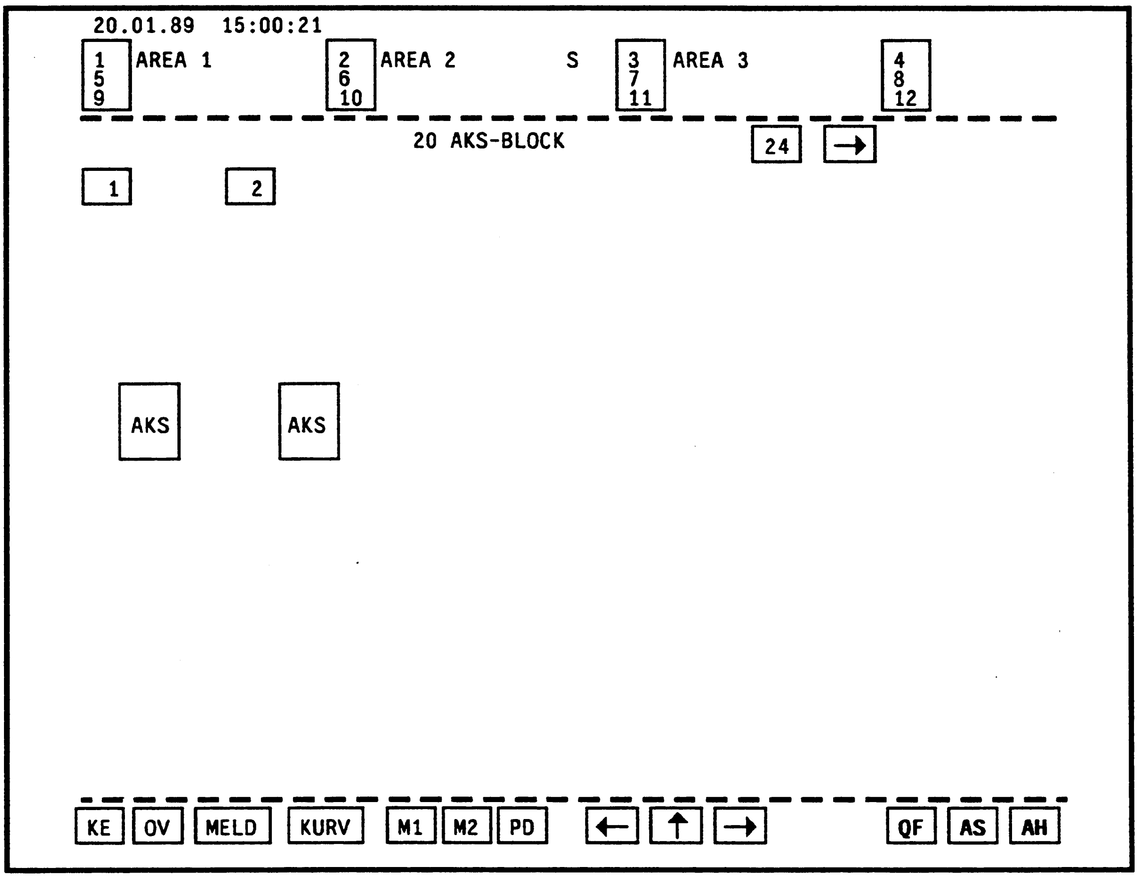


Fig. 4.3-5 Loop display with the two AKS block representations

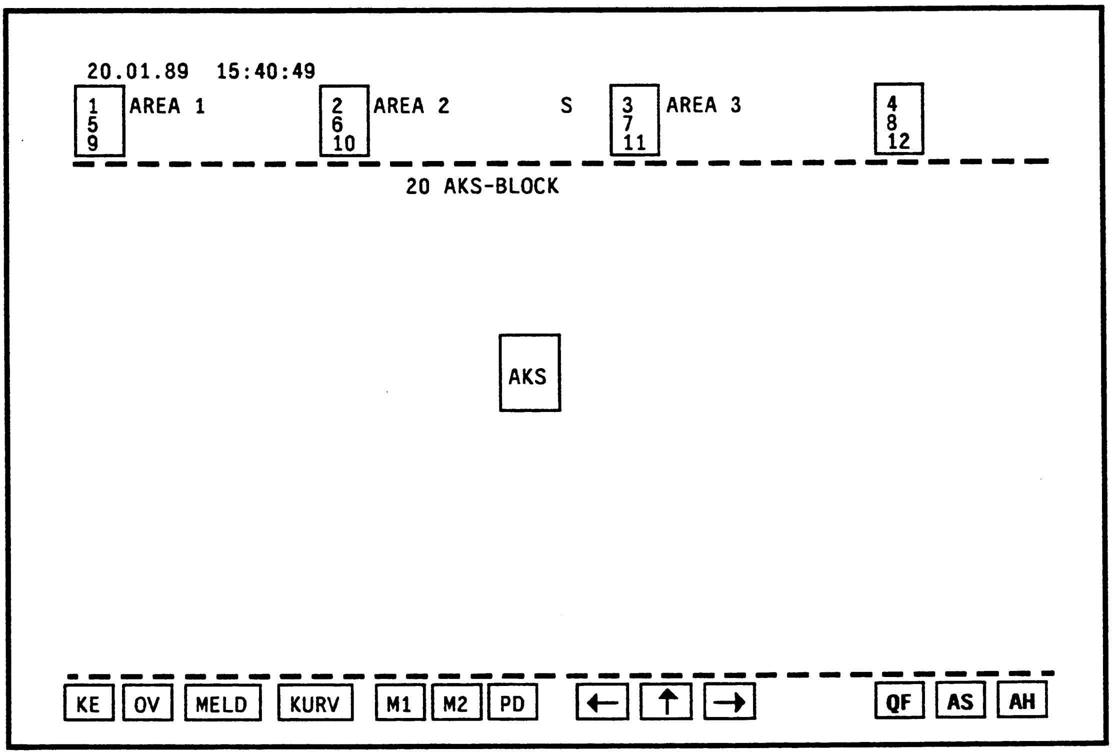
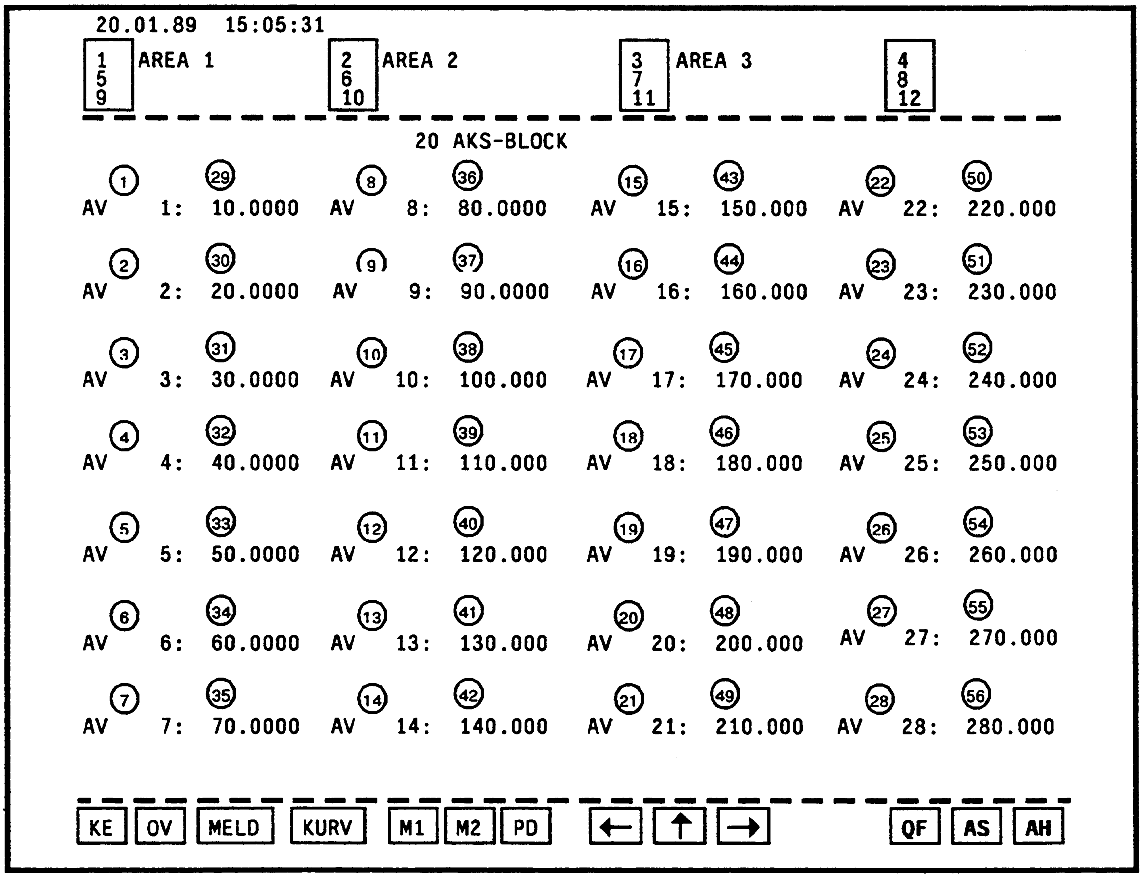


Fig. 4.3-6 AKS block loop display (representation 1)



```
 20.01.89  15:05:31
[1 ]AREA 1          [2 ]AREA 2               [3 ]AREA 3            [4 ]
[5 ]                [6 ]                     [7 ]                  [8 ]
[9 ]                [10]                     [11]                  [12]
--------------------------------------------------------------------------
                            20 AKS-BLOCK
AV   1:  10.0000   AV   8:  80.0000   AV  15:  150.000   AV  22:  220.000

AV   2:  20.0000   AV   9:  90.0000   AV  16:  160.000   AV  23:  230.000

AV   3:  30.0000   AV  10:  100.000   AV  17:  170.000   AV  24:  240.000

AV   4:  40.0000   AV  11:  110.000   AV  18:  180.000   AV  25:  250.000

AV   5:  50.0000   AV  12:  120.000   AV  19:  190.000   AV  26:  260.000

AV   6:  60.0000   AV  13:  130.000   AV  20:  200.000   AV  27:  270.000

AV   7:  70.0000   AV  14:  140.000   AV  21:  210.000   AV  28:  280.000

--------------------------------------------------------------------------
[KE][OV][MELD][KURV] [M1][M2][PD] [←][↑][→]         [QF][AS][AH]
```

Fig. 4.3-7 AKS block loop display (representation 2)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1-28	Analog value 1-28	Segment	6	gn	bk			
29	Binary display 1st value to be sent	1 EA	7	gn	bk			
30	Binary display 2nd value to be sent	2 EA	7	gn	bk			
31	Binary display 3rd value to be sent	3 EA	7	gn	bk			
32	Binary display 4th value to be sent	4 EA	7	gn	bk			
33	Binary display 5th value to be sent	5 EA	7	gn	bk			
. .	. .	. .	. .	. .				
55	Binary display 27th value to be sent	27 EA	7	gn	bk			
56	Binary display 28th value to be sent	28 EA	7	gn	bk			

Legend of Fig. 4.3-7

- **Standardized displays for the B block**

Application:

- Representation 1 of the B block is used as an operator communication block for closed-loop control loops, displaying setpoint (W), actual value (X) and manipulated variable (Y) as well as the modes (manual/automatic, internal/external).
- Representation 2 of the B block is used as an operator communication block for closed-loop control loops, displaying system deviation (Xw) and manipulated variable (Y) as well as the modes (manual/automatic, internal/external).
- Representation 3 of the B block is used as a setpoint setter for closed-loop control loops, displaying expected and actual setpoint.

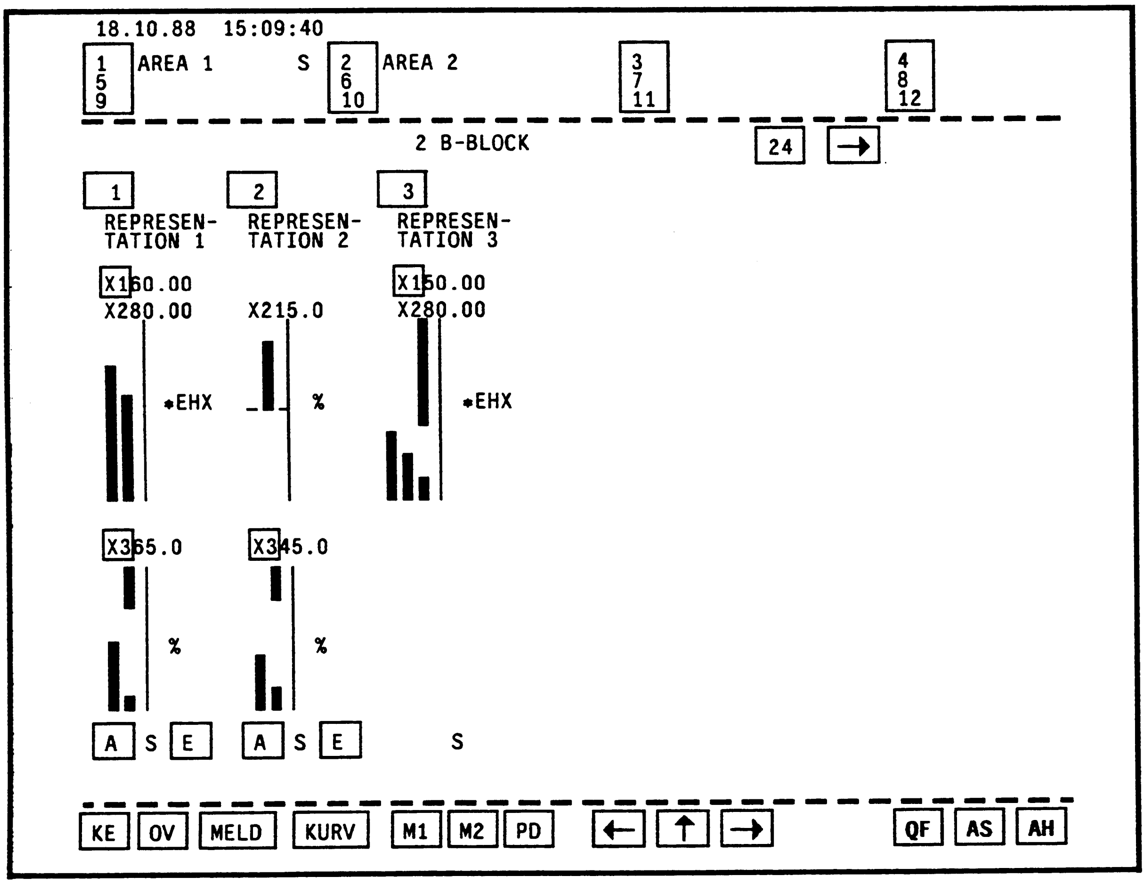


Fig. 4.3-8 Loop display with the three representations of the B block

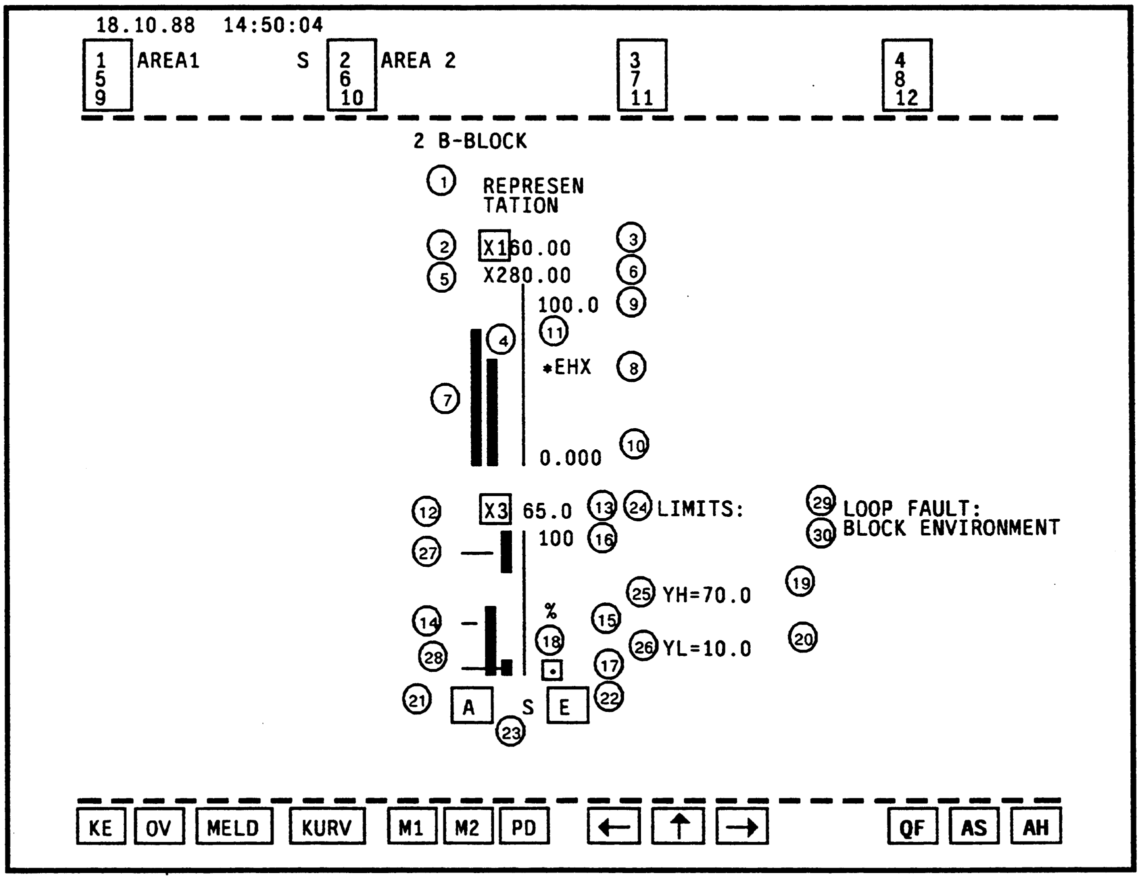


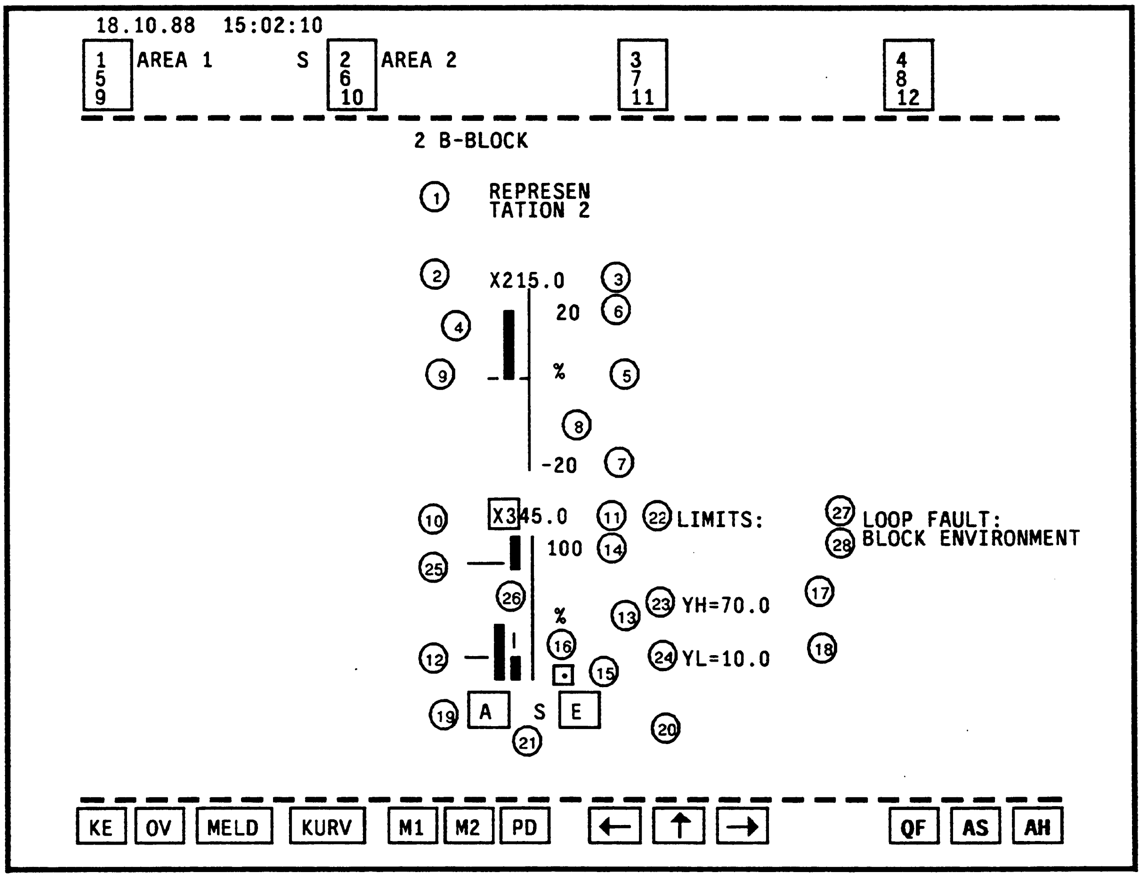
Fig. 4.3-9 Loop display for the B block with W and X display (representation 1)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	45 S16	8+8	gn	bk			
2	Mnemonic name Setpoint W	23 S2	2	bl	bk	"W"	5.0.0.0	
3	Binary display of setpoint	1 AA	5	wh	bl		5.0.0.0	Parameters for operating limits 4 EA. 6 EA
4	Analog display of setpoint	1 AA	≤10	bl	bk			Scaling values 4 EA. 6 EA
5	Mnemonic name of actual value	24 S2	2	ye	bk			
6	Binary display of actual value	2 AA	5	ye	bk			
7	Analog display of actual value	2 AA	≤10	ye	bk			Scaling values 4 EA. 6 EA
8	Unit actual value, setpoint	37 S4	4	gn	bk			
9	Upper display range limit W, X	4 EA	5	gn	bk			
10	Lower display range limit W, X	6 EA	5	gn	bk			
11	Display range of setpoint/actual value	Segment	10	gn	bk			

Legend of Fig. 4.3-9, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
12	Mnemonic name of manipulated variable Y	25 S2	2	wh	ma	"Y"	6.1.0.0	
13	Binary display of manipulated variable	3 AA	4	or	wh		6.0.0.0	
14	Analog display of manipulated variable	3 AA	≤5	or	bk			Scaling values -2. +102
15	Unit of manipulated variable	Segment	4	or	bk			
16	Upper display range limit Y	Segment	3	gn	bk			
17	Lower display range limit	Segment	1	gn	bk			
18	Display range manipulated variable	Segment	5	gn	bk			
19	Upper correcting range limit	7 EA	≤5	wh	bk			Scaling values -2. +102
20	Lower correcting range limit	9 EA	≤5	wh	bk			Scaling values -2. +102
21	Mode	Status	2					Status display 30
	MANUAL			bk	wh	"H"	11.1.0.0	
	AUTOMATIC			bk	gn	"A"	11.1.0.0	
22	Mode INTERNAL	Status	2	wh	bl	"I"	10.0.0.0	Status display 31
	EXTERNAL			wh	bl	"E"	10.0.0.0	
23	Blinking mark I &C fault	Status	1	ye	bk			Status display 10
24	"Limits:"	Segment	10	gn	bk			
25	Mnemonic name "YH = "	Segment	3	gn	bk			
26	Mnemonic name "YL = "	Segment	3	gn	bk			
27	Upper correcting range limit (bar)	7 EA	4	gn	bk			
28	Lower correcting range limit (bar)	9 EA	4	gn	bk			
29	LOOP FAULT	Segment	14	gn	bk			
30	BLOCK ENVIRONMENT	Status	16	ye	bk			Status display 24

Legend of Fig. 4.3-9, part 2



```
18.10.88  15:02:10
1 |AREA 1       S  2 |AREA 2        3        4
5                  6                7        8
9                  10               11       12

                2 B-BLOCK

                  REPRESEN
                  TATION 2

                  X215.0
                       20

                       %

                      -20

                  X345.0     LIMITS:        LOOP FAULT:
                     100                    BLOCK ENVIRONMENT
                             YH=70.0
                     %
                             YL=10.0
                  A   S  E

KE  OV  MELD  KURV  M1  M2  PD  ←  ↑  →     QF  AS  AH
```

Fig. 4.3-10 Loop display for the B block with Xw display (representation 2)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	45 S16	8 + 8	gn	bk			
2	Mnemonic name System deviation XW	24 S2	2	ye	bk			
3	Binary display of system deviation	5 EA	4	ye	bk			
4	Analog display of system deviation	5 EA	≤5	ye	bk			Scaling values + 20, − 20
5	Unit system deviation	Segment	1	ye	bk			
6	Upper display range limit	Segment	2	gn	bk			
7	Lower display range limit	Segment	3	gn	bk			
8	Display range	Segment	10	gn	bk			
9	Reference line 0 System deviation	Segment	1 + 1	gn	bk			
10	Mnemonic name of manipulated variable	25 S2	2	wh	or	"Y"	6.1.0.0	
11	Binary display of manipulated variable	3 AA	4	or	bk		6.1.0.0	
12	Analog display of manipulated variable	3 AA	≤5	or	bk			Scaling values − 2, + 102
13	Unit of manipulated variable	Segment	4	or	bk			
14	Upper display range limit Y	Segment	3	gn	bk			
15	Lower display range limit Y	Segment	1	gn	bk			
16	Display range of manipulated variable	Segment	5	gn	bk			
17	Upper correcting range limit	7 EA	≤5	wh	bk			Scaling values − 2, + 102
18	Lower correcting range limit	9 EA	≤5	wh	bk			Scaling values − 2, + 102
19	Mode MANUAL AUTOMATIC	Status	2 2	bk bk	wh gn	"H" "A"	11.1.0.0 11.1.0.0	Status display 30
20	Mode INTERNAL EXTERNAL	Status	2 2	wh wh	bl bl	"I" "E"	10.0.0.0 10.0.0.0	Status display 31
21	Blinking mark I&C fault	Status	1	ye	bk			Status display 10
22	Limitation:	Segment	11	gn	bk			
23	Mnemonic name "YH = "	Segment	3	gn	bk			
24	Mnemonic name "YL = "	Segment	3	gn	bk			
25	Upper correcting range limit	7 EA	4	gn	bk			
26	Lower correcting range limit	9 EA	4	gn	bk			
27	LOOP FAULT	Segment	14	gn	bk			
28	BLOCK ENVIRONMENT	Status	16	ye	bk			Status display 24

Legend of Fig. 4.3-10

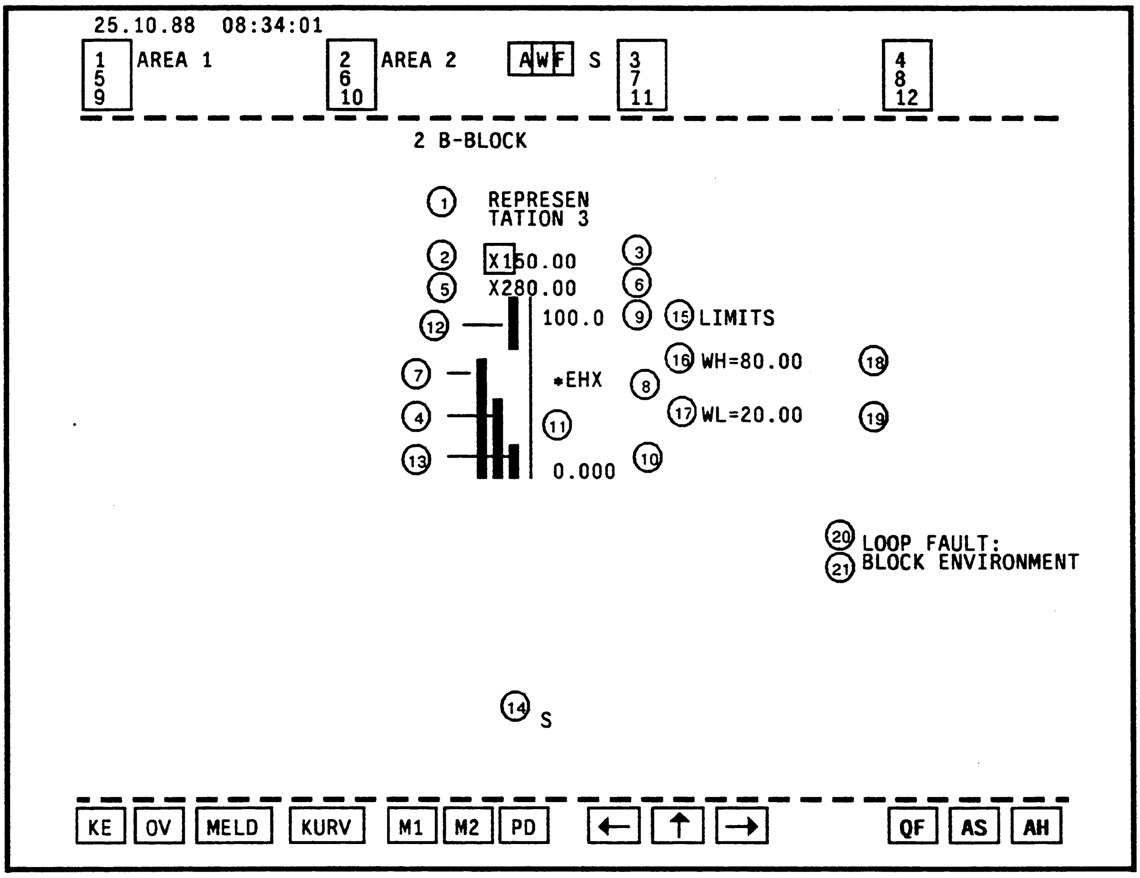


Fig. 4.3-11 Loop display for the B block as a setpoint setter (representation 3)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	45 S16	8+8	gn	bk			
2	Mnemonic name of expected setpoint	23 S2	2	wh	bl	"W"	5.0.0.0	
3	Binary display of expected setpoint	2 EA	5	bl	bk		5.0.0.0	Parameters for operating limits 1 EA. 3 EA
4	Analog display of expected setpoint	2 EA	≤10	bl	bk			Scaling values 4 EA. 6 EA
5	Mnemonic name of actual setpoint	24 S2	2	bl	bk			
6	Binary display of actual setpoint	5 EA	5	bl	bk			
7	Analog display of actual setpoint	5 EA	≤10	bl	bk			Scaling values 4 EA. 6 EA
8	Unit of setpoint	37 S4	4	bl	bk			
9	Upper display range limit	4 EA	5	gn	bk			
10	Lower display range limit	6 EA	5	gn	bk			
11	Display range	Segment	10	gn	bk			
12	Analog display of upper control limit	1 EA	≤10	bl	bk			Scaling values 4 EA. 6 EA
13	Analog display of lower control limit	3 EA	≤10	bl	bk			Scaling values 4 EA. 6 EA
14	Blinking mark I&C fault	Status	1	ye	bk			Status display 10
15	LIMITS:	Segment	11	gn	bk			
16	Mnemonic name of upper setpoint control limit	Segment	3	gn	bk			
17	Mnemonic name of lower setpoint control limit	Segment	3	gn	bk			
18	Binary display of upper setpoint control limit	1 EA	5	gn	bk			Scaling values - 2, +102
19	Binary display of lower setpoint control limit	3 EA	5	gn	bk			Scaling values - 2, +102
20	LOOP FAULT	Segment	14	gn	bk			
21	BLOCK ENVIRONMENT	Status	16	ye	bk			Status display 24

Legend of Fig. 4.3-11

- **Standardized displays for the C block**

Application:

- Representation 1 of the C block is used as a changeover block in the 1-out-of-2 mode, and for displaying the 2 binary signals.
- Representation 2 of the C block is used as a changeover block in the 1-out-of-3 or 2-out-of-3 mode, and for displaying the 3 binary signals.
- Representation 3 of the C block is used as a changeover block for selecting the modes (manual/automatic mode selection), and for displaying the current mode (manual/automatic mode).

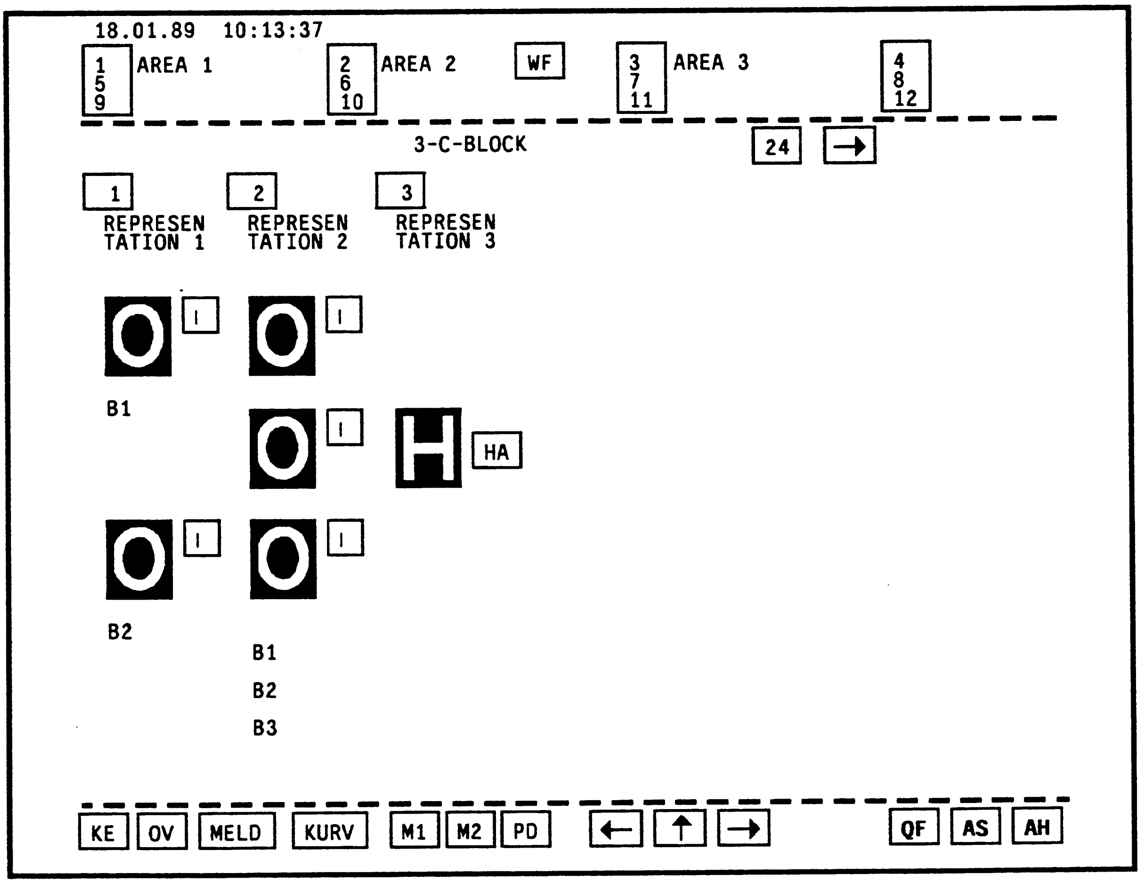


Fig. 4.3-12 Group display with the three representations of the C block

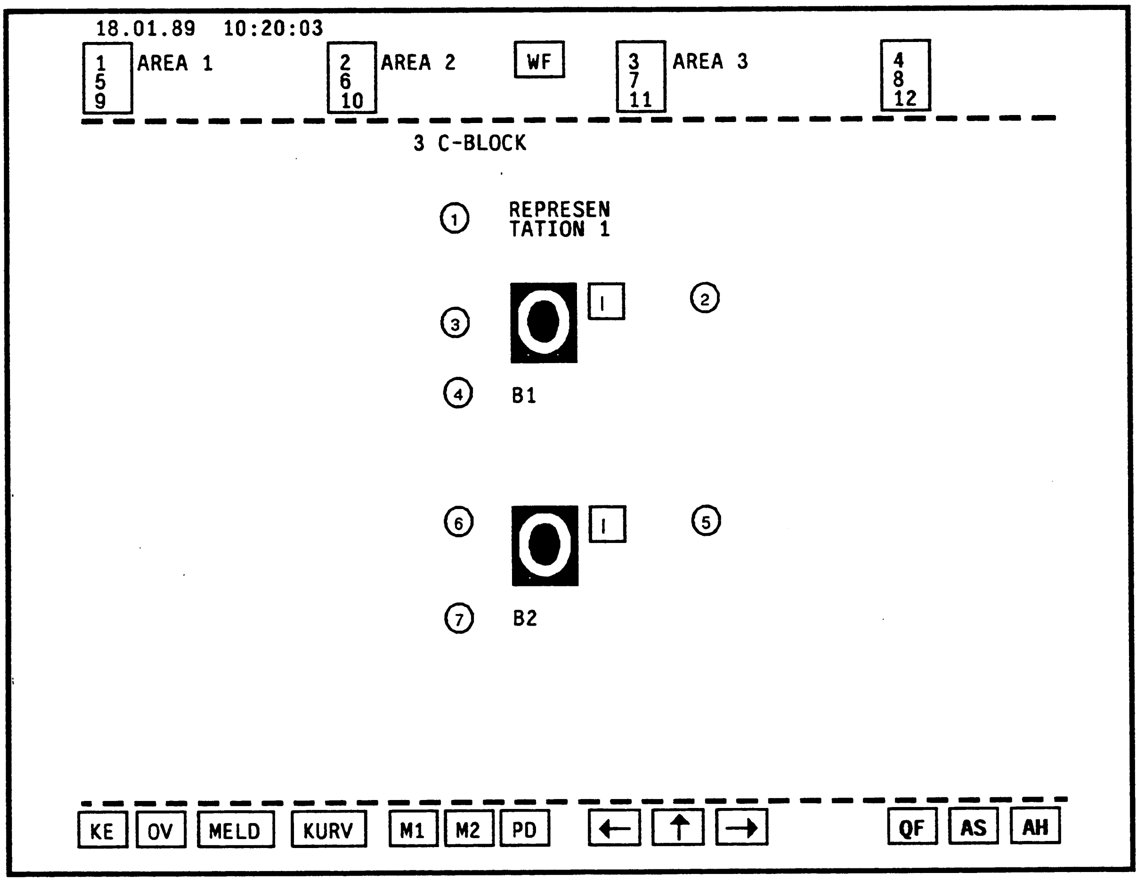


Fig. 4.3-13 Loop display for the C block in 1-out-of-2 mode (representation 1)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	12 S16	6+6+4	gn	bk			
2	Key SWITCH ON Remove	Status	 2 2	 bk bk	 gn bk	 "I" " "	 20.0.0.0 20.0.0.0	Status display 40
3	Status display OFF ON	Status	 3x3 3x3	 bk bk	 wh gn			Status display 41
4	Mnemonic name 1	9 S2	2	gn	bk			
5	Status display OFF ON	Status	 2 2	 bk bk	 gn bk	 "I" "I"	 20.1.0.0 20.1.0.0	Status display 40
6	Status display OFF ON	Status	 3x3 3x3	 bk bk	 wh gn			Status display 41
7	Mnemonic name 2	10 S2	2	gn	bk			

Legend to Fig. 4.3-13

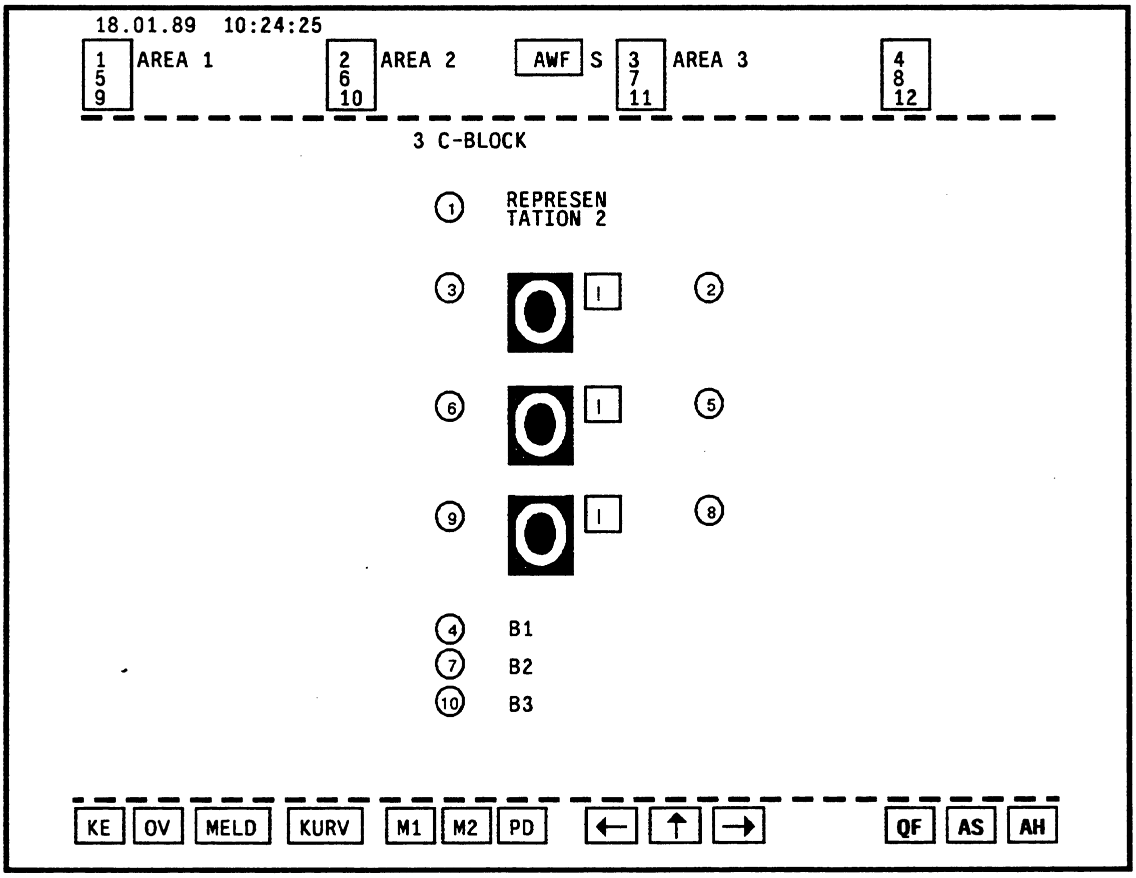


Fig. 4.3-14 Loop display for the C block in 1-out-of-3 mode (representation 2)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	12 S16	6+6+4	gn	bk			
2	Key SWITCH ON Remove	Status	 2 2	 bk bk	 gn bk	 "I" " "	 20.0.0.0 20.0.0.0	Status display 40
3	Status display OFF ON	Status	 3x3 3x3	 bk bk	 wh gn			Status display 41
4	Mnemonic name 1	9 S2	2	gn	bk			
5	Key SWITCH ON Remove	Status	 2 2	 bk bk	 gn bk	 "I" " "	 20.1.0.0 20.1.0.0	Status display 40
6	Status display OFF ON	Status	 3x3 3x3	 bk bk	 wh gn			Status display 41
7	Mnemonic name 2	10 S2	2	gn	bk			
8	Key SWITCH ON Remove	Status	 2 2	 bk bk	 gn bk	 "I" "I"	 20.2.0.0 20.2.0.0	Status display 40

Legend to Fig. 4.3-14, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
9	Status display OFF ON	Status	 3x3 3x3	 bk bk	 wh gn			Status display 41
10	Mnemonic name 3	11 S2	2	gn	bk			

Legend to Fig. 4.3-14, part 2

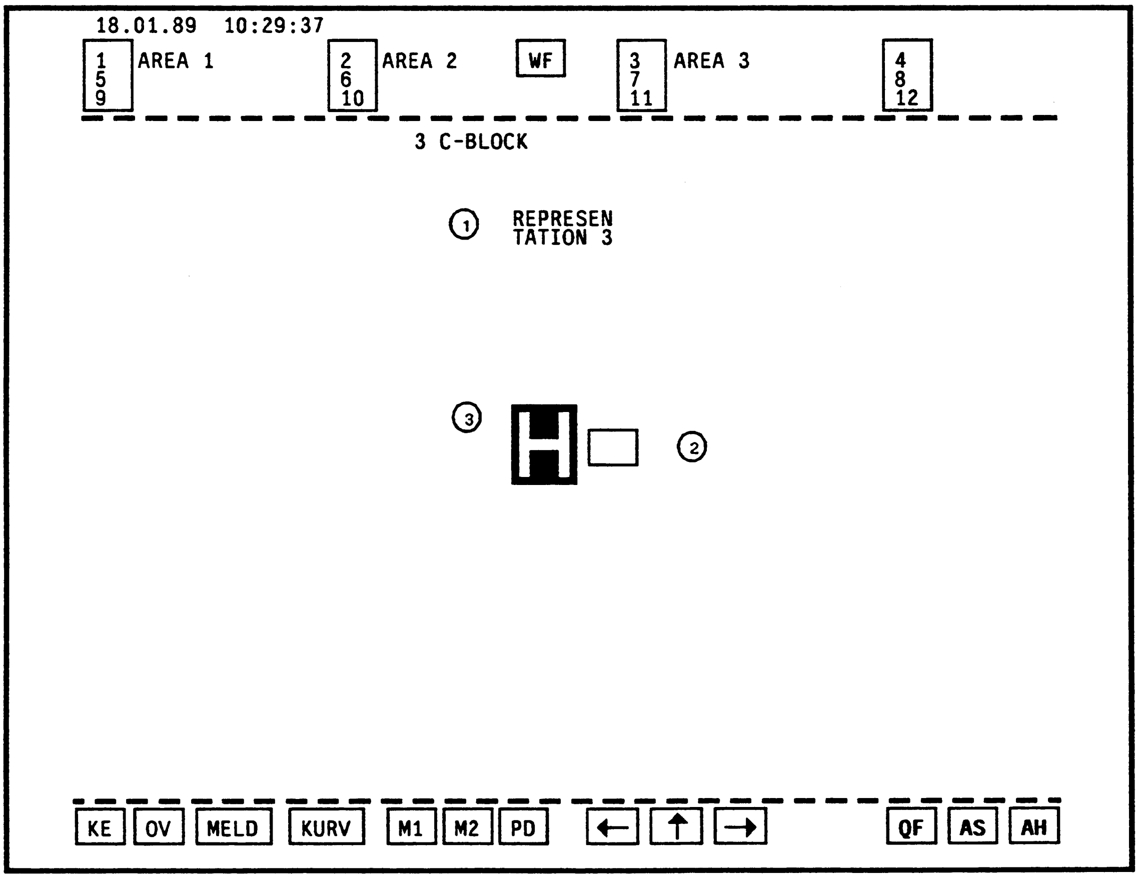


Fig. 4.3-15 Loop display for the C block as a manual/automatic mode selector (representation 3)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	12 S16	8+8	gn	bk			
2	MANUAL/AUTOMATIC selector key	Status	2	bk bk	wh/gn wh/gn	"HA" "HA"	12.0.0.0 12.0.0.0	Status display 42
3	Status display MANUAL AUTOMATIC	Status	 3x3 3x3	 bk bk	 wh gn			Status display 43

Legend to Fig. 4.3-15

- **Standardized display for the DZ block**

Application:

- Representation 1 of the DZ block is used for monitoring and controlling a proportioning process (set counter, reset counter, enable, disable) and for displaying the proportioning state (counter is running, pre-value attained, final value attained).

The DZ block is used for measuring signals from the proportioning counter module 6DS1613 and for transferring commands to the proportioning counter module. A proportioning counter module is required if the DZ block is to be monitored and controlled via the corresponding NORA for the DZ block.

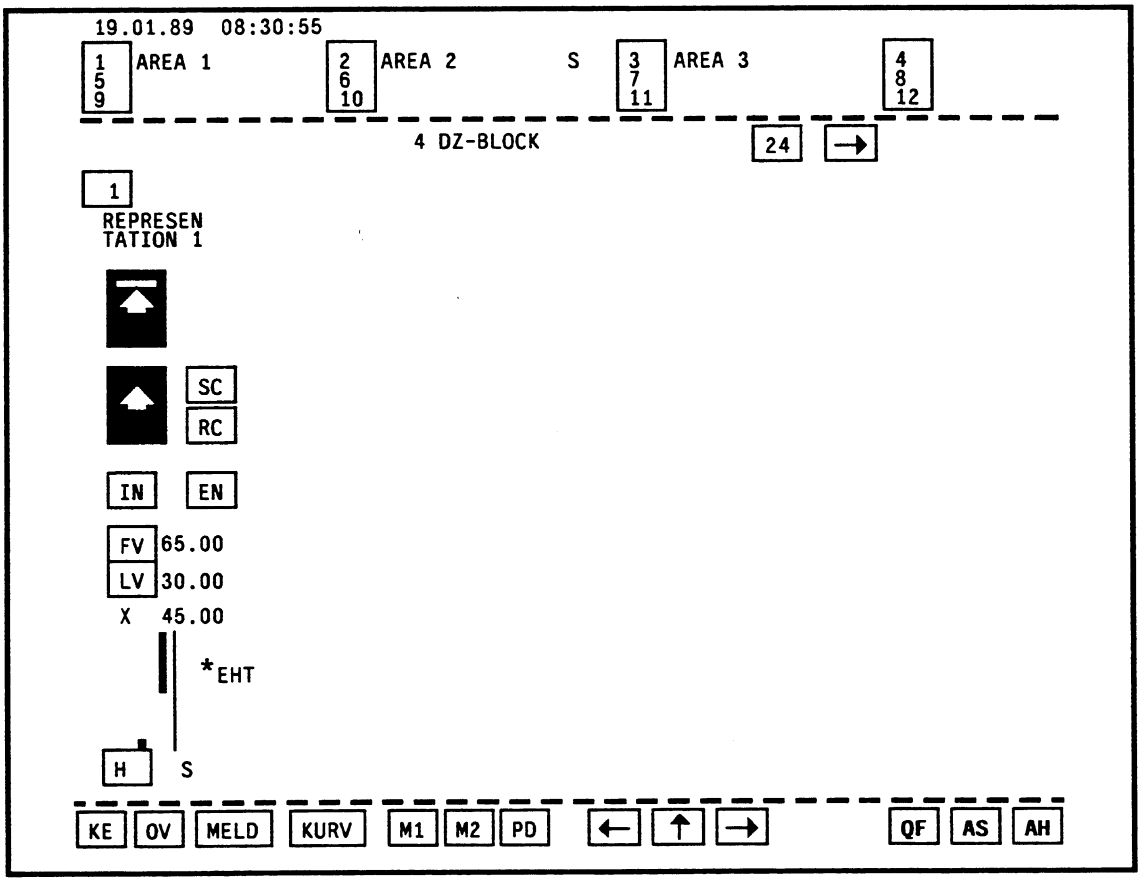


Fig. 4.3-16 Group display for a DZ block used as an up counter

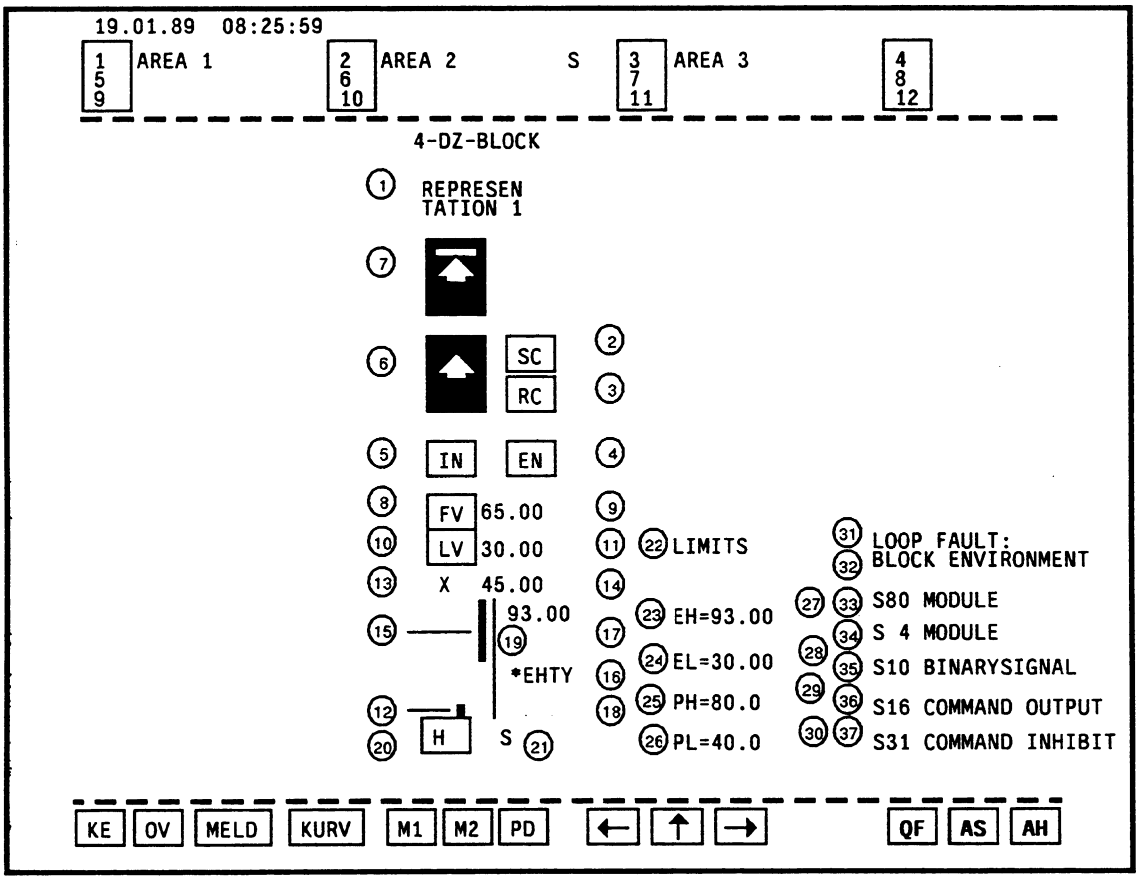


Fig. 4.3-17 Loop display for a DZ block used as an up counter

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	57 S16	6+6+4	gn	bk			
2	Key	Status						Status display 50
	SET COUNTER		2	bk	gn	"SC"	23.0.0.0	
	Remove		2	bk	bk	" "	23.0.0.0	
	Remove		2	bk	bk	" "	23.0.0.0	
3	Key	Status						Status display 51
	RESET COUNTER		2	bk	gn	"RC"	24.0.0.0	
	Remove		2	bk	bk	" "	24.0.0.0	
	Remove		2	bk	bk	" "	24.0.0.0	
4	Key	Status						Status display 52
	ENABLE		2	bk	gn	"EN"	25.0.0.0	
	Remove		2	bk	bk	" "	25.0.0.0	
	Remove		2	bk	bk	" "	25.0.0.0	
5	Key	Status						Status display 53
	INHIBIT		2	bk	wh	"IN"	26.0.0.0	
	Remove		2	bk	bk	" "	26.0.0.0	
	Remove		2	bk	bk	" "	26.0.0.0	
6	Status display	Status						Status display 54
	Counter is running and pre-value has not been attained		3x3	bk	gn			
	Counter is running and output disabled		3x3	bk	wh			
	Counter has attained pre-value		3x3	bk	gn			
7	Status display	Status						Status display 55
	Counter is running and final value has not been attained		3x3	bk	gn			
	Counter is running and output disabled		3x3	bk	wh			
	Counter has attained final value		3x3	bk	gn			
8	Mnemonic name	Status						Status display 57
	Final value		2	wh	bl	"FV"	8.0.0.0	
	Final value		2	bl	bk	"FV"	8.0.0.0	
	Final value		2	bl	bk	"FV"	8.0.0.0	
9	Binary display of final value	2 AA	5	bl	bk			
10	Mnemonic name	Status						Status display 58
	Pre-value		2	wh	bl	"LV"	8.0.0.0	
	Pre-value		2	bl	bk	"LV"	8.0.0.0	
	Pre-value		2	bl	bk	"LV"	8.0.0.0	
11	Binary display of pre-value	3 AA	5	bl	bk			
12	Analog display of pre-value Pre-value	3 AA	≤5	bl	bk			Scaling values 1 EA, 6 EA
13	Mnemonic name of counter value	34 S2	2	ye	bk			
14	Binary display of counter value	1 AA	5	ye	bk			
15	Analog display of counter value	1 AA	≤5	ye	bk			Scaling values 1 EA, 6 EA

Legend to Fig. 4.3-17, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
16	Unit	50 S4	4	gn	bk			
17	Upper display range limit	1 EA	5	gn	bk			
18	Lower display range limit	6 EA	5	gn	bk			
19	Display range	Segment	5	gn	bk			
20	Mode MANUAL AUTOMATIC	Status	 2 2	 bk bk	 wh gn	 "H" "A"	 11.3.0.0 11.3.0.0	Status display 23
21	Blinking mark I&C fault	Status	1	ye gn	bk bk	"S" " + "		Status display 14
22	Limits:	Segment	11	gn	bk			
23	Mnemonic name of final value upper control limit	Segment	11	gn	bk			
24	Mnemonic name of final value lower control limit	Segment	3	gn	bk			
25	Mnemonic name of pre-value upper control limit	Segment	3	gn	bk			
26	Mnemonic name of pre-value lower control limit	Segment	3	gn	bk			
27	Binary display of final value upper control limit	1 EA	5	gn	bk			
28	Binary display of final value lower control limit	3 EA	5	gn	bk			
29	Binary display of pre-value upper control limit	4 EA	5	gn	bk			
30	Binary display of pre-value lower control limit	6 EA	5	gn	bk			
31	LOOP FAULT	Segment	20	gn	bk			
32	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24
33	S80 MODULE	Status	20	ye	bk			Status display 56
34	S4 MODULE	14 AB	20	ye	bk			Status display 160
35	S10 BINARY SIGNAL	15 AB	20	ye	bk			Status display 161
36	S16 COMMAND OUTPUT	16 AB	20	ye	bk			Status display 162
37	S31 COMMAND INHIBIT	17 AB	20	ye	bk			Status display 163

Legend to Fig. 4.3-17, part 2

- **Standardized display for the EG block**

Application:

- Representation 1 of the EG block is used for controlling a switch (switch on, switch off, manual mode, automatic mode).

- Representation 2 of the EG block is used for controlling a valve (open, close, manual mode, automatic mode).

The EG block is used for measuring signals from the open-loop control module 6DS1505-8AA. An open-loop control module is required if the EG block is to be monitored and controlled via the corresponding NORA for the EG block.

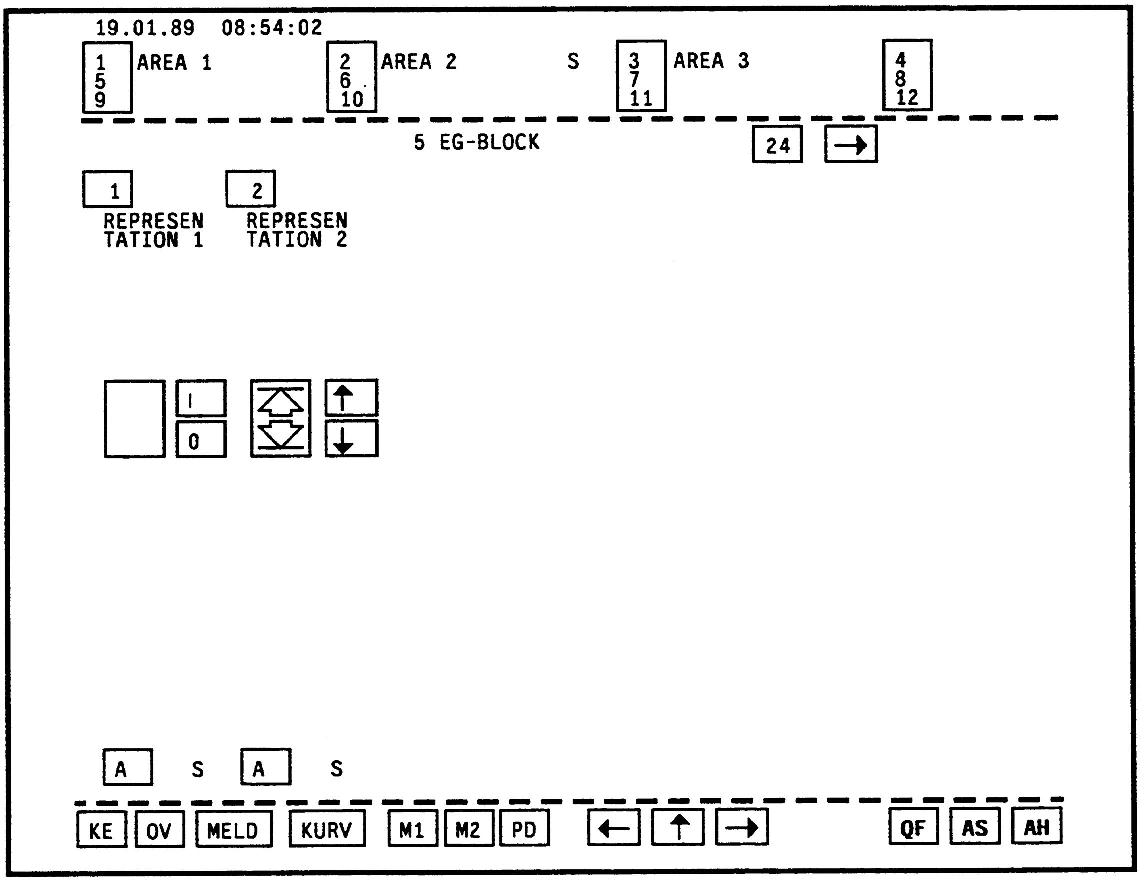


Fig. 4.3-18 Group display with the two representations of the EG block

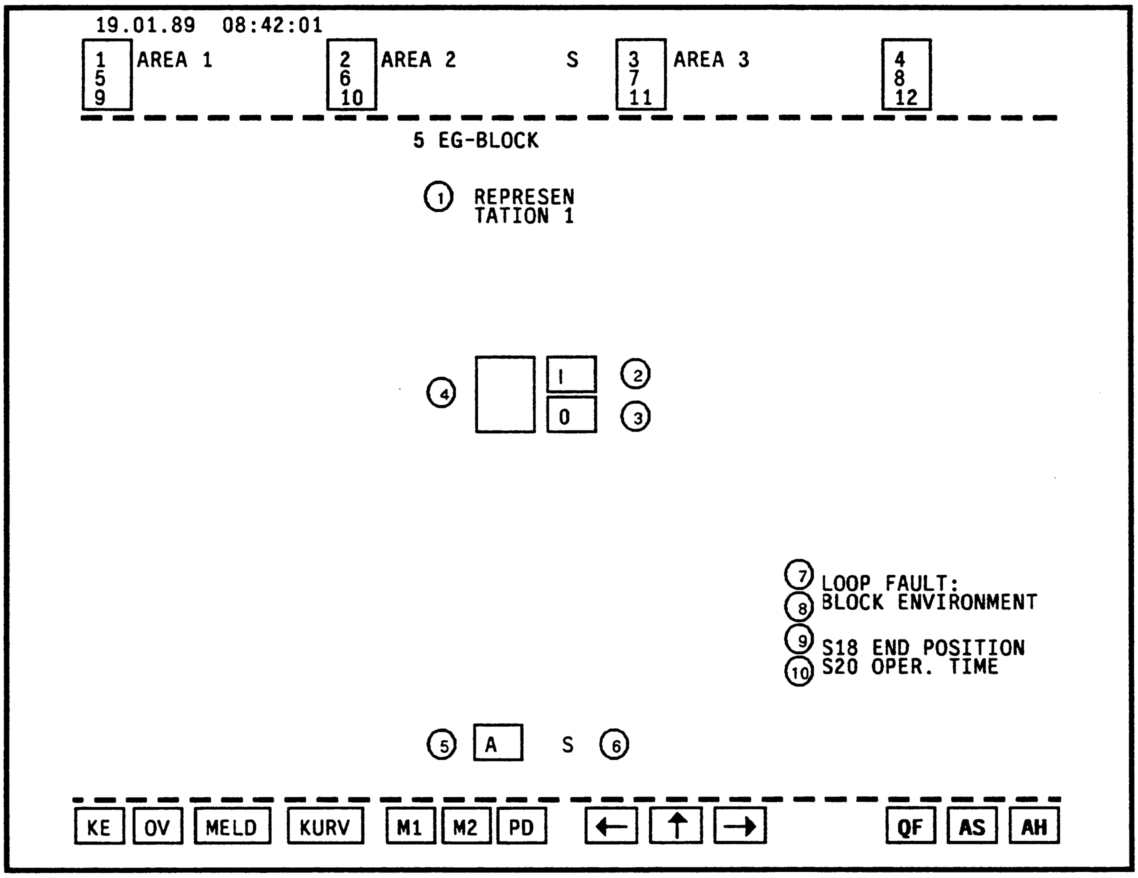


Fig. 4.3-19 Loop display for the EG block controlling a switch (representation 1)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	39 S16	8+8	gn	bk			
2	Key SWITCH ON	Status	2	bk	gn	"I"	27.27.27.0	Status display 60
3	Key SWITCH OFF	Status	2	bk	gn	"O"	27.27.27.1	Status display 61
4	Status display ON OFF	Status	3x3 3x3	bk bk	gn wh			Status display 211
5	Mode AUTOMATIC MANUAL	Status	2 2	bk bk	gn wh	"A" "H"	27.27.27.4 27.27.27.4	Status display 30
6	Blinking mark I&C fault	Status	1	ye	bk	"S"		Status display 16
7	LOOP FAULT	Segment	14	gn	bk			
8	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24
9	S18 END POSITION	3 AB	20	ye	bk			Status display 212
10	S20 OPER. TIME	4 AB	20	ye	bk			Status display 213

Legend of Fig. 4.3-19

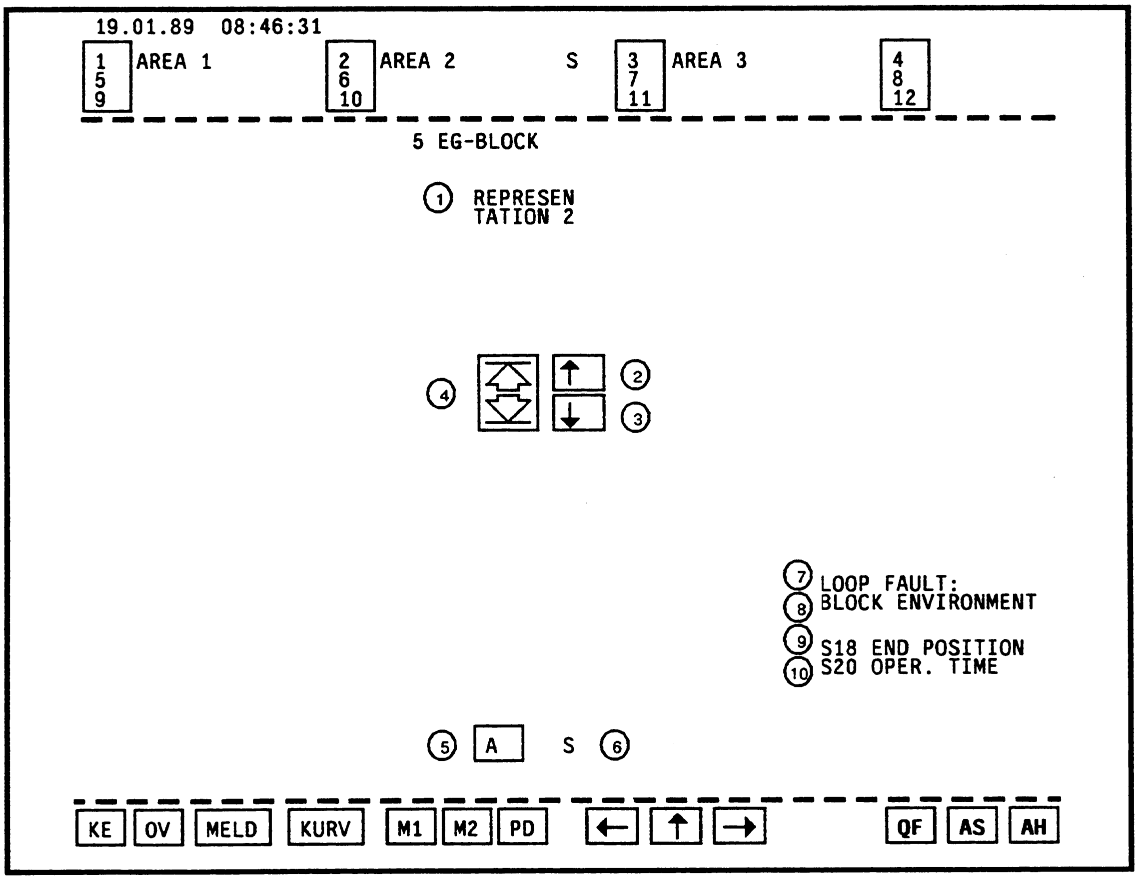


Fig. 4.3-20 Loop display for the EG block controlling a valve (representation 2)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	39 S16	8+8	gn	bk			
2	Key OPEN	Status	2	bk	gn	"↑"	27.27.27.2	Status display 20
3	Key CLOSE	Status	2	bk	gn	"↓"	27.27.27.3	Status display 21
4	Status display OPEN CLOSED	Status	3x3 3x3	bk bk	gn wh			Status display 214
5	Mode AUTOMATIC MANUAL	Status	2 2	bk bk	gn wh	"A" "H"	27.27.27.4 27.27.27.4	Status display 30
6	Blinking mark I&C fault	Status	1 1	ye gn	bk bk	"S" "+"		Status display 16
7	LOOP FAULT	Segment	14	gn	bk			
8	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24
9	S18 END POSITION	3 AB	20	ye	bk			Status display 212
10	S20 OPER. TIME	4 AB	20	ye	bk			Status display 213

Legend of Fig. 4.3-20

- **Standardized display for the EK block**

Application:

- Representation 1 of the EK block is used for controlling a valve for continuous operation without stop key (open, close), and for displaying the valve state (open, opening, closing, intermediate position).
- Representation 2 corresponds to representation 1, and features an additional position indicator.

The EK block is used for measuring signals from the open-loop control module 6DS1501 or from a channel of the open-loop control module 6DS1503, and for transferring commands to the open-loop control modules.

An open-loop control module (valve) is required if the EK block is to be monitored and controlled via the corresponding NORA for the EM block.

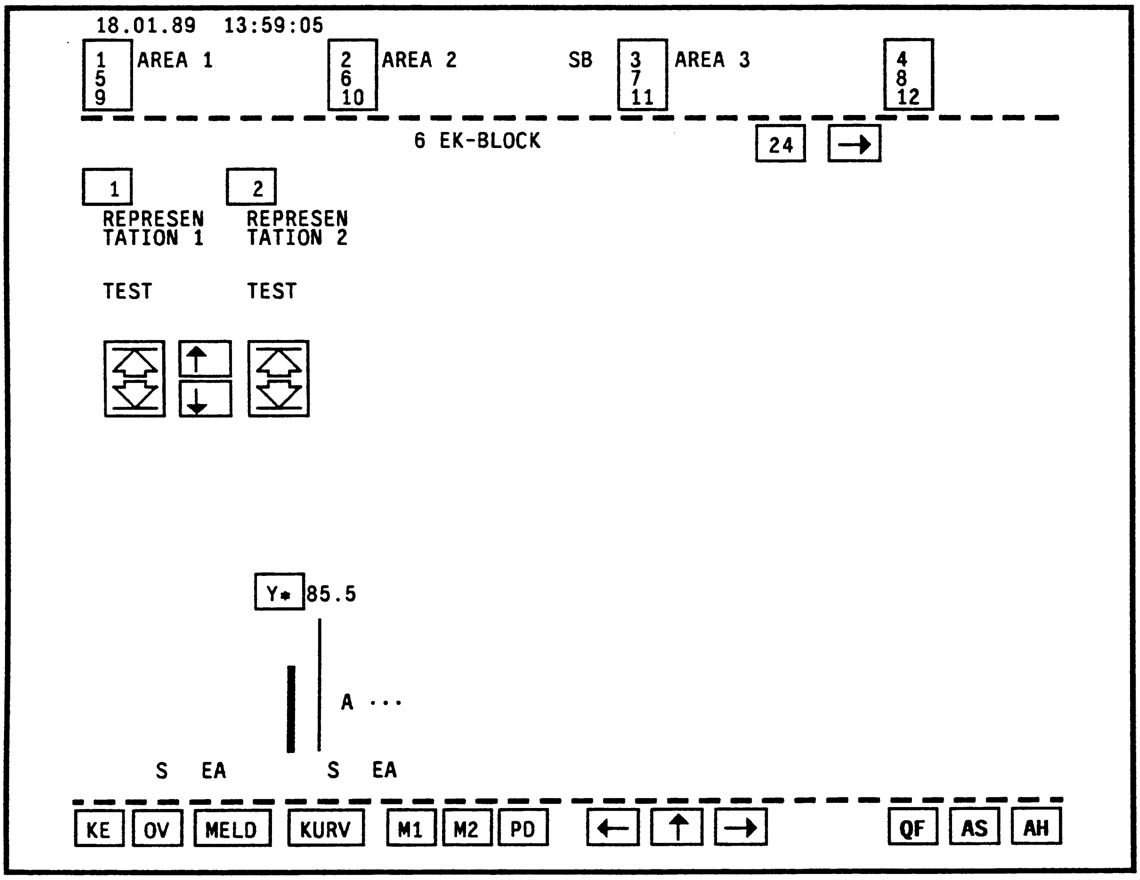
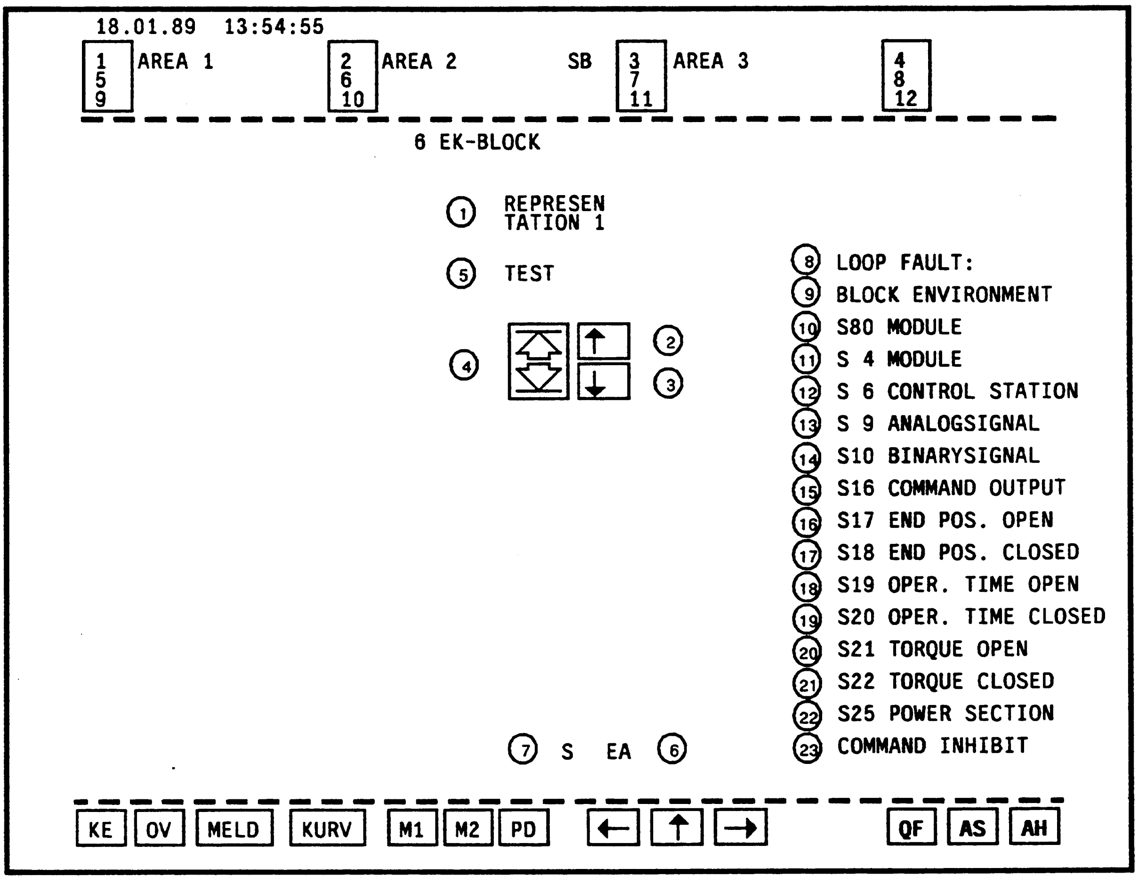


Fig. 4.3-21 Group display with the two representations of the EK block



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6 EK-BLOCK

① REPRESENTATION 1

⑤ TEST

⑦ S EA ⑥

⑧ LOOP FAULT:
⑨ BLOCK ENVIRONMENT
⑩ S80 MODULE
⑪ S 4 MODULE
⑫ S 6 CONTROL STATION
⑬ S 9 ANALOGSIGNAL
⑭ S10 BINARYSIGNAL
⑮ S16 COMMAND OUTPUT
⑯ S17 END POS. OPEN
⑰ S18 END POS. CLOSED
⑱ S19 OPER. TIME OPEN
⑲ S20 OPER. TIME CLOSED
⑳ S21 TORQUE OPEN
㉑ S22 TORQUE CLOSED
㉒ S25 POWER SECTION
㉓ COMMAND INHIBIT

Fig. 4.3-22 Loop display for representation 1 of the EK block

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	42 S16	8+8	gn	bk			
2	Key OPEN	Status	2	bk	gn	" ↑ "	16.1.16.1	Status display 20
3	Key CLOSE	Status	2	bk	gn	" ↓ "	17.1.17.1	Status display 21
4	State OPEN/CLOSED	Status	3x3	bk				Status display 245
5	Test position No test position	25 AB	4 4	ye	bk ws			Status display 164
6	Automatic enabled Automatic disabled	Status	2 2	gn gn	bk bk	"EA" "DA"		Status display 63
7	Blinking mark I&C fault	Status	1	ye	bk			Status display 244
8	LOOP FAULT	Segment	14	gn	bk			
9	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24
10	S80 MODULE	28 AB	20	ye	bk			Status display 56
11	S4 MODULE	27 AB	20	ye	bk			Status display 160
12	S6 CONTROL STATION	26 AB	20	ye	bk			Status display 165
13	S9 ANALOGSIGNAL	24 AB	20	ye	bk			Status display 171
14	S10 BINARYSIGNAL	15 AB	20	ye	bk			Status display 161
15	S16 COMMAND OUTPUT	16 AB	20	ye	bk			Status display 162
16	S17 END POS. OPEN	18 AB	20	ye	bk			Status display 172
17	S18 END POS. OPEN	19 AB	20	ye	bk			Status display 173
18	S19 OPER. TIME OPEN	22 AB	20	ye	bk			Status display 174
19	S20 OPER. TIME CLOSED	23 AB	20	ye	bk			Status display 175
20	S21 TORQUE OPEN	20 AB	20	ye	bk			Status display 176
21	S22 TORQUE CLOSED	21 AB	20	ye	bk			Status display 177
22	S25 POWER SECTION	14 AB	20	ye	bk			Status display 170
23	COMMAND INHIBIT	Status	20	ye	bk			Status display 241

Legend of Fig. 4.3-22

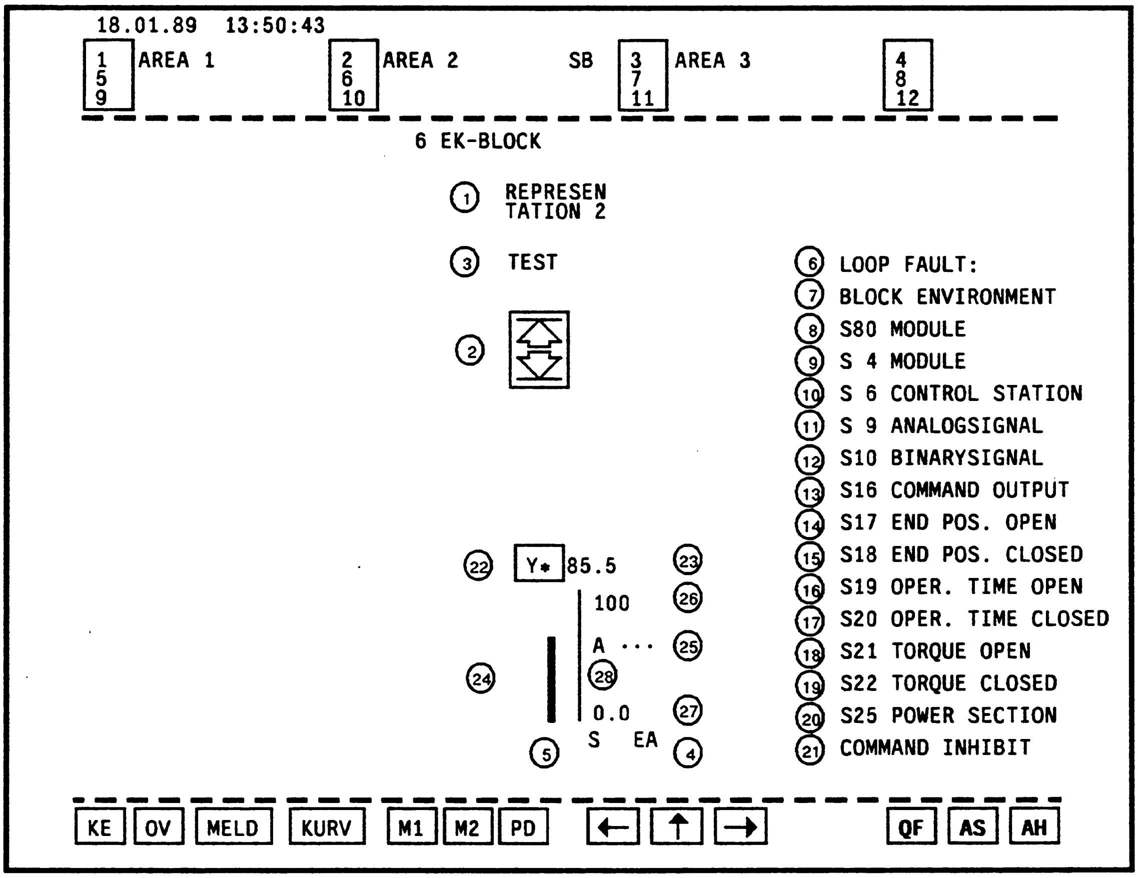


Fig. 4.3-23 Loop display for representation 2 of the EK block

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	42 S16	8+8	gn	bk			
2	State OPEN/CLOSED	Status	3x3					Status display 245
3	Test position No test position	25 AB	4 4	ye bk	bk ws			Status display 164
4	Automatic enabled Automatic disabled	Status	2 2	gn gn	bk bk	"EA" "DA"		Status display 63
5	Blinking mark I&C fault	Status	1	ye	bk			Status display 244
6	LOOP FAULT	Segment	14	gn	bk			
7	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24
8	S80 MODULE	28 AB	20	ye	bk			Status display 56
9	S4 MODULE	27 AB	20	ye	bk			Status display 160
10	S6 CONTROL STATION	26 AB	20	ye	bk			Status display 165
11	S9 ANALOGSIGNAL	24 AB	20	ye	bk			Status display 171
12	S10 BINARYSIGNAL	15 AB	20	ye	bk			Status display 161
13	S16 COMMAND OUTPUT	16 AB	20	ye	bk			Status display 162
14	S17 END POS. OPEN	18 AB	20	ye	bk			Status display 172
15	S18 END POS. CLOSED	19 AB	20	ye	bk			Status display 173
16	S19 OPER. TIME OPEN	27 AB	20	ye	bk			Status display 174
17	S20 OPER. TIME CLOSED	23 AB	20	ye	bk			Status display 175
18	S21 TORQUE OPEN	20 AB	20	ye	bk			Status display 176
19	S22 TORQUE CLOSED	21 AB	20	ye	bk			Status display 177
20	S25 POWER SECTION	14 AB	20	ye	bk			Status display 170
21	COMMAND INHIBIT	Status	20	ye	bk			Status display 241
22	Process-related name	35 S2	2	bk	or			
23	Binary display	4 PA	4	or	bk			
24	Bar value	4 PA	5	or	bk			
25	Unit	41 S4	4	gn	bk			
26	Binary display	1 EA	3	gn	bk			
27	Binary display	2 EA	3	gn	bk			
28	Auxiliary display line	Segment	5	gn	bk			

Legend of Fig. 4.3-23

- **Standardized display for the EM block**

Application:

- Representation 1 of the EM block is used for controlling a motor (switch on, switch off), and for displaying the motor state (on, off), without motor current indication.

The EM block is used for measuring signals from the open-loop control module 6DS1500 or from a channel of the open-loop control module 6DS1502, and for transferring commands to the open-loop control modules.

An open-loop control module (motor) is required if the EM block is to be monitored and controlled via the corresponding NORA for the EM block.

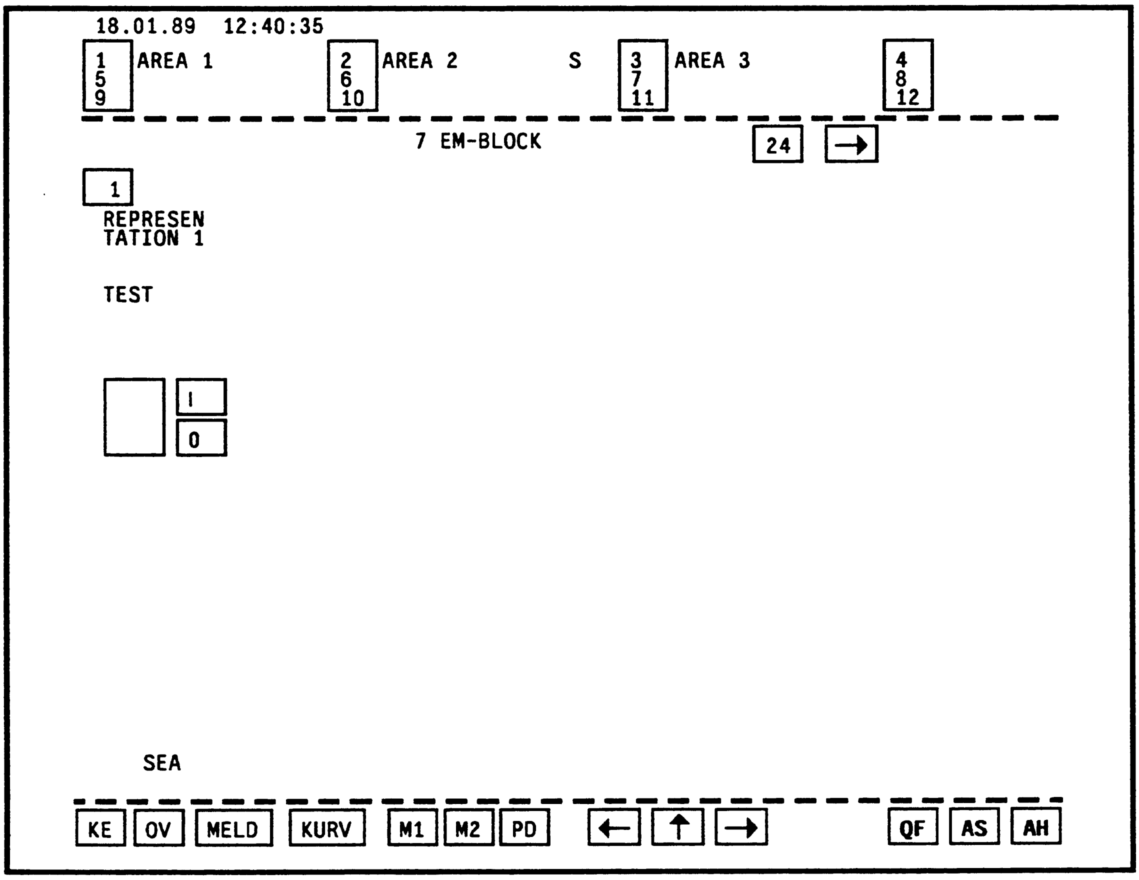


Fig. 4.3-24 Loop display for the EM block without motor current indicator

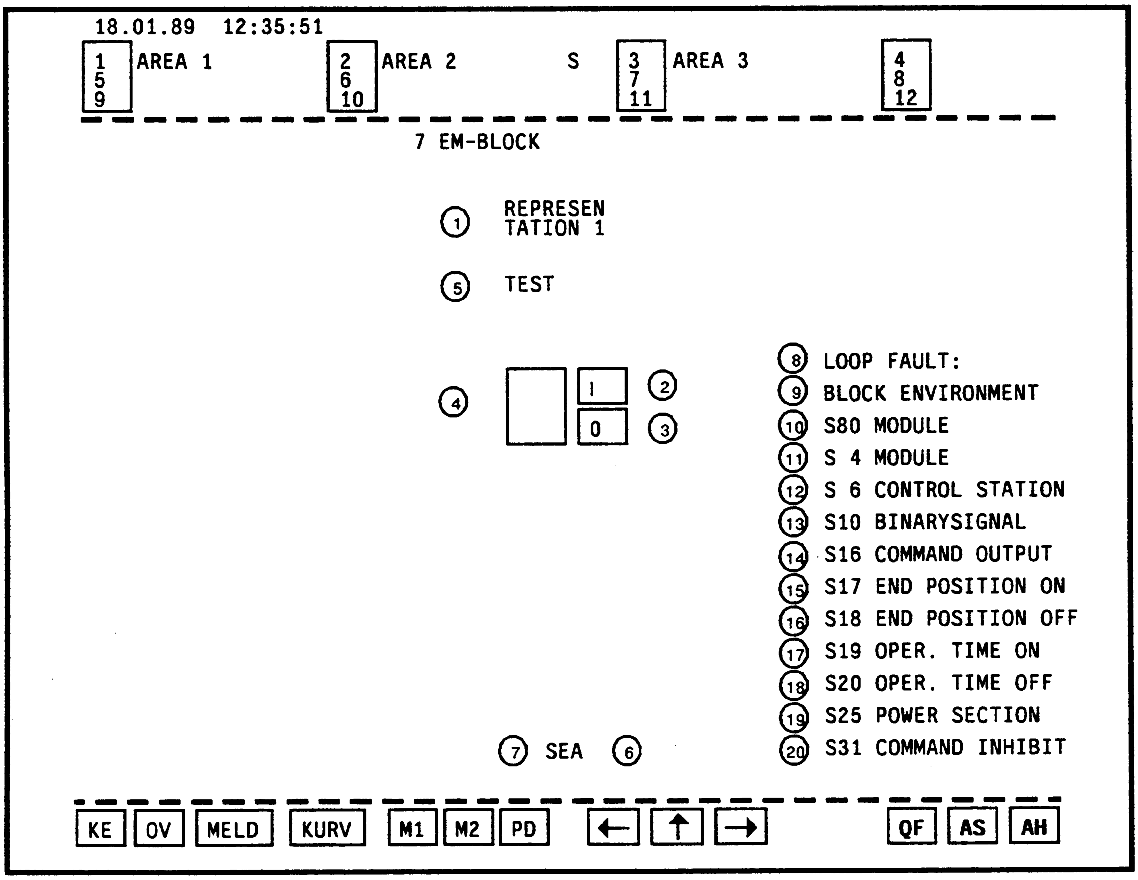


Fig. 4.3-25 Loop display for the EM block without motor current indicator

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	12 S16	8+8	gn	bk			
2	Key SWITCH ON	Status	2 2	bk bk	gn gn	" I " " I "	20.1.0.0 20.1.0.0	Status display 60
3	Key SWITCH OFF	Status	2 2	bk bk	gn gn	" 0 " " 0 "	21.0.0.0 21.0.0.0	Status display 61
4	Status display ON OFF	Status	3x3 3x3	bk bk	wh gn			Status display 62
5	Test position No test position	13 AB	4 4	ye bk	bk bk	"TEST" " "		Status display 164
6	Automatic enabled Automatic disabled	Status	2 2	gn gn	bk bk	"EA" "DA"		Status display 63
7	Blinking mark I&C fault	Status	1 1	ye gn	bk bk	"S" " + "		Status display 15
8	LOOP FAULT	Segment	14	gn	bk			
9	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24
10	S80 MODULE	Status	20	ye	bk			Status display 56
11	S4 MODULE	17 AB	20	ye	bk			Status display 160
12	S6 CONTROL STATION	16 AB	20	ye	bk			Status display 165
13	S10 BINARYSIGNAL	8 AB	20	ye	bk			Status display 161
14	S16 COMMAND OUTPUT	9 AB	20	ye	bk			Status display 162
15	S17 END POSITION ON	12 AB	20	ye	bk			Status display 166
16	S18 END POSITION OFF	11 AB	20	ye	bk			Status display 167
17	S19 OPER. TIME OPEN	15 AB	20	ye	bk			Status display 168
18	S20 OPER. TIME OFF	14 AB	20	ye	bk			Status display 169
19	S25 POWER SECTION	7 AB	20	ye	bk			Status display 170
20	S31 COMMAND INHIBIT	10 AB	20	ye	bk			Status display 163

Legend of Fig. 4.3-25

- **Standardized display for the EU block**

Application:

- Representation 1 of the EU block is used for controlling a motor (switch on, switch off), and for displaying the motor state (on, off), without motor current indicator.
- Representation 2 corresponds to representation 1, and includes a motor current indicator.

The EU block is used for measuring signals from the open-loop control module 6DS1500 or from a channel of the open-loop control module 6DS1502, and for transferring commands to the open-loop control modules.

An open-loop control module (motor) is required if the EU block is to be monitored and controlled via the corresponding NORA for the EU block.

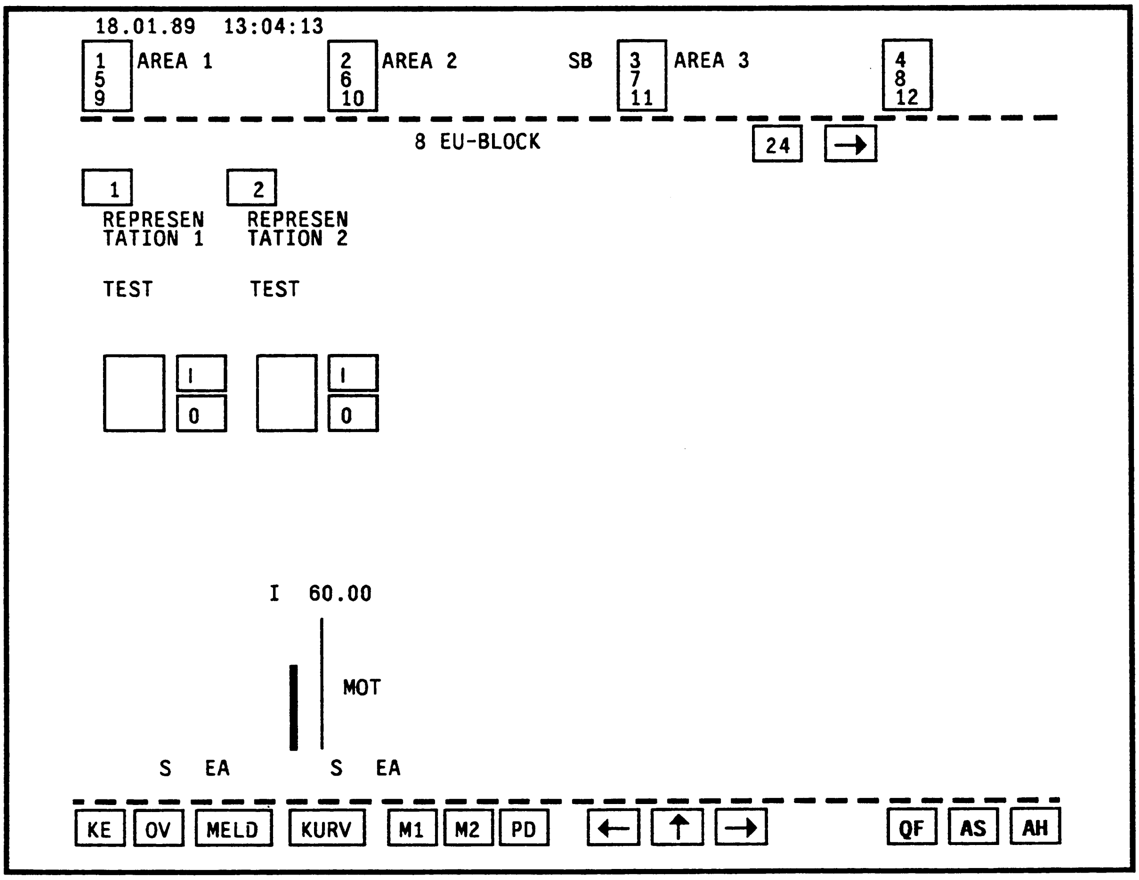


Fig. 4.3-26 Group display with the two representations of the EU block

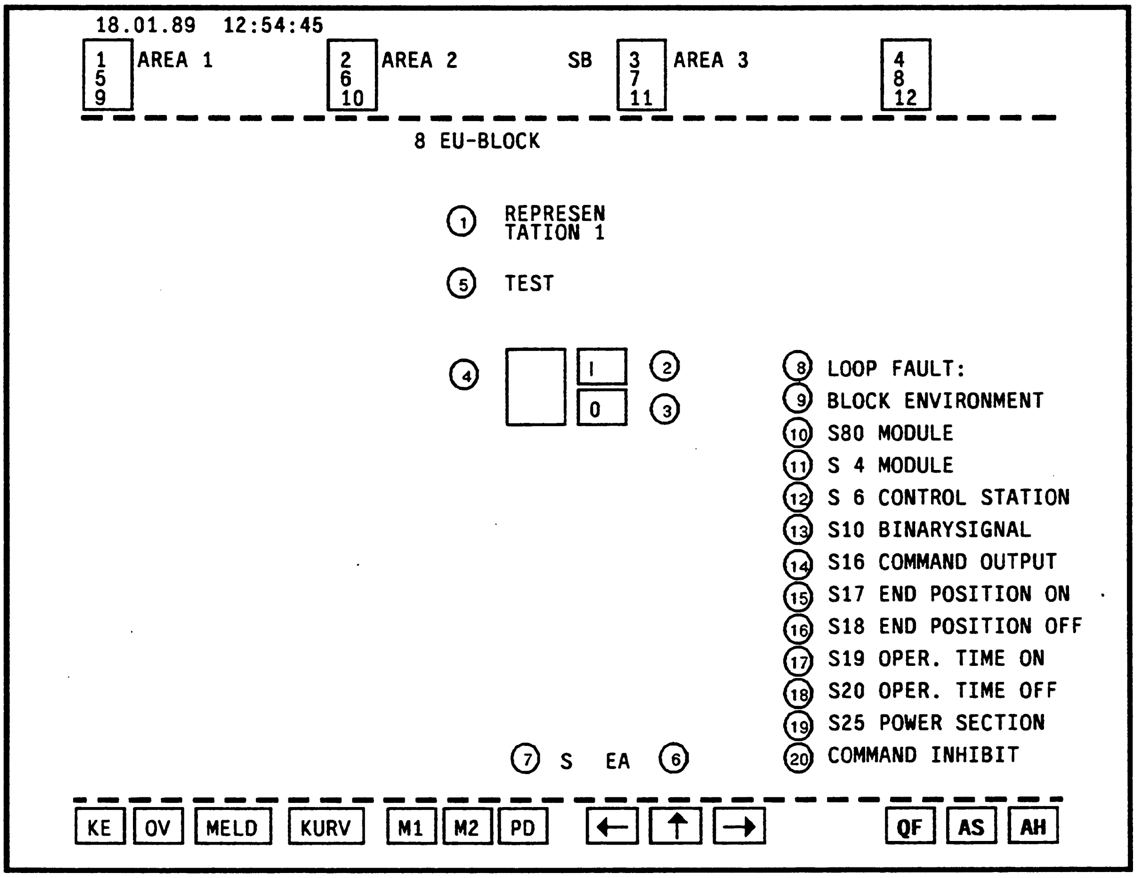


Fig. 4.3-27 Loop display for representation 1 of the EU block

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	34 S16	8+8	gn	bk			
2	Key SWITCH ON	Status	2	bk	gn	" I "	28.28.0.0	Status display 60
3	Key SWITCH OFF	Status	2	bk	gn	" 0 "	28.28.28.0	Status display 61
4	State ON/OFF	Status	3x3	bk	gn			Status display 242
5	Test position No test position	13 AB	4 4	ye bk	bk wh			Status display 164
6	Automatic enabled Automatic disabled	Status	2 2	gn	bk bk	"EA" "DA"		Status display 63
7	Blinking mark I&C fault	Status	1	ye	bk			Status display 243
8	LOOP FAULT	Segment	14	gn	bk			
9	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24
10	S80 MODULE	18 AB	20	ye	bk			Status display 56
11	S4 MODULE	17 AB	20	ye	bk			Status display 160
12	S6 CONTROL STATION	16 AB	20	ye	bk			Status display 165
13	S10 BINARYSIGNAL	8 AB	20	ye	bk			Status display 161
14	S16 COMMAND OUTPUT	9 AB	20	ye	bk			Status display 162
15	S17 END POSITION ON	12 AB	20	ye	bk			Status display 166
16	S18 END POSITION OFF	11 AB	20	ye	bk			Status display 167
17	S19 OPER. TIME ON	15 AB	20	ye	bk			Status display 168
18	S20 OPER. TIME OFF	14 AB	20	ye	bk			Status display 169
19	S25 POWER SECTION	7 AB	20	ye	bk			Status display 170
20	COMMAND INHIBIT	Status	20	ye	bk			Status display 241

Legend of Fig. 4.3-27

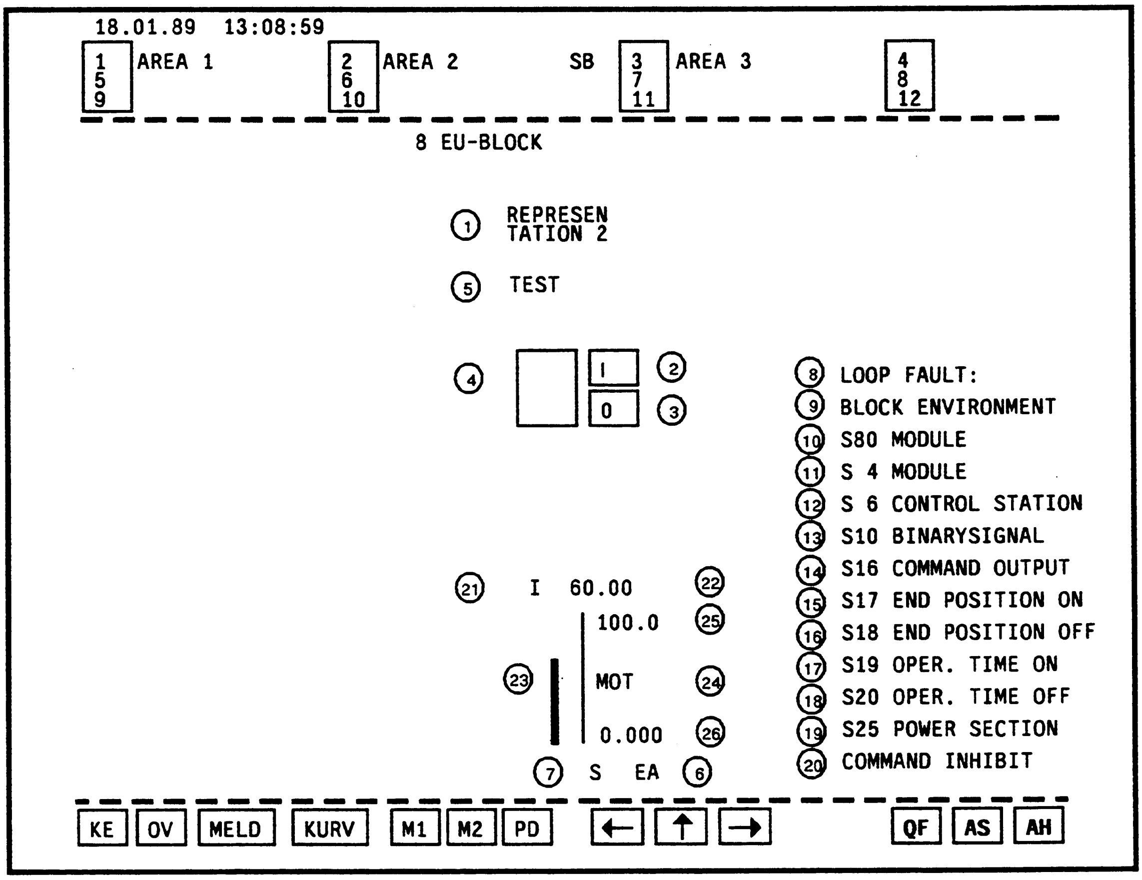


Fig. 4.3-28 Loop display for representation 2 of the EU block

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	34 S16	8+8	gn	bk			
2	Key SWITCH ON	Status	2	bk	gn	" I "	28.28.0.0	Status display 60
3	Key SWITCH OFF	Status	2	bk	gn	" 0 "	28.28.28.0	Status display 61
4	State ON/OFF	Status	3x3					Status display 242
5	Test position No test position	13 AB	4 4	gn bk	bk wh			Status display 164
6	Automatic enabled Automatic disabled	Status	2 2	gn wh	bk bk			Status display 63
7	Blinking mark I&C fault	Status	1	ye	bk			Status display 243
8	LOOP FAULT	Segment	14	gn	bk			
9	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24
10	S80 MODULE	18 AB	20	ye	bk			Status display 56
11	S4 MODULE	17 AB	20	ye	bk			Status display 160
12	S6 CONTROL STATION	16 AB	20	ye	bk			Status display 165
13	S10 BINARYSIGNAL	8 AB	20	ye	bk			Status display 161
14	S16 COMMAND OUTPUT	9 AB	20	ye	bk			Status display 162
15	S17 END POSITION ON	12 AB	20	ye	bk			Status display 166
16	S18 END POSITION OFF	11 AB	20	ye	bk			Status display 167
17	S19 OPER. TIME ON	15 AB	20	ye	bk			Status display 168
18	S20 OPER. TIME OFF	14 AB	20	ye	bk			Status display 169
19	S25 POWER SECTION	7 AB	20	ye	bk			Status display 170
20	COMMAND INHIBIT	Status	20	ye	bk			Status display 241
21	Process-related name	32 S2	2	ye	bk			
22	Binary display	2 EA	5	ye	bk			
23	Bar value	2 EA	5	ye	bk			
24	Unit	33 S4	4	ye	bk			
25	Binary display	1 EA	5	gn	bk			
26	Binary display	3 EA	5	gn	bk			
27	Auxiliary display line	Segment	5	gn	bk			

Legend of Fig. 3.4-28

- **Standardized display for the EV block**

Application:

- Representation 1 of the EV block is used for controlling a valve for continuous operation without stop key (open, close), and for displaying the valve state (open, opening, closing, intermediate position).

The EV block is used for measuring signals from the open-loop control module 6DS1501 or from a channel of the open-loop control module 6DS1503, and for transferring commands to the open-loop control modules.

An open-loop control module (valve) is required if the EV block is to be monitored and controlled via the corresponding NORA for the EV block.

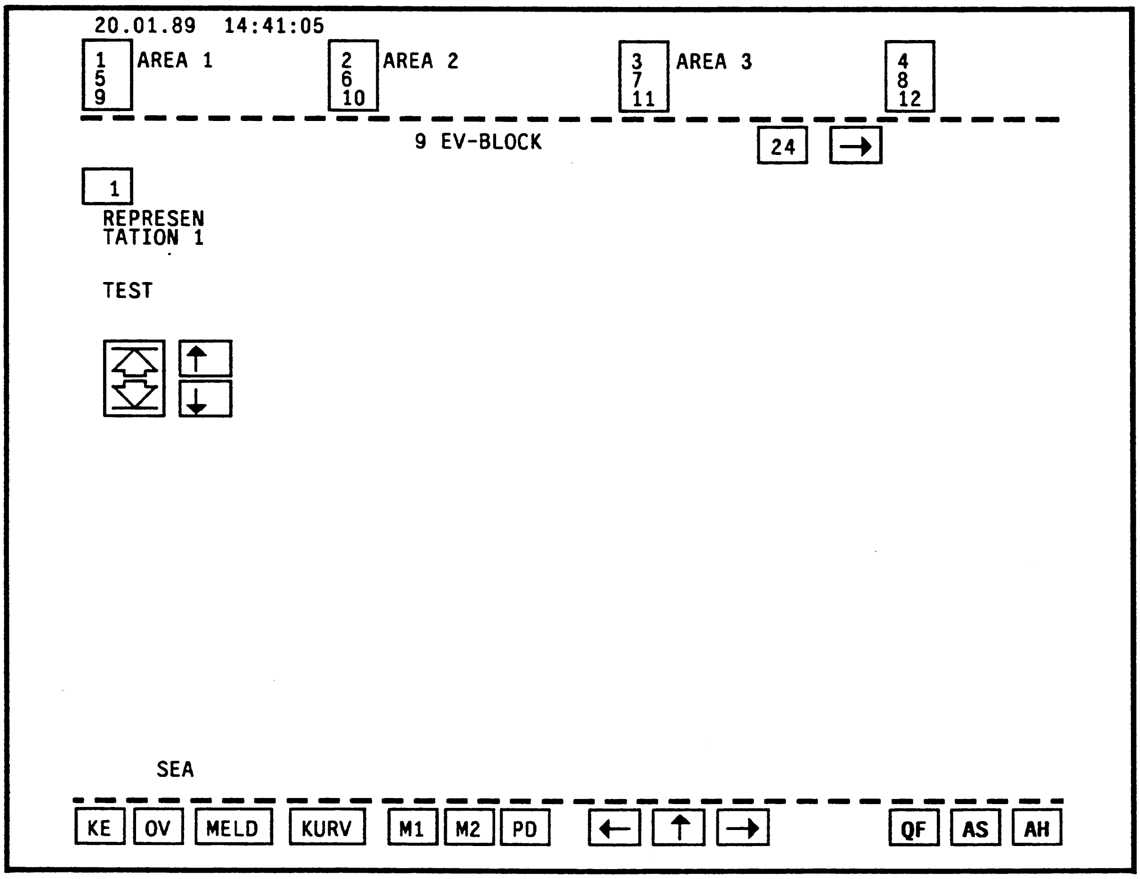


Fig. 4.3-29 Group display of the EV block for continuous operation without stop key

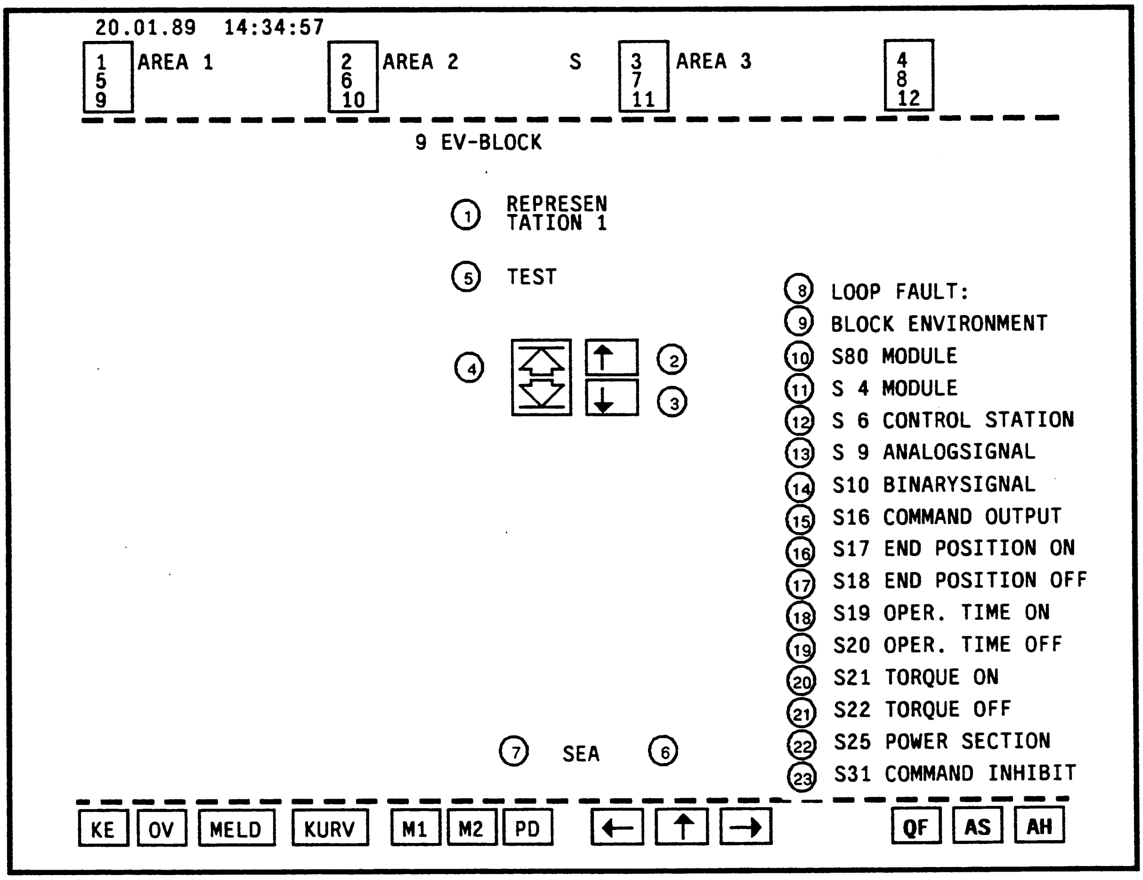


Fig. 4.3-30 Loop display of the EV block for continuous operation without stop key

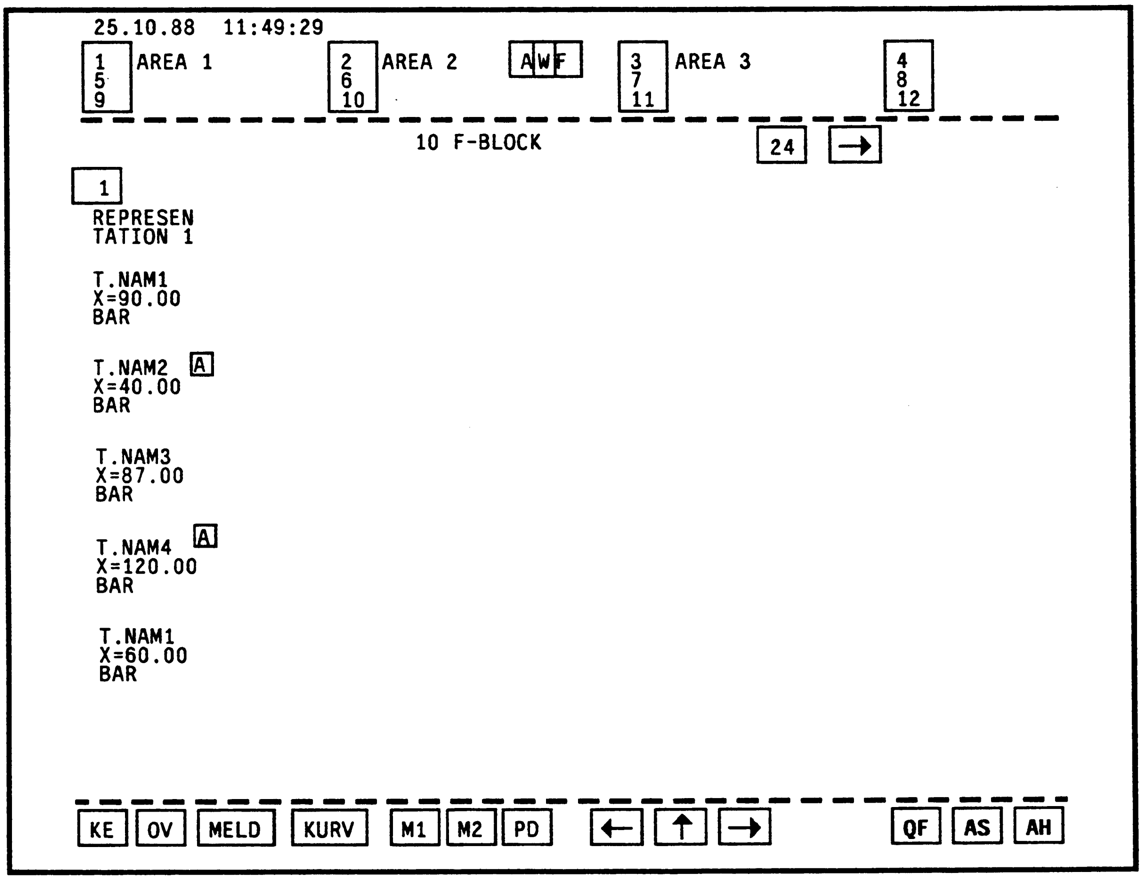
No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	12 S16	8+8	gn	bk			
2	Key SWITCH ON	Status	2 2	bk bk	gn gn	" ↑ " " ↑ "	16.1.0.0 16.1.0.0	Status display 20
3	Key SWITCH OFF	Status	2 2	bk bk	gn gn	" ↓ " " ↓ "	17.1.0.0 17.1.0.0	Status display 21
4	Status display OPENING OPEN CLOSING CLOSED	Status	3x3 3x3 3x3 3x3	bk bk bk bk	gn gn wh wh			Status display 71
5	Test position No test position	25 AB	4 4	ye wh	bk bk			Status display 164
6	Automatic enabled Automatic disabled	Status	2 2	gn wh	bk bk	"EA" "DA"		Status display 63
7	Blinking mark I&C fault	Status	1 1	ye gn	bk bk	"S" " + "		Status display 16
8	LOOP FAULT	Segment	14	gn	bk			
9	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24
10	S80 MODULE	Status	20	ye	bk			Status display 56
11	S4 MODULE	28 AB	20	ye	bk			Status display 160
12	S6 CONTROL STATION	26 AB	20	ye	bk			Status display 165
13	S9 ANALOGSIGNAL	24 AB	20	ye	bk			Status display 171
14	S10 BINARYSIGNAL	15 AB	20	ye	bk			Status display 161
15	S16 COMMAND OUTPUT	16 AB	20	ye	bk			Status display 162
16	S17 END POSITION OPEN	19 AB	20	ye	bk			Status display 172
17	S18 END POSITION CLOSED	18 AB	20	ye	bk			Status display 173
18	S20 OPER. TIME OPEN	22 AB	20	ye	bk			Status display 174
19	S25 OPER. TIME CLOSED	23 AB	20	ye	bk			Status display 175
20	S21 TORQUE OPEN	20 AB	20	ye	bk			Status display 176
21	S22 TORQUE CLOSED	21 AB	20	ye	bk			Status display 177
22	S25 POWER SECTION	14 AB	20	ye	bk			Status display 170
23	S31 COMMAND INHIBIT	17 AB	20	ye	bk			Status display 163

Legend to Fig. 4.3-30

- **Standardized display for the F block**

Application:

- Representation 1 of the F block is used for displaying five measured values and monitoring these values to remain within a given pair of limit values (upper limit value, lower limit value).



```
25.10.88  11:49:29
1 AREA 1     2 AREA 2   AWF   3 AREA 3     4
5            6                7            8
9            10               11           12

                10 F-BLOCK              24  →
1
REPRESEN
TATION 1

T.NAM1
X=90.00
BAR

T.NAM2 A
X=40.00
BAR

T.NAM3
X=87.00
BAR

T.NAM4 A
X=120.00
BAR

T.NAM1
X=60.00
BAR

KE  OV  MELD  KURV  M1  M2  PD   ←  ↑  →    QF  AS  AH
```

Fig. 4.3-31 Loop display for the F block

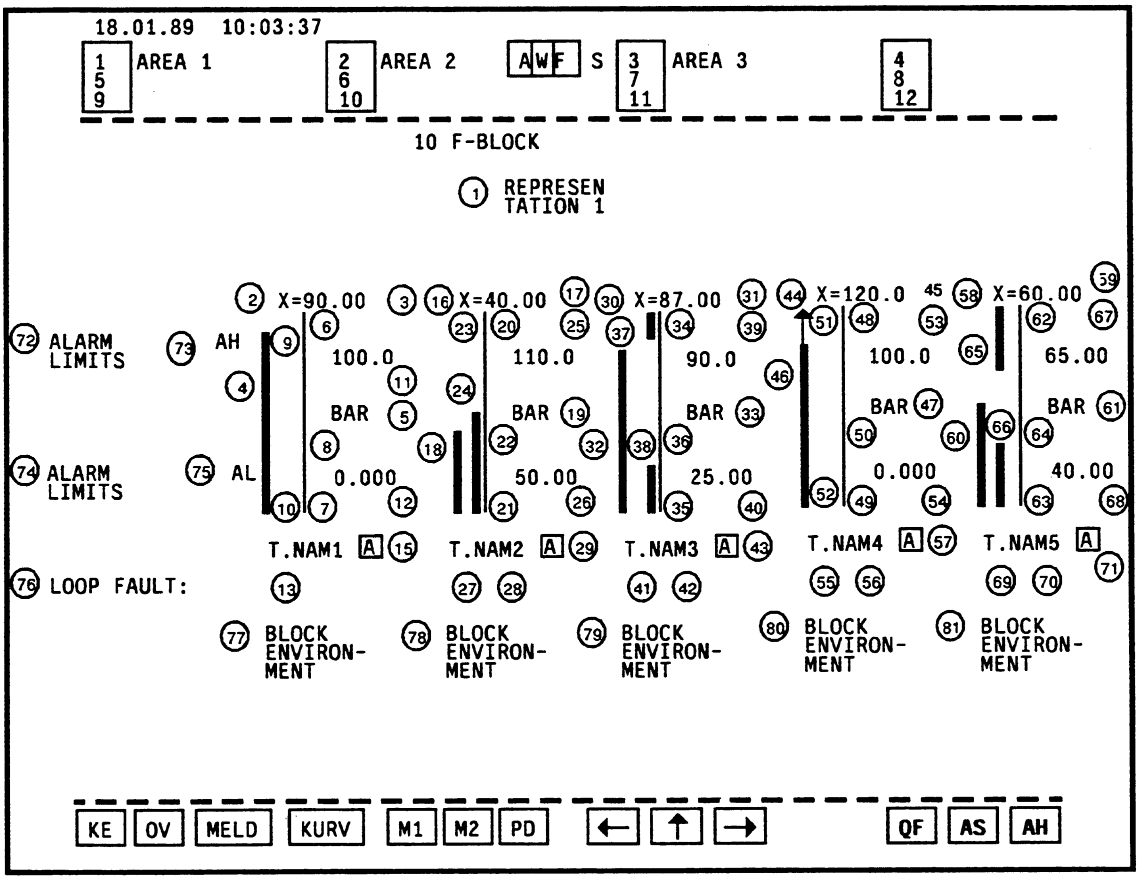


Bild 4.3-32 Loop display for the F block

	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	49 S16	8+8	gn	bk			
2	Mnemonic name 1	Segment	2	ye	bk			
3	Binary display 1	2 EA	5	ye	bk			
4	Analog display 1	2 EA	≤10	ye	bk			Scaling val., default 100.0; may be altered using FRANZ
5	Unit 1	36 S4	4	ye	bk			
6	Upper display range limit value 1	Segment	5	gn	bk			Scaling values of 4
7	Lower display range limit value 1	Segment	5	gn	bk			Scaling values of 4
8	Display range 1	Segment	10	gn	bk			
9	Analog display of upper display limit 1	1 EA	≤10	rd	bk			Scaling values of 4
10	Analog display of lower display limit 1	3 EA	≤10	rd	bk			Scaling values of 4
11	Binary display of upper display limit 1	1 EA	5	rd	bk			
12	Binary display of lower display limit 1	3 EA	5	rd	bk			
13 14	Process-related name 1 Process-related name 1	34 S4 35 S4	4 2	gn gn	bk bk			Left-hand part Right-hand part
15	Blinking mark alarm 1	Status	1	wh	rd			Status display 80
16	Mnemonic name 2	Segment	2	ye	bk			
17	Binary display 2	5 EA	5	ye	bk			
18	Analog display 2	5 EA	≤10	ye	bk			Scaling val., default 100.0; may be altered using FRANZ
19	Unit 2	39 S4	4	ye	bk			
20	Upper display range limit value 2	Segment	5	gn	bk			Scaling values of 18
21	Lower display range limit value 2	Segment	5	gn	bk			Scaling values of 18
22	Display range 2	Segment	10	gn	bk			
23	Analog display of upper display limit 2	4 EA	≤10	rd	bk			Scaling values of 18
24	Analog display of lower display limit 2	6 EA	≤10	rd	bk			Scaling values of 18
25	Binary display of upper display limit 2	4 EA	5	rd	bk			
26	Binary display of lower display limit 2	6 EA	5	rd	bk			

Legend of Fig. 4.3-32, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
27 28	Process-related name 2 Process-related name 2	37 S4 38 S4	4 2	gn gn	bk bk			Left-hand part Right-hand part
29	Blinking mark alarm 2	Status	1	wh	rd			Status display 81
30	Mnemonic name 3	Segment	2	ye	bk			
31	Binary display 3	8 EA	5	ye	bk			
32	Analog display 3	8 EA	≤10	ye	bk			Scaling values, default 100.0; may be altered using FRANZ
33	Unit 3	42 S4	4	ye	bk			
34	Upper display range limit value 3	Segment	5	gn	bk			Scaling values of 32
35	Lower display range limit value 3	Segment	5	gn	bk			Scaling values of 32
36	Display range 3	Segment	10	gn	bk			
37	Analog display of upper display limit 3	7 EA	≤10	rd	bk			Scaling values of 32
38	Analog display of lower display limit 3	9 EA	≤10	rd	bk			Scaling values of 32
39	Binary display of upper display limit 3	7 EA	5	rd	bk			
40	Binary display of lower display limit 3	9 EA	5	rd	bk			
41	Process-related name 3 Process-related name 3	40 S4 41 S4	4 2	gn gn	bk bk			Left-hand part Right-hand part
43	Blinking mark alarm 3	Status	1	wh	rd			Status display 82
44	Mnemonic name 4	Segment	2	ye	bk			
45	Binary display 4	11 EA	5	ye	bk			
46	Analog display 4	11 EA	≤10	ye	bk			Scaling values, default 100.0; may be altered using FRANZ
47	Unit 4	45 S4	4	ye	bk			
48	Upper display range limit value 4	Segment	5	gn	bk			Scaling values of 46
49	Lower display range limit value 4	Segment	5	gn	bk			Scaling values of 46
50	Display range 4	Segment	10	gn	bk			
51	Analog display of upper display limit 4	10 EA	≤10	rd	bk			Scaling values of 46
52	Analog display of lower display limit 4	12 EA	≤10	rd	bk			Scaling values of 46

Legend of Fig. 4.3-32, part 2

	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
53	Binary display of upper display limit 4	10 EA	5	rd	bk			
54	Binary display of lower display limit 4	12 EA	5	rd	bk			
55	Process-related name 4 Process-related name 4	43 S4 44 S4	4 2	gn gn	bk bk			Left-hand part Right-hand part
57	Blinking mark alarm 4	Status	1	wh	rd			Status display 83
58	Mnemonic name 5	Segment	2	ye	bk			
59	Binary display 5	14 EA	5	ye	bk			
60	Analog display 5	14 EA	≤10	ye	bk			Scaling values, default 100.0; may be altered using FRANZ
61	Unit 5	48 S4	4	ye	bk			
62	Upper display range limit value 5	Segment	5	gn	bk			Scaling values of 60
63	Lower display range limit value 5	Segment	5	gn	bk			Scaling values of 60
64	Display range 5	Segment	10	gn	bk			
65	Analog display of upper display limit 5	13 EA	≤10	rd	bk			Scaling values of 60
66	Analog display of lower display limit 5	15 EA	≤10	rd	bk			Scaling values of 60
67	Binary display of upper display limit 5	13 EA	5	rd	bk			
68	Binary display of lower display limit 5	15 EA	5	rd	bk			
69 70	Process-related name 5 Process-related name 5	46 S4 47 S4	4 2	gn gn	bk bk			Left-hand part Right-hand part
71	Blinking mark alarm 5	Status	1	wh	rd			Status display 84
72	ALARM LIMITS	Segment	10	gn	bk			
73	Mnemonic name	Segment	2	gn	bk			
74	ALARM LIMITS	Segment	10	gn	bk			
75	Mnemonic name	Segment	2	gn	bk			
76	LOOP FAULT	Segment	14	gn	bk			
77	BLOCK ENVIRONMENT	Status	8 + 8	ye	bk			Status display 85
78	BLOCK ENVIRONMENT	Status	8 + 8	ye	bk			Status display 85
79	BLOCK ENVIRONMENT	Status	8 + 8	ye	bk			Status display 85
80	BLOCK ENVIRONMENT	Status	8 + 8	ye	bk			Status display 85
81	BLOCK ENVIRONMENT	Status	8 + 8	ye	bk			Status display 85

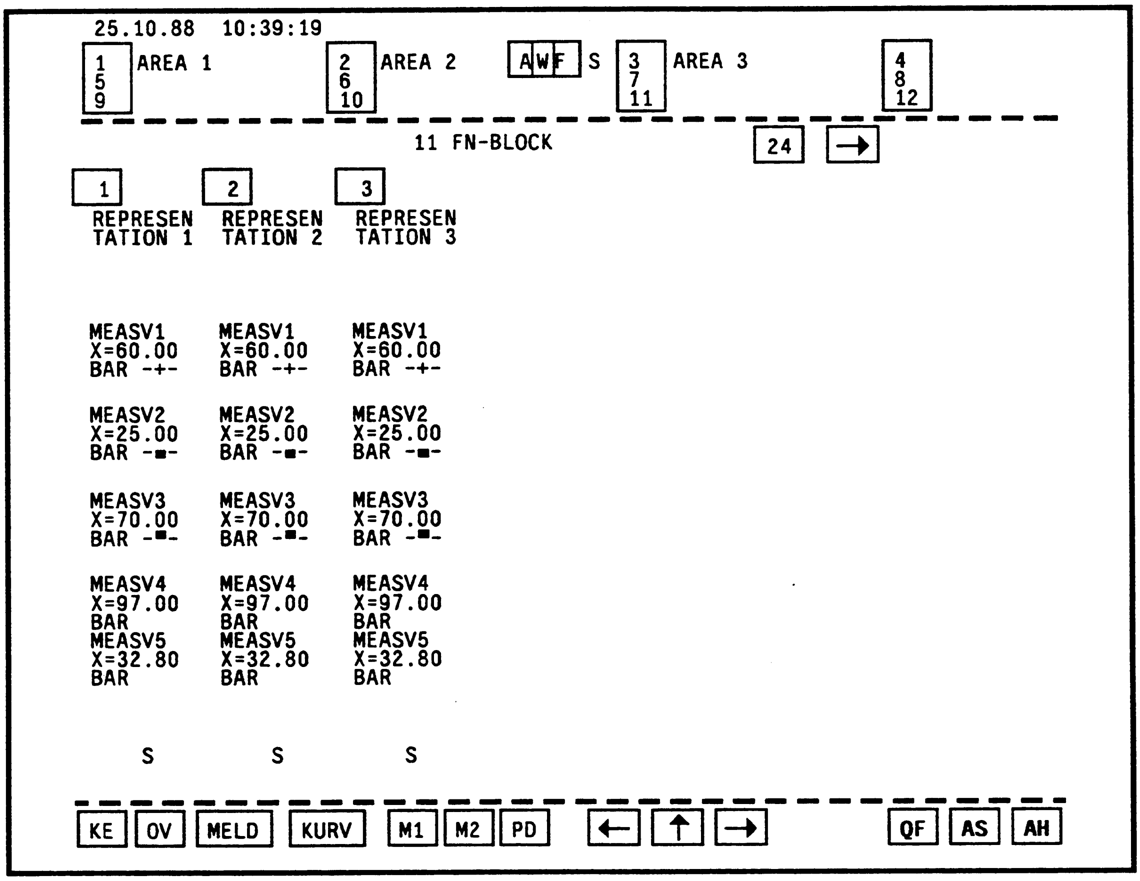
Legend of Fig. 4.3-32, part 3

- **Standardized display for the FN block**

Application:

- The FN block features three representations which are used for displaying five measured values. The first three measured values are monitored for one pair of limit values (upper and lower limit value) each. Display range and limit values are read from the AS when the display is selected. The limit values are displayed as "approaching bars".
- Representation 1 is used for monitoring the WARNING limits (WFA mode = 0).
- Representation 2 is used for monitoring the FAULT limits (WFA mode = 1).
- Representation 3 is used for monitoring the ALARM limits (WFA mode = 2).

Design requirements enable the FN block in acknowledged fault state (S) to be repeatedly acknowledged.



```
   25.10.88  10:39:19
 1  AREA 1          2  AREA 2     A W F  S  3  AREA 3           4
 5                  6                       7                   8
 9                  10                      11                  12
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                           11 FN-BLOCK                  24   →
  1          2          3
 REPRESEN   REPRESEN   REPRESEN
 TATION 1   TATION 2   TATION 3


 MEASV1     MEASV1     MEASV1
 X=60.00    X=60.00    X=60.00
 BAR -+-    BAR -+-    BAR -+-

 MEASV2     MEASV2     MEASV2
 X=25.00    X=25.00    X=25.00
 BAR -■-    BAR -■-    BAR -■-

 MEASV3     MEASV3     MEASV3
 X=70.00    X=70.00    X=70.00
 BAR -▀-    BAR -▀-    BAR -▀-

 MEASV4     MEASV4     MEASV4
 X=97.00    X=97.00    X=97.00
 BAR        BAR        BAR
 MEASV5     MEASV5     MEASV5
 X=32.80    X=32.80    X=32.80
 BAR        BAR        BAR


     S          S          S
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 KE  OV  MELD  KURV  M1  M2  PD   ←  ↑  →        QF  AS  AH
```

Fig. 4.3-33 Loop display with the three representations of the FN block

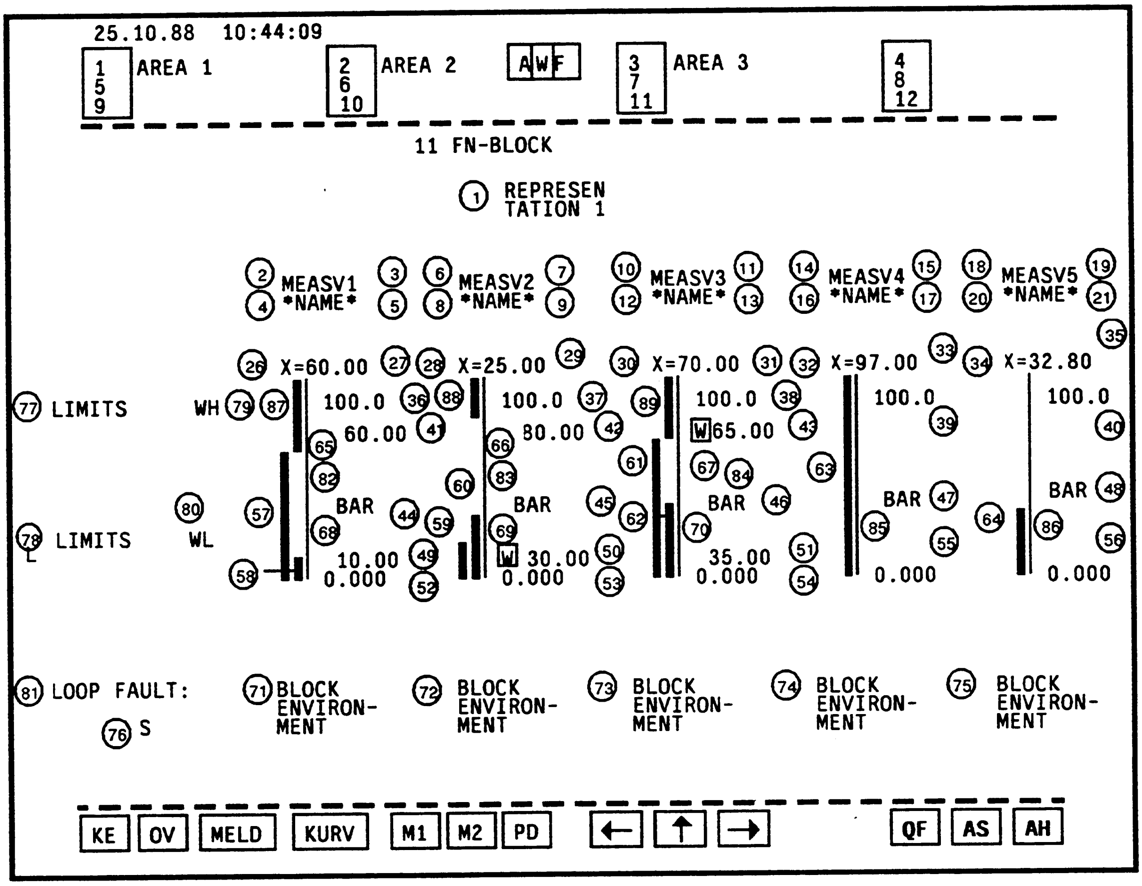


Fig. 4.3-34 Loop display for the FN block (representation 1)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	93 S16	8+8	gn	bk			
2	Measured value name 1	68 S4	4	gn	bk			
3	Measured value name 1	50 S2	2	gn	bk			
4	Measured value name 1	51 S2	2	gn	bk			
5	Measured value name 1	69 S4	2	gn	bk			
6	Measured value name 2	71 S4	2	gn	bk			
7	Measured value name 2	52 S2	2	gn	bk			
8	Measured value name 2	53 S2	2	gn	bk			
9	Measured value name 2	72 S4	4	gn	bk			

Legend of Fig. 4.3-34, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
10	Measured value name 3	74 S4	4	gn	bk			
11	Measured value name 3	54 S2	2	gn	bk			
12	Measured value name 3	55 S2	2	gn	bk			
13	Measured value name 3	75 S4	4	gn	bk			
14	Measured value name 4	77 S4	4	gn	bk			
15	Measured value name 4	56 S2	2	gn	bk			
16	Measured value name 4	57 S2	2	gn	bk			
17	Measured value name 4	78 S5	4	gn	bk			
18	Measured value name 5	80 S4	4	gn	bk			
19	Measured value name 5	58 S2	2	gn	bk			
20	Measured value name 5	59 S2	2	gn	bk			
21	Measured value name 5	81 S4	4	gn	bk			
26	Mnemonic name of measured value	Segment	2	ye	bk			
27	1st measured value	3 EA	5	ye	bk			
28	Mnemonic name of measured value	Segment	2	ye	bk			
29	2nd measured value	9 EA	5	ye	bk			
30	Mnemonic name of measured value	Segment	2	ye	bk			
31	3rd measured value	15 EA	5	ye	bk			
32	Mnemonic name of measured value	Segment	2	ye	bk			
33	4th measured value	21 EA	5	ye	bk			
34	Mnemonic name of measured value	Segment	2	ye	bk			
35	5th measured value	27 EA	5	ye	bk			
36	Upper display range limit 1	1 EA	5	gn	bk			
37	Upper display range limit 2	7 EA	5	gn	bk			
38	Upper display range limit 3	13 EA	5	gn	bk			
39	Upper display range limit 4	19 EA	5	gn	bk			
40	Upper display range limit 5	25 EA	5	gn	bk			
41	Upper limit value W for 1	2 EA	5	rd	bk			
42	Upper limit value W for 2	8 EA	5	rd	bk			
43	Upper limit value W for 3	14 EA	5	rd	bk			

Legend of Fig. 4.3-34, part 2

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
44	Unit of measured value 1	87 (70) S4 *)	4	ye	bk			
45	Unit of measured value 2	88 (73) S4 *)	4	ye	bk			
46	Unit of measured value 3	89 (76) S4 *)	4	ye	bk			
47	Unit of measured value 4	90 (79) S4 *)	4	ye	bk			
48	Unit of measured value 5	91 (82) S4 *)	4	ye	bk			
49	Lower limit value W for 1	5 EA	5	rd	bk			
50	Lower limit value W for 2	11 EA	5	rd	bk			
51	Lower limit value W for 3	17 EA	5	rd	bk			
52	Lower display range limit 1	6 EA	5	gn	bk			
53	Lower display range limit 2	12 EA	5	gn	bk			
54	Lower display range limit 3	18 EA	5	gn	bk			
55	Lower display range limit 4	24 EA	5	gn	bk			
56	Lower display range limit 5	30 EA	5	gn	bk			
57	Analog display of 1st actual value	3 EA	≤10	ye	bk			Scaling values 1EA 6EA
58	Analog display of 1st lower limit W	5 EA	≤10	rd	bk			Scaling values 1EA 6EA
59	Analog display of 2nd actual value	9 EA	≤10	ye	bk			Scaling values 7EA 12EA
60	Analog display of 2nd lower limit W	11 EA	≤10	rd	bk			Scaling values 7EA 12EA
61	Analog display of 3rd actual value	15 EA	≤10	ye	bk			Scaling values 13EA 18EA
62	Analog display of 3rd lower limit W	17 EA	≤10	rd	bk			Scaling values 13EA 18EA
63	Analog display of 4th actual value	21 EA	≤10	ye	bk			Scaling values 19EA 24EA
64	Analog display of 5th actual value	27 EA	≤10	ye	bk			Scaling values 25EA 30EA

*) The element number to be parameterized is shown in brackets.

Legend of Fig. 4.3-34, part 3

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
65	W upper blinking mark 1	Status	1					Status display 219
66	W upper blinking mark 2	Status	1					Status display 220
67	W upper blinking mark 3	Status	1					Status display 221
68	A lower blinking mark 1	Status	1					Status display 220
69	A lower blinking mark 2	Status	1					Status display 221
70	A lower blinking mark 3	Status	1					Status display 222
71	Block environment 1	36 EB	8+8	ye	bk			Status display 85
72	Block environment 2	37 EB	8+8	ye	bk			Status display 85
73	Block environment 3	38 EB	8+8	ye	bk			Status display 85
74	Block environment 4	39 EB	8+8	ye	bk			Status display 85
75	Block environment 5	40 EB	8+8	ye	bk			Status display 85
76	Blinking mark I&C fault	Status	1	ye	bk			Status display 215
77	LIMITS	Segment	10	gn	bk			
78	LIMITS	Segment	10	gn	bk			
79	Mnemonic name "WH"	Segment	2	gn	bk			
80	Mnemonic name "WL"	Segment	2	gn	bk			
81	LOOP FAULT	Segment	13	gn	bk			
82	Display range 1	Segment	10	gn	bk			
83	Display range 2	Segment	10	gn	bk			
84	Display range 3	Segment	10	gn	bk			
85	Display range 4	Segment	10	gn	bk			
86	Display range 5	Segment	10	gn	bk			
87	Analog display of 1st upper limit A	2 EA	≤10	rd	bk			
88	Analog display of 2nd upper limit A	8 EA	≤10	rd	bk			
89	Analog display of 3rd upper limit A	14 EA	≤10	rd	bk			

Legend of Fig. 4.3-34, part 4

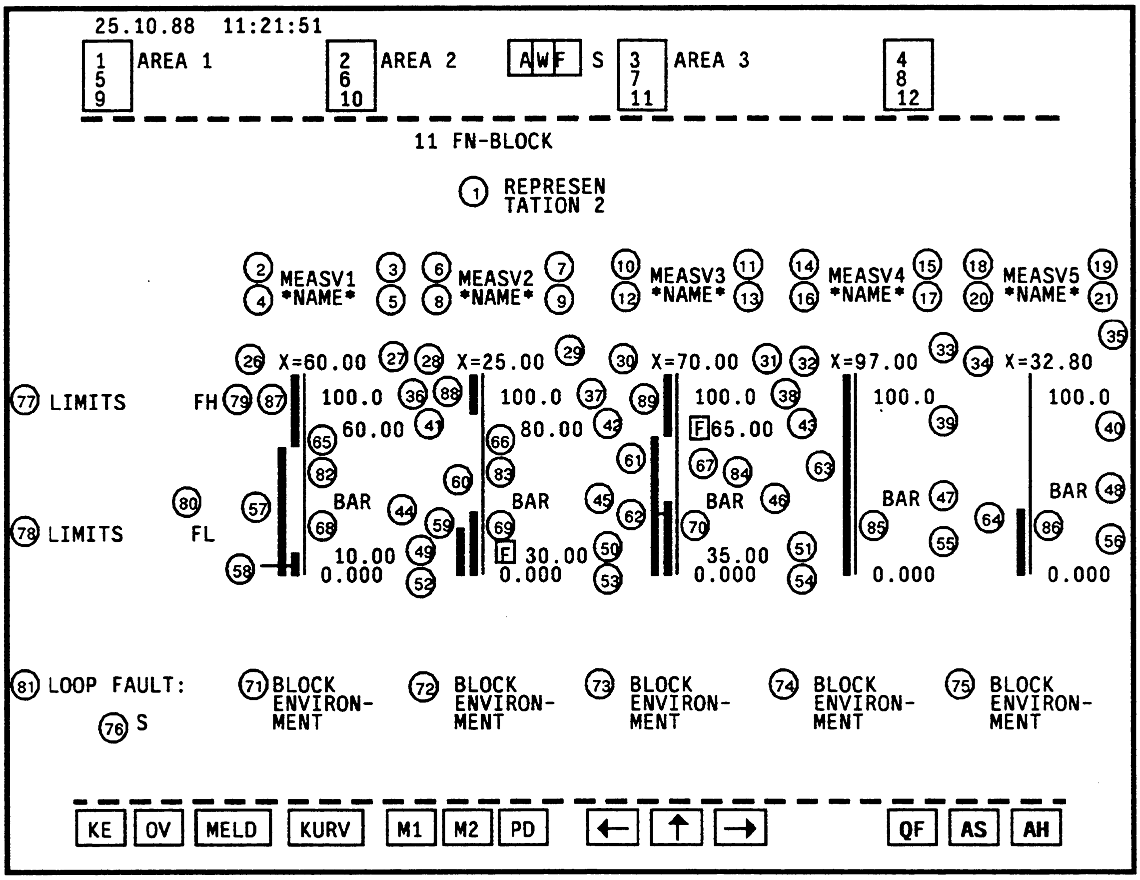


Fig. 4.3-35 Loop display for the FN block (representation 2)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	93 S16	8+8	gn	bk			
2	Measured value name 1	68 S4	4	gn	bk			
3	Measured value name 1	50 S2	2	gn	bk			
4	Measured value name 1	51 S2	2	gn	bk			
5	Measured value name 1	69 S4	2	gn	bk			
6	Measured value name 2	71 S4	2	gn	bk			
7	Measured value name 2	52 S2	2	gn	bk			
8	Measured value name 2	53 S2	2	gn	bk			
9	Measured value name 2	72 S4	4	gn	bk			

Legend of Fig. 4.3-35, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
10	Measured value name 3	74 S4	4	gn	bk			
11	Measured value name 3	54 S2	2	gn	bk			
12	Measured value name 3	55 S2	2	gn	bk			
13	Measured value name 3	75 S4	4	gn	bk			
14	Measured value name 4	77 S4	4	gn	bk			
15	Measured value name 4	56 S2	2	gn	bk			
16	Measured value name 4	57 S2	2	gn	bk			
17	Measured value name 4	78 S5	4	gn	bk			
18	Measured value name 5	80 S4	4	gn	bk			
19	Measured value name 5	58 S2	2	gn	bk			
20	Measured value name 5	59 S2	2	gn	bk			
21	Measured value name 5	81 S4	4	gn	bk			
26	Mnemonic name of measured value	Segment	2	ye	bk			
27	1st measured value	3 EA	5	ye	bk			
28	Mnemonic name of measured value	Segment	2	ye	bk			
29	2nd measured value	9 EA	5	ye	bk			
30	Mnemonic name of measured value	Segment	2	ye	bk			
31	3rd measured value	15 EA	5	ye	bk			
32	Mnemonic name of measured value	Segment	2	ye	bk			
33	4th measured value	21 EA	5	ye	bk			
34	Mnemonic name of measured value	Segment	2	ye	bk			
35	5th measured value	27 EA	5	ye	bk			
36	Upper display range limit 1	1 EA	5	gn	bk			
37	Upper display range limit 2	7 EA	5	gn	bk			
38	Upper display range limit 3	13 EA	5	gn	bk			
39	Upper display range limit 4	19 EA	5	gn	bk			
40	Upper display range limit 5	25 EA	5	gn	bk			
41	Upper limit value F for 1	2 EA	5	rt	bk			
42	Upper limit value F for 2	8 EA	5	rt	bk			
43	Upper limit value F for 3	14 EA	5	rt	bk			

Legend of Fig. 4.3-35, part 2

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
44	Unit of measured value 1	87 (70) S4 *)	4	ye	bk			
45	Unit of measured value 2	88 (73) S4 *)	4	ye	bk			
46	Unit of measured value 3	89 (76) S4 *)	4	ye	bk			
47	Unit of measured value 4	90 (79) S4 *)	4	ye	bk			
48	Unit of measured value 5	91 (89) S4 *)	4	ye	bk			
49	Lower limit value F for 1	5 EA	5	rt	bk			
50	Lower limit value F for 2	11 EA	5	rt	bk			
51	Lower limit value F for 3	17 EA	5	rt	bk			
52	Lower display range limit 1	6 EA	5	gn	bk			
53	Lower display range limit 2	12 EA	5	gn	bk			
54	Lower display range limit 3	18 EA	5	gn	bk			
55	Lower display range limit 4	24 EA	5	gn	bk			
56	Lower display range limit 5	30 EA	5	gn	bk			
57	Analog display of 1st actual value	3 EA	≤10	ye	bk			Scaling values 1EA 6EA
58	Analog display of 1st lower limit F	5 EA	≤10	rt	bk			Scaling values 1EA 6EA
59	Analog display of 2nd actual value	9 EA	≤10	ye	bk			Scaling values 7EA 12EA
60	Analog display of 2nd lower limit F	11 EA	≤10	rt	bk			Scaling values 7EA 12EA
61	Analog display of 3rd actual value	15 EA	≤10	ye	bk			Scaling values 13EA 18EA
62	Analog display of 3rd lower limit F	17 EA	≤10	rt	bk			Scaling values 13EA 18EA
63	Analog display of 4th actual value	21 EA	≤10	ye	bk			Scaling values 19EA 24EA
64	Analog display of 5th actual value	27 EA	≤10	ye	bk			Scaling values 25EA 30EA

*) The element number to be parameterized is shown in brackets.

Legend of Fig. 4.3-35, part 3

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
65	F upper blinking mark 1	Status	1					Status display 223
66	F upper blinking mark 2	Status	1					Status display 223
67	F upper blinking mark 3	Status	1					Status display 223
68	F lower blinking mark 1	Status	1					Status display 223
69	F lower blinking mark 2	Status	1					Status display 223
70	F lower blinking mark 3	Status	1					Status display 223
71	Block environment 1	36 EB	8+8	ye	bk			Status display 85
72	Block environment 2	37 EB	8+8	ye	bk			Status display 85
73	Block environment 3	38 EB	8+8	ye	bk			Status display 85
74	Block environment 4	39 EB	8+8	ye	bk			Status display 85
75	Block environment 5	40 EB	8+8	ye	bk			Status display 85
76	Blinking mark I&C fault	Status	1	ye	bk			Status display 215
77	"LIMITS"	Segment	10	gn	bk			
78	"LIMITS"	Segment	10	gn	bk			
79	Mnemonic name "FH"	Segment	2	gn	bk			
80	Mnemonic name "FL"	Segment	2	gn	bk			
81	"LOOP FAULT"	Segment	13	gn	bk			
82	Display range 1	Segment	10	gn	bk			
83	Display range 2	Segment	10	gn	bk			
84	Display range 3	Segment	10	gn	bk			
85	Display range 4	Segment	10	gn	bk			
86	Display range 5	Segment	10	gn	bk			
87	Analog display of 1st upper limit F	2 EA	≤10	rd	bk			
88	Analog display of 2nd upper limit F	8 EA	≤10	rd	bk			
89	Analog display of 3rd upper limit F	14 EA	≤10	rd	bk			

Legend of Fig. 4.3.-35, part 4

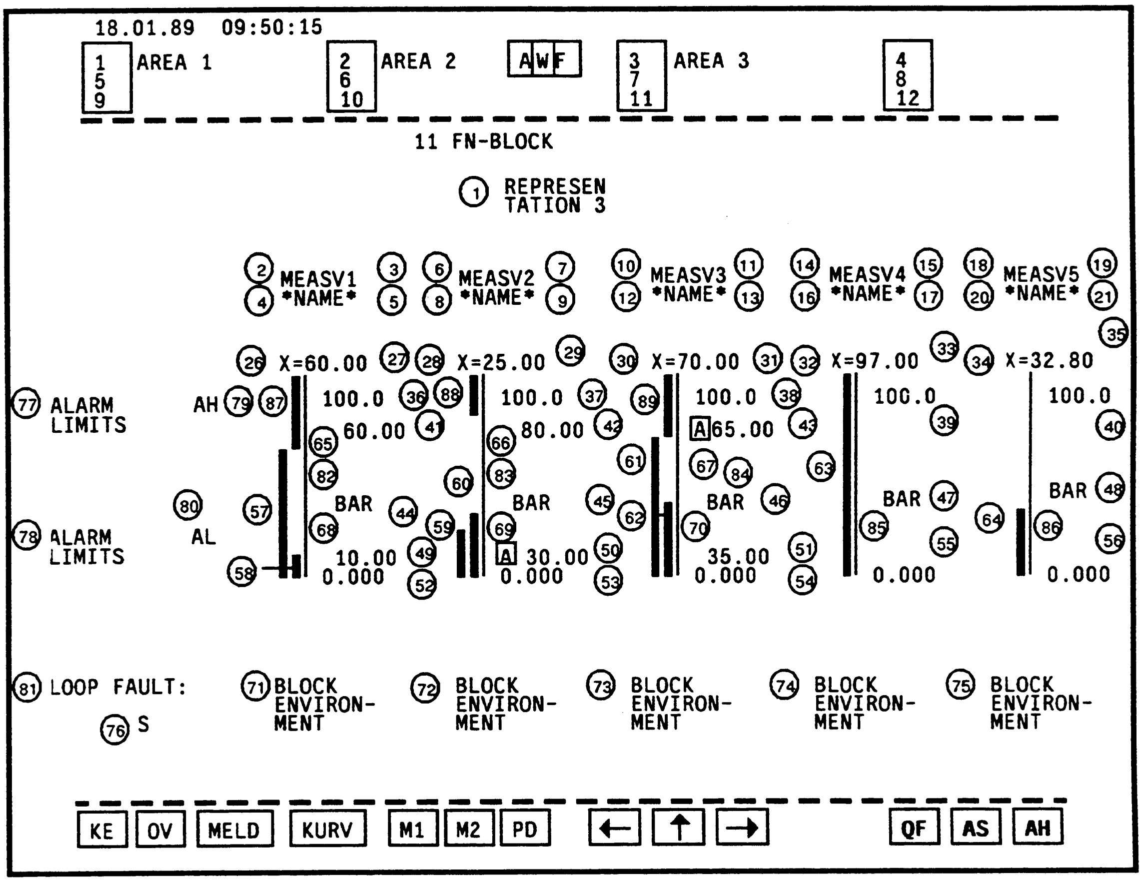


Fig. 4.3-36 Loop display of the FN block (representation 3)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	93 S16	8+8	gn	bk			
2	Measured value name 1	68 S4	4	gn	bk			
3	Measured value name 1	50 S2	2	gn	bk			
4	Measured value name 1	51 S2	2	gn	bk			
5	Measured value name 1	69 S4	2	gn	bk			
6	Measured value name 2	71 S4	2	gn	bk			
7	Measured value name 2	52 S2	2	gn	bk			
8	Measured value name 2	53 S2	2	gn	bk			
9	Measured value name 2	72 S4	4	gn	bk			

Legend of Fig. 4.3-36, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
10	Measured value name 3	74 S4	4	gn	bk			
11	Measured value name 3	54 S2	2	gn	bk			
12	Measured value name 3	55 S2	2	gn	bk			
13	Measured value name 3	75 S4	4	gn	bk			
14	Measured value name 4	77 S4	4	gn	bk			
15	Measured value name 4	56 S2	2	gn	bk			
16	Measured value name 4	57 S2	2	gn	bk			
17	Measured value name 4	78 S5	4	gn	bk			
18	Measured value name 5	80 S4	4	gn	bk			
19	Measured value name 5	58 S2	2	gn	bk			
20	Measured value name 5	59 S2	2	gn	bk			
21	Measured value name 5	81 S4	4	gn	bk			
26	Mnemonic name of measured value	Segment	2	ye	bk			
27	1st measured value	3 EA	5	ye	bk			
28	Mnemonic name of measured value	Segment	2	ye	bk			
29	2nd measured value	9 EA	5	ye	bk			
30	Mnemonic name of measured value	Segment	2	ye	bk			
31	3rd measured value	15 EA	5	ye	bk			
32	Mnemonic name of measured value	Segment	2	ye	bk			
33	4th measured value	21 EA	5	ye	bk			
34	Mnemonic name of measured value	Segment	2	ye	bk			
35	5th measured value	27 EA	5	ye	bk			
36	Upper display range limit 1	1 EA	5	gn	bk			
37	Upper display range limit 2	7 EA	5	gn	bk			
38	Upper display range limit 3	13 EA	5	gn	bk			
39	Upper display range limit 4	19 EA	5	gn	bk			
40	Upper display range limit 5	25 EA	5	gn	bk			
41	Upper limit value F for 1	2 EA	5	rd	bk			
42	Upper limit value F for 2	8 EA	5	rd	bk			
43	Upper limit value F for 3	14 EA	5	rd	bk			

Legend of Fig. 4.3-36, part 2

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
44	Unit of measured value 1	87 (70) S4 *)	4	ye	bk			
45	Unit of measured value 2	88 (73) S4 *)	4	ye	bk			
46	Unit of measured value 3	89 (76) S4 *)	4	ye	bk			
47	Unit of measured value 4	90 (79) S4 *)	4	ye	bk			
48	Unit of measured value 5	91 (89) S4 *)	4	ye	bk			
49	Lower limit value F for 1	5 EA	5	rd	bk			
50	Lower limit value F for 2	11 EA	5	rd	bk			
51	Lower limit value F for 3	17 EA	5	rd	bk			
52	Lower display range limit 1	6 EA	5	gn	bk			
53	Lower display range limit 2	12 EA	5	gn	bk			
54	Lower display range limit 3	18 EA	5	gn	bk			
55	Lower display range limit 4	24 EA	5	gn	bk			
56	Lower display range limit 5	30 EA	5	gn	bk			
57	Analog display of 1st actual value	3 EA	≤10	ye	bk			Scaling values 1EA 6EA
58	Analog display of 1st lower limit F	5 EA	≤10	rd	bk			Scaling values 1EA 6EA
59	Analog display of 2nd actual value	9 EA	≤10	ye	bk			Scaling values 7EA 12EA
60	Analog display of 2nd lower limit F	11 EA	≤10	rd	bk			Scaling values 7EA 12EA
61	Analog display of 3rd actual value	15 EA	≤10	ye	bk			Scaling values 13EA 18EA
62	Analog display of 3rd lower limit F	17 EA	≤10	rd	bk			Scaling values 13EA 18EA
63	Analog display of 4th actual value	21 EA	≤10	ye	bk			Scaling values 19EA 24EA
64	Analog display of 5th actual value	27 EA	≤10	ye	bk			Scaling values 25EA 30EA
65	A upper blinking mark 1	Status	1					Status display 216
66	A upper blinking mark 2	Status	1					Status display 217
67	A upper blinking mark 3	Status	1					Status display 218

*) The element number to be parameterized is shown in brackets.

Legend of Fig. 4.3-36, part 3

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
68	A lower blinking mark 1	Status	1					Status display 217
69	A lower blinking mark 2	Status	1					Status display 218
70	A lower blinking mark 3	Status	1					Status display 80
71	Block environment 1	36 EB	8+8	ye	bk			Status display 85
72	Block environment 2	37 EB	8+8	ye	bk			Status display 85
73	Block environment 3	38 EB	8+8	ye	bk			Status display 85
74	Block environment 4	39 EB	8+8	ye	bk			Status display 85
75	Block environment 5	40 EB	8+8	ye	bk			Status display 85
76	Blinking mark I&C fault	Status	1	ye	bk			Status display 215
77	ALARM LIMITS	Segment	10	gn	bk			
78	ALARM LIMITS	Segment	10	gn	bk			
79	Mnemonic name "AH"	Segment	2	gn	bk			
80	Mnemonic name "AL"	Segment	2	gn	bk			
81	LOOP FAULT	Segment	13	gn	bk			
82	Display range 1	Segment	10	gn	bk			
83	Display range 2	Segment	10	gn	bk			
84	Display range 3	Segment	10	gn	bk			
85	Display range 4	Segment	10	gn	bk			
86	Display range 5	Segment	10	gn	bk			
87	Analog display of 1st upper limit F	2 EA	≤10	rd	bk			
88	Analog display of 2nd upper limit F	8 EA	≤10	rd	bk			
89	Analog display of 3rd upper limit F	14 EA	≤10	rd	bk			

Legend of Fig. 4.3-36, part 4

- **Standardized display for the G block**

Application:

- Representation 1 is used for monitoring and controlling sequence cascades in power plant systems.

During communication with the AS 220 it should be noted that the G block has only been implemented in the AS 220 power engineering version, and not in the process engineering version. This restriction does not apply for AS 230 systems.

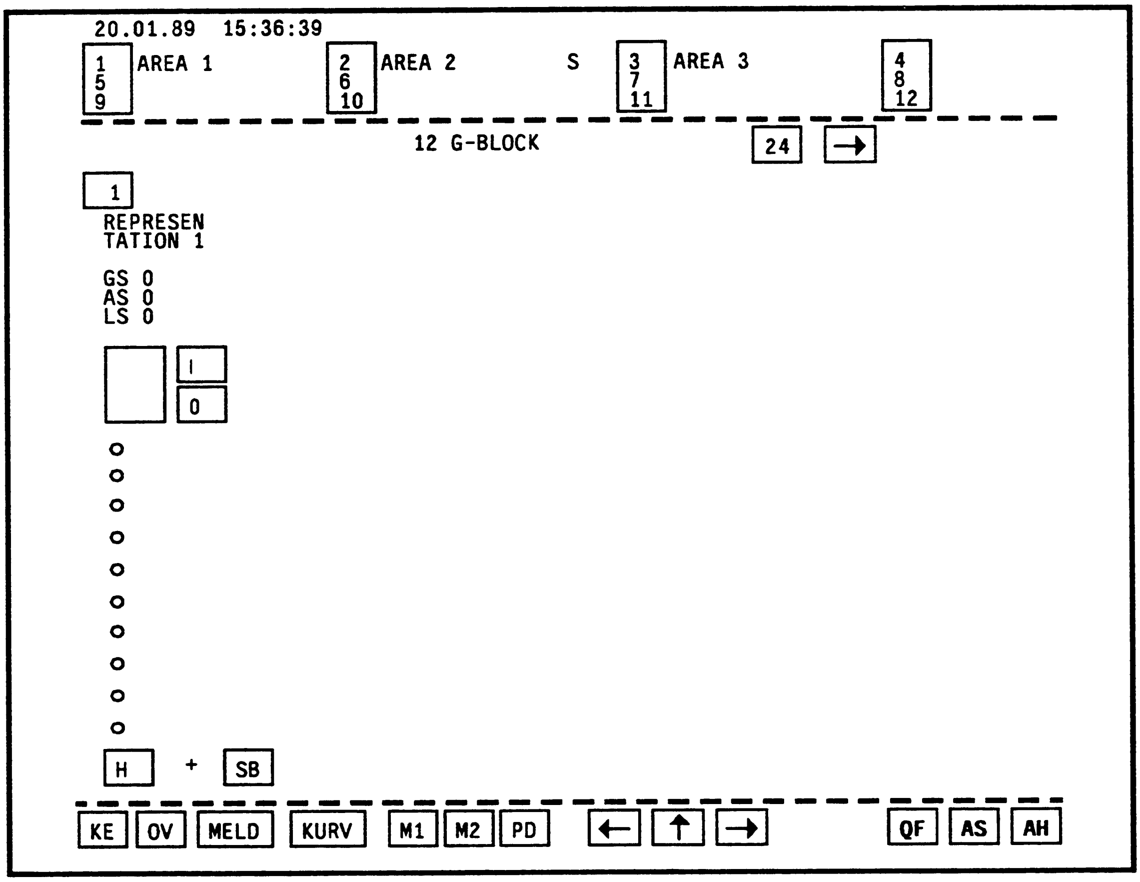


Fig. 4.3-37 Loop display for the G block

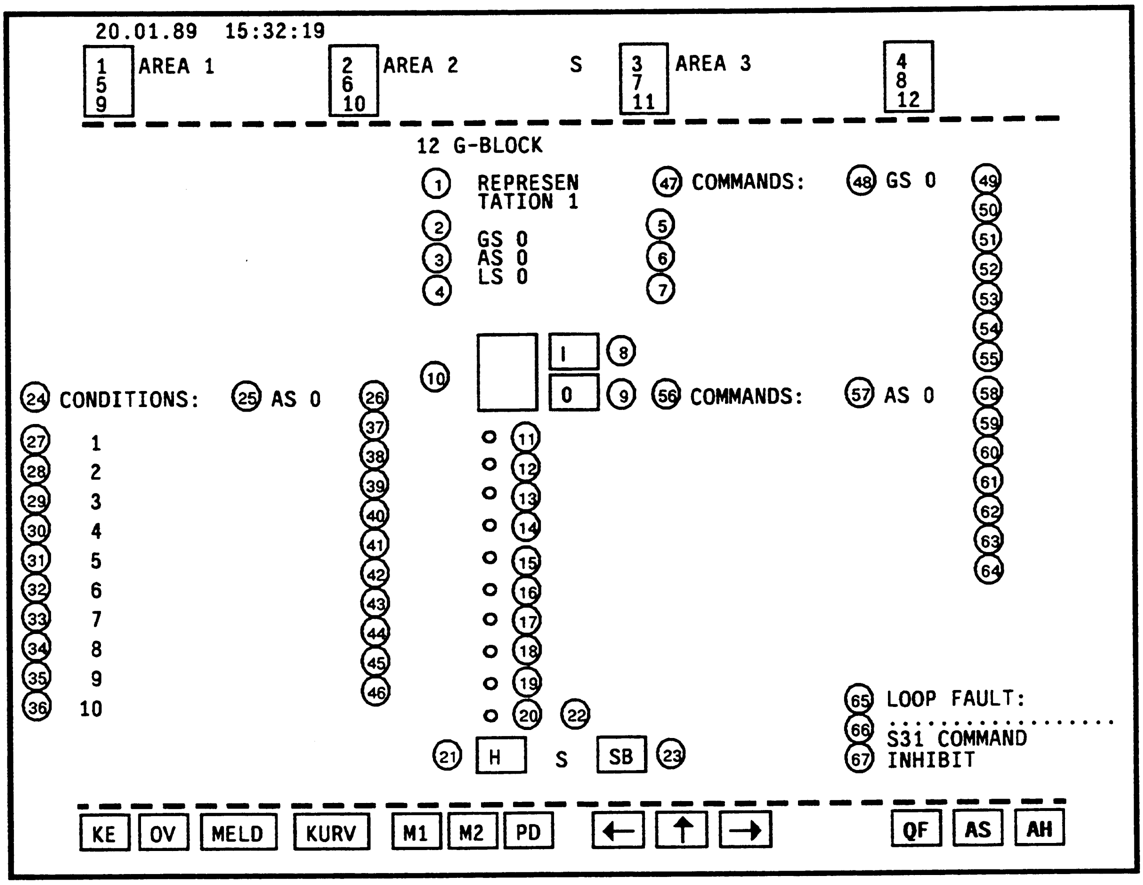


Fig. 4.3-38 Loop display for the G block

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	30 S16	8+8	gn	bk			
2	Mnemonic name Set step	18 S2	2	ye	bk			
3	Mnemonic name Next step	19 S2	2	gn	bk			
4	Mnemonic name Previous step	20 S2	2	bl	bk			
5	No. of set step	5 VB	2	ye	bk			
6	No. of next step	6 VB	2	gn	bk			
7	No. of previous step	7 VB	2	bl	bk			
8	Key ON PROGRAM	Status	2	bk	gn	"I"	20.4.0.0	Status display 60
9	Key OFF PROGRAM	Status	2	bk	gn	"0"	21.2.0.0	Status display 61

Legend of Fig. 4.3-38, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
10	ON PROGRAM RUNNING	Status						Status display 90
	ON PROGRAM EXECUTED		3x3	bk	gn			
	OFF PROGRAM RUNNING		3x3	bk	gn			
	OFF PROGRAM		3x3	bk	wh			
	EXECUTED		3x3	bk	wh			
	NO PROGRAM SELECTED		3x3	bk	bk			
		8 VB						Status display 190
11	Condition 1	Bit 7						
12	Condition 2	Bit 8						
13	Condition 3	Bit 9						
14	Condition 4	Bit 10						
15	Condition 5	Bit 11						
16	Condition 6	Bit 12						
17	Condition 7	Bit 13						
18	Condition 8	Bit 14						
19	Condition 9	Bit 15						
20	Condition 10	Bit 16						
21	Mode	Status						Status display 91
	MANUAL		2	bk	wh	"H"	14.0.0.0	
	AUTOMATIC		2	bk	gn	"A"	14.0.0.0	
	OPERATOR GUIDE		2	bk	gn	"ML"	14.0.0.0	
22	Blinking mark	Status	1	ye	bk	"S"		Status display 17
	I&C fault		1	gn	bk	"+"		
23	Start condition selector key	Status	2	bk	gn	"SB"		Status display 92 FRANZ DIALOG: image number for selecting a "start conditions" image
	Removing the selector key CONDITIONS		2	wh	bk	" "		
24	"Conditions":	Segment	12	gn	bk			
25	Mnemonic name of next step	19 S2	2	gn	bk			
26	No. of next step	6 VB	2	gn	bk			
27	Number 1	Segment	1	gn	bk			
28	Number 2							
29	Number 3							
30	Number 4							
31	Number 5							
32	Number 6							
33	Number 7							
34	Number 8							
35	Number 9							
36	Number 10							

Legend of Fig. 4.3-38, part 2

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
37	Name of condition 1	6 VB	16	gn	bk			Status display 200 or 203
38	Name of condition 2							
39	Name of condition 3							
40	Name of condition 4							
41	Name of condition 5							
42	Name of condition 6							
43	Name of condition 7							
44	Name of condition 8							
45	Name of condition 9							
46	Name of condition 10							
47	COMMANDS:	Segment	8	gn	bk			
48	Mnemonic name Set step	18 S2	2	ye	bk			
49	Number of set step	5 VB	2	ye	bk			
50	Command 1 of set step	5 VB	16	gn	bk			Status display 201 or 204
51	Command 2 of set step							
52	Command 3 of set step							
53	Command 4 of set step							
54	Command 5 of set step							
55	Command 6 of set step							
56	COMMANDS:	Segment	8	gn	bk			
57	Mnemonic name Next step	19 S2	2	gn	bk			
58	Number of next step	6 VB	2	gn	bk			
59	Command 1 of next step	6 VB	16	gn	bk			Status display 202 or 205
60	Command 2 of next step							
61	Command 3 of next step							
62	Command 4 of next step							
63	Command 5 of next step							
64	Command 6 of next step							
65	LOOP FAULT:	Segment	14	gn	bk			
66	STEP RUN TIME	Status	20	ye	bk			Status display 93
67	S31 COMMAND INHIBIT	Status	20	ye	bk			Status display 94

Legend of Fig. 4.3-38, part 3

- **Standardized display for the GK block**

Application:

The tasks of the subgroup control block are as follows:

- Controlling a subgroup in step mode.
- Co-ordinating and monitoring the sequence cascades for operation and shutdown.
- Processing the information for monitoring and control using standardized displays.

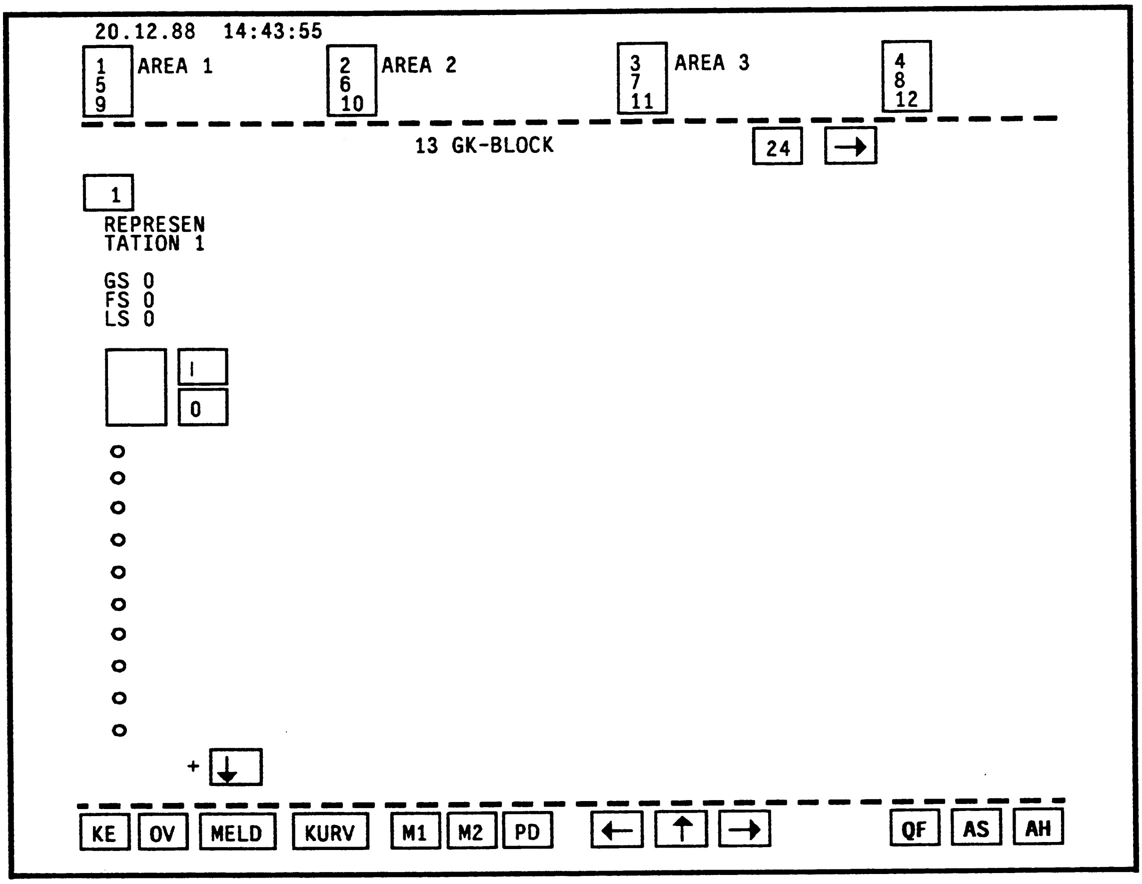


Fig. 4.3-39 Loop display for the GK block

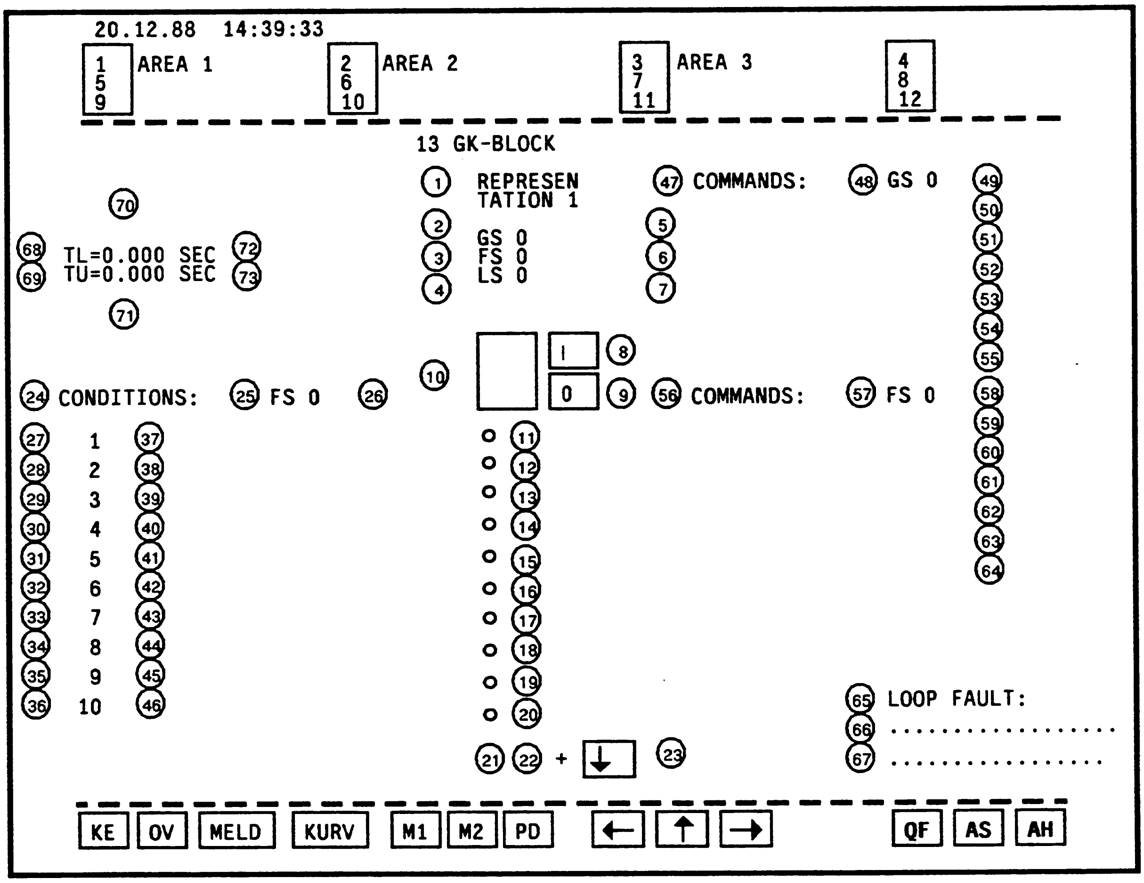


Fig. 4.3-40 Loop display for the GK block (start conditions)

Note regarding variable 23

The image number of a process display and the start conditions can be stored here during a FRANZ dialog session.

Procedure:

Insert control field 159 (start conditions) into a FRANZ individual display and interconnect it with the required GK block. The start conditions can then be entered into this display in plaintext. Then store the process display and insert the number of the created process display at variable 23 of the GK block loop display (cf. Chapter 4.2.4.1).

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	36 S16	8 + 8	gn	bk			
2	Mnemonic name Set step	28 S2	2	gn	bk			
3	Mnemonic name Next step	32 S2	2	wh	bk			
4	Mnemonic name Previous step	33 S2	2	bl	bk			
5	No. of set step	5 VA	2	gn	bk			
6	No. of next step	7 VA	2	wh	bk			
7	No. of previous step	7 VB	2	bl	bk			
8	Key ON PROGRAM	Status	2	bk	gn	" I "	20.20.20.1	Status display 60
9	Key OFF PROGRAM	Status	2	bk	gn	" 0 "	20.20.20.2	Status display 61
10	Status display: - Operation Shutdown Operation program active Shutdown program active Operation Q Shutdown Q Operation program Q active Shutdown program Q active	Status	 3x3 3x3 3x3 3x3 3x3 3x3 3x3 3x3 3x3 3x3 3x3	 wh bk bk bk bk bk bk bk bk bk	 bk gr wh gr wh bl bl bl bl bl			Status display 247
		19 VB						Status display 190
11	Condition 1	Bit 7						
12	Condition 2	Bit 8						
13	Condition 3	Bit 9						
14	Condition 4	Bit 10						
15	Condition 5	Bit 11						
16	Condition 6	Bit 12						
17	Condition 7	Bit 13						
18	Condition 8	Bit 14						
19	Condition 9	Bit 15						
20	Condition 10	Bit 16						
21	Mode MANUAL AUTOMATIC OPERATOR GUIDE	Status	 2 2 2	 bk bk bk	 wh gn gn	 " H " " A " " ML "	 14.14.14.14	Status display 91
22	Blinking mark I&C fault	Status	1	ye	bk			Status display 246
23	Start condition selector key Removing the selector key	Status	2 2	bk wh	gn bk	" ↓ " " ↓ "		Status display 21 FRANZ DIALOG: Image number for selecting a "start conditions" image
24	CONDITIONS	Segment	12	gn	bk			
25	Mnemonic name of next step	32 S2	2	wh	bk			
26	No. of next step	6 VA	2	wh	bk			

Legend of Fig. 4.3-40 part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
27	Number 1	Segment	1	gn	bk			
28	Number 2							
29	Number 3							
30	Number 4							
31	Number 5							
32	Number 6							
33	Number 7							
34	Number 8							
35	Number 9							
36	Number 10							
37	Name of condition 1	6 VA	16	gn	bk			Status display 200 or 203
38	Name of condition 2							
39	Name of condition 3							
40	Name of condition 4							
41	Name of condition 5							
42	Name of condition 6							
43	Name of condition 7							
44	Name of condition 8							
45	Name of condition 9							
46	Name of condition 10							
47	COMMANDS:	Segment	8	gn	bk			
48	Mnemonic name of set step	28 S2	2	gr	bk			
49	Number of set step	5 VA	2	gr	bk			
50	Command 1 of set step	5 VA	16	gn	bk			Status display 201 or 204
51	Command 2 of set step							
52	Command 3 of set step							
53	Command 4 of set step							
54	Command 5 of set step							
55	Command 6 of set step							
56	COMMANDS:	Segment	8	gn	bk			
57	Mnemonic name of next step	32 S2	2	wh	bk			
58	Number of next step	6 VA	2	wh	bk			
59	Command 1 of next step	6 VA	16	gn	bk			Status display 202 or 205
60	Command 2 of next step							
61	Command 3 of next step							
62	Command 4 of next step							
63	Command 5 of next step							
64	Command 6 of next step							
65	LOOP FAULT	Segment	14	gn	bk			
66	STEP RUN TIME	Status	16	ye	bk			Status display 93
67	COMMAND INHIBIT	Status	16	ye	bk			Status display 241
68	"TL = "	Segment	3	gn	bk			
69	"TU = "	Segment	3	gn	bk			
70	Step duration	1 AA	5	gn	bk			
71	Time from KB block	10 VA	5	gn	bk			
72	Interlocking by unit	35 S4	4	gn	bk			
73	Interlocking by unit	35 S4	4	gn	bk			

Legend of Fig. 4.3-40, part 2

- **Standardized display for the M block**

Application:

- Representation 1 for the M block is used for displaying one measured value and monitoring this value to remain within three pairs of limit values (upper alarm limit, lower alarm limit, upper warning limit, lower warning limit, upper fault limit, lower fault limit).

Note:
In order to guarantee a correct display of the marks "A", "W" and "F", the limit values must be configured in the AS according to their hierarchy. Here the following applies:

AH ≥ WH ≥ FH und AL ≤ WL ≤ FL

An M block which is interconnected via WAS with an R block does not transmit a status change to the OS 265. It is thus not expedient to configure a block interconnected via WAS in the OS 265 system.

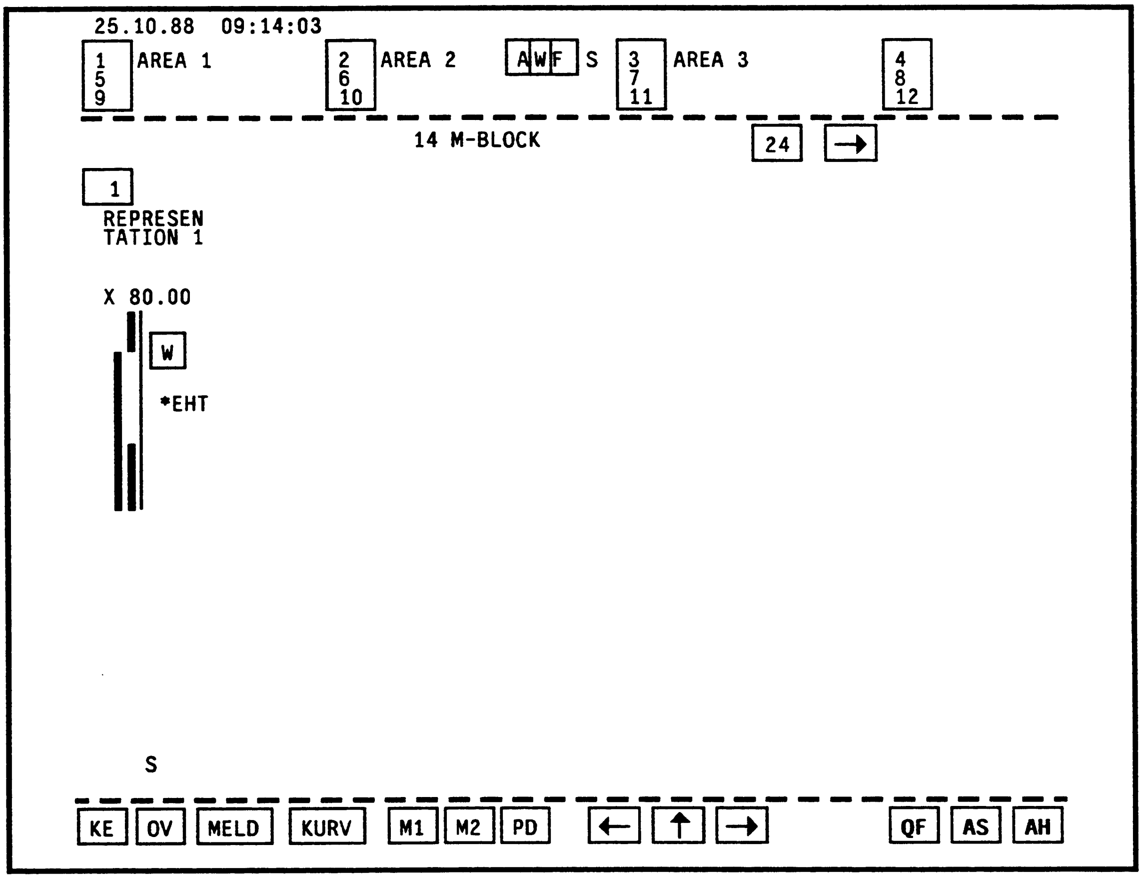


Fig. 4.3-41 Group display for the M block

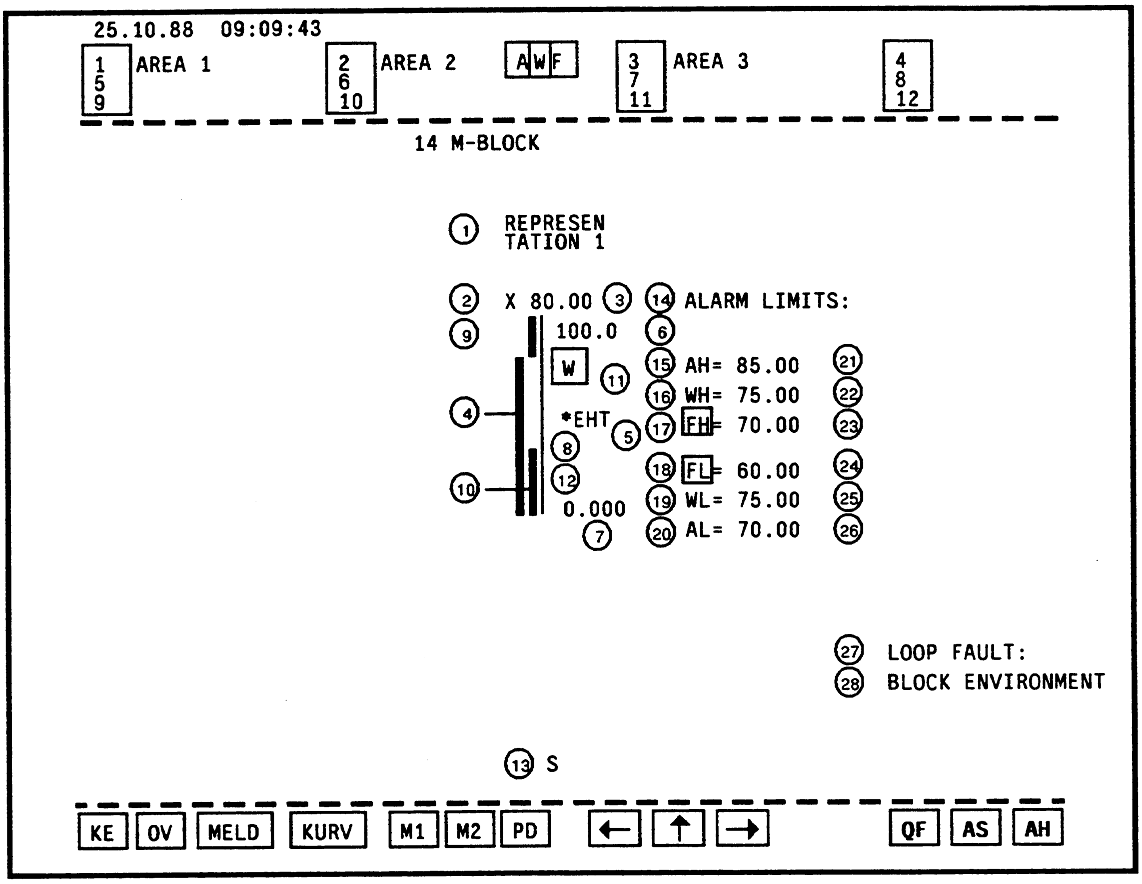


Fig. 4.3-42 Loop display for the M block

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	31 S16	8+8	gn	bk			
2	Mnemonic name of measured value	20 S2	2	ye	bk			
3	Binary display of measured value	2 EA	5	ye	bk			
4	Analog display of measured value	2 EA	≤10	ye	bk			Scaling values 1 EA. 3 EA
5	Measured value unit	29 S4	4	ye	bk			
6	Upper display range limit	1 EA	5	gn	bk			
7	Lower display range limit	3 EA	5	gn	bk			
8	Display range	Segment	10	gn	bk			
9	Analog display of upper limit A	11 EA	≤10	rd	bk			Scaling values 1 EA. 3 EA
10	Analog display of lower limit A	12 EA	≤10	rd	bk			Scaling values 1 EA. 3 EA

Legend of Fig. 4.3-42, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
11	Upper A Upper W Upper F	Status	1	wh bk bk	rd ye bl			Status display 100
12	Lower F Lower W Lower A	Status	1	bk bk wh	bl ye rd			Status display 101
13	Blinking mark I&C fault	Status	1 1	ye gn	bk bk	"S" " + "		Status display 102
14	ALARM LIMITS	Segment	11	gn	bk			
15	Mnemonic name "AH = "	Segment	3	gn	bk			
16	Mnemonic name "WH = "		3	gn	bk			
17	Mnemonic name "FH = "		3	bk	bl	"FH"	7.0.0.0	
18	Mnemonic name "FL = "		3	bk	bl	"FL"	7.0.0.0	
19	Mnemonic name "WL = "		3	gn	bk			
20	Mnemonic name "AL = "		3	gn	bk			
21	Upper limit value	11 EA	5	gn	bk			
22	Upper warning limit	13 EA		gn	bk			
23	Upper fault limit	5 EA		gn	bk			
24	Lower fault limit	8 EA		gn	bk			
25	Lower warning limit	14 EA		gn	bk			
26	Lower alarm limit	12 EA		gn	bk			
27	LOOP DIAGNOSIS	Segment	14	gn	bk			
28	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24

Legend of Fig. 4.3-42, part 2

- **Standardized display for the MKS block**

Application:

The 32 bits of the MKS block in the AS are only transferred to the OS 265 after a change has occurred.

- Representation 1
Representation 1 is sufficient if an MKS block is only to be interpreted for MELD (a message text for each of the 32 bits can be configured in MELD). Representation 1 is solely used for MKZ transfer during MELD configuration and bit classification.

- Representation 2
All 32 bits of the MKS message are interpreted in representation 2. Each MKS bit is displayed in the group display and loop display according to its classification (MKS processing, Chapter 6.3). Bits with the same message identifier are ORed for the status word related to the MKS block which yields the indicator in the NORA area display. The priority rule "A before W before S before F before B" applies for the indication in the NORA area display. The same priority pattern is also used for the OR combination of the group status. This representation also enables bits to be collected for MELD and to be provided with the corresponding message text.

Note:
- Using FRANZ resources, this MKS block representation should be supplemented by texts which inform about the process activities.
- The MKS block status word only exists in the OS system. It has the same assignment as a TML block.

Important: NORA images which have been re-configured using FRANZ may not be re-processed in NORA since this would delete FRANZ image parts (here: the texts).

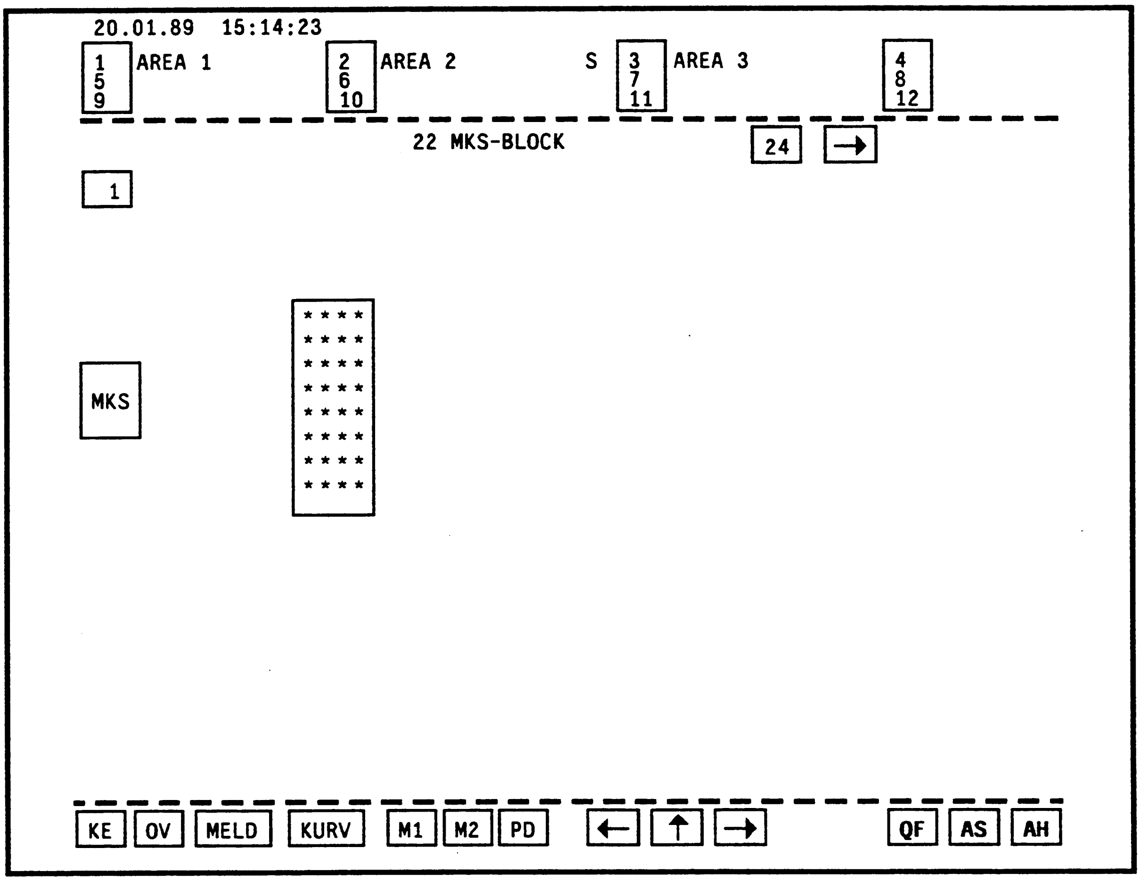


Fig. 4.3-43 Group display with both MKS block representations

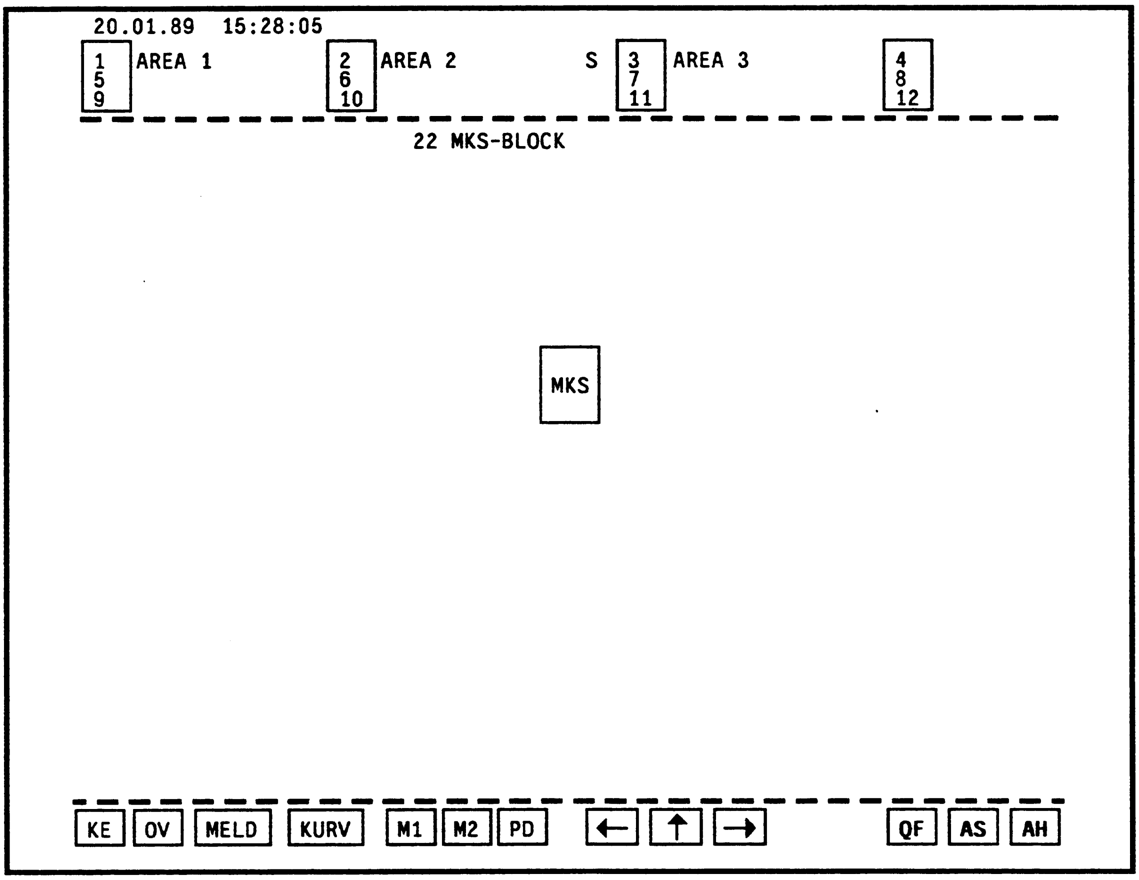
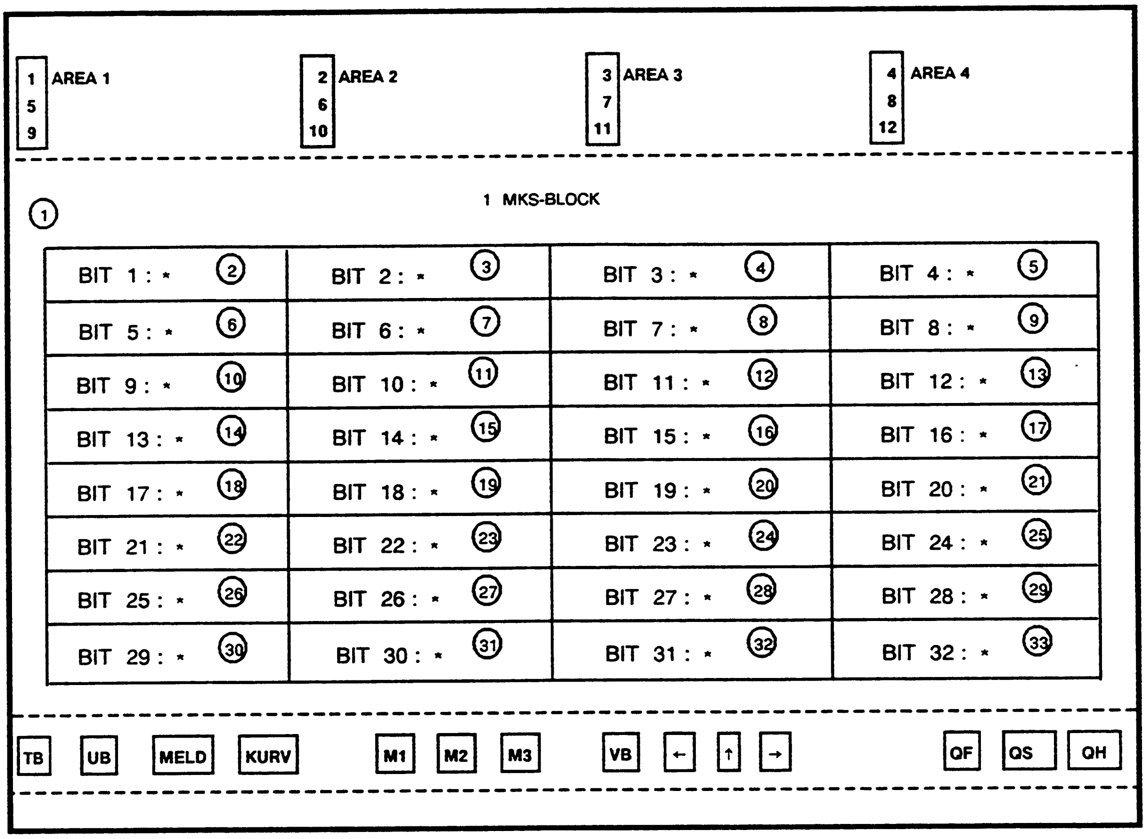


Fig. 4.3-44 Loop display for the MKS block (representation 1)



BIT 1 : * ②	BIT 2 : * ③	BIT 3 : * ④	BIT 4 : * ⑤
BIT 5 : * ⑥	BIT 6 : * ⑦	BIT 7 : * ⑧	BIT 8 : * ⑨
BIT 9 : * ⑩	BIT 10 : * ⑪	BIT 11 : * ⑫	BIT 12 : * ⑬
BIT 13 : * ⑭	BIT 14 : * ⑮	BIT 15 : * ⑯	BIT 16 : * ⑰
BIT 17 : * ⑱	BIT 18 : * ⑲	BIT 19 : * ⑳	BIT 20 : * ㉑
BIT 21 : * ㉒	BIT 22 : * ㉓	BIT 23 : * ㉔	BIT 24 : * ㉕
BIT 25 : * ㉖	BIT 26 : * ㉗	BIT 27 : * ㉘	BIT 28 : * ㉙
BIT 29 : * ㉚	BIT 30 : * ㉛	BIT 31 : * ㉜	BIT 32 : * ㉝

Bild 4.3-45 Loop display of the MKS-Block (representation 2)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Segment			gn	bk			
2-33	Pseudo status of the MKS bits 1-32 Classification abbreviation	Bit 1-32	1	Depends on classification	Depends on classification			ZA 4095

Legend of Fig. 4.3-45

- **Standardized display for the MSB block**

Application:

- Representation 1	is used for controlling a motor (switch on, switch off), and for displaying the motor state (on, off).
- Representation 2	is used for controlling a valve (open, close) and for indicating the valve state (open, closed).
- Representation 3	is used for controlling an actuator (open, close) with STOP key and for indicating the state (open, closed, opening, closing) and the position.

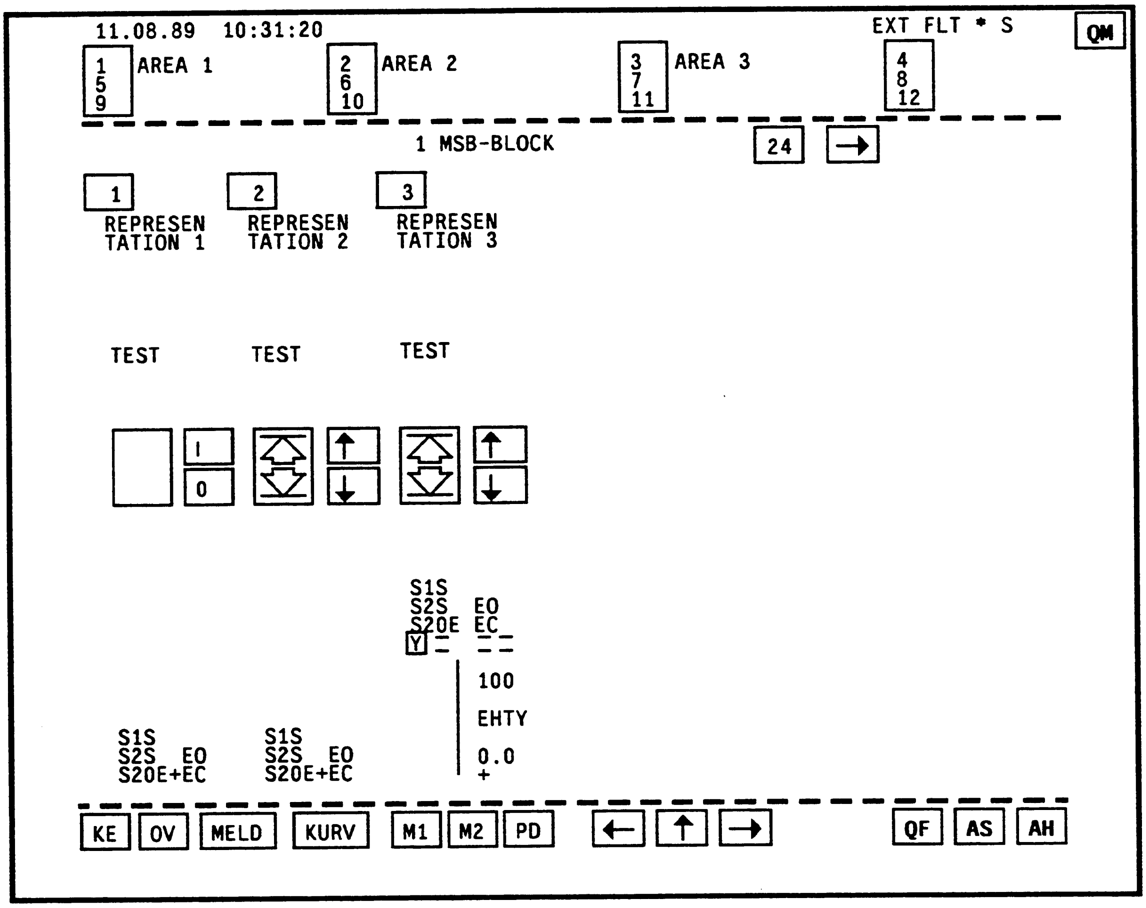


Fig. 4.3-46 Group display with the three representations of the MSB block

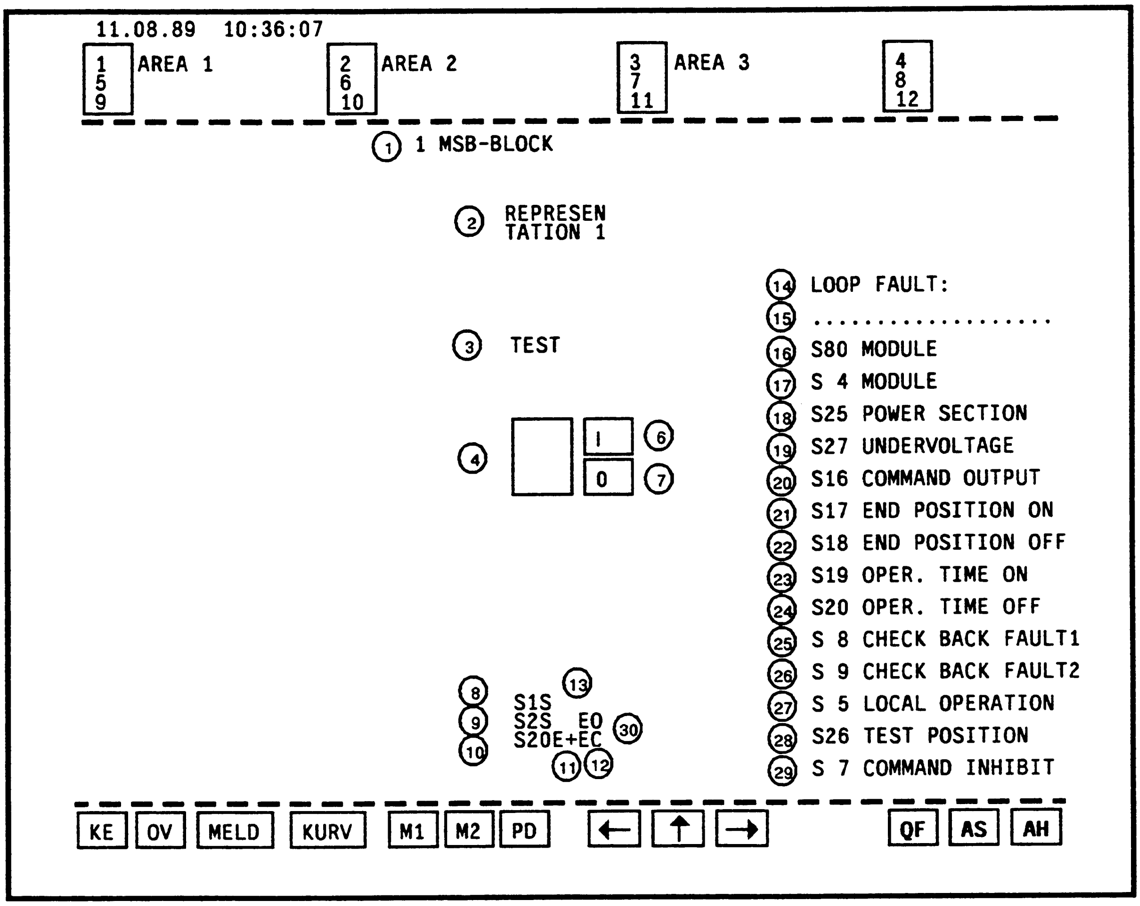


Fig. 4.3-47 Loop display of the MSB block (representation 1)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Static frame			bk	bk			PK 318
2	Process-related name	77 S16	8+8	gn	bk			
3	TEST	56 PB	4					ZA 164
4	ON/OFF state Command inhibit	Status	3x3					ZA 275
5	Key: switch on/ module acknowledgement	Status	2			" I "	30.99.7.0	ZA 276
6	Time-out status	Status	1					ZA 277
7	Key: switch off/ module acknowledgement	Status	2			" 0 "	30.99.8.0	ZA 278
8	S1S	8 AB	3					ZA 279
9	S2S	9 AB	3					ZA 280
10	S20E	10 AB	4					ZA 281

Legend of Fig. 4.3-47, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
11	Blinking mark I&C fault/ Loop message field	Status	1					ZA 290
12	EO	7 AB	2					ZA 282
13	EC	6 AB	2					ZA 283
14	LOOP FAULT	Segment	14	gn	bk			
15	BLOCK ENVIRONMENT	Status	20					ZA 24
16	S80 MODULE	75 PB	20					ZA 56
17	S4 MODULE	1 AB	20					ZA 160
18	S25 POWER SECTION	55 PB	20					ZA 170
19	S27 UNDERVOLTAGE	58 PB	20					ZA 284
20	S16 COMMAND OUTPUT	59 PB	20					ZA 162
21	S17 END POSITION ON	54 PB	20					ZA 166
22	S18 END POSITION OFF	53 PB	20					ZA 167
23	S19 OPER. TIME ON	52 PB	20					ZA 168
24	S25 OPER. TIME OFF	51 PB	20					ZA 169
25	S8 CHECK BACK FAULT 1	61 PB	21					ZA 285
26	S9 CHECK BACK FAULT 2	62 PB	21					ZA 286
27	S5 LOCAL OPERATION	60 PB	20					ZA 287
28	S26 TEST POSITION	56 PB	20					ZA 288
29	S7 COMMAND INHIBIT	63 PB	20					ZA 289
30	Dummy ZA for control field input QB	Status	1					ZA 294

Legend of Fig. 4.3-47, part 2

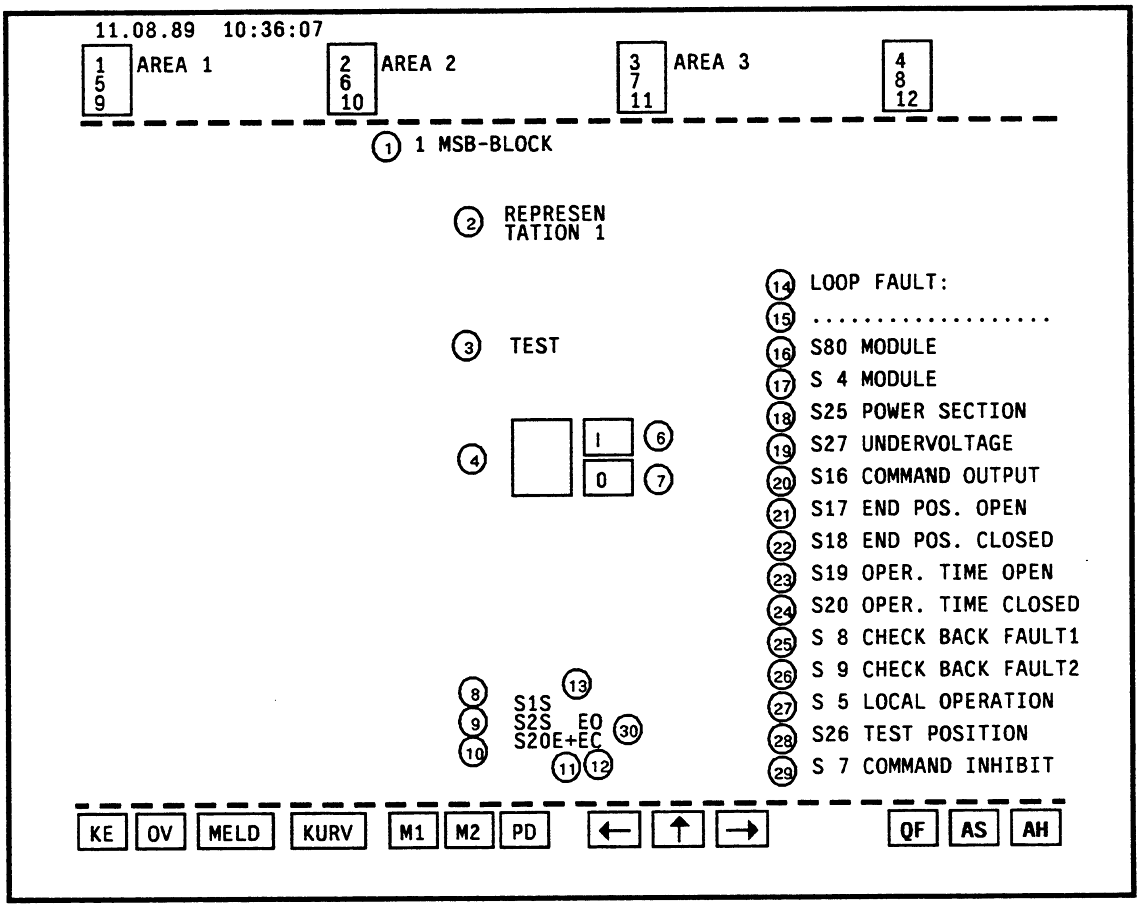


Fig. 4.3-48 Loop display of the MSB block (representation 2)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Static frame			bk	bk			PK 318
2	Process-related name	77 S16	8+8	gn	bk			
3	TEST	56 PB	4					ZA 164
4	OPEN/CLOSED state Command inhibit	Status	3x3					ZA 291
5	Key: open/module acknowledgement	Status	2			” I ”	30.99.9.0	ZA 292
6	Time-out status	Status	1					ZA 277
7	Key: close/module acknowledgement	Status	2			” O ”	30.99.10.0	ZA 293
8	S1S	8 AB	3					ZA 279
9	S2S	9 AB	3					ZA 280
10	S20E	10 AB	4					ZA 281

Legend of Fig. 4.3-48, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
11	Blinking mark I&C fault/ Loop message field	Status	1					ZA 290
12	FZ	7 AB	2					ZA 282
13	FA	6 AB	2					ZA 283
14	LOOP FAULT	Segment	14	gn	bk			
15	BLOCK ENVIRONMENT	Status	20					ZA 24
16	S80 MODULE	75 PB	20					ZA 56
17	S4 MODULE	1 AB	20					ZA 160
18	S25 POWER SECTION	55 PB	20					ZA 170
19	S27 UNDERVOLTAGE	58 PB	20					ZA 284
20	S6 COMMAND OUTPUT	59 PB	20					ZA 162
21	S7 END POS. OPEN	54 PB	20					ZA 172
22	S18 END POS. CLOSED	53 PB	20					ZA 173
23	S19 OPER. TIME OPEN	52 PB	20					ZA 174
24	S20 OPER. TIME CLOSED	51 PB	20					ZA 175
25	S8 CHECK BACK FAULT 1	61 PB	21					ZA 285
26	S9 CHECK BACK FAULT 2	62 PB	21					ZA 286
27	S5 LOCAL OPERATION	60 PB	20					ZA 287
28	S26 TEST POSITION	56 PB	20					ZA 288
29	S7 COMMAND INHIBIT	63 PB	20					ZA 289
30	Dummy ZA for control field input QB	Status	1					ZA 294

Legend of Fig. 4.3-48, part 2

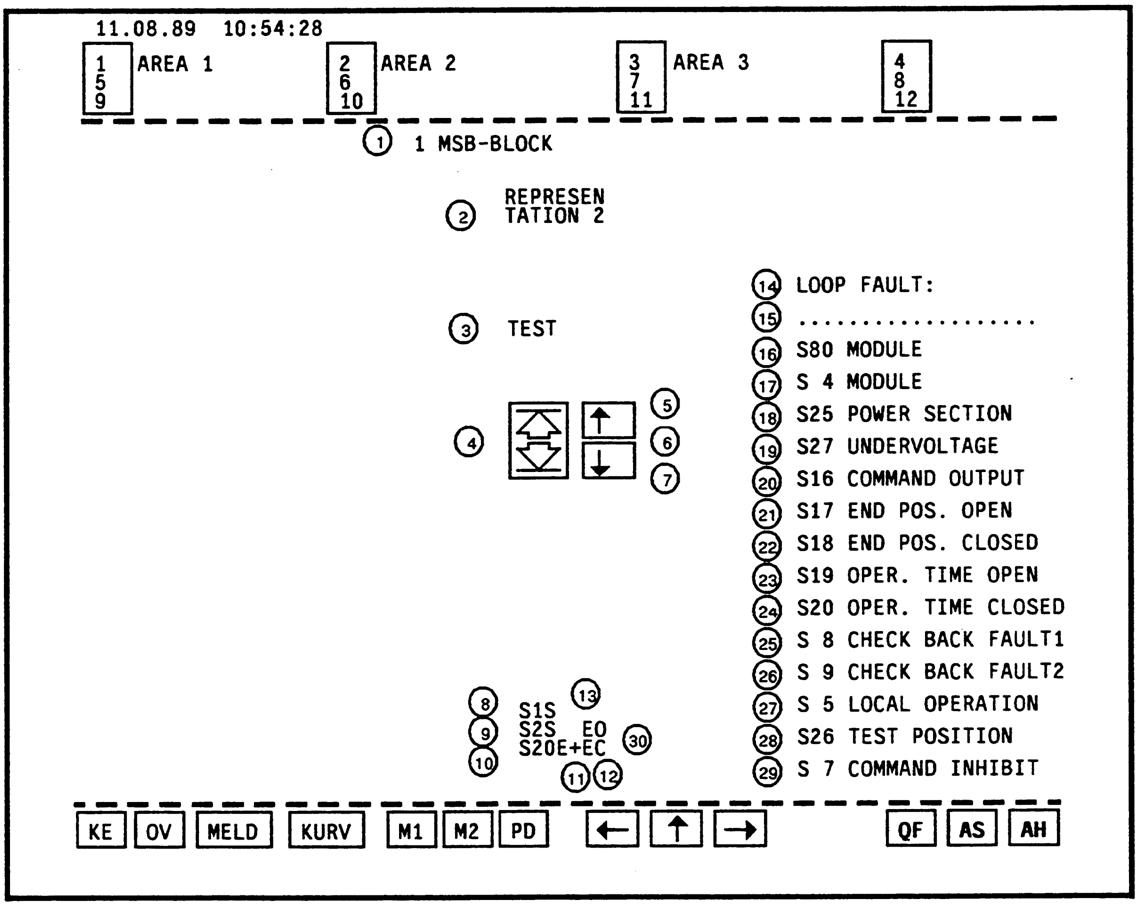


Fig. 4.3-49 Loop display of the MSB block (representation 3)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Static frame			bk	bk			PK 318
2	Process-related name	77 S16	8+8	gn	bk			
3	TEST	56 PB	4					ZA 164
4	OPEN/CLOSED state Command inhibit	Status	3x3					ZA 295
5	Key: open/module acknowledgement	Status	2			"↑"	30.99.11.0	ZA 292
6	Time-out status	Status	1					ZA 277
7	Key: close/module acknowledgement	Status	2			"↓"	30.99.12.0	ZA 293
8	S1S	8 AB	3					ZA 279
9	S2S	9 AB	3					ZA 280
10	S20E	10 AB	4					ZA 281
11	Blinking mark I&C fault/Loop message field	Status	1					ZA 290

Legend of Fig. 4.3-49, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
12	FZ	6 AB	2					ZA 283
13	FA	7 AB	2					ZA 282
14	LOOP FAULT	Segment	14	gn	bk			
15	BLOCK ENVIRONMENT	Status	20					ZA 24
16	S80 MODULE	75 PB	20					ZA 56
17	S4 MODULE	1 AB	20					ZA 160
18	S25 POWER SECTION	55 PB	20					ZA 170
19	S27 UNDERVOLTAGE	58 PB	20					ZA 284
20	S16 COMMAND OUTPUT	59 PB	20					ZA 162
21	S17 END POS. OPEN	54 PB	20					ZA 172
22	S18 END POS. CLOSED	53 PB	20					ZA 173
23	S19 OPER. TIME OPEN	52 PB	20					ZA 174
24	S20 OPER. TIME CLOSED	51 PB	20					ZA 175
25	S21 TORQUE OPEN	20 AB	20					ZA 176
26	S22 TORQUE CLOSED	19 AB	20					ZA 177
27	S8 CHECK BACK FAULT1	61 PB	21					ZA 285
28	S9 CHECK BACK FAULT2	62 PB	21					ZA 286
29	S5 LOCAL OPERATION	60 PB	20					ZA 287
30	S26 TEST POSITION	56 PB	20					ZA 288
31	S7 COMMAND INHIBIT	63 PB	20					ZA 289
32	Process-related name	38 S2	2	bk	or			
33	Binary display	14 EA	4	or	bk			
34	Binary display	13 EA	3	gn	bk			
35	Bar value position indication	14 EA	5	or	bk			Scaling values 13EA 15EA
36	Unit	16 S4	4	gn	bk			
37	Binary display	15 EA	3	gn	bk			
38	Dummy ZA for control field input QB	Status	1					ZA 294
39	Limitation position indication	Segment	5	gn	bk			

Legend of Fig. 4.3-49, part 2

- **Standardized display for the R block**

Application:

- Representation 1 of the R block is used for monitoring and controlling closed-loop control circuits and displaying setpoint (W), actual value (X), manipulated value (Y) and the modes (manual/automatic, internal/external).

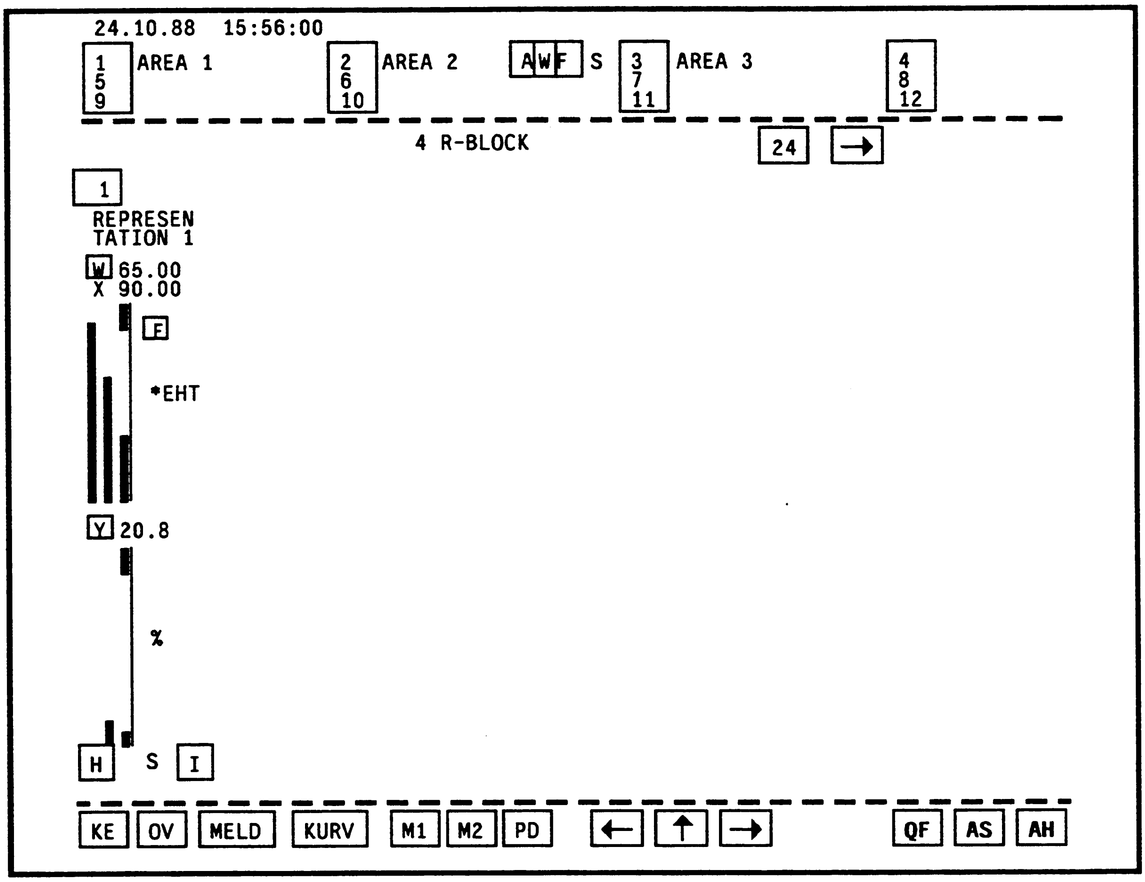


Fig. 4.3-50 Group display for the R block

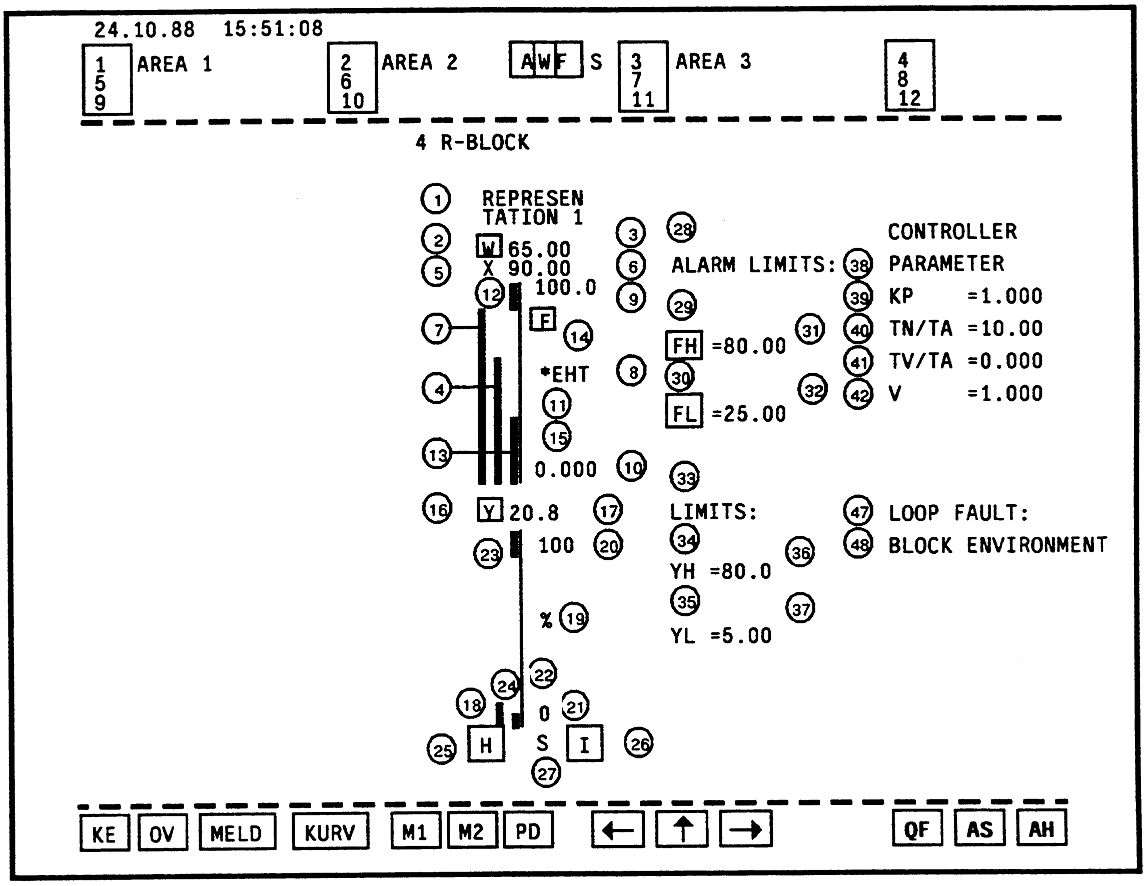


Fig. 4.3-51 Loop display for the R block

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	60 S16	8+8	gn	bk			
2	Mnemonic name of setpoint	36 S2	2	wh	bl	"W"	5.0.0.0	
3	Binary display of setpoint	1 AA	5	bl	bk		5.0.0.0	
4	Analog display of setpoint	1 AA	≤10	bl	bk			Scaling values 8 EA. 10 EA
5	Mnemonic name of actual value	37 S2	2	ye	bk			
6	Binary display of actual value	12 EA	5	ye	bk			
7	Analog display of actual value	12 EA	≤10	ye	bk			Scaling values 8 EA. 10 EA
8	Setpoint/actual value unit	52 S4	4	gn	bk			
9	Upper display range limit W, X	8 EA	5	gn	bk			
10	Lower display range limit W, X	10 EA	5	gn	bk			

Legend of Fig. 4.3-51, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
11	Display range setpoint/ actual value	Segment	10	gn	bk			
12	Analog display of upper limit value F	5 EA	≤10	bl	bk			Scaling values 8 EA. 10 EA
13	Analog display of lower limit value F	6 EA	≤10	bl	bk			Scaling values 8 EA. 10 EA
14	Blinking mark upper F	Status	1	bk	bl			Status display 100
15	Blinking mark lower F	Status	1	bk	bl			Status display 101
16	Mnemonic name of manipulated variable	38 S2	2	wh	or	"Y"	6.1.0.0	
17	Binary display of manipulated variable	3 AA	4	or	bk			
18	Analog display of manipulated variable	3 AA	≤5	or	bk			Scaling values -2. +102
19	Unit of manipulated variable	Segment	1	gn	bk			
20	Upper display range limit Y	Segment	3	gn	bk			
21	Lower display range limit Y	Segment	1	gn	bk			
22	Display range manipulated variable	Segment	5	gn	bk			
23	Upper correcting range limit	17 EA	≤5	wh	bk			Scaling values -2. +102
24	Lower correcting range limit	19 EA	≤5	wh	bk			Scaling values -2. +102
25	Mode MANUAL AUTOMATIC	Status	 2 2	 bk bk	 wh gn	 "H" "A"	 11.2.0.0 11.2.0.0	Status display 23
26	Mode INTERNAL EXTERNAL	Status	 2 2	 wh wh	 bl bl	 "I" "E"	 10.1.0.0 10.1.0.0	Status display 112
27	Blinking mark I&C fault	Status	1 1	ye gn	bk bk	"S" " + "		Status display 102
28	ALARM LIMITS:	Segment	11	gn	bk			
29 30	Mnemonic name "FH = " Mnemonic name "FL = "	Segment	2 2	wh wh	bl bl	"FH" "FL"	7.0.0.0 7.0.0.0	
31 32	Upper error limit Lower error limit	5 EA 6 EA	5 5	gn gn	bk bk		7.0.0.0 7.0.0.0	
33	LIMITS:	Segment	11	gn	bk			

Legend of Fig. 4.3-51, part 2

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
34 35	Mnemonic name "YH = " Mnemonic name "YL = "	Segment	3 3	gn gn	bk bk			
36	Upper correcting range limit	17 EA	4	gn	bk			
37	Lower correcting range limit	19 EA	4	gn	bk			
38 39 40 41 42	CONTROLLER PARAMETER: "KP = " "TN / TA = " "TV / TA = " "V = "	Segment	16 6 6 6 6	gn gn gn gn gn	bk bk bk bk bk			
43	Binary value KP	1 EA	5	gn	bk			
44	Binary value TN/TA	2 EA	5	gn	bk			
45	Binary value TV/TA	3 EA	5	gn	bk			
46	Binary value V	4 EA	5	gn	bk			
47	LOOP FAULT	Segment	14	gn	bk			
48	BLOCK ENVIRONMENT	Status	20	ye	bk			Status display 24

Legend of Fig. 4.3-51, part 3

- **Standardized display for the RE block**

Application :

- Representation 1 of the RE block is used for monitoring and controlling closed-loop control circuits and displaying setpoint (W), actual value (X), manipulated value (Y) and the modes (manual/automatic/CPU operation).

The RE block is used for measuring signals from the single-channel closed-loop control modules 6DS1400 (S-type closed-loop controller) and 6DS1401 (K-type closed-loop controller) and for transferring commands to the closed-loop control modules.

A closed-loop control module is required if the RE block is to be monitored and controlled via the corresponding NORA for the RE block.

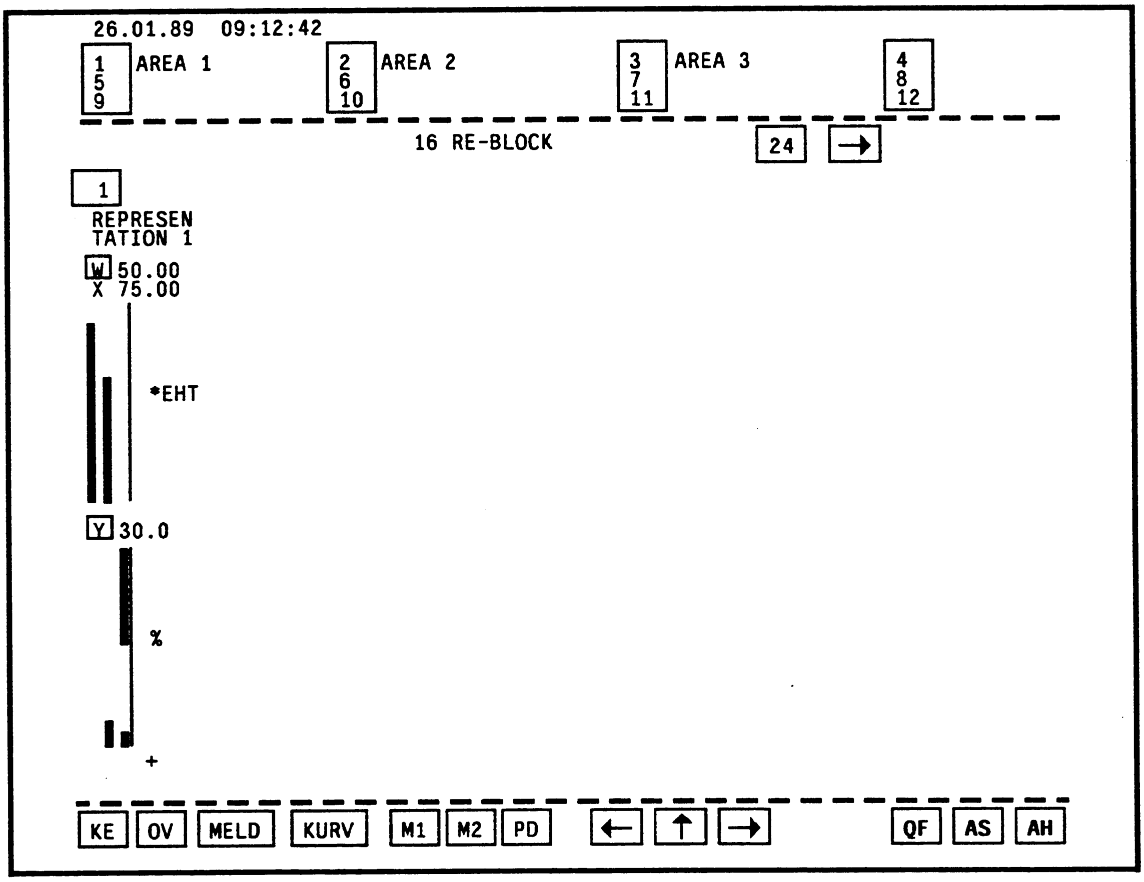


Fig. 4.3-52 Group display for the RE block

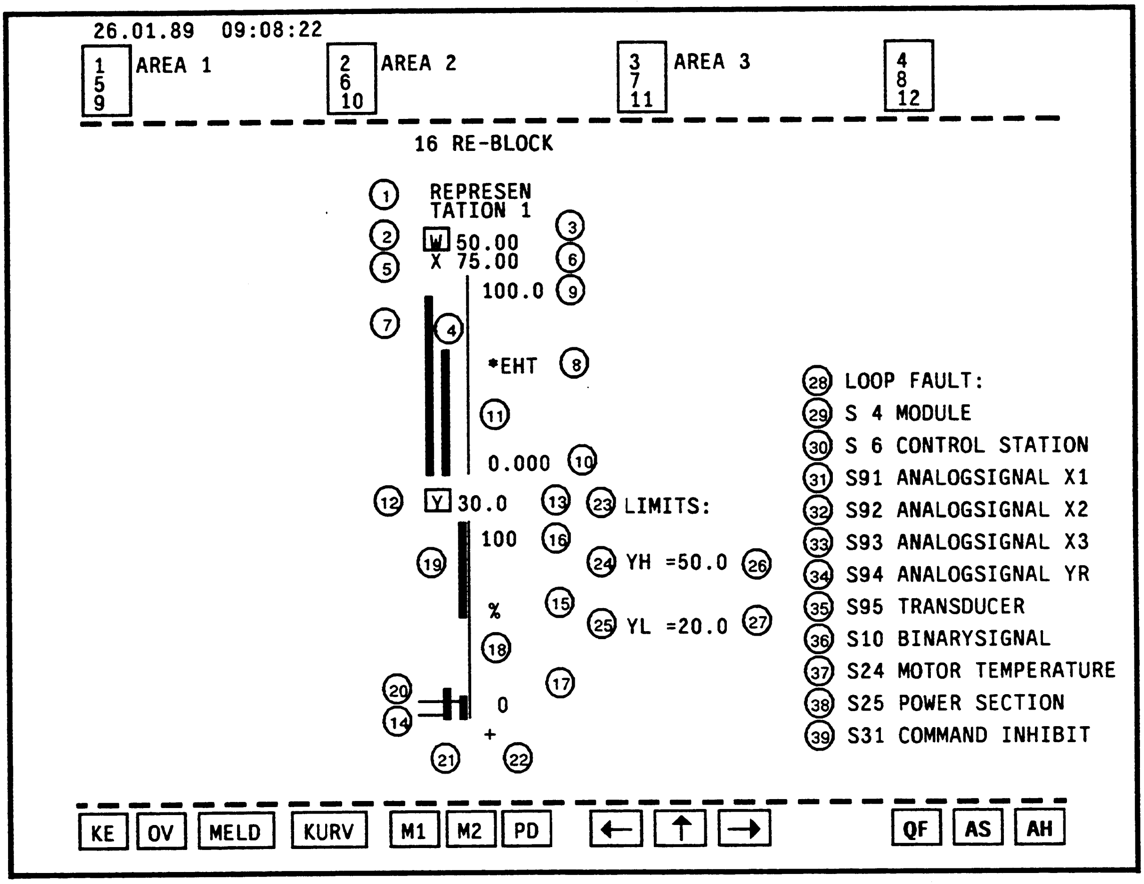


Fig. 4.3-53 Loop display for the RE block

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	63 S16	8+8	gn	bk			
2	Mnemonic name of setpoint	39 S2	2	wh	bl	"W"	5	
3	Binary display of setpoint	5 AA	5	bl	bk			
4	Analog display of setpoint	5 AA	≤10	bl	bk			Scaling values 15 EA, 16 EA
5	Mnemonic name of actual value	40 S2	2	ye	bk			
6	Binary display of actual value	7 AA	5	ye	bk			
7	Analog display of actual value	7 AA	≤10	ye	bk			Scaling values 15 EA, 16 EA
8	Unit actual value, setpoint	55 S4	4	gn	bk			
9	Upper display range limit W, X	15 EA	5	gn	bk			
10	Lower display range limit W, X	16 EA	5	gn	bk			
11	Display range of setpoint/actual value	Segment	10	gn	bk			

Legend of Fig. 4.3-53, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
12	Mnemonic name of manipulated variable	41 S2	2	wh	or	"Y"	6.1.0.0	
13	Binary display of manipulated variable	4 AA	4	or	bk		6.1.0.0	
14	Analog display of manipulated variable	4 AA	≤5	or	bk			
15	Unit of manipulated variable	Segment	1	gn	bk			
16	Upper display range limit Y	Segment	3	gn	bk			
17	Lower display range limit Y	Segment	1	gn	bk			
18	Display range of manipulated variable	Segment	5	gn	bk			
19	Upper correcting range limit	3 EA	≤5	wh	bk			Scaling values −2. +102
20	Lower correcting range limit	3 EA	≤5	wh	bk			Scaling values −2. +102
21	Mode: MANUAL AUTOMATIC CPU	Status	2 2 2	bk bk bk	wh bk bk	"H" "A" "C"	13.0.0.0 13.0.0.0 13.0.0.0	Status display 120
22	Blinking mark I&C fault	Status	1 1	ye gn	bk bk	"S" "+"		Status display 10
23	Limits:	Segment	11	gn	bk			
24	Mnemonic name "YH="	Segment	3	gn	bk			
25	Mnemonic name "YL="		3	gn	bk			
26	Upper correcting range limit	3 EA	4	gn	bk			
27	Lower correcting range limit	5 EA	4	gn	bk			
28	LOOP FAULT	Segment	14	gn	bk			
29	S4 MODULE	37..AB	20	ye	bk			Status display 160
30	S6 CONTROL STATION	38 AB	20	ye	bk			Status display 165
31	S91 ANALOGSIGNAL X1	39 AB	20	ye	bk			Status display 178
32	S92 ANALOGSIGNAL X2	40 AB	20	ye	bk			Status display 179
33	S93 ANALOGSIGNAL X3	41 AB	20	ye	bk			Status display 180
34	S94 ANALOGSIGNAL YR	42 AB	20	ye	bk			Status display 181
35	S95 TRANSDUCER	43 AB	20	ye	bk			Status display 182
36	S10 BINARYSIGNAL	44 AB	20	ye	bk			Status display 161
37	S24 MOTOR TEMPERAT.	45 AB	20	ye	bk			Status display 183
38	S25 POWER SECTION	46 AB	20	ye	bk			Status display 170
39	S31 COMMAND INHIBIT	47 AB	20	ye	bk			Status display 163

Legend of Fig. 4.3-53, part 2

- **Standardized display for the RI block**

Application:

- Representation 1 of the RI block is used for monitoring and controlling closed-loop control circuits and displaying setpoint (W), actual value (X), manipulated value difference (DY) and the modes (manual/automatic, internal/external).

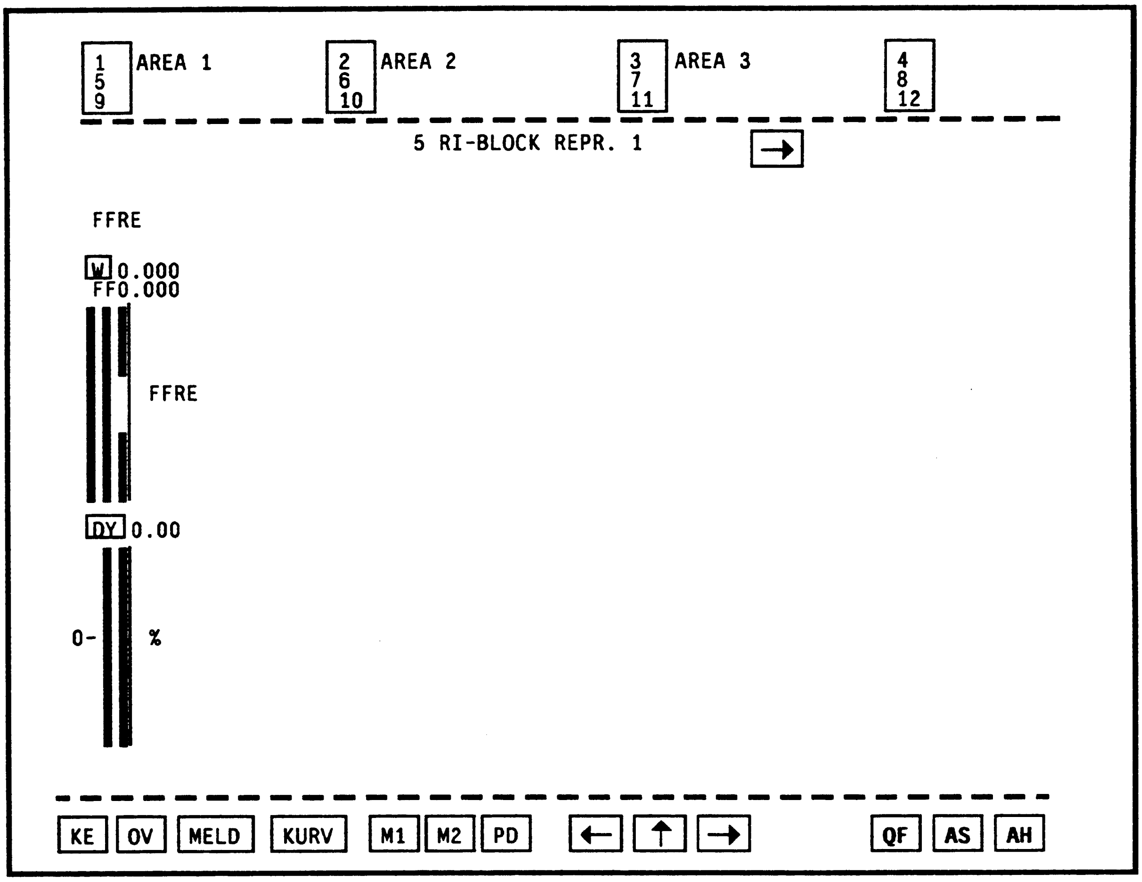


Fig. 4.3-54 Group display for the RI block

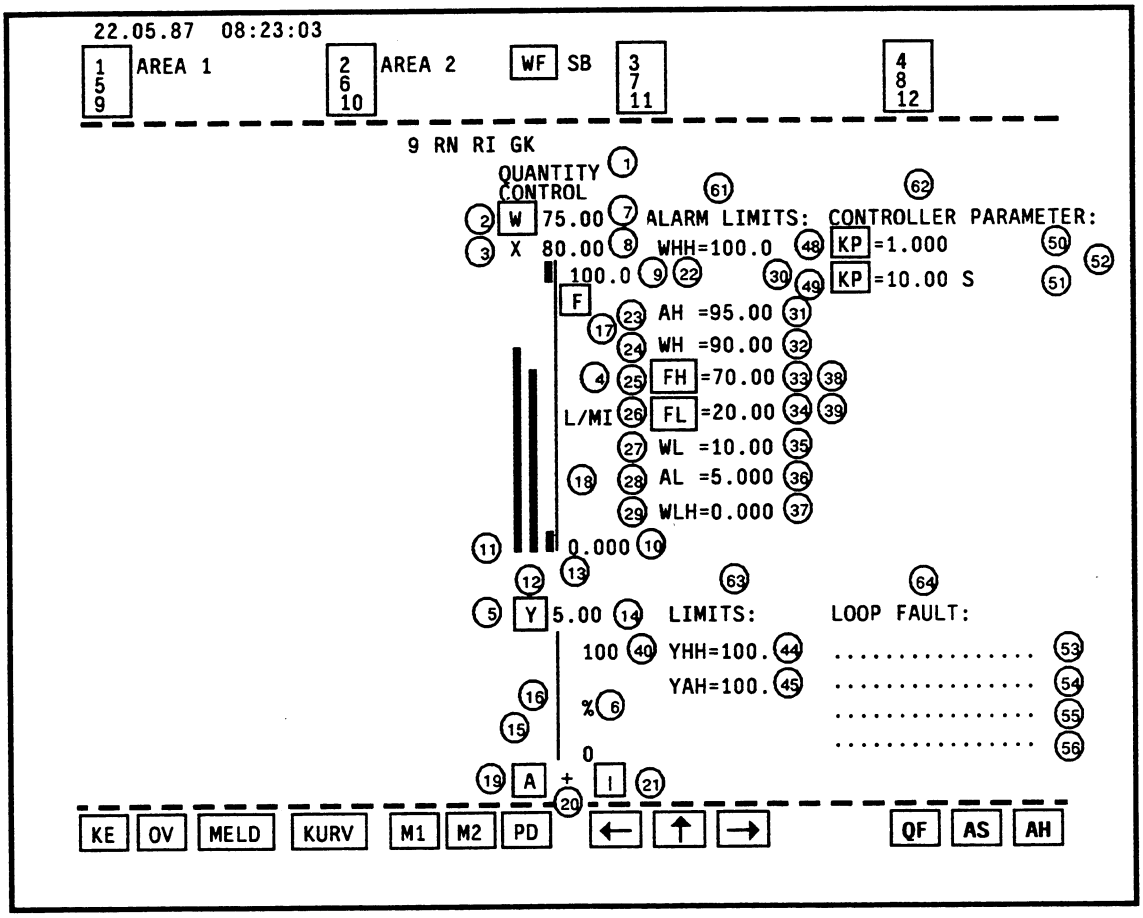


Fig. 4.3-55 Loop display for the RI block

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	90 S16	8+8	gn	bk			
2	Process-related mnemonic name	42 EB	2	bk bl	bl bk	" w " " WN "	5.0.0.0	Status display 234 (setpoint)
3	Process-related mnemonic name	59 S2	2	ye	bk			(actual value)
4	Unit of setpoint/actual value	83 S4	4	gn	bk			
5	Process-related mnemonic name	Segment	2	or	bk	" DY "	7.0.0.0	Actuating increment
6	Unit of manipulated variable	Segment	1	gn	bk			
7	Binary display of setpoint	1 AA	5	bl	bk			Scaling values 12 EA 16EA
8	Binary display of actual value	18 EA	5	ye	bk			Scaling values 12 EA 16EA
9	Binary display Upper display range limit	12 EA	5	gn	bk			
10	Binary display Lower display range limit	16 EA	5	gn	bk			

Legend of Fig. 4.3-55, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
11	Bar display of actual value	18 EA	≤10	ye	bk			Scaling values 12 EA 16EA
12	Bar display of setpoint	1 AA	≤10	bl	bk			Scaling values 12 EA 16EA
13	Bar display of limits	6 EA 5 EA	≤10	rd	bk			Scaling values 12 EA 16EA
14	Binary display of manipulated variable	3 AA	4	or	bk			Scaling values 0 to 104
15	Bar display of manipulated variable	3 AA	≤5	or	bk			Scaling values 0 to 104
16	Bar display of manipulated variable limits	28 EA 29 EA	≤5	gn	bk			Scaling values 0 to 104
17	Display of upper alarm	Status	1					Status display 100
18	Display of lower alarm	Status	1					Status display 101
19	Mode selection Manual/automatic	Status	2	bk bk	wh gn	" H " " A "	29.29.29.0	Status display 23
20	Blinking mark I&C fault	Status	1					Status display 102
21	Lower setpoint limit in manual mode	Status	2	wh wh	bl bl	"I" "E"	29.29.0.0	Status display 112
22	Mnemonic name of setpoint input limit O	Segment	3					
23	Mnemonic name of upper alarm	Segment	2					
24	Mnemonic name of upper warning	Segment	2					
25	Mnemonic name of lower fault	Segment	2	bk	bl	" FH "	7.0.0.0	With keyswitch 3
26	Mnemonic name of upper fault	Segment	2	bk	bl	" FL "	7.0.0.0	With keyswitch 3
27	Mnemonic name of lower warning	Segment	2					
28	Mnemonic name of lower alarm	Segment	2					
29	Mnemonic name of setpoint input limit U	Segment	2					
30	Binary display of setpoint input limit O	13 EA	5	gn	bk			
31	Binary display of upper alarm	5 EA	5	gn	bk			
32	Binary display of upper warning	7 EA	5	gn	bk			
33	Binary display of upper fault	9 EA	5	gn	bk		7.0.0.0	With keyswitch 3
34	Binary display of lower fault	10 EA	5	gn	bk		7.0.0.0	With keyswitch 3
35	Binary display of lower warning	8 EA	5	gn	bk			
36	Binary display of lower alarm	6 EA	5	gn	bk			
37	Binary display of setpoint input limit U	15 EA	5	gn	bk			

Legend of Fig. 4.3-55, part 2

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
38	Limit value selection	1 43 EB 0	2	bk ye	bk bk			Status display 236
39	Limit value selection	1 43 EB 0		bk ye	bk bk			Status display 236
40	Mnemonic name of upper limit of manual setpoint	Segment	3					
41	Mnemonic name of upper limit of automatic setpoint	Segment	3					
42	Mnemonic name of lower limit of automatic setpoint	Segment	3					
43	Mnemonic name of lower limit of manual setpoint m	Segment	3					
44	Binary display of upper limit (manual)	25 EA	4	gn	bk			
45	Binary display of upper limit (automatic)	28 EA	4	gn	bk			
46	Binary display of lower limit (automatic)	29 EA	4	gn	bk			
47	Binary display of lower limit (manual)	27 EA	4	gn	bk			
48	Mnemonic name "KP"	Segment	2	bk	gr	" KP "	7.0.0.0	With keyswitch 3
49	Mnemonic name "TN"	Segment	2	bk	gr	" TN "	7.0.0.0	With keyswitch 3
50	Binary display "KP"	1 EA	5	gn	bk		7.0.0.0	With keyswitch 3
51	Binary display "TN"	2 EA	5	gn	bk		7.0.0.0	With keyswitch 3
52	Unit of "TN"	Segment	1	gn	bk			
53	BLOCK ENVIRONMENT 1	53 EB	20 0 1	gn ye	bk bk			Status display 237
54	BLOCK ENVIRONMENT 2	54 EB	20 0 1	gn ye	bk bk			Status display 238
55	BLOCK ENVIRONMENT 3	55 EB	20 0 1	gn ye	bk bk			Status display 239
56	BLOCK ENVIRONMENT 4	56 EB	20 0 1	gn ye	bk bk			Status display 240
61	ALARM LIMITS:	Segment	11	gn	bk			
62	CONTROLLER PARAMETER	Segment	16	gn	bk			
63	LIMITS:	Segment	11	gn	bk			
64	LOOP FAULT	Segment	14	gn	bk			

Legend of Fig. 4.3-55, part 3

- **Standardized display for the RK block**

Application:

The RK block is used for monitoring and controlling closed-loop control circuits and displaying setpoint (W), actual value (X), manipulated value (Y) and the modes (manual/automatic/CPU operation).

- The RK block features three representations which are used for displaying measured values. One pair of limit values (upper and lower limit value) are monitored for each of these measured values. Display range and limit values are read from the AS when the display is selected. The limit values are displayed as "approaching bars".
- Representation 1 is used for monitoring the WARNING limits (WFA mode = 0).
- Representation 2 is used for monitoring the FAULT limits (WFA mode = 1).
- Representation 3 is used for monitoring the ALARM limits (WFA mode = 2).

The RK block is used for measuring signals from the single-channel closed-loop control modules 6DS1400 (S-type closed-loop controller) and 6DS1401 (K-type closed-loop controller) and for transferring commands to the closed-loop control modules.

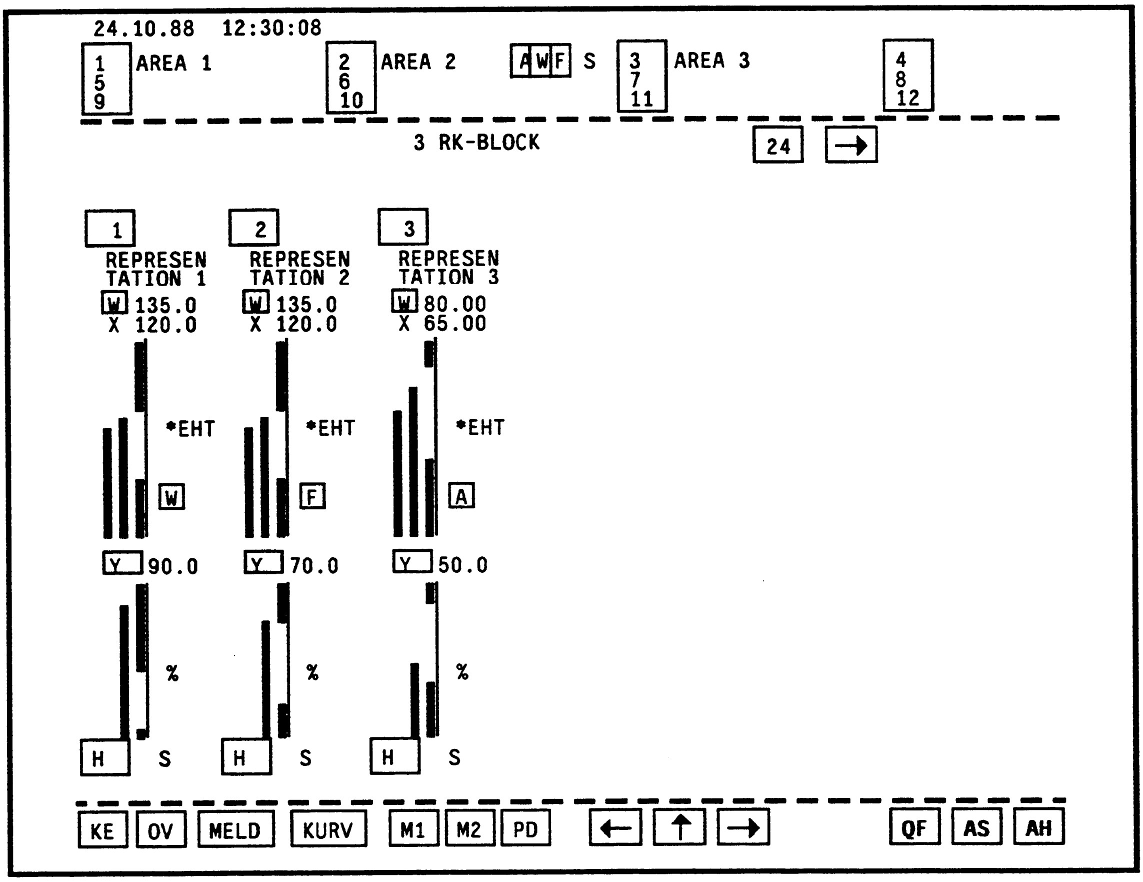


Fig. 4.3-56 Group display with the three representations of the RK block

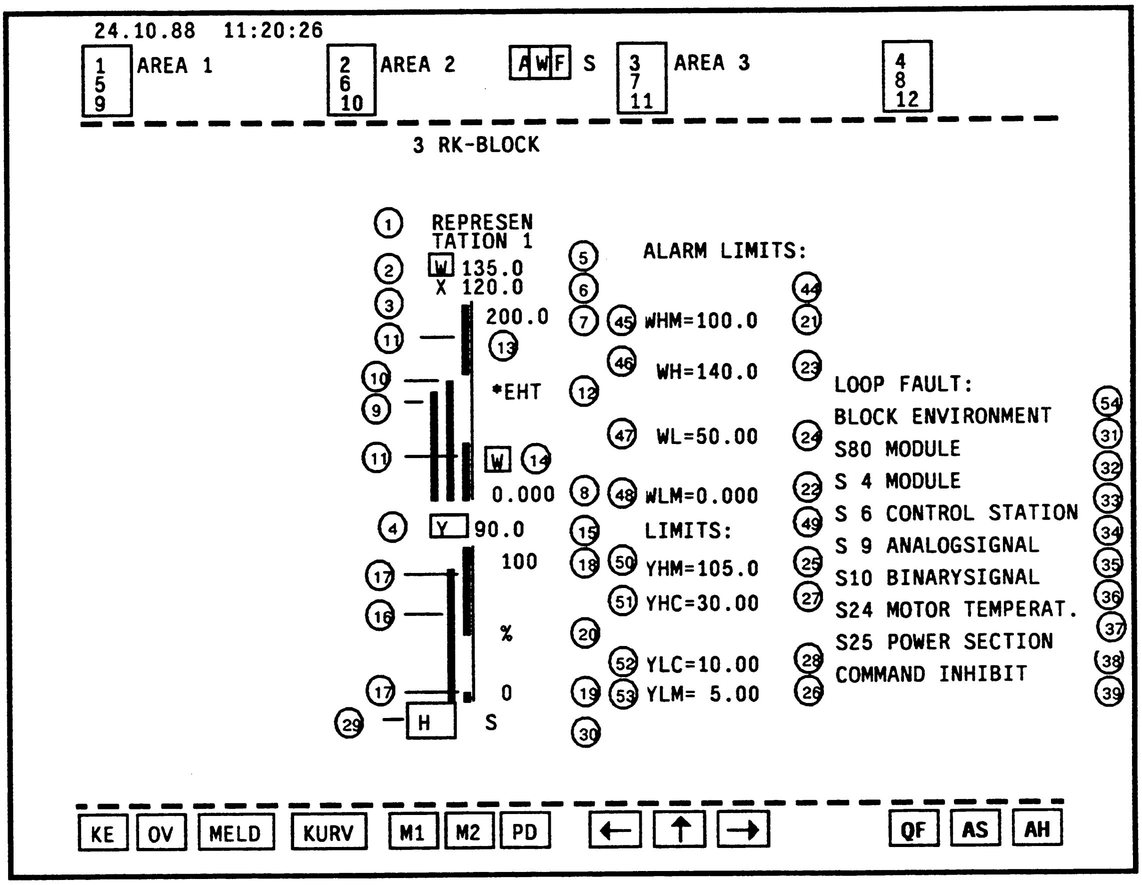


Fig. 4.3-57 Loop display of the RK block (representation 1)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	79 S16	8+8	gn	bk			
2	Process-related mnemonic name of setpoint	48 S2	2	wh	bl	"w"	5.0.0.0	
3	Process-related mnemonic name of actual value	52 S2	2	ye	bk			
4	Process-related mnemonic name	35 EB	2	bk or	or bk	"y"	6.1.0.0	
5	Binary display of setpoint	5 AA	5	bl	bk		5.0.0.0	Scaling values 15 EA 16EA
6	Binary display of actual value	7 AA	5	ye	bk			Scaling values 15 EA 16EA
7	Binary display Upper display ranye limit	15 EA	5	gn	bk			
8	Binary display Lower display ranye limit	16 EA	5	gn	bk			
9	Bar display of actual value	7 AA	≤10	ye	bk			Scaling values 15 EA 16EA

Legend of Fig. 4.3-57, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
10	Bar display of setpoint	5 AA	≤10	bl	bk			Scaling values 15 EA 16EA
11	Bar display Warning displays	19 EA (OG) 20 EA (UG)	≤10	ye	bk			Scaling values 15 EA 16EA
12	Units of setpoint/actual value	70 S4	4	gn	bk			
13	Blinking mark upper W	Status	1	bk	ye			Status display 252
14	Blinking mark lower W	Status	1	bk	ye			Status display 253
15	Binary display of manipulated variable	4 AA	4	or	bk		6.1.0.0	Scaling values –2, 102
16	Bar display of manipulated variable	4 AA	≤5	or	bk			Scaling values –2, 102
17	Bar display of manipulated variable limits	22 EA (YHC) 23 EA (YLC)	≤5	gn	bk			Scaling values –2, 102
18	Upper manipulated variable	Segment	3	gn	bk			
19	Lower manipulated variable	Segment	1	gn	bk			
20	Unit of manipulated variable	Segment	1	gn	bk			
21	Upper setpoint limit in manual mode	6 EA	5	gn	bk			
22	Lower setpoint limit in manual mode	8 EA	5	gn	bk			
23	Upper warning limit	19 EA	5	gn	bk			
24	Lower warning limit	20 EA	5	gn	bk			
25	Upper limit of manipulated variable in manual mode	3 EA	5	gn	bk			
26	Lower limit of manipulated variable in manual mode	5 EA	5	gn	bk			
27	Upper limit of manipulated variable in CPU mode	22 EA	5	gn	bk			
28	Lower limit of manipulated variable in CPU mode	23 EA	5	gr	bk			
29	Mode selection	Status	2	bk bk bk	wh gn gn	" H " " A " " C "	13.13.13.13	Status display 23
30	I&C fault alarm	Status	1	ye bk gn	bk bl bk	"S" "B" " + "		Status display 254
31	BLOCK ENVIRONMENT	Status	0 16 1 16	gn ye	bk bk			Status display 24

Legend of Fig. 4.3-57, part 2

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
32	S80 module	44 AB	0 16 1	gn ye	bk bk			Status display 56
33	S4 module	37 AB	0 16 1	gn ye	bk bk			Status display 160
34	S6 control station	38 AB	0 16 1	gn ye	bk bk			Status display 165
35	S9 analog signal	39 AB	0 16 1	gn ye	bk bk			Status display 171
36	S10 binary signal	40 AB	0 16 1	gn ye	bk bk			Status display 161
37	S24 motor temperature	41 AB	0 16 1	gn ye	bk bk			Status display 183
38	S25 power section	42 AB	0 16 1	gn ye	bk bk			Status display 259
39	Command inhibit	Status	0 16 1	gn ye	bk bk			Status display 241
44	ALARM LIMITS	Segment	11	gn	bk			
45	Process-related mnemonic name of manual setpoint	Segment	3	gn ye wh	bk			
46	Process-related mnemonic name of upper warning limit	Segment	2	gn ye	bk			
47	Process-related mnemonic name of lower warning limit	Segment	2	gn ye	bk			
48	Process-related mnemonic name of lower setpoint limit in manual mode	Segment	3	gn ye wh	bk			
49	LIMITS:	Segment	11	gn	bk			
50	Process-related mnemonic name of upper setpoint limit in manual mode	Segment	3	gn or wh	bk			
51	Process-related mnemonic name of upper limit of manipulated variable in CPU mode	Segment	3	gn or gn	bk			
52	Process-related mnemonic name of lower limit of manipulated variable in manual mode	Segment	3	gn or gn	bk			
53	Process-related mnemonic name of lower limit of manipulated variable in CPU mode	Segment	3	gn or wh	bk			
54	LOOP FAULT	Segment	14	gn	bk			

Legend of Fig. 4.3-57, part 3

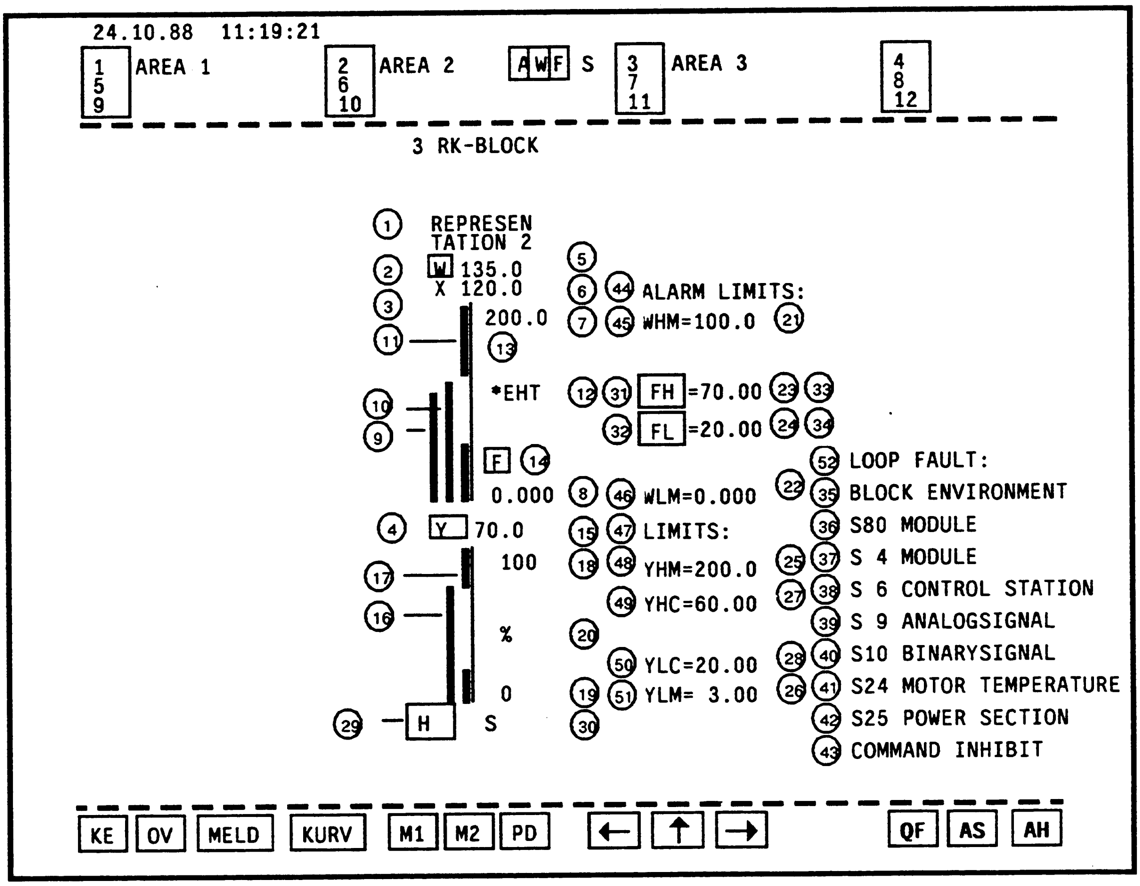


Fig. 4.3-58 Loop display of the RK block (representation 2)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	7 S16	8+8	gn	bk			
2	Process-related mnemonic name of setpoint	48 S2	2	wh	bl bk	" w "	5.0.0.0	
3	Process-related mnemonic name of actual value	52 S2	2	ye	bk			
4	Process-related mnemonic name of manipulated variable	35 EB	2	bk or	or bk	" y "	6.1.0.0	
5	Binary display of setpoint	5 AA	5	bl	bk		5.0.0.0	Scaling values 15 EA 16EA
6	Binary display of actual value	7 AA	5	ye	bk			Scaling values 15 EA 16EA
7	Binary display Upper display range limit	15 EA	5	gn	bk			
8	Binary display Lower display range limit	16 EA	5	gn	bk			

Legend of Fig. 4.3-58, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
9	Bar display of actual value	7 AA	≤10	ye	bk			Scaling values 15 EA 16EA
10	Bar display of setpoint	5 AA	≤10	bl	bk			Scaling values 15 EA 16EA
11	Bar display Fault limits	19 EA (OG) 20 EA (UG)	≤10	bl	bk			Scaling values 15 EA 16EA
12	Units of setpoint/actual value	70 S4	4	gn	bk			
13	Blinking mark upper fault	Status	1	bk	bl			Status display 111
14	Blinking mark lower fault	Status	1	bk	bl			Status display 110
15	Binary display of manipulated variable	4 AA	4	or	bk		6.1.0.0	Scaling values -2, 102
16	Bar display of manipulated variable	4 AA	≤5	or	bk			Scaling values -2, 102
17	Bar display of manipulated variable limits	22 EA (YHC) 23EA (YLC)	≤5	gn	bk			Scaling values -2, 102
18	Upper manipulated variable	Segment	3	gn	bk			
19	Lower manipulated variable	Segment	1	gn	bk			
20	Unit of manipulated variable	Segment	1	gn	bk			
21	Upper setpoint limit in manual mode	6 EA	5	gn	bk			
22	Lower setpoint limit in manual mode	8 EA	5	gn	bk			
23	Upper warning limit	19 EA	5	gn	bk		7.0.0.0	
24	Lower warning limit	20 EA	5	gn	bk		7.0.0.0	
25	Upper limit of manipulated variable in manual mode	3 EA	5	gn	bk			
26	Lower limit of manipulated variable in manual mode	5 EA	5	gn	bk			
27	Upper limit of manipulated variable in CPU mode	22 EA	5	gn	bk			
28	Lower limit of manipulated variable in CPU mode	23 EA	5	gn	bk			
29	Mode selection	Status	2	bk bk bk	wh gn gn	" H " " A " " C "	13.13.13.13	Status display 23

Legend of Fig. 4.3-58, part 2

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
30	I&C fault alarm	Status	1	ye bl	bk bk			Status display 254
31	Key for upper fault limit entry	Segment	2	bk ye	bl bk	" OF "	7.0.0.0	With keyswitch 3
32	Key for lower fault limit entry	Segment	2	bk ye	bl bk	" UF "	7.0.0.0	With keyswitch 3
33	Display of upper system deviation	25 EB	0 2 1	ye	bk			Status display 255
34	Display of lower system deviation	25 EB	0 2 1	ye	bk			Status display 255
35	BLOCK ENVIRONMENT	Status	0 16 1	gn	bk			Status display 24
36	S80 module	44 AB	0 16 1	gn	bk			Status display 56
37	S4 module	37 AB	0 16 1	gn	bk			Status display 160
38	S6 control station	38 AB	0 16 1	gn	bk			Status display 165
39	S9 analog signal	39 AB	0 16 1	gn ye	bk bk			Status display 171
40	S10 binary signal	40 AB	0 16 1	gn ye	bk bk			Status display 161
41	S24 motor temperature	41 AB	0 16 1	gn ye	bk bk			Status display 183
42	S25 power section	42 AB	0 16 1	gn ye	bk bk			Status display 259
43	Command inhibit	Status	0 16 1	gn ye	bk bk			Status display 241
44	ALARM LIMITS	Segment	11	gn	bk			
45	Process-related mnemonic name of upper setpoint in manual mode	Segment	3	gn bl wh	bk			
46	Process-related mnemonic name of lower setpoint in manual mode	Segment	2	gn bl wh	bk			
47	LIMITS:	Segment	11	gn	bk			
48	Process-related mnemonic name of upper setpoint limit in manual mode	Segment	3	gn or wh	bk			
49	Process-related mnemonic name of upper limit of manipulated variable in CPU mode	Segment	3	gn or ye	bk			
50	Process-related mnemonic name of lower limit of manipulated variable in manual mode	Segment	3	gn or gn	bk			
51	Process-related mnemonic name of lower limit of manipulated variable in CPU mode	Segment	3	gn or wh	bk			
52	LOOP FAULT	Segment	14	gn	bk			

Legend of Fig. 4.3-58, part 3

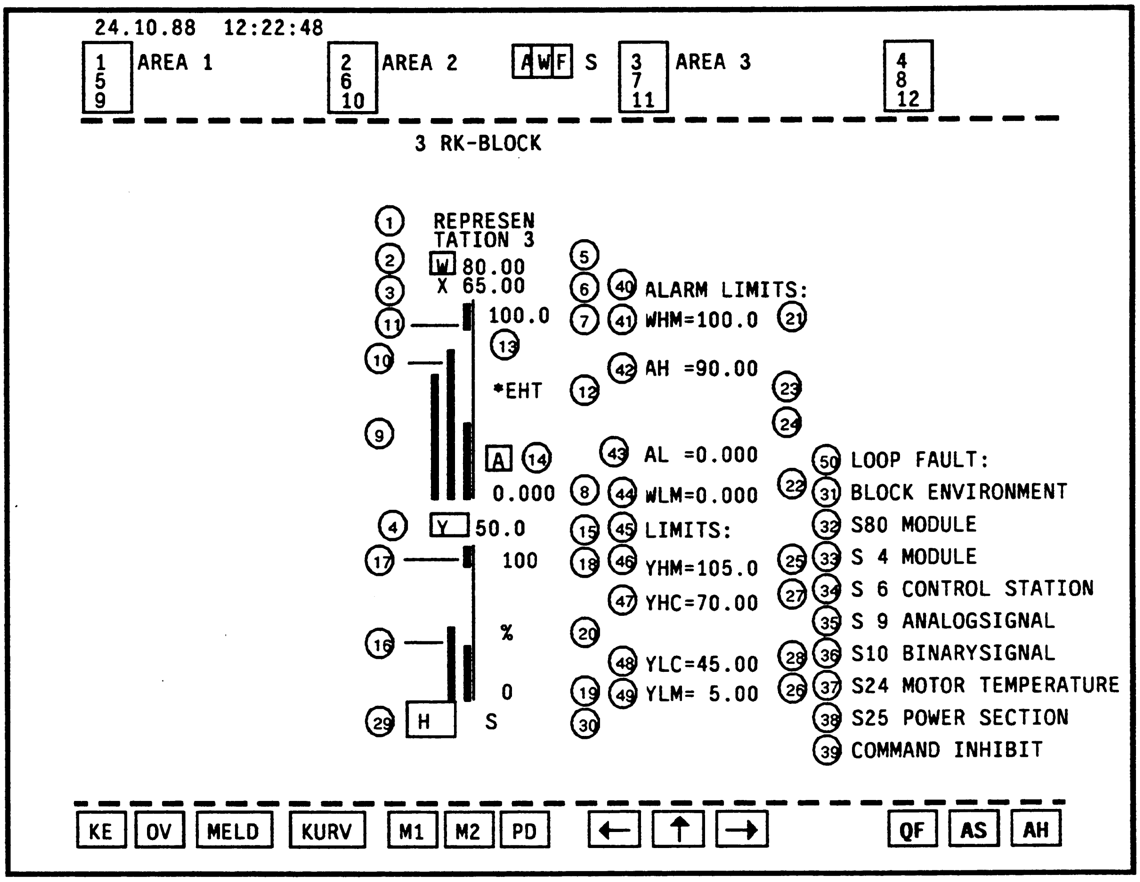


Fig. 4.3-59 Loop display of the RK block (representation 3)

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	78 S16	8+8	gn	bk			
2	Process-related mnemonic name of setpoint	48 S2	2	wh	bl bk	"w"	5.0.0.0	
3	Process-related mnemonic name of actual value	52 S2	2	ye	bk			
4	Process-related mnemonic name of manipulated variable	35 EB	2	bk or	or bk	"y"	6.1.0.0	
5	Binary display of setpoint	5 AA	5	bl	bk		5.0.0.0	Scaling values 15 EA 16EA
6	Binary display of actual value	7 AA	5	ye	bk			Scaling values 15 EA 16EA
7	Binary display Upper display range limit	15 EA	5	gn	bk			
8	Binary display Lower display range limit	16 EA	5	gn	bk			
9	Bar display of actual value	7 AA	≤10	ye	bk			Scaling values 15 EA 16EA
10	Bar display of setpoint	5 AA	≤10	bl	bk			Scaling values 15 EA 16EA

Legend of Fig. 4.3-59, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
11	Bar display Warning displays	19 EA (OG) 20 EA (UG)	≤10	ye	bk			Scaling values 15 EA 16EA
12	Units of setpoint/actual value	70 S4	4	gn	bk			
13	Blinking mark upper A	Status	1	bk	ye			Status display 84
14	Blinking mark lower A	Status	1	bk	ye			Status display 83
15	Binary display of manipulated variable	4 AA	4	or	bk		6.1.0.0	Scaling values –2, 102
16	Bar display of manipulated variable	4 AA	≤5	or	bk			Scaling values –2, 102
17	Bar display of manipulated variable limits	22 EA (YHC) 23 EA (YLC)	≤5	gn	bk			Scaling values –2, 102
18	Upper manipulated variable	Segment	3	gn	bk			
19	Lower manipulated variable	Segment	1	gn	bk			
20	Unit of manipulated variable	Segment	1	gn	bk			
21	Upper setpoint limit in manual mode	6 EA	5	gn	bk			
22	Lower setpoint limit in manual mode	8 EA	5	gn	bk			
23	Upper alarm limit	19 EA	5	gn	bk			
24	Lower alarm limit	20 EA	5	gn	bk			
25	Upper limit of manipulated variable in manual mode	3 EA	5	gn	bk			
26	Lower limit of manipulated variable in manual mode	5 EA	5	gn	bk			
27	Upper limit of manipulated variable in CPU mode	22 EA	5	gn	bk			
28	Lower limit of manipulated variable in CPU mode	23 EA	5	gn	bk			
29	Mode selection	Status	2	bk bk bk	wh gn gn	" H " " A " " C "	13.13.13.13	Status display 23
30	I&C fault alarm	Status	1	ye bl	bk bk			Status display 254
31	BLOCK ENVIRONMENT	Status	0 16 1 16	gn ye	bk bk			Status display 24
32	S80 module	44 AB	0 16 1 16	gn ye	bk bk			Status display 56
33	S4 module	37 AB	0 16 1	gn ye	bk bk			Status display 160
34	S6 control station	38 AB	0 16 1	gn ye	bk bk			Status display 165

Legend of Fig. 4.3-59, part 2

No.	Representation	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
35	S9 analog signal	39 AB	0 16 1	gn ye	bk bk			Status display 171
36	S10 binary signal	40 AB	0 16 1	gn ye	bk bk			Status display 161
37	S24 motor temperature	41 AB	0 16 1	gn ye	bk bk			Status display 183
38	S25 power section	42 AB	0 16 1	gn ye	bk bk			Status display 259
39	Command inhibit	Status	0 16 1	gn ye	bk bk			Status display 241
40	ALARM LIMITS	Segment	11	gn	bk			
41	Process-related mnemonic name of manual setpoint	Segment	3	gn ye wh	bk			
42	Process-related mnemonic name of upper warning limit	Segment	2	gn ye	bk			
43	Process-related mnemonic name of lower warning limit	Segment	2	gn ye	bk			
44	Process-related mnemonic name of lower setpoint limit in manual mode	Segment	3	gn ye wh	bk			
45	LIMITS:	Segment	11	gn	bk			
46	Process-related mnemonic name of upper setpoint limit in manual mode	Segment	3	gn OR wh	bk			
47	Process-related mnemonic name of upper limit of manipulated variable in CPU mode	Segment	3	gn OR gn	bk			
48	Process-related mnemonic name of lower limit of manipulated variable in manual mode	Segment	3	gn OR gn	bk			
49	Process-related mnemonic name of lower limit of manipulated variable in CPU mode	Segment	3	gn OR wh	bk			
50	LOOP FAULT	Segment	14	gn	bk			

Legend of Fig. 4.3-59, part 3

- **Standardized display for the RN block**

Application:

- Representation 1 of the RN block is used for monitoring and controlling closed-loop control circuits and displaying setpoint (W), actual value (X), manipulated value (Y) and the modes (manual/automatic, internal/external).

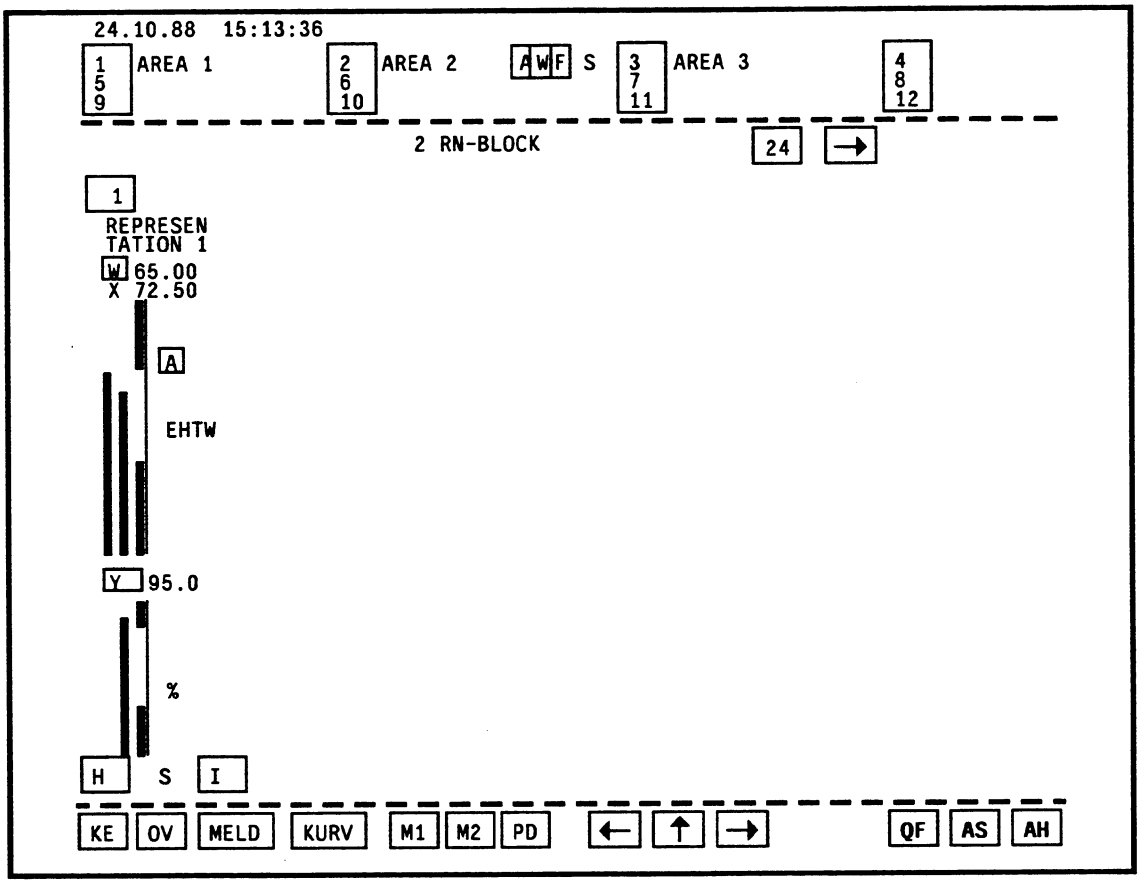


Fig. 4.3-60 Group display for the RN block

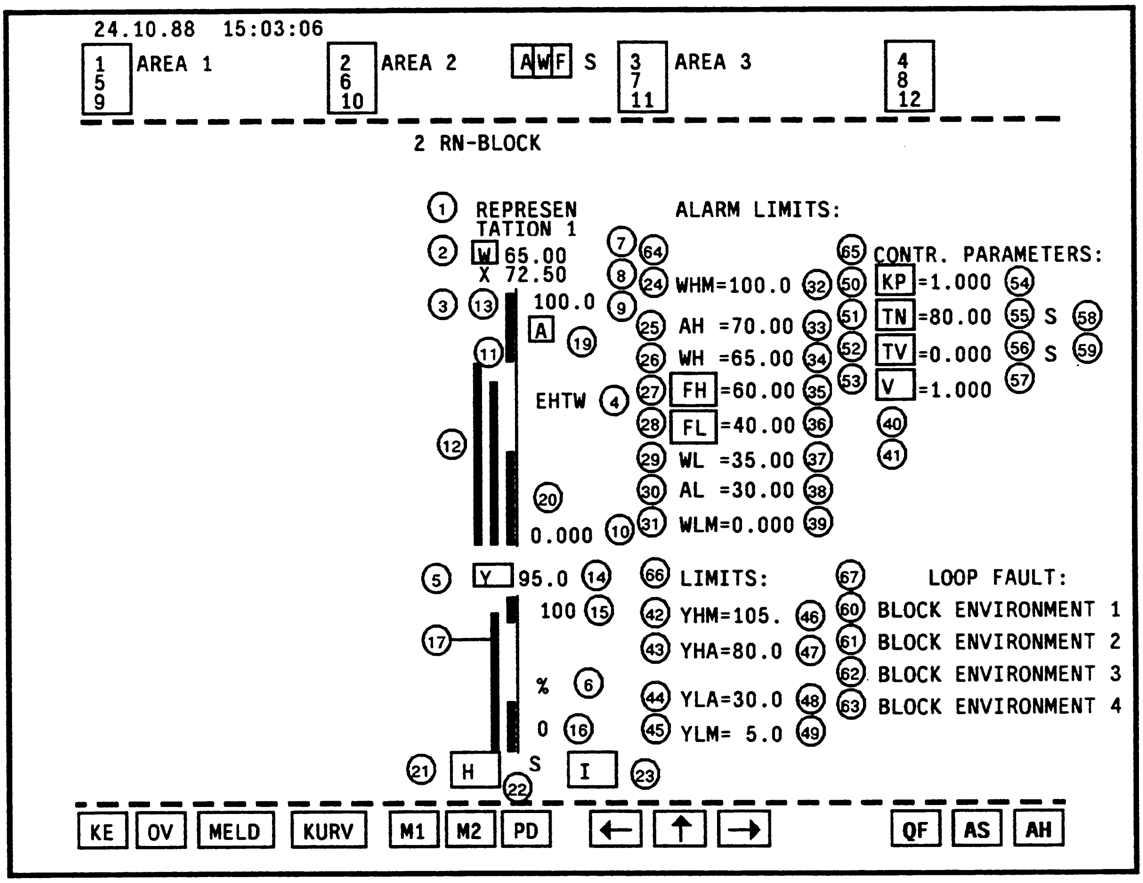


Fig. 4.3-61 Loop display for the RN block

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
1	Process-related name	90 S16	8+8	gn	bk			
2	Process-related mnemonic name	42 EB	2	bk bl	bl bk	"w" "w n"	5.0.0.0	Status display 234 (setpoint)
3	Process-related mnemonic name	59 S2	2	ye	bk			(Actual value)
4	Units of setpoint/actual value	83 S4	4	gn	bk			
5	Process-related mnemonic name	44 EB	2	bk	or	" Y "	6.1.0.0	Status display 235 (manipulated variable)
6	Unit of manipulated variable	Segment	1	gn	bk		5.0.0.0	
7	Binary display of setpoint	1 AA	5	bl	bk			Scaling values 12 EA 16EA
8	Binary display of setpoint	18 EA	5	ye	bk			Scaling values 12 EA 16EA
9	Binary display of upper display range limit	12 EA	5	gn	bk			
10	Binary display of lower display range limit	16 EA	5	gn	bk			

Legend of Fig. 4.3-61, part 1

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
11	Bar display of actual value	18 EA	≤10	ye	bk			Scaling values 12 EA 16EA
12	Bar display of setpoint	1 AA	≤10	bl	bk			Scaling values 12 EA 16EA
13	Bar display of limits	6 EA 5 EA	≤10	rd	bk			Scaling values 12 EA 16EA
14	Binary display of manipulated variable	3 AA	4	or	bk		6.1.0.0	Scaling values 0 to 104
15	Binary display of upper limit of manipulated variable	Segment	3	gn	bk			
16	Binary display of lower limit of manipulated variable	Segment	1	gn	bk			
17	Bar display of manipulated variable	3 AA	≤5	or	bk			Scaling values 0 to 104
18	Bar display Manipulated variable limits	28 EA 29 EA	≤5	gn	bk			Scaling values 0 to 104
19	Display of upper alarm	Status	1					Status display 100
20	Display of lower alarm	Status	1					Status display 101
21	Mode selection MANUAL/AUTOMATIC	Status	2 2	bk bk	wh gn	"M" "A"	29.29.29.0	Status display 23
22	Blinking mark I&C fault	Status	1					Status display 102
23	Mode selection INTERNAL/EXTERNAL	Status	2 2	wh wh	bl bl	"I" "E"	29.29.0.0	Status display 112
24	Mnemonic name of setpoint input limit O	Segment	3					
25	Mnemonic name of upper alarm	Segment	2					
26	Mnemonic name of upper warning	Segment	2					
27	Mnemonic name of upper fault	Segment	2	bk	bl	"FH"	7.0.0.0	With keyswitch 3
28	Mnemonic name of lower fault	Segment	2	bk	bl	"FL"	7.0.0.0	With keyswitch 3
29	Mnemonic name of lower warning	Segment	2					
30	Mnemonic name of lower alarm	Segment	2					
31	Mnemonic name of setpoint lower input limit	Segment	3					
32	Binary display of setpoint upper input limit	13 EA	5	gn	bk			
33	Binary display of upper alarm	5 EA	5	gn	bk			
34	Binary display of upper warning	7 EA	5	gn	bk			
35	Binary display of upper fault	9 EA	5	gn	bk		7.0.0.0	With keyswitch 3
36	Binary display of lower fault	10 EA	5	gn	bk		7.0.0.0	With keyswitch 3
37	Binary display of lower warning	8 EA	5	gn	bk			
38	Binary display of lower alarm	6 EA	5	gn	bk			
39	Binary display of setpoint lower input limit	15 EA	5	gn	bk			

Legend of Fig. 4.3-61, part 2

No.	Description	Source	Representation			Operator input		Comment
			Format	FGC	BGC	Key	Key set	
40	Limit value selection	43 EB 0	2	bk ye	bk bk			Status display 236
41	Limit value selection	43 EB 0	2	bk ye	bk bk			Status display 236
42	Mnemonic name of upper limit of manual setpoint	Segment	3					
43	Mnemonic name of upper limit of automatic setpoint	Segment	3					
44	Mnemonic name of lower limit of automatic setpoint	Segment						
45	Mnemonic name of lower limit of manual setpoint	Segment						
46	Binary display of upper limit (manual)	25 EA	3	gn	bk			
47	Binary display of upper limit (automatic)	28 EA	1	gn	bk			
48	Binary display of lower limit (automatic)	29 EA	4	gn	bk			
49	Binary display of lower limit (manual)	27 EA	4	gn	bk			
50	Mnemonic name "KP"	Segment	2	bk	gn	"KP"	7.0.0.0	With keyswitch 3
51	Mnemonic name "TN"	Segment	2	bk	gn	"TN"	7.0.0.0	With keyswitch 3
52	Mnemonic name "TV2"	Segment	2	bk	gn	"TV"	7.0.0.0	With keyswitch 3
53	Mnemonic name "V"	Segment	2	bk	gn	"V"	7.0.0.0	With keyswitch 3
54	"KP"	1 EA	5	gn	bk		7.0.0.0	With keyswitch 3
55	Binary display "TN"	2 EA	5	gn	bk		7.0.0.0	With keyswitch 3
56	Binary display "TV"	3 EA	5	gn	bk		7.0.0.0	With keyswitch 3
57	Binary display "V"	4 EA	5	gn	bk		7.0.0.0	With keyswitch 3
58	Unit of "TN"	Segment	1	gn	bk			
59	Unit of "TV"	Segment	1	gn	bk			
60	BLOCK ENVIRONMENT 1	53 EB 0 1	20	gn ye	bk bk			Status display 237
61	BLOCK ENVIRONMENT 2	54 EB 0 1	20	gn ye	bk bk			Status display 238
62	BLOCK ENVIRONMENT 3	55 EB 0 1	20	gn ye	bk bk			Status display 239
63	BLOCK ENVIRONMENT 4	56 EB 0 1	20	gn ye	bk bk			Status display 240
64	ALARM LIMITS:	Segment	11	gn	bk			
65	CONTROLLER PARAMETERS	Segment	16	gn	bk			
66	LIMITS	Segment	11	gn	bk			
67	LOOP FAULT	Segment	14	gn	bk			

Legend of Fig. 4.3-61, part 3

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5 FRANZ Design

The FRANZ design dialog permits free configuration of user-related process displays which can be shown on the screen as individual displays or large-size images.

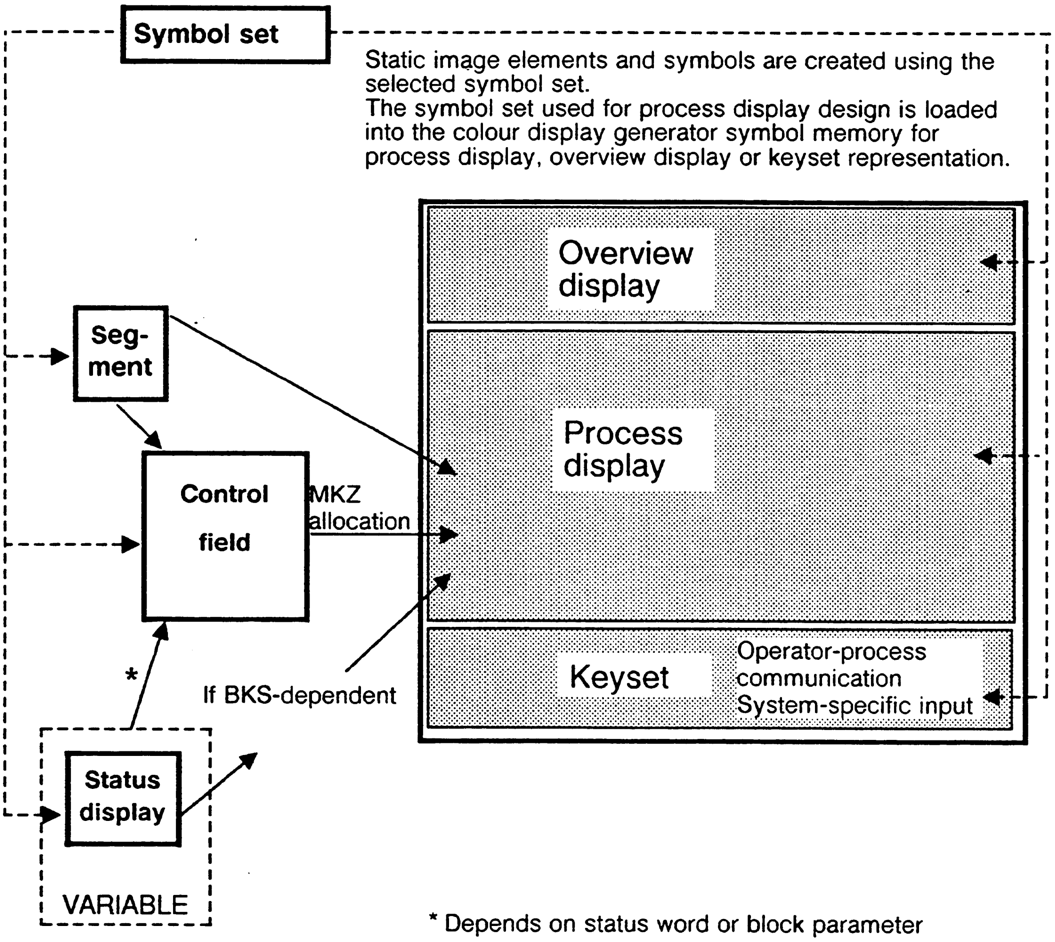
All aids are provided which are required for representing a process overview and displaying malfunctions in the individual process sections.

Structured process displays, which are composed of segments and control fields, can also be interconnected with one another (hierarchy levels).

Note: If this function package is to be used, the planned basic NORA data may not be deleted.

5.1 General Procedure

Freely configurable plant displays (process displays, windows, overview displays, key sets) in FRANZ are composed of individual image elements. All elements (symbol set, status display, segment, key set, control field) must first be configured individually before they can be assembled within a process display.



* Depends on status word or block parameter

Fig. 5-1 Process display design overview

Procedure:

1. Create a supply of symbols (symbol sets), segments, status displays and control fields.
2. Use the existing supply of symbols and segments to create the static background image of a process display or part of a process display.
3. Use status displays, control fields and menu fields for creating variable fields which then allow variable information to be displayed.

5.1.1 Screen Layout

During the operating phase, the screen is subdivided into three fixed areas:

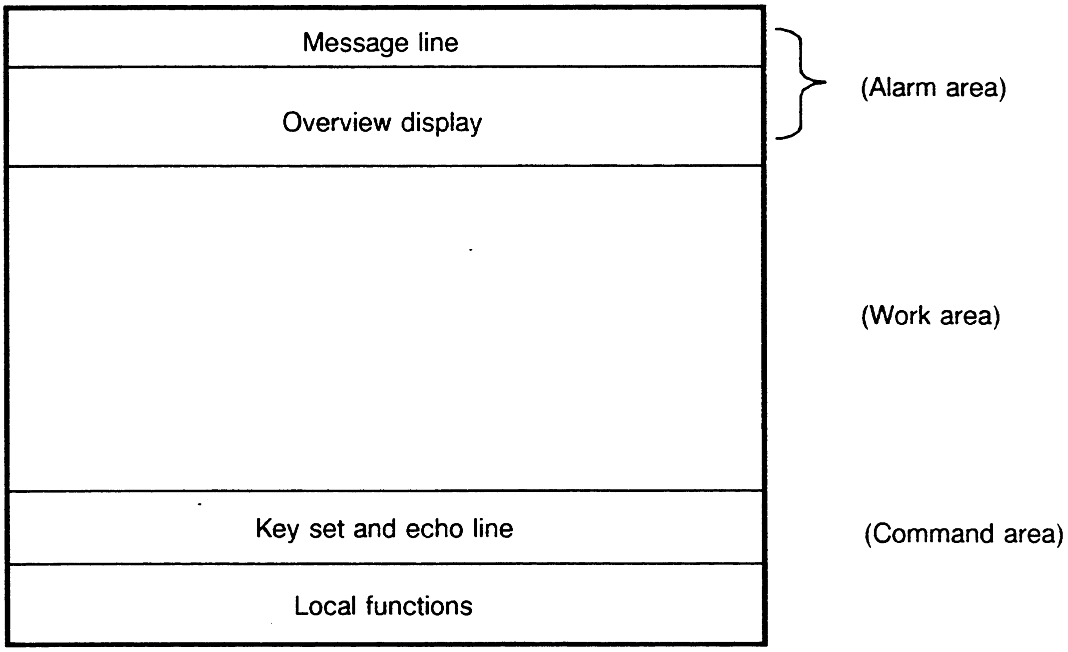


Fig. 5-2 Screen layout

Irrespective of the extension of the other areas, an image is designed for each area during FRANZ design. Each image is created from position Y = 1 and X = 1.

The number of lines which can be used for process image display depends on the extension of the area overview (overview design) and the command area (key set design).

The following relationship should be observed during FRANZ design:

		e.g. default values
34 screen lines	– 1 message line	34 - 1
	– 1m lines for the plant overview	- 4
	– n key set lines (incl. echo line)	- 3
	– 2 lines for local functions	- 2
Total usable number of lines for plant image display		24

5.1.2 Design Phases

The individual design phases are selected in the FRANZ dialog menu field.

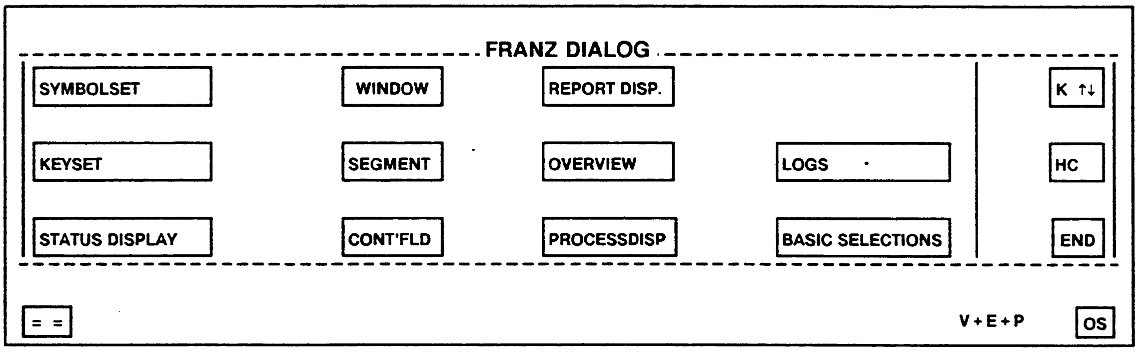


Fig. 5-3 FRANZ DIALOG menu field

SYMBOLSET

Symbol sets are the basis of all screen contents.
Designing the required graphics symbols is the first task during graphic image design. This supply is directly stored and can be retrieved at any moment.

Load symbol set

During the operating phase, the DS 078 symbol memory is subdivided such that two (different) symbol sets can be loaded for creating a screen contents. One symbol set memory is reserved for window representation, the second one for the other screen contents (overview display, segment, process display).

This structure has the following significance for design work:

- Each window can be created using a separate symbol set. The corresponding symbol set is loaded into the dedicated symbol memory when a window is displayed.

- A fixed assignment is made between a process display and the symbol set used for its design (the symbol set is stored together with the process display number).

  The symbol set allocated to the process display is loaded into the DS 078 symbol memory when a process image is displayed during the operating phase (also for overview and process display representation).

After the symbol supply has been configured (which can include one or more symbol sets), the required symbol set must be loaded before the design activities can start.

SEGMENT

Process display design can be simplified by defining repeatedly required image elements as segments which may be retrieved as required.

STATUS DISPLAY

Variables relating to binary signals or bits can be designed during this phase. The various states of this graphic variable are called alternatives, and designed consecutively. The status display supply can be used when inserting variable fields into the process display or the control field.

The user must design all alternatives of a graphic variable which can be addressed by the automation system. Only the significant bits of the bit range must be taken into account when determining the alternatives.

KEYSET

The key sets required for variable-related operator input can be designed using the key set design function. During this phase, the required functions are stored with the keys defined in the virtual keyboard.

CONT'FLD

Control fields consist of a segment and/or several variables. These variables may be binary values, bars, trends, status displays or character strings.

Control fields can be designed as operator-controllable or non-operator-controllable fields. If an operator-controllable control field is designed, the assigned set must either have been designed **before** or must be a part of the basic data key sets.

PROCESSDISP

The image representing a process is designed during this phase. Previously designed image elements, such as segments and control fields, can be used as design aids. Only the entire process display can be designed. As a second possibility, a part of the static process display can be designed and the variable fields or segments be inserted at the required position of the process display.

WINDOW

In order to increase the convenience of operator input, window displays can selected in process displays. The windows can either be positioned as required or at certain default locations, which depend on the window size.

Window configuration is performed in two phases:

- Layout configuration: window size and window layout are designed in this phase. Layout design is performed in the same manner as for process displays, i.e. using segments, background images (static), control fields and variables.
- Selection configuration: position and size of the window selector key, number of the window to be displayed and the window position are defined in this phase.

Windows are a subset of the process displays, and represent a small process display.

REPORT DISP.

User-related logs enables the user to create user-related logs in dialog mode. Log displays also consist of a background image (static) and variables (dynamic). A log display is designed using the FRANZ resources for process display design.
Printout of the user-related logs is started by key selection and/or by MKS bit control. The keys must be created according to the key design rules. MKS bit assignment is performed in the MKS FUNCTIONS dialog.

OVERVIEW

This phase allows design of the overall process display. It is judicious to limit the fault indication to the individual plant sections.

The designer defines the plant sections to be included in the overview by entering the process image number.

5.1.3 Logs

The logging function in FRANZ dialog is used for documentation updating. The key functions and related examples are discussed in Chapter 9.2.1.

5.1.4 Basic Selections

This function permits basic setting of
- ONLINE updating cycle time
- date/time representation
- heartbeat monitoring function ON/OFF
- automation system selection.

This parametrization is discussed in Chapter 2.4.

5.2 Introduction to the FRANZ Dialog

Data for new or continued design can be read and the design dialog activated after OFFLINE initialization has been terminated.

The dialogs MKS FUNCTIONS and FRANZ, which are discussed in this Chapter, can be selected in the newly displayed menu field.

5.2.1 User Guidance

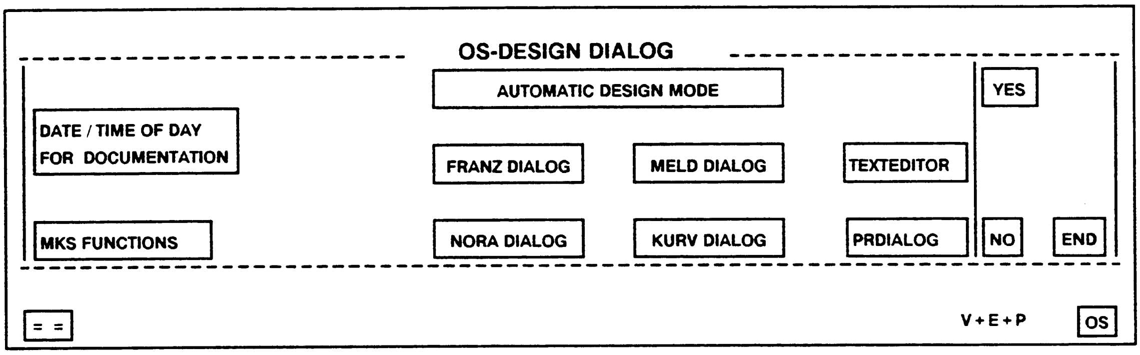


Fig. 5-4 Menu field OS-DESIGN DIALOG

The system guides the designer in the following way:

A menu field with the menu selection currently valid for selective use is offered. This prevents incorrect inputs caused by illegal combinations.

In addition, the designer is guided by texts which appear in the message line and specify either the designer's task for the next step or signal an input error.

All items selected in the work area are marked by a blinking cursor after an input.

The first character of the key blinks and the message RIGHT or WRONG appears in the first third of the message line after each keyboard operation.

Each dialog step can be terminated by either selecting the ABORT key or by entering a different function.

The following description, which is presented as a table, specifies in one column the designer's input. The second column shows the reaction of the design dialog on the monitor. This description also contains references (→) to the required menu fields or identical functions.

The function keys are described as they appear in the menu fields.

An initiated dialog sequence can be aborted by selecting a different key. The system then continues with the new dialog sequence.

5.2.2 General Key Selection

Menu fields related to the individual design phases enable the user to initiate the required dialog steps. Some keys have the same function in all menu fields.

END

Selecting the END key exits the currently displayed menu and re-displays the previous menu in which this menu can be activated. The message "DISPLAY NOT YET STORED" appears and the displayed menu field remains on the screen if the END key is selected before the designed display has been stored. Select STORE if the design is to be stored, or DELETE if it is not to be retained.

HC

Selecting this key prints a hard copy of the screen content if a hard copy unit has been connected.

-↑ ↓-

This key moves the menu field to the upper/lower half of the screen and makes image parts visible which were covered by the menu field.

-K-

The displayed menu field is cleared in order to make image parts visible which were covered by the menu field. The menu field re-appears when the light pen touches the screen at any operator-controllable location.

CLEAR

The displayed image is removed from the screen but not from the memory. The image must be deleted if it is not to be stored.

ABORT

Selecting this key aborts an active dialog (e.g. after incorrect input).

CREATE/CHANGE

STORE

RETRIEVE

DELETE

The effect of these keys, which appear in numerous displays, depends on the individual dialog. They are therefore described individually.

5.3 Symbol Design

The symbol design dialog is utilized for creating or correcting symbol sets using the virtual key menus displayed on the screen. Symbol design screen masks are described in Chapter 5.3.5.

Functions:

- Symbol set display
- Symbol set generation
- Symbol set deletion
- Symbol set design
- Enlarged display of symbols in the design field
- Display of symbols in the control field
- Hard copy output
- Loading the required symbol set into the hardware symbol memory of the colour display generator and transfer of the symbol set number to the design program.

Comment:
In this document, the term "symbol set" only stands for the loadable part of the character set actually used for image design which can be designed freely (2nd half = 128 symbols). The first half of the character sets is memory-resident and consists of the upper case letters, standard symbols, figures, special characters and control characters which may not be used as required.

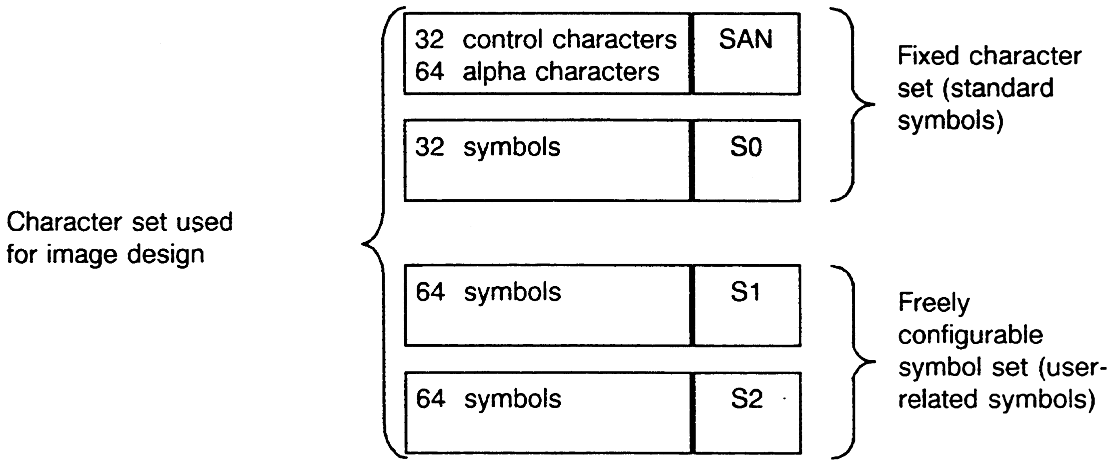


Fig. 5-5 Character set in the symbol memory

5.3.1 Brief Description

The symbol design dialog is utilized for creating or correcting symbol sets using the virtual key menus displayed on the screen.

The following items are displayed for symbol set design:

- The symbol sets to be edited (old set, new set).
- Symbol set function key set menus (display, scroll, delete, clear, create symbol sets).
- Symbol field function key set menus (clear, store, copy, display symbols).
- Character key set menu for symbol display and design.
- Numeric key set menu for symbol set number selection.
- Design field for the display, design and correction of symbols in a larger scale (12 x 9 symbol fields corresponding to the 12 x 9 pixels of a symbol).
- Control field for the display of symbols and characters in normal scale.

One half of the new and one half of the old symbol set are displayed during the design activities.

Old set

Only existing symbol sets can be displayed as old sets. These sets have numbers which can be used for retrieving the set.

New set

A new set is created if one of the functions

- CREATE
- LOADED SET

is activated.

The number of a newly created set is defined by the OS system.

A hard copy of the new symbol set can be produced if a hard copy unit has been connected.

A new set and an old set cannot be displayed together, as only a maximum of 128 symbols can be loaded into the hardware symbol memory of the colour display generator.

For this reason, the first half of the loadable symbol memory is reserved for the currently displayed old set and the second half for the new set. The other halves of the old and new set can be displayed using the scroll keys. The respective half of the symbol memory is then restored and displayed.

The symbol number of the first symbol of the displayed page (symbol 1 for page 1, symbol 65 for page 2) is shown in the symbol field and identifies the displayed page. The number of the selected symbol is displayed when this symbol is displayed, stored, cleared or copied. The symbol and the selected function blink on the display.

5.3.2 Menu Field Structure

The following fields used for displaying symbol sets and symbols are provided on the screen:

- **Old symbol set** (The old symbol set (one page) is displayed in the upper half of the screen. The number of the set currently displayed and the number of the selected symbol are displayed in the image frame. The number of the first symbol of the displayed page is shown there after scrolling. All positions of the displayed symbols are operator-accessible.

- **New symbol set** The new symbol set (one page) is displayed in the lower half of the screen. The structure of this field is identical to the field for the old symbol set.

- **Design field**
  This field in the screen centre is used for the design and display of individual symbols. The field is designed for one symbol: 9 columns wide and 12 lines high.

  The lines and columns are numbered along the margin.

- **Control field**
  The control field, which is 13 columns wide and 7 lines high, is used for displaying symbols. Symbols from the first and second page of the same symbol set cannot be displayed simultaneously.

- **Operator input menu field for NEW SET**
  This menu field is displayed to the right-hand side of the symbol set field. The background colours of the function keys are:
  Green for LOADED SET, PAGING, CREATE and DISPLAY FULL SET.
  Yellow for CLEAR and DELETE.

- **Operator input menu field for old set**
  This menu field is displayed to the right-hand side of the symbol set field. The background colours of the function keys are:
  Green for DISPLAY, PAGING and DISPLAY FULL SET.
  Yellow for CLEAR and DELETE.

- **Operator input menu field for symbol operations**
  This menu field is displayed to the right-hand side of the design field. The background colours of the function keys are:
  Green for STORE, COPY, DISPLAY, REPEAT. ENTRY.
  Yellow for CLEAR.

  This menu field disappears after DISPLAY has been selected and a menu field for selecting the set number and enabling the symbol set function appears.

- **Operator input menu field for the control field**
  CLEAR is the only key in this field, and has a yellow background.

- **Character menu field**
  The character menu field is displayed in the right-hand half of the screen after the program has been started. The displayed characters (NIL dot, *) can be used for designing and representing symbols (in the design field) and composite symbols (in the control field). The design character is also used for output in the control field if a symbol has not been selected for display in the design field.

  The character menu field disappears after the DISPLAY symbol set function has been selected.

- **Numeric menu field**
  This menu field is used for selecting a set number and is displayed after the DISPLAY symbol set function has been selected. The set number currently selected or assigned when creating a new set is displayed. Numbers with one or two digits are selected such that the figures are shifted from left to right.
  The tens position of one-digit numbers must be (invisibly) zero. The function will be executed once the green ENABLE key has been selected. Both fields are active. The numeric menu field disappears when the BASIC SETTING key is selected.

- **YES and NO keys**
  These keys appear in the last line on the screen when the functions CLEAR or DELETE have been selected. Selecting YES executes the function, NO resets all functions. The background colour of YES is red; the background of NO is yellow.

- **BASIC SETTING key**
  This key is used for cancelling a selected function and for changing blinking (selected) keys/characters to a steady representation (initial state). The key has a green background.

- **END key**
  This END key in the last line is used for terminating the program. The key has a blue background and all its fields are active.

- **Displays in the menu fields**

Old set no.:	**	Number of the displayed set.
New set no.:	**	Number of the new set.
Syno.:	***	Number of the blinking symbol (selected or 1st symbol on the page after the page is displayed)
Set no.:	**	Number of the old or new set in the set control function DISPLAY.

5.3.3 Operator Input

General comments

- A selected function blinks if input of a symbol position, figure/character or subsequent function is expected.
- A selected position in a symbol field blinks.
- A selected character (NIL or *) blinks. The "*" character is used for design if no other character has been selected.
- Control functions which may not be switched on simultaneously mutually deactivate one another when selected.
- The main function of a control function consisting of several function steps must be selected first.
- The symbol set number must be selected when an old set is being displayed.

  The character menu field is replaced by the numeric menu field when this set function is selected. The set number is entered from right to left, by selecting the numeric keys, with a leading zero preceding one-digit set numbers. Set numbers between 01 and 99 are valid.
- Selecting the ENABLE key executes a previously selected function.
- Functions are reset and blinking positions displayed in steady representation when the BASIC SETTING key is selected.
- The functions CLEAR SET and DELETE SET must be selected twice in order to prevent inadvertent modification of the set.

5.3.3.1 Old Set

- **Display and scroll functions**

The symbol sets stored in the OS system data can be displayed. For this purpose, first select the DISPLAY function, then the required set number. Selecting the ENABLE key then displays the first half of the symbol set. A plaintext message appears if the required set cannot be found.

The number of the first symbol of the displayed page is shown in the margin of the symbol field (symbol 1 corresponds to the 1st page, symbol 65 to the 2nd page).
Only half (1 page = 64 symbols) of an old and new set are displayed simultaneously.

The menu field for functions contained in the old set is in the top right-hand corner of the screen.

DISPLAY

Select the DISPLAY key.
The message ENTER SET NO. appears in the message line.

Select the required symbol set (01...99) after the numeric menu field has been displayed.

Select the ENABLE key.

PAGING

This function can only be selected when a set is displayed. The page of the symbol set which is not displayed is loaded and displayed.

- **Delete and clear**

Only displayed sets can be cleared. Cleared symbol sets are only filled with NIL dot, they are not deleted from the system data section.

The DELETE function removes the set from the system data section, i.e. it no longer exists. Only displayed sets can be deleted. The displayed set number is replaced with blanks when a displayed set is deleted.

CLEAR

Select the CLEAR key and then the YES key for confirmation.
The symbol set is cleared (filled with NIL dots) and its first page displayed.
The message "SET CLEARED" appears in the message line.

Select DELETE and then YES for confirmation.

DELETE

The symbol set is deleted from the OS system housekeeping and no longer exists.

Selecting the NO key cancels the selected function, and removes the YES and NO keys.

Selecting any other function/key has the same effect.

- **Hard copy output - display full set**

The displayed symbol set is completely (both pages) re-stored in the unit symbol memory and the first page displayed on the screen when the function keys DISPLAY FULL SET (separately for old and new set) are selected. The keys BASIC SETTING, HARD COPY and END enable the further sequence to be controlled.

- After the BASIC SETTING key has been pressed, the hard copy output is cancelled and the menu fields previously displayed (in initial state) and symbol sets reappear on the screen.
- The hard copy function is executed after the HARD COPY key has been selected: the first image line is established, the function keys disappear and a hard copy is produced (if a hard copy unit is connected). The hard copy function is then cancelled as explained above.
- The program is terminated when the END key is selected. The last symbol set to have been loaded in the unit symbol memory remains unchanged and complete in the memory. The hard copy function can thus be used for loading symbol sets for, for example, a subsequent image design.

5.3.3.2 New Set

- **Creating symbol sets**

A new set is created if one of the following functions is activated:

1. CREATE. A new symbol set with the next free set number (in ascending order) is created. The new set (field bottom left) is first filled with NIL dots (cleared).

2. LOADED SET. This function creates a new symbol set with the next free set number (in ascending order) and copies all symbols from the loaded set (field top right) to the newly created set (field bottom left).

CREATE

Select the CREATE key. The lowest free number in the system is allocated to the new set. The set is cleared, and its 1st page displayed.

LOADED SET

Menu field in the bottom half of the screen.

Select the LOADED SET key. The symbol set (3rd and 4th page) from the unit symbol memory is read and re-stored in the new set. The message SET LOADED is displayed.

An old symbol set can be transferred in two different ways:

Using the function READ LOADED SET requires the following input sequence:
- Create and delete a new set.
- Display the first page of the old set.
- Display the entire old set.
- Select BASIC SELECTIONS.
- Use the function READ LOADED SET for reading the symbol memory; transfer symbols to the new set.

Using the COPY function, both pages of the old set can be copied in the new set after a new set has been created.

- **Paging**

This function permits paging in the 128 user-related symbols.

PAGING

This function can only be selected when a set is displayed.

Select the PAGING key.
The page of the symbol set which is not displayed is loaded and displayed.

- **Delete and clear**

Only displayed sets can be cleared. Cleared symbol sets are only filled with NIL dot, they are not deleted from the system data section.

The DELETE function removes the set from the system data section, i.e. it no longer exists. Only displayed sets can be deleted. The displayed set number is replaced with blanks when a displayed set is deleted.

CLEAR

Select the CLEAR key and then the YES key for confirmation.
The symbol set is cleared (filled with NIL dots) and its first page displayed.
The message "SET CLEARED" appears in the message line.

DELETE

Select DELETE and then YES for confirmation.
The symbol set is deleted from the OS system housekeeping and no longer exists.

Selecting the NO key cancels the selected function, and removes the YES and NO keys.

Selecting any other function/key has the same effect.

- **Display full set**

The screen is cleared and all 224 symbols of the selected set are displayed. Selecting the BASIC SETTING key brings the previous display back on the screen.

5.3.3.3 Symbol Field

- **Symbol display**

Any symbol from a loaded symbol set can be displayed in the design field (12 x 9 image positions) in enlarged fashion. (Each symbol field point corresponds to one image position.) Asterisks (*) are used for this type of representation.

DISPLAY

Select the DISPLAY key. "A" in the key blinks.

Select any symbol in the new or old set.
The selected symbol and the preselected character are displayed in the design field in enlarged fashion.

- **Clear a symbol**

Any symbol in a loaded set can be cleared

- by clearing the design field and storing the blank symbol
- by replacing the symbol by NIL dots. A NIL dot is entered in the CLEAR function by selecting the desired symbol position.

Note:
This NIL dot is only used to select the symbol more easily. Contrary to the standard NIL dots, it is actually a symbol which is also stored when a display is created.

- **Copy symbols**

Individual symbols or group of symbols (strings) can be copied from one set to another. The source set is marked by selecting the first and last symbol of the group (if you only wish to copy one symbol, select it twice); the target is marked by selecting the first position in the target set. The copied symbols are displayed immediately.

Selecting the BASIC SETTING key cancels the selected positions and permits the source symbol string position to be corrected. The COPY function can subsequently be performed.

Since the positions in the source set may be selected in any order, positions in the source symbol set can be corrected until the desired start and end symbols start blinking. The individual symbol numbers are displayed are displayed inside the menu field frame. Only the last two selected positions in the source set and one position in the target set are significant for the copy procedure. This fact is particularly important if the display has been scrolled in the meantime.

Symbols can be copied in both directions: from the old symbol set to the new one and vice versa. Direct copying within the same set is not possible. A temporary new set can be created for this purpose.

- Select the BASIC SETTING key.
  All selected functions are cancelled.
- Select the COPY key. The C in the key starts blinking.
- Select the start symbol of the string to be copied; the symbol starts blinking.
- Select the end symbol of the string; the symbol starts blinking.
- Select the start symbol position in the target symbol set.
  The symbol string is copied; copying stops at the page end of the target set if the space at the target position is insufficient.

5.3.3.4 Symbol Design

- **Design a symbol**

The characters "NIL" and "*" are provided for designing a symbol or modifying the symbol displayed in the design field. These characters are also used for the control field display if no other symbol has been selected.

- Select the required position in the design field; an asterisk (*) character is then displayed here.
- Selecting the function key REPEAT. ENTRY activates the "repeated entry" design mode. In similar fashion to the image design (DIAVID), the selected character (* or NIL dot) is displayed between two positions in the same line or column. The BASIC SETTING key resets the first position and the function must be re-selected.

- **Store symbol**

The selected symbol in the design field which is displayed in enlarged fashion can be re-stored to any symbol position of a loaded set.

The STORE function must be newly selected for each re-storing process in order to avoid symbols to be overwritten inadvertently.

STORE

Select the STORE key.
Select any symbol position in the old or new set. The symbol is re-stored and the symbol from the design field appears in normal size at the selected position in the symbol field. The design field remains unchanged.

- **Clear design field**

CLEAR

Select the CLEAR key. "C" in the key starts blinking.
Select any position in the design field.
The design field is cleared and NIL dots are displayed in all positions.

5.3.3.5 Control Display Design

All previously displayed symbols (actual pages of the new and old set) are valid for designing images in the control field. The characters of the character keyboard (*,.) can also be used.

- Select the required symbol or character.
- Select the position in the control field.

Comment:
Symbols in the unit symbol memory are re-stored and the symbols displayed in the control field change accordingly if a new page is displayed. This can be prevented by re-storing (e.g. copying) the other page into a temporary new set.

- **Display symbols in the control field**

All the symbols and characters of a symbol set can be used for designing segments in the control field (7 x 13 image positions). This enables you to see how different symbols fit together (plant segments, composite symbols). White on black is the only representation possible. The control field position is selected after the symbol has been selected (may be repeated). The selected symbol is displayed in the control field.

Note: Only symbols from the same group of 64 (either 1-64 or 65-128) are displayed in the control field. Scrolling from the one page of the symbol set to the other one also changes the control field display.

- **Clear the control field**

The control field can be cleared at any time by selecting the CLEAR FIELD function (NIL dot output). Individual control field positions can be cleared by entering NIL dots.

5.3.4 Conventions for the Design of Bar/Pointer Symbols

Sequence of bar/pointer symbols for symbol design

Always select the first symbol of the corresponding symbol sequence when specifying the bar symbol for a bar diagram in a control field or a process image. A bar is defined as a pointer by selecting black as the foreground colour. The selected background colour is then used as the pointer's foreground colour.

Bar symbols can be subdivided into three classes:

1. **Symbols for vertical bars**

There must be 26 symbols for vertical bars. The following figure shows an example of 26 possible symbols for a vertical bar:

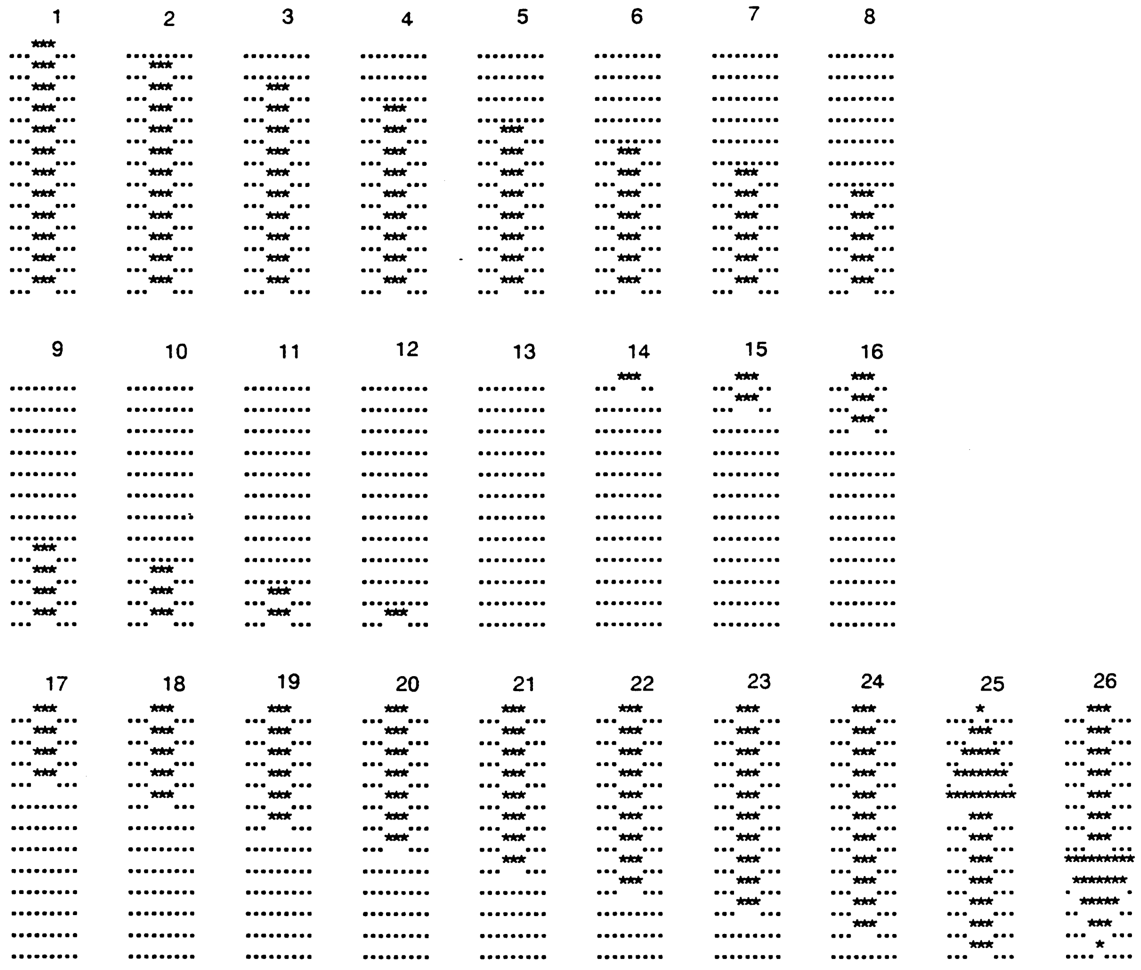


Fig. 5-6 Symbols for vertical bars

The bar width can be designed as required. The symbols 25 and 26 are required for representing the bar value beyond the upper or lower limit, respectively.

2. Symbols for horizontal bars

There must be 20 symbols for horizontal bars. The following figure shows an example of 20 symbols possible for a horizontal bar:

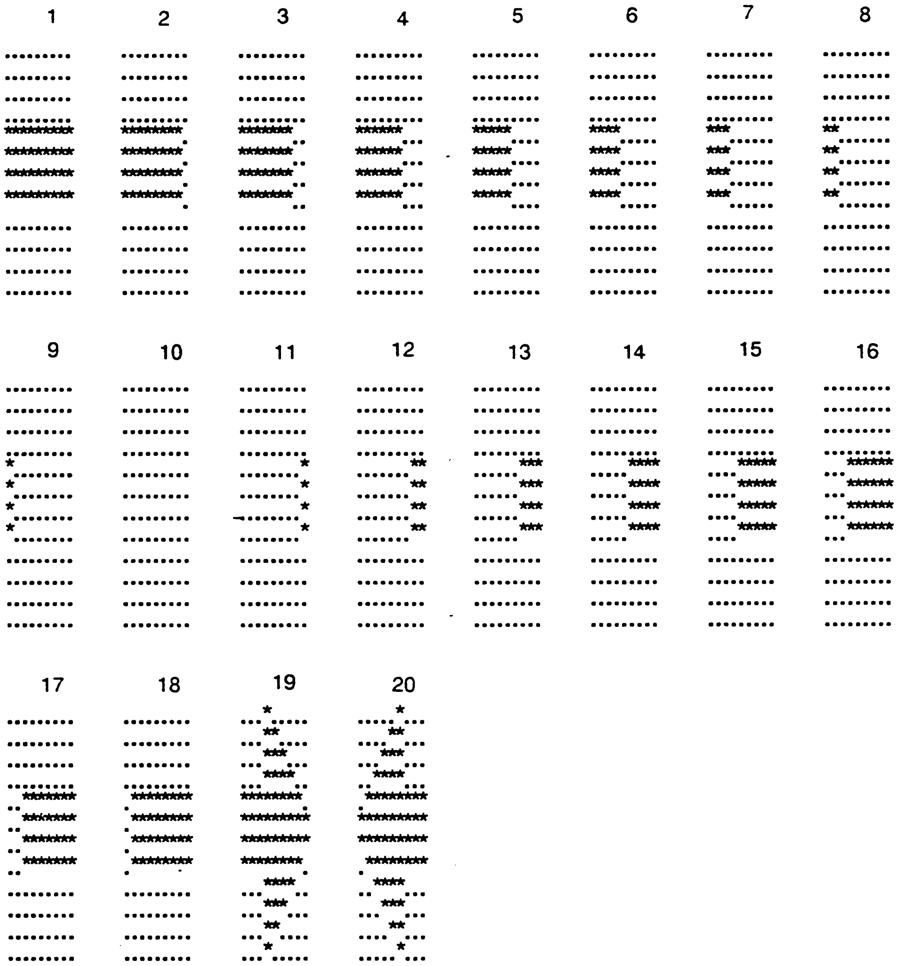


Fig. 5-7 Symbols for horizontal bars

The bar width can be designed as required. The symbols 19 and 20 are required for representing the bar value beyond the upper or lower limit, respectively.

3. Symbols for trend representation and pointers

Trend representation only requires 13 symbols. The following figure shows an example of 13 possible symbols:

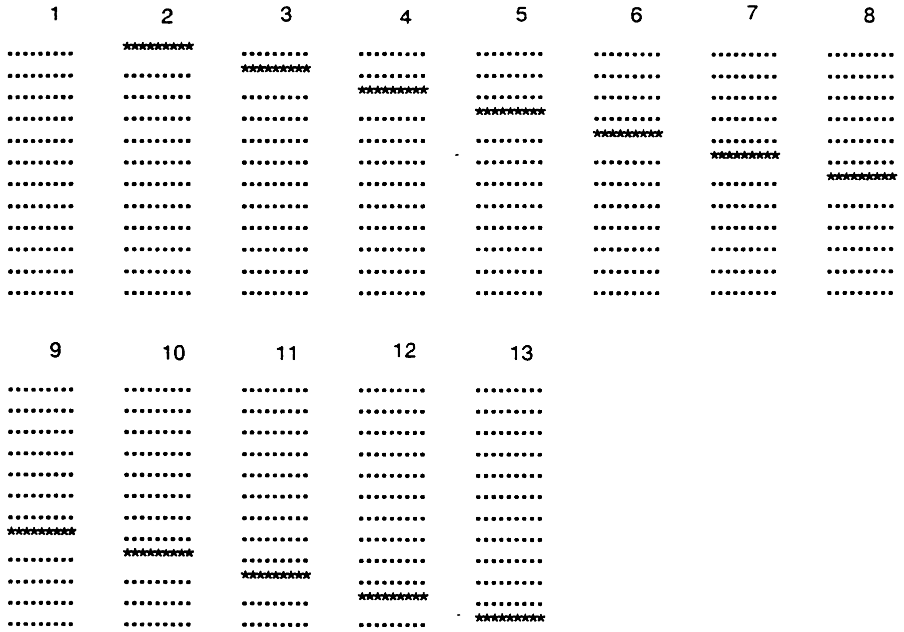
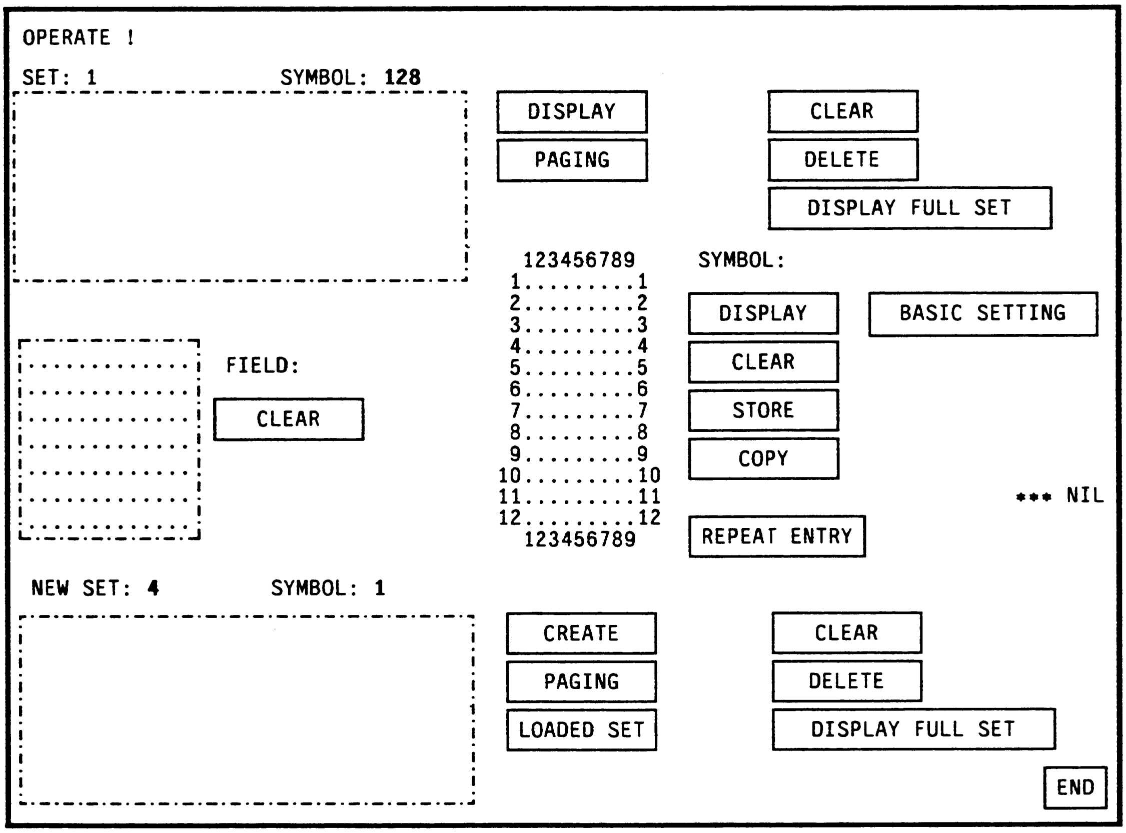


Fig. 5-8 Trend representation and pointer symbols

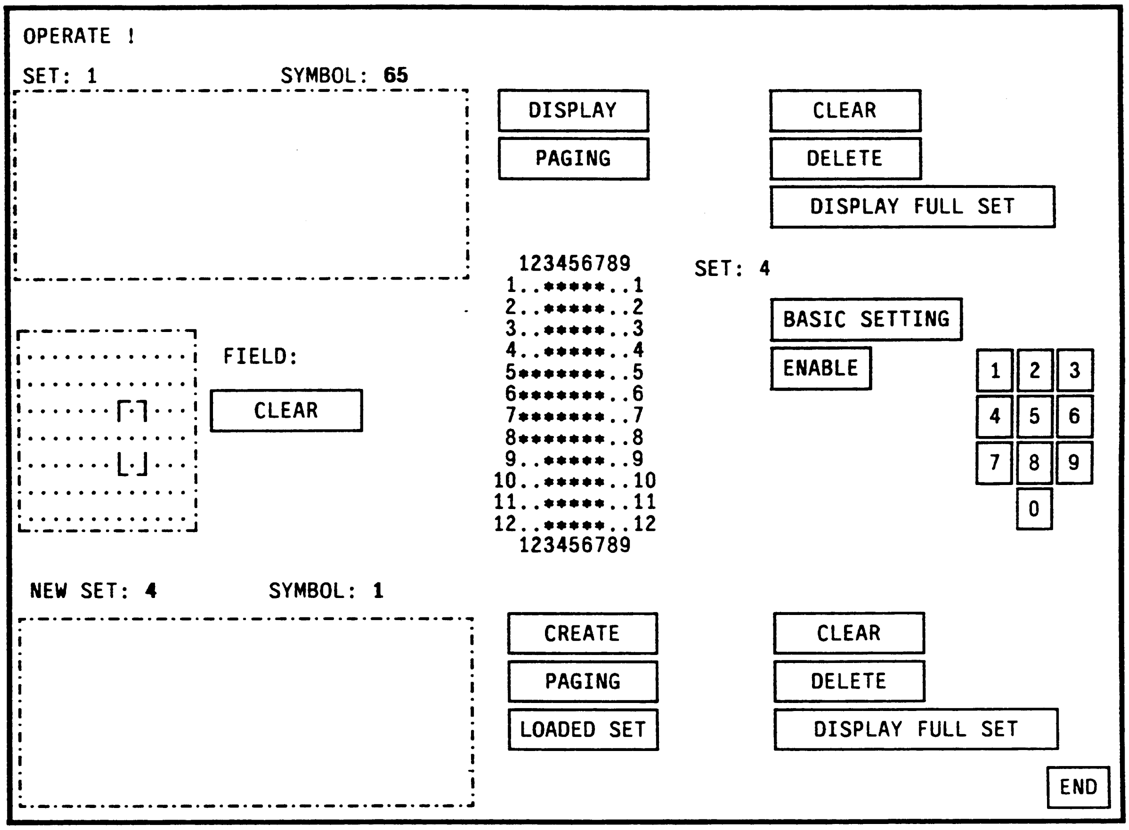
The width of the pointer symbol can be designed according to the requirements. Symbols representing the bar value beyond the upper or lower limit are not required for trend representation as the values transferred from the TELEPERM M automation system have already been normalized to the range between 0 and 255.

5.3.5 Screen Menus



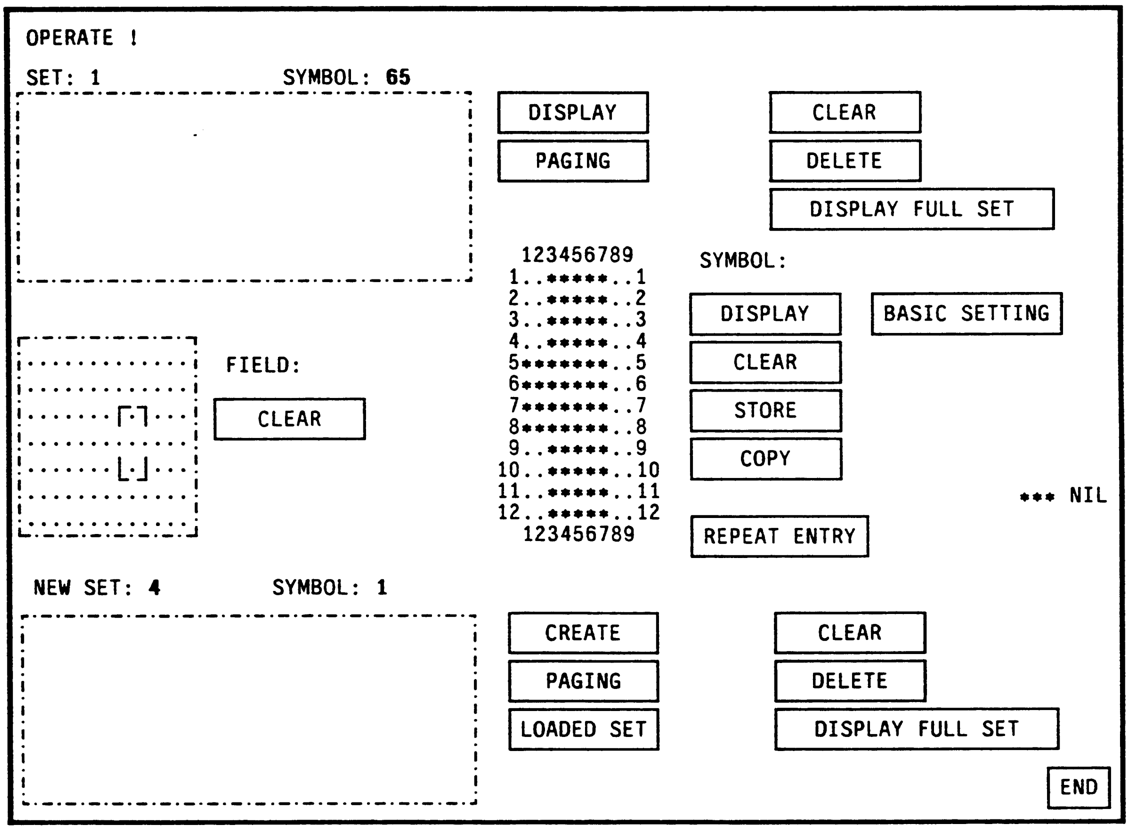
```
OPERATE !
SET: 1                SYMBOL: 128

         123456789
        1.........1
        2.........2
        3.........3
        4.........4
        5.........5
        6.........6
        7.........7
        8.........8
        9.........9
       10.........10
       11.........11
       12.........12
         123456789

*** NIL

NEW SET: 4            SYMBOL: 1
```

Fig. 5-9 Fields and key sets in basic setting



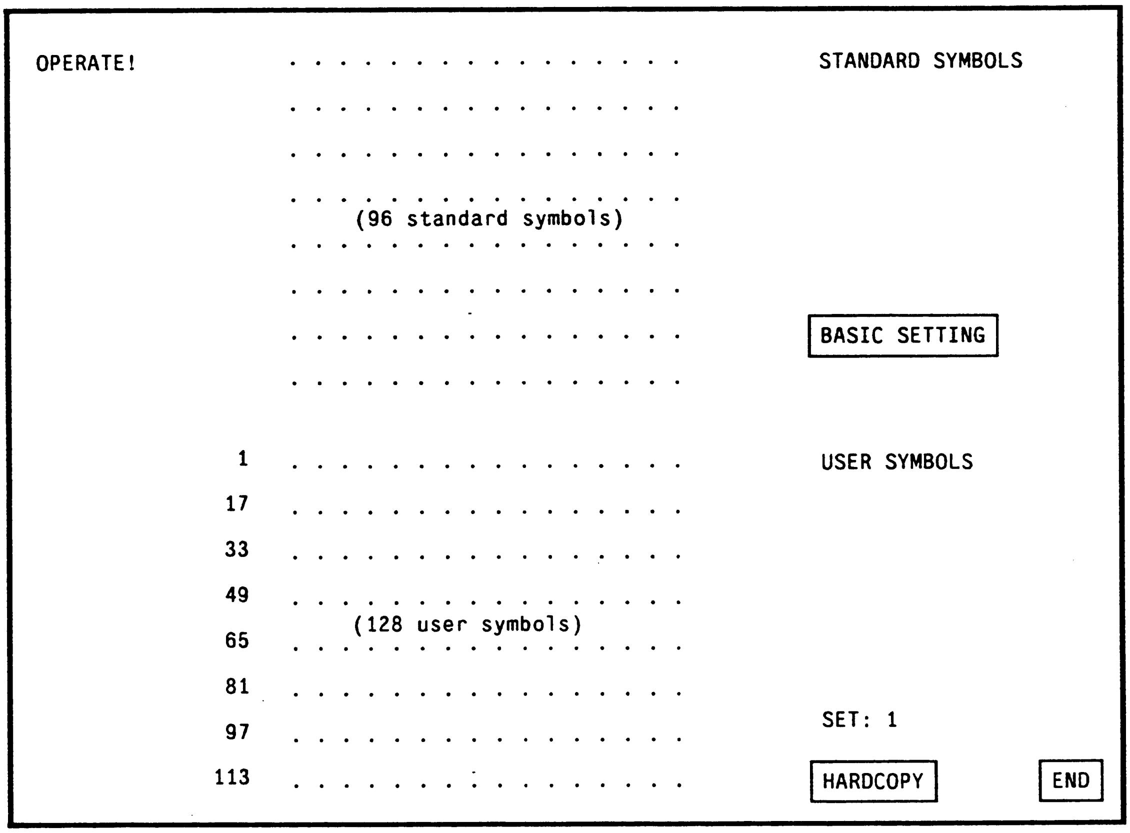
```
  123456789
 1..*****..1
 2..*****..2
 3..*****..3
 4..*****..4
 5*******..5
 6*******..6
 7*******..7
 8*******..8
 9..*****..9
10..*****..10
11..*****..11
12..*****..12
  123456789
```

Fig. 5-10 Fields and key sets after a set function has been selected



```
  123456789
 1..*****..1
 2..*****..2
 3..*****..3
 4..*****..4
 5*******..5
 6*******..6
 7*******..7
 8*******..8
 9..*****..9
10..*****..10
11..*****..11
12..*****..12
  123456789
```

*Fig. 5-11 Symbol display in the design field (by * character)*



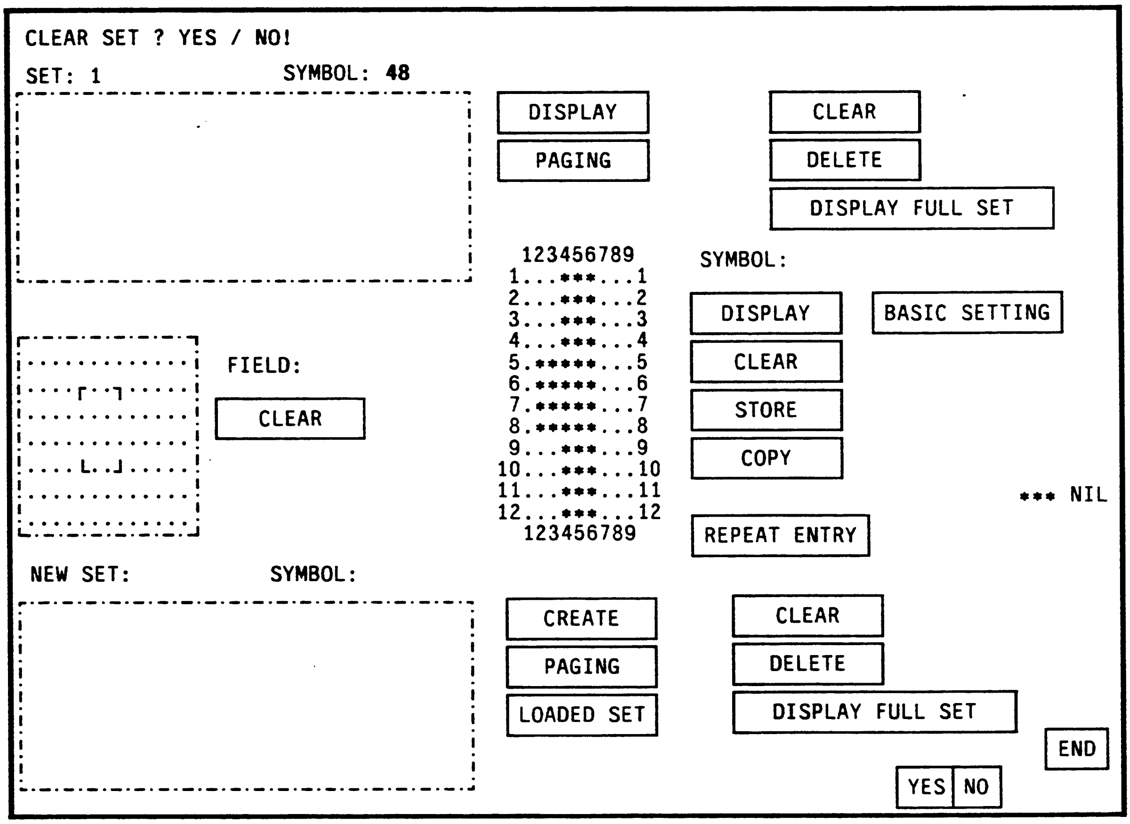
OPERATE!

(96 standard symbols)

(128 user symbols)

SET: 1

Fig. 5-12 Display of a character set with operator input keys



CLEAR SET ? YES / NO!

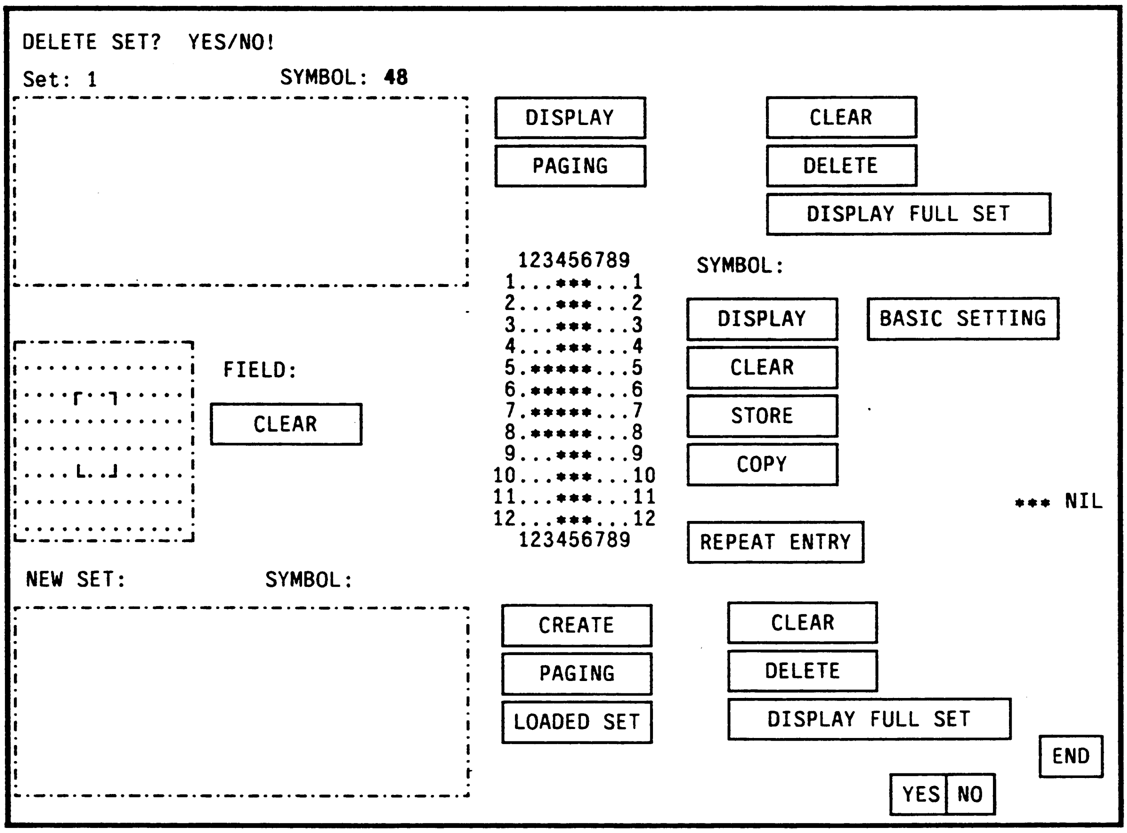
SET: 1 SYMBOL: 48

```
 123456789
1...***...1
2...***...2
3...***...3
4...***...4
5.*****...5
6.*****...6
7.*****...7
8.*****...8
9...***...9
10...***...10
11...***...11
12...***...12
 123456789
```

*** NIL

NEW SET: SYMBOL:

Fig. 5-13 Menu field after the "CLEAR SET" function has been selected



DELETE SET? YES/NO!

Set: 1 SYMBOL: **48**

NEW SET: SYMBOL:

```
  123456789
 1...***...1
 2...***...2
 3...***...3
 4...***...4
 5.*****...5
 6.*****...6
 7.*****...7
 8.*****...8
 9...***...9
10...***...10
11...***...11
12...***...12
  123456789
```

Fig. 5-14 Menu field after the "DELETE SET" function has been selected

5.4 Segment Design

Identical image elements which appear repeatedly in the plant representation (process display, window) can be designed as segments.

A segment can be freely designed from a symbol supply (load symbol set). The system automatically assigns a segment number in ascending order.

Two identical segments cannot be stored under two different segment numbers.

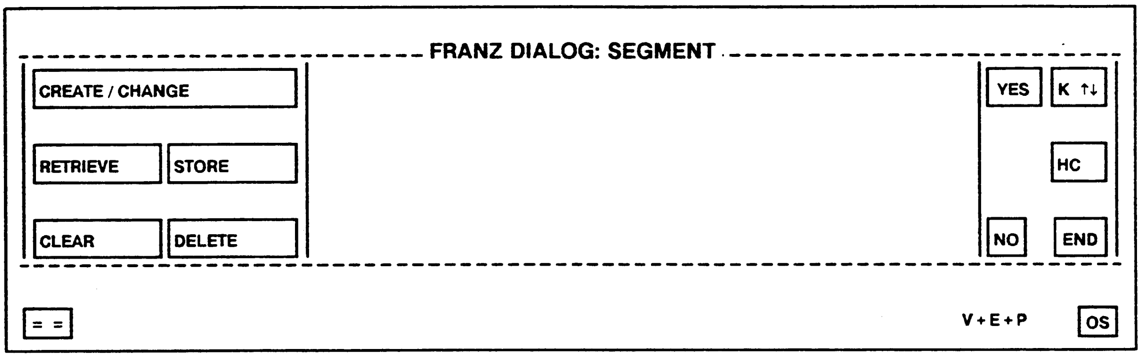


Fig. 5-15 Segment design menu field

- **Create/change segment**

Action	Reaction
Select function key CREATE/CHANGE	Prompt, using the light pen for specifying two edge positions which identify the extension of the segment in the work area: ENTER SEGMENT EXTENSION.
Enter two positions in the work area	Prompt in the message line for designing the static image data: DESIGN SEGMENT
	The → DIAVID symbol menu field is displayed in the command area
Select character/symbol from the menu field	Character/symbol blinks
Place character/symbol in the work area	Character/symbol is displayed in the work area
Select the END key in the DIAVID menu field	The previous segment design menu field is displayed. FRANZ DIALOG: SEGMENT

An existing segment must be called up first before it can be modified.

- **Store segment**

Action	Reaction
Select function key STORE	Inquiry OVERWRITE LAST VERSION ? ENTER YES/NO is displayed if a segment number has been specified (by previous → RETRIEVAL of an existing segment).
Overwrite YES	The segment is stored under the old number.
Overwrite NO	The segment is stored under a new number.
	Common for YES and NO: Message output OPER. INHIBIT DURING DATA STORAGE while data is being stored.
	The number used for storing the segment is displayed in the echo line.

- **Retrieve segment**

Action	Reaction
Select function key RETRIEVE	Prompt in the message line for entering a segment number: ENTER SEGMENT NUMBER.
	The DIAVID numeric menu field is displayed
Enter the number.	The number appears in the echo line.
Select the END key.	Prompt for entering the light pen position at which the segment display is to begin on the screen: ENTER SEGMENT ORIGIN.
Position light pen to specify the required point	The segment is displayed in the work area, starting at the selected position.
	The → retrieval function menu field is displayed.
	The message disappears from the message line.
Select the END key.	The → segment design menu field is displayed.

- **Clear segment**

Action	Reaction
Select function key CLEAR	The work area is cleared. An unfinished segment is removed from the data.

- **Delete segment**

Action	Reaction
Select function key DELETE	As for the → RETRIEVE segment function.
Select the END key.	Request in message line: DELETE SEGMENT? ENTER YES/NO.
YES or NO	The message disappears from the message line. The segment disappears from the work area.

The segment is deleted from the data if YES has been entered, and remains if the entry was NO.

5.5 Status Display Design

Process states which depend on bits or binary signals are indicated by status displays on the screen. A status display can be inserted into the control field or, if it is related to the BKS block, directly into the process display.

A status display is updated during the operating phase:

- sporadically by AS (status value),
- cyclically, when an image is selected by a fetch message from the OS (reading block parameters).

Shape, colour, blinking or non-blinking representation are designed for **each** alternative of a status display.

- Status display number and number of alternative

The OS assigns the status display number. The numbers of the alternatives must be determined by the designer.

- Assigning the numbers of the alternatives

The alternative numbering system in OS starts at 1, whilst the bit position value starts at 0. This means that alternative 1 is displayed with bit value 0 etc. It should be noted, however, that only those alternatives which are significant for the status display must be designed.

Only two alternatives exist if a status display is related to a binary parameter (EB).

Several alternatives are possible if a status display is related to a status word or an integer parameter.

The first alternative is always required as only the first alternative is displayed in a control output (in control field, process display and overview display).

Note: A status display without first alternative cannot be removed from a display, control field or window.
BKS-controlled status displays must be inserted as "non-accessible".

Example: The bits 7, 15 and 16 are to be interpreted in the bit position range between 7 and 16. Status "0" of the bits 8 to 14 is guaranteed.

Number of alternative	10	4	8	7	6	5	4	3	2	1	0	AS status word
	6	7	8	9	10	11	12	13	14	15	16	OS status word
1		0								0	0	
2		0								0	1	
3		0								1	0	
4		0								1	1	
513		1								0	0	
514		1								0	1	
515		1								1	0	
516		1								1	1	

Only a status display with eight different representations can be designed for the numbers of alternatives determined in this example.

The following points regarding the display during the operating phase must be observed when designing a status display:

- Only designed alternatives are displayed and cause the display to change.
- No output takes place if a possible alternative occurs, which has not been designed, (numbers 5-512 and >516 in the example; status "0" of bits 8-14 is not guaranteed). The last displayed alternative remains on the screen.

Note: All combinations which are possible must be acquired to ensure an up-to-date display. This does also apply to the MKS bit.

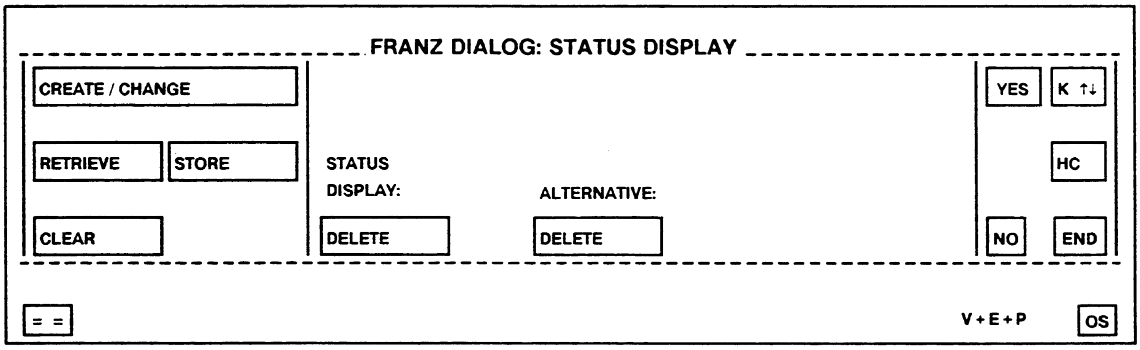


Fig. 5-16 Status display design menu field

- **Create status display**

In contrast to all other design phases, it is not possible to create a new status display with a different number by changing an alternative of, for example, an existing status display.

All alternatives of a status display are designed by repeatedly executing the design steps CREATE, STORE (overwrite: NO, with specification of an alternative number).

Action	Reaction
Select function key CREATE/CHANGE	Prompt for specifying two positions for the status display extension: ENTER STATUS DISPLAY EXTENSION
Enter the two positions.	Prompt in the message line for designing the static image data: DESIGN STATUS DISPLAY The → DIAVID symbol menu field is displayed in the command area.
Select character/symbol from the menu field.	Character/symbol blinks.
Place character/symbol in the work area.	Character/symbol is displayed in the work area.
Select the END key in the DIAVID menu field.	The message disappears from the message line. The → status display design menu field is displayed.

- **Store status display**

Action	Reaction
Select function key STORE	If the number has been specified (by previous → retrieval), the system asks whether you wish to overwrite the alternative of the status display: OVERWRITE LAST VERSION ? ENTER YES/NO.
Overwriting: NO	Prompt for entering alternative number: ENTER NUMBER ALTERNATIVE. The DIAVID numeric menu field is displayed.
Enter alternative number	The number is repeated in the echo line.
Select the END key	The message disappears from the message line.
Overwriting: YES	The message OPER. INHIBIT DURING DATA STORAGE is issued while data is being stored. The status display menu field is displayed. The status display number and the specified alternative number are displayed.

Status displays with the same number of alternatives and identical graphics cannot be stored under different numbers.

- **Retrieve status display**

Action	Reaction
Select function key RETRIEVE	Prompt in the message line for entering the status display number: ENTER STATUS DISPL. NUMBER. The DIAVID numeric menu field is displayed.
Enter the number	The number appears in the echo line.
Select the END key	Prompt for entering the light pen position at which the status display is to begin on the screen: ENTER STATUS DISPLAY ORIGIN.
Position light pen to specify the required point.	The status display appears at the selected position. The → retrieval function menu field is displayed. The message disappears from the message line.
Select the END key.	The → status display design menu field is displayed.

The alternative number cannot be specified when the status display number is output. Only alternative 1 to the status display is displayed directly. Scrolling displays further alternatives.

If alternative 1 is missing, then the control text in the echo line (status display number and alternative number) is not output either.

- **Clear status display**

A new status display can be created after the clear function has been executed. If the CLEAR function key has not been selected, one more alternative to the status display being created can be defined by activating the CREATE and STORE keys in the status display menu and specifying the alternative number.

Action	Reaction
Select function key CLEAR	The work area is cleared. An unfinished alternative of the status display which has not yet been stored is removed from the data.

- **Delete status display**

Action	Reaction
Select function key STATUS DISPLAY: DELETE	As for the → retrieve status display function.
Select the END key.	Request in message line: DELETE STATUS DISPLAY? ENTER YES/NO.
YES or NO	The message disappears from the message line. The status display disappears from the work area.

The status display and all its alternatives are deleted from the data if YES has been entered, and remains if the entry was NO.

- **Delete alternative**

Action	Reaction
Select function key ALTERNATIVE: DELETE	As for the → retrieve status display function.
Select the END key.	Request in message line: DELETE ALTERNATIVE? ENTER YES/NO.
YES or NO	The message disappears from the message line. The alternative disappears from the work area.

Only the alternative of the status display is deleted from the data if YES has been entered, and remains if the entry was NO.

5.6 Key Set Design

A key set contains virtual keys which are used during the operating phase for operator inputs to the OS system (system-specific inputs) or to an operator-accessible block in an AS (operator-process communication).

A key set is designed in two phases:

- Key set extension and graphic representation of the keys (static)
- Assigning the function which is to be executed when the key is selected.

- Extension

Key sets must extend over at least two lines. The specification of the extension must include the input echo line.

As echo line, it is always the first line which is written to in the operating phase.

The line which does not contain the input keys automatically becomes the echo line in on line mode. The echo line is thus the first or the last line of the key set.

Note:
All key sets supplied together with the basic data extend over three lines. The user-specific key sets should also be set up in three lines. If a key set has more than three lines, the lines of the work area which are overwritten by the key set will not be re-displayed after the key set has been cleared. If only two lines are used for the user-specific key sets, all basic data key sets must also be reduced to two lines.

- Representation

The graphic key representation can be freely designed using a symbol set (load symbol set).

- Operator input

In the second phase, PROCESS OPERATION or SYSTEM OPERATIONS allocates an operator input function to the designed keys (Chapter 5.6.1). Menu fields with appropriate input alternatives are offered for this purpose. All input keys which cause a control output in the echo line must be in the same line. Each operator input function can be provided with an authorization code (PROTECTION). A protected key can only be selected during the operating phase if the key switch has been set to the specified position.

- Key set number

The designer must allocate a key set number to a newly designed key set. This number has the same form as a process display level number.

A. B. C. D $(0 \leq A, B, C, D \leq 254)$

Certain key set numbers have already been allocated to the pre-configured key sets in the basic data record (Chapter 4.3.4). The designer should therefore only use key set numbers greater than 40.x.x.x.

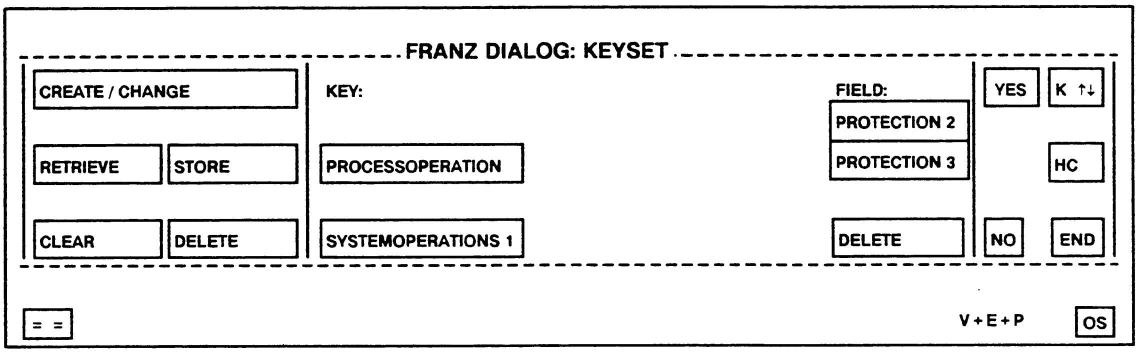


Fig. 5-17 Key set design menu field

Note:
Key sets for process displays should use area numbers < 100 $(D \leq 99)$ since the numbers > 100 are used for PK key sets.

- **Create/change a key set**

Action	Reaction
Select function key CREATE/CHANGE	Prompt for entering the four-digit level number: ENTER KEYSET NUMBER
	The DIAVID numeric menu field is displayed.
Enter the level number.	The level number appears in the echo line.
Select the END key.	The level is displayed if it exists in the data.
	Prompt, using the light pen, for entering two positions which define the key set extension: ENTER KEYSET EXTENSION.
Use the light pen to mark two positions.	The message in the message line disappears.
Select the END key.	Prompt for designing the static image data appears in the message line: DESIGN KEYSET
	The → DIAVID symbol menu field is displayed in the command area.
Select character/symbol in the menu field	Character/symbol blinks.
Place character/symbol in the work area.	Character/symbol is displayed in the work area.
Select the END key in the DIAVID menu field once design has been terminated.	The message disappears from the message line.
	The → key set design menu field is displayed.

- **Store key set**

Action	Reaction
Select function key STORE	If the level number has been specified (previous → retrieval of an existing key set), inquiry: OVERWRITE LAST VERSION ? ENTER YES/NO.
Overwriting: NO	Prompt for entering key set level number: ENTER KEYSET NUMBER.
	The DIAVID numeric menu field is displayed.
Enter the level number.	The level number is repeated in the echo line.
Select the END key.	Message output OPER. INHIBIT DURING DATA STORAGE while static image data is being stored.
Overwriting: YES	The → key set design menu field is displayed.
	The level number is displayed in the echo line (the key set is stored under the same number).

- **Retrieve key set**

Action	Reaction
Select function key RETRIEVE	Prompt in the message line for entering the key set level number: ENTER KEYSET NUMBER.
	The DIAVID numeric menu field is displayed.
Enter the level number.	The number appears in the echo line.
Select the END key.	The key set is displayed in the work area starting at position 1,1.
	The → retrieval function menu field is displayed.
Select the END key.	The → retrieval function menu field is displayed.

In order to establish the initial state, the CLEAR key must be selected before the RETRIEVE key can be activated again.

- **Clear/delete key set**

Action	Reaction
Select function key CLEAR	The work area is cleared. An unfinished key set which has not yet been stored is removed from the data.

Action	Reaction
Select function key DELETE	As for the → RETRIEVE KEYSET function.
Select the END key.	Request in message line: DELETE KEYSET? ENTER YES/NO.
YES or NO	The message disappears from the message line. The key set disappears from the work area.

The key set is deleted from the data if YES has been entered, and remains if the entry was NO.

5.6.1 Process/System Operations

The variable name which can be specified within key design consists of the parameter number and the parameter type.

An operator input function must be assigned to the designed key.

5.6.1.1 Process Operation

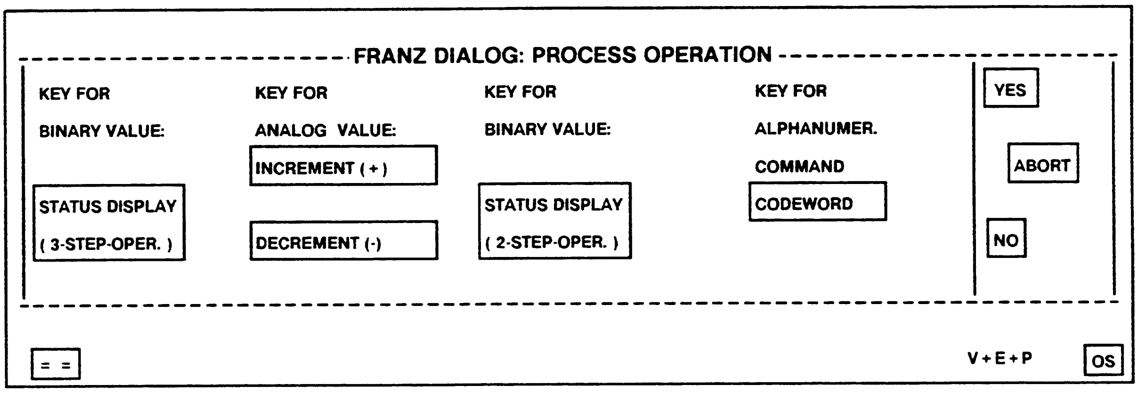


Fig. 5-18 PROCESS OPERATION menu field

All these keys are only permitted in a key set. Menu field functions which permit process control by selecting a key from the key set and the EXECUTE key (exception: 2-key operation, Chapter 5.6.1.2) are described here.

- **Status display** (2- or 3-step operation)

This key can only be selected if the key set has been allocated to an operator-accessible status display.

The binary parameter is stored by operator input directly behind the key. This is a block-related specification; different parameters require different key sets to be designed.

The difference between the STATUS DISPLAY (2-STEP OPER.) key and the STATUS DISPLAY (3-STEP OPER.) key is in the operator input sequence during the operating phase. The EXECUTE key is required to terminate a three-key operation.

Two-key operation sequence:

- Select the object in the display.
- Select the required function in the key set (e.g. ON).

Three-key operation sequence:

- Select the object in the display.
- Select the required function in the key set (e.g. ON).
- Select the EXECUTE key.

See Chapter 5.6.1.2 for notes regarding the EXECUTE key.

Keys which have been created using the STATUS DISPLAY (2-STEP OPER.) function implicitly contain the EXECUTE key function. This saves one operation.

Note 1:

The 2-STEP OPER. function makes it possible to select an object in the display and to select **one** key (e.g. ON or OFF) in the key set. The following solution would also be possible with increased design effort:

Status displays with control function (e.g. ON and OFF indicators) are inserted next to the object (e.g. motor). Selecting a status display displays a key set which only contains the EXECUTE key. This EXECUTE key has been created using the 2-STEP OPER. function and thus contains the parameter number of the AS binary input to be controlled and the EXECUTE key. The text EXECUTE instead of ON and OFF is used as key inscription.

Operator input status displays (ON or OFF) are created such that one alternative shows the state (ON or OFF) while the other alternative contains blanks. The respective key set is allocated when the displays are inserted in the control field.

Advantage of this procedure:
Only the key (ON or OFF) required for the next operator input is displayed in the image. If a motor is running, for example, only the OFF key is displayed. Selecting this OFF key displays a key set which contains the EXECUTE key required for terminating the operator input.

Disadvantage:
Increased design effort and additional keys in the display.

Note 2:

All operator inputs related to binary values in the NORA function package have been implemented using "three-key operation".

Note 3:

Two-key operation can be aborted by a key featuring the EXECUTE function and an ABORT inscription. Two-key operation can then be aborted without selecting a function key.

Action	Reaction
Select function key STATUS DISPLAY (2-/3-STEP OPERATION]	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area	The system inquires whether a parameter number specification is required. PARAMETER NUMBER ? ENTER YES/NO
Parameter number: YES (NO is not sensible with TELEPERM M)	Prompt for entering the parameter number: PARAMETER NUMBER
	The DIAVID numeric menu field is displayed.
Enter the parameter number.	The number appears in the echo line.
Select the END key.	Prompt for entering the parameter type: PARAMETER TYPE
	The → parameter type menu field is displayed.
Select the END key.	The system inquires whether key labels for the process communication keyboard are required: PBT KEY LABELS? ENTER YES/NO *)
YES	Prompt for entering the bit position range: ENTER BIT RANGE
	The DIAVID alphanumeric keypad is displayed.
Enter the bit position range.	The characters appear in the echo line.
Select the END key.	End of the function key configuration.
	The menu field containing the selected PROCESS OPERATION key is displayed.
PBT KEY LABELS: NO	End of the function key configuration function.
	The menu field containing the selected PROCESS OPERATION key is displayed.

---

*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

- **Increment (+)**

This key of the key set enables a binary value to be increased by an increment value. If the binary value has been configured with readable limits (see Chapter 5.12.3.2), the entered value is compared with the input limits selected in the AS. This value is only transferred to the AS if it remains within the limits. This check is omitted if "configurable limits" has been configured.

The increment value must be stored in per cent quantities (no integer values required).

Action	Reaction
Select function key INCREMENT (+)	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	Prompt for entering the increment in per cent: ENTER INCREMENT The DIAVID numeric menu field is displayed.
Enter the increment value in per cent.	The increment value is repeated in the echo line.
Select the END key.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected PROCESS OPERATION key is displayed.

- **Decrement (-)**

This key of the key set enables a binary value to be decreased by a decrement value. If the binary value has been configured with readable limits (see Chapter 5.12.3.2), the entered value is compared with the input limits selected in the AS. This value is only transferred to the AS if it remains within the limits. This check is omitted if "configurable limits" has been configured.

The increment value must be stored in per cent quantities (no integer values required).

The dialog sequence is the same as for the increment function.

*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

- **Code word (not in TELEPERM M)**

This key can be used for defining a command as a code word behind a key. The automation system must recognize this command in on line mode.

Action	Reaction
Select function key CODEWORD	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	Prompt for entering up to 10 code word characters: CODEWORD?
	The DIAVID alphanumeric menu field is displayed.
Enter the code word.	The code word is repeated in the echo line.
Select the END key.	The menu field containing the selected PROCESS OPERATION key is displayed.

5.6.1.2 System Operation 1

All possible system operator inputs are contained in the three menu fields SYSTEM OPERATIONS 1, 2 and 3.

The respective menu fields can be selected via the keys KS1, KS2, and KS3.

Selecting the ABORT key reverses all entries made during the dialog. The initial menu field it then displayed in its basic state.

Restrictions regarding the function keys are discussed together with the individual functions.

The inquiry "VARIABLE NAME? ENTER YES/NO" must be answered with NO if function keys in the control field and process display are concerned.

The inquiry "PBT LABELS? ENTER YES/NO" is always answered with NO in the system operation functions. This inquiry is used for configuring process operations using the PK 318 process communication keyboard (see PK 318 description in Chapter 5 of Vol. 1).

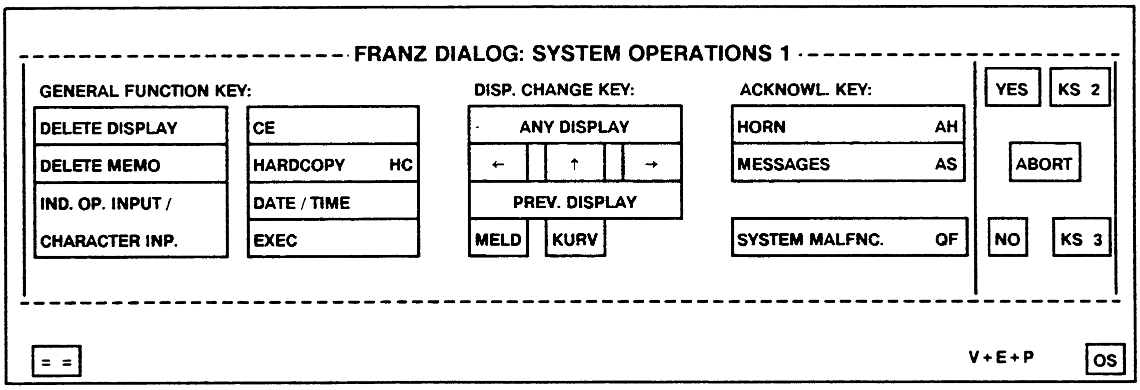


Fig. 5-19 Menus field for "SYSTEM OPERATIONS 1"

GENERAL FUNCTION KEY

• DELETE DISPLAY

This key is used in on line mode to clear the whole screen and display the overview display. It may only be used when an overview display has been designed, otherwise screen input will be blocked.

The key is permitted in the key set, the control field and the process display.

Action	Reaction
Select function key DELETE DISPLAY	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

• DELETE MEMO

This key may only be used together with the scratch pad function. Selecting this key clears all entries in the scratch pad.

The key is only permitted in a key set.

Action	Reaction
Select function key DELETE MEMO	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

- **INDIRECT OPERATOR INPUT/CHARACTER INPUT**

A key must exist for every character which is to be entered in a certain dialog in the operating phase. This type of input is only permitted in a key set.

The second type of input is also permitted in the control field, the window and the process display. This input mode, also known as indirect operator input, defines a key with the function "CHARACTER" and specifies the variable where values are to be entered. It is thus possible to select one particular field and to enter values in a different one. The variable where values are to be entered must be designed first. The character defined behind the key (up to two characters can be stored) is used for documentation updating. During key configuration for the PK 318, the character entered can be used for allocating a key on the keyboard . (See PK 318 description in Vol. 1, Chapter 5)

Action	Reaction
Select function key INDIRECT OPERATOR INPUT/CHARACTER INPUT	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	Prompt for entering a character: ENTER CHARACTER
	The DIAVID alphanumeric menu field is displayed.
Enter the character.	The character is repeated in the echo line.
Select the END key.	The system inquires whether indirect operator input is required: POSITION FOR INDIRECT OPERATION? ENTER YES/NO.
Indirect operator input: YES	Prompt for using the light pen to specify the variable field where values are to be entered: SELECT OPERAT. FIELD
Place the light pen on the variable where values are to be entered.	
Indirect operator input: NO	The menu field containing the SYSTEM OPERATIONS 1 key selected is displayed.

- **CE**

This key enables deletion of the last figure or character to have been entered.

The key is only permitted in a key set.

Action	Reaction
Select function key CE	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **HARDCOPY HC**

This key is used in the operating phase to produce a hard copy of the screen contents. The hard copy unit must be connected to the signal module in the DS 078 terminal (see OS 265 Manual).

The key is only permitted in a key set.

Action	Reaction
Select function key HARDCOPY HC.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

---

*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

- **DATE/TIME**

This key is used in the key set to create a key which allows date and time setting via the DIAVID numeric menu fields in the operating phase.

Action	Reaction
Select function key DATE/TIME	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **EXEC**

This function key must exist in all key sets which initiate operator-process communication.

Exception:	process operation	INCREMENT VALUE DECREMENT VALUE STATUS DISPLAY (2-STEP OP.)

The key is only permitted in a key set and may only exist in the key set which has directly ben accessed. It may not exist in a key set which can be called by DISPLAY KEY SET.

Action	Reaction
Select function key EXEC	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

DISPLAY CHANGE KEY

All these keys are permitted in the key set, the control field, the window and the process display.

- **ANY DISPLAY**

When this key is selected, the display changes to the process display stored under this key. Where large size images are concerned, the position of the first window displayed can be specified. The system does not verify whether or not a large size image is displayed when this key function is created.

Action	Reaction
Select function key ANY DISPLAY	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use the light pen to indicate the two positions in the work area.	Only if the key is within the overview display: prompt for entering the plant area number: ENTER AREA NUMBER. The DIAVID numeric menu field is displayed.
Enter the plant area number.	The number is repeated in the echo line.
Select the END key.	Prompt for entering the process display level number: PROCESS DISP. NUMBER? The DIAVID numeric menu field is displayed.
Enter the 4-digit process display level number.	The number is repeated in the echo line.
Select the END key.	Only if the key is not in the key set: If scroll memory (hardware) has been installed, a prompt for entering the position of the process display section to be displayed appears: ENTER WINDOW POSITION: LINE.COLUMN. The DIAVID numeric menu field is displayed.
Enter line number and column number, separated by a point (position = left-hand top corner of the window) or select the END key immediately if no window position is to be entered.	The two numbers are repeated in the echo line.
Select the END key.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

- **Display change to higher hierarchy levels**

The " ↑ " key is used to alter the display from one hierarchy level up to the next without specifying an image number.

Action	Reaction
Select function key ↑	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **Display change within the same hierarchy level to the left**

The " ← " key is used to alter the display to the image with the next lower image number (to the left) within the same hierarchy level. There should be no gaps between the numbers within a hierarchy level if this method of changing displays is to be used.

Action	Reaction
Select function key ←	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

- **Display change within the same hierarchy level to the right**

The " → " key is used to alter the display to the image with the next higher image number (to the right) within the same hierarchy level. There should be no gaps between the numbers within a hierarchy level if this method of changing displays is to be used.

Action	Reaction
Select function key →	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **PREV. DISPLAY**

This key initiates the display of the image displayed in the operating phase immediately before the current image.

The key is permitted in the key set, the control field, the window and the process display.

Action	Reaction
Select function key PREV. DISPLAY	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

- **MELD**

This key is used in the operating phase to output the alarm sequence display in the work area (see Chapter 7, MELD).

The key is only permitted in a key set.

Action	Reaction
Select function key MELD	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	Prompt for entering a key set level number: ENTER KEY SET NUMBER.
Specification of the key set containing the alarm sequence input. As this key set does not exist yet, the END key must be selected here.	The DIAVID numeric menu field is displayed.
Select the END key.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

Note: Key set input must be skipped by selecting END (without input).

- **KURV**

This key is used in on line mode to select the curve display (see Chapter 8, KURV).

The key is only permitted in a key set.

Action	Reaction
Select function key KURV.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

ACKNOWLEDGEMENT KEY

- **Horn acknowledgement AH**

If an audible indicator has been connected, it will be activated in the operating phase via the VDU channel when an alarm (A), warning (W) or I&C alarm (S) occurs. This key can be used to switch off the audible indicator until the next event occurs.

This function has been tailored to TELEPERM M and is therefore subject to fixed conventions (status routing to the OS-internal group status).

The key is permitted in a key set only.

Action	Reaction
Select function key HORN AH	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **MESSAGES AS/SYSTEM MALFUNCTION QF**

Alarms (A), warnings (W), and I&C alarms (S) are acknowledged by selecting the AS key in the operating phase.

All alarms in a large size image must be acknowledged, even those outside the displayed section or underneath windows. Windows are also acknowledged, provided they are visible and the MKZ concerned comes from this process display.

Selecting the QF key determines the system configuration and displays it in the work area. All I&C alarms waiting in the internal OS buffer are released.

- **Acknowledge window AW**

Alarms, warnings and I&C alarms are acknowledged in the window by selecting "AW". As windows are not integrated in the display hierarchy, the modification is not ORed in the overview.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

The keys are only permitted in a key set.

Action	Reaction
Select function key MESSAGES AS/SYSTEM MALFCT. QF	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use the light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of the function key configuration function. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

5.6.1.3 System Operations 2

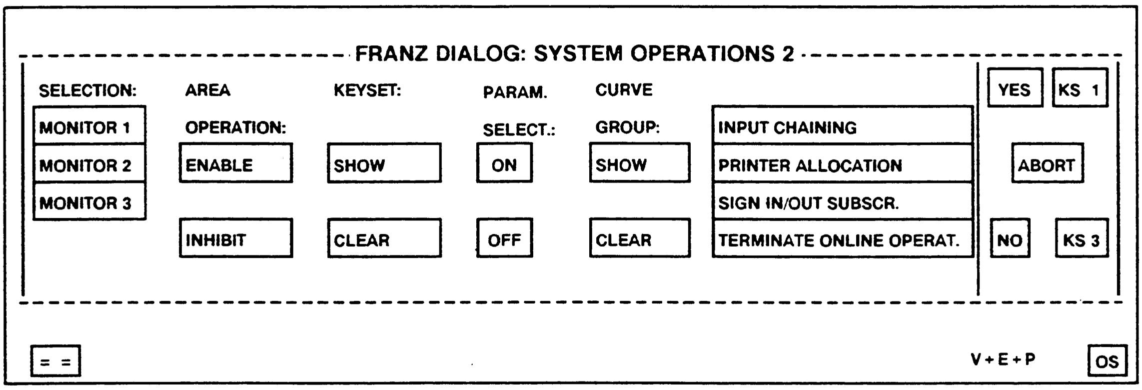

Fig. 5-20 Menu field for SYSTEM OPERATIONS 2

- **Input chaining**

Selecting this key enables the operator to jump from input field to input field during the operating phase. Entered values are buffered. These buffered values are processed individually and transferred to the configured devices (AS) after the EXECUTE key has been selected (cf. Vol. 1, Chapter 2.3.3).

Note:
This function has not been released for configuration.

Action	Reaction
Select function key INPUT CHAINING.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **Printer allocation**

Selecting this key enables a key to be stored in the key set which calls the printer allocation GE form for the log types I&C alarms, operator control log, plaintext log, alarm sequence log and user-specific log during the operating phase.

The key is only permitted in a key set.

Action	Reaction
Select function key PRINTER ALLOCATION.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

- **Sign in/out subscriber**

This key can be used for storing a function in the key set which calls the form "SIGN IN/OUT SUBSCR." in the operating phase. This form enables the operator to log on/off for status and/or text with any device which exists during the initialization phase.

The key is only permitted in a key set.

Action	Reaction
Select function key SIGN IN/OUT SUBSCR.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **Terminate online operation**

This key can be used for terminating on line mode. New data may then be entered, the design phase continued in off line mode or a new on line system loaded.

The key is only permitted in a key set.

Action	Reaction
Select function key TERMINATE ONLINE OPERAT.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

If this key is selected in the operating phase, the menu field "ACTIVATE ON-LINE OPERATION" "ACTIVATE DESIGN DIALOG" appears after the protective request has been answered by "YES".

A light pen is required for inputs to this function. The PK 318 process communication keyboard cannot be used here.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

SELECTION

If one of these keys is selected in the operating phase before the image is changed, the process image will be displayed on the monitor selected.

The keys are only permitted in a key set.

- **Monitor 1**

Action	Reaction
Select function key MONITOR 1.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

Monitor 2 and **3**:

as for monitor 1.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

AREA OPERATION

The two functions INHIBIT area and ENABLE area can only be stored in the key set. Selecting these keys in the operating phase displays a different key set which can be used for entering the number of the area to be inhibited/enabled.

- **Inhibit area** (for the areas 1 - 12)

Action	Reaction
Select function key INHIBIT.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	Prompt for entering a key set level number for the area number input: ENTER KEYSET NUMBER.
Enter the key set number.	The DIAVID numeric menu field is displayed.
	The number is repeated in the echo line.
Select the END key.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **Enable area**

Action	Reaction
Select function key ENABLE.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	Prompt for entering a key set level number for the area number input: ENTER KEYSET NUMBER.
	The DIAVID numeric menu field is displayed.
Enter the key set number.	The number is repeated in the echo line.
Select the END key.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

KEY SET

These keys can be used for displaying or deleting a key set. These keys can be used in the key set, in the control field, in the window or in the process display.

- **Show key set**

Action	Reaction
Select function key SHOW.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION
Use light pen to indicate the two positions in the work area.	Prompt for entering a key set level number for the area number input: ENTER KEYSET NUMBER. The DIAVID numeric menu field is displayed.
Enter the level number.	The number is repeated in the echo line.
Select the END key.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **Clear key set**

Action	Reaction
Select function key CLEAR.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

PARAMETER SELECTION

These keys can be used in the operating phase for activating or de-activating the alternative display of up to four variables in the same position. A set number allocation (between 1 and 4) establishes the interconnection between the variable in the control field or the process display and the activation (i.e. display) initiated by the key.

The two keys are permitted in a key set only.

- **Switch on parameter selection**

Action	Reaction
Select function key ON.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	Prompt for entering a set number between 1 and 4: ENTER SET NUMBER BETWEEN 1 AND 4. Do not derive set number from the BKS. The DIAVID numeric menu field is displayed.
Enter a number between one and four.	The number is repeated in the echo line.
Select the END key.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **Switch off parameter selection**

Action	Reaction
Select function key OFF.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	Prompt for entering a set number between 1 and 4: ENTER SET NUMBER BETWEEN 1 AND 4. The DIAVID numeric menu field is displayed.
Enter a number between one and four.	The number is repeated in the echo line.
Select the END key.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

CURVE GROUP

These keys are used in the operating phase for directly (i.e. with one key) selecting a curve group or for clearing the full graphics module (i.e. remove all displayed curve groups from the screen). These keys can be used in the key set, in the control field, in the window or in the process display.

- **Show**

Action	Reaction
Select function key SHOW	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	ENTER CURVE GROUP NUMBER (0-9999).
	The DIAVID numeric menu field is displayed.
Enter a number between 0 and 9999	The number is repeated in the echo line.
	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

The corresponding curve group is displayed if this key is selected during the operating phase.

- **Clear**

Action	Reaction
Select function key CLEAR.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

The full graphics module is cleared, i.e. all displayed curve groups removed from the screen if this key is selected during the operating phase.

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*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

5.6.1.4 System Operations 3

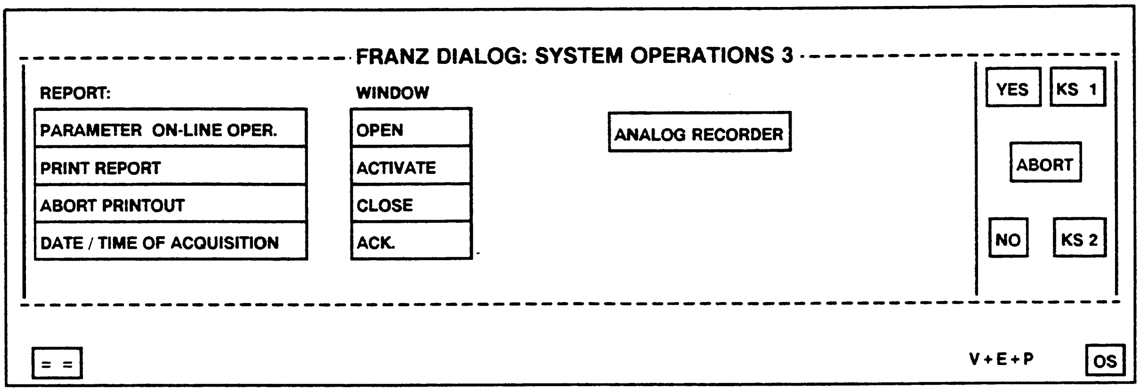


Fig. 5-21 Menu field for SYSTEM OPERATIONS 3

The key functions in this menu field are related to system operations for windowing, user-specific logs and analog recorder mode.

Restrictions with regard to the REPORT function keys are discussed together with the individual functions.

WINDOW

- **OPEN**

This selector key, which can be inserted in a process display, key set or another window (only one window at a time can be displayed), is required for opening a window in a process display.

Selecting this key initiates the dialog used for extending the window selector key, defining the window position and entering the number of the window to be inserted.

Action	Reaction
Select function key OPEN.	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	VARIABLE NAME? ENTER YES/NO.
NO	The DIAVID numeric menu field is displayed.
	Prompt for entering the window number: ENTER WINDOW NO.
Enter the level number	The entered number of the window to be displayed is repeated in the echo line.

Action	Reaction
Select the END key.	The window number is accepted. The menu field WINDOWPOSITION is displayed. this menu field is used for defining the window position. 14 fixed positions and selection of one random window position are available.
Select one of the 14 fixed positions.	The co-ordinate of the selected number is displayed in the echo line.
Select ANY.	The DIAVID numeric menu field is displayed. The prompt ENTER LINE.COLUMN is displayed (odd number of columns).
Enter the two figures, separated by a point.	The input (correction) 1) is displayed in the echo line. The window position may be modified as long as the END key has not been selected. The window position is accepted 2).
Select the END key.	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

1) The system corrects the number by one position to the right if an even number of columns is specified. The corrected input is displayed in the echo line.

2) The position specification only refers to the work area (also for scrolled images), i.e. to a frame of 29 lines and 80 columns.
The system rejects the input and displays the message "WINDOW POSITION NOT PERMITTED" if a window cannot be displayed on the specified position.

- **ACTIVATE WINDOW**

Selecting this key makes a window operator-accessible for inputs using the process operation keyboard. From now on until the window is closed, all subsequent operator inputs using the process operation keyboard refer to the selected window (not the process display level).

This key function remains without any effect if a process operation keyboard has not been connected to the corresponding operation channel. Input is made using the light pen.

Action	Reaction
Select function key ACTIVATE	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **CLOSE WINDOW**

Selecting this key initiates the function CLOSE THE CURRENTLY DISPLAYED WINDOW. This key should be configured in the window or in a key set.

Action	Reaction
Select function key CLOSE	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **ACKNOWLEDGE WINDOW**

Action	Reaction
Select function key ACKNOWLEDGE	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

REPORTS

• PARAMETER ON-LINE OPERATION

This key is selected for configuring the function "REP. menu selection". This key should only be included in one key set.

• PRINT REPORT

Selecting this key prints a displayed user log during the operating phase.

This system function can only be used in conjunction with user-specific log design. This key can therefore only be contained in the log display or in the related key set.

Action	Reaction
Select function key PRINT REPORT	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

• ABORT PRINTOUT

Selecting this function key during the operating phase aborts the log which is currently being printed.

This system function can only be used in conjunction with user-specific log design. This key can therefore only be contained in the log display or in the related key set.

Action	Reaction
Select the function key ABORT PRINTOUT	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **DATE/TIME OF ACQUISITION**

This key is used for allocating the DATE/TIME function to a variable field with log display. During the operating phase, date and time of the one-time log variable acquisition are displayed at this position in the log display.

This system function can only be used in conjunction with user-specific log design.

Action	Reaction
Select function key DATE/TIME OF ACQUISITION	Prompt for entering the starting position: "ENTER STARTING POSITION"
Use light pen to indicate the starting position in the work area.	The date "31.12.89 12:00" is displayed at the specified location. End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

- **ANALOG RECORDER**

Selecting this function key during the operating phase displays a key set which is used for activating the analog recorder input menu.

The key is only permitted in a key set.

Action	Reaction
Select function key ANALOG RECORDER	Prompt for entering the key starting and end position: ENTER KEY EXTENSION.
Use light pen to indicate the two positions in the work area.	ENTER KEY SET NUMBER
Enter key set number.	PBT KEY LABELS? ENTER YES/NO *)
NO	End of function key configuration. The menu field containing the selected SYSTEM OPERATIONS 1 key is displayed.

---

*) See Vol. 1, Chapter 5 for notes regarding inputs related to PK 318.

5.6.2 Protect/delete field

- **Protection 2**

Action	Reaction
Select function key PROTECTION2	The key set design menu field remains on the display. The next variable designed is provided with keyswitch protection 2 (V + E).

- **Protection 3**

Action	Reaction
Select function key PROTECTION3	The key set design menu field remains on the display. The next variable designed is provided with keyswitch protection 3 (V + E + P).

- **Delete**

Action	Reaction
Select function key DELETE	As for the function DELETE FIELD in the → variable field menu field.

5.7 Control Field Design

A control field may consist of a segment and one or several variables.

Key functions can be configured on the segments or variables in the control field which are used, for example, for controlling a variable displayed in the control field. The key-specific dialog is performed in the same manner as for key set design.

In the operating phase, a control field is used for monitoring and controlling an AS function block. All variables in a control field must therefore come from the same block type.

A control field is allocated to the AS block by MKZ assignment (measuring point identifier) when the control field is inserted in the process display.

- **Control field number**

The system automatically assigns the control field number when a designed control field is stored.

5.7.1 Design

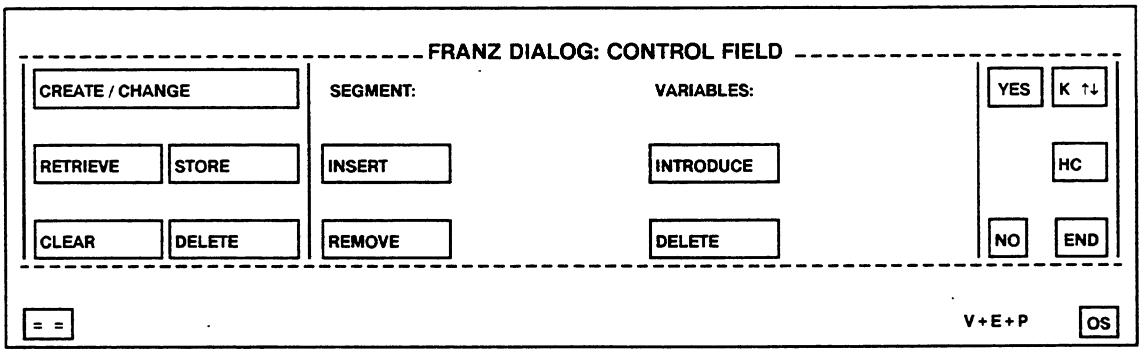


Fig. 5-22 Control field design menu field

- **Create/change**

Action	Reaction
Select function key CREATE/CHANGE	Prompt for entering the key starting and end position: REPRESENTATION OF CONTROL FIELD
Enter two positions in the work area.	The message disappears from the message line. The → control field properties menu field is displayed.

Select the END key in this menu field and continue the dialog by entering a segment or variable if a NORA control field is not to be designed.

- **Store**

Action	Reaction
Select function key STORE	If a number has been specified (by previous → retrieval), the system inquires: OVERWRITE LAST VERSION ? ENTER YES/NO
Overwriting: NO	The control field is stored under a newly assigned number.
Overwriting: YES	The control field is stored under the specified number.
	The number used for storing the control field is displayed in the echo line.

- **Retrieve control field**

Action	Reaction
Select function key RETRIEVE	Prompt in the message line for entering a control field number: CONTR. FIELD NUMBER.
	The DIAVID numeric menu field is displayed in the command area.
Enter number	The number is displayed in the echo line
Select the END key	The control field appears in the work area from position 1,1.
	The → retrieval function menu field is displayed.
Select the END key	The message disappears from the message line. The → control field design menu field is displayed.

Before the RETRIEVE function key can be re-activated, the CLEAR function key must be selected in order to establish the initial status.

- **Clear**

Action	Reaction
Select function key CLEAR	The work area is cleared. An unfinished control field remains in the data.

- **Delete**

Action	Reaction
Select function key DELETE	As for the → retrieve control field function.
Select the END key	Request in message line: DELETE CONTROL FIELD? ENTER YES/NO.
YES or NO	The message disappears from the message line. The control field disappears from the work area.

The control field is deleted from the data if YES was entered, and remains if the entry was NO.

SEGMENT

- **Insert segment**

Action	Reaction
Select function key SEGMENT: INSERT	Prompt for entering the segment position in the image: ENTER SEGMENT ORIGIN.
Position the light pen to specify the required point in the work area.	The message disappears from the message line. The process display is saved and the work area cleared. As for the function → retrieve segment.
Select the END key.	Prompt for specifying the segment connecting point: ENTER SEGMENT CONNECTOR.
Position the light pen to specify the required connecting point in the segment.	The message disappears from the message line.
	The saved process display is displayed in the work area. The segment is inserted at the position indicated.

Exactly one segment can be inserted in a control field.

- **Remove segment**

Action	Reaction
Select function key SEGMENT: REMOVE	Prompt for specifying a position in the displayed segment: IDENTIFY VARIABLE FIELD.
Position the light pen on a point in the segment for identification.	The message disappears from the message line. The marked segment blinks. Inquiry in the message line: REMOVE SEGMENT ? ENTER YES/NO.
Remove: YES	The segment disappears from the process display.
Remove: NO	The message disappears from the message line.

VARIABLE

The variable name to be specified within the control field consists of the parameter number and the parameter type.

- **Introduce variable**

Action	Reaction
Select function key VARIABLES: INTRODUCE	If the control field is not displayed, the message NO DISPLAY SHOWN appears. Otherwise the → variable field menu field is displayed.

- **Delete variable**

Action	Reaction
Select function key VARIABLES: DELETE	The message is displayed: DELETE ALL VARIABLE FIELDS? ENTER YES/NO.
Delete: YES	All variable fields in the control field are deleted from the display.
Delete: NO	The control field design menu field remains on the screen.

All variable fields of the control field are removed from the data if YES was entered, and remain if the entry was NO.

5.7.2 NORA for TML Blocks

The FRANZ dialog NORA CONTROL FIELDS is used for creating additional NORA representations of the standard blocks or user-related NORAs for TML blocks.

5.7.2.1 Design

Since all required variable fields and related key set must be designed, designing special NORAs is quite a time-consuming job. In addition, the associated NORA control fields for the individual hierarchy levels (area, group, loop) must be designed.

The following dimensions are required for the control fields:

• area display	1 symbol
• group display	23 lines x 10 columns
• loop display	23 lines x 79 columns

The following control field properties can be allocated using the displayed menu field:

• Hierarchy level:	Area, group, loop
• Block type:	Block type accessed by the NORA in the AS. - The corresponding standard type must be selected if a new representation of a standard block is to be designed. - A new block name (type) must be specified after the TML/NOT OP.BLOCK key has been selected if a NORA for a TML block is to be designed.
• Representation number:	Up to 45 different representations are possible for every block type.
• Block character:	(For documentation purposes only) A standard type with response equivalent to the TML block can be specified here.

Please note the following points when designing a control field:

INTERNAL must be specified as parameter type (as always for TML block parameter access).

As the targets change according to the insertion location within the hierarchy, normal jump keys with fixed targets cannot be used in NORA area or group control fields for jumping downwards within the NORA hierarchy (area display → loop display; group display → loop display). For this reason, the following "trick" is used:

When the status display of the area control field is inserted into the control field, it is declared OPERABLE and the key set number is defined as 0.0.0.254. The system uses this dummy number for determining the correct target. The S16 string (which must be inserted on position 2.2) in the group control field is declared operable, and the key set number to be specified here is 0.0.254.254.

5.7.2.2 Dialog

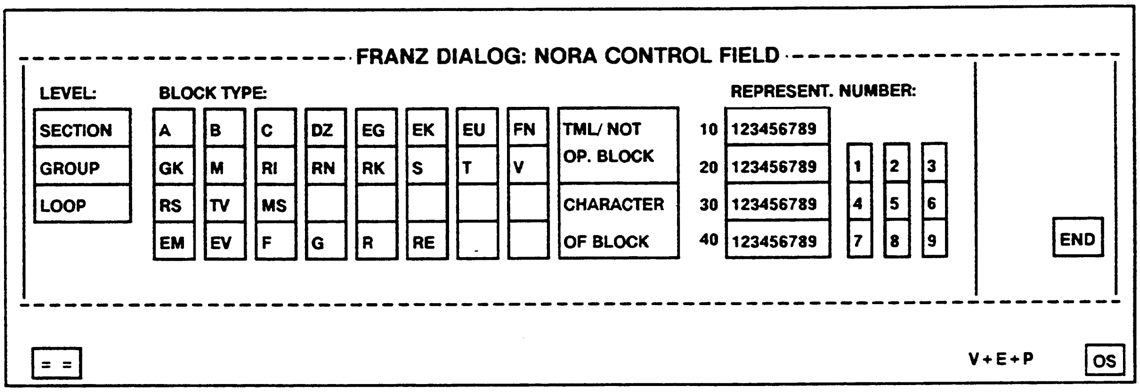


Fig. 5-23 Control field characteristics menu field

- **Control field hierarchy**

The control field must be marked according to its application within the NORA hierarchy.

Action	Reaction
Select function key AREA or GROUP or LOOP	All control field characteristics and the specification "AREA" or "GROUP" or "LOOP" respectively are displayed in the command line.

- **Control field representation**

Up to 45 different block representation forms can be specified.

Action	Reaction
Select function key 1 to 9 (01...09) 10 1 to 9 (11...19) 20 1 to 9 (21...29) 30 1 to 9 (31...39) 40 1 to 9 (41...49) *) **)	All control field characteristics together with the current representation number are displayed in the command line (completed to four digits by adding zeros).

*) Unit digit
**) Ten's digit

- **Standard type**

This parameter is used for assigning a standard block name to the control field.

Action	Reaction
Select function key A, B, C, DZ, EK, EU, FN, GK, M, RI, RN, RK, S, T, V, RS, TV, MS, EM, EV, F, G, R, RE	All control field properties and the current standard type specifications are displayed in the command line.

- **TML/NOT OP. BLOCK**

This parameter is used for assigning the block type of a random block to the control field.

Action	Reaction
Select function key TML/NOT OP. BLOCK	The message ENTER TYPE TML/NOT OP. BLOCK is displayed. The DIAVID alphanumeric menu field is displayed.
Enter the block type.	The block type is repeated in the echo line.
Select the END key.	The message disappears from the message line. All control field properties and the current block type specification are displayed in the command line.

- **Block character**

This parameter can only be used as a documentation aid for marking the response of a block in the automation system
(a freely configurable block can respond in the same way as a closed-loop block, for example).

Action	Reaction
Select function key CHARACTER OF BLOCK	The message "ENT. STANDARD TYPE" is displayed.
Select a standard function block.	The message disappears from the message line. All control field properties and the current block behaviour are displayed in the command line.

5.8 Process Display

5.8.1 Process Display Format

- **Individual displays**

The work area is provided for plant display representation. Overview displays should possibly be designed as individual displays. Detailed displays can be shown as individual displays and/or large-size images. The user can specify the screen layout of individual displays according to the system requirements (Chapter 5.1.1). Message line, input line and one key line are system lines which are always displayed. The maximum work area consists of 29 lines with 80 columns each (i.e. 2320 fields.).

The number of lines contained in the overview field and the number of key lines are configured during the design phase. The work area is then reduced accordingly (default value: 24 lines).

Note: If you insert variables beyond the visible area, individual variables might not be displayed.

- **Large-size image**

Each display channel has one large-size image memory as a standard feature. This memory is used for displaying system images which are larger than the work area. Using virtual keys, the work area can be scrolled as a window across the large-size image whilst message line, overview field, input line and key line(s) remain stationary. Message line, input line and one key line are system lines which are always displayed. The maximum work area consists of 29 lines with 80 columns each (i.e. 2320 fields.). The number of lines contained in the overview field and the number of key lines are configured during the design phase.

A detailed display can be designed as a large-size image. Within the following limits, the user can choose the size of the large-size image according to requirements:

A large-size image consists of Y lines with X columns each:

$Y \times X \leq 40960$
$X \geq 80$
$Y \geq 32$
The minimum size is 33 x 80 or 32 x 81.

A large-size image can thus consist of a maximum of 512 lines with 80 columns or of 1280 columns with 32 lines (16 individual displays).

Selecting the virtual keys for the required direction (up, down, left, right) starts scrolling. The large-size image window is moved by the scroll keys (Chapter 2.1.2). Major process and I&C fault alarms are displayed during scrolling whilst cyclic updating of the work area is stopped and date/time output suspended.

Once scrolling is stopped, the newly displayed large size image section is updated immediately and date and time output is continued.

- **Process display number assignment**

Process displays used for process hierarchy representation are specified by a four-part number sequence. This enables four different hierarchy levels to be represented. The first number corresponds to the lowest hierarchy level, the second number to the next higher level, etc. The individual numbers in the sequence must be separated by a point. A process image level number may not be specified without the number for the highest (4th) hierarchy level.

Image level 1:	0.0.0.1	to	0.0.0.254	
Image level 2:	0.0.1.B	to	0.0.254.B	(1 ≤ B ≤ 254)
Image level 3:	0.1.G.B	to	0.254.G.B	(1 ≤ G ≤ 254, 1 ≤ B ≤ 254)
Image level 4:	1.K.G.B	to	254.K.G.B	(1 ≤ K ≤ 254, 1 ≤ G ≤ 254, 1 ≤ B ≤ 254)

Note:
If NORA is used for configuration, certain level numbers are assigned by the system, and cannot be modified or used for other displays. These are, for the hierarchy levels

area	0.0.0.1	to	0.0.0.12	
group	0.0.1.B	to	0.0.24.B	(1 ≤ B ≤ 12)
loop	0.1.G.B	to	0.8.G.B	(1 ≤ G ≤ 24, 1 ≤ B ≤ 12)

User-specific logs and windows which also obtain an image level number are not included into the image hierarchy.

Image level numbers used for log displays may not be used for process displays. This restriction does not apply to the image level numbers of the window. This means that the system can distinguish between a window and a process display, even if both have the same number.

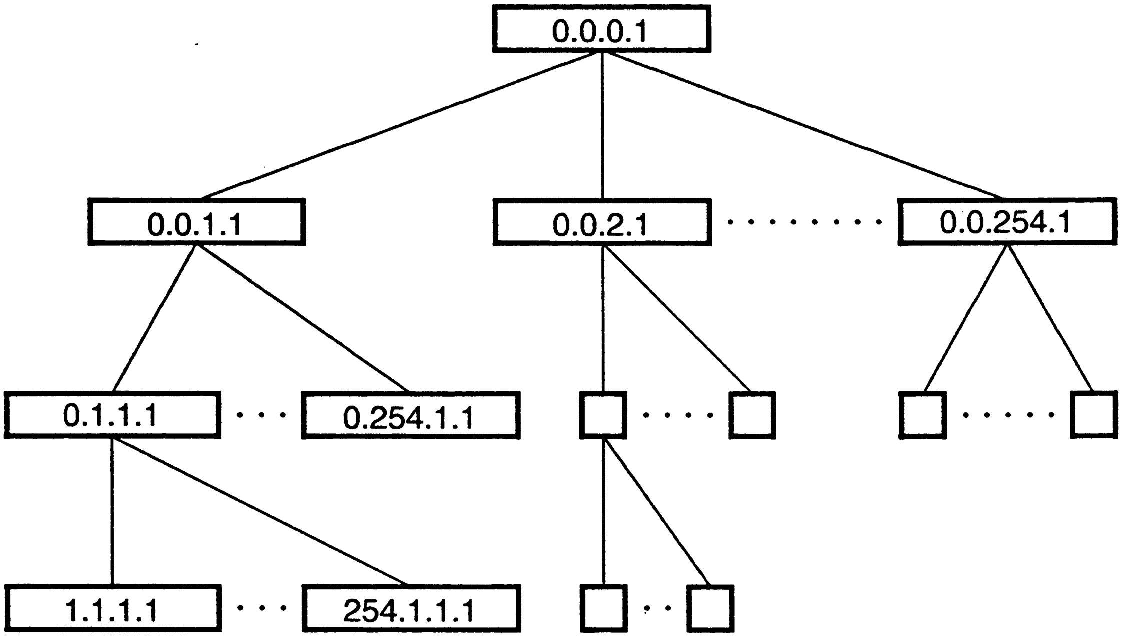
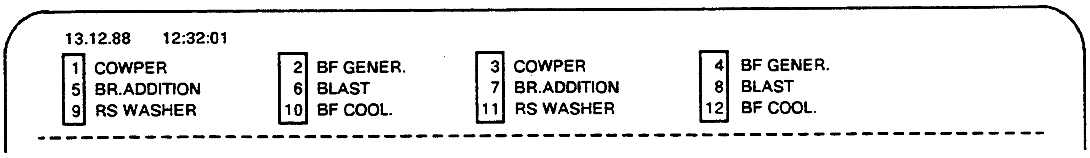
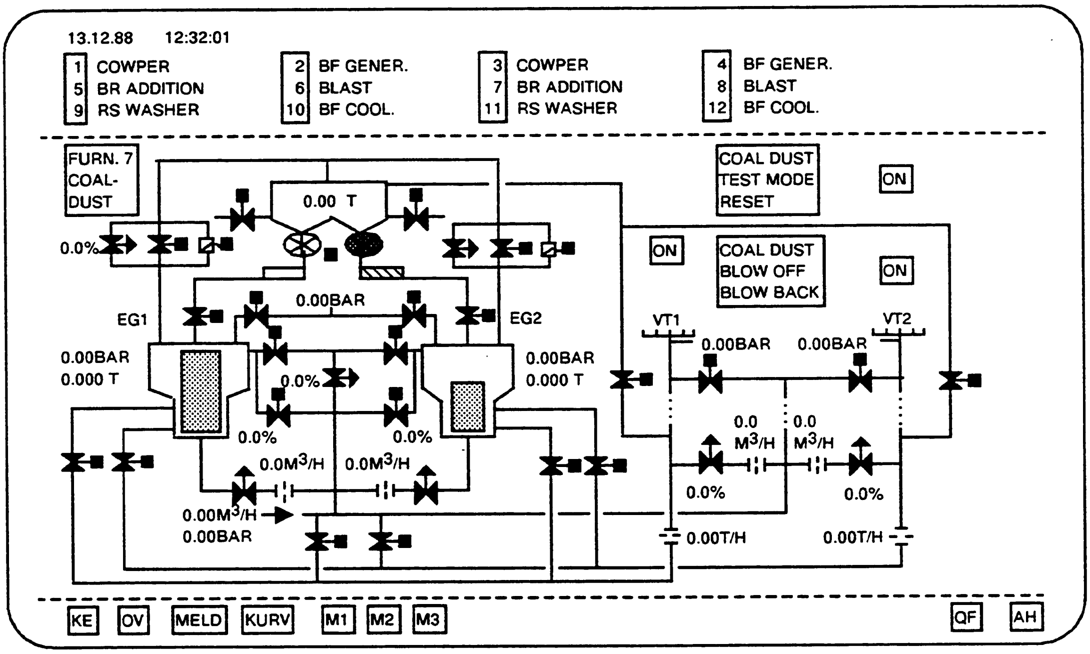


Fig. 5-24 OS 265 image structure (principle)

Area overview



Area display, level 1



Group display, level 2

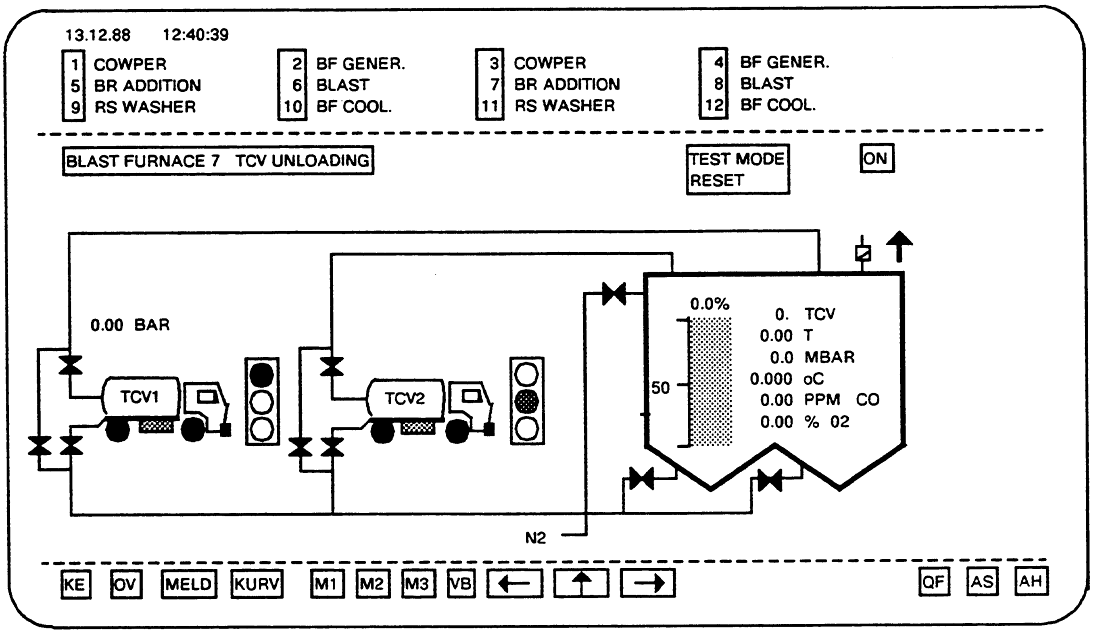
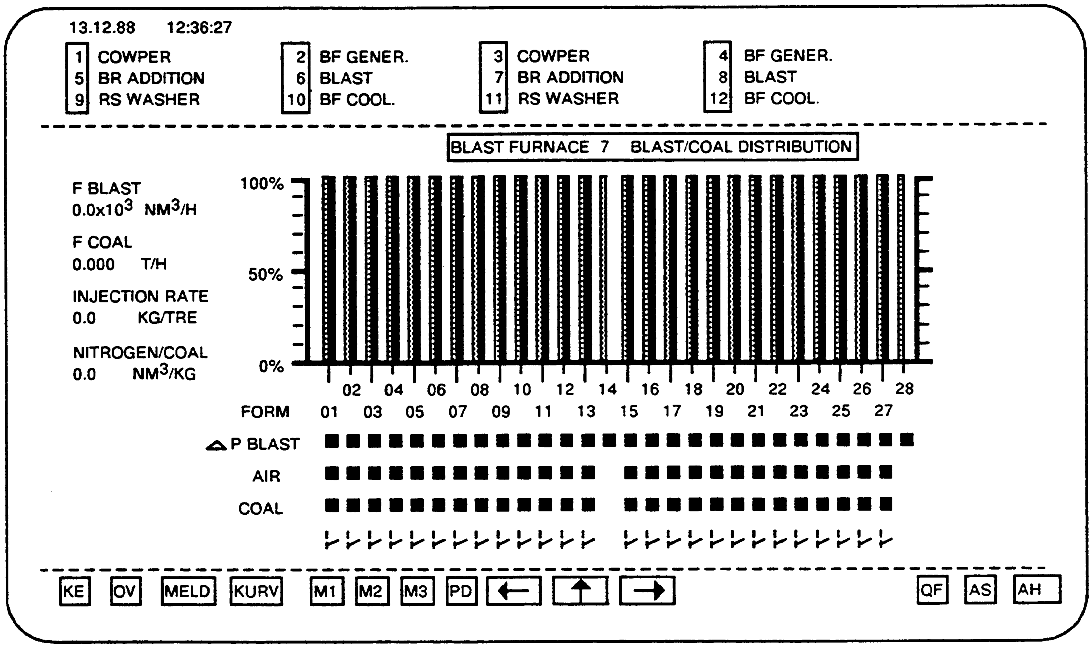


Fig. 5-25 Part 1, OS 265 image structure (example)

Loop display, level 3



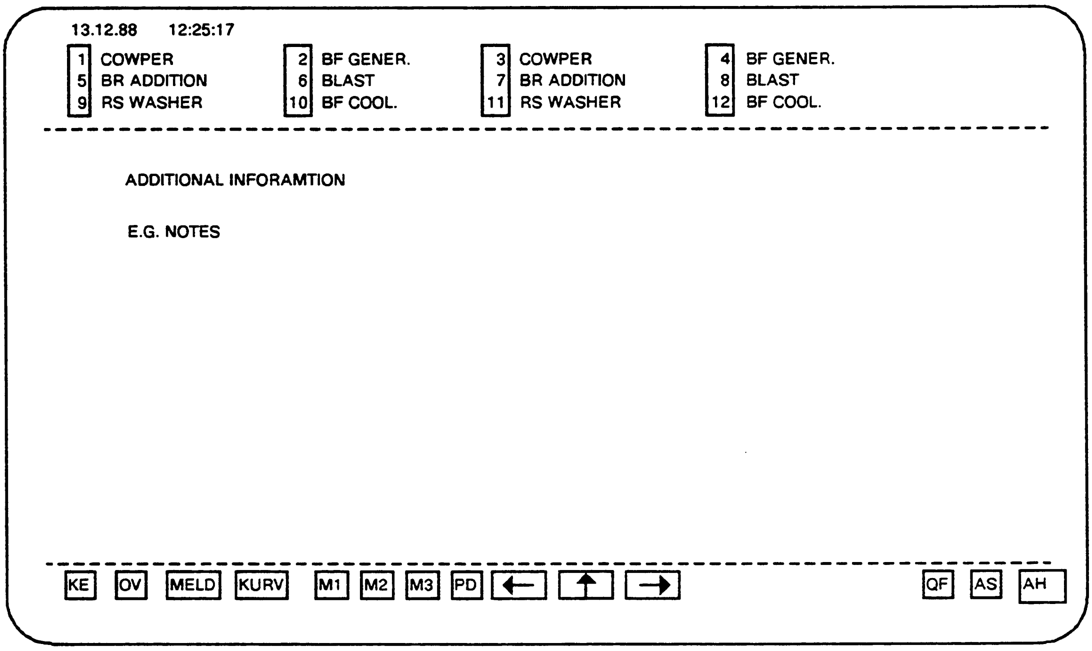
13.12.88 12:36:27

1 COWPER	2 BF GENER.	3 COWPER	4 BF GENER.
5 BR ADDITION	6 BLAST	7 BR ADDITION	8 BLAST
9 RS WASHER	10 BF COOL.	11 RS WASHER	12 BF COOL.

BLAST FURNACE 7 BLAST/COAL DISTRIBUTION

F BLAST
$0.0x10^3$ NM^3/H
F COAL
0.000 T/H
INJECTION RATE
0.0 KG/TRE
NITROGEN/COAL
0.0 NM^3/KG

Detailed display, level 4



13.12.88 12:25:17

1 COWPER	2 BF GENER.	3 COWPER	4 BF GENER.
5 BR ADDITION	6 BLAST	7 BR ADDITION	8 BLAST
9 RS WASHER	10 BF COOL.	11 RS WASHER	12 BF COOL.

ADDITIONAL INFORAMTION

E.G. NOTES

Fig. 5-25 Part 2, OS 265 image structure (example)

5.8.2 Process Display Updating

The following rules apply for display and updating process displays:

- All static image parts (segments) have been configured in the OS 265 system and are only displayed once after the image has been selected.
- The parameters for the process-related block names (S16) and units (S4) are only read once from the automation systems and displayed after the image has been selected. The image in the OS 265 must therefore be changed after the S16 and S4 strings in the AS have been re-parameterized.
- All parameters (S2, EA, EAD, AA, AAD, VA, I, ID, EB, AB, VB) for the image selected are read periodically in the configured updating cycle (e.g. 2 seconds). If the values have changed, the associated displays will also be changed (process-related mnemonic name, digital, analog and status displays).
- All displays of the image selected, which have been derived from the BKS (binary linking transmitter block), are updated periodically (status displays).
- All displays which have been derived from the status of the operator-accessible standard blocks are only updated after a status change has occurred (mode selection, process fault message, I&C fault alarm).
- See Chapter 6.1 for MKS bit-dependent updating.

5.8.2.1 Image-Related Updating Time

Irrespective of the selected system cycle, each process display can have its separate updating cycle.

In general, the updating cycle of a process display is specified such that 1 second updating time is considered for 50 variables. It is assumed that in average 40% of the displayed values have changed and are therefore to be updated.

Opening a window in a process display increases the number of variables to be updated. This increased load for the OS system must be taken into account when defining the process display and window updating cycle.

As a window is normally opened when "something happens" or an operator input is expected, the above-mentioned per cent value will be insufficient in window mode. It can be assumed that approximately 80% of the variables change within an updating cycle. This means that an updating rate of approximately 25 variables per second must be taken into account. The following calculation methods result:

Process display (without window)

$$\text{Cycle} = \frac{\text{Number of variables}}{50}$$

Window

$$\text{Cycle} = \frac{\text{Number of variables}}{25}$$

The result is to be rounded to the next higher integer number.

The case that a window has been opened in a process display and the updating cycle has been defined such that <u>all</u> displayed variables can be updated is covered by the following formula:

$$Zp = \frac{Vp}{50} \left(1 + \frac{1}{Zw} \cdot \frac{Vw}{25}\right)$$

It means:

Zp = Process display cycle with window (to be rounded to the next higher integer number)

Vp = Number of variables in the process display

Zw = Cycle defined for the window with the highest number of variables in this process display

Vw = Number of variables in the window with the highest number of variables in this process display

Only those variables are to be taken into account which are to be updated cyclically.

Example of the procedure:

A process display contains 60 variables which are to be updated cyclically. Three windows can be opened in the process display:

Window 1 contains 10 variables
Window 2 contains 15 variables
Window 3 contains 20 variables

A cycle of 2 seconds is defined for all windows (this value is normally sufficient for the requirements). Window 3 is used for calculating the image-related updating cycle of the process display:

Vp = 60, Zw = 2, Vw = 20

$$Zp = \frac{60}{50} \left(1 + \frac{1}{2} \cdot \frac{20}{25}\right)$$

= 1.68, rounded to

Zp = 2 seconds.

If a 1-second cycle is defined for window 3, the result is, however

$$Zp = \frac{60}{50} \left(1 + \frac{1}{1} \cdot \frac{20}{25}\right)$$

= 2.16, rounded to

Zp = 3 seconds

Note: It is also possible that a window with a smaller number of variables, but a shorter updating cycle, causes a higher system load than the window with the highest number of variables.

Example:
Window 1 with 10 variables: 1 second
Window 2 with 15 variables: 2 seconds
Process display with 75 variables

The result for window 1 is

$$Zp = \frac{75}{50} \quad (1 + \frac{1}{1} \quad \cdot \quad \frac{10}{25} \quad)$$

= 2.1, rounded to

Zp = 3 seconds

The result for window 2 is

$$Zp = \frac{75}{50} \quad (1 + \frac{1}{2} \quad \cdot \quad \frac{15}{25} \quad)$$

= 1.95, rounded to

Zp = 2 seconds.

In such a case, the higher cycle must always be used for the process display. If necessary, the calculation must be repeated for several windows until the system load caused by the windows has been determined without any doubts.

The given formula defines the correlation between the number of variables in the process display and in the window. Even for windows, the updating cycle should normally not be shorter than two seconds. Shorter cycles increase the system load unnecessarily. The updating cycle of the process display should be defined accordingly if a 1-second updating cycle is required. The specified formula might be helpful for this calculation. It should be remembered, however, that the formula has been determined empirically. No guarantee can be given that the calculation will be successful for each individual case. Process displays and windows must therefore be tested using the calculated cycles.

5.8.3 Process Display Design

A process display consists of two parts: the background image which contains the process-related static information and the previously designed image elements (segment, control field, status display, variable) which are inserted in the static image.

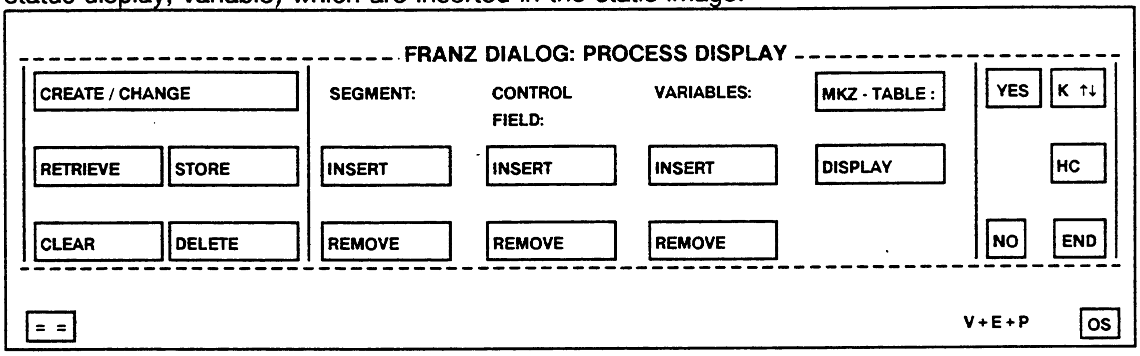


Fig. 5-26 Menu field for process display design

- **Create/change**

Action	Reaction
Select function key CREATE/CHANGE	Prompt for specifying the process display level number: PROCESS DISP. NUMBER. The DIAVID numeric menu field is displayed.
Enter the level number.	The level number appears in the echo line.
Select the END key.	The level is displayed if it exists in the data. If a new process display is to be created, prompt for entering the image format (number of lines and columns): ENTER FORMAT: ROWS.COLUMNS
Enter the two figures, separated by a point.	The input appears in the echo line.
Select the END key.	A prompt for designing the image data appears in the message line: DESIGN PROCESS DISPLAY. The DIAVID symbol menu field is displayed in the command area.
Select a character/symbol in the menu field.	The character/symbol blinks.
Place a character/symbol in the work area.	The character/symbol is displayed in the work area.
Select the END key in the DIAVID menu field.	The message disappears from the message line. The → process display design menu field is displayed.

If a symbol set has not yet been loaded, the message SYMBOL SET NOT LOADED will be issued when a new image is created.

The image format prompt must be answered with 29 lines and 80 columns if an individual display is to be designed.

A large size image must have at least 32 lines and more than 80 columns or more than 32 lines and at least 80 columns.

- **Store**

Action	Reaction
Select function key STORE.	Prompt for specifying the large size image section to be displayed by positioning the light pen within the image (large size image only): ENTER WINDOW POSITION FOR REDISPLAY.
Position the light pen.	If a level number has already been specified (previous → retrieval or creating an existing process display), inquiry: OVERWRITE LAST VERSION ? ENTER YES/NO.
Overwrite: NO	Prompt for entering the new level number: PROCESS DISP. NUMBER. The DIAVID numeric menu field is displayed.
Enter the level number.	The level number is repeated in the echo line.
Select the END key.	Message output OPER. INHIBIT DURING DATA STORAGE while static image data is being stored.
Overwrite: YES.	Work area and large size image memory are cleared. Prompt for entering the key field to be displayed with the process display: ENTER KEYSET NUMBER TO PROCESS DISPLAY. As for function → retrieve key set.
Select the END key.	The → process display design menu field is displayed.

The additional prompt "ENTER IMAGE-RELATED UPDATING CYCLE" enables assignment of a separate cycle to each process display, independent from the selected system cycle. A figure between 1 and 255 specifying the duration in seconds of one image updating cycle can be entered. The number of variables must not be exceeded for the cycle specified (in particular for the 1-s-cycle).

If a window is to be inserted in the process display, the number of variables in the window must be taken into account with respect to the updating time.

If the prompt is answered by END without any additional input, the updating cycle used in the whole system also applies to this image.

- **Retrieve**

Action	Reaction
Select function key RETRIEVE.	Prompt in the message line for entering a level number: PROCESS DISP. NUMBER.
	The DIAVID numeric menu field is displayed.
Enter the level number.	The number appears in the echo line.
Select the END key.	The process display appears on the screen.
	The → retrieve functions menu field is displayed.
Select the END key.	The message disappears from the message line.
	The process display design menu field is displayed.

Before the RETRIEVE function key can be re-activated, the CLEAR function key must be selected in order to establish the initial status.

- **Clear**

Action	Reaction
Select function key CLEAR	The work area is cleared.
	An unfinished process display which has not been stored is removed from the data.

- **Delete**

Action	Reaction
Select function key DELETE	As for the → retrieve process display function.
Select the END key.	Request in message line: DELETE PROCESS DISPLAY ? ENTER YES/NO.
YES or NO	The message disappears from the message line.
	The process display disappears from the work area.
	The process display design menu field is displayed.

The process display is deleted from the data if YES was entered, and remains if the entry was NO.

SEGMENT :

- **Insert segment**

Action	Reaction
Select function key SEGMENT: INSERT	Prompt for entering the segment position in the image: ENTER SEGMENT ORIGIN.
Position the light pen to specify the required point in the work area.	The message disappears from the message line.
	The process display is saved and the work area cleared.
	As for the function → retrieve segment.
Select the END key.	Prompt for specifying the segment connecting point: ENTER SEGMENT CONNECTOR.
Position the light pen to specify the required point in the segment.	The message disappears from the message line.
	The saved process display is displayed in the work area.
	The segment is inserted at the position indicated.

- **Remove segment**

Action	Reaction
Select function key SEGMENT: REMOVE	Prompt for specifying a position in the displayed segment: IDENTIFY VARIABLE FIELD.
Position the light pen on a point in the segment for identification.	The message disappears from the message line.
	The marked segment blinks.
	Inquiry in the message line: DELETE SEGMENT ? ENTER YES/NO.
Delete: YES	The segment disappears from the process display.
Delete: NO	The message disappears from the message line.

CONTROL FIELD:

- **Insert control field**

The MKZ (bus no., device no, block type and block no.) is specified to insert a control field. The control field is then firmly assigned to a function block in the AS.

If a control field is to be displayed according to the BKS (corresponds to the BKS interconnection), variable name (MKZ) and a BKS block name must be specified when the control field is inserted.

The control field is only displayed if the number in the specified bit field is not equal to zero. This enables the alternate display of several control fields on the same position, dependent on the BKS interconnection.

Restrictions are:

- Bits causing different control fields to be displayed may not be set at the same time.
- Since BKS control does not switch over static segments, a control field may either not contain static or sporadic information (segments or status displays whose parameterization has been specified as sporadic) or the control fields which are displayed under BKS control must contain identical information (identical segments).
- Control fields must be of the same size and may not contain NIL dots, otherwise remainders of an alternating image will show.
- Operator inputs always refer to the last control field to have been inserted.

Image-related bar limits can be specified for control fields which possess at least one bar with configured limits. These bar limits, which can be specified when the control field is inserted in the process display, apply for all bars with configured bar limits within the control field.

Action	Reaction
Select function key INSERT	Prompt for entering the control field position in the image: ENTER CONTROL FIELD ORIGIN
Position the light pen to specify the required point in the work area.	Prompt for entering the variable name (not BKS): VARIABLE NAME? BUS.SUBSCR.BLOCK.NO.
	The DIAVID alphanumeric menu field is displayed.
Enter the variable name according to the pattern.	The entered variable name appears in the echo line.
Select the END key.	Inquiry: BKS-BLOCK? ENTER YES/NO.
Yes	Prompt for entering the BKS name: BKS NAME? BUS.SUBSCR.BKS.NO.
	The DIAVID alphanumeric menu field is displayed.
Enter the BKS name according to the specified pattern.	The entered BKS name appears in the echo line.
Select the END key.	Prompt for entering the bit position range in the BKS: ENTER BITRANGE FROM - TO.
	The DIAVID alphanumeric menu field is displayed.
Enter the two bit position numbers which must be separated by a hyphen	The two numbers appear in the echo line.
Select the END key.	The process display is saved and the work area cleared.
BKS: NO	
Select the END key.	Continue as for the function → retrieve control field (Chapter 5.7).
	Prompt for entering the control field connecting point: ENTER CONTROL FIELD CONNECTOR.
Position the light pen to specify the connecting point in the control field.	The message disappears from the message line.
	The saved process display is displayed in the work area.
	If the control field contains at least one bar with configured bar limits, a prompt for entering the image-related upper bar limits appears: BAR'S UPPER LIMIT IN DISPLAY?
	The DIAVID numeric menu field is displayed.

Action	Reaction
Select the END key immediately if no image-related bar limits are required. Select the END key.	The upper bar limit appears in the echo line.
	Prompt for entering the image-related lower bar limit: BAR'S LOWER LIMIT IN DISPLAY?
	The DIAVID numeric menu field is displayed.
Else: Enter upper bar limit. Enter lower bar limit.	The lower bar limit appears in the echo line.
	The control field is inserted at the specified position.
	The → process display design menu field is displayed in the command area.

Note:
The control field size must be taken into account when a control field is inserted into a process display. For example, a control field which is superimposed on a process display such that it projects beyond the right-hand margin of the process display, cannot be completely removed.

- **Remove control field**

Action	Reaction
Select function key REMOVE	Prompt for specifying a position in the displayed control field: IDENTIFY VARIABLE FIELD
Position the light pen on a point in the control field for identification.	The message disappears from the message line. The marked control field blinks. Inquiry in the message line: REMOVE CONTROL FIELD? ENTER YES/NO.
Remove: YES	The control field disappears from the process display.
Remove: NO	The message disappears from the message line.

VARIABLE FIELDS:

- **Insert variable fields**

Action	Reaction
Select function key VARIABLE: INSERT	The → variable field menu field is displayed.

- **Remove variable fields**

All control fields are removed when the "Remove variable" function is selected.

Action	Reaction
Select function key VARIABLE: REMOVE.	Inquiry in message line: DELETE ALL VARIABLE FIELDS? ENTER YES/NO.
Remove all: YES	All variable fields (no segments) in the control field are deleted from the display (including control fields).
Remove all: NO	The message disappears from the message line.

MKZ table

- **DISPLAY MKZ table**

The MKZ table can be used for modifying process display variables without actually retrieving the process display.

Note: Do not use this function for NORA process displays.

5.9 Window

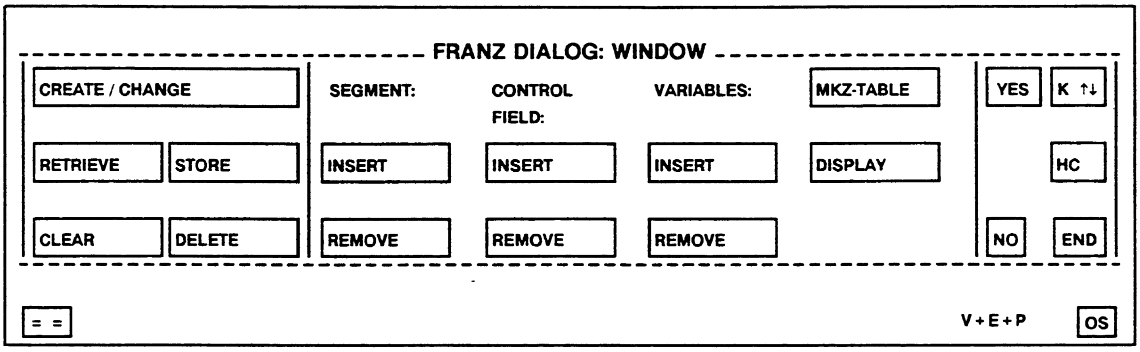


Fig. 5-27 Window design menu field

A window is designed in two phases:

- layout design
- selection configuration

The window layout is designed in the same manner as the process display: specifying the window size, creating the background image (static) and inserting the variables (dynamic).

The window position in the process display and the extension of the selector and de-selector keys is defined during selection configuration.
These are system functions which are described in Chapter 5.6.1.4 (SYSTEM OPERATIONS 3).

5.9.1 Window Size

The window format is defined using the WINDOW SIZE menu field.

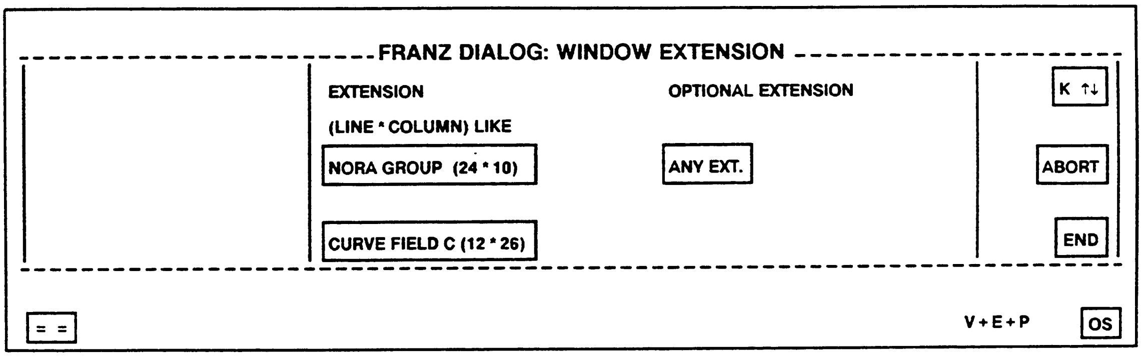


Fig. 5-28 Window size menu field

The following formats are permitted for the window size:

Fixed size: 24 lines x 10 columns
(corresponds to the NORA group control field)

12 lines x 26 columns
(corresponds to the KURV-C field)

Any size: Max. format of an individual display (even number of columns)
(29 lines x 80 columns).

Only a format with an even number of columns is accepted by the system if ANY EXT. has been selected. If the designer specifies an odd number of columns, the system will decrease the entered value by one and the message "WINDOW 1 COLUMN SMALLER" will be displayed. The system will not accept a window format 1.1.

The message "WINDOW EXTENSION NOT ACCEPTABLE" will be displayed and the input rejected if an attempt is made to specify a format which is larger than an individual display. The window size can then be specified again.

5.9.2 Window Position

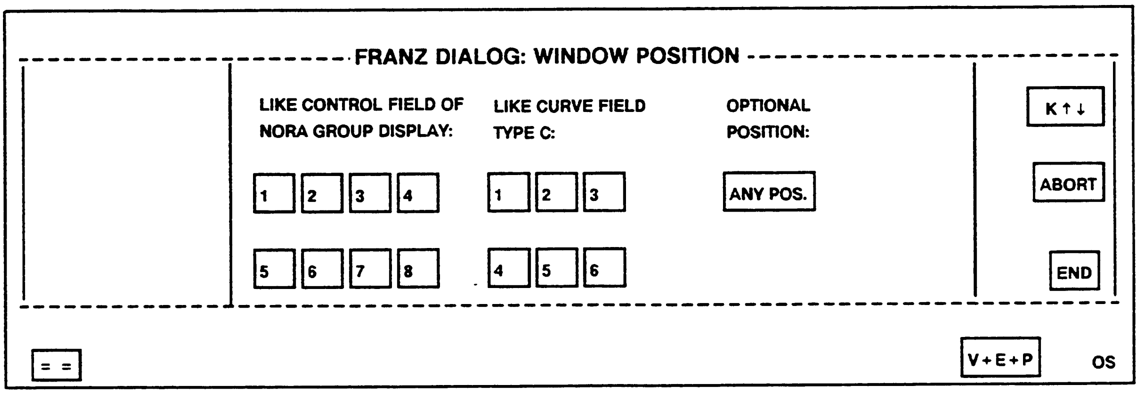


Fig. 5-28a Menu field for specifying the window position

The following window positions within the process display (work area) can be defined using the WINDOW POSITION menu field.

Preferred positions:	Positions of the NORA control fields on group level Positions of the KURV fields
Free positions:	Position input as lines, columns (odd number of columns). Any position in the work area (29 lines x 80 columns) is valid.

The system can place a freely positioned window on odd-numbered columns only. If the designer specifies an even number of columns, the system will correct this value and shift the position by one column to the left. The message "WINDOW MOVED 1 COLUMN TO THE LEFT" is displayed.

The system rejects any input which makes it impossible to insert the window into the work area (outside the 29x80 work area), and displays the message "WINDOWPOSITION NOT PERMITTED".

The system does not check whether size and position specified for the window fit completely into the work area. Only the window part inside the individual display format will be displayed during the operating phase, the rest will be omitted.

The window position dialog is performed when the OPEN WINDOW key (Chapter 5.6.1.4) is designed.

5.9.3 Window Updating

Window updating is identical to process display updating.

Remember, when specifying the updating cycle, that the variables to be updated consist of the process variables and the window variables (see Chapter 5.8.2.1).

5.9.4 Window Design

- **Create/change**

Action	Reaction
Select function key CREATE/CHANGE	Prompt for entering the window number: ENTER WINDOW NO.
	The DIAVID numeric menu field is displayed.
Enter the level number.	The level number appears in the echo line.
Select the END key.	If a window with the specified level number already exists or if a previously created window has not yet been stored, the inquiry CHANGE WINDOW EXTENSION? YES/NO is displayed.
Change NO	The dialog is continued with the window design.
Change YES	The window format can be changed using the WINDOW EXTENSION menu field.
	If a new window is to be created, the prompt ENTER WINDOWEXT. is displayed and the WINDOW EXTENSION menu field appears on the screen. Using this menu field, the window size can be specified either in one of two fixed formats or in a freely selectable format.
Select the key NORA GROUP (24*10)	The input 24.10 appears in the echo line.
Select the key CURVE FIELD TYPE C (12*26)	The input 12.26 appears in the echo line.
Select the ANY EXT. key	The prompt ENTER ROW.COLUMN is displayed.
	The DIAVID numeric menu field is displayed.
Enter the two figures, separated by a point.	The input appears in the echo line.
Terminate the ANY EXT. input by selecting the END key.	The input (correction *) is displayed in the echo line.
	The segment "WINDOWEXTENSION" is displayed.

---

*) The OS program decreases the number of columns by one if the designer has specified an odd number of columns. The message WINDOW 1 COLUMN SMALLER is displayed.

Action	Reaction
	The window format can be modified as required before the END key in the WINDOW EXTENSION has been selected.
Select the END key	The work area is structured according to the window format and the prompt DESIGN WINDOW appears in the message line.
	The window background image can be designed using the displayed DIAVID symbol menu field.
Select character/symbol in the menu field.	The selected character/symbol blinks.
Place a character/symbol in the work area.	The character/symbol is displayed in the work area.
Select the END key.	The window design menu field is displayed.

If a symbol set has not yet been loaded, the message SYMBOL SET NOT LOADED will be issued when a new window is created.

The selector key and the window position are configured in the dialogs INSERT VARIABLES and SYSTEMOPERATIONS 3.

Note: The system does not check whether size and position specified for the window fit completely into the work area.
Only the window part inside the individual display format will be displayed during the operating phase, the rest will be omitted.

- **Store**

Action	Reaction
Select function key STORE	The system inquires: OVERWRITE LAST VERSION ? ENTER YES/NO if a window with the same level number exists.
YES/NO input	Message output OPER. INHIBIT DURING DATA STORAGE while static image data is being stored.
Overwrite NO	Prompt for entering the new level number: ENTER WINDOW NO. The DIAVID numeric menu field is displayed.
Enter the level number.	The level number is repeated in the echo line.
Overwrite YES/NO	Prompt for specifying the image-related updating cycle: ENTER UPDATING CYCLE. The DIAVID numeric menu field is displayed.
Enter a number between 1 and 255	The input is repeated in the echo line.
Select the END key.	The work area is cleared. Prompt for entering the key field to be displayed with the window: ENTER KEYSET NUMBER TO WINDOW. **Note:** When selecting a key set, make sure that the latter was created with the symbol set used in the process display concerned. If this is not observed, the window key set is displayed in the operating phase with the symbol set of the process display. As for function → retrieve key set.
Select the END key.	The window design menu field is displayed. The message LEVEL STORED UNDER NUMBER x.x.x.x. appears in the echo line.

Specifying the updating cycle assigns each window an updating rate which is independent from the system cycle. The rate is entered as a time value between 1 and 255 seconds.
The number of variables to be updated consists of the total of process display variables and window variables. The number of variables must not be exceeded for the cycle specified (in particular for the 1-s-cycle). (Cf. notes in Chapter 5.8.2.1.)
If the prompt is answered by END without any additional input, the updating cycle used in the whole system also applies to this window.

- **Retrieve**

Action	Reaction
Select function key RETRIEVE	Prompt in the message line for entering a level number: ENTER WINDOW NO. The DIAVID numeric menu field is displayed.
Enter the level number.	The level number appears in the echo line.
Select the END key.	WINDOW appears on the screen. The → retrieval function menu field is displayed.
Select the END key	The message disappears from the message line. The window design menu field is displayed.

Before the RETRIEVE function key can be re-activated, the CLEAR function key must be selected in order to establish the initial status.

- **Clear**

Action	Reaction
Select function key CLEAR	The work area is cleared. An unfinished window which has not yet been stored is deleted from the data.

- **Delete**

Action	Reaction
Select function key DELETE	As for the → RETRIEVE WINDOW function.
Select the END key.	Request in message line: DELETE WINDOW? ENTER YES/NO.
YES or NO	The message disappears from the message line. The control field disappears from the work area. The window design menu field is displayed.

The window is deleted from the data if YES was entered, and remains if the entry was NO.

- **Inserting segments, control fields and variables**

Segments, control fields and variables are inserted in a window in the same manner as during the process display design procedure (Chapter 5.8.3).

Differences are:

- Elements of segments or control fields which do not fit into the window are truncated. In contrast to process display design, these elements can be deleted completely.
- The system rejects an origin position if the control field or segment, which is to be inserted, is completely outside the window. The message NOT INSERTED BECAUSE OUTSIDE OF WINDOW is displayed.

Note: Control field parts which exceed the window format will be truncated. In the operating phase, the truncated parts are displayed in the next lower line of the window.

- **DISPLAY MKZ table**

The handling of the windows' MKZ table is the same as the handling of the process displays (see Chapter 5.11).

5.10 User-Specific Logs

This function enables the user to create customized logs. These user logs are designed in FRANZ in the same fashion as process displays.

During the operating phase, a designed user log can be output in two different manners:

1. Selection via the screen

   The log is first displayed on the screen using an image selector key in the process display or overview display. All variables are read **once** when the log display is selected.
   Selecting a key (e.g PRINT REPORT) in a key set related to the log display starts printout.

2. Direct output:

   The log is printed without being displayed on the screen (background processing). All variables are updated (as in 1.) if the log image is displayed on the screen.

   a) Time-controlled (once or cyclically)
      - By parameter assignment in the PROT mask.

   b) MKS bit-controlled
      - Sporadically by MKS bit assignment to the log image (Chapter 6.2).

   An MKS bit must be assigned to the log. The MKS PROCESSING dialog is used for allocating the MKS bit to the process display or log image. A significance change from 0 to 1 triggers the associated log; all variables are read once. The MKS block must be collected in MELD in order to make this function effective.

   Several logs may be assigned to one MKS bit.

As the system must distinguish between a log display and a process display, log displays are marked as such in the OS. (Only log displays can be printed during the operating phase; the input is rejected and an error message issued if an attempt is made to print a process display.)

5.10.1 Log Display Design

Log displays are set up in a design dialog (like process displays) and consist of a static background image and dynamic variables. (Chapter 5.8.3). The characteristics of a log display (log name, print format, symbol set) are described in the following sections.

Selecting the REPORT DISP. key initiates the log display design dialog. Within the OS system, this key identifies the following Figure as log display. Apart from this feature, the key has the same functions as the PROCESS DISPLAY key.

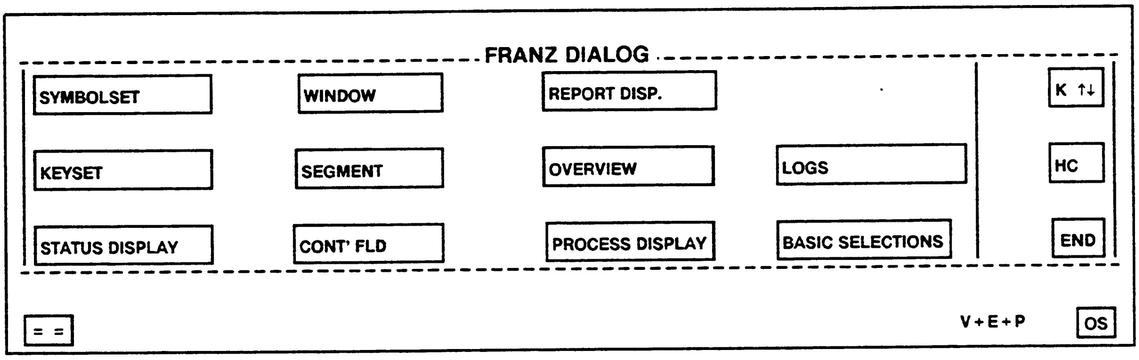


Fig. 5-29 Menu field FRANZ DIALOG

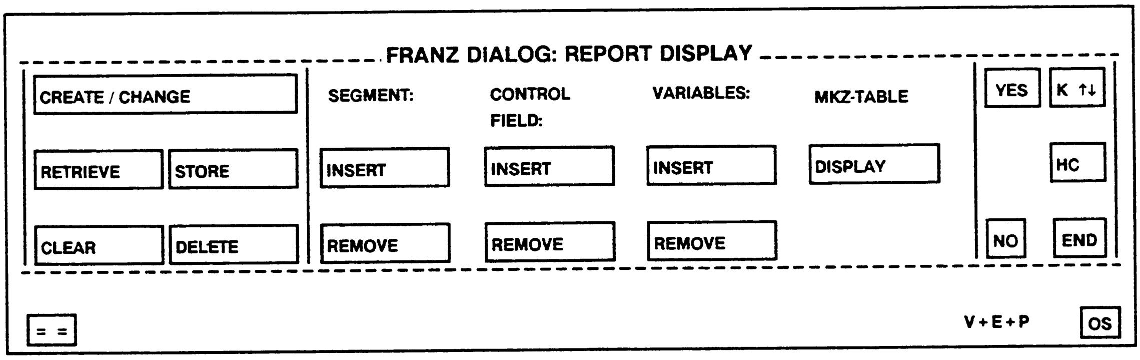


Fig. 5-30 REPORT display design menu field

The REPORT DISPLAY menu field contains the same functions as the PROCESS DISPLAY menu field.

5.10.2 Print Format

Each log is provided with a 7-line print header which contains date and time of the printout, a page number, comment, and the log name. The first 20 characters (in the first line) after the NIL dots are used as log name in the LOG mask.

1st line:	The top line of the OS 265-3 standard log contains - date and time of the printout - page number for the current log
2nd to 6th line:	May be structured by the user according to requirements.
7nd line:	Blank line

The first five lines of the log image are reserved for the log heading. The log heading must also be taken into consideration if the printout runs over several pages.

A user display consisting of a scrolled image must be distributed over several printed pages. A control character (↓), which initiates form feed, can be entered into the scrolled image for this purpose. The control character must be in the first column. The corresponding line is not printed. The log header is printed again after each form feed.

Without this control character, continuous printout is performed, even beyond the end of a page. The log header is only printed once at the beginning of the log.

- **Symbol set**

Only the symbols of the alphanumeric symbol set (SAN) are permitted for background image design. Asterisks are printed if any other symbols are used (e.g. graphic symbols).

- **Background image**

Multiple use of a background image is possible (as for a process display).

5.10.3 Log Size

The size (lines and columns) of a newly created log display must be specified.

Minimum - Individual display
Maximum - Scrolled image

The number of columns depends on the connected printer:

PT 88	80 columns
PT 89	132 columns
PT 90	80 columns

The user is responsible for the correct specification of the number of columns; the OS merely checks whether the format is larger than an individual display.

5.10.4 Log Name

A name of up to 20 characters may be assigned to each log. A message "INCOMPLETE LOG IMAGE, NO NAME" is displayed during log design if the log name has been omitted. The log is stored all the same. The name column of the LOG mask contains blanks.

The first characters of the first line in the background image are interpreted as the log name. The name begins with the first character and ends with a NIL dot or with the 20th character of the first line. An information text may be entered if there are any free character locations left in the first line after the log name.
The log name must satisfy the following requirements:

- It must be entered in the first line of the log display.
- It may begin in any column; only NIL dots are permitted to the left of the name.
- It may not contain any NIL dots.

5.10.5 Insert Variable

Variables are entered in the same manner as in process display design by specifying the MKZs and an origin position. Date and time can be entered directly during acquisition (system operations 3).

BKS-dependent status displays cannot be entered directly.The status displays may only contain alphanumeric characters. Asterisks are printed if any other symbols are used (e.g. graphic symbols).

Note:
Only the area between overview and key set is logged with individual displays (29 lines x 80 columns) if the process display is selected via the monitor and printed afterwards.

Date and time of the one-time acquisition are printed during the operating phase at the position specified for the variable "date/time of acquisition".

If this variable is inserted into a log display, a dummy is displayed first to demonstrate the output location. During a new design, the date "32.12.89 12:00" is output at the location which has been defined as origin position. This value, which is not updated, cannot be changed during design.

- **Value parametrization**

Cyclic, one-time or sporadic value parametrization can be designed for the variable output on the screen. Irrespective of the value parametrization, a log is only updated once when the display is selected.

- **Operator-accessible variable**

Variables can be operator-accessible for entering values (e.g. laboratory data) before printout is started.

- **Scratch pad**

A scratch pad field can also be inserted into the user log. This is performed in the same fashion as in a process display or window (see Chapter 5.13.1.3).

- **Display MKZ table**

The MKZ table of the user logs is handled in the same fashion as the MKZ table of the process displays or windows (see Chapter 5.11).

5.10.6 Key Sets

FRANZ key sets are used for log input. These key sets, which only contain system operations, are allocated to the logs during design.

The following system functions (SYSTEM OPERATIONS 3) are valid for operator input during the operating phase:

- PARAMETER ON-LINE OPERATION
  REP. menu selector key. This key should only be installed in one key set.

- PRINT REPORT
  Selecting this key starts printout of the displayed log.

- ABORT PRINTOUT
  Selecting this key aborts the currently running printout.

- DATE/TIME OF ACQUISITION
  Selecting this key enables a field to be defined which contains date and time of the one-time value acquisition.

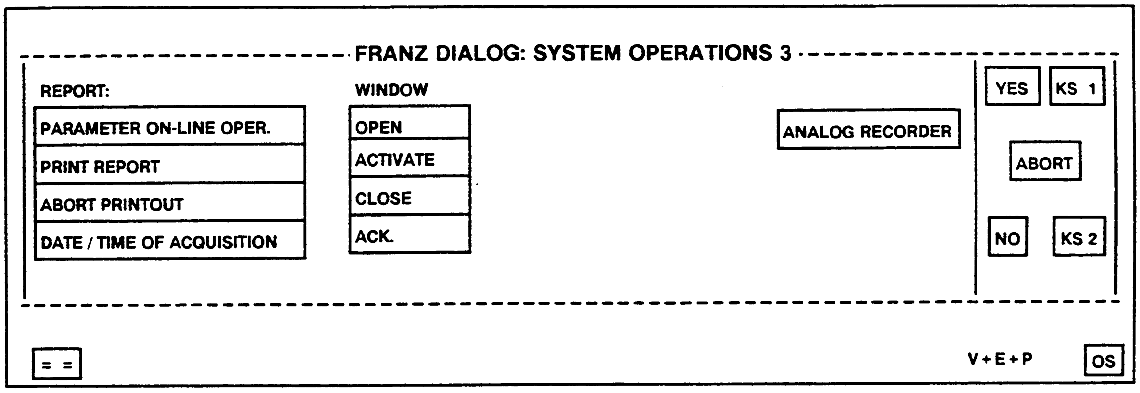


Fig. 5-31 SYSTEM OPERATIONS 3

Log selection on the screen is performed via process display selector keys.

5.11 MKZ Tables

Variables which have been entered into the
- process display,
- window,
- user log

by specifying their respective MKZs are automatically accepted into the MKZ list (including their start positions).
These specifications may therefore be **changed** without actually activating the related process display, window, or log display.
Deleting existing MKZs or entering new MKZs into the list is **not** possible.
Select the RETRIEVE key in the FRANZ DIALOG PROCESS DISPLAY (or FRANZ DIALOG WINDOW or FRANZ DIALOG LOG DISPLAY) in order to show the required process display on the screen.

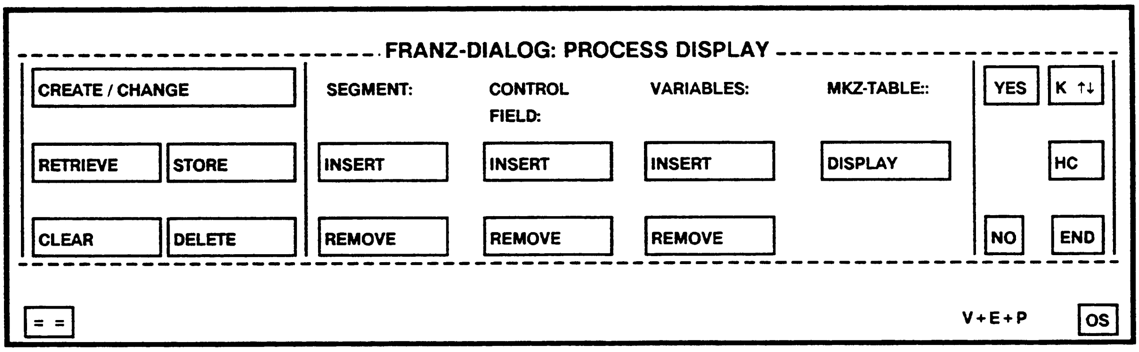
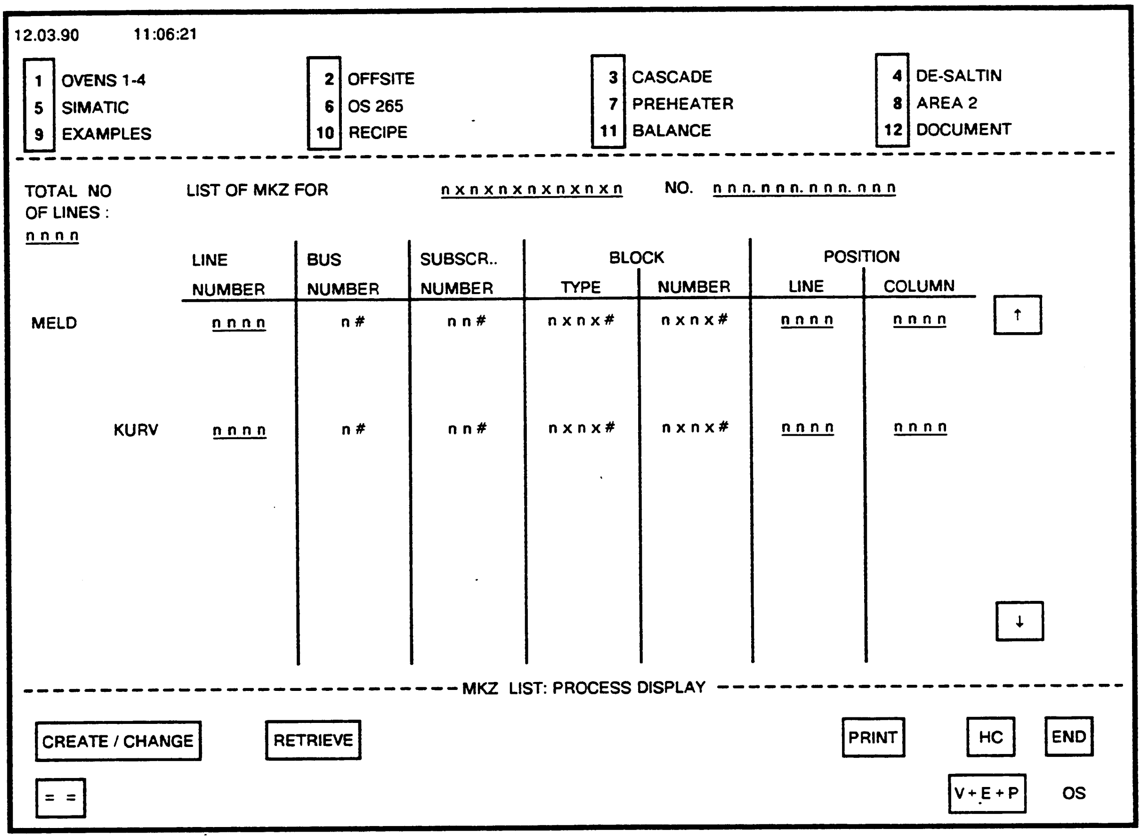


Fig. 5-32 Process display design menu field

The menu shown in Fig. 5-33 is displayed in the work area when the "MKZ TABLE: DISPLAY" key is selected. MKZs (bus and device number, MKZ type, block number) which have already been designed in the process display are shown in the order of their origin position (line/column). The appropriate form processing key set is provided in the operator input area.



TOTAL NO OF LINES : nnnn

LIST OF MKZ FOR nxnxnxnxnxnxn NO. nnn.nnn.nnn.nnn

	LINE NUMBER	BUS NUMBER	SUBSCR.. NUMBER	BLOCK TYPE	BLOCK NUMBER	POSITION LINE	POSITION COLUMN
MELD	nnnn	n#	nn#	nxnx#	nxnx#	nnnn	nnnn
KURV	nnnn	n#	nn#	nxnx#	nxnx#	nnnn	nnnn

Fig. 5-33 MKZ list menu

Input field type : Input field/character string
Scroll key type : Menu field/new display (right, left)

nnn	Dummy for a numeric input field
nxn	Dummy for an alphanumeric input field
nnn, nxn	Dummy for an indicator field (no input possible)
#	Dummy for an error mark (F)
MELD/KURV	only point out that the MKZ was collected in this package (also see the Note on the next page).

CREATE / CHANGE

The CREATE/CHANGE key enables modifications to be performed in all operator-accessible fields in the menu. After this key has been selected, access is provided to the alphanumeric DIAVID menu field (TF). Entries are performed in white (foreground colour) and on black (background colour).
A line-by-line plausibility check is performed on the entries after the END key has been pressed, and the input dialog via the DIAVID menu field terminated. Processing is indicated by a change in the colours (white on green) and a left-justified display of one-digit figures. NIL dots are converted into blanks.
An entry must have been changed before a plausibility check is performed, and the data is stored into the OS data. An incorrect entry is marked by an error mark (black F on red background) next to the related input field.

In this case the entries are not accepted into the OS data.

RETRIEVE

Swift selection of a specific process display MKZ (window or log display) is possible by entering the origin position (line/column) of the required MKZ via the DIAVID menu field into the first position of the menu.
Selecting the RETRIEVE key retrieves the MKZ. The user is prompted by the message "ENTER X.Y POSITION" to enter the required data. If the entered position value is less than any existing position value, the first variable will be displayed. If the position value is greater than any existing position value, the last variable will be displayed.
An invalid position is rejected and the message "WRONG" displayed.

↑ **↓**

Two scroll keys are located next to the menu in the work area. Using these keys permits scrolling forwards and backwards through the MKZ list. Further scrolling is not possible once the top or the end of the list have been reached.

Note: The "CHANGE" function may not be used for NORA process displays. In NORA via group form, see Chapter 4.2.3.

MKZ collected in KURV or MELD before, are not modified automatically, but must be deleted and collected.

5.12 Overview Display

The overview display, which shows the total process overview, is always displayed during the operating phase, irrespective of the mode selected.

The process can be subdivided into individual areas, each representing a separate system part.

The basic OS data contains a pre-designed NORA overview display. The system parts in this displays are numbered from 1 to 12; the states of the loops related to an area are displayed as a common display in an area message field to the right of the area name.

The user may either utilize the NORA overview display for FRANZ or design a completely new overview display.

5.12.1 Design

The overview in FRANZ can only be reduced and/or FRANZ image selector keys inserted if FRANZ and NORA are used in parallel.

When inserting FRANZ image selector keys, it has to be ensured that the key field sizes do not project into the area-specific fields (A, W, F, M, S, B), otherwise the displays might be modified during a display change.

The pre-designed NORA overview display must first be deleted before a new overview can be designed.

The new overview display can then be designed over the full width of the screen and an extension of ≤ 8 characters.

The area-related fields (A, W, F, M, S, B) are inserted using the COMMON STATUS DISPLAY function.
The area numbers ...1 to ...12 should also be used for the new overview.

5.12.2 Representing Display Repetition in the Overview Display

- **Common displays for block states**

If you wish to design a common display in the plant overview, select the COMMON STATUS DISPLAY function key, then specify:

- the position in the overview display,
- the process display level number (no plant area number, except for "P"),
- the bit location for the common display in the group status word of this area and the associated status display.

Only the states of those block (= control fields) which exist in the specified process display are ORed and shown in the overview. All block status words of one area - specified during display repetition design by the process display level number of the highest hierarchical level - are ORed to a group status according to the bit routing which has been specified in the communication software.
The status display for a common alarm used for the display repetition function must have four alternatives which correspond to the four possible representation types of the common alarm:

1st alternative:	No alarm pending
2nd alternative:	Alarm is pending
3rd alternative:	Alarm has just disappeared (corresponds to the representation of no alarm; a disappearing alarm would remain until a new status change occurs).
4th alternative:	Alarm has just appeared.

Cf. status displays 1...9 of the basic data.

- **Common displays for pending alarms**

Apart from the additional specification of the plant area number, this type of common display in the plant overview is designed in the same way as a common display for block states. The status display of this common alarm type must have the following three alternatives:

1st alternative:	No alarm pending	(= blank)
2nd alternative:	Appearing alarms which have not yet been acknowledged exist	(= M blinking)
3rd alternative:	Alarms exist which have been acknowledged but have not yet disappeared	(= M steady)

When this variable is inserted in the overview display, the bit position range must be defined by bit 9-9. This bit position is not really interpreted for the status display, and is only used as an internal flag. This status display with this bit position specification is displayed exclusively by the alarm sequence display (MELD).

- **Display for disabled area**

A status display with two alternatives must be designed to show the functions INHIBIT AREA and ENABLE AREA in the plant overview:

1st alternative:	Area display enabled	(e.g. black blank)
2nd alternative:	Area display disabled	(e.g. red S).

This status display is interconnected with bit position range 7-7 in the respective group status. An area number may not be specified when inserting the status display in the overview display.

5.12.3 Design Dialog

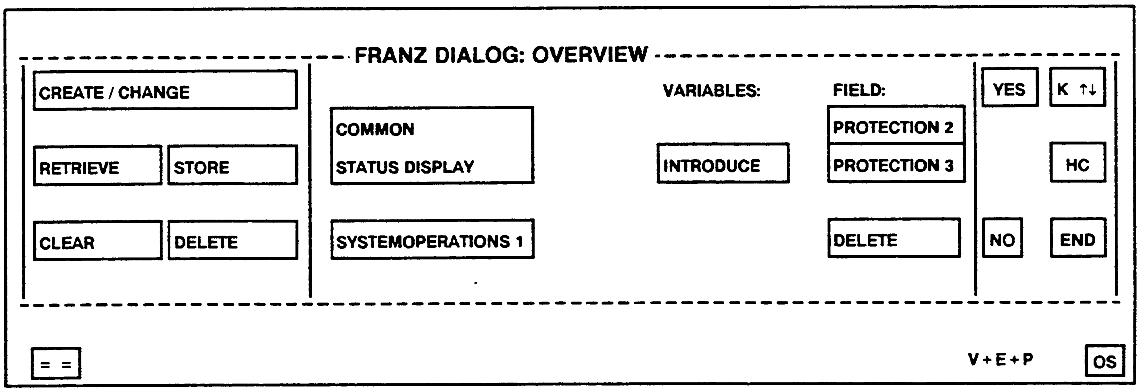


Fig. 5-34 System overview design menu field

Please remember when using symbols in the overview display or in the status displays that the symbol set may alter when the image in the work area is changed, if a different symbol set has been allocated to the process display.

The symbols in the overview display only become visible after the display has been selected for the first time in on line mode.

The overview extension must be specified without a message line.

- **Create/change**

Action	Reaction
Select function key CREATE/CHANGE	Prompt for entering two positions which specify the overview display extension (without message line): ENTER OVERVIEW EXTENSION.
Enter the two positions in the work area.	The message disappears from the message line. Prompt for designing the static image data appears in the message line: DESIGN OVERVIEW DISPLAY. The DIAVID numeric menu field is displayed.
Select a character/symbol in the menu field.	The character/symbol blinks.
Place a character/symbol in the work area.	The character/symbol is displayed in the work area.
Select the END key.	The message disappears from the message line. The → overview display design menu field is displayed.

- **Store**

Action	Reaction
Select function key STORE	If an overview exists, the prompt is displayed: OVERWRITE OVERVIEW ? ENTER YES/NO
Overwrite: YES	Message output OPER. INHIBIT DURING DATA STORAGE while static image data is being stored.
Overwrite: NO	The work area is cleared.
	The text LEVEL STORED UNDER NO. 0.0.0.1 (fixed number, may not be changed) appears in the command line.

If NO has been entered, the newly designed overview display will not be stored and the previous overview remains.

- **Retrieve**

Action	Reaction
Select function key RETRIEVE	The overview is displayed in the work area.

Before the RETRIEVE function key can be re-activated, the CLEAR function key must be selected in order to establish the initial status.

- **Clear**

Action	Reaction
Select function key CLEAR	Only the static data in the work area is cleared.

- **Delete**

Action	Reaction
Select function key DELETE	The overview display appears in the work area. Prompt in the message line: DELETE OVERVIEW ? YES/NO
YES or NO	The message disappears from the message line. The overview display disappears from the work area.

The overview display image is deleted from the data if YES was entered, and remains if the entry was NO.

- **Display repetition**

Action	Reaction
Select function key COMMON STATUS DISPLAY	Prompt for entering the position in the overview display at which the display is to be repeated: ENTER POSITION FOR COMMON STATUS DISPLAY.
Position the light pen within the overview display.	The message disappears from the message line. The overview display is saved and the work area cleared. As for the function → retrieve status display.
Select the END key.	Prompt for entering the position of the status display connecting point: ENTER STATUS DISPLAY CONNECTOR.
Position the light pen to specify the connecting point in the control field.	The message disappears from the message line. The work area is cleared and the saved overview display appears in the work area. Prompt for entering the number of the process display level in which the sporadic status changes which are to be ORed, appear: ENTER LEVEL NUMBER FOR REPEATED DISPLAY (only a level number of the highest hierarchy level may be entered). The DIAVID numeric menu field is displayed.
Enter the process image level number of the highest hierarchy level.	The level number is repeated in the echo line.
Select the END key.	Prompt for entering the plant area number: ENTER AREA NUMBER.

Action	Reaction
Enter the plant area number.	The number is repeated in the echo line.
Select the END key.	Prompt for entering the bit position range referring to the → common status: ENTER BITRANGE FROM - TO (between bits 1 and 16). The DIAVID numeric menu field is displayed.
Enter the bit position range according to the pattern.	The entered value is repeated in the echo line.
Select the END key.	The message disappears from the message line. The status display appears in the overview display at the position selected. The → overview display design menu field is displayed.

- **System operations 1**

Action	Reaction
Select function key SYSTEM OPERATIONS 1	The → system operations 1 function menu field is displayed (Chapter 5.6.1.2).

FIELD:

The keys under this heading permit manipulation of variable fields.

The FIELD: PROTECTION function is used for the keyswitch protection of a variable in the overview display, and must be parameterized before the variable is entered. Individual variables may be removed from the overview display using the FIELD: DELETE function.

- **Protection 2**

Action	Reaction
Select function key PROTECTION 2 (position V + E, V + E + P)	The message RIGHT appears briefly in the first third of the message line. The keyswitch protection is only effective for the next variable to be entered. The PROTECTION key must be selected each time a keyswitch-protected variable is entered. If a keyswitch protection has been unintentionally specified, it can only be lifted by attempting to enter a variable and terminating the dialog by selecting the ABORT key.

- **Protection 3**

Action	Reaction
Select function key PROTECTION 3 (position V + E + P)	The overview design keyboard field remains in the display. The next variable is provided with keyswitch protection 3.

- **Delete**

Action	Reaction
Select function key DELETE	Prompt for positioning the light pen in order to specify the variable to be deleted: IDENTIFY VARIABLE FIELD
Place the light pen on the variable field to be deleted.	The selected variable field blinks.
	The program inquires whether the selected variable is actually to be deleted: DELETE VARIABLE? YES/NO (at this point in time, the variable has been recognized by the system, and the message text thus contains the correct name, for example: DELETE STATUS DISPLAY ? ENTER YES/NO).
Delete: YES	The variable is removed from the overview display and replaced by NIL dots.
Delete: NO	The blinking variable field changes to a steady display.

VARIABLE:

- **Introduce**

This key may not be used by the operator. It can only be activated via coded and keyswitch-protected operator input and is used for system maintenance only.

Action	Reaction
Select function key VARIABLES: INTRODUCE	The message NOT ALLOWED appears in the message line.

5.13 Variables

5.13.1 Variable Field Menu Field

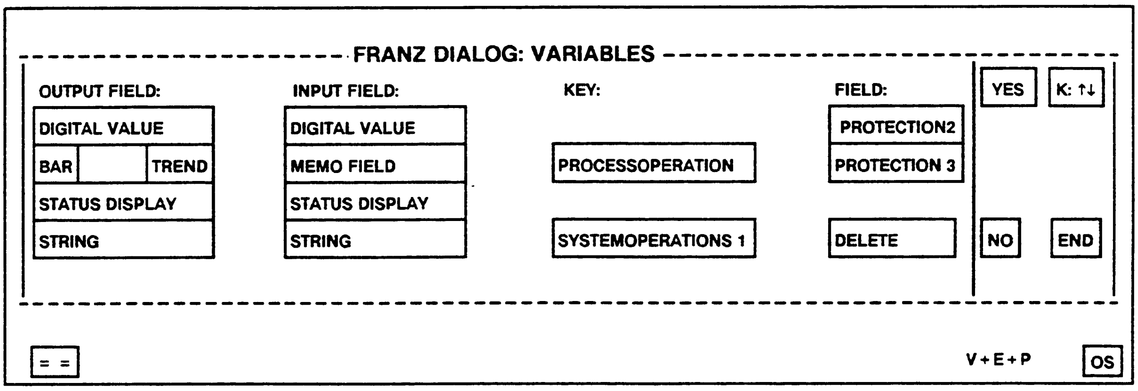


Fig. 5-35 Menu field for variables

In this menu field, the term "variable name" occurs with each variable which is to be designed. This term has different meanings, depending on the actual design phase:

a) The variable name in the control field and the key set consists of the parameter number and the parameter type.

b) In a process display, the four different automation systems which can be connected have an influence on the variable name meaning:

The variable name consists of

-	TELEPERM M	bus number (BA), device number (TA) in a TELEPERM M system,
-	TELEPERM ME	block type (BLOCK) and block number (NO) in a TELEPERM ME system,
-	GEMAT LS300-C 30	a string of up to 20 characters in a GEMAT LS300-C 30 system.
-	SIMATIC S5	The variable name is not yet defined for SIMATIC S5.

All variables with keyswitch protection must be marked by the key "FIELD: PROTECTION" before they are inserted.

Up to 8 digits can be specified as an extension of variable fields for binary values.

Pointers can be designed in the bar design phase by specifying BLACK as the foreground colour. This requires different symbols than are used for the bars. During the design phase, pointers are only displayed as a black blank.

If several functions (e.g. key functions) have been overlaid, the last function to have been entered will be removed when the function is deleted. The static part of the keys also disappears. The underlying second function is then no longer accessible.

Static segments and keys are overwritten by dynamic variables at the points where they overlap, corresponding to the designed extension.

If the dynamic variable cannot be operator-controlled, the overlaid key at this position cannot be operator-controlled either.

If the overlaid key is to be used for accessing the overlapped field, the overlapping updated variables must formally be designed as operator-accessible variables (e.g. by specifying a key set number). The function defined by the overlaid key is executed when an input is performed.

Whilst the request for specifying the variable field extension is being displayed, the message in the message line will be cleared once a different key is selected.

5.13.1.1 Output Fields in the Control Field

Automation system parameter number and type, group status (= group status, generated by the communication software in the OS system) and status word (=status) of all output variables can be specified as alternative or combinational values in a dialog.

Possible alternative or combinational values.

Parameter number	Group status	Status word	Validity
X			The variables are displayed according to the value from the automation system and the other design specifications.
X	X		The variables are displayed according to the alternative combination of the value from the automation system and the status value. A colour change (not in a status display) occurs in the event of status alterations.
X		X	
	X	X	Status information display; only expedient for status displays.

Invalid entries which have not been disabled in the dialog must be skipped by selecting the END key in the menu field displayed.

- **Binary value**

Action	Reaction
Select function key DIGITAL VALUE	Prompt for entering the starting and end position of the variable: EXTENSION OF VARIABLE FIELD?
Use the light pen to enter the positions.	The system inquires whether a parameter number is to be entered: PARAMETER NUMBER ? ENTER YES/NO. NO is an illegal entry causing the message: VARIABLE NAME WRONG and aborting the function.
Parameter number: YES	Prompt for entering the parameter number: PARAMETER NUMBER? The DIAVID numeric menu field is displayed.
Enter the parameter number.	The parameter number appears in the echo line.
Select the END key.	Prompt for entering the parameter type: PARAMETER TYPE? The → parameter type menu field is displayed (Chapter 5.14.2).
Select the END key.	The system inquires whether a logic combination with the group status is required: COMMON STATUS ? YES/NO. If NO is entered, the inquiry COMMON STATUS will be replaced by the inquiry STATUSWORD? Only one option can be selected by a YES/NO decision.
Common status or status word: YES	Prompt for entering the bit position range in the group status or status word: ENTER BITRANGE FROM - TO (Chapter 5.15.2). The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.
Select the END key or enter common status or status word: NO	Prompt for entering the positions to the right of the decimal point: ENTER NUMBER OF DECIMAL PLACES. The DIAVID numeric menu field is displayed.

Action	Reaction
Enter the fractional part.	The input is repeated in the echo line.
Select the END key.	Prompt for entering the colour representation: COLOUR? (Default: foreground white, background black). The DIAVID numeric menu field is displayed.
Select the END key.	Prompt for entering the variable values: ENTER VALUE UPDATING MODE. The → variable field property menu field is displayed (Chapter 5.13.3).
Select the END key.	For control purposes, the binary value (with a default value 0) is displayed in the position selected. The → variable field menu field is displayed.

The additional prompt ENTER NUMBER OF DECIMAL PLACES enables configuration of any fixed point representation (for tables, for example). Floating point format is output if the inquiry is terminated by END without any additional input. Entering "0" provides fixed point representation without any digits after the decimal point. Entering "2", for example, provides fixed point representation with two digits after the decimal point.

- **Bar**

Representation of the same bar with different readable bar limits in the same control field is not permitted.

Action	Reaction
Select function key BAR	Prompt for specifying the bar origin (zero point): ENTER ORIGIN OF BAR.
Use the light pen to enter the position in the work area.	Prompt for specifying the bar height which implicitly defines the bar direction: ENTER BAR HEIGHT
Use the light pen to indicate the position in the work area (horizontal or vertical orientation is defined by the location of this point in relation to the bar origin).	Prompt for entering the bar width (i.e. number of symbol fields): ENTER BAR WIDTH
Use the light pen to indicate the bar width in the work area.	The system inquires whether a parameter number is to be specified: PARAMETER NUMBER? YES/NO.
	NO is an illegal entry causing the message VARIABLE NAME WRONG to be displayed and aborting the function.
Parameter number: YES.	Prompt for entering the parameter number: ENTER PARAMETER NUMBER.
	The DIAVID numeric menu field is displayed.
Enter the parameter number.	The parameter number appears in the echo line.
Select the END key.	Prompt for entering the parameter type: PARAMETER TYPE? The → parameter type menu field is displayed (Chapter 5.14.2).
Select the END key.	The system inquires whether a logic combination with the common status is required: COMMON STATUS? YES/NO.
	If NO is entered, the inquiry COMMON STATUS will be replaced by the inquiry STATUSWORD? Only one option can be selected by a YES/NO decision.
Common status or status word: YES	Prompt for entering the bit position range in the common status or status word: ENTER BITRANGE FROM - TO (Chapter 5.15.2).
	The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.

Action	Reaction
Select the END key or enter NO as a reply to the status word inquiry.	Prompt for entering the bar properties: ENTER BARCHARACTERISTICS (default: unipolar, single, lower limit 0 and upper limit 100). The bar property menu field is displayed (Chapter 5.14.3).
Select the END key.	Prompt for entering the first bar symbol (Chapter 5.3.4, conventions): ENTER BAR SYMBOL. The symbol menu field is displayed.
Enter the bar starting symbol.	The symbol appears in the echo line.
Select the END key.	Prompt for specifying the bar colour: COLOUR? (default: foreground white, background black). The colour menu field is displayed (Chapter 5.13.2)
Select the END key.	Prompt for entering the variable values: ENTER VALUE UPDATING MODE. The → variable field property menu field is displayed (Chapter 5.13.3).
Select the END key.	For control purposes, a 100% representation of the bar is displayed at the position selected (30% for approaching bars). The → variable field menu field is displayed.

- **Trend**

In the operating phase, the TELEPERM M automation system supplies the trend values for curve 1 (=X) and curve 2 (=Y) as bytes in the same word. A YES/NO decision in the dialog is therefore required in order to specify the value which is currently designed.

Action	Reaction
Select function key TREND	Prompt for specifying by selecting YES or NO, whether curve 1 (=X) or curve 2 (=Y) are to be displayed: TREND FOR CURVE 1: ENTER/YES TREND FOR CURVE 2: ENTER/NO
YES or NO	Continue as for function → bar output field, with the exception that the trend is displayed as a pointer and therefore different characters are used. This also includes different conventions for designing the first trend symbols. The 13 parameters must be specified when accessing the trend block in TELEPERM M. The values must move from right to left (only vertical trend representation is possible). In the operating phase, 25 trend values are displayed in an updating cycle (moving from right to left). Any specification of readable or configurable limits is irrelevant as TELEPERM M has standardized fixed values between 0 and 25.

Note:
Only one trend curve for X and Y is permitted in a process display.

- **STATUS DISPLAY** (when parameter number YES has been selected)
(see Chapter 11.9)

Action	Reaction
Select function key STATUS DISPLAY.	Prompt for specifying the status display position appears in the message line: ENTER STATUS DISPLAY ORIGIN.
Use the light pen to indicate the position in the work area.	The system inquires whether a parameter number is to be specified: PARAMETER NUMBER? ENTER YES/NO
Parameter number: YES	Prompt for entering the parameter number: PARAMETER NUMBER?
	The DIAVID numeric menu field is displayed.
Enter the parameter number.	The parameter number appears in the echo line.
Select the END key.	Prompt for entering the parameter type: PARAMETER TYPE? The →parameter type menu field is displayed (Chapter 5.14.2).
Select the END key.	The system inquires whether the → parameter number is a binary value: BINARY VALUE? YES/NO
Binary value: YES	Prompt for entering the bit position range in the binary value: ENTER BIT RANGE FROM - TO (Chapter 5.15.2).
	The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.
Select the END key.	The message disappears from the message line.
	The image in the work area is saved, and the work area cleared. As for function → retrieve status display (Chapter 5.5.3).
Select the END key.	Prompt for entering the connecting point position.
Position the light pen to specify the required point in the status display.	Prompt for entering the variable values: ENTER VALUE UPDATING MODE.
	The → variable field property menu field is displayed (Chapter 5.13.3).

Action	Reaction
	The image is re-displayed in the work area and the status display inserted at the position specified. The variable field menu field is displayed. End of function if binary values have been selected.
Binary value: NO	The system inquires whether a logic combination with the common status is required: COMMON STATUS? YES/NO. If NO is entered, the inquiry COMMON STATUS will be replaced by the inquiry STATUS WORD. Only one option can be selected by a YES/NO decision.
Common status or status word: YES	Prompt for entering the bit position range in the common status or status word: ENTER BIT RANGE FROM - TO (Chapter 5.15.2). The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.
Select the END key or enter common status or status word: NO	The message disappears from the message line. The image in the work area is saved, and the work area cleared as for the function → RETRIEVE STATUS DISPLAY (Chapter 5.5).
Select the END key.	Prompt for entering the connecting point position.
Position the light pen to specify the required point in the status display.	Prompt for entering the variable values: ENTER VALUE UPDATING MODE. The → variable field property menu field is displayed (Chapter 5.13.3).. The image is re-displayed in the work area and the status display inserted at the position specified. The variable field menu field is displayed.

- **STATUS DISPLAY** (when parameter number NO has been selected)

Action	Reaction
Select function key STATUS DISPLAY	Prompt for specifying the status display position appears in the message line: ENTER STATUS DISPLAY ORIGIN.
Use the light pen to indicate the position in the work area.	The system inquires whether a parameter number is to be specified: PARAMETER NUMBER? ENTER YES/NO.
Parameter number: NO	The system inquires whether interconnection with the common status is required: COMMON STATUS? YES/NO.
	The inquiry COMMON STATUS is replaced with STATUS WORD if NO is entered. Only one alternative may be selected by a YES/NO decision.
Common status or status word YES	Prompt for entering the bit position range in the common status or status word: ENTER BIT RANGE FROM - TO (Chapter 5.15.2).
	The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.
Common status word NO.	The system inquires whether an MKS bit is to be specified:MKS BIT ? YES/ NO
MKS bit YES	Prompt for entering the bit position range in the MKS block: ENTER BIT RANGE FROM - TO (Chapter 5.15.2).
	The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.
Select the END key	The message disappears from the message line.
	The image in the work area is saved, and the work area cleared: As for function → RETRIEVE STATUS DISPLAY (Chapter 5.5.3)
	Prompt for entering the connecting point position
Position the light pen to specify the required point in the status display.	Prompt for entering the variable values: ENTER VARIABLE UPDATING.
	The → variable field property menu field is displayed (Chapter 5.13.3)

- **Character string**

This variable enables representation of any character string (ASCII standard).

Action	Reaction
Select function key STRING	Prompt for entering the starting and end position of the variable: EXTENSION OF VARIABLE FIELD?
Use the light pen to select the positions in the work area (12 or 14 characters).	The system inquires whether a parameter number is to be entered: PARAMETER NUMBER? YES/NO.
Parameter number: NO	NO is an illegal entry causing the message: VARIABLE WRONG to be displayed and aborting the function.
Parameter number: YES	Prompt for entering the parameter number: PARAMETER NUMBER?
	The DIAVID numeric menu field is displayed.
Enter the parameter number.	The parameter number appears in the echo line.
Select the END key.	Prompt for entering the parameter type: PARAMETER TYPE?
	The → parameter type menu field is displayed (Chapter 5.14.2); select S2, S4 or S16.
Select the END key.	The system inquires whether a logic combination with the common status is required: COMMON STATUS ? YES/NO.
	If NO is entered, the inquiry COMMON STATUS will be replaced by the inquiry STATUS WORD. Only one option can be selected by a YES/NO decision.
Common status or status word: YES.	Prompt for entering the bit position range in the common status or status word: ENTER BIT RANGE FROM - TO (Chapter 5.15.2).
	The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.

Action	Reaction
Select the END key or enter common status or status word: NO	Prompt for entering the colour representation: COLOUR? (default: foreground white, background black). The colour menu field is displayed (Chapter 5.13.2).
Select the END key.	Prompt for entering the variable values: ENTER VALUE UPDATING MODE. The → variable field property menu field is displayed (Chapter 5.13.3).
Select the END key.	For control purposes, the character string FFRE is displayed at the position selected. The → variable field menu field is displayed (Chapter 5.13.2).

5.13. 1. 2. Output Fields in the Process Display

Only BKS-controlled status displays can be used as output fields in a process display.

The bit position specification of a BKS block is subject to certain conventions (Chapter 5.15.2). Invalid entries which have not been disabled in the dialog must be skipped by selecting the END key in the menu field displayed. In overlaid BKS-controlled control fields, only the last control field to have been displayed is accessible for MKZ transfer to MELD or KURV.

- **Status display**

Action	Reaction
Select function key STATUS DISPLAY	Prompt for specifying the status display position appears in the message line: ENTER STATUS DISPLAY ORIGIN.
Use the light pen to indicate the position in the work area.	Prompt for entering the variable name: VARIABLE NAME? BUS SUBSCR. BLOCK.NO (for TELEPERM M) or VARIABLE NAME? (for all other automation systems). The DIAVID alphanumeric menu field is displayed.
Enter the variable as required.	The variable name appears in the echo line.
Select the END key.	Inquiry for BKS interconnection: BKS-BLOCK? ENTER YES/NO.
BKS: YES	Prompt for entering the BKS name: BKS NAME? BUS.SUBSCR.BKS.NO. The DIAVID alphanumeric menu field is displayed.
Enter the BKS name.	The name appears in the echo line.
Select the END key.	Prompt for entering the bit position range within the 128 BKS bits: ENTER BIT RANGE FROM - TO (Chapter 5.15.2). The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.
Select the END key or enter BKS: NO.	The message disappears from the message line.

Action	Reaction
	The image in the work area is saved, and the work area cleared.
	As for function → retrieve status display (Chapter 5.5).
Select the END key.	Prompt for entering the connecting point position in the status display: ENTER CONNECTOR OF STATUS DISPLAY.
Position the light pen to specify the required point in the status display.	Prompt for entering the variable values: ENTER VALUE UPDATING MODE.
	The → variable field property menu field is displayed.
	The image in the work area is re-displayed, and the status display inserted at the position specified.
	The variable field menu field is displayed.

5.13.1.3 Control Field Input Fields

Automation system parameter number and type, group status (= group status, generated for TELEPERM M by the communication software in the OS system) and status word (=status) of all input variables can be specified in a dialog as alternative or combinational values. As input fields are not updated, combinational specifications have no effect in the operating phase.

Specifying parameter number and parameter type is only permitted for binary values, status displays and in freely configurable format.

A common status or status word specification (without parameter number) is only permitted in status displays.

Illegal combinational specifications in the dialog should thus be skipped by entering NO.

- **Binary value**

Action	Reaction
Select function key DIGITAL VALUE	Prompt for entering the starting and end position of the variable: EXTENSION OF VARIABLE FIELD?
Use the light pen to select the positions in the work area.	Prompt for entering the parameter number: PARAMETER NUMBER? YES/NO NO is an illegal entry causing the message VARIABLE NAME WRONG to be displayed and aborting the function.
Parameter number: YES	Prompt for entering the parameter number: PARAMETER NUMBER? The DIAVID numeric menu field is displayed.
Enter parameter number.	The parameter number appears in the echo line.
Select the END key.	Prompt for entering the parameter type: PARAMETER TYPE? The → parameter type menu field is displayed (Chapter 5.14.2).
Select the END key.	The system inquires whether a logic combination with the common status is required: COMMON STATUS? ENTER YES/NO If NO is entered, the inquiry COMMON STATUS will be replaced by STATUS WORD. Only one option can be selected by a YES/NO decision.
Status word: YES	Prompt for entering the bit position range in the common status or status word: ENTER BIT RANGE FROM - TO (Chapter 5.15.2). The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.
Select the END key or enter common status or status word: NO	Prompt for entering the positions to the right of the decimal point: ENTER NUMBER OF DECIMAL PLACES. The DIAVID numeric menu field is displayed.
Enter the fractional part. Select the END key.	The input is repeated in the echo line. Prompt for entering the colour representation: COLOUR? (Default: foreground white, background black).
Select the END key.	The colour menu field is displayed (Chapter 5.13.2). The image in the work area is saved, and the work area cleared. Specification of the input key set as for the function → retrieve key set.

Action	Reaction
Select the END key.	The saved image is displayed in the work area. The system inquires whether the "INCREMENT (+)" or "DECREMENT (-) keys for incremental change of the values exist in the key set or in a subsequent key set (Chapter 5): INCREMENTAL ADJUSTMENT IN KEYSET ? ENTER YES/NO (If one of the two keys is contained in the specified key set, this inquiry is not displayed, and the next inquiry appears).
Incremental change: YES	Inquiry whether the value range limits are readable: LIMITS FOR VALUE RANGE READABLE ? ENTER YES/NO.
Limits readable: YES	Prompt for specifying the parameter number for upper and lower limit: PARAMETER NO. FOR UPPER.LOWER LIMIT. (Limits must be of the same type.) The DIAVID numeric menu field is displayed.
Enter two parameter numbers, separated by a point.	The two numbers appear in the echo line.
Select the END key.	Prompt for entering the parameter type of the two parameter numbers: PARAMETER TYPE? The → parameter type menu field is displayed.
Select the END key.	For control purposes, the default value 0 is displayed in the position selected.
Limits readable: NO.	Prompt for specifying the upper range limit: UPPER LIMIT FOR VALUE RANGE? The DIAVID numeric menu field is displayed.
Enter the upper limit.	The upper limit is repeated in the echo line.
Select the END key.	Prompt for specifying the lower range limit: LOWER LIMIT OF VALUE RANGE? The DIAVID numeric menu field is displayed.
Enter the lower limit.	The lower limit is repeated in the echo line. For control purposes, the default value 0 is displayed in the position selected.
Select the END key.	The → variable field menu field is displayed.

The additional prompt ENTER NUMBER OF DECIMAL PLACES enables configuration of any fixed point representation (for tables, for example). Floating point format is output if the inquiry is terminated by END without any additional input. Entering "0" provides fixed point representation without any digits following the decimal point. Entering "2", for example, provides fixed point representation with two digits following the decimal point.

- **Status display**

Action	Reaction
Select function key STATUS DISPLAY	Prompt for specifying the status display position appears in the message line: ENTER STATUS DISPLAY ORIGIN.
Use the light pen to indicate the position in the work area.	The system inquires whether a parameter number is to be specified: PARAMETER NUMBER ? ENTER YES/NO
Parameter number: YES	Prompt for entering the parameter number: PARAMETER NUMBER?
	The DIAVID numeric menu field is displayed.
Enter the parameter number.	The parameter number appears in the echo line.
Select the END key.	Prompt for entering the parameter type: PARAMETER TYPE?
	The → parameter type menu field is displayed (Chapter 5.14.2).
Select the END key.	The system inquires whether the parameter number is a binary value: BINARY VALUE ? ENTER YES/NO
Binary value: YES	Prompt for entering the bit position range in the binary value: ENTER BIT RANGE FROM - TO (Chapt. 5.15.2).
	The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.
Select the END key.	The message disappears from the message line.
	The image in the work area is saved, and the work area cleared.
	As for function → retrieve status display (Chapter 5.5.3).
	Prompt for entering the connecting point position: ENTER STATUS DISPLAY CONNECTOR.

Action	Reaction
Position the light pen to specify the required point in the status display.	Input key set definition as for the function → retrieve key set.
Select the END key.	The image is re-displayed in the work area, and the status display inserted at the position specified. Display of the variable field menu field. End of function if binary values have been selected.
Binary value: NO	The system inquires whether a logic combination with the common status is required: COMMON STATUS? ENTER YES/NO. If NO is entered, the inquiry COMMON STATUS will be replaced by STATUS WORD. Only one option can be selected by a YES/NO decision.
Common status or status word: YES	Prompt for entering the bit position range in the group status or status word: ENTER BIT RANGE FROM - TO (Chapter 5.14.2). The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.
Select the END key or enter common status or status word: NO	The message disappears from the message line. The image in the work area is saved, and the work area cleared. As for function → retrieve status display (Chapter 5.5).
Select the END key.	Prompt for entering the connecting point position: ENTER STATUS DISPLAY CONNECTOR.
Position the light pen to specify the required point in the status display.	Input of key set definition as for function → retrieve key set.
Select the END key.	The saved image is displayed in the work area. The status display appears at the specified location. The variable field menu field is displayed.

- **Character string**

This variable enables representation of any character string (ASCII standard).

Action	Reaction
Select function key STRING	Prompt for entering the starting and end position of the variable: EXTENSION OF VARIABLE FIELD?
Use the light pen to select the positions in the work area.	The system inquires whether a parameter number is to be entered: PARAMETER NUMBER ? ENTER YES/NO. NO is an illegal entry causing the message VARIABLE NAME WRONG to be displayed and aborting the function.
Parameter number: YES	Prompt for entering the parameter number: PARAMETER NUMBER? The DIAVID numeric menu field is displayed.
Enter the parameter number.	The parameter number appears in the echo line.
Select the END key.	Prompt for entering the parameter type: PARAMETER TYPE? The → parameter type menu field is displayed (Chapter 5.14.2).
Select the END key.	The system inquires whether a logic combination with the common status is required: COMMON STATUS? ENTER YES/NO If NO is entered, the inquiry COMMON STATUS will be replaced by STATUS WORD. Only one option can be selected by a YES/NO decision.
Common status or status word: YES.	Prompt for entering the bit position range in the common status or status word: ENTER BIT RANGE FROM - TO (Chapter 5.15.2). The DIAVID numeric menu field is displayed.
Enter the two bit position numbers, separated by a hyphen.	The input is repeated in the echo line.
Select the END key or enter group status or status word: NO.	Prompt for entering the colour representation: COLOUR? (Default: foreground white, background black). The colour menu field is displayed (Chapter 5.13.2).

Action	Reaction
Select the END key.	The image in the work area is saved, and the work area cleared. Key set specification as for the function → retrieve key set.
Select the END key.	The saved image is displayed in the work area. For control purposes, the character string FFRE is displayed at the position selected. The → variable field menu field is displayed.

5.13.1.4 Input Fields in the Process Display

Input field specification in the process display is not permitted in TELEPERM M (exception: scratch pad).

- **Scratch pad**

Action	Reaction
Select function key MEMO FIELD	Prompt for entering the starting and end position of the variable: EXTENSION OF VARIABLE FIELD.
Use the light pen to select the positions in the work area.	Prompt for entering the colour representation: COLOUR? (Default: foreground white, background black). The colour menu field is displayed (Chapter 5.13.2).
Select the END key.	The image in the work area is saved, and the work area cleared. Input key set definition as for function → retrieve key set (Chapter 5.5.3).
Select the END key.	The saved image is displayed in the work area. Scratch pad and the message OPER. INHIBIT DURING DATA STORAGE are displayed in the message line whilst the scratch pad is being accepted. The → variable field menu field is displayed.

Note:
In the operating phase, scratch pad entries are displayed in all the images (after image change) in which this control field has been inserted.

5.13.1.5 PROCESSOPERATIONS/SYSTEMOPERATIONS1 keys

Operator-process communication keys are only permitted in a key set.

- **Operator-process communication**

Action	Reaction
Select function key PROCESSOPERATION	The → process operation function menu field is displayed (Chapter 5.6.1.1).

- **System operation**

Action	Reaction
Select function key SYSTEMOPERATIONS 1	The→ system operation function menu field 1 is displayed (Chapter 5.6.1.2).

5.12.1.6 PROTECTION/DELETE Fields

The keys discussed here facilitate the manipulation of variable fields.

The function "FIELD: PROTECTION", which must be parameterized before the variable is introduced, provides keyswitch protection of a variable in the control field or in the process display.

The function "FIELD: DELETE" removes single variable fields from the control field or the process display. If several variables (also of a different type) have been overlaid at the same position, the last variable to have been entered in the control field or process display will be deleted first. The last variable to have been designed is documented in the first position (delete using documentation updating).

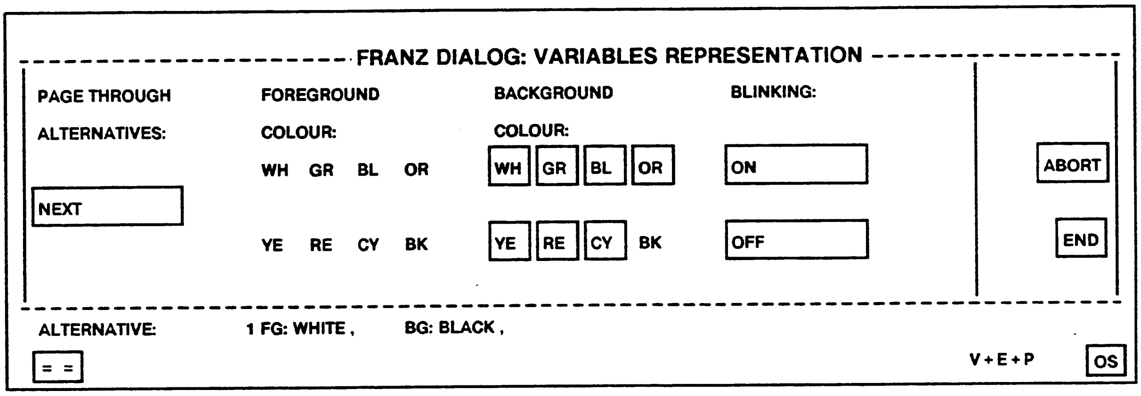
- **Protection**

Action	Reaction
Select function key PROTECTION 2 (position V + E, V + E + P)	The message RIGHT appears briefly in the first third of the message line. Keyswitch protection is only effective for the next variable to be entered. Every time a keyswitch-protected variable is entered, the PROTECTION 2 key must be selected. A keyswitch protection which has been specified unintentionally can only be lifted by attempting to enter a variable and terminating the dialog by selecting the abort (ABR) key.
PROTECTION 3 (Position V + E + P)	The next variable is provided with keyswitch protection 3.

- **Delete**

Action	Reaction
Select function key DELETE	Prompt for positioning the light pen in order to specify the variable to be deleted: SPECIFY VARIABLE FIELD
Place the light pen on the variable field to be deleted.	The selected variable field blinks.
	The system inquires whether the selected variable is actually to be deleted: DELETE VARIABLE ? YES/NO (at this point, the variable has been recognized by the system, the message text thus contains the correct name for xxxx, for example: DELETE BINARY VALUE ? YES/NO).
Delete: YES	The variable is removed from the control field or process display and replaced by NIL dots.
Delete: NO	The blinking variable field changes to a steady display. The → variable field menu field is displayed.

5.13.2 Variable Representation



ALTERNATIVE: 1 FG: WHITE , BG: BLACK ,

Fig. 5-36 Variable representation menu field

The colour and blinking status of a variable can be specified in this menu field. The message NOT ALLOWED is displayed when an attempt is made to repeatedly enter a colour without previous specification of foreground or background colour.

The default settings are: white foreground, black background and non-blinking. The NEXT ALTERNATIVE key can be used for specifying other colours or states for variables which are logically combined with the common status or status word. All possible alternatives must be specified.

The selected colours, blinking mode and alternative number are displayed in the echo line.

5.13.2.1 Colours

Action	Reaction
Select function keys	
WH	white
GN	green
BL	blue
OR	orange
YE	yellow
RE	red
CY	cyan
BK	black

These keys exist twice in the key set. The background of the keys for the background colours is in the associated colour; the keys for the foreground colours are labelled in the associated colour.

5.13.2.2 Blinking on/off

Action	Reaction
Select function keys BLINKING: ON or BLINKING: OFF	The message RIGHT appears briefly in the first third of the message line.

5.13.2.3 Next Alternative

Action	Reaction
Select function key NEXT	The message RIGHT appears briefly in the first third of the message line. The internal alternative counter is incremented by one. Only the first alternative may be checked in off line mode as it is used for the control display of the variable. The complete set of alternatives can only be checked in the operating phase.

5.13.2.4 Abort

Action	Reaction
Select function key ABORT	The appropriate initial menu field (e.g. control field design or process display design) is displayed. All entries made up to this point which refer to the variables are cancelled.

5.13.3 Variable Field Properties

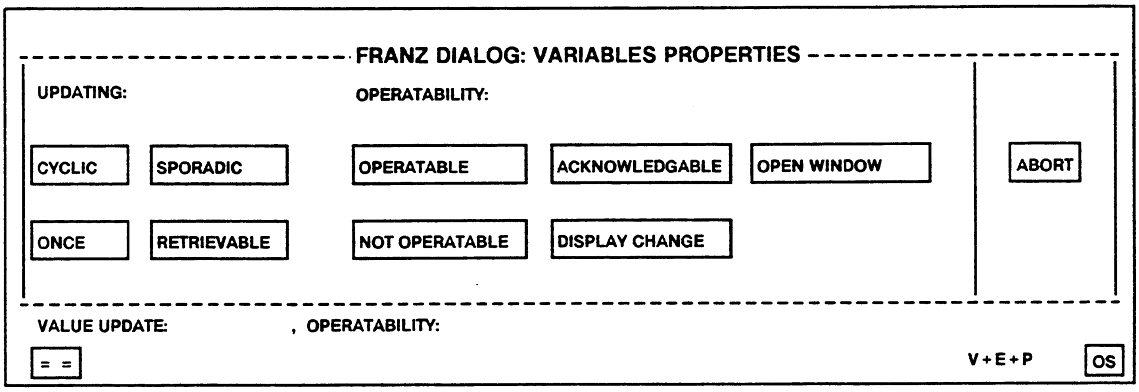


Fig. 5-37 Variable field properties menu field

A plausibility check - related to the variable type - is not performed when keys in this menu field are used. Valid entries - related to the variable type - are listed in the individual function key descriptions.

The selected parameter value and the output field type are echoed in the command line.

5.13.3.1 Updating

The following specifications select the updating mode. One of these keys must be selected as no default value has been specified.

- **Cyclic**

This selection is valid for all → variable types.

Action	Reaction
Select function key CYCLIC	Prompt for specifying the → output field type: OUTPUT FIELD-TYPE? (Chapter 5.13.3.2).

- **Sporadic**

This selection is only valid for the variable type → status display.

Action	Reaction
Select function key SPORADIC	Prompt for specifying the → output field type: OUTPUT FIELD-TYPE? (Chapter 5.13.3.2).

- **Once**

This selection is valid for all → variable types. The variable is read cyclically if it is logically combined with the common status or the status word.

Action	Reaction
Select function key ONCE	Prompt for specifying the → output field type: OUTPUT FIELD-TYPE? (Chapter 5.13.3.2).

- **Retrievable**

This selection is valid for all → variable types. The only subsequent operator input is the output field type OPERATABLE since no other display occurs in the operating phase.

This variable value input enables the alternate display of up to four different variables in the same position (set 1 to 4). If a key set is allocated to the appropriate set call ON keys and one set call OFF key, the selected variable can be displayed (example: set call key no. 1 must have a set call OFF key in the allocated key set). The set function is only valid for the selected variable, not for the whole image.

The default setting of the retrievable variable is OFF. All retrievable variables are cyclically updated in the operating phase, even when they have not been switched on.

Retrievable variables on the same position in a process display are only permitted either within a control field or within the process display. The variables may never be mixed in the same position in the process display and the control field.

Action	Reaction
Select function key RETRIEVABLE	Prompt for entering a set number between 1 and 4: ENTER SET NUMBER BETWEEN 1 AND 4. The DIAVID numeric menu field is displayed.
Enter a figure between 1 and 4.	The set number is repeated in the echo line.
Select the END key.	If the set number is not valid, the message SET-NUMBER NOT ACCEPTABLE is displayed. If a correct set number has been entered, a prompt for specifying the → output field type is displayed: OUTPUTFIELD-TYPE? (Chapter 5.13.3.2).

5.13.3.2 Output Field Type

The output field types are valid for all variable types. The only exception is that a bar/trend may not be of the output field type OPERATABLE (operator-accessible). Only the output field types "NOT OPERATABLE " (not operator-accessible) and "DISPLAY CHANGE" are valid options for BKS variables.

- **Operator accessible**

When operating digital values (incremental, decremental or absolute-value adjustment), the entered value is compared with the operating limits set in the AS and only transferred to the AS if the entered value is within these limits.

This check is only performed if the digital value was planned with readable limits. It is not performed if "configurable limits" has been planned.

When the operating limits are violated, the value is not transferred to the AS and the message "ILLEGAL VALUE" is output.

Action	Reaction
Select function key OPERATABLE	Prompt for entering the key set level number required for the variable input: ENTER KEYSETNUMBER FOR OPERATION. The DIAVID numeric menu field is displayed.
Enter the key set level number.	The level number is repeated in the echo line.
Select the END key.	A correct level number is accepted; if an incorrect level number has been entered, the number will be requested again in blinking representation. The function ends here for the variable types "bar/trend status display" and "free format". The next menu field in the dialog description of the individual variable fields (Chapters 5.13.1.1 and 5.13.1.2) is displayed. The dialog is continued for the variable type "binary value" only. The system inquires whether the "INCREMENT (+)" or "DECREMENT (-) keys for incremental change of the values exist in the key set or in a subsequent key set (Chapter 5.6.1.1): INCREMENTAL ADJUSTMENT IN KEYSET ? ENTER YES/NO (If one of the two keys is contained in the specified key set, this inquiry is not displayed, and the next inquiry appears).

Action	Reaction
Increment/decrement value: YES	In automation systems other than TELEPERM M, the limits cannot be read, only output directly (continue as for 'limits readable: YES'). Inquiry whether the value range limits can be read: LIMITS FOR VALUE RANGE READABLE? ENTER YES/NO
Limits readable: YES	Prompt for specifying the parameter number for upper and lower limit: ENTER PARAMETER NO. FOR UPPER.LOWER LIMIT.
	The DIAVID numeric menu field is displayed.
Enter two parameter numbers, separated by a point.	The two numbers appear in the echo line.
Select the END key.	Prompt for entering the parameter type of the two parameter numbers: PARAMETER TYPE?
	The → parameter type menu field is displayed (Chapter 5.14.2).
Select the END key. Increment/decrement value: NO.	The next menu field in the dialog description of the individual variable fields is displayed (Chapters 5.13.1.1. and 5.13.1.2).
	The function ends here if the limits are readable.
Limits readable: NO	Prompt for specifying the upper limit: UPPER LIMIT FOR VALUE RANGE?
	The DIAVID numeric keypad is displayed.
Specify the upper limit.	The upper limit appears in the echo line.
Select the END key.	Prompt for specifying the lower limit: ENTER LOWER RANGE LIMIT. The DIAVID numeric keypad is displayed.nzeigen des DIAVID-Ziffern-TFs
	The DIAVID numeric menu field is displayed.
Specify the lower limit.	The lower limit appears in the echo line.
Select the END key.	The next → menu field in the dialog description of the individual variable fields is displayed (Chapters 5.13.1.1 or 5.13.1.2).

- **Acknowledgement possible**

This option is possible for all → variable types allowing a status which can be acknowledged.

If these variables are selected in the operating phase, the status of this block only is acknowledged without any further key operation.

Action	Reaction
Select function key ACKNOWLEDGEABLE	The next menu field in the dialog description of the individual variable types is displayed. (Chapters 5.13.1.1 and 5.13.1.2).

- **No operator access possible**

This option is possible for all → variable types. The variable is used as an output variable for display only.

Action	Reaction
Select function key NOT OPERATABLE	The next menu field in the dialog description of the individual variable types is displayed. (Chapters 5.13.1.1 and 5.13.1.2).

- **Display change**

This option is possible for all → variable types. When this variable is selected in the operating phase, the specified image is displayed without any further key operation. The segment of a large size image is displayed if a detail position has been specified.

Example:

Representation of a common alarm by a status display, using the output field type DISPLAY CHANGE in an overview process display. The process display level number entered specifies the image with the detailed information.

Action	Reaction
Select function key DISPLAY CHANGE	Prompt for entering the process display level number: ENTER PROCESS DISPLAY LEVEL NUMBER. The DIAVID numeric menu field is displayed.
Enter the process display level number.	The level number is repeated in the echo line.
Select the END key.	If scroll memory (hardware) has been installed: Prompt for entering the image section position: ENTER WINDOW-POSITION LINE.COLUMN. The DIAVID numeric menu field is displayed.
Enter line number and column number, separated by a point.	The next menu field in the dialog description of the individual variable types is displayed. (Chapters 5.12.1.1 and 5.12.1.2).

- **Open window**

Action	Reaction
Select function key OPEN WINDOW	Prompt for entering the window number: ENTER WINDOW NUMBER. The DIAVID numeric menu field is displayed.
Enter the window number.	The window number is repeated in the echo line. Prompt for entering the window position: ENTER WINDOW POSITION. The DIAVID numeric menu field is displayed.
Enter window position.	The window is displayed with a fixed or freely selectable position.

5.14 Menu Fields

5.14.1 Retrieval Function Menu Field

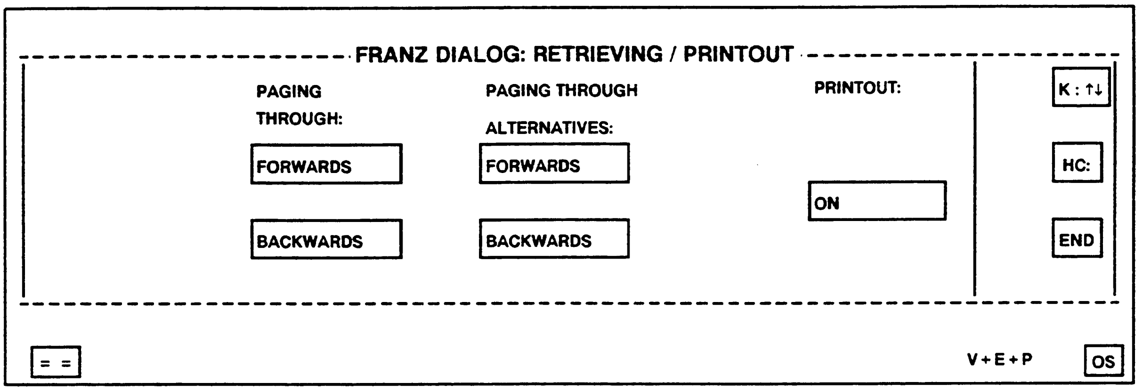


Fig. 5-38 Menu field "retrieve/printout"

The designer uses this menu field to retrieve an image from his supply. He may correct his selection by scrolling the images until he eventually finds the image he requires.

Two additional scroll keys for status displays facilitate scrolling through the various alternatives.

Select the END key to terminate the image selection.

Scrolling backwards takes longer than scrolling forwards if there are larger gaps in the image supply.

Scrolling in the key sets and process displays follow the pattern below, and not the hierarchy structure:

```
  0 .   0 .   0 .     1
  0 .   0 .   0 .     2
                      :
  0 .   0 .   0 .   254
  0 .   0 .   1 .     1
  0 .   0 .   1 .     2
                      :
  0 .   0 .   1 .   254
  0 .   0 .   2 .     1
                      :
  0 .   0 .   2 .   254     Scroll
              :             forwards
  0 .   0 . 254 .     1
                      :
  0 .   0 . 254 .   254
  0 .   1 .   1 .     1
                      :
  0 .   1 .   1 .   254
              :
  0 .   1 . 254 .     1
                      :
  0 .   1 . 254 .   254
        :
  0 . 254 .   1 .     1
                      :
  0 . 254 .   1 .   254     Scroll
              :             backwards
  0 . 254 . 254 .     1
                      :
  0 . 254 . 254 .   254
  1 .   1 .   1 .     1
                      :
  1 .   1 .   1 .   254
              :
  1 .   1 . 254 .     1
                      :
  1 .   1 . 254 .   254
        :
  1 . 254 .   1 .     1
                      :
  1 . 254 .   1 .   254
              :
  1 . 254 . 254 .     1
                      :
  1 . 254 . 254 .   254
  :
254 .   1 .   1 .     1
                      :
254 .   1 .   1 .   254
              :
```

Continued:

```
254 .   1 . 254 .     1
                      :
254 .   1 . 254 .   254
        :
254 . 254 .   1 .     1
                      :
254 . 254 .   1 .   254
              :
254 . 254 . 254 .     1
                      :
254 . 254 . 254 .   254
```

- **Forward/backward scrolling**

These two keys are used for scrolling through the pages (also across gaps).

Action	Reaction
Select function key PAGING THROUGH: FORWARDS or BACKWARDS	The next or previous image (i.e. the image with the next higher or next lower image number) is displayed.

- **Forward/backward scrolling through alternatives**

These two keys are used for scrolling through the various alternatives of a status display (also across gaps). The key functions are "PAGING THROUGH FORWARDS" and "PAGING THROUGH BACKWARDS" in other images (not status displays).

Action	Reaction
Select function key PAGING THROUGH: FORWARDS or BACKWARDS	The status display alternatives with the next higher or next lower number are displayed.

- **Printout**

Selecting this key starts a printout of the image currently displayed in the monitor work area. Symbols in the images are replaced by *, blanks by dots.

Action	Reaction
Select function key PRINTOUT: ON	The retrieval functions menu field disappears. The message OPER. INHIBIT DURING DATA STORAGE is displayed while the print buffer is being edited. The retrieval functions menu field is displayed. The image in the work area is printed on printer 1.

5.14.2 Parameter Type Menu Field

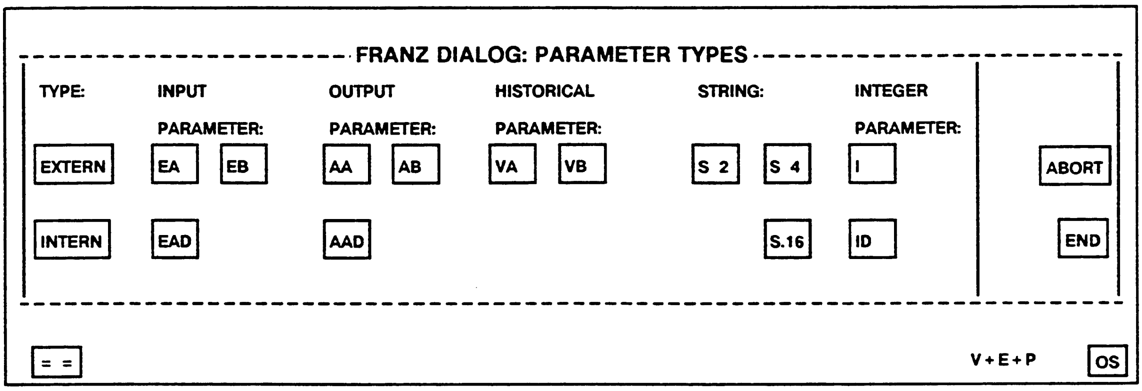


Fig. 5-39 Parameter type menu field

In TELEPERM M, a parameter type must be specified for each parameter number. The default setting is only "lower parameter number", a parameter type has not been specified.

Only the parameter types listed in the menu field can be accessed. Provided the access is legal within TELEPERM M, other parameter types can only be accessed by specifying a type which is contained in the menu field.

- **Internal/external**

"Internal parameter number" defines a parameter number to be internal to the TELEPERM M system. To a certain extent, internal parameter numbers are different in the AS 220 and AS 230/AS 235 systems.

External parameter numbers are identical in AS 220 and AS 230/AS 235, and can also be found in the TELEPERM M block description.

Action	Reaction
Select function key INTERN or EXTERN	The text INTERNAL or EXTERNAL appears in the echo line.

Note: RN parameters (90 to 95 and 112 to 129) from the AS 230/AS 235 have to be stored as internal parameters.

- **Parameter type**

All parameter types represented by a key are valid for on line access.

Action	Reaction
Select function keys: EA analog input or EB binary input or AA analog output or AB binary output or VA bit pattern VB bit pattern or S2 2-character string or S4 4-character string or S16 16-character string or EAD analog input AAD analog output	The corresponding brief parameter descriptions (as on the key label) are displayed in the echo line.
I integer parameter	Type not permissible for bars.
ID double precision integer parameter	Type not permissible for bars.

- **Abort**

Selecting this key reverses all entries made during the last dialog sequence.

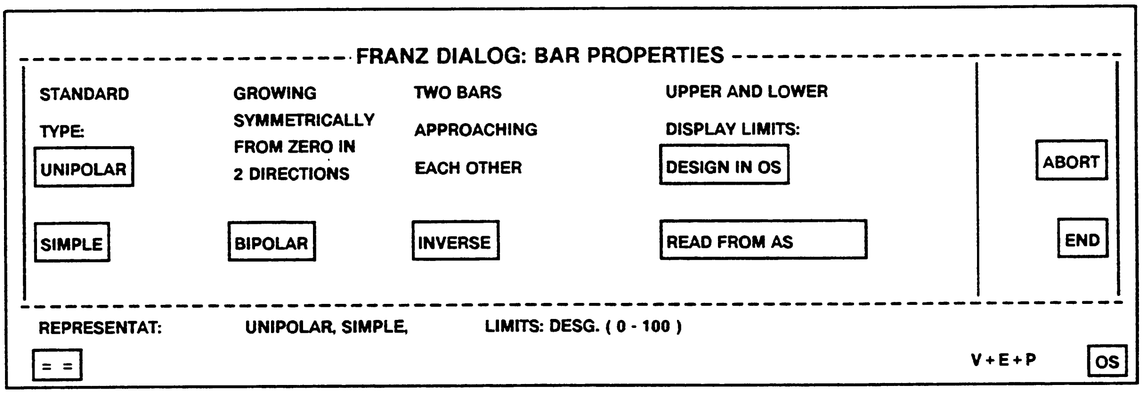
Action	Reaction
Select function key ABORT	The dialog is aborted. The initial menu field in which the aborted dialog was started is displayed.

- **End**

Selecting this key terminates the parameter type selection. The last parameter selection to have been displayed in the echo line will be accepted.

Action	Reaction
Select function key END	The menu field specified in the dialog sequence of the function currently being executed is displayed.

5.14.3 Bar Properties Menu Field



REPRESENTAT: UNIPOLAR, SIMPLE, LIMITS: DESG. (0 - 100)

Fig. 5-40 Bar properties menu field

This menu field is used for designing bar diagrams. The default setting is: unipolar representation, simple with configured bar limits (upper limit = 100 and lower limit = 0).

Specific system conventions which must be observed when designing a bar diagram are described together with the individual function keys.

The lower bar limit always refers to the bar origin.

A trend can only be displayed as unipolar and simple bar with upper limit 0. All other trend representations must be implemented by appropriate standardizations in the automation system.

For control purposes, the selected bar characteristics are displayed in the echo line.

- **UNIPOLAR**

All values to be displayed are contained inside the value range defined by upper and lower display limits.

Action	Reaction
Select function key UNIPOLAR	The message RIGHT appears briefly in the first third of the message line.

- **BIPOLAR**

The lower limit specified for this bar type must be 0. The lower limit must be read by the automation system if readable limits have been selected. The upper limit may be either positive or negative.

Bipolar bar representation means that a bar is mirrored symmetrically at its origin. The value range thus extends from the upper limit to the complement of the upper limit. The specification APPROACHING is not permitted in bipolar bar representation.

Action	Reaction
Select function key BIPOLAR	The message RIGHT appears briefly in the first third of the message line.

- **SIMPLE**

Simple representation means that only one bar is displayed within the bar extension specified (in contrast to approaching bar representation).

Action	Reaction
Select function key SIMPLE	The message RIGHT appears briefly in the first third of the message line.

- **TWO BARS APPROACHING EACH OTHER: INVERSE**

This type of bar diagram shows two bars within the specified bar extension (origin, height, width). One bar grows from the origin towards the vertex, the second bar grows from the vertex towards the origin. All factors specified for one bar also apply for the other.

As this type of bar diagram can be used, for example, to represent a tolerance range, the user must ensure that the values for the two bars do not overlap. The maximum accuracy of this diagram is one symbol field. This means that a whole symbol field will be displayed as a tolerance range if a tolerance range is so small that it would lie completely within one symbol field.

Only the parameter of the bar growing from the origin can be transferred during MKZ transfer to MELD or KURV.

Approaching bars are only permitted within a control field.

Action	Reaction
Select function key INVERSE	Prompt for entering the parameter number of the second bar growing from the vertex towards the origin: ENTER PARAMETER NUMBER FOR INVERSE BARS. The DIAVID numeric menu field is displayed.
Enter the parameter number.	The parameter number is repeated in the echo line.
Select the END key.	The bar properties menu field is displayed.

- **UPPER AND LOWER DISPLAY LIMITS: DESIGN IN OS**

This key is used for defining the upper and lower limit values in the OS system.

Action	Reaction
Select function key DESIGN IN OS	Prompt for entering the upper bar limit: UPPER LIMIT OF BAR? The DIAVID numeric menu field is displayed.
Enter the upper limit.	The upper limit is repeated in the echo line.
Select the END key.	Prompt for entering the lower bar limit: LOWER LIMIT OF BAR? The DIAVID numeric menu field is displayed.
Enter the lower limit.	The lower limit is repeated in the echo line.
Select the END key.	The bar properties menu field is displayed.

Note: Only use limits of the same type.

- **UPPER AND LOWER DISPLAY LIMITS: READ FROM AS**

This method of range limit input reads, in on line mode, the bar limits from the automation system and then uses them for bar standardization. The parameter number from the automation system must be specified during the design phase. The parameter type can only be specified for both parameter types, i.e. the limits must be of the same type in the AS. Readable bar limits are only permitted within a control field.

Action	Reaction
Select function key READ FROM AS	Prompt for entering the parameter number for the upper and lower limit in the automation system: PARAMETER NUMBER FOR UPPER.LOWER LIMIT The DIAVID numeric menu field is displayed.
Enter the two parameter numbers, separated by a point.	The two parameter numbers are repeated in the echo line.
Select the END key.	Prompt for entering the parameter type: PARAMETER TYPE? The → parameter type menu field is displayed (Chapter 5.13.2).
Select the END key.	The bar properties menu field is displayed.

- **ABORT**

Selecting this key reverses all entries made during the last dialog sequence.

Action	Reaction
Select function key ABORT	The initial menu field in which the aborted dialog has been started is displayed. All entries made during this dialog sequence are reset.

5.15 System Conventions

5.15.1 Restriction Regarding Binary Words

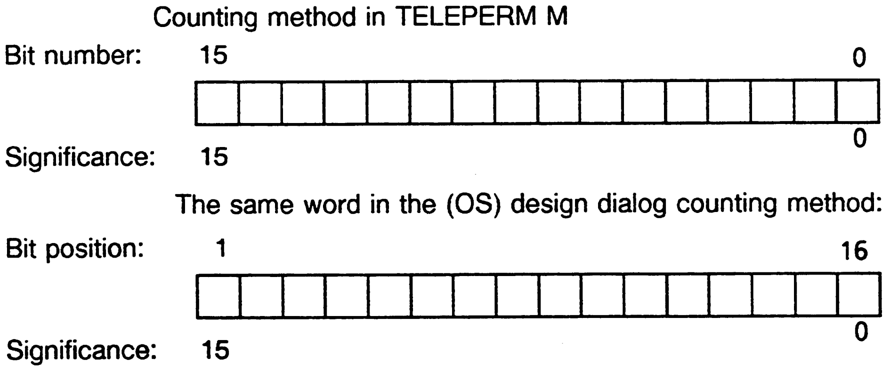
Bits 7 to 16 (10 bits) can be used in the operating phase for binary words which are to be read cyclically. Bits 1 to 6 have a different assignment in TELEPERM M.

5.15.2 Number Specifications

- Integer number counting always begins with one. Zero is an invalid number and causes either an error message or a prompt to repeat the entry.

  All position specifications (section position in the display change function), for example, and bit position specifications must be counted from 1.

- In addition, observe VB parameter and status when specifying the bit position for TELEPERM M:



- The method used for counting the BKS bit specification is identical to the method used in TELEPERM M. The least significant bit is the bit with the smallest bit location number.

  Note: Specifying the bit position range always initiates interpretation of one or several bits. These bits are interpreted as a binary number by the OS system.

- Bit position range 16-16 must be specified if a status display is interconnected with a binary input or output (EB or AB).

  For example: A bit position range 12-14 provides up to 8 alternatives. Alternative 1 (0 does not exist) is displayed when bits 12, 13 and 14 are zero simultaneously.

- The process display level number must differ from zero in the position for the highest hierarchy level. If an incorrect entry is made, the operator is prompted by a blinking message to repeat the level number entry.

5.15.3 General Restrictions

- Number of devices in a process display with bar diagrams in a TELEPERM M system:

Up to 16 different devices can contribute to the bar values in a process display. This restriction only applies for bars with readable bar limits or approaching bars or image-specific bar limits (inserting a control field into the process display).

In other automation systems:
Including the bars of the control fields inserted in the process display, up to 16 different bars may be contained in the display. This restriction only applies for bars with readable bar limits (only possible in a control field), approaching bars (only possible in a control field), or image-specific bar limits (inserting a control field into the process display).

- Segments in a process display
  In TELEPERM M, segments are inserted in the static background image. As segments are output together with the static background image, they are not output individually in the operating phase. A change in a segment is only considered in the process display if the images containing the modified segment have been re-processed by the functions CREATE and STORE when OVERWRITING YES is selected. Remainders of the old segment can be corrected in the process display using the DIAVID design menu field.

- All variable fields
  The maximum vertical extension of the variable fields is limited by the visible part of the individual process display in the work area (i.e. 23 lines maximum).

- Binary values
  The extension is specified by a maximum of eight digits for fixed or floating point representation. A 9-digit input is always displayed in fixed point representation.

- Bars
  The same bar value may not be displayed with different limits inside one control field. Other automation systems (not TELEPERM M) only allow readable bar limits and approaching bars if the automation system guarantees that all values which are to be updated in the displayed image are returned together in the sequence specified by OS. The maximum bar height is 23 characters.

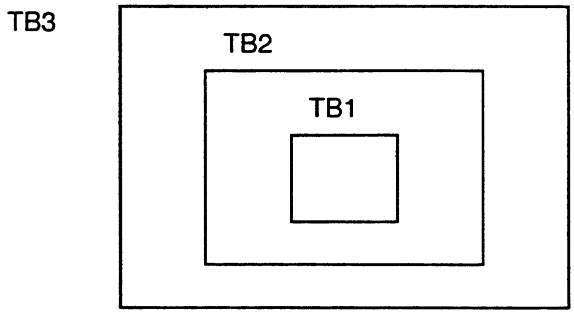
- Operator-accessible output fields
  OS enables an output of operator-accessible TELEPERM M standard blocks to be displayed (by specifying the output parameter number) and the associated input to be written. Since only one parameter number (of the output) can be defined during the design phase, the OS system (link) determines the input parameter number in the operating phase when the value is written.

- Deleted sets
  Deleted sets (e.g. control fields, segments) remain in the images in which they have been entered. Sets should therefore be removed from the images before they are deleted.

- Alarm sequence display messages
  Messages from the alarm sequence display (MELD) related to a plant area which has been deleted from the freely configurable displays are still displayed in the operating phase.

- Nested sets
  The inner object of nested sets (e.g. segments) can only be deleted from an image after the enclosing outer object has been deleted.

For example: Segments 1 to 3 (TB1 to TB3)



First delete TB3 and TB2 if TB1 is to be deleted.

- Overlapping static and dynamic data.
  See Chapter 5.13.

- MKZ transfer to MELD or KURV
  MKZ transfer to MELD or KURV for approaching bars is only possible for the bar growing from the bar origin.

- FRANZ configuration on the S block
  In order to display the block status (ON/OFF), the respective status display has to be configured on the status word. Due to the special features of the S block, the status display is not updated when configured to the parameter 1 AB (EIAU).

- BKS-controlled status displays must be configured as "non-accessible" when inserted in a process display.

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6 MKS Processing

OS 265 permits the following utilization (interpretation) of messages from the MKS block:

- Updating of a cyclically read variable in a process display (no window) may be depending on an MKS bit.
- User-specific logs are printed after an MKS bit status change.
- An alarm identifier (A, W, F, S, B), which is classified and interpreted in NORA/FRANZ/MELD, can be assigned to each MKS bit.
- Display of status displays which are interconnected with any MKS block bit position range (up to 16 bits), provided that the bits have not been classified.

Multiple use of an MKS bit is possible.

Example: Process display updating, user-specific printout and output of a (classified) MKS alarm in MELD can be assigned to **one** MKS bit. Acknowledgement in MELD does not influence updating or printout.

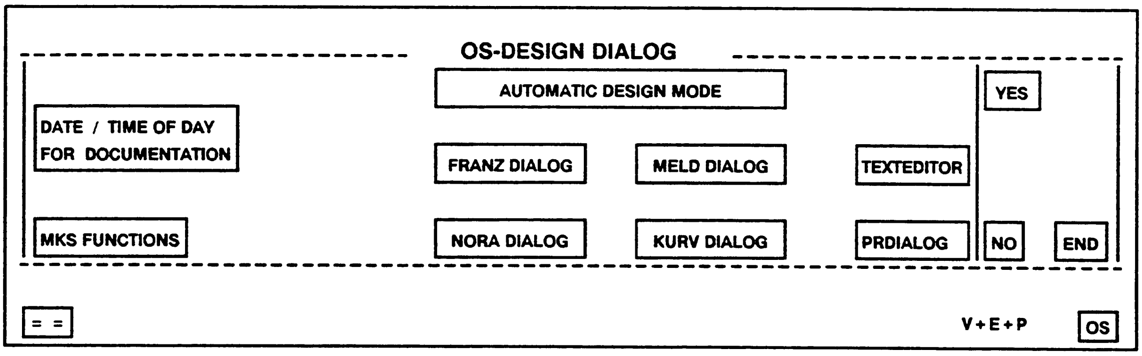


Fig. 6-1 Design dialog, basic menu field

Selecting the MKS FUNCTIONS key in the basic design dialog menu field initiates the dialog for MKS bit classification and MKS-bit-depending display updating.

• MKS message structure

Each MKS message contains a binary field of 32 status bits, and one acknowledgement bit for each status bit. An MKS message is received by the OS in the following manner:

- During process link initialization (initialization into the operating phase), the OS logs on with the configured MKS blocks of the AS devices for receiving their messages. The corresponding MKS blocks must have been configured in NORA/FRANZ or MELD.
- The MKS block in the AS **sporadically** (upon transition of one of the 32 bits) transmits its message to the registered receiver.

6.1 Display Updating Controlled by MKS Bits

It is possible to control process display updating by an MKS bit allocated to the process display.

Bits from MKS messages, whose status change from 0 to 1 during the operating phase initiates updating of the allocated process display, are defined in the design dialog for this purpose.

- **Operating phase**

  If an MKS bit has been assigned to a process display, this process display will be updated **in addition** to the normal updating cycle once the related MKS bit has been received. This applies to all variables to be read cyclically.

  All variables which are updated upon AS initiative (status, MKS messages, BKS messages) are updated once the corresponding messages have been received.
  An "operator-accessible" variable type is returned immediately after it has been entered, irrespective of the MKS bit or updating cycle selected.

  The OS does not react if the image is not displayed on the screen when the allocated MKS bit is received. MKS-bit-controlled updating is performed in the background if the displayed image is covered (whole or part) by a curve field or a window.

6.1.1 Allocation between MKS Bit and Process Display

Allocation between MKS bit number and process display number is performed via the MKS FUNCTIONS dialog.

This MKS must have been configured in the NORA system. Only those MKS messages are accepted in the operating phase which have been collected in the MELD system.

The MKS concerned must therefore be configured in NORA before the MKS-bit-dependent display updating is configured. All MKS bits concerned must be collected in MELD in order to make the function effective during the operating phase.

6.1.2 Form Processing

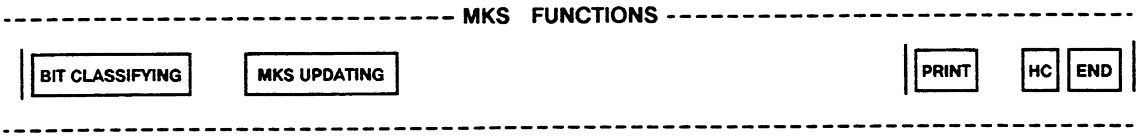
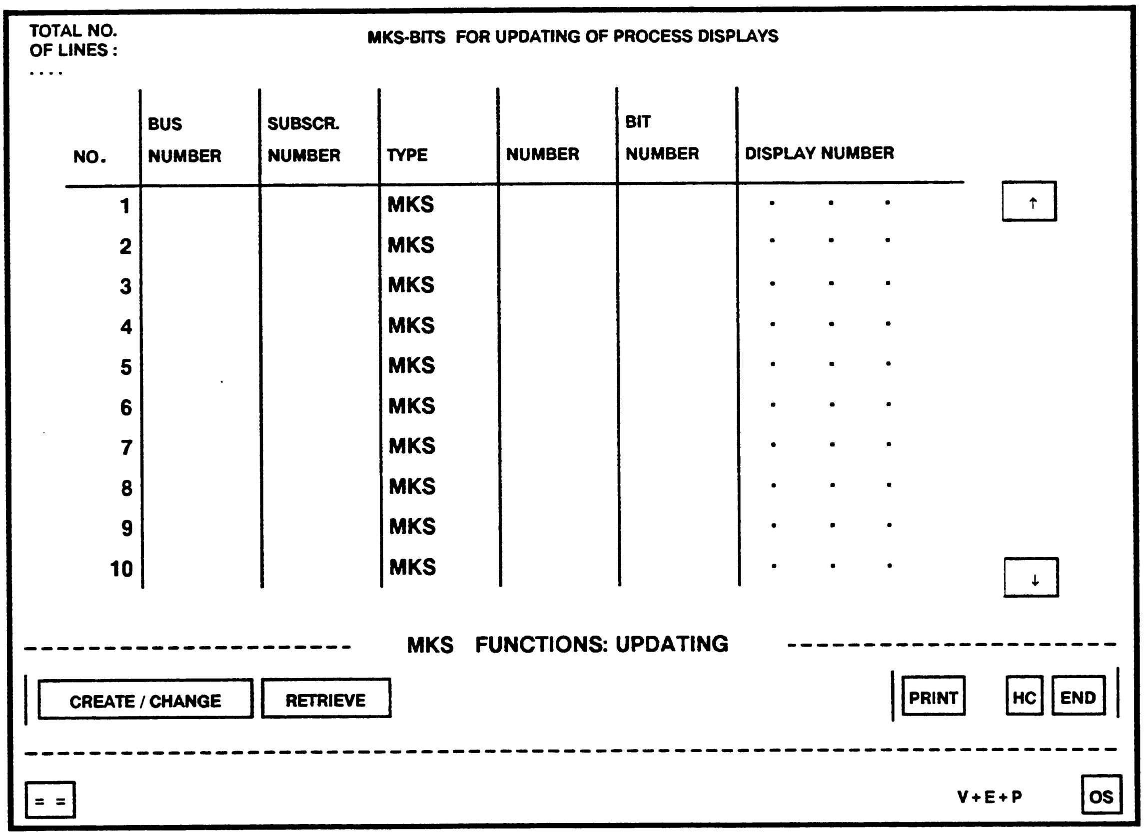


Fig. 6-2 MKS processing

The menu for combining the display and bit numbers logically is displayed in the work area after the MKS UPDATING key has been selected. Existing entries are displayed. The number of existing entries is displayed next to TOTAL NO. OF LINES: Selecting the CREATE/CHANGE function key in the displayed menu field permits new entries.


TOTAL NO. OF LINES : ....

MKS-BITS FOR UPDATING OF PROCESS DISPLAYS

NO.	BUS NUMBER	SUBSCR. NUMBER	TYPE	NUMBER	BIT NUMBER	DISPLAY NUMBER
1			MKS			. . .
2			MKS			. . .
3			MKS			. . .
4			MKS			. . .
5			MKS			. . .
6			MKS			. . .
7			MKS			. . .
8			MKS			. . .
9			MKS			. . .
10			MKS			. . .

Fig. 6-3 Allocation between MKS bit and process display number

- **Scrolling**

Up to 10 lines of the menu are displayed in the work area. Selecting the scroll keys enables the table to be moved up or down by 10 lines.

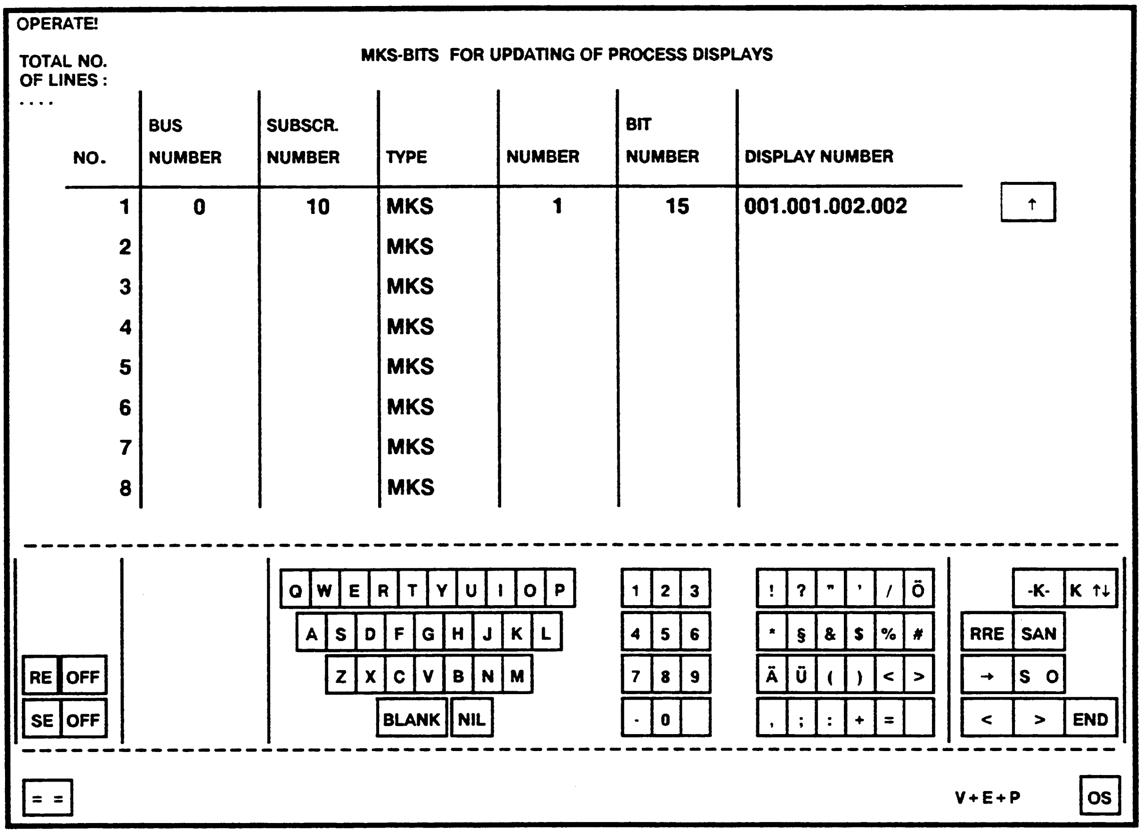
Only the 10 lines on the display can be processed in create/change mode; the scroll keys cannot be selected here.

The last list element remains in the first table position if an attempt is made to scroll beyond the table end (number next to TOTAL NO. OF LINES:). Further scrolling is not performed.

Scrolling upwards beyond the table beginning is not possible. The first element is displayed in the first position.

- **Create/change key**

Selecting the CREATE/CHANGE key enables the whole screen page to be edited. The DIAVID menu field is displayed in the command area. Scrolling is not possible in this mode.



OPERATE!

TOTAL NO. OF LINES : ....

MKS-BITS FOR UPDATING OF PROCESS DISPLAYS

NO.	BUS NUMBER	SUBSCR. NUMBER	TYPE	NUMBER	BIT NUMBER	DISPLAY NUMBER
1	0	10	MKS	1	15	001.001.002.002
2			MKS			
3			MKS			
4			MKS			
5			MKS			
6			MKS			
7			MKS			
8			MKS			

Fig. 6-4 Menu entry using the DIAVID menu field

- **Editing**

The cursor appears in the first input field of the first line of the list when the menu is displayed in the work area.

Light pen or alphanumeric keyboard can be used for performing modifications and new entries in any of the displayed 10 lines. Input fields are marked by NIL dots.

A required allocation is entered as

bus number
device number
MKS block number
bit number
process display level number.

The previous UPDATING level is displayed once the END key has been selected. The table is not deleted; the plausibility of all entries is checked.

- **Plausibility check**

The following check is performed for each modified line:

1. Bus address	0 - 7
2. Device address	0 - 99
3. Block number	Bus address, device address, MKS and MKS number (the block must have been configured in NORA)
4. Bit number	1-32
5. Display number	In form a.b.c.d Part a: 0 - 255 Part b: 0 - 255 Part c: 0 - 255 Part d: 1 - 255

The code "**F**" is displayed next to the value in the respective column if one of these conditions is not satisfied, and the complete line will not be stored.

Incorrect lines can be modified by selecting the CREATE/CHANGE key again. Selecting the RETRIEVE key or a scroll key deletes an incorrect line from the table. The line is retained as a blank line. Unconfigured lines are only removed during configuration check (cf. terminate dialog).

A window or key set level number can be entered instead of the display level number. Since an allocated window or key set is part of an (OS-internal) image area which is not addressed by the MKS-bit-dependent display updating, such an entry will not be marked as incorrect input and has no effect on updating of an allocated window or key set during the operating phase.

- **RETRIEVE**

The DIAVID menu field is displayed after the RETRIEVE key has been selected. The number of the first entry to be displayed can be entered using this menu field.

The UPDATING menu field is re-displayed once the END key has been selected. The table is displayed from the last entry if the entered number was higher than the number of the last entry.

- **HC or PRINT**

Selecting the HC or PRINT key initiates the work area contents to be output to a hard copy unit or a printer.

- **Terminating the dialog**

The basic menu field (design dialog) is re-displayed once the END key has been selected.

All lines which have not been configured are removed in the configuration check. The table is "compressed".

Note: Remember in shadow mode that the numbers of the entries change when the table is compressed.
Shadow mode should therefore not be used in this function.

6.2 MKS-Bit-Dependent User-Specific Logs

An MKS bit can be assigned to a user-specific log. The allocated log is initiated and **all** variables are read **once** when the bit value changes from 0 to 1. All variables are updated once if the log display is shown on the screen when the status changes. This function is only effective if the MKS bit is collected in MELD.

This bit may also be used in MELD. Logging is not influenced by an acknowledgement there.
The message MKS BIT NOT DESIGNED is suppressed if the bit has not been configured in MELD.
A bit can be assigned to several logs.

6.2.1 Allocation between MKS Bit and User-Specific Log

User-specific logs are created in the same manner as in process display design. The designed log displays are also stored under a display level number.

Allocation between MKS bit and log display is thus performed in the same manner and in the same format as the allocation between MKS bit and process display (Chapters 6.1.1 and 6.1.2).

6.3 Classification of MKS Bits

6.3.1 Summary

The individual bits of an MKS messages can be interpreted in the NORA/FRANZ and MELD configuration dialogs. MKS bits can be allocated to (classified in) different alarm classes:

(A) -	Alarm
(W) -	Warning
(F) -	Fault
(S) -	Fault signal (external fault)
(B) -	Operator request
Blank	An alarm identifier has not been assigned

These bits can be acknowledged as usual by selecting the AS key (in the case of A, W or S). If such a bit is used in a process display of the highest hierarchical level, it is ORed in the overview in accordance with its alarm class.
If allocated to the alarm class A, W or S, there is an audible alarm in the case of incoming alarms.
For interpretation purposes, the user must distinguish between classified and unclassified MKS bits. The following possibilities exist:

- **Interpretation of classified MKS bits**
  - in NORA/FRANZ and MELD
  - in NORA/FRANZ only (not collected or configured in MELD)
  - in MELD only (using NORA representation 1, i.e. no interpretation of the classification in NORA/FRANZ).
- **Interpretation of unclassified MKS bits**
  - in NORA/FRANZ and MELD (for MELD identifier "M", any interpretation in NORA/FRANZ) (e.g. operating state of an aggregate)
  - in NORA/FRANZ only (not collected or configured in MELD, any interpretation for NORA/FRANZ)
  - in MELD only (with identification "M"; interpretation has not been configured in NORA/FRANZ).

6.3.2 Alarm Class Assignment

The allocation of an alarm class to an MKS bit is performed during the design phase using a mask which displays all 32 bits of a selected MKS. If a bit has already been classified, the classification is displayed.
Once an alarm identifier (A, W, F, S or B) has been assigned to the bit, the latter is kept by NORA/FRANZ and MELD under this identifier. This applies to indications on the screen as well as to logs. In line with the OS alarm philosophy, these indications are assigned certain attributes (flahing/non-flashing/colour) whereby the following priorities apply: A has a higher priority than W, W has a higher priority than S, S has a higher priority than F, and F has a higher priority than B (e.g. for the NORA area display) and the ORing taking place in the overview display is accordingly.
If a bit contains a blank or there is no entry at all, MELD interpretes it as an "M". In NORA/FRANZ, the bit can be used for any indications (without acknowledgement or ORing).

Upon classification, the bit can be collected for MELD and provided with the respective alarm text. The evaluation takes place automatically in accordance with the classification, i.e. no further MELD-specific measures have to be taken.

Select the MKS PROCESSING key in the basic menu field of the design dialog to start the bit classification menue dialog.

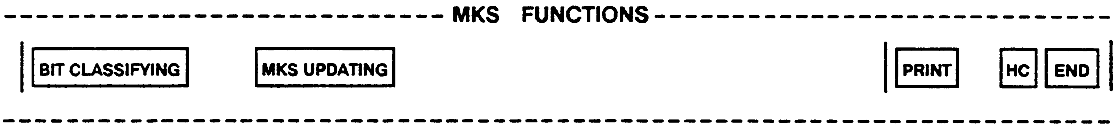
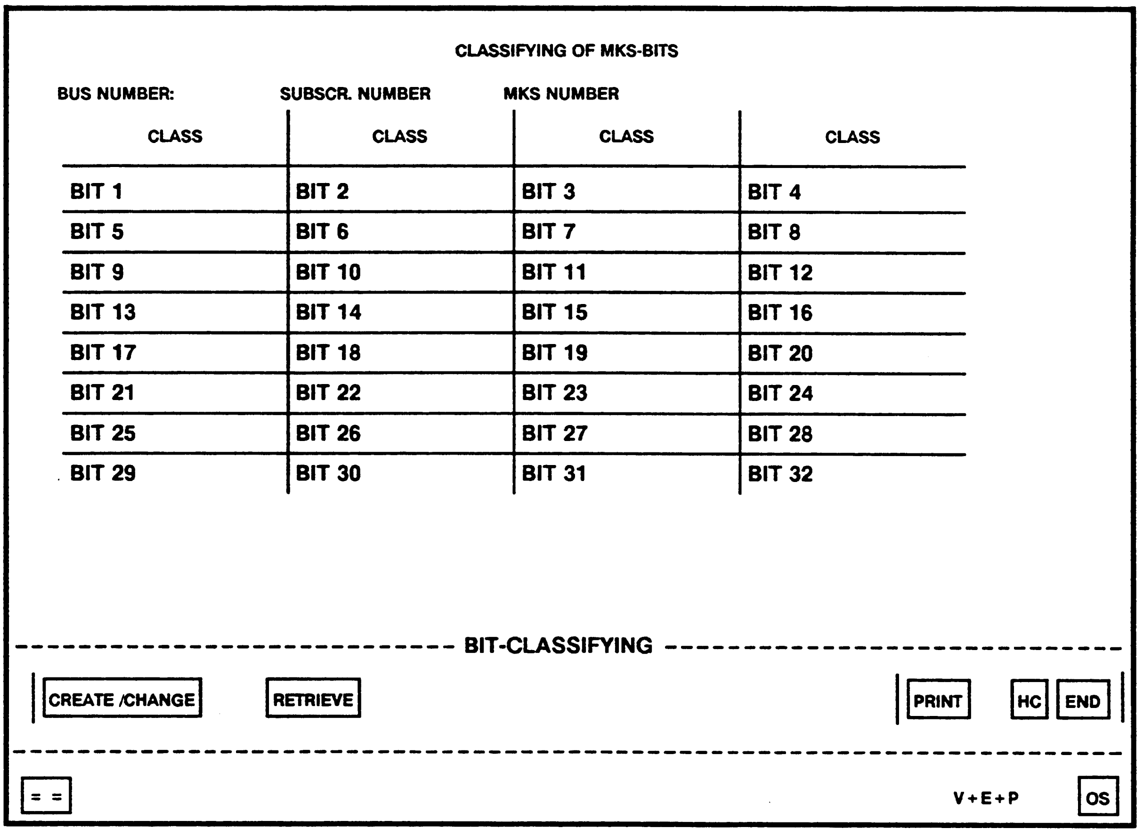


Fig. 6-5 MKS processing

Selecting the BIT CLASSIFICATION key displays a mask in the work area which enables an alarm class to be allocated to each bit of the MKS block.



CLASSIFYING OF MKS-BITS

BUS NUMBER: SUBSCR. NUMBER MKS NUMBER

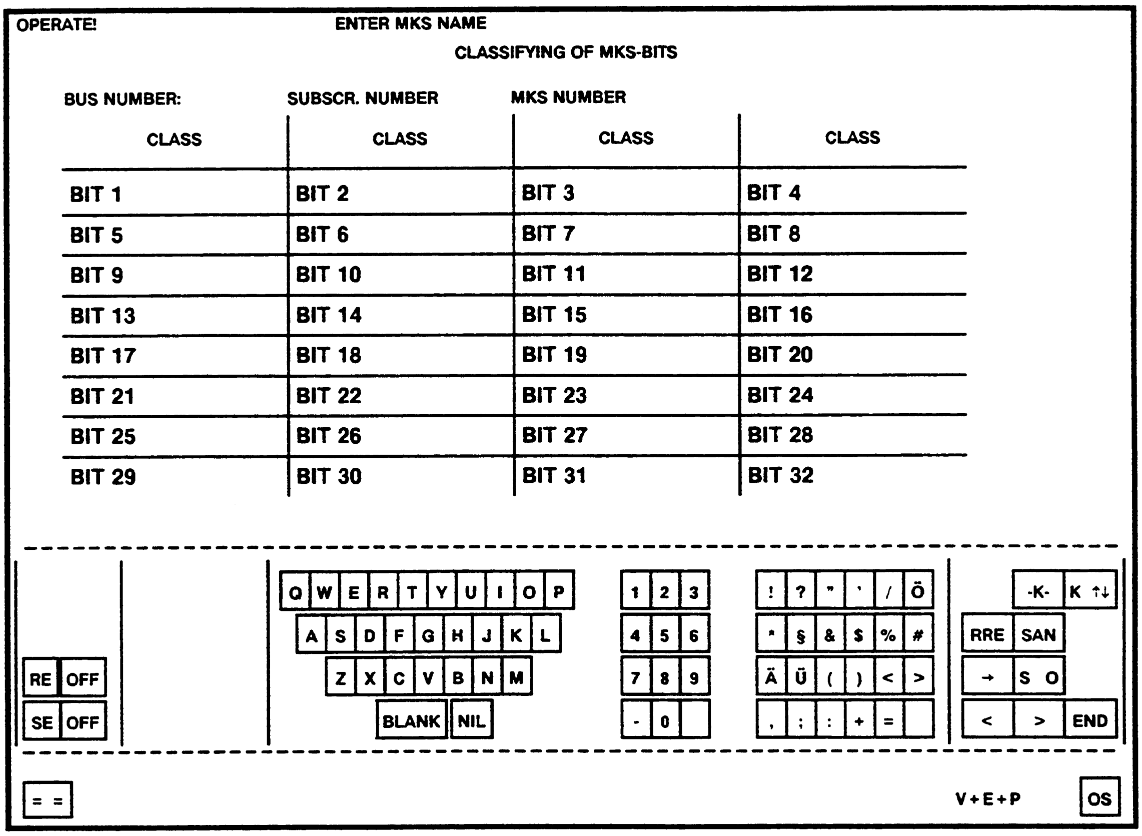
CLASS	CLASS	CLASS	CLASS
BIT 1	BIT 2	BIT 3	BIT 4
BIT 5	BIT 6	BIT 7	BIT 8
BIT 9	BIT 10	BIT 11	BIT 12
BIT 13	BIT 14	BIT 15	BIT 16
BIT 17	BIT 18	BIT 19	BIT 20
BIT 21	BIT 22	BIT 23	BIT 24
BIT 25	BIT 26	BIT 27	BIT 28
BIT 29	BIT 30	BIT 31	BIT 32

Fig. 6-6 After selection of the key BIT CLASSIFICATION

The key set related to the menu enables the user to go to the CREATE/CHANGE or the RETRIEVE branch.

• CREATE / CHANGE

Selecting the CREATE/CHANGE key displays the DIAVID alphanumeric menu field and the prompt ENTER MKZ OF MKS BLOCK below the bit classification mask.



OPERATE! ENTER MKS NAME

CLASSIFYING OF MKS-BITS

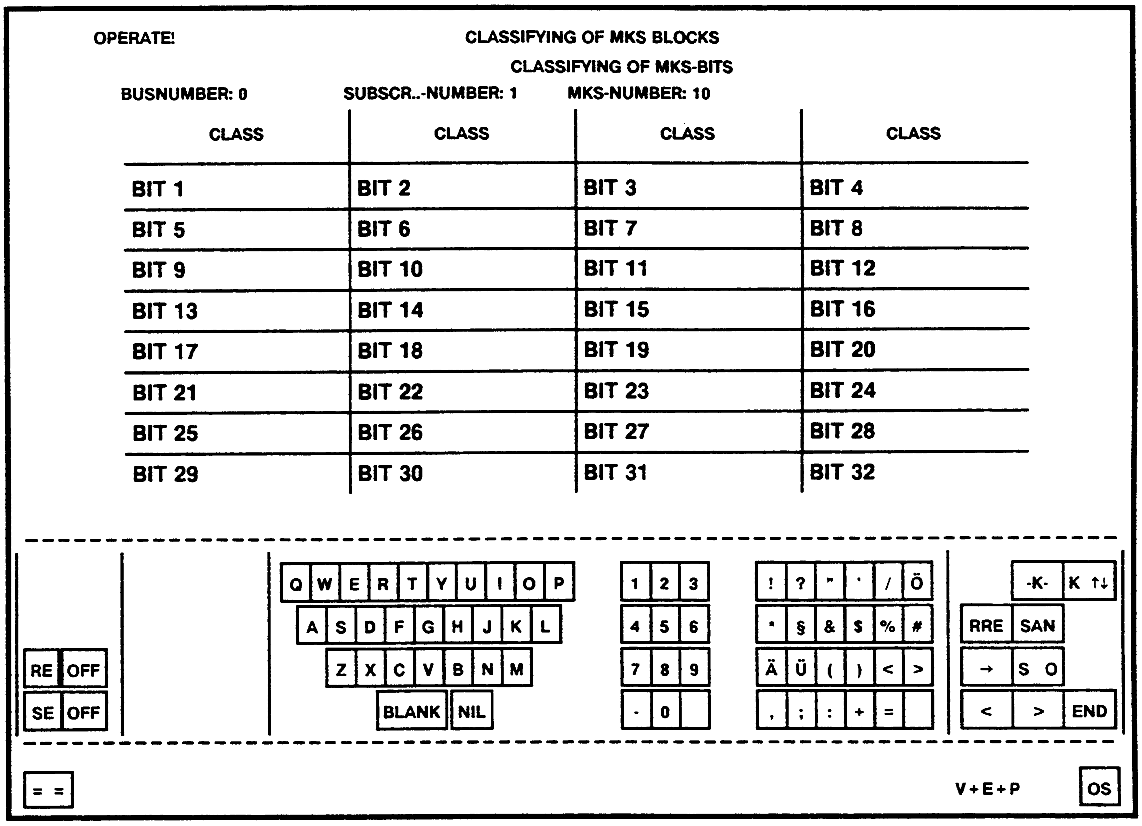
BUS NUMBER: SUBSCR. NUMBER MKS NUMBER

CLASS	CLASS	CLASS	CLASS
BIT 1	BIT 2	BIT 3	BIT 4
BIT 5	BIT 6	BIT 7	BIT 8
BIT 9	BIT 10	BIT 11	BIT 12
BIT 13	BIT 14	BIT 15	BIT 16
BIT 17	BIT 18	BIT 19	BIT 20
BIT 21	BIT 22	BIT 23	BIT 24
BIT 25	BIT 26	BIT 27	BIT 28
BIT 29	BIT 30	BIT 31	BIT 32

Fig. 6-7 Input of the required MKS block

The menu for the selected MKS block (Fig. 6-7) is displayed after the correct MKS block name has been entered and the END key selected. Bus number, device number and MKS number are entered in the form header.

All 32 bits of the selected MKS block are displayed in the work area. Before a new entry is performed, input fields are marked by NIL dots. Existing classifications are displayed. The cursor, which appears on bit 1 when the menu is newly selected, can be placed on any input field required.



OPERATE!

CLASSIFYING OF MKS BLOCKS

CLASSIFYING OF MKS-BITS

BUSNUMBER: 0 SUBSCR..-NUMBER: 1 MKS-NUMBER: 10

CLASS	CLASS	CLASS	CLASS
BIT 1	BIT 2	BIT 3	BIT 4
BIT 5	BIT 6	BIT 7	BIT 8
BIT 9	BIT 10	BIT 11	BIT 12
BIT 13	BIT 14	BIT 15	BIT 16
BIT 17	BIT 18	BIT 19	BIT 20
BIT 21	BIT 22	BIT 23	BIT 24
BIT 25	BIT 26	BIT 27	BIT 28
BIT 29	BIT 30	BIT 31	BIT 32

Fig. 6-8 MKS bit classification menu

The cursor is automatically positioned on the next input field once an entry to a bit has been performed.

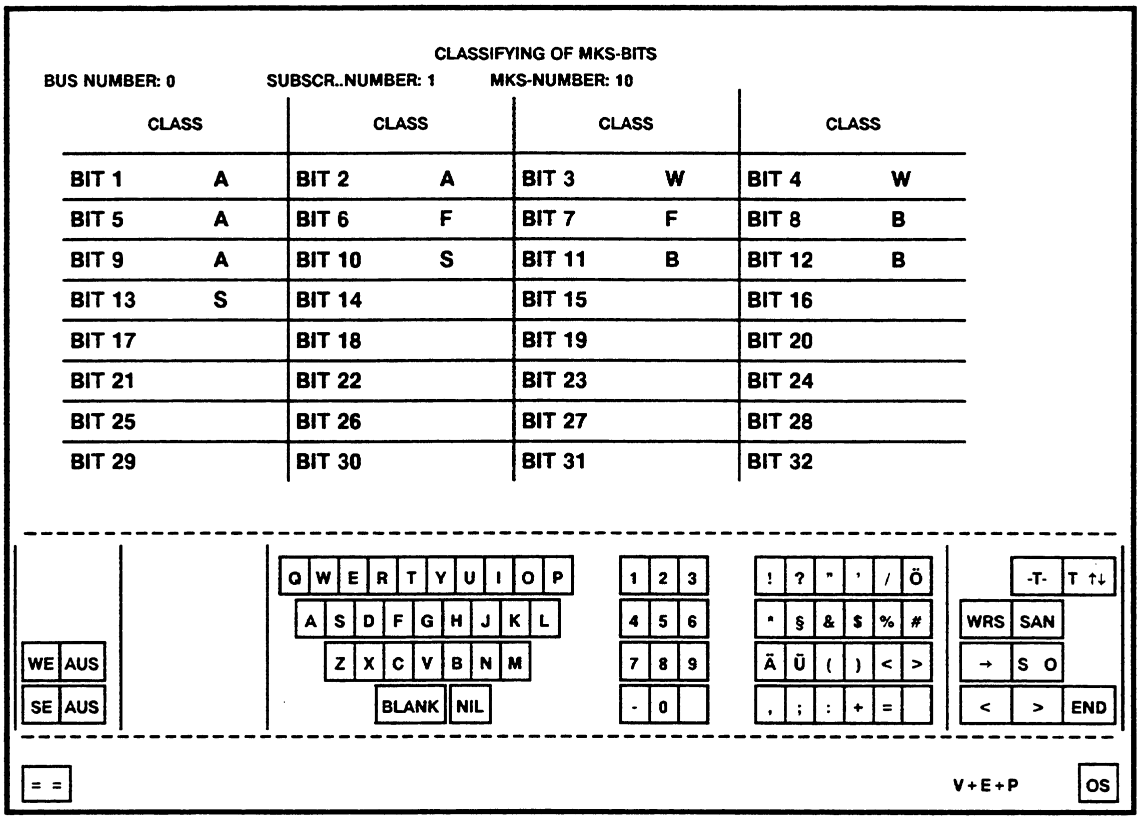
The following entries are possible:

A	for alarm
W	for warning
F	for fault
S	for I&C alarm
B	for operator request

Selecting the END key terminates input after the MKS bits have been provided with the required alarm classes.
A bit is considered as being unclassified if a blank has been assigned to a bit or if no entry or an incorrect entry has been performed. An incorrect entry will be deleted.

- **RETRIEVE**

  Selecting the RETRIEVE key displays the menu; entries may not be modified or extended. The DIAVID menu field and the prompt ENTER MKZ OF MKS BLOCK are displayed below the menu after the RETRIEVE key has been selected.
  The menu for the selected MKS block is displayed after the MKS block name has been entered and the END key selected.



CLASSIFYING OF MKS-BITS

BUS NUMBER: 0 SUBSCR..NUMBER: 1 MKS-NUMBER: 10

CLASS		CLASS		CLASS		CLASS	
BIT 1	A	BIT 2	A	BIT 3	W	BIT 4	W
BIT 5	A	BIT 6	F	BIT 7	F	BIT 8	B
BIT 9	A	BIT 10	S	BIT 11	B	BIT 12	B
BIT 13	S	BIT 14		BIT 15		BIT 16	
BIT 17		BIT 18		BIT 19		BIT 20	
BIT 21		BIT 22		BIT 23		BIT 24	
BIT 25		BIT 26		BIT 27		BIT 28	
BIT 29		BIT 30		BIT 31		BIT 32	

Fig. 6-9 Completed MKS bit classification menu

Bus number, device number and MKS number of the block are entered in the form header. All 32 bits and the allocated alarm classes are listed in the form.

- **END**

Selecting an END key in one of the dialog menu fields terminates MKS bit classification.

6.3.3 Interpretation of Classified Bits

- **Creation of a status word**

The OS creates a status word for each classified bit in an MKS block. The status word assignment corresponds to the TML block assignment. The status word retrieves its data from the states and acknowledgement states of the classified bits.

- All acknowledged bits and all bits which have been classified for mandatory acknowledgement (A, W and S) are ANDed to form the acknowledgement bit in the status word.
- The states of bits with the same classification are ORed and entered into the corresponding status bit.

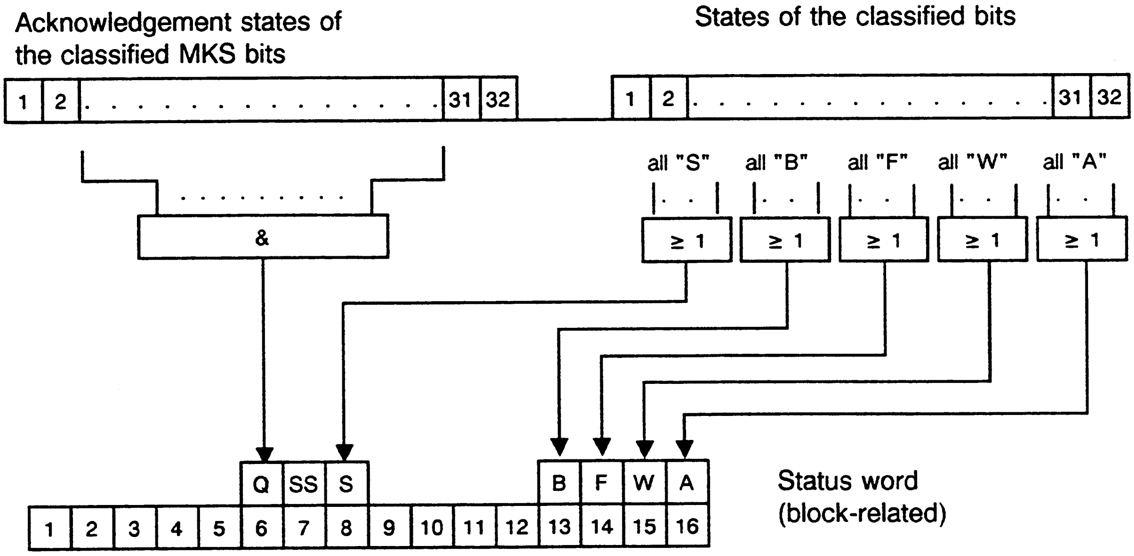


Fig. 6-10 MKS block status word

Fig. 6-10 shows that the acknowledgement bit in the status word will not be set before all classified bits, which require acknowledgement, have been acknowledged.

- **Interpretation in FRANZ**

Status displays inserted in a control field which has been interconnected with a bit position range of the status word (up to 16 bits) or the common status (up to 8 bits) enable any bit to be interpreted in FRANZ (cf. Chapter 5.5).
The result of the OR operation is entered into the overview according to classification if this process display has been allocated to the highest hierarchy level.

The MKS block has a status word inside the OS system, whose assignment corresponds to the TML block assignment. Since all classified MKS bits of an MKS block are ORed into this status word according to their classification, group messages of an MKS message are provided in this status word. The system can therefore distinguish between an MKS bit and a status bit when the bit position range for an MKS block is entered.

Configuring the status display with individual MKS bit evaluation:

eg. Status display:	alternative 1	+	gn/bk	n.bl.
	alternative 2	A	rd/bk	n.bl.
	alternative 3	+	gn/bk	n.bl.
	alternative 4	A	rd/bk	blinking

- **Interpretation in NORA**

The basic data in NORA is extended by MKS representation 2. This provides the following new representations:

Loop display representation (Control Field No. 204)
Group display representation (Control Field No. 202)
Area display representation (Control Field No. 201)

Remember the following points when interpreting an MKS bit in NORA:

- There are new status displays in MKS representation 2, which contain an asterisk "*" (grey/black) as alternative 1. A blank is displayed at the corresponding position of the group and loop display if a bit has been configured in representation 2, but not classified in the MKS block.

- All 32 bits are interpreted in representation 2 of the MKS block. The following exception applies:
  Coded input of status displays is required since any MKS bit classification is possible. This is achieved by inserting the pseudo status display 4095. The OS recognizes this number in the operating phase as a classified status display, and inserts the display which corresponds to the classification.

  Using FRANZ resources, the user may create customized NORA representations which contain special status displays for the individual classifications. NORAs may be created for individual bits, several bits, or all 32 bits of an MKS block.

- Only the classification with the highest priority is displayed in a NORA area display.

- **Interpretation in MELD**

MKS blocks with classified bits may be collected for MELD, and provided with the corresponding message text string. The procedure is the same as for an MKS block without classified bits (see Chapter 7).
The only difference is in the number of alarm classes (A, W, F, S, B, M instead of M).

6.3.4 Interpretation of Unclassified Bits

Interpretation of unclassified bits is performed in the same fashion as interpretation of classified bits, with the following exceptions;

- any interpretation is possible in NORA/FRANZ;
- only an M is used as alarm class in MELD;
- status displays in NORA/FRANZ can be 16 bits wide.

6.4 Configuration Notes

Since **all** classified bits are part of the status word of an MKS block, NORA representations for an MKS block must be designed and utilized such that correct process monitoring and operator guidance is possible.
If, for example, an MKS block with NORA representation 1 and classified bits were inserted into a process display, the associated area message field would start blinking, and no related message could be found in the subordinate process displays.

An MKS block is acknowledged only after **all** classified bits and **all** bits requiring acknowledgement have been acknowledged.
An S in the area overview remains blinking, for example, if an alarm-classified message is pending after all fault-classified bits have been acknowledged.

These restrictions yield several points which must be observed during configuration:

- MKS blocks may not be used across several areas. Do not use more than one alarm class per MKS block.

  Reason: If blocks are used across several areas, the alarm does not stop flashing in the area in which all bits have been acknowledged because some bits are still unacknowledged in other areas.
  If more than one alarm class is used in an MKS block (e.g. A and W) both a W and an A is displayed in the overview although there is just an alarm or a warning.

- All classified bits of an MKS block must be interpreted if the area display contains an MKS block which is to be ORed. (If a classified bit is not interpreted, it remains blinking after it has been acknowledged.)
- MKS blocks must be configured in groups if not all classified bits are interpreted in the NORA representation of an MKS block.
- MKS control fields classified in FRANZ and used to collect for MELD must be stored in their own process display.
- The NORA representation 1 of the MKS block must not be classified.

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7 Alarm Sequence Display (MELD)

The alarm sequence display is used for acquiring, displaying and logging alarms, which occur during the operating phase, in chronological order (cf. Chapter 2.5, Operating Phase).

Appearing alarms are derived from status and MKS messages and sorted according to the areas.

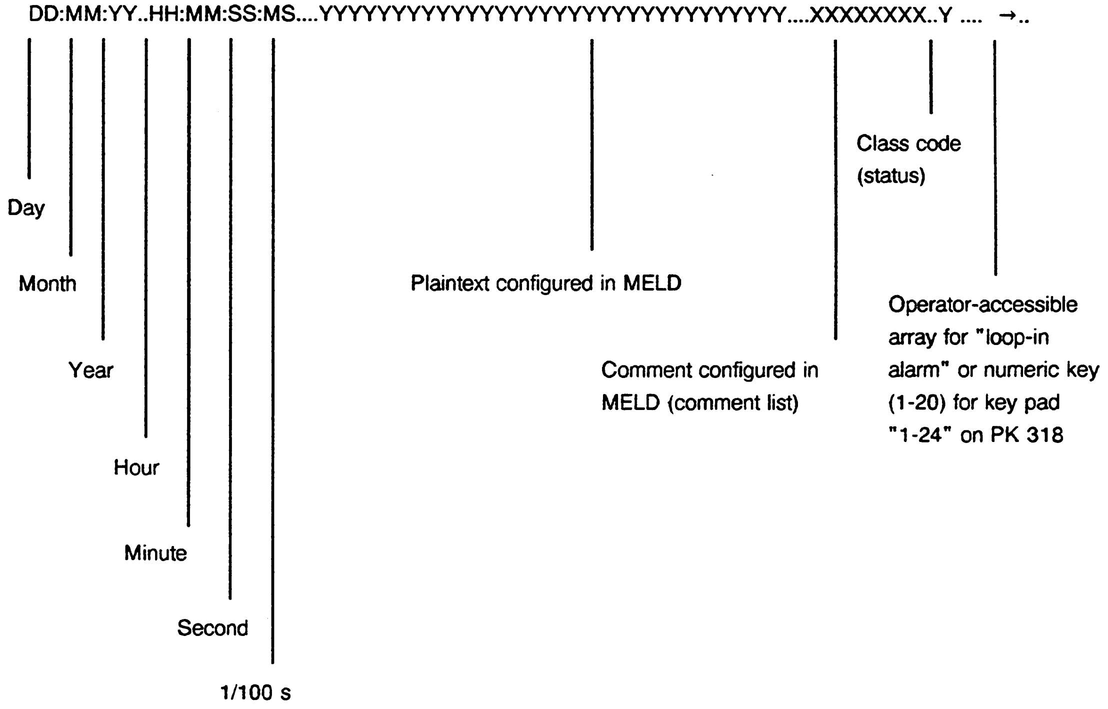
An alarm message consists of

- time from the AS (hours, minutes, seconds in a status message; in addition 1/100 seconds in MKS);
- date form the OS (day, month, year);
- S16 string from the automation system; a freely configurable string is output in an MKS alarm instead of the S16 string;
- message text (a freely configurable 16-character string);
- comment (8-character string);
- class: code A, W, F, M, S, B (blinking if the alarm has not been acknowledged, steady if the alarm has been acknowledged).

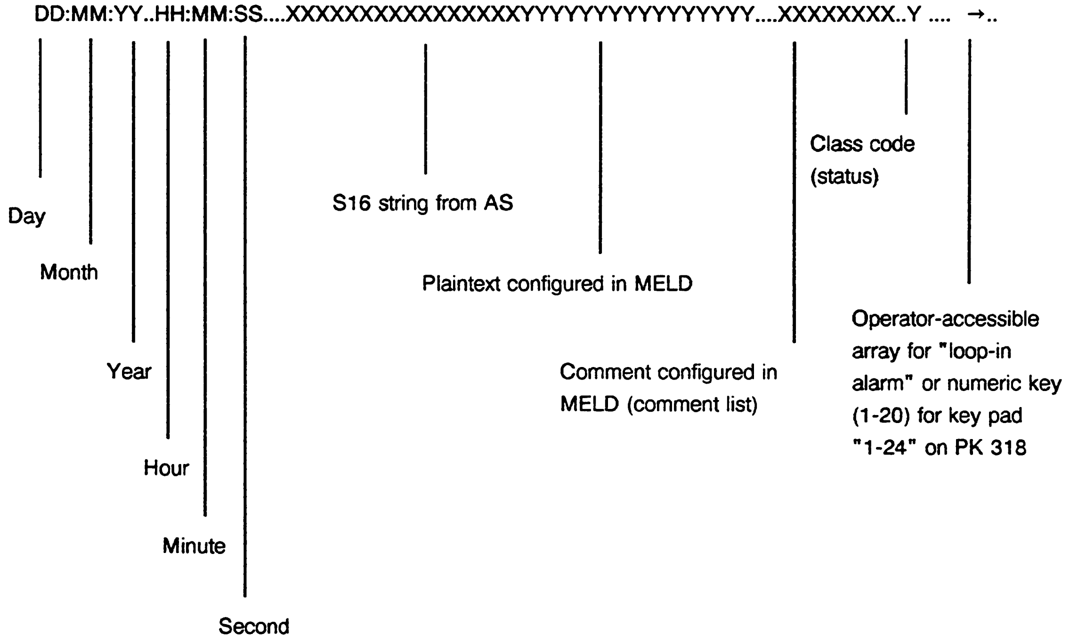
A : alarm
W : warning
F : fault
M : message
S : malfunction
B : service request

	Message text	Comment	Class code
Alarm appearing Alarm acknowledged Alarm disappearing	black on green black on green black on green	black on green black on green black on white	blinking steady steady
Alarm appearing Alarm disappearing Alarm acknowledged	black on green black on green black on green	black on green black on white black on white	blinking blinking steady

- Alarm message structure of an MKS block



- Alarm message structure of an operator-accessible block



7.1 MELD Form Dialog

Since the alarms (except MKS alarms) are obtained from the status words of the configured blocks (MKZ), the MELD function package is not configured before displays (NORA and/or FRANZ) have been created which contain variables from blocks which are also to be used in MELD.

The MELD configuration consists of three phases:

1. Modify/adjust the HIN comment lists
2. Collect alarms
3. Specify texts, HIN numbers and (for MKS messages) bit number in the alarm list.

The configured system overview is displayed once MELD DIALOG has been selected. Starting from this overview, all displays can be selected for MELD which are used for collecting MKZs. The image selector keys have the same function as in the operating phase.

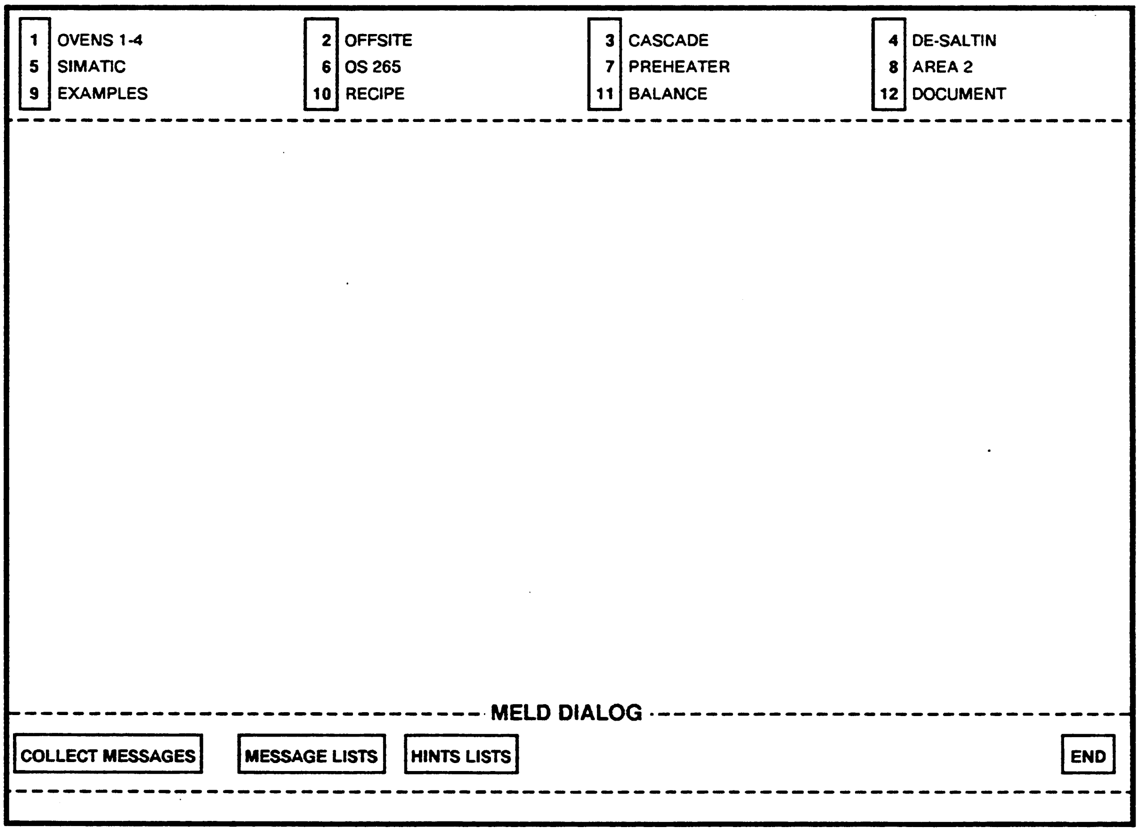
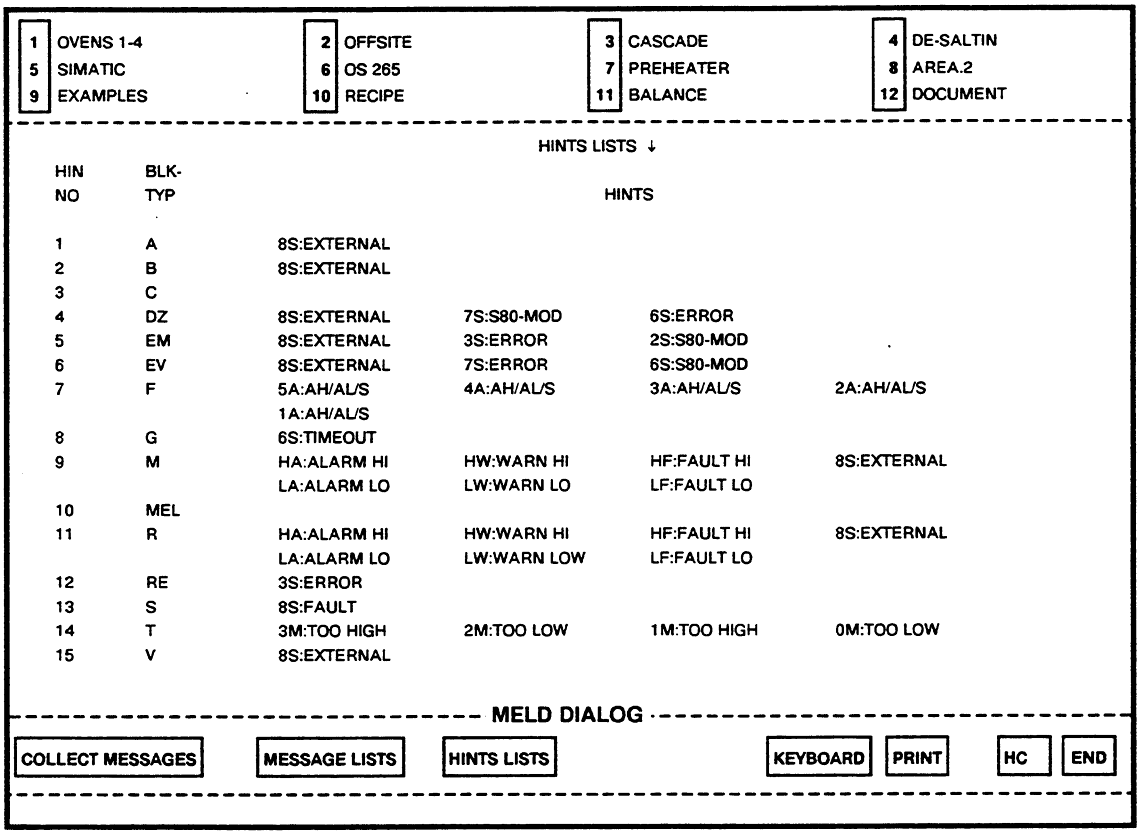


Fig. 7-1 Display after MELD - "COLLECT MESSAGES" (blinking) has been selected

7.1.1 Comment Configuration

Comment lists in MELD contain a collection of comments which is specific to the individual blocks (for example, the comments related to the R block: TOO HIGH, TOO LOW, HIGH, LOW, ENVIRONMENT).

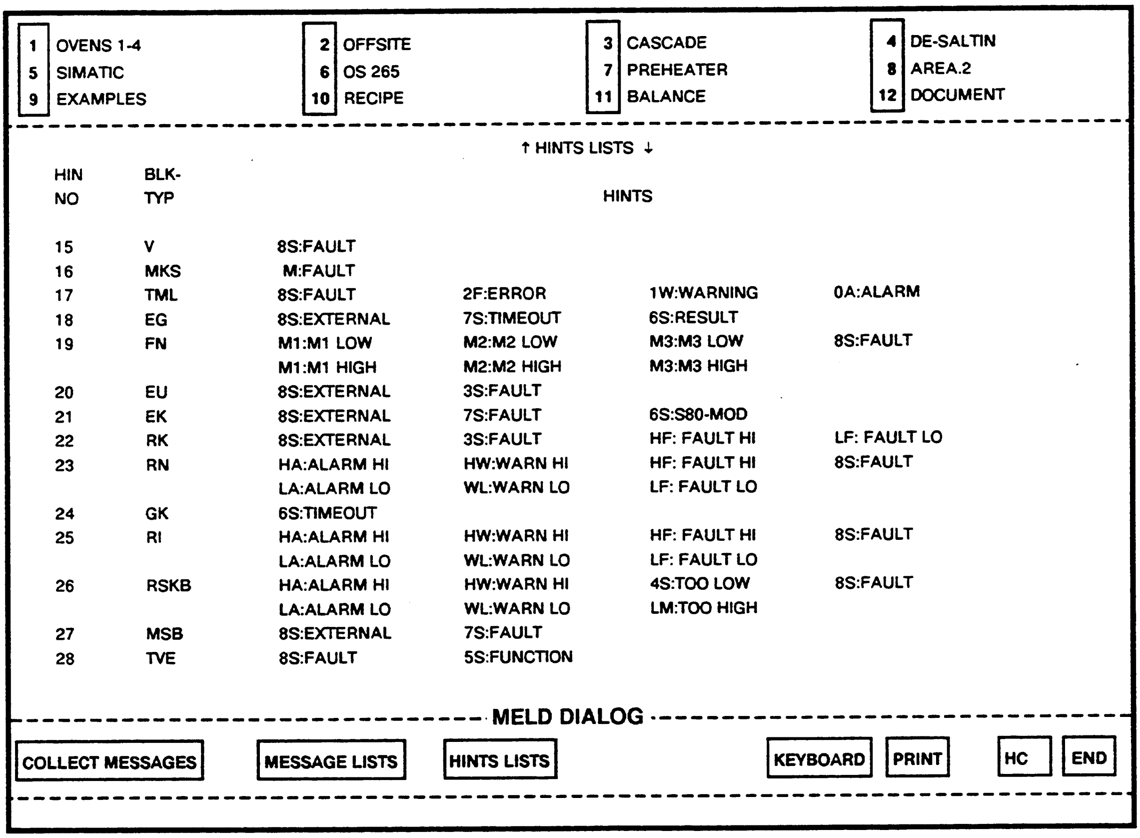
Comment list menu with default values



HINTS LISTS ↓

HIN NO	BLK-TYP	HINTS			
1	A	8S:EXTERNAL			
2	B	8S:EXTERNAL			
3	C				
4	DZ	8S:EXTERNAL	7S:S80-MOD	6S:ERROR	
5	EM	8S:EXTERNAL	3S:ERROR	2S:S80-MOD	
6	EV	8S:EXTERNAL	7S:ERROR	6S:S80-MOD	
7	F	5A:AH/AL/S 1A:AH/AL/S	4A:AH/AL/S	3A:AH/AL/S	2A:AH/AL/S
8	G	6S:TIMEOUT			
9	M	HA:ALARM HI LA:ALARM LO	HW:WARN HI LW:WARN LO	HF:FAULT HI LF:FAULT LO	8S:EXTERNAL
10	MEL				
11	R	HA:ALARM HI LA:ALARM LO	HW:WARN HI LW:WARN LOW	HF:FAULT HI LF:FAULT LO	8S:EXTERNAL
12	RE	3S:ERROR			
13	S	8S:FAULT			
14	T	3M:TOO HIGH	2M:TOO LOW	1M:TOO HIGH	0M:TOO LOW
15	V	8S:EXTERNAL			

Fig. 7-2 Display after MELD - HINT LISTS (HIN 1st page) has been selected

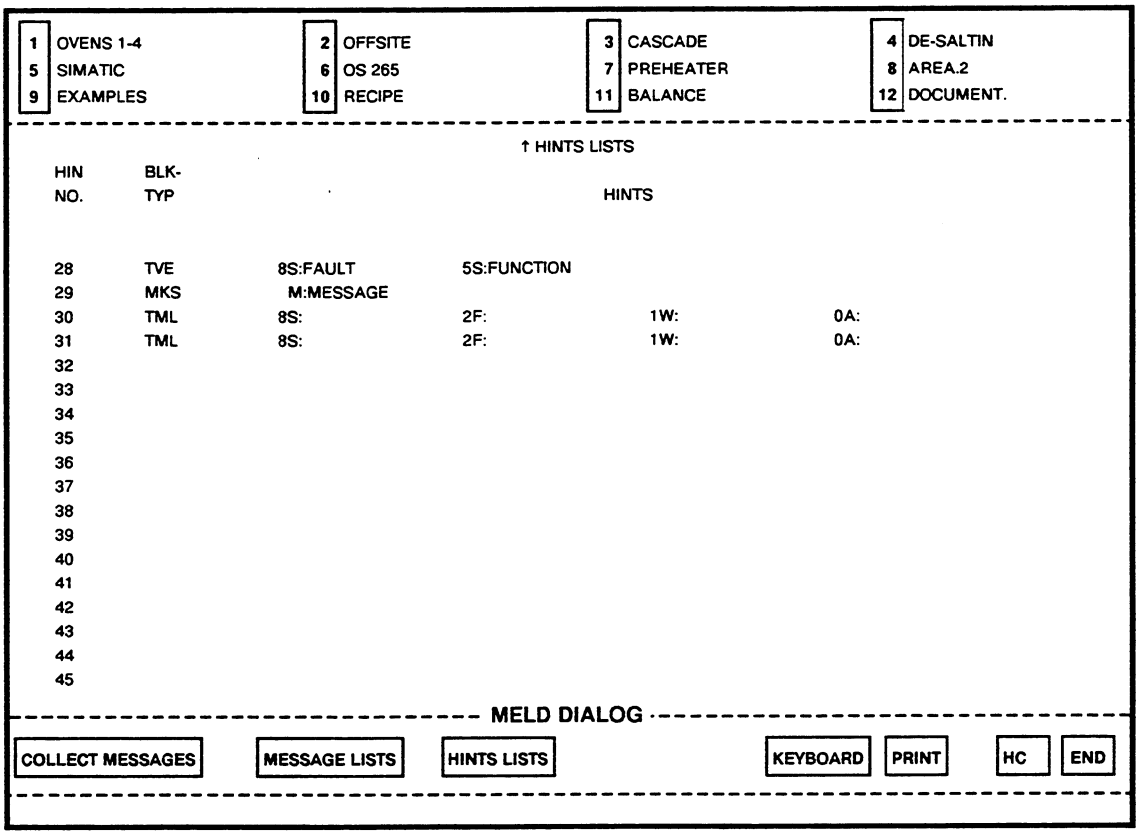


```
 1 OVENS 1-4          2 OFFSITE          3 CASCADE          4 DE-SALTIN
 5 SIMATIC            6 OS 265           7 PREHEATER        8 AREA.2
 9 EXAMPLES          10 RECIPE          11 BALANCE         12 DOCUMENT
---------------------------------------------------------------------------
                                ↑ HINTS LISTS ↓
  HIN     BLK-
  NO      TYP                               HINTS

  15      V       8S:FAULT
  16      MKS      M:FAULT
  17      TML     8S:FAULT       2F:ERROR       1W:WARNING     0A:ALARM
  18      EG      8S:EXTERNAL    7S:TIMEOUT     6S:RESULT
  19      FN      M1:M1 LOW      M2:M2 LOW      M3:M3 LOW      8S:FAULT
                  M1:M1 HIGH     M2:M2 HIGH     M3:M3 HIGH
  20      EU      8S:EXTERNAL    3S:FAULT
  21      EK      8S:EXTERNAL    7S:FAULT       6S:S80-MOD
  22      RK      8S:EXTERNAL    3S:FAULT       HF: FAULT HI   LF: FAULT LO
  23      RN      HA:ALARM HI    HW:WARN HI     HF: FAULT HI   8S:FAULT
                  LA:ALARM LO    WL:WARN LO     LF: FAULT LO
  24      GK      6S:TIMEOUT
  25      RI      HA:ALARM HI    HW:WARN HI     HF: FAULT HI   8S:FAULT
                  LA:ALARM LO    WL:WARN LO     LF: FAULT LO
  26      RSKB    HA:ALARM HI    HW:WARN HI     4S:TOO LOW     8S:FAULT
                  LA:ALARM LO    WL:WARN LO     LM:TOO HIGH
  27      MSB     8S:EXTERNAL    7S:FAULT
  28      TVE     8S:FAULT       5S:FUNCTION

------------------------------ MELD DIALOG --------------------------------
COLLECT MESSAGES   MESSAGE LISTS   HINTS LISTS      KEYBOARD  PRINT   HC  END
---------------------------------------------------------------------------
```

Fig. 7-3 Display after MELD - HINT LISTS (HIN 2nd page) has been selected



```
 1 OVENS 1-4            2 OFFSITE            3 CASCADE            4 DE-SALTIN
 5 SIMATIC              6 OS 265             7 PREHEATER          8 AREA.2
 9 EXAMPLES            10 RECIPE            11 BALANCE           12 DOCUMENT.
------------------------------------------------------------------------------
                                   ↑ HINTS LISTS
   HIN      BLK-
   NO.      TYP                                      HINTS


   28       TVE          8S:FAULT        5S:FUNCTION
   29       MKS           M:MESSAGE
   30       TML          8S:             2F:             1W:             0A:
   31       TML          8S:             2F:             1W:             0A:
   32
   33
   34
   35
   36
   37
   38
   39
   40
   41
   42
   43
   44
   45
------------------------------- MELD DIALOG -----------------------------------
COLLECT MESSAGES   MESSAGE LISTS   HINTS LISTS          KEYBOARD  PRINT   HC  END
------------------------------------------------------------------------------
```

Fig. 7-4 Display after MELD - HINT LISTS (HIN 3rd page) has been selected

The type MKS must first be assigned to a comment list by entering the type in a free type field. The comment list numbers are allocated in ascending order without leaving a gap; any block sequence is possible.

Up to 99 comment lists may be configured.

The assignment between comment list number and type remains fixed and cannot be changed.

The type-specific input fields are displayed after type assignment has been performed.

Example: 23 R HA:........ HW:......... HF:........ 8S:........
LA:........ LW:........ LF:.....

Type

No. Input field

The comment list containing type-specific comments can be configured afterwards.

Comment texts and default texts can be modified as required.

Scrolling through the comment lists is possible as more comment lists can be configured than can be displayed on the screen. Arrows appear at the top of the screen next to the HINTS LIST header if more comment lists have been configured than can be displayed. Selecting these keys scrolls the display forwards and backwards.

Comment lists **cannot** be deleted.

7.1.2 Collect Alarms

This key selects a mode for NORA or FRANZ which sends the MKZ of a loop to MELD every time this loop is selected. MELD performs area-specific collection of these alarms.

The display (the displayed section of large-size images) is selected in which the measuring point has been collected if the "loop-in alarm" version (operating phase 2.5.6) has been selected during the operating phase. If this display is a window, the display level number (large-size image section) is selected from which this window has been called.

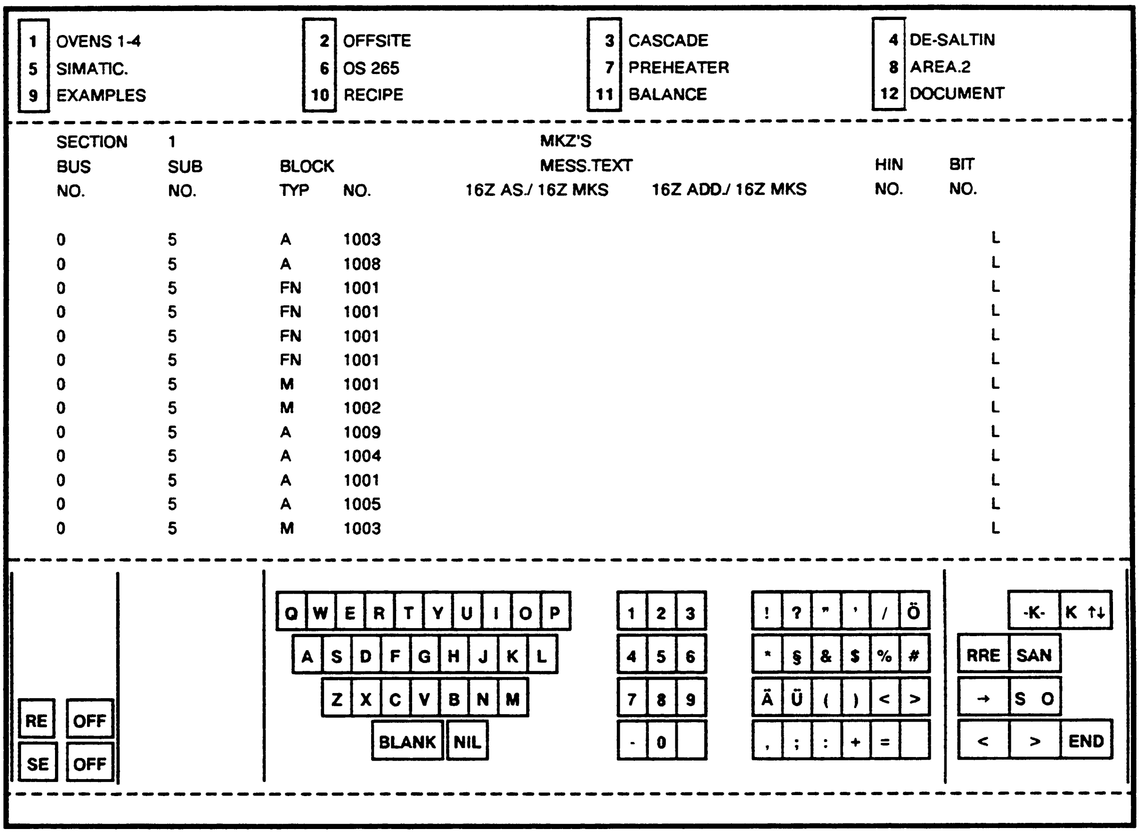
Note:

- MKZs cannot be selected in the 24th line of a FRANZ or NORA display.
- The function is exited and the collected MKZ deleted when the END key is selected. The MESSAGE LIST key must be selected if the collected MKZs are to be utilized in MELD. The previously collected messages are listed on the screen.
- If the display number of the process display is changed after an MKZ has been collected, the alarm must be collected again in MELD. The "loop-in alarm" function jumps to the wrong display if the "old" alarm has not been deleted first.
- AKS blocks do not have an S16 string. Since initialization would therefore take excessively long, they may not be collected in MELD.
- MKS control fields should be stored in their own process display for collecting purposes. Otherwise it may take up to 2 minutes to update the analog/status variables in the process displays in which the MKS control fields are installed.

7.1.3 Alarm Text Configuration

The collected alarms and the corresponding input fields are output for configuration. A scroll function is also available (as for the comment lists).

Alarm list form



1	OVENS 1-4	2	OFFSITE	3	CASCADE	4	DE-SALTIN
5	SIMATIC.	6	OS 265	7	PREHEATER	8	AREA.2
9	EXAMPLES	10	RECIPE	11	BALANCE	12	DOCUMENT

SECTION 1

BUS NO.	SUB NO.	BLOCK TYP	NO.	MKZ'S MESS.TEXT 16Z AS./ 16Z MKS	16Z ADD./ 16Z MKS	HIN NO.	BIT NO.
0	5	A	1003				L
0	5	A	1008				L
0	5	FN	1001				L
0	5	FN	1001				L
0	5	FN	1001				L
0	5	FN	1001				L
0	5	M	1001				L
0	5	M	1002				L
0	5	A	1009				L
0	5	A	1004				L
0	5	A	1001				L
0	5	A	1005				L
0	5	M	1003				L

Fig. 7-5 Display after MELD MESSAGE LIST KEYBOARD has been selected

Area 1 or the last area in which the function "collect alarms" has been activated is output automatically when the MESSAGE LIST function is selected. Any different area must be selected in the usual manner.

Alarm text (auxiliary text) and comment list number can be added to the collected alarms (MKZ). Auxiliary text and HIN number can be modified as required. The HIN number is checked for plausibility.

The first MKZ with a missing HIN number is displayed first if the selected alarm list contains MKZs which have not yet been configured completely.

- **Text configuration for operator-accessible blocks**

  1. Auxiliary text - up to 16 freely configurable characters
  2. HIN number specification.

The default value is entered in the operating phase if a value has not been entered.

- **Text configuration for MKS alarms**

1. Double - if several bits of an MKS block are to be provided with an alarm text.
2. Alarm text - up to 32 freely configurable characters

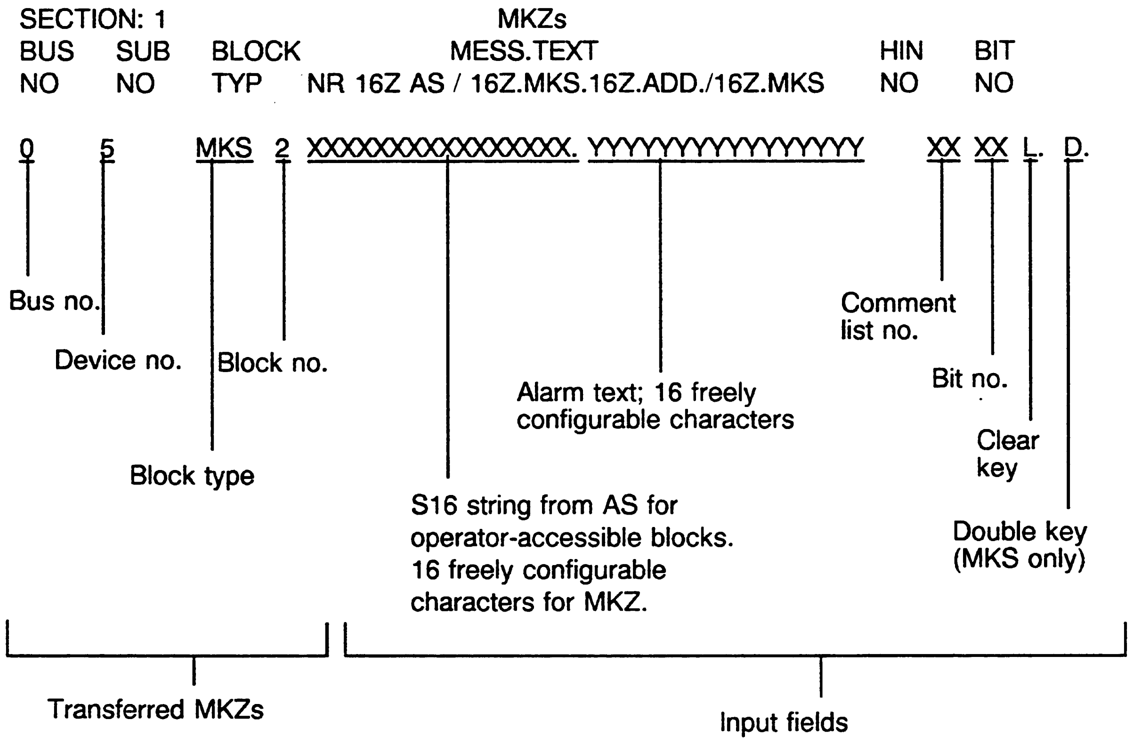
3. Specification of HIN number.

4. Specification of bit number.

The message MKS-BIT NOT DESIGNED is displayed in the operating phase if one (or several) MKS bit(s) from a received message cannot be allocated.

Note: The same bit number for an MKS block cannot be configured in several areas and "NN" is output as bit No.

Text configuration



```
SECTION: 1                    MKZs
BUS  SUB  BLOCK             MESS.TEXT                          HIN  BIT
NO   NO   TYP   NR 16Z AS / 16Z.MKS.16Z.ADD./16Z.MKS           NO   NO

0    5    MKS  2 XXXXXXXXXXXXXXXX. YYYYYYYYYYYYYYYY            XX XX L. D.
```

7.1.4 General Keys

KEYBOARD	Request for the virtual menu field.
HC, PRINTER	Video or printer hard copy

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8 KURV Design

8.1 Procedure

KURV is configured in the design phase after configuration of FRANZ/NORA has been terminated. Measuring points in FRANZ/NORA displays are selected during configuration and combined to individual curve groups. Curve parameters (such as name, type, unit, display range) and group parameters (such as display cycle, curve field type and group number) must also be entered. Repeated selection enables a measuring point to be displayed in several curves and different amplitude scales.

It can also be defined whether specific curve groups are to be filed onto the hard disk. Individual data items can be corrected, deleted or logged once configuration has been terminated. At the end of the design phase, the lists can be stored on the hard disk. If KURV has already been designed, data can be modified when data is read after the design phase has been initiated. This means that new groups can be added or existing KURV data be modified.

Data input is performed in a dialog using either an alphanumeric keyboard or a light pen for selecting function keys (keys initiating a specific function when they are touched with the light pen) or the DIAVID menu field in FRANZ.

The exact procedures of this design dialog are described in Chapter 8.4.

8.1.1 Curve Group Configuration

A maximum of 6 measuring points are combined during curve group configuration. Selecting the measuring points in the FRANZ/NORA displays provides allocation between the measuring points and the curve. A dialog identification number between 1 and 6 is assigned to each curve. The first selected measuring point is then allocated to curve 1, the second point to curve 2, etc. As a standard feature, each curve can be distinguished in the representation on the monitor by a separate colour.

Group data is entered after the curves have been grouped together. Group data consists of:
- group field number
- curve field type
- storage cycle
- filing on hard disk

The data for each of the 6 possible curves is configured next.

This curve data consists of:
- name, type and unit of the measuring point
- transfer type of the measuring point
- acquisition cycle
- display range
- data reduction type

The exact input sequence is described in Chapter 8.4.

Three different types of curve groups must be distinguished during design: assigned curve groups (G) which are configured in the design phase and the free curve groups (FG) and special curve groups (SG) which can be configured in the operating phase.

- **Assigned curve groups (G)**

Assigned curve groups are composed in the design phase. Modifications during the operating phase are not possible. A number between 1 and 9999 can be assigned as a group number. As only a maximum of 1000 curve groups can be configured, this permits a certain group structure to be established.

The maximum number of curves is 2000. Assigned curve groups can be filed onto the hard disk.

- **Free curve groups (FG)**

Assigned curve groups cannot be changed in the operating phase. As it is sometimes useful for test purposes to modify measuring point evaluation, 16 curve groups can be composed according to requirements. These groups are called free curve groups (FG0 to FG15).

Except for the fact that the unassigned curve group is configured in the operating phase, configuration is performed in the same manner as for the assigned curve groups.

Since less space is provided in the operating phase, special key sets are used for input. Acquisition and storage of measured values begins after configuration has been terminated. Operator input and selection have the same priority as for assigned curve groups. The history of the unassigned curve group is maintained in the main memory only.

- **Special curve groups (SG)**

Special curve groups are composed of curves belonging to the assigned curve groups. Yet there is one limitation: All curves of one SG must have the same storage cycle.

In special curve groups, curves can be displayed together with their history in the main memory, short-term memory and long-term memory.

With special curve groups, you can access historical values preceding the creation date.

The configuring start is similar to that of free curve groups.

8.1.1.1 Definition of the Curve Groups to be Filed

The designer defines during configuration of the assigned curve groups whether or not the values of these groups are to be filed on hard disk. Long-term filing of the curve values on the hard disk is possible. These filing data can also be saved on magnetic tape cassette. Filed values can be re-displayed for control purposes, for example.

Filing data saved on magnetic tape cassette can be copied to the hard disk and are thus available to be displayed.

8.1.1.2 Name, Type and Unit

In order to be able to quickly identify measuring points during representation in the operating phase, they are provided with a measuring point name, a type and a unit during configuration. The name may consist of up to 10, the type of 2 and the unit of 6 characters.

8.1.1.3 Transfer of Measured Values

AKS messages are the preferred method for transferring measured values from the automation systems (AS) to the OS KURV system. Fetch messages must be used for reading measuring points which are not contained in an AKS message. The contents of AKS messages and the necessary fetch jobs are stored in the KURV lists.

- **AKS messages**

A measured value from an automation system can only be transferred by an AKS message after an AKS block has be defined in the AS, incorporated in a processing block (XB) and interconnected with the required inputs and outputs of the blocks to be displayed.

KURV configuration in the design phase requires a corresponding MKZ to be selected in the FRANZ/NORA system displays. The corresponding AKS block number must be specified as message number and the corresponding location number in the AKS block as location when the message definition is requested (Chapter 8.4.4.3). A "repetition rate" is also requested during message definition. This repetition rate should be identical to the execution time of the XB block which includes the AKS block. The next shorter time value possible should be entered if this rate cannot be entered by the condition specified in Chapter 8.4.4.3.

If measured values from different automation systems are to be transferred via AKS messages, a number of AKS blocks must be defined in each automation system which corresponds to the number of measured values to be transferred.

It is possible to define an AKS block 1 in AS1 and an AKS block 1 in AS2. Only AKS 1, the related location and the repetition rate are to be specified together with the corresponding MKZs in KURV design. Using the MKZ bus and device number, KURV can assign the AKS messages from the AS correctly

Note:
Receive blocks for AKS messages transferred from the AS need not be specified in KURV. KURV provides for a correct reception and interpretation of the messages.

The following examples provide some useful information regarding KURV design in the OS and the necessary requirements in the automation system. The examples are strongly simplified and only represent a section of the parts concerned.

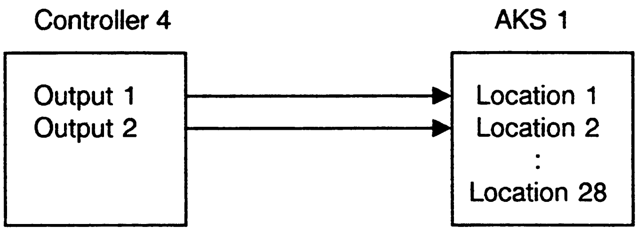
Configuration example

Data in an automation system:

Block sequence

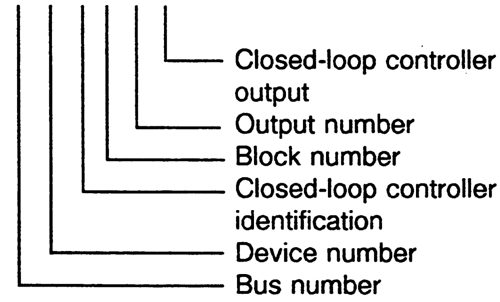
	:	
	:	
XB	1	Processing block 1 with 1-second processing cycle
AKS	1	AKS block 1
	:	
	:	
XB	n	Processing block n with 0.5-second processing cycle
R	4	Closed-loop controller 4
	:	
	:	

Block interconnection in the automation system



Configuration in the OS by KURV

Design dialog
:
:
MKZ definition : MKZ 0. 1. R. 4. 1. A.

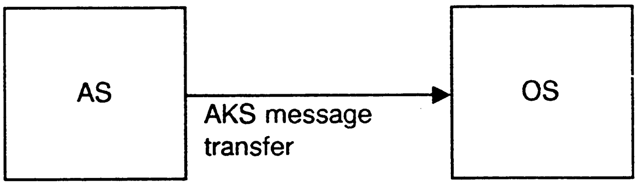


:
:
:
:
:
:
:
Acquisition cycle : 4s
:
Message definition input

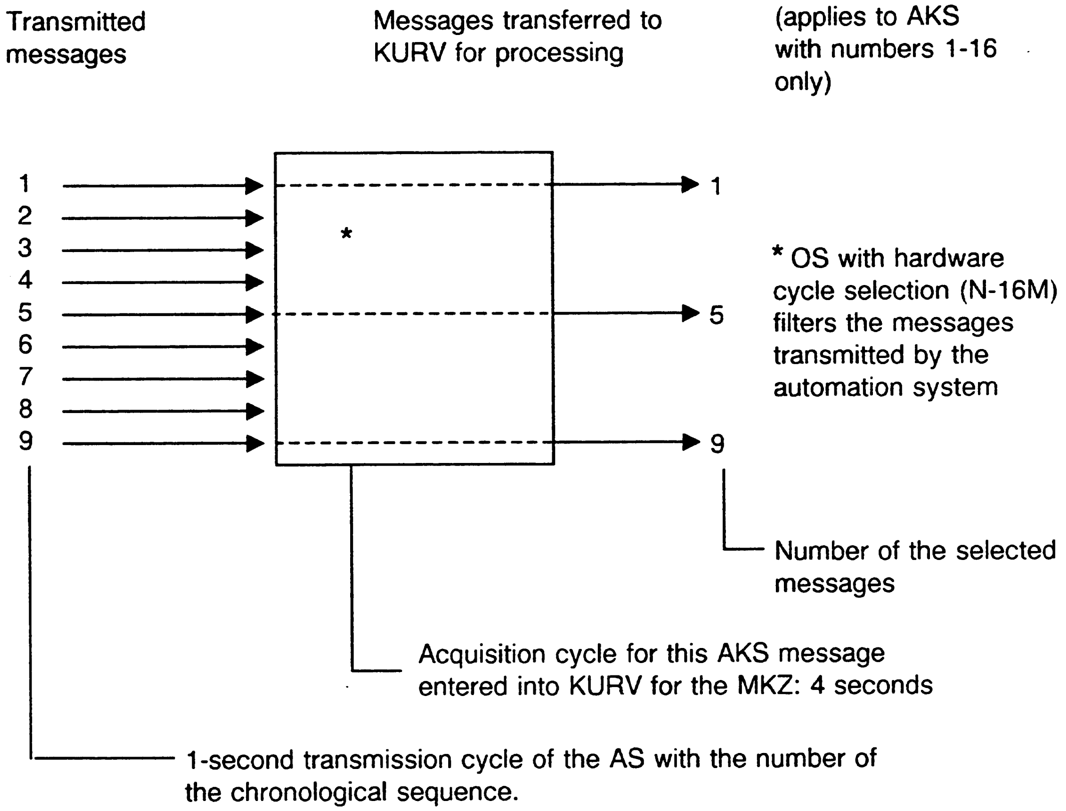
- AKS number : 1
- Location number : 1
- Repetition time : 1s

(KURV accepts bus and device number from the MKZ).

Processing during the operating phase:



Processing of received AKS messages:



* OS with hardware cycle selection (N-16M) filters the messages transmitted by the automation system

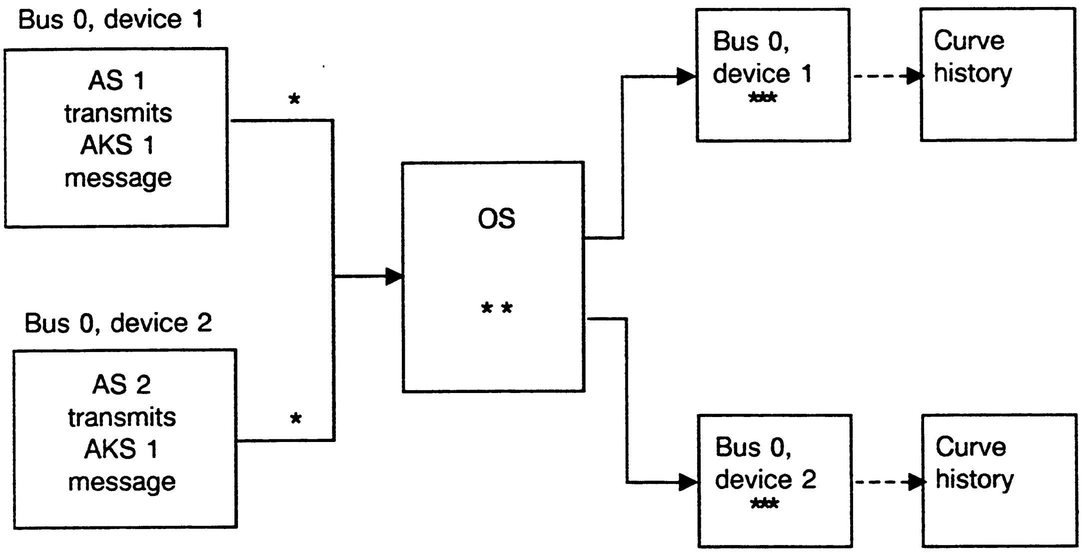
Number of the selected messages

Acquisition cycle for this AKS message entered into KURV for the MKZ: 4 seconds

1-second transmission cycle of the AS with the number of the chronological sequence.

Every fourth AKS message is only acquired if a repetition time of 1 second and an acquisition cycle of 4 seconds have been selected.

Processing of two AKS messages from two AKS with AKS number 1 and acceptance of the values into the curve history:



* AKS message transfer with bus and device number.

** The AKS message receiver block in KURV receives and distributes the AKS messages (defined by MKZ configuration in the design phase).

*** The distributed messages are processed according to the configuration and allocated to the curves.

- **Fetch messages**

In addition to measured value transfer from the AS to the OS via AKS messages, fetch messages can be used for requesting the values.

For this purpose, a request message is sent to the AS during the on-line phase shortly before the measured value is required by KURV in the OS for acquisition. The AS then sends a reply message, which contains the desired value, to the OS.

Only measured values which can be operated in NORA/FRANZ can be retrieved by fetch messages.

A maximum of 50 fetch messages can be managed by KURV. One fetch message can retrieve a maximum of 28 measured values, which must be from the same device and have an identical request cycle.

CPU and bus load are higher if fetch messages are used than in the case of AKS messages. This only applies to values acquired in cycles smaller than 1 minute.

If, during initialization into the operating phase, the system communicates with a partner (e.g. AS) and realizes that a configured MKZ cannot be found, the entire fetch message configured during the design phase will not be processed. The values of all curves related to the measured values required in the message will be missing.

Note:
It is possible during phases of "high load" that KURV cannot perform the activities required for transmitting request messages. This means that values are not requested from the automation systems and failures are thus acquired.

8.1.1.4 Display Range

In order to display measured values from different measuring points in a curve field and to adjust the amplitudes of these curves to each other, a display range is defined for each curve during configuration. This range consists of an upper and a lower value for representation in the operating phase.

In order to save space, this configured display range is used for converting the real measured values into integer point co-ordinate values. Since each measured value occupies 2 words = 4 bytes in the original floating point representation but only 1 byte as byte-structured co-ordinate, a reduction of 75% can be achieved. Conversion is performed according to the formula:

$$MVB = (MVG - LOL) * FACTOR$$

with

FACTOR = 1 / (UPL-LOL)
MVB : measured value in byte structure, $0 \leq MWB \leq 250$
MVG : measured value as floating point figure

LOL and UPL are the lower and upper display range, respectively. The other values are reserved for special applications:

251	:	MV<LOL	Measured value smaller than lower display range
252	:	MV>UPL	Measured value greater than upper display range
253	:	INVLD	Invalid measured value
254	:	??????	Value not yet stored
255	:	ABSENT	Failed measured value

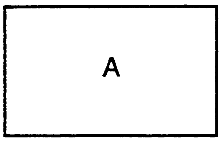
Note:
The maximum deviation between the curve values stored in the history data and the actual measured values caused by this conversion in the operating phase is ± 1/250 of the display range.

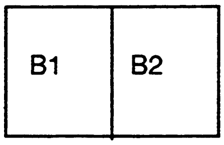
8.1.1.5 Curve Field Types and Annotation Field

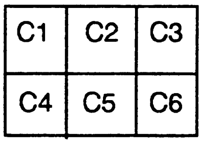
The screen is subdivided into curve fields which always occupy the same screen area when curve groups are displayed. Each curve field can contain a curve group. The curve fields are distinguished by their size and location:

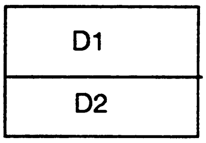
- Type A : fills the entire screen
- Type B : fills half the screen
- Type C : fills 1/6 of the screen
- Type D: fills half the screen

The location (for B and C) is defined by figures:









During configuration, a fixed curve field type is allocated to each curve group. When a curve group is selected it is therefore automatically displayed in the proper curve field. Several curve groups can be displayed at the same time, provided their curve fields do not overlap.

Examples:
No overlapping: C1,C3,C5,C6 or B1,C3,C6 or D1, C4, C5, C6
Overlapping: A1,C1 or B1,C3,C4 or D2, B1

If the field of a newly selected group overlaps, all displayed groups are cleared from the screen and the selected group is then displayed. Screen areas which are not occupied by a curve group show the FRANZ or NORA plant displays or windows (windows cover curve fields).

Each curve field consists of an annotation field with the curve parameters, and a co-ordinate field in which the curves are represented (Fig. 8.1).

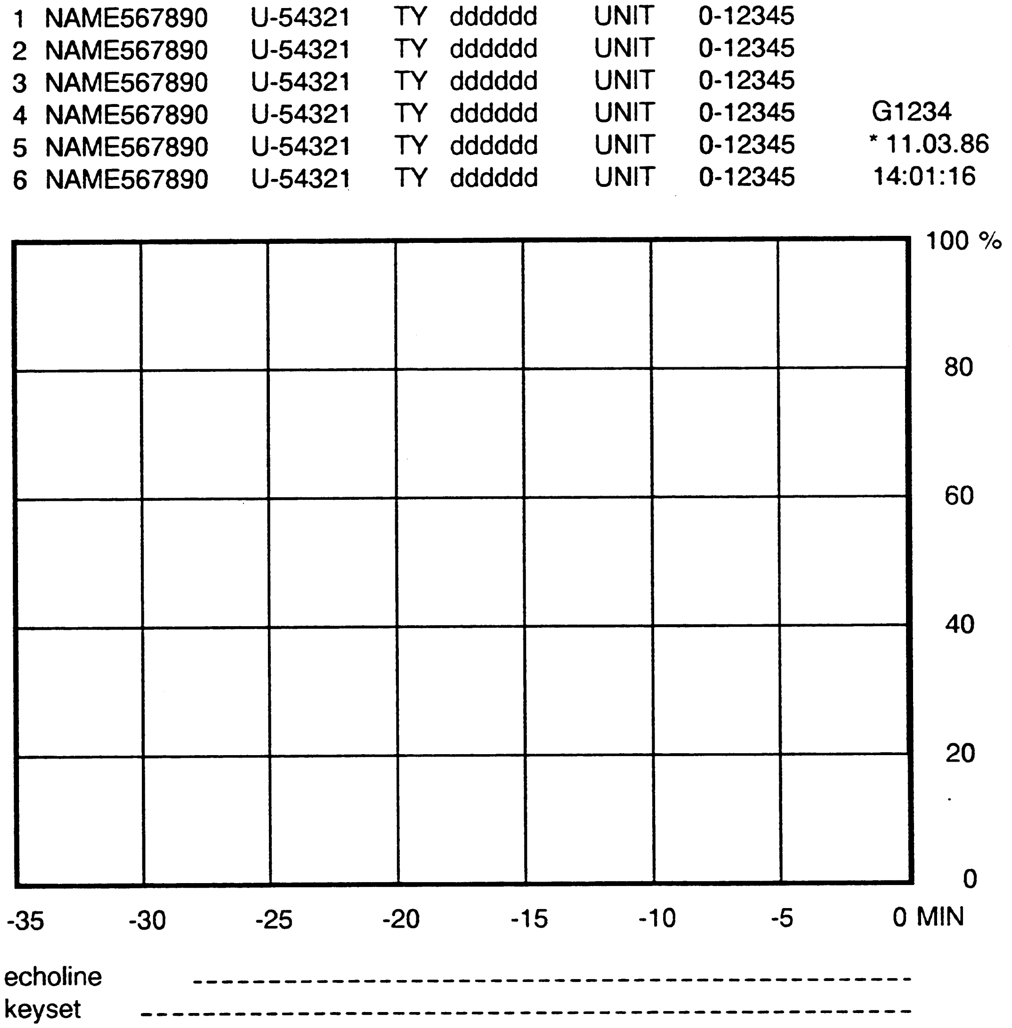
The co-ordinate field contains a co-ordinate system consisting of time and amplitude axis. The curves are displayed horizontally, i.e. the time axis is the x axis and the amplitude axis is the y axis. The amplitude axis is provided with per cent values. The time values displayed on the time scales refer to the date/time field in the curve field. Possible units are S (for seconds), M (for minutes), HR (for hours) and D (for days).

The curve values displayed in the curve field (Chapter 8.1.1.7) are updated on the right-hand side. This means that the most recent values (time 0) appear on the right-hand side and that the older values (history) are shifted to the left (time <0).

Size and contents of the annotation field and the number of represented curves depend on the curve field size (Fig. 8.1). Field types A, B and D permit the display of up to six curves in a curve group; field type C is limited to only two curves (curve 1 and curve 2). Depending on the curve field size, the annotation field shows the specified curve parameters, the group number, the axis annotation as well as date, time and measured value (in digital representation) of the last storage as well as the storage cycle of the group.

The time value refers to the curve value on the extreme right-hand if the curve display has been selected by date/time or by scrolling in the curve history.

It should be noted that an inaccuracy of ± 1/250 of the display range is possible between the digital representation of the displayed measured value and the value in AS or FRANZ/NORA. (Chapter 8.1.1.4).



```
1 NAME567890   U-54321   TY  dddddd    UNIT   0-12345
2 NAME567890   U-54321   TY  dddddd    UNIT   0-12345
3 NAME567890   U-54321   TY  dddddd    UNIT   0-12345
4 NAME567890   U-54321   TY  dddddd    UNIT   0-12345     G1234
5 NAME567890   U-54321   TY  dddddd    UNIT   0-12345     * 11.03.86
6 NAME567890   U-54321   TY  dddddd    UNIT   0-12345     14:01:16
```

```
echoline   ---------------------------------------------
keyset   ------------------------------------------------
```

Fig. 8-1 Part 1: Curve field type A structure

Explanations:

1) Curve field

Horizontal display	: 480 curve points
Vertical display	: 186 curve points Grid line with % indication of the display range Grid line curve history for moment
-35 -30..	: Time reference in the curve field (results from storage cycle times number of curve points)
MIN	: Time scale unit

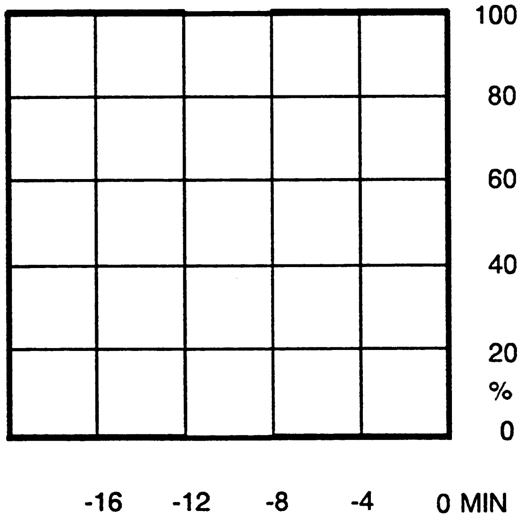
2) Annotation field

All curve-related specifications are displayed in green; the binary value is displayed in the configured curve colour.

1 : Curve number
NAME567890 : MKZ name
TY : MKZ type
U-54321 : Lower display range
O-12345 : Upper display range
dddddd : Binary value of the curve value displayed on the right-hand side
UNIT : MKZ unit
G1234 : Curve group number
5s : Storage cycle
* : Code of a time interval which exists twice in the curve field
11.03.86 : Date of the time displayed to the right
14:01:16 : Time of the time displayed to the right

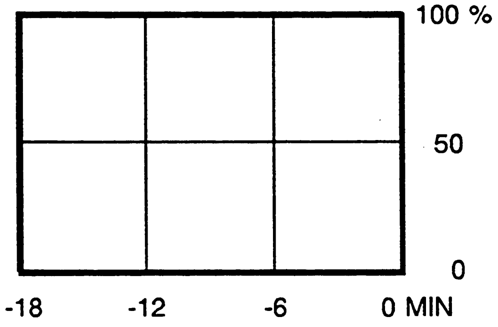
Curve field type B1

1 NAME567890 TY   2 NAME567890 TY
3 NAME567890 TY   4 NAME567890 TY
5 NAME567890 TY   6 NAME567890 TY
G 2000
U-12345 O 12345   4s   11.03.86
2 12345 UNIT   14:01:16



Curve field type C6

1 NAME567890 TY
2 NAME567890 TY   G 3000
U-100.0 0 100.0   11. 03. 86
1 6.398 UNIT 6s   14: 01: 18



echo line --
key set --

Fig. 8-1 Part 2: Curve field types B and C

1	NAME123456	U-54321	TY	dddddd	UNIT	0-12345	
2	NAME123456	U-54321	TY	dddddd	UNIT	0-12345	
3	NAME123456	U-54321	TY	dddddd	UNIT	0-12345	G1234
4	NAME123456	U-54321	TY	dddddd	UNIT	0-12345	2s
5	NAME123456	U-54321	TY	dddddd	UNIT	0-12345	04.12.92
6	NAME123456	U-54321	TY	dddddd	UNIT	0-12345	13:52:30

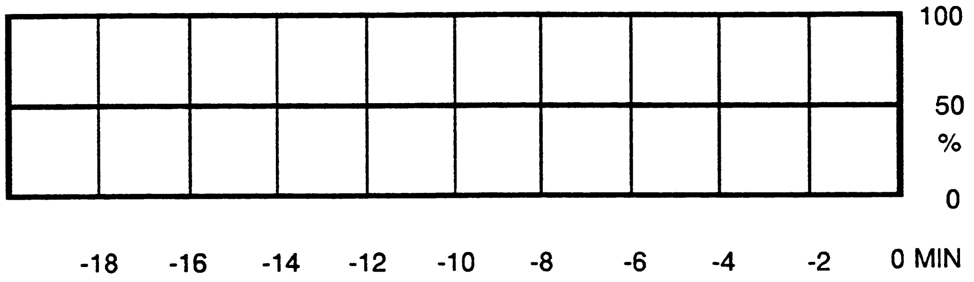


Fig. 8-1 Part 3: Curve field type D

Explanation : See curve field type A

Exceptions:

Only display range, binary value and unit of the active curve are displayed.

		Type B	Type C	Type D
Horizontal display	:	270 points	180 points	594 points
Vertical display	:	186 points	71 points	95 points

8.1.1.6 Curve History

The stored measured values (Chapter 8.1.1.8) form the curve history. The history enables older curve points to be displayed when a curve group is selected.

An approximate value for the history length in the main memory (Chapter 8.4.5.4) can be entered during configuration. The system does not necessarily keep to this value; the actual value is defined during ONLINE restart. The available main memory space is allocated according to the ratio of the approximate history values (Chapter 8.3.1).

The history length of curve groups filed on hard disk consists of the values in the file and in the main memory. The number of file values is defined by the period of filing which has already been performed.

For fixed curve groups (Chapter 8.1.1), storing the history begins with the ONLINE initialization; free curve groups (Chapter 8.1.1) start history storage when their creation process is terminated.

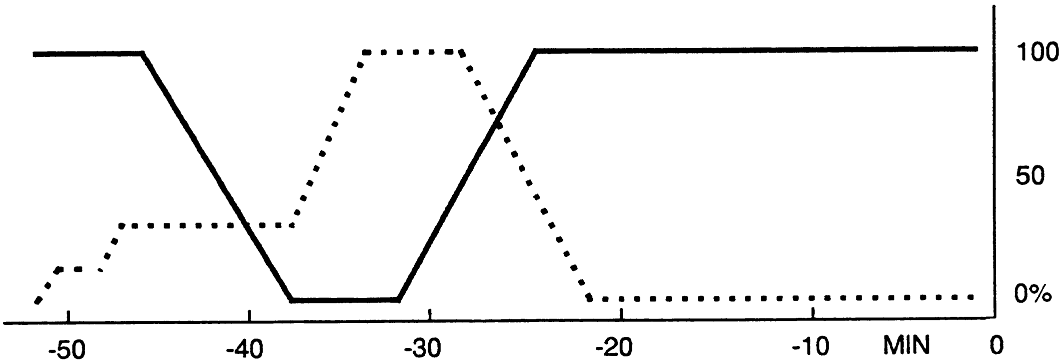
8.1.1.7 Updating

The curve group is updated in the storage cycle once it has been displayed (annotation field, axes, history). This means that a new measured value which is to be displayed enters the curve display from the right. Older measured values are shifted to the left and the new measured value is displayed at the extreme right (Fig. 8-2).

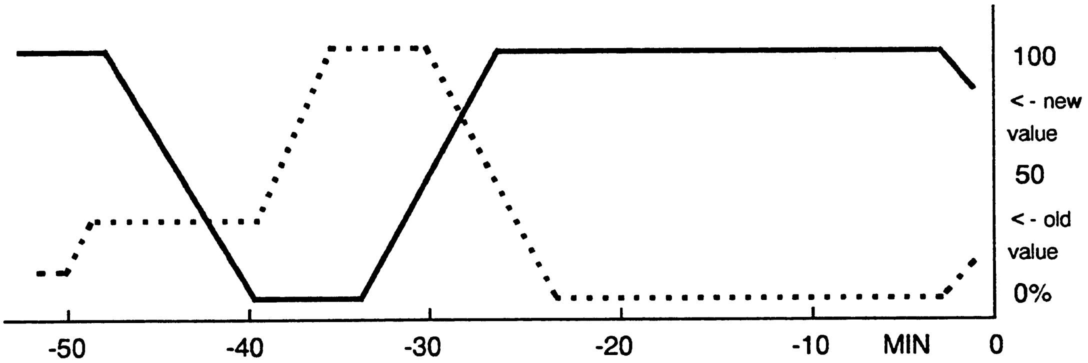
Specific entries (e.g. stopping updating by operator input) stop updating for a certain period of time. The curves then remain in position and may be investigated. Storage of the curve history (Chapter 8.1.1.6), however, continues. When the operator enters the continuation command (or end of hard copy printout), the history data collected in the meantime is output.

Two curves have been configured in the displayed group.
Display cycle = 4s
Curve 1 : —
Curve 2 : - - -

a) Situation at t = 16.10.00 hours



b) Situation at t = 16.10.08 hours



c) Situation at t = 16.10.16 hours

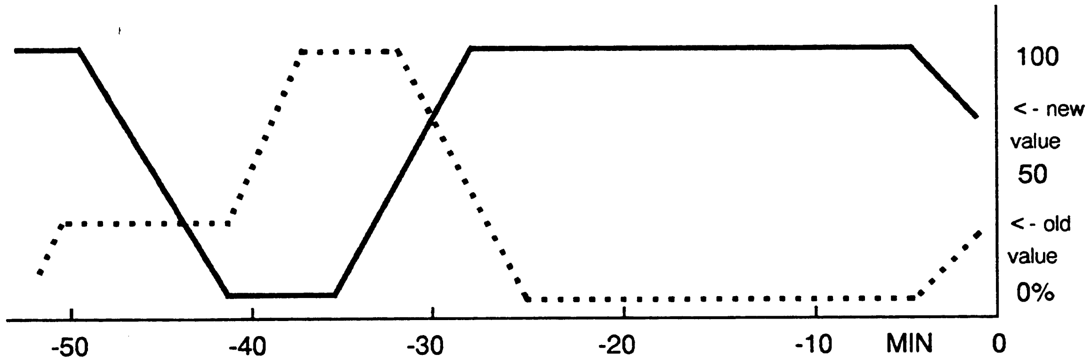


Fig. 8-2 Example of updating process

8.1.1.8 Cycle Processing

The KURV system uses the acquisition and storage cycle for synchronizing and controlling acquisition, storage and updating (Chapter 8.1.1.7). These cycles specify when the corresponding activities are to be performed.

Acquisition and storage cycle are defined in the design phase for each curve or curve group. All cycles start at 0 hours and must be integer factors of a day = 24 hours = 1440 minutes = 86400 seconds in order to prevent overlapping.

The cycle length is limited to 12 hours = 720 minutes = 43200 seconds. A maximum of 15 different cycle time values for the assigned curve groups and one time value for the unassigned curve group can be stored in the system.

- **Acquisition cycle**

When designing a curve, the user defines the acquisition cycle, which specifies whether the KURV system processes (acquires) a measuring signal applied via an AKS message or a fetch job for reading a measuring point is transferred. All acquisition are active at midnight (0 o'clock). After this time, an acquisition becomes active when the time is an integer multiple of the related cycle.

- **Storage cycle**

When configuring a group, the designer defines the display cycle and thus the storage cycle. The storage cycle defines the updating time intervals (i.e. when a point is added to each curve) for the curves of this group (Chapter 8.1.1.7). These points are stored at the same time in the history data (Chapter 8.1.16).

The following combinations between storage and acquisition cycle are possible:

- Acquisition cycle < storage cycle:
  Several measured values are waiting to be displayed; a data reduction is performed (if configured) or the last value to have been acquired is displayed (Chapter 8.1.1.9).

- Acquisition cycle = storage cycle:
  Exactly one measured value is waiting to be displayed, and is displayed.

- Acquisition cycle > storage cycle:
  This combination is not accepted by KURV

8.1.1.9 Data Reduction

If an acquisition cycle has been configured which is shorter than the group storage cycle, several measured values are acquired in each storage cycle (= interval between two storage processes). The designer can configure the data reduction type and define which value is to be used for storage and/or curve updating. One of four possible options can be selected in this process:

- **No reduction**

The measured values are acquired in current acquisition cycles. The last value to have been acquired overwrites the previous value. The last value to have been acquired is always displayed in the current storage cycle.

If a valid value has not been acquired in the last storage cycle (MV<LOL, MV>UPL, no measured value), a message appears in the annotation field and a curve point is output (the curve is shifted to the left, however).

A curve point is issued at 0% if MV<LOL or no/an invalid measured value has been acquired; MV>UPL yields a curve point at 100%.

- **Minimum reduction**

The smallest of the values acquired during a storage cycle is stored. Illegal values do not influence the minimum definition. The last invalid value to have been acquired is stored if a valid value has not been acquired after the last storage process.

- **Maximum reduction**

The highest of the values acquired during a storage cycle is stored. Illegal values do not influence the maximum definition. The last invalid value to have been acquired is stored if a valid value has not been acquired after the last storage process.

- **Minimum/maximum reduction**

Maximum and minimum reductions are alternately performed in the storage cycles. A minimum reduction is performed in the first storage cycle, a maximum reduction in the next storage cycle, then a minimum reduction etc. The measured values related to a storage cycle include all values between the cycle limits; the value of the right hand limit is included, the value of the left-hand limit is not included (Fig. 8-4).

Note: Maximum and minimum reduction are alternately performed after the OS start-up. If, for instance, values of one measuring point are acquired in 2 OS systems, the maximum might be stored in one OS and the minimum in the other.

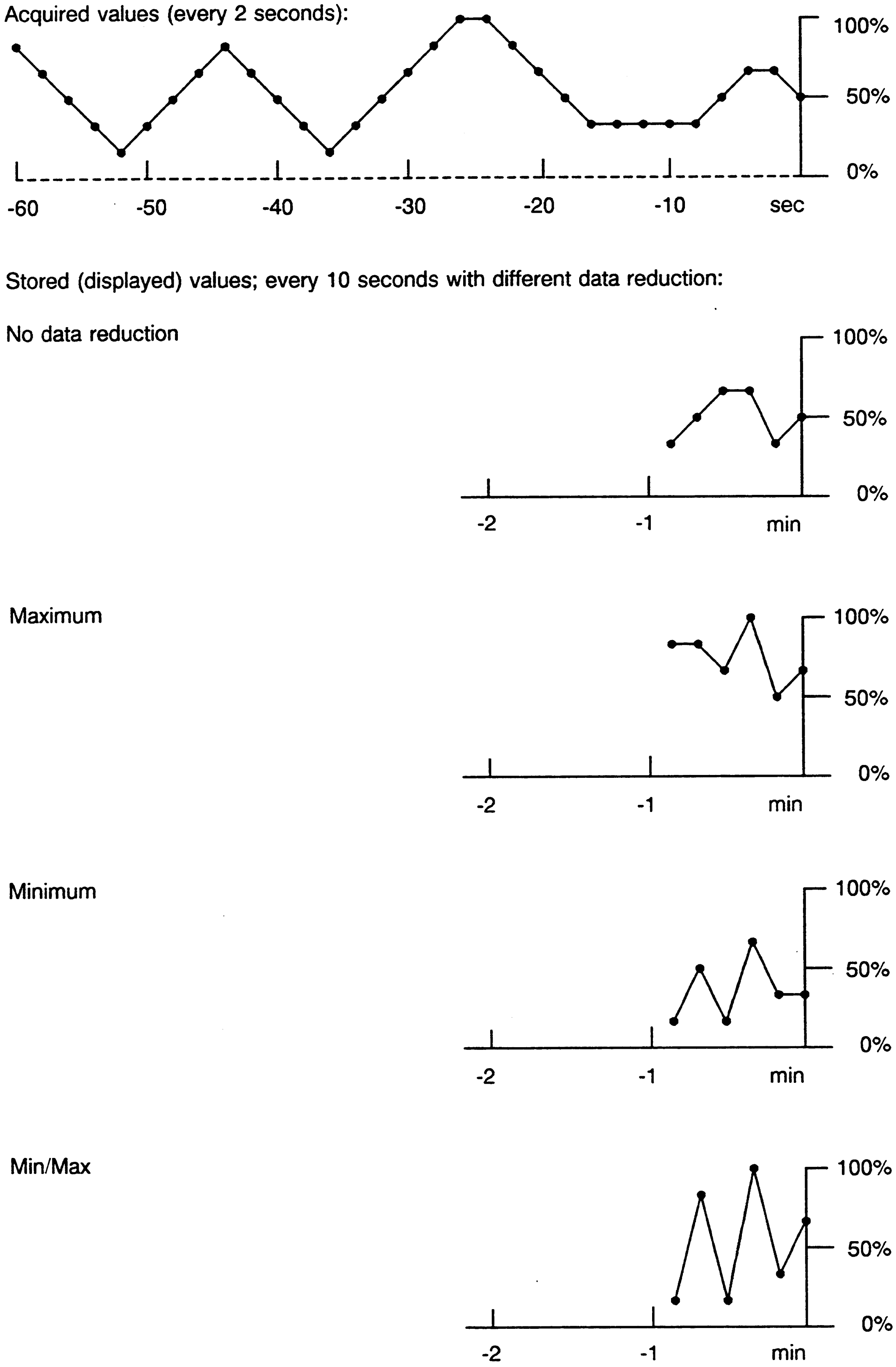
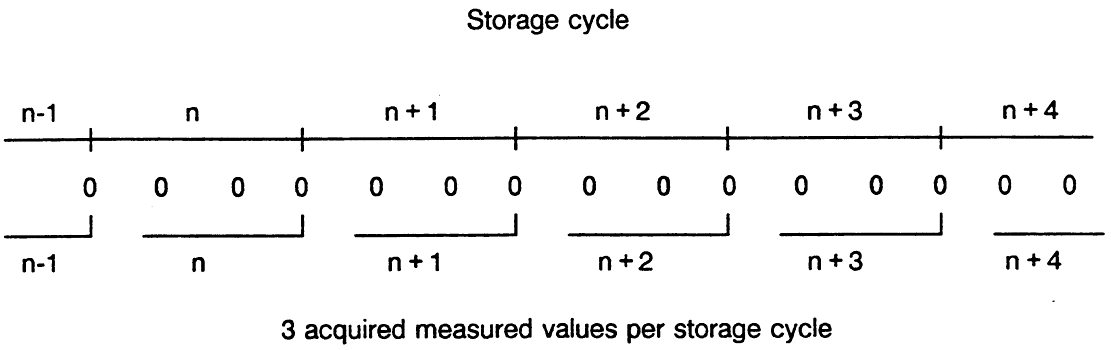


Fig. 8-3 Example of data reduction

1. The storage cycle is an integer multiple of the acquisition cycle (e.g. acquisition cycle = 4 seconds, storage cycle = 12 seconds).



2. The storage cycle is not an integer multiple of the acquisition cycle (e.g. acquisition cycle = 4 seconds, storage cycle = 10 seconds).

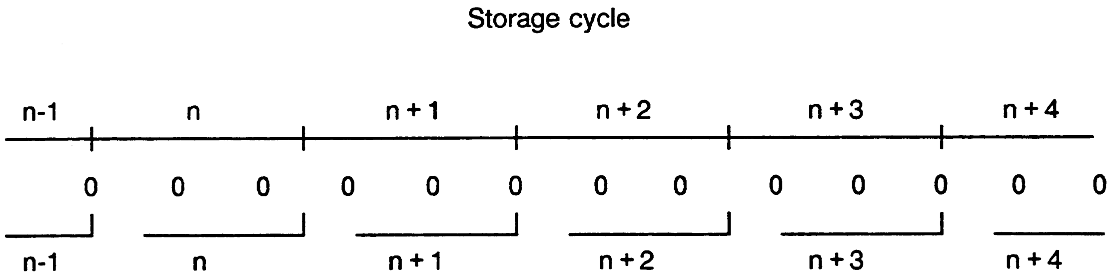


Fig. 8-4 2 and 3 acquired values per storage cycle

The example makes it obvious that the storage cycle should always be an integer multiple of the acquisition cycle.

8.1.2 Filing Onto Hard Disk

8.1.2.1 Filing Areas

Five filing areas are provided on the hard disk for filing curve values. The identifiers 1, 2, 3, 4 and 5 are firmly assigned to these areas.

8.1.2.2 Short-Term/Long-Term Files

The standard filing procedure files all curves during all storage cycles at identical intervals onto the hard disk. An "infinite" file can be created by saving full file areas from the hard disk onto magnetic tape cassettes and re-writing to the saved file areas. The saved time period only depends on the number of magnetic tape cassette used.
This filing procedure can be changed by configuration.

Cycles for long-term filing can be selected (marked) during the design phase (Chapter 8.4.5.4). A short-term and a long-term file are then created in the operating phase on the hard disk (cf. Operating Phase, Chapter 2.4.8.2). The short-term file includes filing areas 1, 2 and 3 whilst the long-term file includes areas 4 and 5. The system renames the long-term filing areas from 4 to A and from 5 to B when the filing procedure is configured.

Firstly, all curves are stored in area 1 of the short-term file. Curves with long-term marks stored in the short-term file are stored in filing area A and the system changes over to area 2 once this area is full. Curves with long-term marks are again stored in filing area A and the system changes over to area 3 once area 2 is full. Once area 3 is full, the curves with long-term marks are copied to area A, area 1 is cleared and data are filed there. Long-term filing is automatically routed to area B.

The system clears area A and transfers long-term data to area A after area B has been filled. Cyclic filing has thus been implemented for the short-term file with the areas 1, 2 and 3 and for the long-term file with areas A and B.

Note:
Using long-term filing is only expedient if it is related to a small area of the filing groups (with long cycle time).

The following values should be considered as maximum limits:
Each long-term filing area should comprise at least four times the short-term file capacity.

Two filing procedures exist:

- Filing all curves of identical time periods. This includes the possibility of creating an "endless file" by saving the filing areas onto magnetic tape cassettes.

- Filing the curves via short-term and long-term file (different time periods).

8.1.2.3 Filing Cycle

The filing cycle defines the longest time interval after which the curve groups to be filed are transferred from the main memory to the hard disk. This time interval represents the maximum amount of data which will be lost in the event of an OS failure. The default value for the filing cycle is 30 minutes.

8.1.2.4 File Version

KURV maintains an internal file version in order to provide correct allocation between file data and data used (curve group to be filed).

Each system start increases the version number by one if the number of curves or curve groups to be filed has changed. Such an increase does also take place upon each modification of the display area or with the data reduction of a curve from one file group. This change is displayed to the user. The file versions of read data and file data can be different when filed curve groups are displayed; the system code must be the same, however.

8.1.2.5 Identification number

A 4-digit identification number can be assigned to each filing area.

8.1.2.6 Area Label

The KURV label contains the KURV configuration level, the file version, the date of the current file version, the area number and the date of the first and last filing. System code and occupancy (in per cent) are also contained in the label.

Date/time of the first modification/creation of a file group after system start-up are accepted as date of the current version.

8.1.2.7 Clear File Area

A function can be used for clearing areas to which KURV has already transferred file data. All data related to filing are reset.

8.1.3 Changing Configured Data

Some of the configured data can be modified. A distinction must be made between changes related to configured data and changes related to subsequent configurations.

8.1.3.1 Modification of Existing Data

The following data of existing curve groups can be modified:

Measuring point name, type and/or unit for all curves of an MKZ with selection via group/curve number or in the OS display.

- Changing the group data of a curve group
  - Changing the group number
  - Changing the curve field type
  - Changing the file reference
- Changing the curve data of a curve
  - Changing name, type and unit
  - Changing the display range
  - Changing data reduction
  - Changing curve colour
  - Deleting an MKZ from all existing curve groups
  - Deleting curve groups

8.1.3.2 Modifications for further Entries

- Changing the colour sequence

The sequence of the curve colours specified during configuration

Curve 1	blue
Curve 2	yellow
Curve 3	green
Curve 4	red
Curve 5	magenta
Curve 6	cyan

can be changed. Individual colours can also be repeatedly assigned to the curves. These changes apply for all subsequently configured curves.

The colour of existing curves can be changed according to the specification in Chapter 8.1.3.1.

- Changing the history length

A standard history length of 600 points is defined for each cycle. This value can be changed inside the range from 50 to 3200 points. The length of the specified history influences memory segmentation (Chapter 8.3).

- Cycle sequence extension

The existing cycle sequence can be extended to up to 15 cycles.

8.1.4 Selector Groups

A selector pointer can be stored for each MKZ with a related curve. This selector pointer points to a selectable curve which contains a curve for the corresponding MKZ. This curve is displayed in the operating phase if a curve group is selected via MKZ.

8.2 Time Response

The CPU load due to measurement acquisition and storage depends on

- the number of curves configured;
- the acquisition and storage cycles;
- the data reduction type;
- the time.

The CPU load is particularly high, for example, if many curves are present and the time is 0 o'clock, since all curves must be sampled and stored at this time. A rough value for the CPU load (KURV acquisition and storage only, AKS and fetch message processing as well as other OS functions not taken into account) can be given by

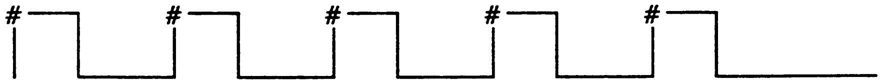
$$B = \text{approximately } 4 * (10 + Z * 4 + K * 16 + E * 7 + A * 5) * 10^{-3}\ \%$$

These mean:

- B = CPU load at the time t
- Z = number of existing cycles
- K = number of curves to be processed, in which acquisition and/or storage cycle are currently active
- E = number of currently active acquisition cycles at the time t
- A = number of currently active storage cycles at the time t

Given 1500 curves, the CPU load caused by KURV is approximately 100% at the time when all acquisition and storage cycles are active (0 o'clock). The time required for acquisition and storage can be longer than the time interval between two cyclic activations if more than 1500 curves have been configured. This means that the above-mentioned action cannot be performed and is omitted. KURV buffers this and makes up during the next activation.

Execution time for very few cycles



Execution time with high load (high number of curves, all cycles active)

*	one activation is omitted due to the long execution time
**	the omitted action is performed now
#	time of activation
o	missing activation

The interval between two activations is one second. The shortest cycle time is two seconds, and normally not all the curves are sampled and stored within this time. It is therefore not very likely that the situation mentioned above will occur. The omitted execution can normally be repeated without any problems as, with a shortest cycle time of 4 seconds, no large data quantities need to be sampled and stored in the second after the "high load" has occurred.

This also ensures that no curve points are missing, which prevents the allocation of stored curve point/time and displayed curve point/display time from diverging. If the load is excessively high, failures may be sampled and stored instead of measured values (see Chapter 8.2.1).

8.2.1 Processing and Time Adjustment

KURV processes any execution program activation failures, which are due to the long execution times required for acquisition and storage of curve values (see Chapter 8.2), as well as other time adjustment activities (such as summer and winter time setting etc.). This ensures that date and time of values stored after the time adjustment, which are displayed in the curve field, agree with the current time.

In time deviation, three different cases can be distinguished:

1. The time has been set back by one or several seconds between two activations (once per second).
2. The time has not been changed between two activations.
3. The time has been set forward by one or several seconds between two activations.

Normally, the time is changed by one second between two activations.

Ref. 1 and 2:

If the time difference between two activations lies between -60 to 0 seconds, measured values will not be processed until the time has reached a value which is one second higher than the time before the difference was detected.

If the time difference is greater than -60 seconds (e.g. -1 hour), the system determines how often each individual cycle was active during the period of the time variations, specifically for each cycle. The reference time stored with the data for this cycle is corrected in order to display the correct time for subsequent storage activities after time variations have occurred. The correction factor can be determined from the "number of active cycles in the period of time variations" multiplied by the "cycle time". This value is subtracted from the reference time.

Before this correction is performed with curve groups which are filed on the hard disk, the curve history values, which have been stored since the last filing, are filed. The values which are accepted in the history after the time has been adjusted are filed together with the new time.

Ref. 3:

The missing interval is post-processed if the time difference between two activations lies in the range between +2 seconds and 60 seconds. A loop enters the value "ABSENT" during current acquisitions for each missing second, in the interval between the time before the adjustment plus 1 second and the current time minus 1 second. Whether or not this "failure" is entered in the curve history buffer depends on the data reduction type, the storage cycle and the moment of time adjustment.

This value appears as "ABSENT" in a displayed curve field in the annotation field and as a curve point at 0%.

The following points always apply:

a) If a storage cycle without data reduction is active before the time adjustment, "ABSENT" is accepted into the curve history if an acquisition was active during the time adjustment.

b) If one or more values were acquired during a storage cycle with data reduction performed before the time adjustment, the value resulting from the data reduction of the acquired valid values is accepted into the history if the storage cycle becomes active during the adjustment interval.

c) "ABSENT" is accepted into the curve history if the storage cycle becomes active during the adjustment interval and if no values have been acquired in a storage cycle with data reduction occurring before the time adjustment.

d) If the first values of a storage cycle with data reduction have been sampled during adjustment, the value resulting from the data of the acquired valid values is accepted into the history if the storage cycle only becomes active after the adjustment.

If the time difference is greater than +60 seconds (e.g. +1 hour), the system determines how often each individual cycle was active during the period of time variations, specifically for each cycle. The reference time stored with the data for this cycle is corrected in order to display the correct time for subsequent storage activities after time variations have occurred. The correction factor can be determined from the "number of active cycles in the period of time variations" multiplied by the "cycle time". This value is added to the reference time.

Before this correction is performed for curve groups filed on the hard disk, the curve history values, which have been stored since the last filing, are filed. The values which are accepted into the history after the time has been adjusted are filed together with the new time.

Note:

- This can result in a grossly distorted image for the curve values during and immediately after the time adjustment with respect to the values stored by KURV in the curve history if data reduction has been performed.

- The moment/interval of a time adjustment of the values accepted by KURV into the history data cannot be seen clearly in the curve group display. The time scales specified in the curve field refer to the point in time which is output in the curve field. If displayed history values are taken from the external storage, the code "*" precedes the time displayed in the curve field for all time values which exist twice because the time has been set back. If the time has been set forward, the missing interval is displayed by "ABSENT" in the curve field (gap).

8.3 Memory Requirements

8.3.1 Main Memory Requirements

The following specifications are only valid if filing is not performed onto hard disk. The memory space required for KURV can be subdivided into two areas:

- memory space for lists
- memory space for curve history

The configured curve data, such as cycle time, measuring point specifications etc. are stored in the lists. The memory requirements for the lists consist of:

- number of curve groups	Gr * 23 words
- number of curves	Ku * 25 words
- number of measuring points	Mm * 8 words
- number of AKS and fetch messages	At * 34 words

The results of the individual calculations are to be rounded to the next higher kbyte value before they are added. In addition, 1024 words are required for basic data.

The following example explains the extensive calculation of the memory requirements for the curve history. The number of possible curve values per cycle which can be stored (history) is based on the main memory assignment (operating phase), which depends on the history length values specified in the OFFLINE design dialog (Chapter 8.4.5.4). The specified space in the main memory is only reserved in the design phase, it cannot be used for designing plant displays (NORA, FRANZ, etc.). It must be remembered that the values specified in the design phase are only guide values.

For a restart during the operating phase KURV occupies the entire space available in the main memory. The space requirements per cycle is calculated as a function of the number of curves in this cycle. The actually free main memory space (main memory list length) is occupied in equal parts for each cycle (maximum 63 kwords per cycle).

A waste of 1 kword is produced by this distribution scheme of the free main memory.

The total space for the history data results to

$$= \text{(free main memory lists)} - \frac{\text{(free main memory lists)}}{32}$$

Waste is not produced if the memory space is distributed to each cycle according to size; a maximum of 63 kwords per cycle can then be distributed to the curves of each cycle. This corresponds to 128,000 stored values.

The minimum number of curves is 8 (default), i.e. a maximum of 21,845 curve values per curve and cycle can be stored. This space is not actually available, however.

The actually assigned space per cycle can be calculated from the ration of the locations reserved during configuration in the design phase. The number of curves per cycle is rounded up to even numbers. If less than 8 curves are contained in a cycle, the default value is set to 8.

The following history length configuration is assumed:
(example without rounding errors)

FG *)	with	8	curves	x	400 points	= 3,200 points	= approx. 38.1%
Cycle 1	with	12	curves	x	200 points	= 2,400 points	= approx. 28.6%
Cycle 2	with	10	curves	x	100 points	= 1,000 points	= approx. 11.9%
Cycle 3	with	6	curves	x	300 points	= 1,800 points	= approx. 21.4%
						= 8,400 points	= 100 %

*) Free curve group

The cycles 4 - 15 do not contain any curves.

Free main memory space	118 kwords	
- Lists	8 kwords	
- Waste	4 kwords	
= Space available	106 kwords	(in operating phase)

The following number of storage items for the history length results from the above-mentioned assumptions:

FG	38.1%	of	106 kwords	= 41,355 words	→	82,710 items
Cycle 1	28.6%	of	106 kwords	= 31,043 words	→	62,086 items
Cycle 2	11.9%	of	106 kwords	= 12,916 words	→	25,832 items
Cycle 3	21.4%	of	106 kwords	= 23,228 words	→	46,456 items

The actual length of the curve history is:

Example 1

FG	with 82,710	items for	8	curves	→	10,338	points/curve
Cycle 1	with 62,086	items for	12	curves	→	5,173	points/curve
Cycle 2	with 25,832	items for	10	curves	→	2,583	points/curve
Cycle 3	with 46,456	items for	6	curves	→	7,742	points/curve

It is possible in this distribution to the individual cycles that

Due to the memory space available, the number of curves and the rounding, the resulting history length in this distribution to the individual cycles can be much smaller or much larger than has been specified in the design phase.

Example 2; space available = 4 kwords = 4,096 words

FG	38.1%	of	4 kwords	→	3,120 points	=	390 points/curve
Cycle 1	28.6%	of	4 kwords	→	2,342 points	=	195 points/curve
Cycle 2	11.9%	of	4 kwords	→	974 points	=	97 points/curve
Cycle 3	21.4%	of	4 kwords	→	1,752 points	=	292 points/curve

The following calculation determines the memory space required for a given number of curves and a certain history length:

1) Specify the minimum history length per cycle.
2) Determine the number of curves per cycle. This value is rounded up to the next higher even number which is greater than 5. The storage cycle is significant for the allocation. The number of curves in the unassigned curve group must always be 8.

The required memory space in words for each cycle results from 1. and 2. by calculating (history length * number of curves) / 2. The total space required for the history data is determined by adding the requirements of the individual cycles.

The "waste", which results from the integer part of

$$\frac{\text{required space for history}}{32} + 1 \text{ kword}$$

must be added to this value.

Adding the requirements for lists to this result yields the total memory space required by KURV for data and history.

Note:
The system has been designed for a data quantity which corresponds to 500 curves in approximately 200 curve groups. Data areas for 75 measuring points, 83 curves and 40 curve groups are reserved in the design dialog. Space for 15 message blocks has already been provided. This requires a data area of 10 kwords. Another 12 kwords are required for free and special curve groups.

It must be remembered that the maximum length of the main memory history can be 64 kwords per cycle. This means that for 100 curves being stored in a cycle, a maximum of 64,000 * 2/100 = 1,280 points history are stored in the main memory. If more points are required, the cycle in which storage is to be performed should be configured several times and, in group configuration, the storage cycle distributed over the individual cycles.

Note:
In the operating phase, the actual history distribution is shown in the log of the general KURV data.

8.3.1.1 Main Memory Requirements with Filing

The system needs additional space for the input and output transfer buffers required for curve value filing or display. These buffers are only created if file groups exist. The length per operator input channel is 3,240 words.

8.3.2 Memory Requirements per Cycle in the File Area

The space required per cycle for storing the history data in a file area is

$$P = \frac{A}{Z} * K * 14$$

It means:

P Storage space in the file area [in bytes]
A Filing period. Time interval which is to be filed without changing area.
Z Storage cycle for which the calculation is to be performed.
K Number of curves divided by 14 and rounded up to the next higher integer number. An integer result must be increased by 1.

Note:
The following results are ideal values which may be subject to variation due to external events (e.g. filing is frequently activated/deactivated, etc.). In average, the result varies by -10%.

The main memory history length of cycles, in which values are to be filed on hard disk, also influences the resulting time which can be filed on hard disk without area change.

8.3.3 Total Space Requirements on the Hard Disk

The total memory requirements consist of the calculated values for each individual cycle and of management information. The management information consists of 40 kbytes file administration and the lists for the KURV data (see Chapter 8.3.1 for calculation).

8.3.4 Calculation Example

Storage cycles	:	4 s	20 s	20 min
Number of curves	:	19	24	60
Filing period	:	7 days		

The 103 curves have been configured in 17 curve groups with 6 curves each and in one group with one curve.

7 days = 168 hours = 10.080 minutes = 604.800 seconds

604.800 seconds : 4 seconds = 151,200
19 curves : 14 curves = 1.3......rounded up 2
Space requirement 4-s cycle = 151,200 * 2 * 14 = 4,233,600 bytes
604,800 seconds : 20 seconds = 30,240
24 curves : 14 curves = 1.7.... rounded up 2
Space requirement 20-s cycle = 30,240 * 2 * 14 = 846,720 bytes

10,080 minutes : 20 minutes = 504
60 curves : 14 curves = 4,2..... rounded up 5
Space requirement 20-min cycle = 504 * 5 * 14 = 35,280 bytes

Total space requirements for the curve history on the external storage unit:

4,233,600	bytes	for 4-s-cycle
846,720	bytes	for 20-s-cycle
35,280	bytes	for 20-min-cycle
5,115,600	bytes	for all file data

Storage requirements for the KURV data lists		rounded
Number of curve groups	17 * 23 words =	391 words → 1,024 words
Number of curves	103 * 25 words =	2,575 words → 3,072 words
Number of measuring points	103 * 8 words =	824 words → 1,024 words
Number of AKS and/or fetch messages	5 * 34 words =	170 words → 1,024 words
List for KURV data		6,144 words
Basic data		1,024 words
		7,168 words
Transfer buffer (for 2 operator input channels)		9,720 words
		16,868 words

Total storage requirements for history and administration

History	:	5,115,600 bytes
KURV lists	:	14,336 bytes
Buffer	:	19,440 bytes
Administration	:	40,960 bytes
		5,190,336 bytes

Space provided by one file area: 20 Mbytes (45 Mbytes with FP 41-E). The higher capacity provides a longer filing period in this example.

Area capacity	:	20,971,520 bytes
- KURV lists	:	14,336 bytes
- Administration	:	40,960 bytes
History		20,916,224 bytes

$$\text{Factor} = \frac{\text{Available space for history}}{\text{Calculated space for history}}$$

20,916,224 : 5,115,600 = approximately 4.1

Existing filing period = 7 days * 4.1 = approximately 28 days
A total filing period of approximately 140 days results with five filing areas.

Note regarding long-term filing:

This example refers to the standard filing procedure (all curves are filed over the same period). Since all curves are stored in the short-term file, the short-term file is calculated in the same manner if short-term/long-term file has been configured. Only the cycles with long-term filing identification must be taken into account when calculating the long-term file.

Notes regarding "K" in the calculation formula:
1 must be added to an integer result as the full amount of 14 curves from a cycle cannot always be combined for filing (depends on quantity).

Example 1:

28 curves in 5 groups with the same storage cycle

Groups 1 - 4	6	curves each
Group 5	4	curves

Up to 14 curves of a cycle are grouped and filed.

In this example, the following filing takes place:

1. Groups 1 and 2 with 6 curves, i.e.12 curves
2. Groups 3 and 4 with 6 curves, i.e.12 curves
3. Group 5 with 4 curves

This shows that space for 14 additional curves has been provided by this type of configuration.

Example 2:

28 curves in 6 groups with the same storage cycle

Groups 1-4	6	curves each
Groups 5-6	2	curves each

Up to 14 curves of a cycle are grouped and filed.

In this example, the following filing takes place:

1. Groups 1 and 2 with 6 curves each and group 5 with 2, i.e. 14 curves
2. Groups 3 and 4 with 6 curves each and group 6 with 2, i.e. 14 curves

This shows that this type of configuration provides optimum utilization of the file area.

8.3.5 Example of Time Periods which can be Filed

Guide values for a 10-MB area are specified in the following example in order to provide a rough overview of the time periods which can be filed in an area.

Example 1:
This example shows for various cycles the connection between the possible file length and the number of curves to be filed.

File length	Number of curves	For storage cycle
1 day	360	4 s
	900	10 s
	1800	20 s
1 week	50	4 s
	125	10 s
	250	20 s
	750	1 min
	1500	2 min
1 month (30 days)	180	1 min
	900	5 min
	1800	10 min

Example 2:
Area change:

For file length	Change within approximately
1 day	35 min
7 days	210 min
30 days	17 hrs

Example 3:
File length and storage cycle

The following values alternatively apply for 14 curves with the same storage cycle.

	Storage cycle	File length (can be stored) in an area				
	4 s	26 days				
or	10 s	65 days	or	2.1 months		
or	1 min	390 days	or	12.5 months	or	1.06 years
or	10 min	3,900 days	or	125 months	or	10.6 years
or	1 h	23,400 days	or	750 months	or	63.6 years

The file length must be divided by the rounded result of the curve calculation divided by 14 if the same storage cycle contains additional curves.

8.4 Configuration Dialog

The OFFLINE program package of the KURV system contains a configuration program which enables the user to group the measuring point values which are to be displayed in the operating phase as curves. FRANZ/NORA must have previously been configured. Data input is performed in a dialog using a light pen. The user only selects function keys (keys which initiate the associated function when they are selected) or, for special entries, an alphanumeric menu field (DIAVID). Alphanumeric characters are entered as a string either via a virtual typewriter keyboard displayed on the screen or via an alphanumeric keyboard. Using this input dialog program, the user can combine curve groups each consisting of up to six curves.

The user defines the acquisition and storage cycles, the curve field type (= the screen section required for a curve group representation) and, for each measuring point to be acquired, measuring point name, type, unit, upper and lower display range, measuring value transfer type, curve colour and data reduction type.

It can also be specified whether or not the curve group is to be filed on the hard disk.

The curve colour, which results from the measuring point selection sequence, is preset in a specific sequence for each curve in a group.

The user can delete existing groups and measuring points, modify the history length and the curve colour sequence and complete the cycle sequence.

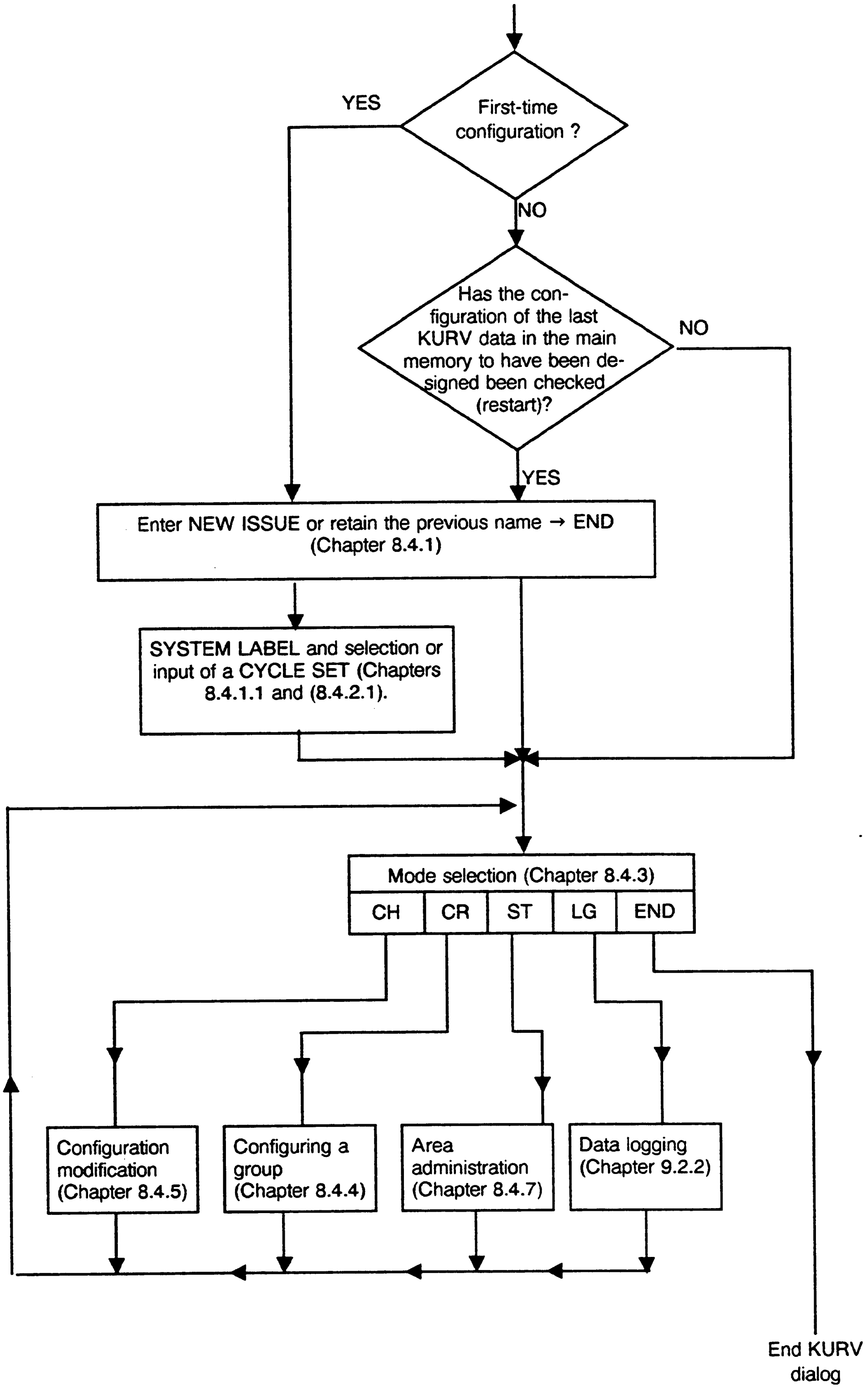
Measuring point name, type and unit of configured measuring points can also be modified.

Configured data can be logged in a system or group log.

As configuration data must normally be entered in a specific sequence, the user is prompted accordingly by dialog messages.

The following chart illustrates the chronological sequence of a configuration dialog.

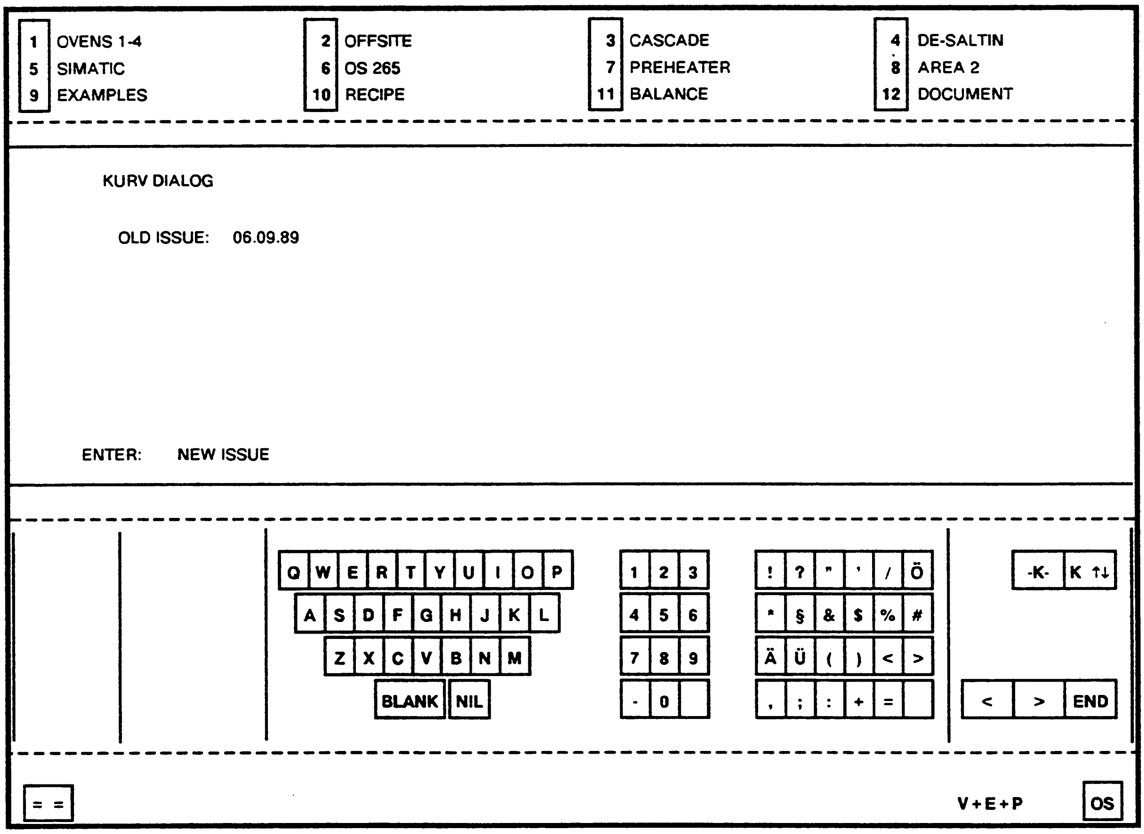
KURV design dialog



8.4.1 Entering the Configuration Version

The initial configuration menu and the DIAVID menu field are displayed at the beginning of the configuration dialog. The new configuration version can now be entered in order to enable the user to identify the created data in the future. Any name can be chosen which does not exceed 10 characters and does not contain a comma. Characters after a comma are not accepted. The name is filled with blanks if less than 10 characters are entered. The old version is retained if END is selected without entering a new version.

KURV key sets in the design phase



KURV DIALOG

OLD ISSUE: 06.09.89

ENTER: NEW ISSUE

Fig. 8-5 Display after KURV has been selected (new selection)

ENTER: NEW ISSUE

Input: via DIAVID menu field
- up to 10 characters are accepted
- characters after the comma are not accepted
- the old version is retained if no input is made (DIAVID END key)

Selecting the END key terminates the input.

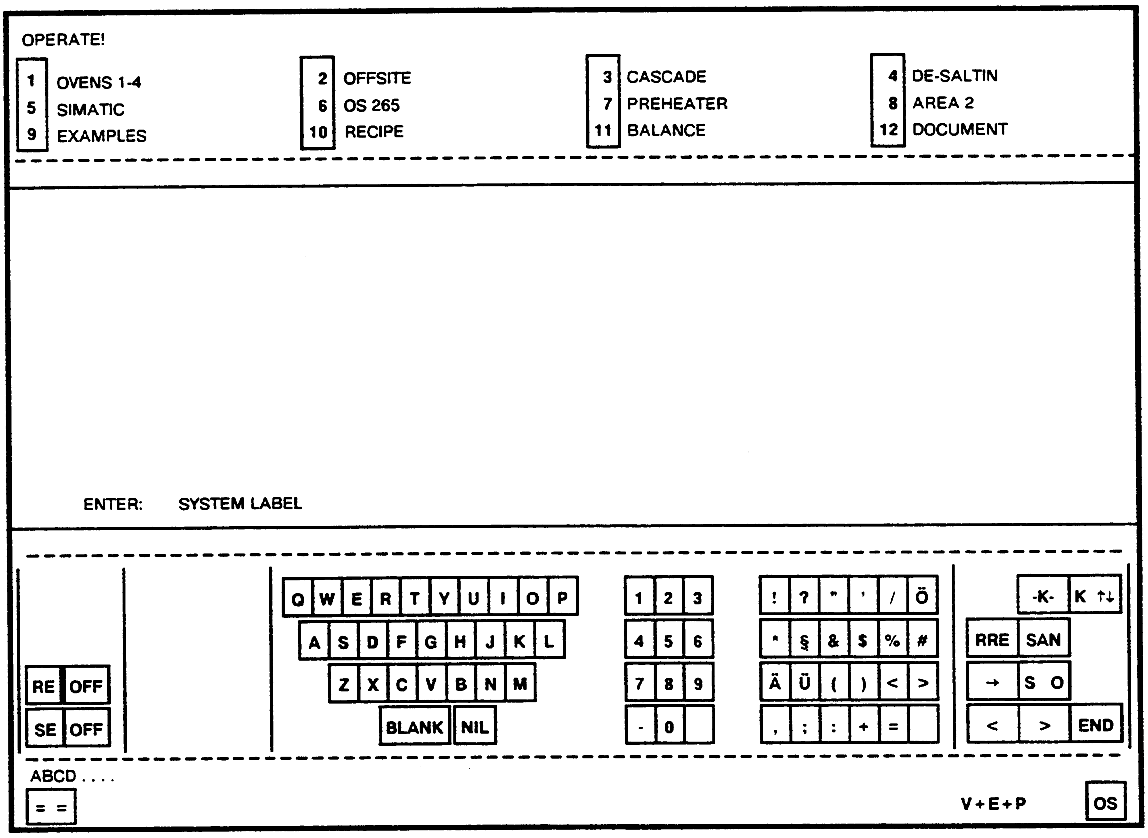
8.4.1.1 System Identifier

A system-specific system identifier must be entered during the first-time configuration of KURV. This avoids undefined system states due to confused file cassettes when several systems with different configurations are used. The system identifier, which is stored on the hard disk together with the data, can consist of up to four characters.

Missing characters are filled with blanks if less than four characters are entered. The identifier consists of four blanks if the END key in the DIAVID menu field is selected without previous input.

If a non-letter character is entered within the system identifier, this character and all subsequent characters are replaced with blanks.

Note:
Execute the function "STORE DATA ON DISK" at least once before a first-time configuration of KURV.



ENTER: SYSTEM LABEL

Fig. 8-6

ENTER: SYSTEM LABEL

This input is only requested during first-time configuration (first KURV configuration using the read data).

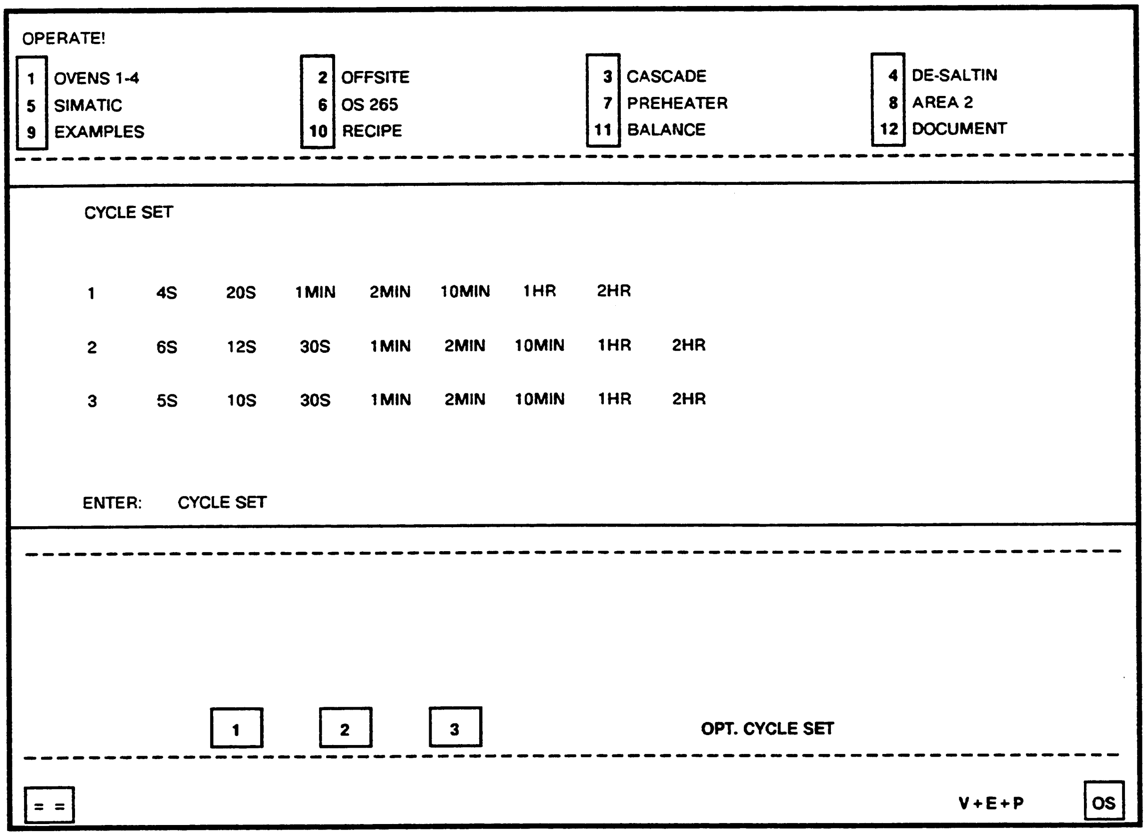
Input: via DIAVID menu field
- up to 4 characters are accepted
- characters after the comma are not accepted
- the system enters 4 blanks if an entry is not made (END key in DIAVID)

8.4.2 Entering the Cycle Sequence During First-Time Configuration

The cycle sequence for measured value acquisition and storage is defined during the first-time configuration of KURV. This means that the user defines the time sequence provided for measured value acquisition and storage. This sequence can be extended at a later point in time.

Three system cycle sequences and the related operator input keys are displayed on the screen. A cycle sequence without default values can be created in addition to the system cycle sequences. The configured cycle sequence can only be entered during first-time configuration and is valid for the entire KURV system. It is possible, however, to complete the cycle sequence later if the maximum number of cycles has not been used (Chapter 8.4.5.5).

Acquisition cycles and storage cycles can only be selected from the cycle time values of the cycle sequence which have been configured here.



OPERATE!

1 OVENS 1-4	2 OFFSITE	3 CASCADE	4 DE-SALTIN
5 SIMATIC	6 OS 265	7 PREHEATER	8 AREA 2
9 EXAMPLES	10 RECIPE	11 BALANCE	12 DOCUMENT

CYCLE SET

1	4S	20S	1MIN	2MIN	10MIN	1HR	2HR	
2	6S	12S	30S	1MIN	2MIN	10MIN	1HR	2HR
3	5S	10S	30S	1MIN	2MIN	10MIN	1HR	2HR

ENTER: CYCLE SET

Fig. 8-7

ENTER: CYCLES

This input is only requested during first-time configuration (first KURV configuration using the read data).

Input: via function keys

a. : 1, 2 or 3
- select one of the specified cycle sequences

b. : OPT. CYCLE SET
- enter a freely selectable cycle sequence

Input: via DIAVID menu field
- up to 15 cycle time values separated by a comma
- each time value must be an integer factor of 86,400 seconds
- the smallest cycle value is 2 seconds
- the largest cycle value is 12 hours = 720 minutes = 43,200 seconds
- the values must be separated by a comma
- max. 3 digits + unit per figure
- valid units:
  S = seconds
  MIN = minutes
  HR = hours

8.4.2.1 System Cycle Sequence

The three system cycle sequences are selected via the operator input keys (1, 2 or 3). The following cycle sequences have been specified in the system:

No.	Cycle time values								
1	4S	20S	1MIN	2MIN	10MIN	1HR	2H		
2	6S	12S	30S	1MIN	2MIN	4MIN	10MIN	1HR	2HR
3	5S	10S	30S	1MIN	2MIN	10MIN	1HR	2HR	

The related cycle sequence is accepted in the system.

Note:
A selected sequence can be modified by using the CYC function (Chapter 8.4.5.5) for a configuration change.

8.4.2.2 Freely Selectable Cycle Sequence

Selecting the INPUT key displays the DIAVID menu field on the screen.

A sequence with a maximum of 15 cycle time values can be entered now.

The selected cycle time value (in seconds) must be an integer factor of 86,400 (number of seconds per day) which may not be greater than 43,200 (12 hours = maximum cycle time). For example:

86.400 S / 1 HR = 24
86.400 S / 160 S = 540
86.400 S / 7 S = 12,342 remainder 6; KURV rejects this input

The individual time values, which must be separated by a comma, are entered as three-digit number (maximum) with subsequent unit (S, MIN, HR).
The length of the input character string is not sufficient if 15 cycle time values with 3 characters each are to be entered before the unit. Input should then be performed as far as possible. The remaining cycles can be entered via the ZY function (cycle sequence extension, Chapter 8.4.5.5) during modification configuration.

Valid units are: S = seconds; MIN = minutes; HR = hours.

Selecting the END key terminates input once the complete sequence has been entered.

The system rejects inputs which do not satisfy these requirements. The entire cycle sequence input must then be repeated.

Example: Cycle 1: 4-s cycle time, 400 points history length
Cycle 2: 4-s cycle time, 200 points history length

- **Cycle is shorter than 4 seconds**

The following exceptions must be remembered when entering cycle time values of less than four seconds and using such a cycle for acquisition and storage of measured values.

The CPU load goes up and an increased number of failures occurs during acquisition/storage due to the time response described in Chapter 8.2. It is possible that acquisition becomes temporarily impossible in these cycles.

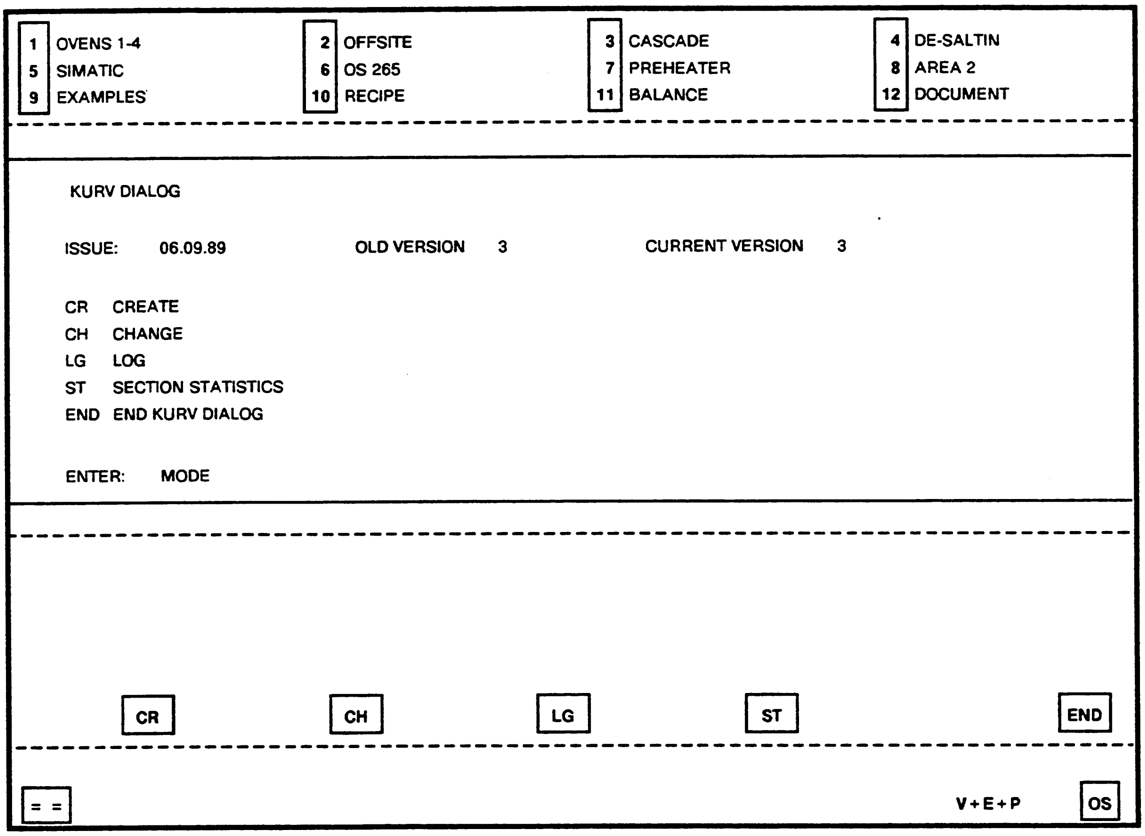
If a display/storage cycle of less than 4 seconds has been selected, the code "??????" can be output in the curve groups displayed on the screen instead of the value stored in the curve history.

It can also happen that the entire OS system responds too slowly.

It is possible (depending on the configured cycles) that proper system operation cannot be guaranteed if more than 1500 curves exist.

8.4.3 Mode Selection

The basic group configuration menu and the related operator input keys are displayed on the screen. The mode is selected via one of the operator input keys (CR, CH, LG, ST, END). The following functions can be initiated:



```
 1 OVENS 1-4          2 OFFSITE          3 CASCADE          4 DE-SALTIN
 5 SIMATIC            6 OS 265           7 PREHEATER        8 AREA 2
 9 EXAMPLES          10 RECIPE          11 BALANCE         12 DOCUMENT

  KURV DIALOG

  ISSUE:    06.09.89        OLD VERSION   3         CURRENT VERSION   3

  CR   CREATE
  CH   CHANGE
  LG   LOG
  ST   SECTION STATISTICS
  END  END KURV DIALOG

  ENTER:    MODE

     CR          CH          LG          ST                   END

 = =                                                   V+E+P   OS
```

Fig. 8-8 Menu after KURV has been selected

CR	Continue configuration (Chapter 8.4.4). Used for group configuration.
CH	Configuration modification (Chapter 8.4.5). Used for modifying existing data..
LG	Logging (Chapter 8.4.8). Used for creating a system of group log.
ST	Area administration (Chapter 8.4.7). User for file area preparation.
END	End of KURV configuration.

This basic menu is always displayed once one of these functions has been terminated. Selecting the END key terminates the KURV configuration dialog. FRANZ, NORA or MELD configuration can then be continued or data can be stored on the hard disk.

8.4.4 Configuring a Curve Group CR

Selecting this mode (continue configuration) provides the user with a dialog menu for configuring a curve group. The following procedure is always required:

- Accepting the measuring points which are to be displayed in the curve group (Chapter 8.4.4.1).
- Definition of the curve group (Chapter 8.4.4.2), i.e. the user defines group number, display cycle and curve field type of the curve group.
- Statement whether or not the curve group is to be filed on the hard disk (Chapter 8.4.4.2).
- Configuration of newly accepted measuring points (Chapter 8.4.4.3). The user defines name, type, unit, upper and lower display range, acquisition cycle, data reduction type and AKS message for each of the up to six measuring points.

Some additional correcting functions for group configuration are provided which enable the user to edit incorrect entries. The configured data is only accepted into the KURV system (i.e. the newly configured data is accepted into the KURV lists) once the group has been completely configured and released by the user (Chapter 8.4.4.4).

- See Chapter 8.4.4.3 for measuring points which have already been configured in the system.

8.4.4.1 MKZ Acceptance from FRANZ or NORA

The area overview existing in FRANZ/NORA and four operator input keys (COLLECT MKZ, LIST MKZ, DELETE LAST MKZ and EXEC) are displayed on the screen.

The COLLECT MKZ key blinks.

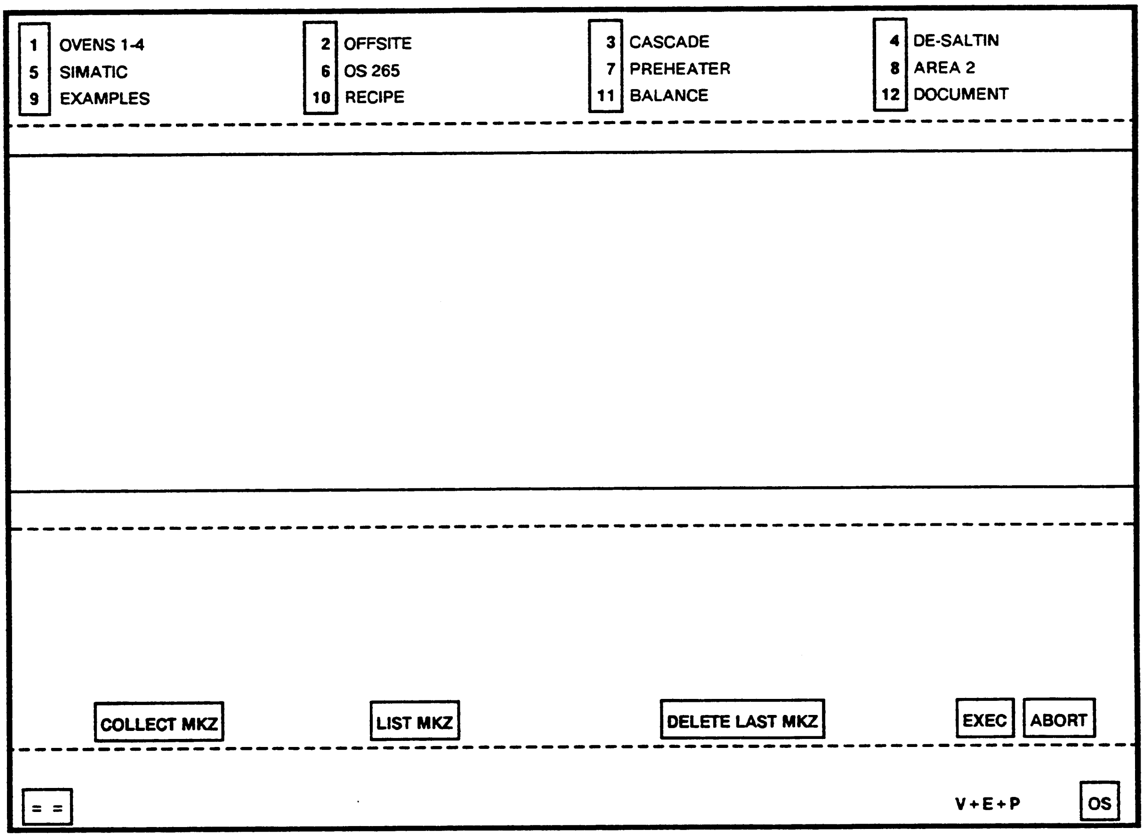


Fig. 8-9 Screen display after KURV → CREATE has been selected

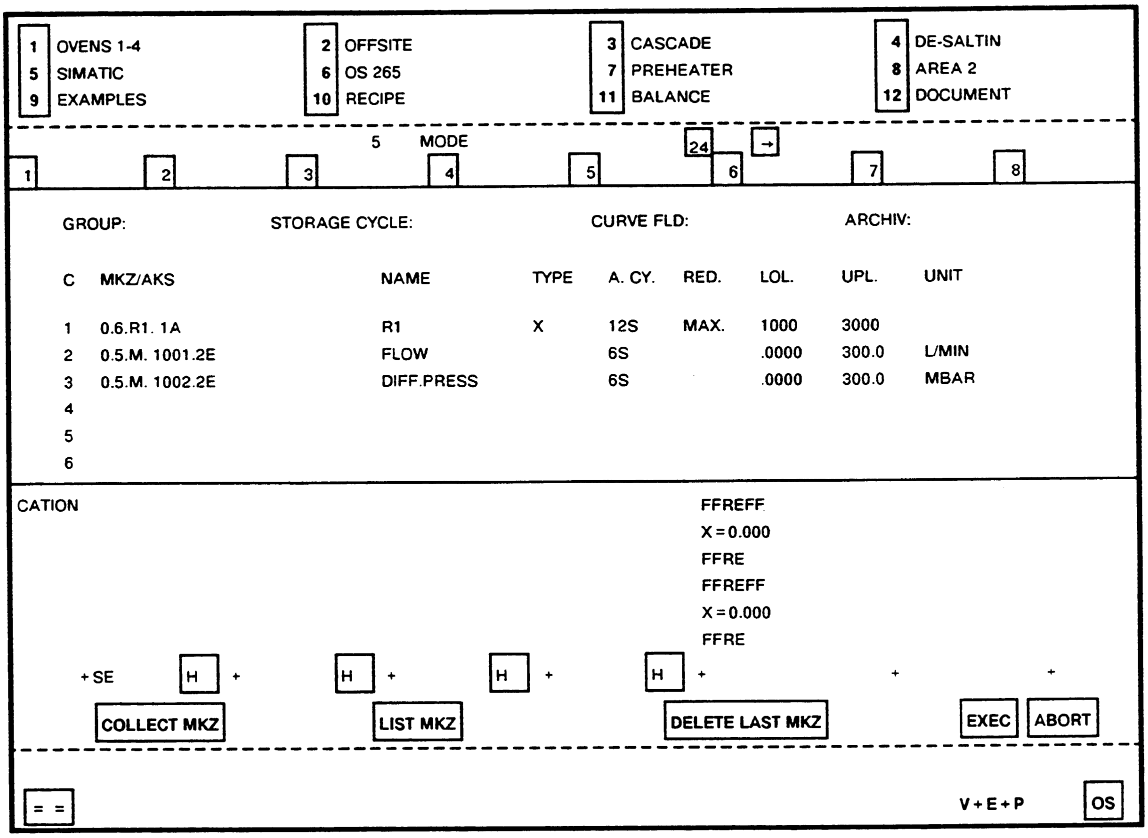
In order to accept the measuring points from FRANZ/NORA, the user first selects the required process displays (see "image selection" in the FRANZ/NORA description). The related FRANZ or NORA system images are then displayed.

The user allocates a curve to each individual measuring point required in the system image by selecting this point using the light pen. This procedure creates a curve group; the sequence of selection defines the curve colour (cf. Chapter 8.4.5.3).

A measuring point can be selected repeatedly (see Chapter 8.4.4.3) if, for example, the same measuring point is to be displayed in several curves with different display ranges.

Selection of the wrong measuring point can be corrected by selecting DELETE LAST MKZ . This includes the function LIST MKZ. If the DELETE LAST MKZ is selected after all MKZs in this group have been cleared, the NORA/FRANZ system image is displayed.

Selecting the LIST MKZ key displays a list of the already selected measuring points in the TELEPERM M MKZ representation. The measuring points are listed in the sequence as they have been selected. A letter "A" next to the MKZ indicates an output, "E" indicates an input.



GROUP: STORAGE CYCLE: CURVE FLD: ARCHIV:

C	MKZ/AKS	NAME	TYPE	A. CY.	RED.	LOL.	UPL.	UNIT
1	0.6.R1. 1A	R1	X	12S	MAX.	1000	3000	
2	0.5.M. 1001.2E	FLOW		6S		.0000	300.0	L/MIN
3	0.5.M. 1002.2E	DIFF.PRESS		6S		.0000	300.0	MBAR
4								
5								
6								

Fig. 8-10 Screen display after KURV → CREATE → LIST MKZ have been selected

Selecting the COLLECT MKZ key displays the selected system images; the user can select further measuring points for acceptance. Selecting the EXEC key terminates MKZ acceptance and starts group definition.

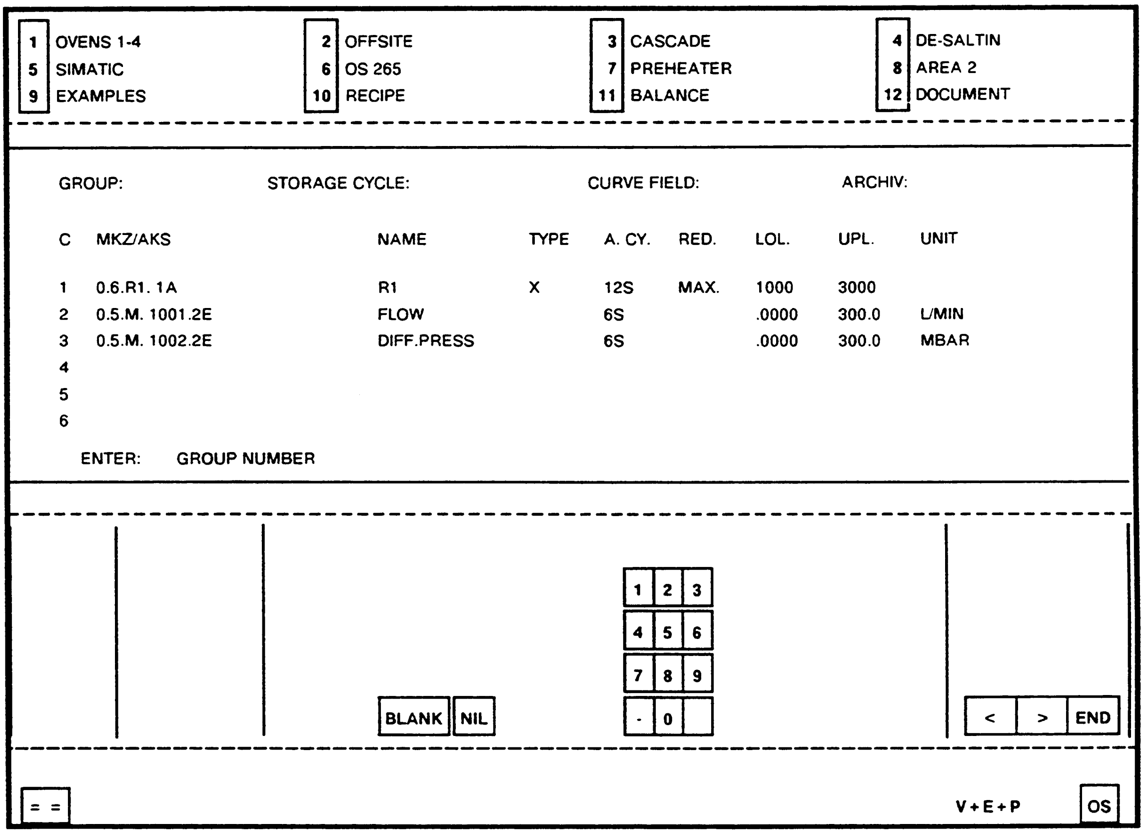
Note:
If FRANZ/NORA do not contain all measuring points required for KURV, the missing points must first be configured as control fields with digital displays in dedicated process displays using FRANZ.

8.4.4.2 Group Definition

The user can assign a group number and define the storage cycle and the curve field type for the composed group once the MKZ from FRANZ/NORA has been accepted.

The user also defines here whether or not the group is to be filed on hard disk.

- **Entering the group number**



GROUP: STORAGE CYCLE: CURVE FIELD: ARCHIV:

C	MKZ/AKS	NAME	TYPE	A. CY.	RED.	LOL.	UPL.	UNIT
1	0.6.R1. 1A	R1	X	12S	MAX.	1000	3000	
2	0.5.M. 1001.2E	FLOW		6S		.0000	300.0	L/MIN
3	0.5.M. 1002.2E	DIFF.PRESS		6S		.0000	300.0	MBAR
4								
5								
6								

ENTER: GROUP NUMBER

Fig. 8-11 Screen display after KURV → CREATE → EXEC have been selected

The group number is entered as a string using the DIAVID menu field displayed on the screen.

Any figure with up to four digits (1...9999) is valid as a group number. The group number is accepted by the system once the END key has been selected.

The inquiry DELETE OLD GROUP? YES/NO is displayed after the message GROUP xxx HAS ALREADY BEEN ASSIGNED.
A new group number can be entered if NO has been selected. The message remains for control purposes until a new group number has been entered.

The configuration dialog is executed as described above if YES is entered. The previously configured MKZ with this group number is retained until the EXEC key is selected.

The group previously configured under this number and the related data are cleared once the ENABLE key has been selected.

Input must be repeated if an incorrect group number has been entered.

- **Entering the storage cycle**

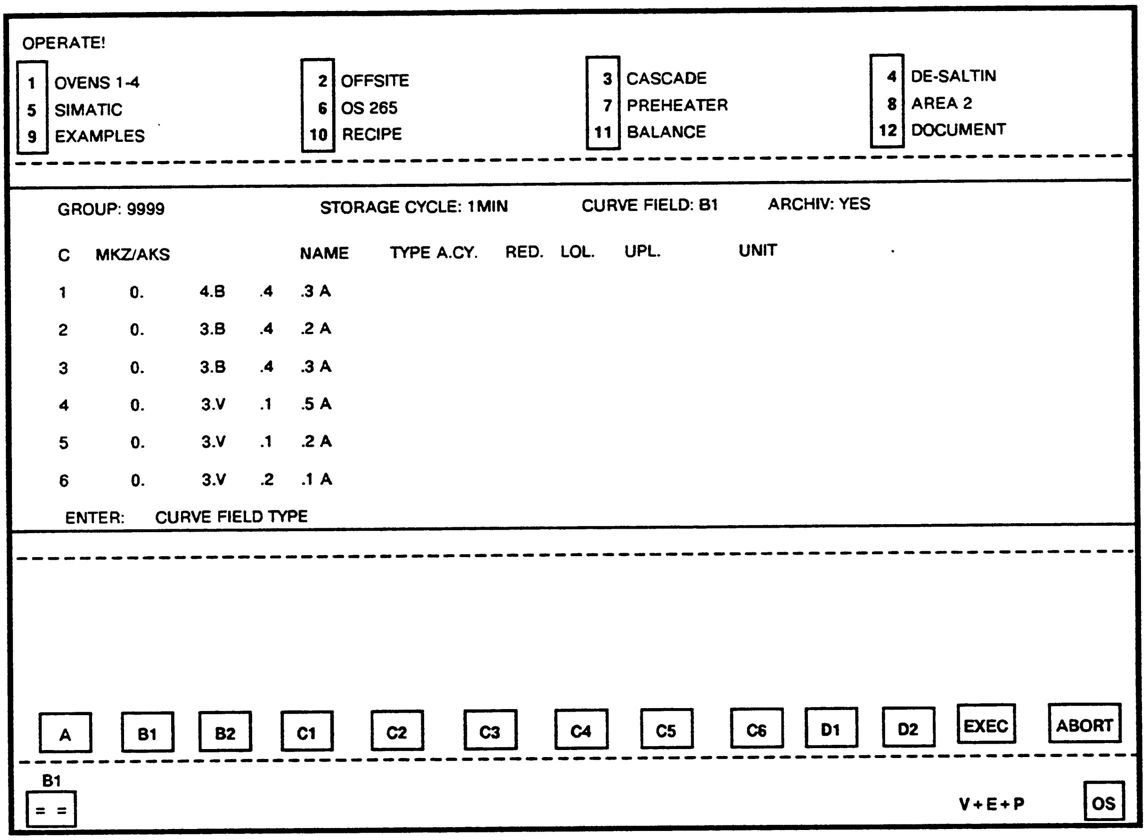
The cycle sequence which has already been configured for the system (Chapter 8.4.2) is displayed as menu field.

The user selects a storage cycle by touching the respective key using the light pen. Since the cycle time of the acquisition cycle, which is selected later, cannot be longer than the storage cycle, a sufficiently long selected storage cycle value must be selected now. The system accepts the cycle after the EXEC key has been selected.

The input is rejected and an error message "STORAGE CYCLE TOO SHORT" displayed if the curve group contains measuring points which have already been configured in other groups of if a storage cycle is entered which is shorter than the shortest existing acquisition cycle. The input must then be repeated.

- **Entering the curve field type**

The possible curve field types are displayed as operator input keys. The user selects a curve field type by touching the respective type and EXEC keys using the light pen.



GROUP: 9999 STORAGE CYCLE: 1MIN CURVE FIELD: B1 ARCHIV: YES

C	MKZ/AKS				NAME	TYPE A.CY.	RED.	LOL.	UPL.	UNIT
1	0.	4.B	.4	.3 A						
2	0.	3.B	.4	.2 A						
3	0.	3.B	.4	.3 A						
4	0.	3.V	.1	.5 A						
5	0.	3.V	.1	.2 A						
6	0.	3.V	.2	.1 A						

ENTER: CURVE FIELD TYPE

Fig. 8-12

The individual curve field types have the following meaning and position:

A = entire screen
B1 = Left-hand screen half
B2 = Right-hand screen half
C1 = 1/6 of the screen, top left
C2 = 1/6 of the screen, top centre
C3 = 1/6 of the screen, top right
C4 = 1/6 of the screen, bottom left
C5 = 1/6 of the screen, bottom centre
C6 = 1/6 of the screen, bottom righgt
D1 = Top screen half
D2 = Bottom screen half

Only the first two measuring points of a C type which have been selected are accepted.

- **Entering group filing**

When the assigned curve group is being configured, the user specifies whether or not the values related to this group are to be filed on the hard disk. Long-term filing of the curve values on the hard disk is possible. The filed data can also be saved on magnetic tape cassette. The filed values can be re-displayed for control purposes.

Filed data saved on magnetic tape cassette can be copied onto the hard disk and are thus available for display.

ARCHIVE THIS GROUP?

Input: via function keys
- YES group is filed on hard disk
- NO group is not filed on hard disk

Note:
OS increases the file version by 1 if KURV configuration has been terminated with a configuration check and "store data", and the number of curve groups or curves which are to be filed are modified in the configured KURV data.

The file version is increased by 1 for each KURV configuration if the number of curve groups or curves to be filed is changed.

8.4.4.3 MKZ Definition

The user defines in succession for each of the up to six MKZ accepted from FRANZ/NORA:

a) Name, type, unit
b) Lower and upper display range
c) Acquisition cycle
d) Message definition
e) Data reduction type

Data is not requested if an MKZ has already been configured in a different group (cf. "Repeatedly accepted MKZs").

- **Entering name, type, and unit**

The measuring points are provided with name, type and unit during configuration. This facilitates swift identification of the measuring points in a curve group representation during the operating phase.

These items are entered via the DIAVID menu field displayed on the screen or via an alphanumeric keyboard. Name, type and unit are entered as a character string in this sequence, separated by commas. The system accepts the data and enters the values into the corresponding line when the END key is selected.

The input is limited to 10 characters for the name, 2 characters for the type and 6 alphanumeric characters for the unit. Missing characters are filled with blanks. The input must be repeated if a comma has ben omitted.

Blanks are accepted if four commas are entered instead of name, type and unit.

ENTER: NAME, TYPE, UNIT

Input: via DIAVID menu field
- separated by commas
- name : max. 10 characters
- type : max. 2 characters
- unit : max. 6 characters

Note:
?? should not be entered as type specification. Measuring points, which still exist in KURV but have been cleared after KURV configuration, cannot be recognized in NORA/FRANZ in the operating phase if ?? is used as type specification..

- **Entering the lower and upper display range**

These items are entered via the DIAVID menu field displayed on the screen. Lower and upper display range are entered as a character string in this sequence, separated by commas. Valid entries are values between -99999 and +99999.

The system accepts the data and enters the values into the corresponding line when the END key is selected. A maximum of 5 figures plus sign may be entered for each display range limit.

The decimal point can be at any digit of the number; it can be omitted if an integer number is entered. Leading zeros can be omitted for values between -1 and 1; a sign is not required for positive values. The value for lower display range must always be less than the value for the upper display range.

The entire string must be repeated after an input error.

ENTER DISP. RANGE: LOWER, UPPER LIMIT

Input: via DIAVID menu field

- separated by commas
- max. 5 figures, decimal point, sign
- decimal point can be omitted for integer values
- sign can be omitted for positive values
- the value for lower display range must be less than the value for the upper display range.

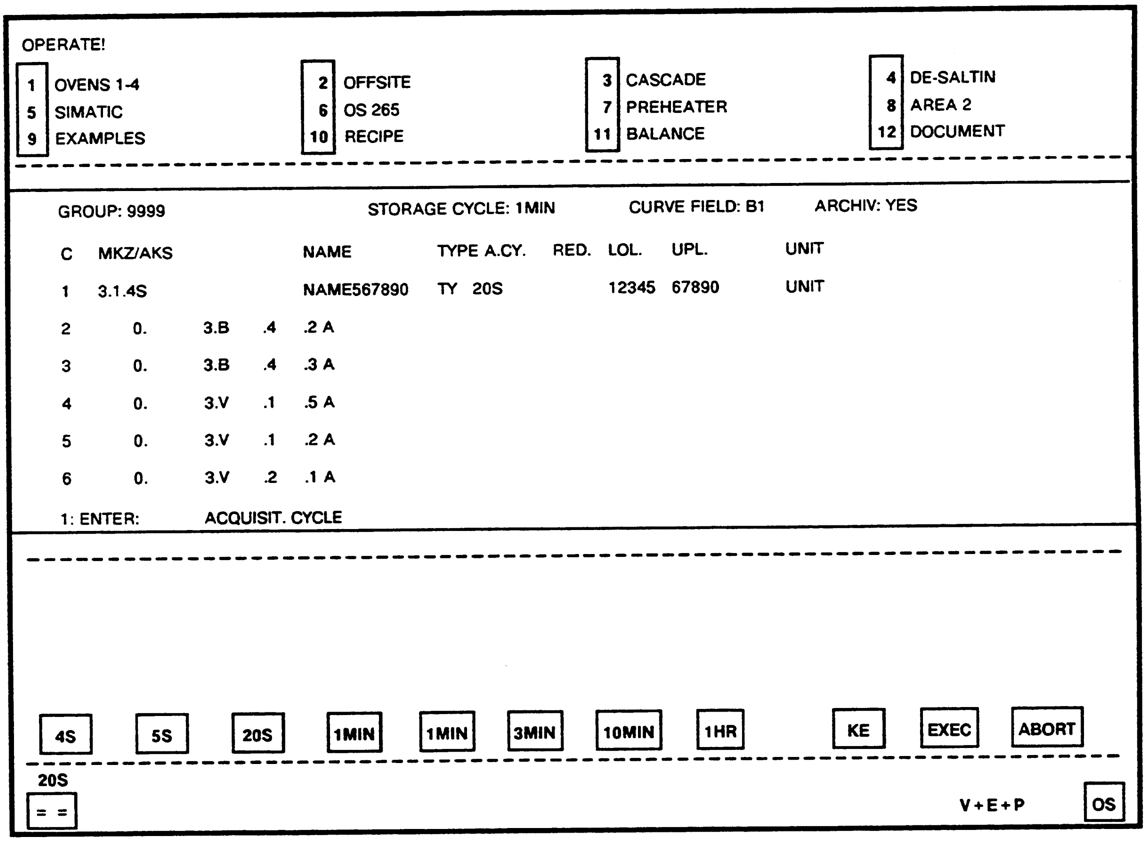
Note:
Rounding (see Chapter 8.1.1.4) can cause a deviation from the specified display range which, during the operating phase, becomes visible in the curve field or log. This effect only happens in very small or very large display ranges where the upper and lower range differ.

- **Entering the acquisition cycle**

The cycle sequence, which has already been configured for the system (Chapter 8.4.2), is displayed as operator input keys. The user selects the acquisition cycle by touching the respective key using the light pen. The value is accepted after EXEC has been selected.

The cycle time value must be shorter than the storage cycle which has already been selected for this group.

The system issues the message ACQUIS. CYCLE TOO LONG if the acquisition cycle is longer than the storage cycle. Input must then be repeated.



```
OPERATE!
 1 OVENS 1-4          2 OFFSITE        3 CASCADE        4 DE-SALTIN
 5 SIMATIC            6 OS 265         7 PREHEATER      8 AREA 2
 9 EXAMPLES          10 RECIPE        11 BALANCE       12 DOCUMENT

   GROUP: 9999              STORAGE CYCLE: 1MIN    CURVE FIELD: B1   ARCHIV: YES

   C  MKZ/AKS               NAME        TYPE A.CY.  RED.  LOL.   UPL.     UNIT
   1  3.1.4S                NAME567890  TY  20S         12345  67890    UNIT
   2     0.   3.B  .4  .2 A
   3     0.   3.B  .4  .3 A
   4     0.   3.V  .1  .5 A
   5     0.   3.V  .1  .2 A
   6     0.   3.V  .2  .1 A
   1: ENTER:  ACQUISIT. CYCLE

 4S   5S   20S   1MIN   1MIN   3MIN   10MIN   1HR      KE   EXEC   ABORT
 20S
 = =                                                    V+E+P           OS
```

Fig. 8-13

ENTER: ACQUISIT. CYCLE

Input: via function keys

- acquisition cycle shorter than storage cycle

KE key : displays the second part of the keys
EXEC key : accepts the previous entries

- **Entering the message definition**

These items are entered via the DIAVID menu field displayed on the screen or via an alphanumeric keyboard.

AKS message number, location number and repetition time are entered as a character string in this sequence, separated by commas. A number between 1 and 8191 can be entered as message number (number of the AKS block).

The location number is a figure between 1 and 28, the repetition time a value with up to 4 digits followed by a unit.

The repetition time is a product of 125 ms * 2 to the power of n (n is a positive integer).

Valid units are "MS" (milliseconds) or "S" (seconds).

The repetition time for the corresponding AKS message need not be entered again if it has already been configured in the group. A list of the input data is displayed when the END key is selected after a correct entry. The data can be checked and must be acknowledged by selecting the YES/NO keys.

Location number and repetition time need not be entered if a message number "0" has been specified. The measuring value is then retrieved by a fetch message (the acquisition cycle time is assumed as repetition time). Up to 50 fetch messages are possible in a system. Up to 28 measured values can be retrieved from an AS by a fetch message.

If, during initialization into the operating phase, the system communicates with a partner (e.g. AS) and realizes that a configured MKZ cannot be found, the entire fetch message configured during the design phase will not be processed. The values of all curves related to the measured values required in the message will be missing.

ENTER: TELEGRAM NO., PARAMETER-NUMBER, REPETIT. TIME

Input: via DIAVID menu field or alphanumeric keyboard

- message number 0 (fetch message)
  → no further input required
- message numbers from 1 to 8191 (AKS message)
- location numbers from 1 to 28
- repetition time: max. 4 digits plus unit
  125 ms * 2 to the power of n, n positive integer
  valid units: MS (milliseconds) and S (seconds)
  - → entered values are output after a correct input
  - → error message is displayed if the entered value is incompatible with previous configurations

AKS NO.: xxxx POSIT NO.: xx TIME: xxxxx RIGHT?

The user can check the entries and acknowledge the values by selecting a key.

Input: via function keys

a. : YES→ message definition is accepted
b. : NO → message definition is requested again

- **Error messages related to AKS message input**

Incompatibilities with previous configuration can easily happen when AKS message definitions are configured. The corresponding error message and the inquiry IS THIS MESSAGE DEFINITION TO BE ACCEPTED? are issued in this case. Selecting the YES key enables the user in certain cases to "force" the message definition input. The following exceptions must be observed, however:

a) CYCLES INCOMPATIBLE

This warning need not be acknowledged. It is issued if the repetition time (WZ) does not harmonize with the storage cycle (AZ) (i.e. AZ = WZ * 2 to the power of n). The messages must then be filtered by the software, which causes an increased CPU load.

b) AKS-POS. OCCUPIED

Caution: The measured value which has previously been configured for this location in the AKS message is cleared from all groups if the YES key is selected.

c) CHANGING AKS-CYCLE

Caution: The previously entered AKS cycle time will be changed; the last repetition time to have been entered is valid.

d) MAX.NO.FETCHTEL.

No more free fetch message exists in the system. The message definition input must be repeated. Only the NO key can be selected for acknowledgement.

e) AKS-CYCLE MISSING/WRONG

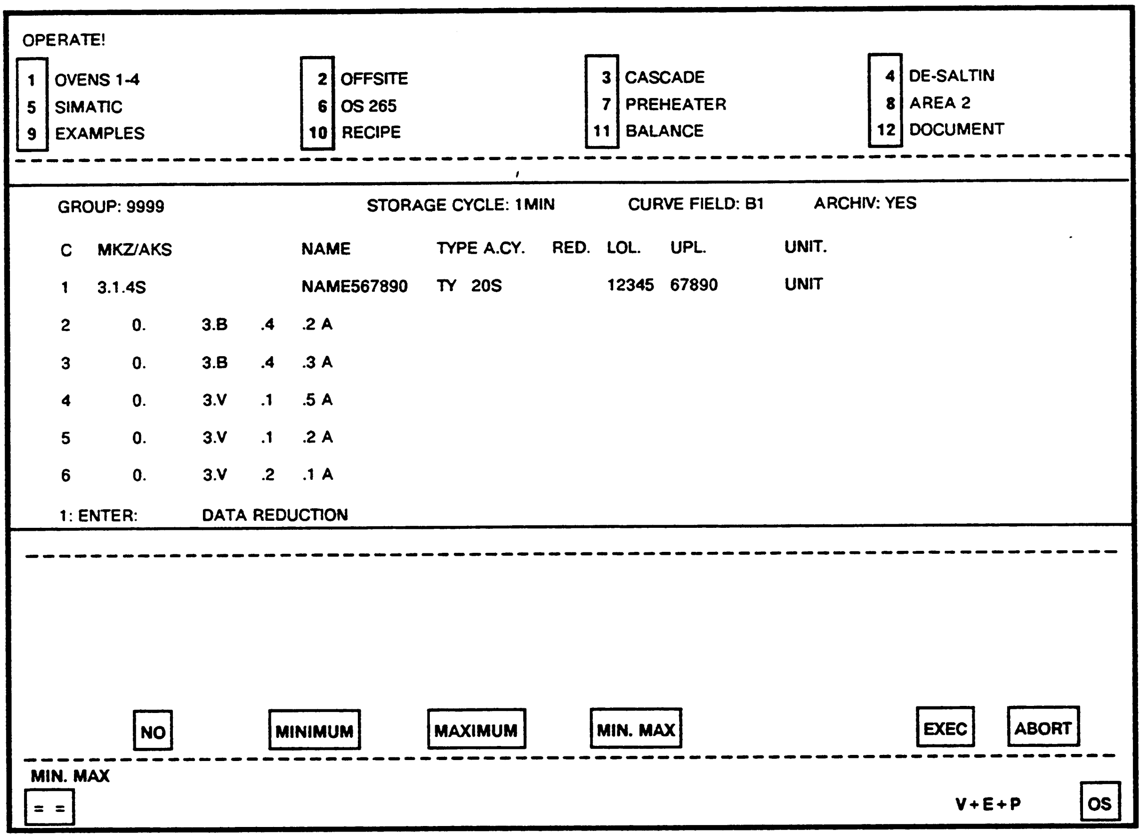
The input must be repeated and the NO key selected when this message appears.

f) AKS-CYC.UNFAVOURABLE

The specified repetition time is not a product of 125 ms * 2 to the power of n, n positive integer (Chapter 8.4.4.3).

- **Entering data reduction**

The possible data reduction types (see Chapter 8.1.19) are displayed as operator input keys.



```
OPERATE!
 1 OVENS 1-4        2 OFFSITE        3 CASCADE        4 DE-SALTIN
 5 SIMATIC          6 OS 265         7 PREHEATER      8 AREA 2
 9 EXAMPLES        10 RECIPE        11 BALANCE       12 DOCUMENT
---------------------------------------------------------------------

  GROUP: 9999              STORAGE CYCLE: 1MIN    CURVE FIELD: B1    ARCHIV: YES

  C  MKZ/AKS               NAME          TYPE A.CY.   RED.  LOL.   UPL.    UNIT.
  1  3.1.4S                NAME567890    TY  20S            12345  67890   UNIT
  2      0.    3.B  .4  .2 A
  3      0.    3.B  .4  .3 A
  4      0.    3.V  .1  .5 A
  5      0.    3.V  .1  .2 A
  6      0.    3.V  .2  .1 A
  1: ENTER:    DATA REDUCTION
---------------------------------------------------------------------



          NO      MINIMUM     MAXIMUM     MIN. MAX             EXEC  ABORT
---------------------------------------------------------------------
MIN. MAX
 = =                                                     V+E+P     OS
```

Fig. 8-14

"ENTER: DATA REDUCTION

Input : Via function keys

NO : Select this key if data reduction is not required

MIN.MAX : Minimum and maximum value are accepted alternately, starting with a maximum value.

MINIMUM : The minimum value is accepted per cycle

MAXIMUM : The maximum value is accepted per cycle

ABORT : Configuration of this curve group is aborted.

EXEC : The selected data reduction type is accepted.

- **Repeatedly accepted MKZ**

A measuring point can be selected repeatedly if a group is composed by selecting the measuring points in the FRANZ or NORA system images (Chapter 8.4.4.1). A measuring point can also be accepted in a different curve after a curve has been configured for this point. This is expedient because several curves in different representation can be displayed for one measuring point and curves related to one measuring point can be displayed in several groups.

It is also possible to combine a certain number of measuring points in several curve groups according to the requirements. This feature enables, for example, the effect of a process input variable on more than six output variables to be displayed.

The curves need only to be configured once in these cases. The system recognized such a multiple configuration, accepts the data from the first configuration and enters these values automatically into the corresponding line on the screen.

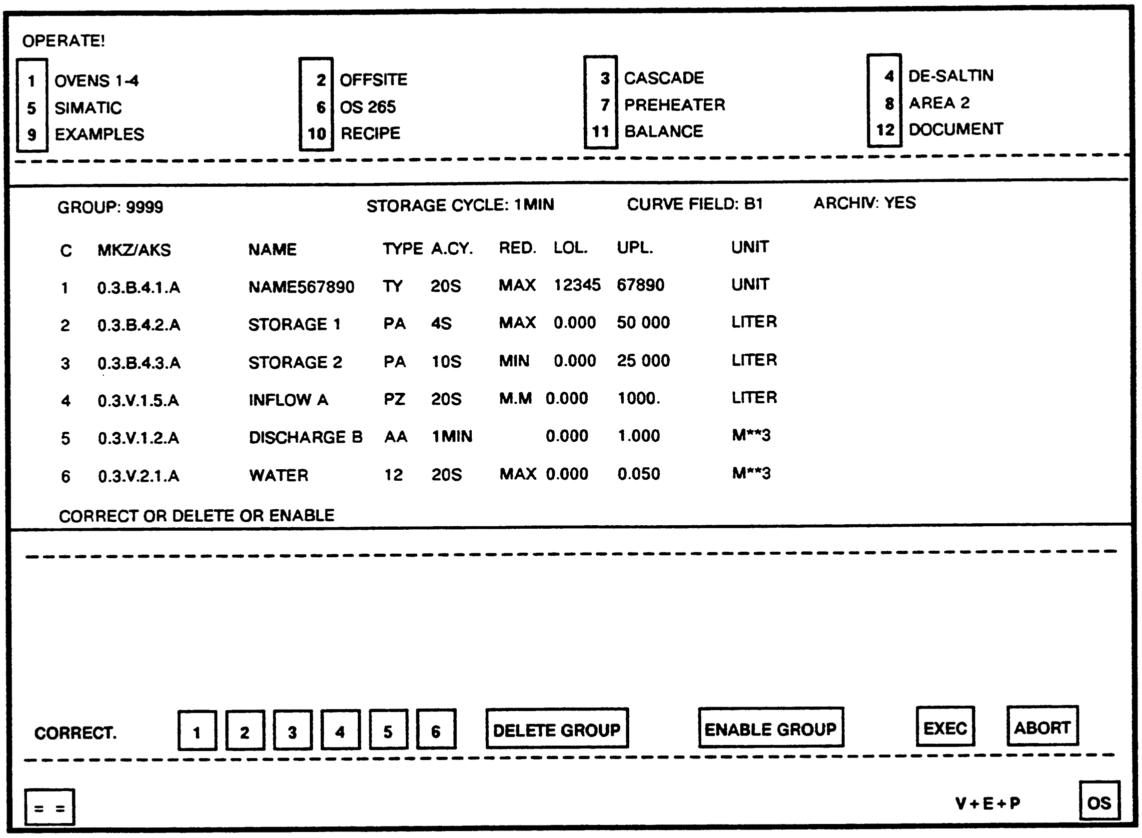
If a curve group contains a mix of configured and unconfigured MKZs, the data for the unconfigured MKZs is requested in succession. Once all MKZs of this group have ben configured, individual parameters can be modified using the correcting function (Chapter 8.4.4.1).

8.4.4.4 Correcting, Clearing and Enabling the Group

Operator input keys for enabling, clearing and correcting (individual parameters) the curve group are displayed once the curve data for all accepted measuring points has been configured.

The data is accepted into the system after the ENABLE key has been selected. Selecting the CLEAR key clears this curve group. Selecting one of the keys 1 ... 6 permits corrections to be performed in the corresponding line. The corresponding parameters of MKZ which have previously been configured in other curve groups can be modified by selecting the DATA REDUCTION and LOL, UPL keys. Selecting the corresponding keys permits name, type and unit of newly configured MKZ in this group to be modified. Selecting the AC-CYCLE key enables the acquisition cycle and the message definition to be modified. Only name and cycle of the first curve of a new measuring point can be modified if a group contains several curves which are related to the new measuring point.

Correction of an individual line cannot be aborted. The entire group is cleared if the inquiry "abort input" is answered with YES.



GROUP: 9999 STORAGE CYCLE: 1MIN CURVE FIELD: B1 ARCHIV: YES

C	MKZ/AKS	NAME	TYPE	A.CY.	RED.	LOL.	UPL.	UNIT
1	0.3.B.4.1.A	NAME567890	TY	20S	MAX	12345	67890	UNIT
2	0.3.B.4.2.A	STORAGE 1	PA	4S	MAX	0.000	50 000	LITER
3	0.3.B.4.3.A	STORAGE 2	PA	10S	MIN	0.000	25 000	LITER
4	0.3.V.1.5.A	INFLOW A	PZ	20S	M.M	0.000	1000.	LITER
5	0.3.V.1.2.A	DISCHARGE B	AA	1MIN		0.000	1.000	M**3
6	0.3.V.2.1.A	WATER	12	20S	MAX	0.000	0.050	M**3

CORRECT OR DELETE OR ENABLE

Fig. 8-15

ENABLE OR DELETE OR CORRECT

These functions enable individual data of curves existing in this group.

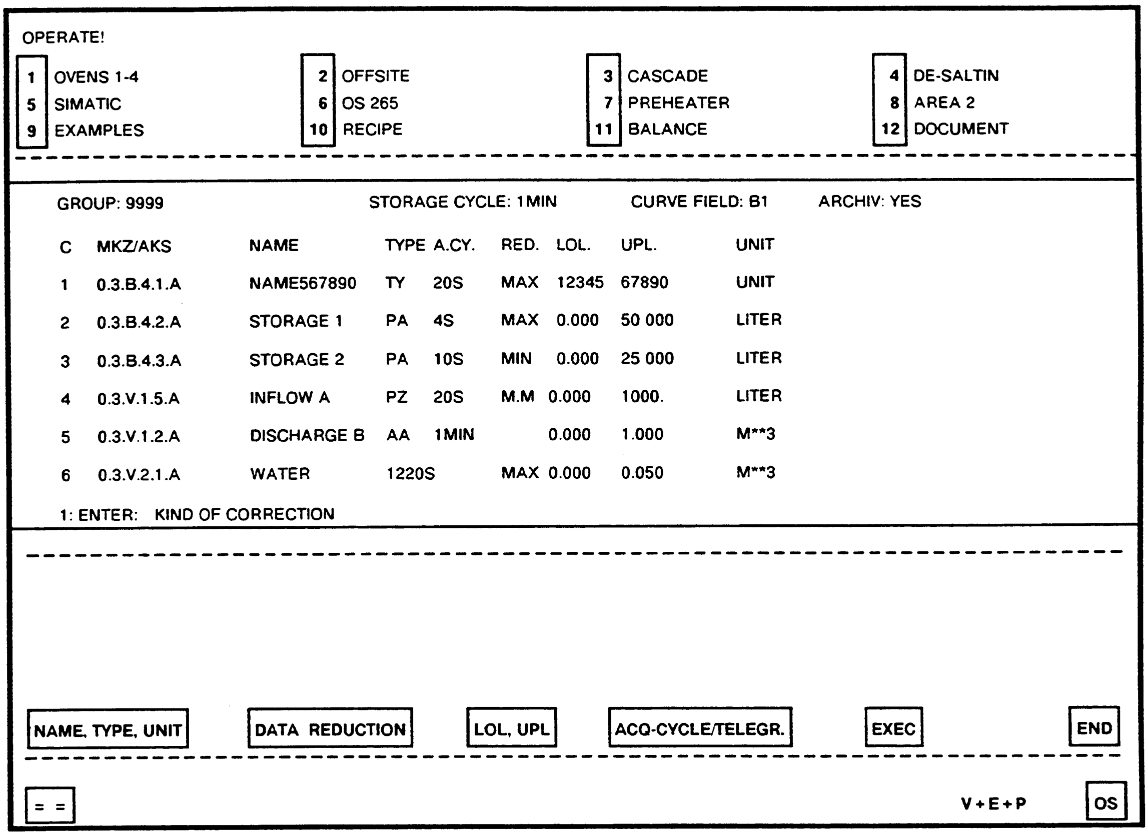
Input: via function keys

a. : 1 ... 6 (= line number in which a value is to be corrected)
→ The new configuration data of the selected line can be entered.

b. : DELETE GROUP
→ The entire group is cleared

c. : ENABLE GROUP
→ The configuration data is accepted into the system.

EXEC key: The previous input is accepted and the corresponding function executed.



```
GROUP: 9999                    STORAGE CYCLE: 1MIN      CURVE FIELD: B1     ARCHIV: YES

C   MKZ/AKS       NAME            TYPE  A.CY.    RED.  LOL.    UPL.       UNIT
1   0.3.B.4.1.A   NAME567890      TY    20S      MAX   12345   67890      UNIT
2   0.3.B.4.2.A   STORAGE 1       PA    4S       MAX   0.000   50 000     LITER
3   0.3.B.4.3.A   STORAGE 2       PA    10S      MIN   0.000   25 000     LITER
4   0.3.V.1.5.A   INFLOW A        PZ    20S      M.M   0.000   1000.      LITER
5   0.3.V.1.2.A   DISCHARGE B     AA    1MIN           0.000   1.000      M**3
6   0.3.V.2.1.A   WATER           1220S          MAX   0.000   0.050      M**3
1: ENTER:   KIND OF CORRECTION
```

Fig. 8-16

Input: Via function keys

a. : NAME, TYPE, UNIT → new entry of name, type, unit

b. : DATA REDUCTION → new entry of data reduction type

c. : LOL/UPL → new entry of display range

d. : ACQ-CYCLE/TELEGR. → new entry of acquisition cycle and message definition

e. : END → terminates modification

EXEC key : the previous inputs are accepted

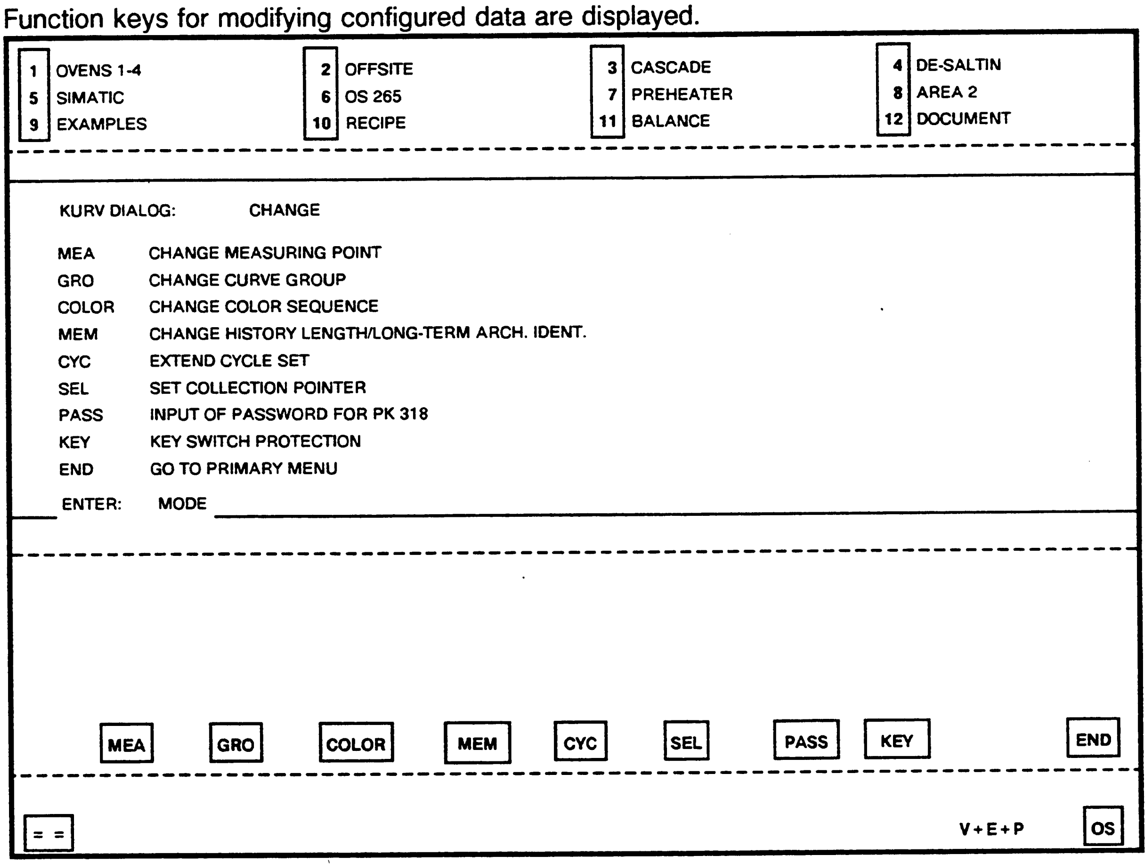
8.4.4.5 Aborting Group Combination

Curve group configuration can be exited when the selected MKZ are cleared and the END key is selected whilst MKZ are determined. If all MKZs for this curve group have been collected and if the system has continued with group data configuration after the END key has been selected, the procedure can be aborted by selecting the END key in an input sequence via the DIAVID menu field without selecting a different key. The ABORT key can be selected in other inputs.

The inquiry ABORTION OF INPUT? YES/NO is displayed next. Selecting YES re-displays the basic menu and all previous inputs in this group are cleared. Selecting NO enables the configuration dialog to be continued.

8.4.5 Configuration Modification CH

Function keys for modifying configured data are displayed.



```
KURV DIALOG:        CHANGE

MEA      CHANGE MEASURING POINT
GRO      CHANGE CURVE GROUP
COLOR    CHANGE COLOR SEQUENCE
MEM      CHANGE HISTORY LENGTH/LONG-TERM ARCH. IDENT.
CYC      EXTEND CYCLE SET
SEL      SET COLLECTION POINTER
PASS     INPUT OF PASSWORD FOR PK 318
KEY      KEY SWITCH PROTECTION
END      GO TO PRIMARY MENU
ENTER:   MODE
```

Fig. 8-17 Screen display after KURV → CHANGE has been selected

The individual functions are selected by one of the function keys (MEA, GRO, COLOR, MEM, CYC, SEL, PASS, KEY). The following functions can be activated:

MEA : Modifying the measuring point data

GRO : Modifying a configured curve group

COLOR : Modifying the curve colour representation

MEM : Modifying the history length and allocating the long-term file identifier

CYC : Extending the configured cycle sequence

SEL : Setting the selector pointer

PASS : Pass word input for PK 318

KEY : Key switch protection

The basic menu is re-displayed once one of these functions has been executed or the END key selected (Chapter 8.4.3).

8.4.5.1 Modifying Measuring Point Data MEA

Selecting MEA displays function keys which enable the user to define how the measuring point, which is to be modified, can be selected. The user is prompted to specify the MKZ in the FRANZ/NORA system display if the SEL. BY PROC. DISP. key is selected. The DIAVID menu field for entering the group number followed by a function key menu field for entering the curve number are displayed if the SEL. BY GROUP/CURVE NUMBER key has been selected.
The MKZ is output if the measuring point has been selected by one of these functions.

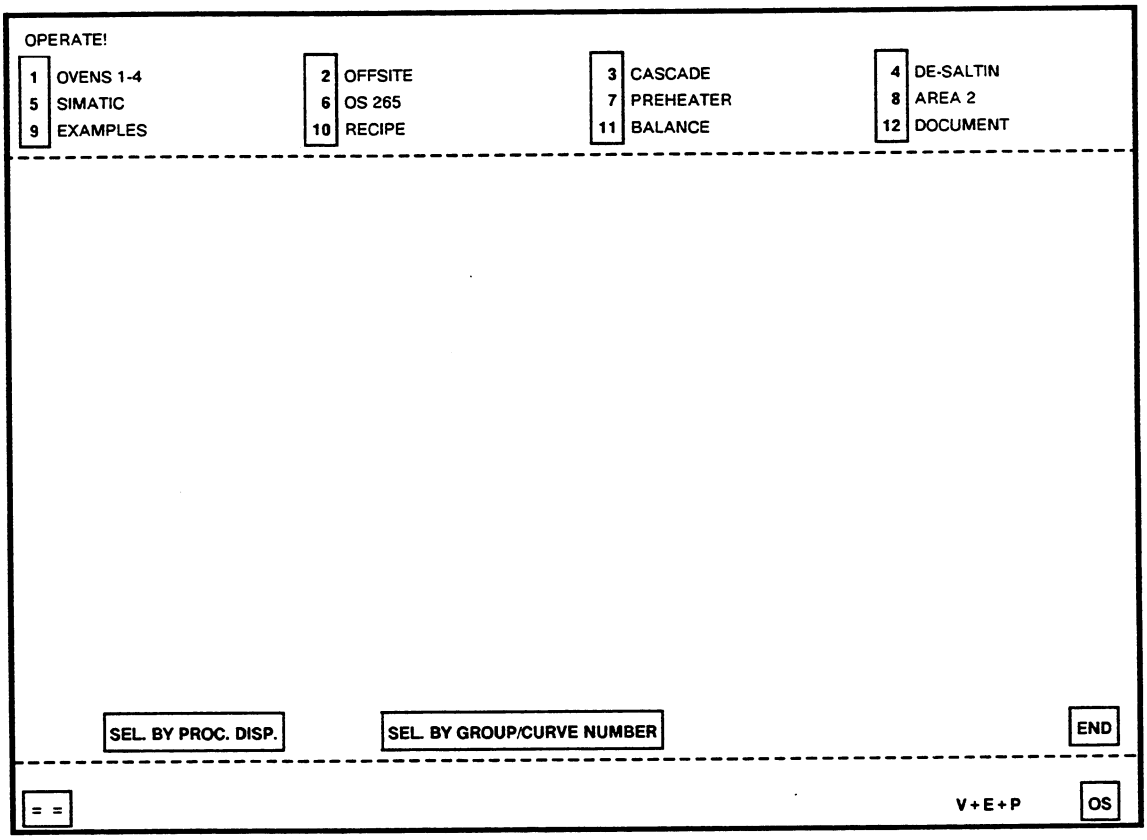


Bild 8-18 Screen display after MEA has been selected

Input : Via function keys

a. : SEL. BY PROC. DISP. → the MKZ in the system display is selected.

b. : SEL. BY GROUP/CURVE NUMBER
→ The measuring point is selected by a group and curve number which contains the configuration of this measuring point.

c. : END → Clearing measuring points is aborted or terminated.

The following parameters of the selected MKZ can be modified by operator input:

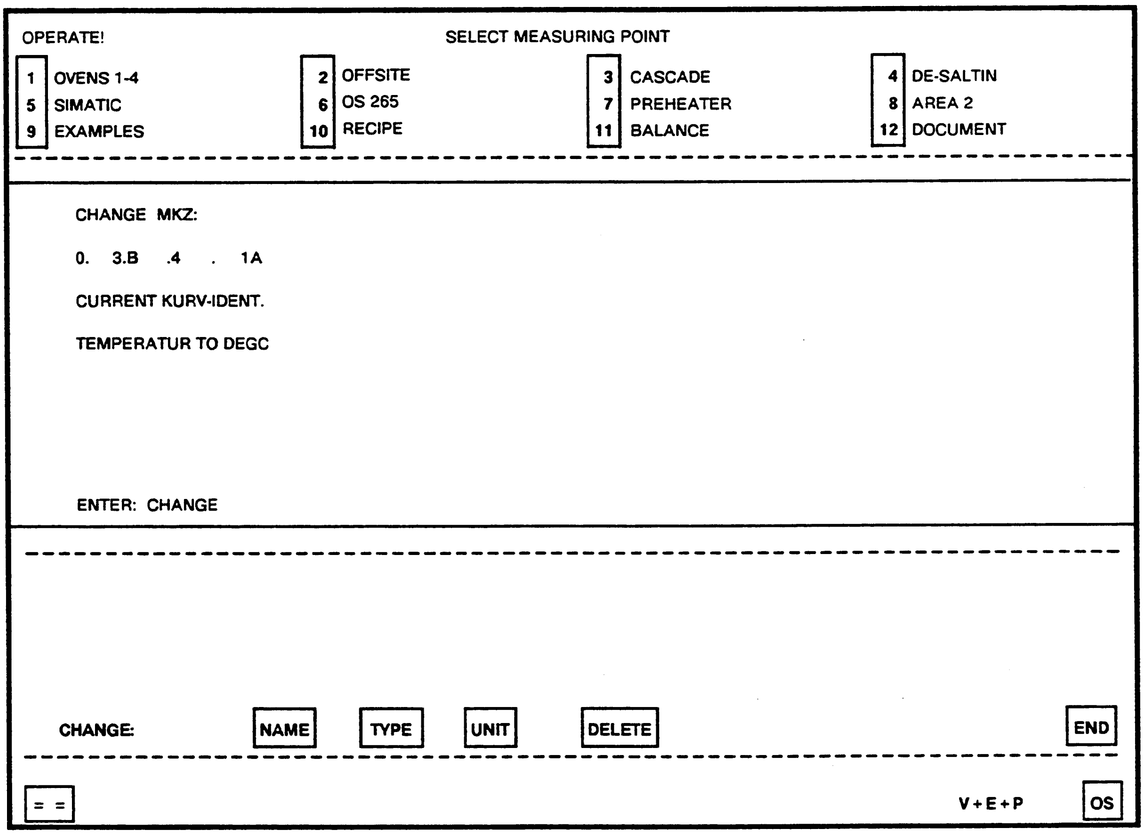
NAME : Enter a new MKZ name
TYPE : Enter a new MKZ type
UNIT : Enter a new MKZ unit
DELETE : Clears this MKZ type from all curve groups

A modification of name, type or unit becomes effective in all curves related to the MKZ (irrespective of selection).

Selecting DELETE clears the MKZ from all curve groups. The curves configured after this MKZ are moved forward after it has been cleared.

Example: The cleared MKZ existed as curve 1 and 4 in group 9998. After it has been cleared, the old curves 2, 3, 5, 6 obtain the new curve numbers 1, 2, 3, 4. The colours allocated to these curves remain the same.

If the last or only curve in one or several groups is cleared when an MKZ is cleared, the related group numbers are released for new configurations. The current file version is increased if at least one curve is cleared from a group which is to be filed.



```
OPERATE!                SELECT MEASURING POINT

CHANGE MKZ:

0.  3.B  .4  .  1A

CURRENT KURV-IDENT.

TEMPERATUR TO DEGC

ENTER: CHANGE
```

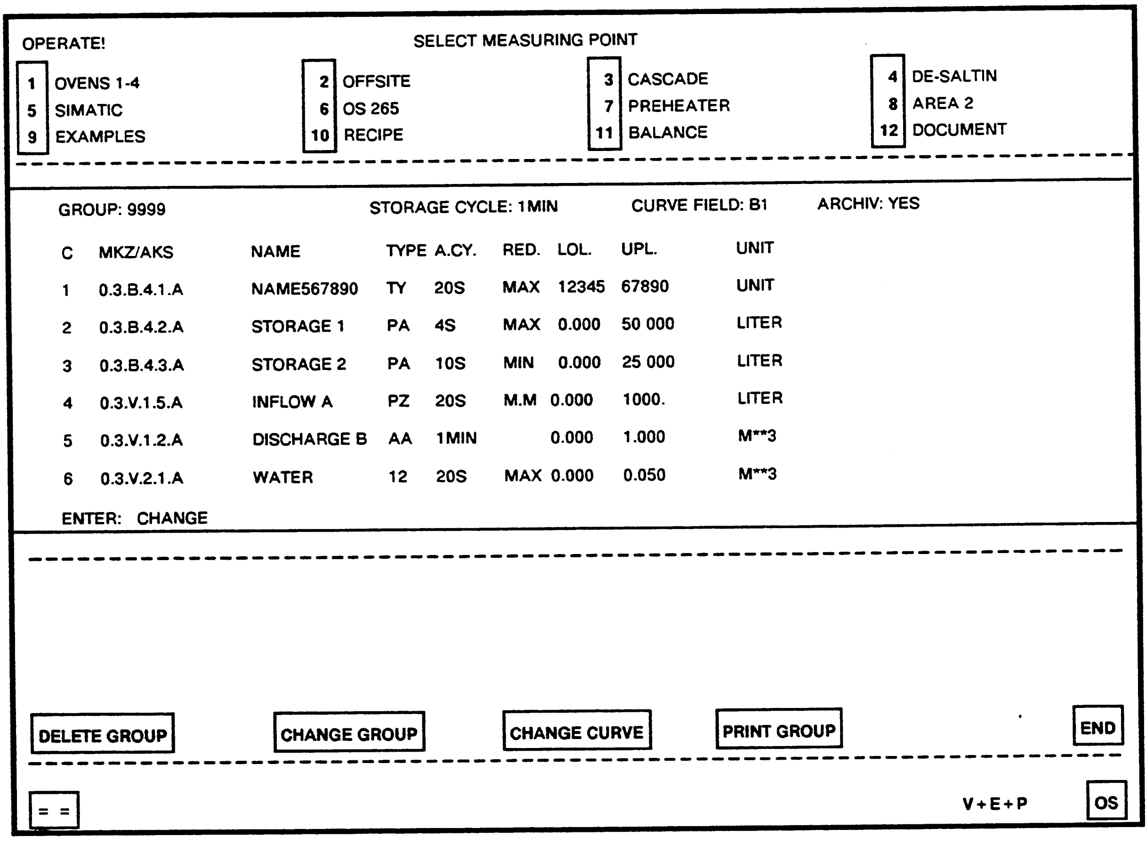
Fig. 8-19 Screen display after an MKZ has been selected

CHANGE MKZ

Input: via function keys

a. : NAME → Name modification, input via DIAVID menu field, 10 characters
b. : TYPE → Type modification; input via DIAVID menu field, 2 characters
c. : UNIT → Unit modification; input via DIAVID menu field, 6 characters
d. : DELETE → Clear MKZ; the function keys YES and NO are displayed
YES = measuring point is cleared
NO = measuring point is not cleared
e. : END → Modification is terminated

8.4.5.2 Modifying a Configured Group GRO



GROUP: 9999 STORAGE CYCLE: 1MIN CURVE FIELD: B1 ARCHIV: YES

C	MKZ/AKS	NAME	TYPE	A.CY.	RED.	LOL.	UPL.	UNIT
1	0.3.B.4.1.A	NAME567890	TY	20S	MAX	12345	67890	UNIT
2	0.3.B.4.2.A	STORAGE 1	PA	4S	MAX	0.000	50 000	LITER
3	0.3.B.4.3.A	STORAGE 2	PA	10S	MIN	0.000	25 000	LITER
4	0.3.V.1.5.A	INFLOW A	PZ	20S	M.M	0.000	1000.	LITER
5	0.3.V.1.2.A	DISCHARGE B	AA	1MIN		0.000	1.000	M**3
6	0.3.V.2.1.A	WATER	12	20S	MAX	0.000	0.050	M**3

ENTER: CHANGE

Fig. 8-20 Listing of the selected group

The curve group which is to be modified is selected via the DIAVID menu field. The selected group is displayed once the group number has been entered. The following operator input keys are provided:

DELETE	Clear group
CHANGE GROUP	Modify group data
CHANGE CURVE	Modify curve data
PRINT GROUP	Log the group on a printer
END	Return to the basic menu

- **Delete curve group**

The system requires acknowledgement via the YES/NO keys when the DELETE GROUP key is selected.

YES clears the selected group and re-displays the basic configuration mask. NO means that further modification functions can be selected. The current file version is increased if a group, which is to be filed has been cleared.

- **Print the displayed curve group**

A group log of the displayed curve group is printed when the PRINT GROUP key is selected (see Chapter 8.4.8.2).

- **Modification of group-related data**

The following keys for initiating the required functions are displayed:

GROUP NUMBER	Assign new group number (cf. Chapter 8.4.4.2)
CURVEFIELDTYPE	Modify curve field type (see below)
ARCHIV.FLAG	Modify file reference (cf. Chapter 8.4.4.2)
END	Return to the group modification menu

Keys for entering the new type are displayed if curve field type modification has been selected.

A modification of the curve field types A, B1, B2, D1 and D2 to C1, C2, C3, C4, C5 or C6 is only possible if not more than two curves exist. The input is rejected and the message PLEASE REPEAT, NUMBER OF CURVES TOO HIGH displayed if more than two curves exist and, for example, C1 is specified as the new curve field type.

A corresponding identifier can be assigned to groups which have not previously been filed on the hard disk by changing the file reference. A configured file reference can also be cleared by this function. Changing the file reference increased the file version.

Changing the group number also redirects existing selector pointers to the new group number.

The group modification menu is re-displayed once the inputs have been terminated.

- **Modification of curve-related data**

After the curve to be modified has been selected, the following items can be modified by selecting the corresponding keys:

- name, type and unit of the measuring point
- display range
- data reduction
- curve colour

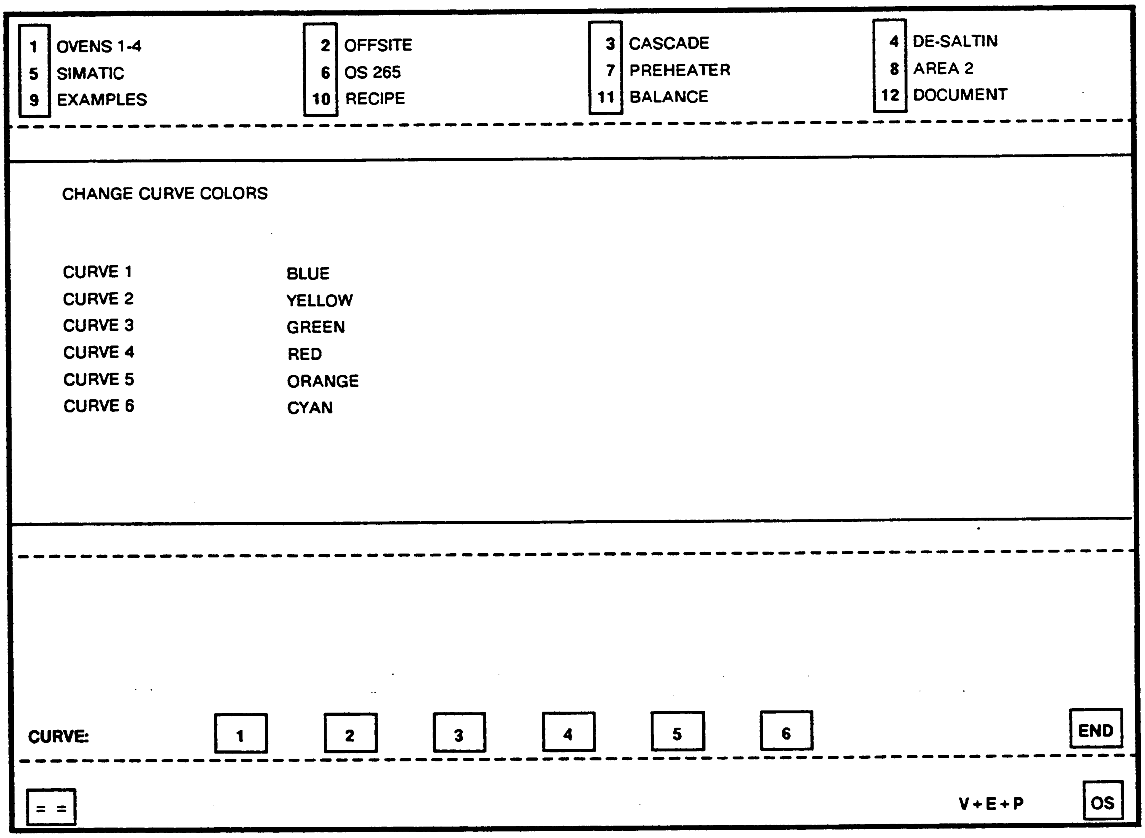
A modification of measuring point name, type and unit also effects all other curve groups which contain the corresponding measuring point.

Once the curve has been selected, further curve data in this group an be modified after an input has been terminated. The group modification selection menu is re-displayed if the abort function is selected during a modification.

The group modification menu is displayed when the END key is selected.

8.4.5.3 Modification of the Color Representation COLOR

A table containing the curve numbers 1 to 6, the related curve colours and the curve selection function keys 1 to 6 are displayed.



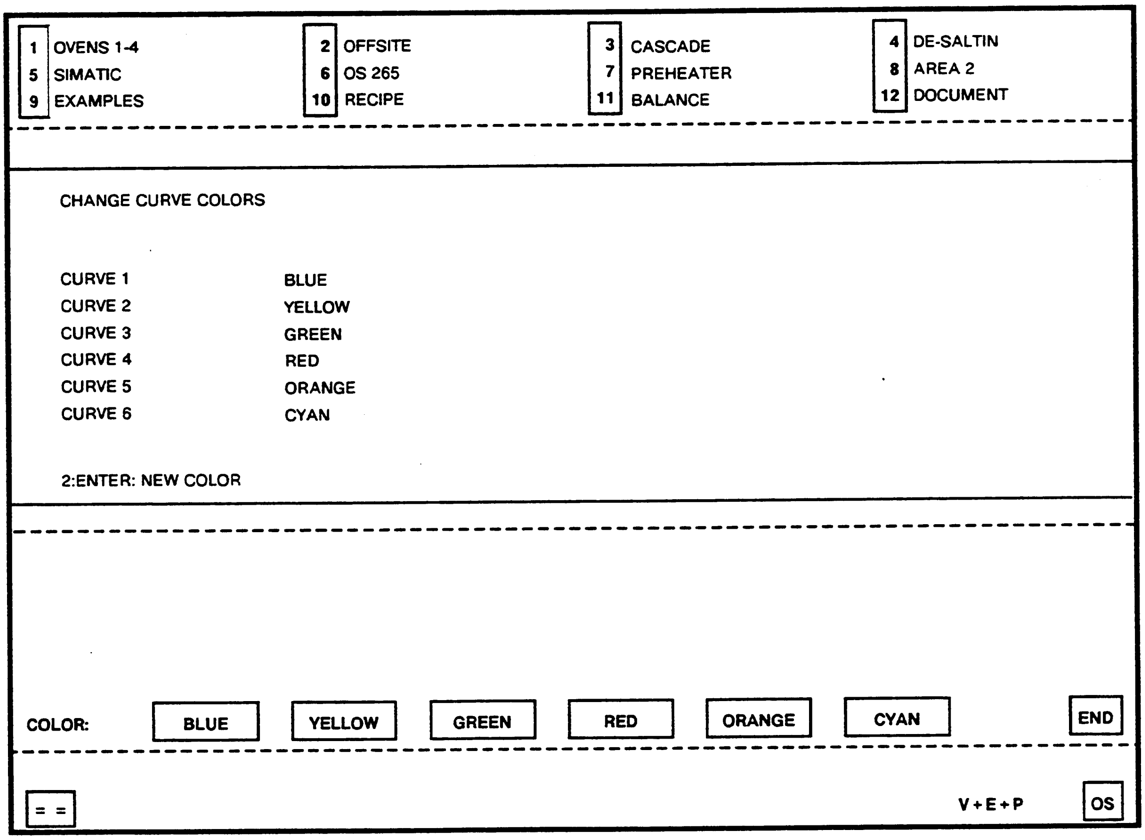
1 OVENS 1-4	2 OFFSITE	3 CASCADE	4 DE-SALTIN
5 SIMATIC	6 OS 265	7 PREHEATER	8 AREA 2
9 EXAMPLES	10 RECIPE	11 BALANCE	12 DOCUMENT

CHANGE CURVE COLORS

CURVE 1	BLUE
CURVE 2	YELLOW
CURVE 3	GREEN
CURVE 4	RED
CURVE 5	ORANGE
CURVE 6	CYAN

Fig. 8-21 Screen display after KURV → CHANGE → COLOR have been selected

The specified curve is selected and the six colours are displayed as function keys when one of this keys is selected. Selecting a function key allocates the corresponding colour to the selected curve. The six curve selection function keys are re-displayed and the next curve colour can be changed.



CHANGE CURVE COLORS

CURVE 1	BLUE
CURVE 2	YELLOW
CURVE 3	GREEN
CURVE 4	RED
CURVE 5	ORANGE
CURVE 6	CYAN

2:ENTER: NEW COLOR

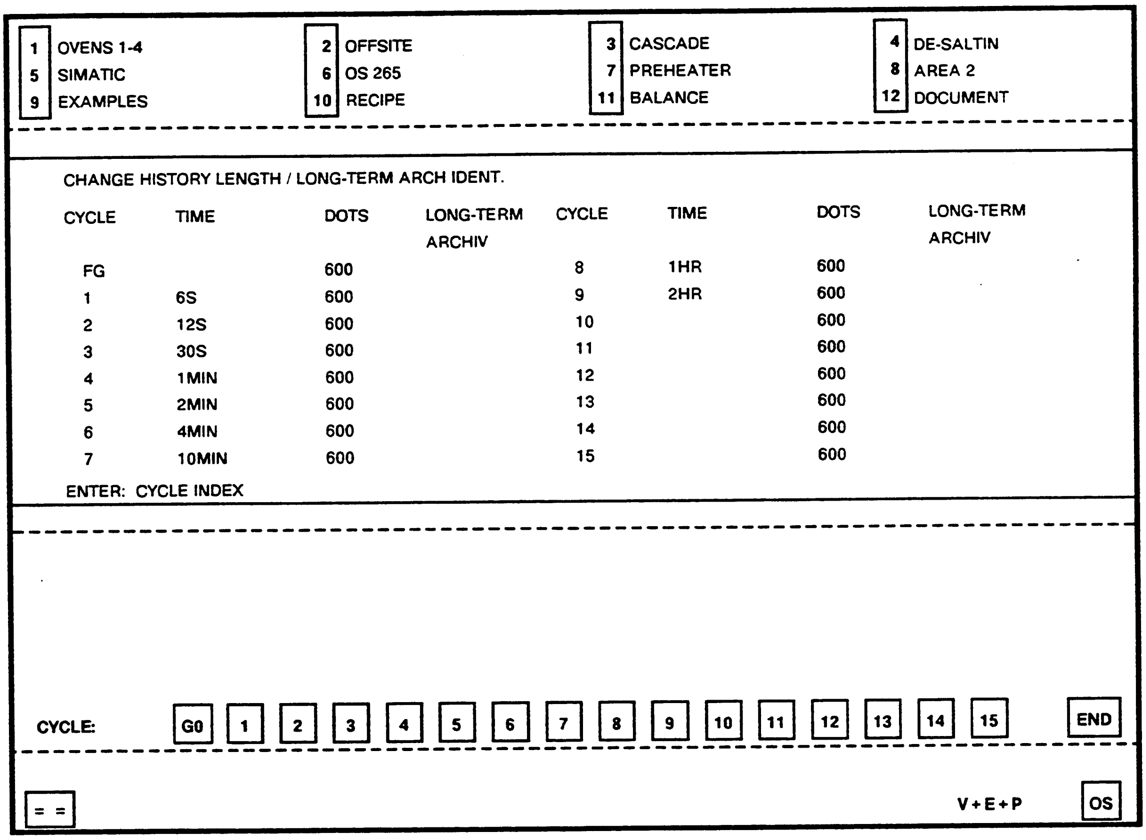
Fig. 8-22 Screen display after CURVE → CHANGE → COLOR → 2

The END key is displayed in both function key menu fields after a colour change has been terminated. Selecting this key re-displays the basic configuration menu. The curves which have been configured before the colour change retain their previous colours.

Only the standard colour sequence can be used for the free curve groups (FG) and special curve groups (SG) which can be configured in the operating phase.

8.4.5.4 Modification of History Length/Long-Term File Identifier

MEM



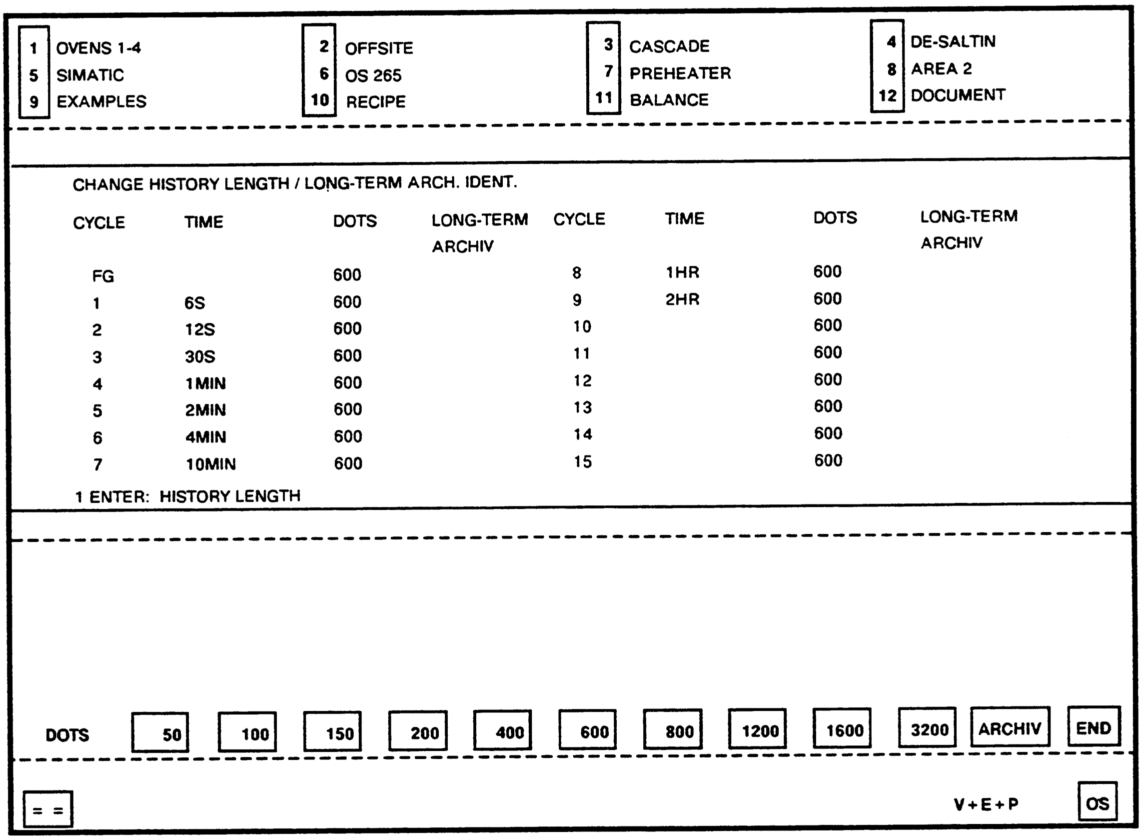
```
 1 OVENS 1-4         2 OFFSITE          3 CASCADE          4 DE-SALTIN
 5 SIMATIC           6 OS 265           7 PREHEATER        8 AREA 2
 9 EXAMPLES         10 RECIPE          11 BALANCE         12 DOCUMENT

CHANGE HISTORY LENGTH / LONG-TERM ARCH IDENT.
CYCLE    TIME     DOTS   LONG-TERM  CYCLE   TIME    DOTS   LONG-TERM
                         ARCHIV                            ARCHIV
  FG              600                8      1HR     600
  1      6S       600                9      2HR     600
  2      12S      600               10              600
  3      30S      600               11              600
  4      1MIN     600               12              600
  5      2MIN     600               13              600
  6      4MIN     600               14              600
  7      10MIN    600               15              600
ENTER: CYCLE INDEX

CYCLE:     GO  1  2  3  4  5  6  7  8  9  10  11  12  13  14  15     END

= =                                                     V+E+P    OS
```

Fig. 8-23 Screen display after KURV → CHANGE → MEM have been selected

- **History length**

A table containing the cycle groups, the cycle time values, the length of the history to be stored and a function key menu field for cycle group selection are displayed. The number of curve points to be stored defines the size of the history length (Chapter 8.1.1.6).

A cycle group is selected via the keys FG (free curve groups), 1 to 15. The valid history length values are displayed as function keys.



CHANGE HISTORY LENGTH / LONG-TERM ARCH. IDENT.

CYCLE	TIME	DOTS	LONG-TERM ARCHIV	CYCLE	TIME	DOTS	LONG-TERM ARCHIV
FG		600		8	1HR	600	
1	6S	600		9	2HR	600	
2	12S	600		10		600	
3	30S	600		11		600	
4	1MIN	600		12		600	
5	2MIN	600		13		600	
6	4MIN	600		14		600	
7	10MIN	600		15		600	

1 ENTER: HISTORY LENGTH

Fig. 8-24 Screen display after KURV → CHANGE → MEM → 1 have been selected

Selecting one of these keys assigns the new history length to the selected cycle group (Chapter 8.1.1.6). The cycle group selection function key menu field re-appears afterwards, and a further history length can be modified.

Selecting the END key, which is provided in both function key menu fields, terminates history length modification and re-displays the basic configuration menu.

- **Long-term file identifier**

The configuration option "selecting the curve history length" (in the main memory) also includes the long-term file identifier input. "*" can be entered as long-term file identifier for each of the displayed cycles (except FG) once the MEM dialog branch in the KURV modification configuration has been selected. The same cycle can be configured twice: with and without long-term file identifier. The required cycle is entered and the ARCHIV key selected before the long-term file identifier is set by entering YES. An existing long-term file identifier can be cleared by entering NO. The identifier can only be set if the cycle is at least 1 minute long.

Curve configuration is performed in the usual manner once the cycles for long-term filing have been selected. The long-term file cycle keys are cyan and the short-term file keys blue when the storage cycles are entered. The file reference LONG is automatically entered if a cyan key has been selected as storage cycle and the inquiry "ARCHIVING OF GROUP?" has been answered with YES. Entering NO only files in the main memory. If a blue key has been selected, the curve group can either be accepted in the short-term file (file identifier "YES") or storage can be limited to the main memory (file identifier "NO").

The information "LONG-TERM ARCHIVE" applies for all groups for which the file identifier "YES" has been configured in the respective filing cycle.

The log of the general KURV data has been extended for documentation updating by the LONG-TERM ARCH. IDENT. information. The file reference LONG then appears in the group log.

The areas A and B must be selected and labelled before the initialization into the operating phase if the identifier LONG-TERM ARCHIVING has been set for the first time during curve configuration.

Note:
Data in area A and/or B, which come from the previous "infinite filing strategy" is cleared during this process. These file areas should be saved onto magnetic tape cassette before the filing strategy is changed (only possible in the operating phase).

A change between the two strategies "infinite file" and "short-term/long-term file" is possible. A "short-term/long-term file" is created if at least one cycle has been provided with the LONG-TERM ARCHIVE identifier. An "infinite file" is created once all existing LONG-TERM ARCHIVE identifiers have been cleared. Areas A and B must be newly labelled and cleared when such a change takes place.

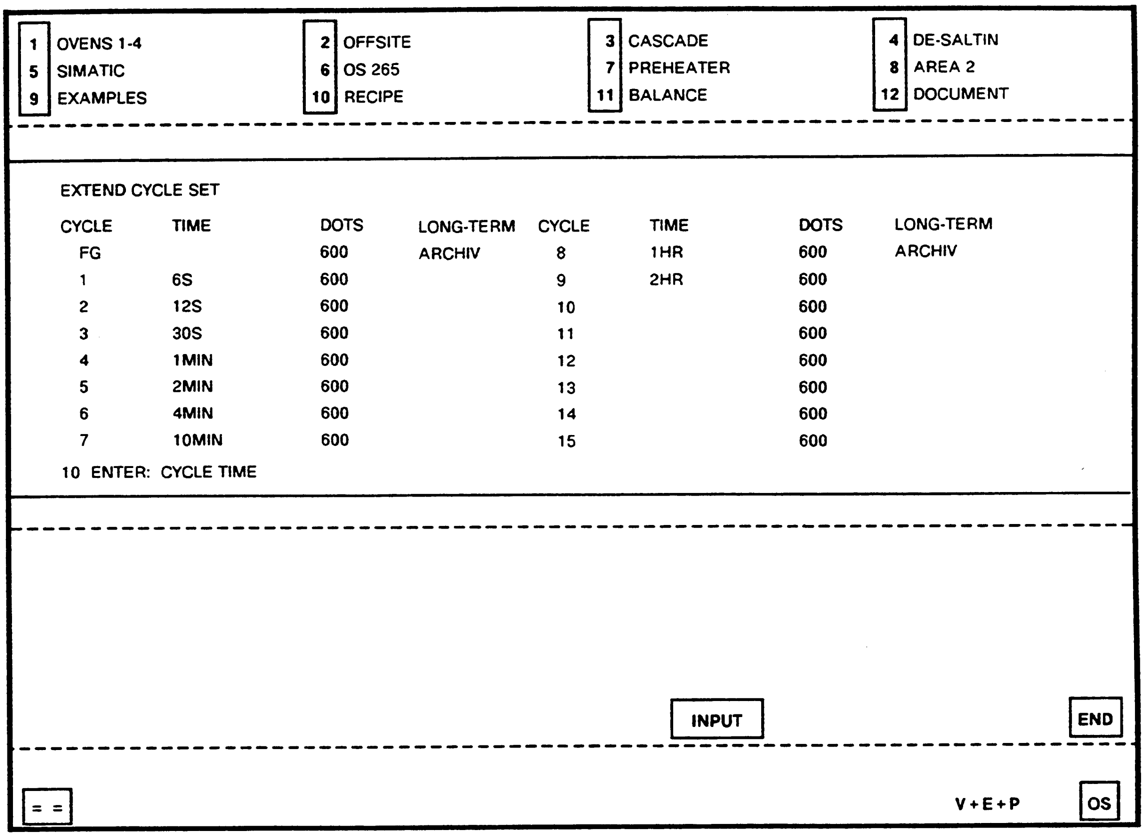
Note:
The user should select one of the two filing strategies before curve configuration is started and maintain this strategy. Frequent and uncontrolled change between the two strategies bears the risk of losing data and making old files incompatible.

The calculation procedure for estimating the long-term filing time interval which can be stored in the areas A and B is the same as for "infinite filing". A waste is produced in the long-term file, however, which depends on the storage space required by the long-term data in the short-term file.

Example:
Before the long-term file data is copied, it occupies 2.1 MB storage space in the long-term file. This means that 2.1 MB storage space are occupied each time data is copied. The size of one file area is 20 MB. 9 x 2.1 MB = 18.9 MB can thus be stored in the long-term file; 1.1 MB cannot be used and are "waste".

8.4.5.5 Extending/Modifying the Cycle Sequence CYC

The table described in Chapter 8.4.2.1 is displayed with the 16 cycle groups and the INPUT and END function keys (possibly even the MODIFY key). The INPUT key is not displayed if 15 cycle time values already exist.



```
 1 OVENS 1-4          2 OFFSITE          3 CASCADE          4 DE-SALTIN
 5 SIMATIC            6 OS 265           7 PREHEATER        8 AREA 2
 9 EXAMPLES          10 RECIPE          11 BALANCE         12 DOCUMENT

   EXTEND CYCLE SET
   CYCLE    TIME       DOTS   LONG-TERM  CYCLE   TIME     DOTS   LONG-TERM
    FG                 600    ARCHIV      8      1HR      600    ARCHIV
    1       6S         600                9      2HR      600
    2       12S        600               10               600
    3       30S        600               11               600
    4       1MIN       600               12               600
    5       2MIN       600               13               600
    6       4MIN       600               14               600
    7       10MIN      600               15               600
   10 ENTER: CYCLE TIME

                                          INPUT                        END

 = =                                                         V+E+P     OS
```

Fig. 8-25 Screen display after KURV → CHANGE → CYC have been selected

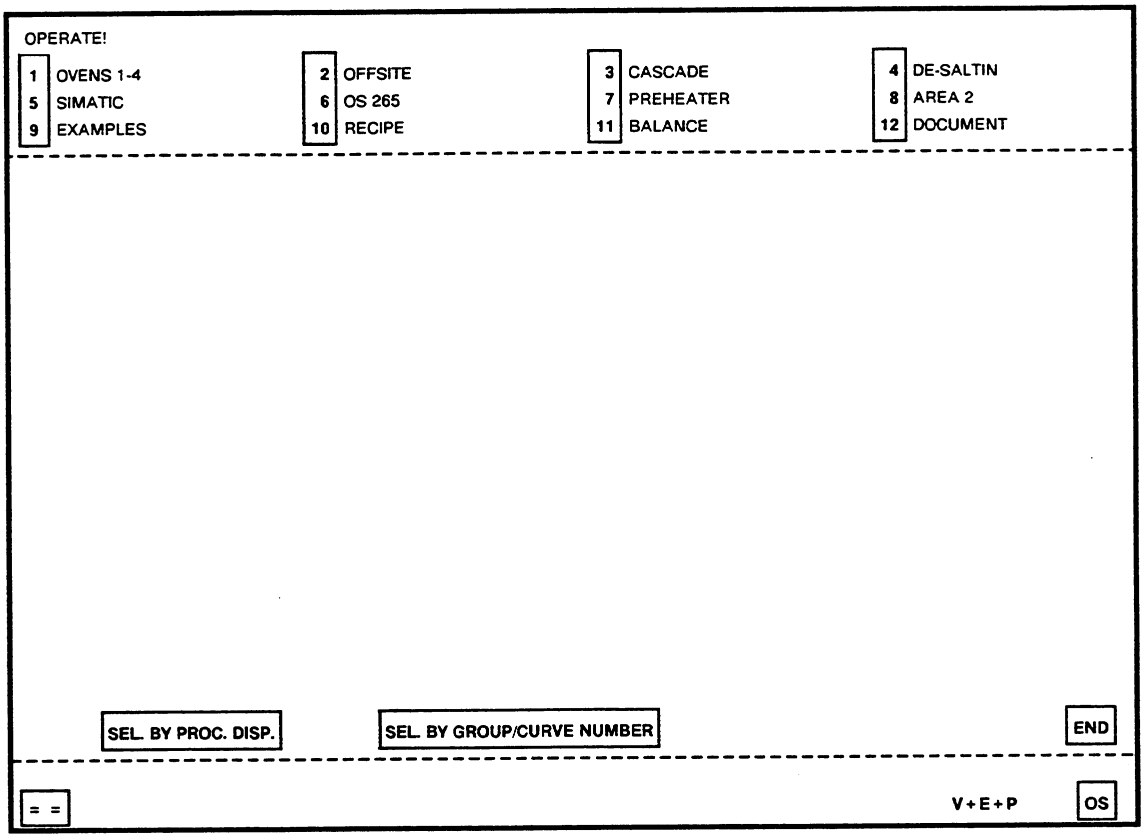
ENTER

The cycle extension is terminated and the basic configuration menu re-displayed when the END key is selected. Selecting the INPUT key displays the DIAVID menu field required for entering a further cycle in the cycle sequence. The specified time value must be an integer factor of 86,400 seconds and may not be less that 2 seconds or longer than 12 hours. The new time (if valid) is accepted and the previous menu field (INPUT, END) is re-displayed after the END key has been selected.

MODIFY

The MODIFY key is only displayed, if there are cycles in which curves have neither been acquired nor stored. Selecting the key, displays a key set which only contains keys of cycles in which no curves have been acquired or stored. These cycles can be selected. The cycle times can be entered via the DIAVID keyboard.

8.4.5.6 Configuring the Selector Pointer SEL



OPERATE!

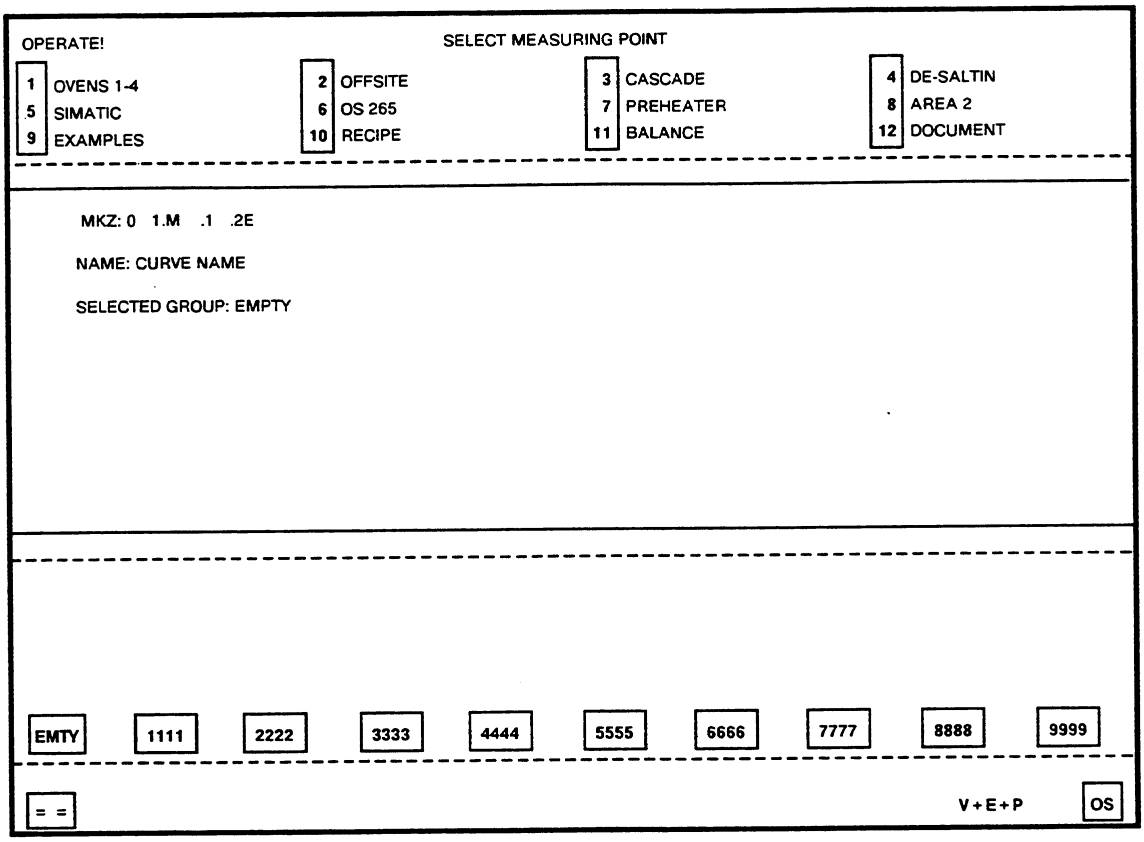
1 OVENS 1-4	2 OFFSITE	3 CASCADE	4 DE-SALTIN
5 SIMATIC	6 OS 265	7 PREHEATER	8 AREA 2
9 EXAMPLES	10 RECIPE	11 BALANCE	12 DOCUMENT

SEL BY PROC. DISP. SEL BY GROUP/CURVE NUMBER END

= = V+E+P OS

Fig. 8-26 Configuring the selector pointer

The measuring point related to the selector group to be configured is selected in a dialog after the SEL key has been selected. This can be performed via the group/curve number or by selecting the measuring point in the process display. All group numbers (1 - 9999) containing this measuring point are displayed as operator input keys after the measuring point has been defined.



MKZ: 0 1.M .1 .2E

NAME: CURVE NAME

SELECTED GROUP: EMPTY

Fig. 8-27 Setting the selector pointer

The key sequence is the same as the configuration sequence of the curve groups. The number of the group which is to be stored as a selector group must be touched using the light pen.
If a curve group has been cleared during configuration and additional groups be configured afterwards, the sequence of the displayed group number keys may differ from the configuration sequence.

Example:
The groups 1 to 6 have been configured in succession; the selected MKZ exists in the groups 1, 3 and 5: the group number key sequence is 1,3,5.

Group 2 is cleared and a curve is configured for the selected MKZ in group 7. If the configuration of the selector pointer to this MKZ is activated now, the following group number keys are displayed: 1 7 3 5.

This effect results from the system-internal data storage structure (empty data elements due to cleared areas are filled by subsequent entries) and the search algorithm for listing group numbers containing a configured measuring point (the search starts at the top of the list).

A maximum of 120 keys are displayed.

A selector group related to the measuring point which has already been configured is displayed under the MKZ. EMTY is displayed if such a group does not exist. Selector group configuration is performed by touching the group number using the light pen.

- **Modifying the selector pointer**

Modifying an existing selector group is performed in the same manner as when the selector group is stored:

Select the corresponding MKZ and touch the group number key which is to be stored as the new selector group.

- **Clearing an existing selector pointer**

Selecting the EMTY key instead of a group number key removes an existing selector group from the data.

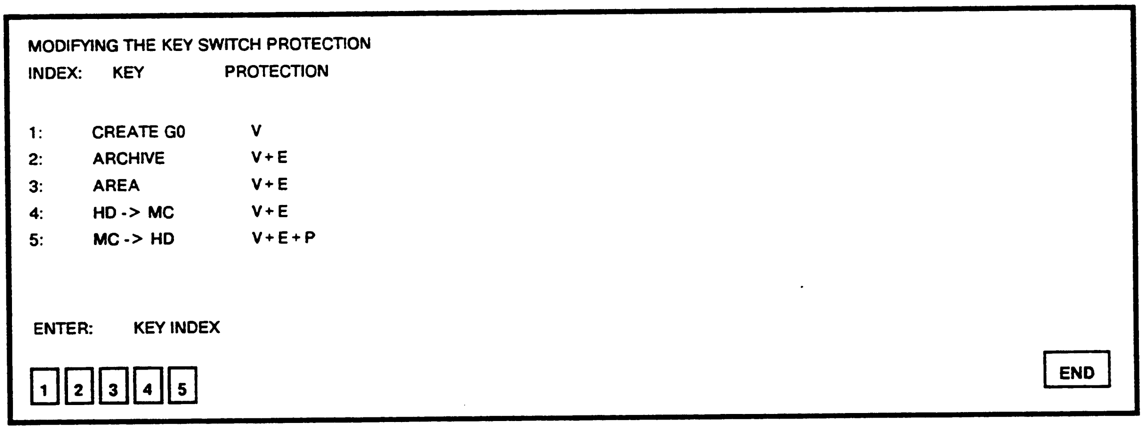
8.4.5.7 Pass Word Configuration for PK 318 PASS

Pass word configuration is only necessary if the process operation keyboard is to be used for operator input in the operating phase (see PK 318 description).

Note: If a password has already been input, another password entry is refused and "WRONG" is output.

8.4.5.8 Key Switch Protection KEY

After actuating the "KEY" key, the below mask is displayed (Fig. 8-28).



```
MODIFYING THE KEY SWITCH PROTECTION
INDEX:   KEY           PROTECTION

1:       CREATE G0     V
2:       ARCHIVE       V+E
3:       AREA          V+E
4:       HD -> MC      V+E
5:       MC -> HD      V+E+P


ENTER:    KEY INDEX
```

Fig. 8-28 Key switch protection

The keys to be protected, their respective index numbers as well as the current key switch protection status is displayed on the above mask. If you want to modify the protection status for a certain operator input, touch the respective key index and then select the protection type V, V + E or V + E + P on the key set.
Leave the dialog branch by pressing the END key after you have carried out all modifications required.

Note: If no authorization has been configured in OFFLINE mode, all keys shown in Fig. 8-28 can only be actuated via V + E + P.

8.4.6 Filing Cycle

The default value of the filing cycle is 30 minutes.

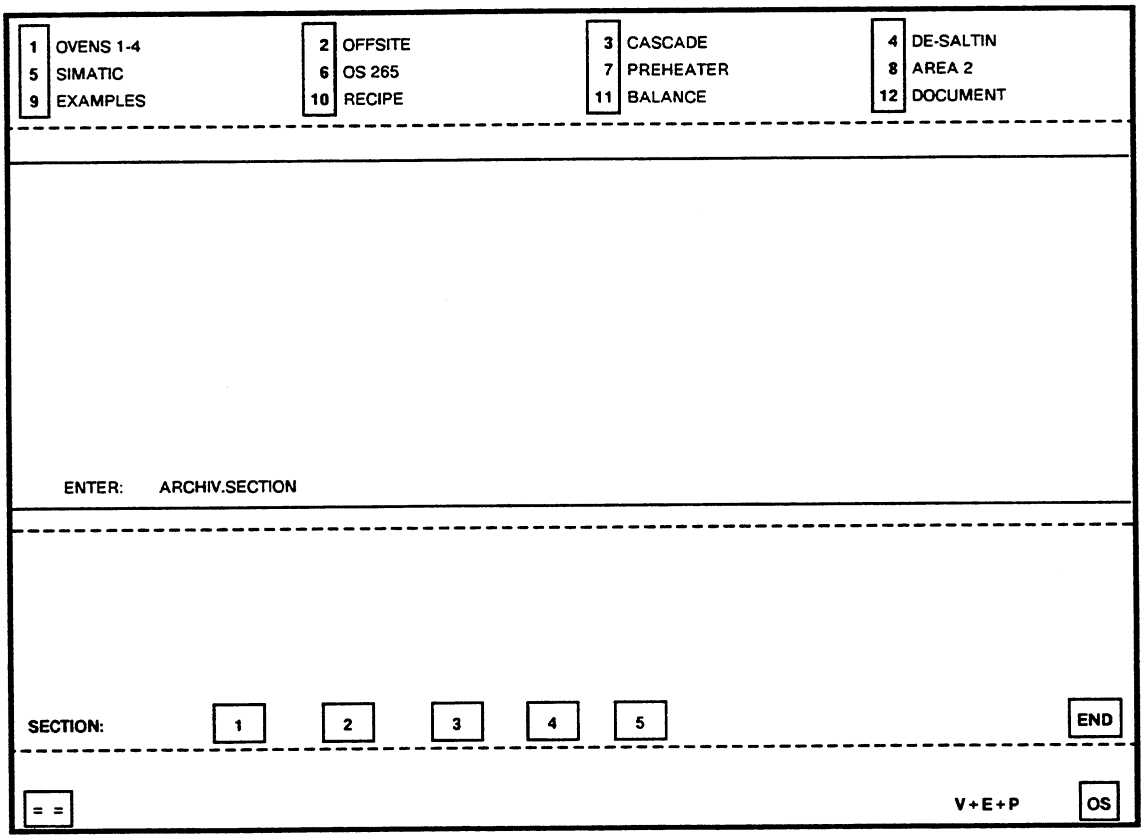
KURV might reduce this value during initialization into the operating phase if the system determines that 50 % of the curve history in the main memory run within a shorter time (this determined time can be found in the general KURV data log in the operating phase).

8.4.7 Area Administration ST

The file area states can be displayed when the area administration mode is selected. The following functions can be initiated:

Selecting an area	(Chapter 8.4.7.1)
Printing an area label	(Chapter 8.4.7.5)
Clearing an area	(Chapter 8.4.7.4)

8.4.7.1 Selecting a Filing Area



ENTER: ARCHIV.SECTION

Fig. 8-29 Screen display after KURV → ST have been selected

The filing area is selected via an operator input key.

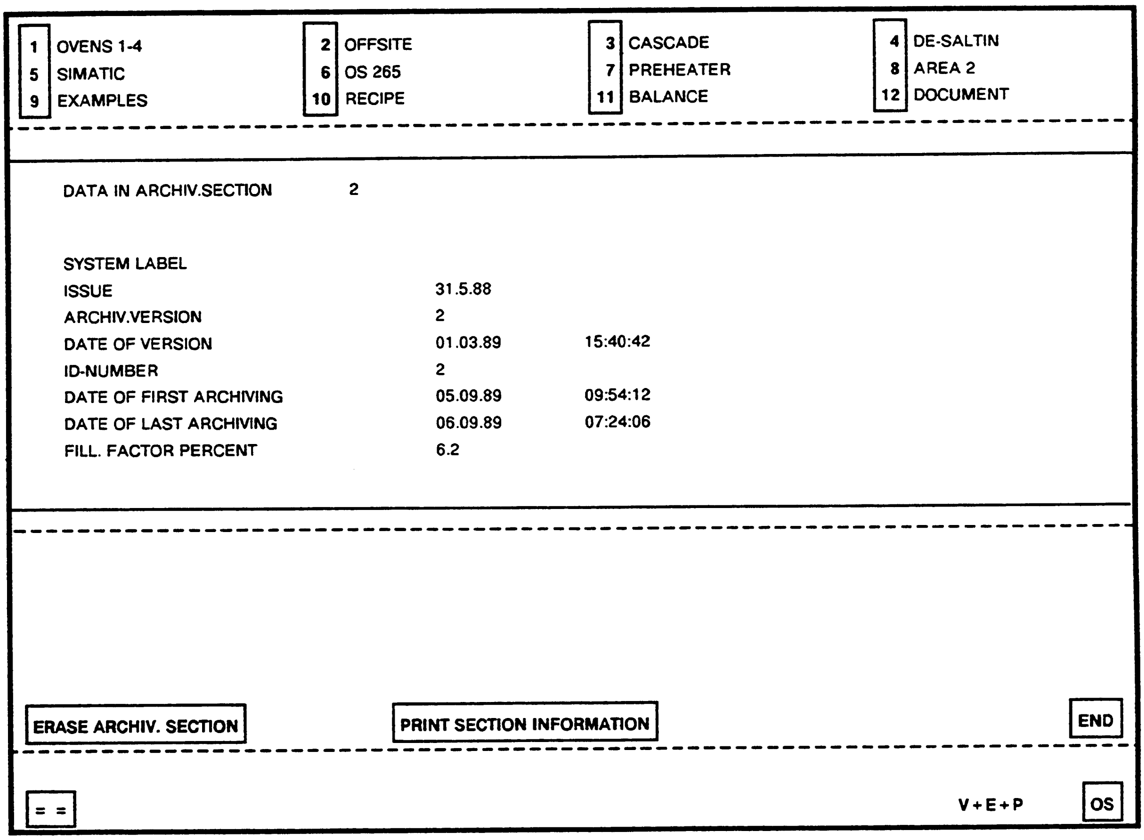
8.4.7.2 Code Number

In order to be able to distinguish the filing areas, a code number is requested each time an area has been cleared. Valid numbers between 0 and 9999 can be entered via a numeric DIAVID menu field (numeric keys only). Selecting END terminates the input. The input must be repeated after an invalid entry. Number 1 is assigned to an area if the END key is selected without previous input. The subsequently displayed area label enables the input to be checked.

The preparation of the filing area in the operating phase is terminated after the code number has been entered.

8.4.7.3 Area Label

The functions
ERASE ARCHIVES SECTION (Chapter 8.4.7.4)
PRINT SECTION INFORMATION (Chapter 8.4.7.5)
END
can be selected when the area label is displayed.



1 OVENS 1-4	2 OFFSITE	3 CASCADE	4 DE-SALTIN
5 SIMATIC	6 OS 265	7 PREHEATER	8 AREA 2
9 EXAMPLES	10 RECIPE	11 BALANCE	12 DOCUMENT

DATA IN ARCHIV.SECTION 2

SYSTEM LABEL		
ISSUE	31.5.88	
ARCHIV.VERSION	2	
DATE OF VERSION	01.03.89	15:40:42
ID-NUMBER	2	
DATE OF FIRST ARCHIVING	05.09.89	09:54:12
DATE OF LAST ARCHIVING	06.09.89	07:24:06
FILL. FACTOR PERCENT	6.2	

Fig. 8-30 Screen display after KURV → ST → 2 have been selected

The area label contains the following information:

Curve configuration level	(Chapter 8.4.2)
Filing version	(Chapter 8.4.1.1)
System identifier	
Code number	(Chapter 8.4.7.2)
Date of first filing	
Date of last filing	
Occupancy in per cent	(Chapter 8.4.8.1)

1.1.80 is displayed as the date of the first and last filing of files which have not yet been used for filing in the operating phase. The filed period is displayed if filing has already been performed.

The specification for "FILL FACTOR IN PERCENT" in areas which have not yet been used for filing refers to the storage space which is not available for KURV filing. If filing has already been performed, the occupancy refers to the space available for filing data.

8.4.7.4 Erase Area

Areas which have been used for filing in the operating phase and which are no longer needed can be erased by selecting the ERASE key. In order to prevent inadvertent inputs, the inquiry "ERASE? YES/NO" is displayed after this key has been selected. The previous menu is re-displayed if NO is entered. The filing data is cleared and the first BE menu displayed if YES is entered.

8.4.7.5 Print Section Label

Selecting the PRINT key prints the KURV label of the currently selected area.

Areas which have not yet been used for filing are identified by the specification DATE OF FIRST/LAST ARCHIVING = 01.01.80 00:00:00.

8.4.8 Logging LG

After the LOGGING mode has been selected, a menu field is displayed which can be used for starting logging (Chapter 9.2.2).

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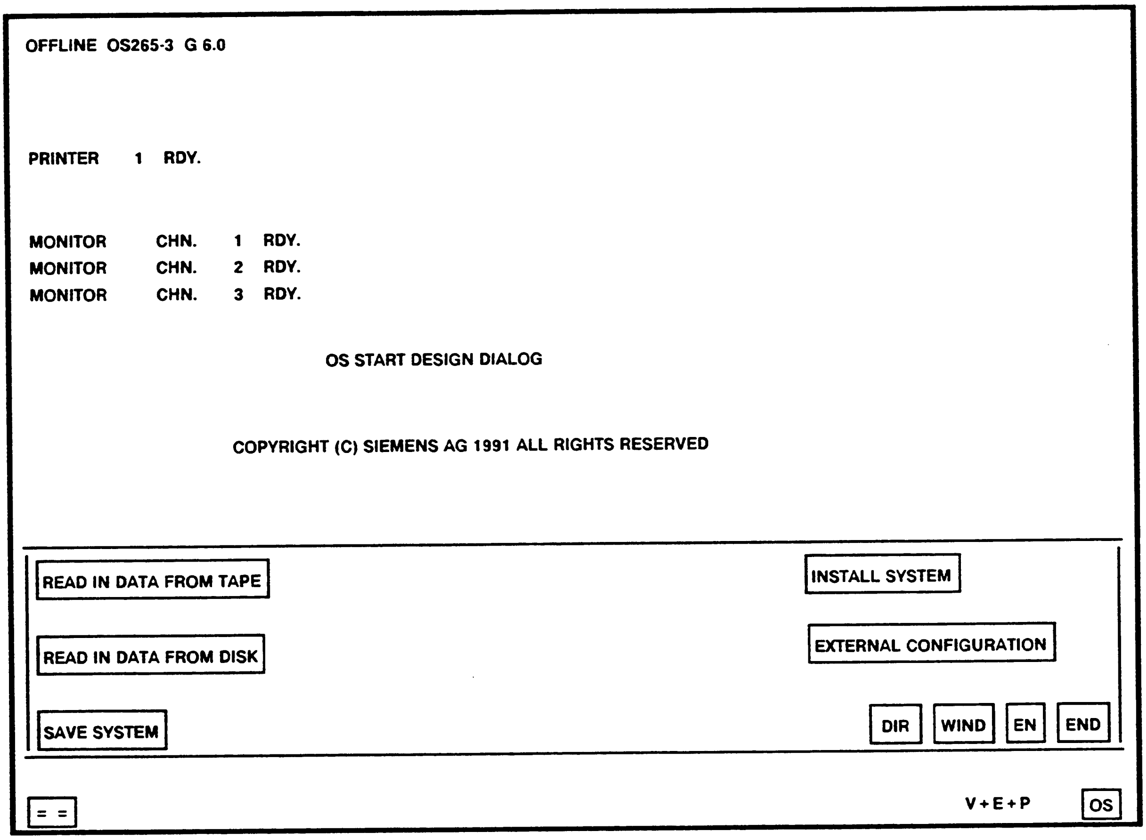
9 Logging

The system software (OFFLINE) has been designed for operation using one printer. During start-up, the system checks whether the printer is ready, and displays the result on the monitor (Fig. 9-1).



```
OFFLINE OS265-3 G 6.0

PRINTER    1  RDY.

MONITOR    CHN.   1  RDY.
MONITOR    CHN.   2  RDY.
MONITOR    CHN.   3  RDY.

                    OS START DESIGN DIALOG

        COPYRIGHT (C) SIEMENS AG 1991 ALL RIGHTS RESERVED
```

Fig. 9-1 OFFLINE initialization menu

Two different log types are available to the user in the design phase:

- Hardcopy of the screen display
- Logging of the configuration data

Printer 1 is the default selection for logging activities. Printout initiation is ignored if printer 1 is not ready.

The logging device is defined during system initialization. All printout initiations are ignored if initialization takes place without printer.

Printout initiation is ignored if the logging printer is not ready.

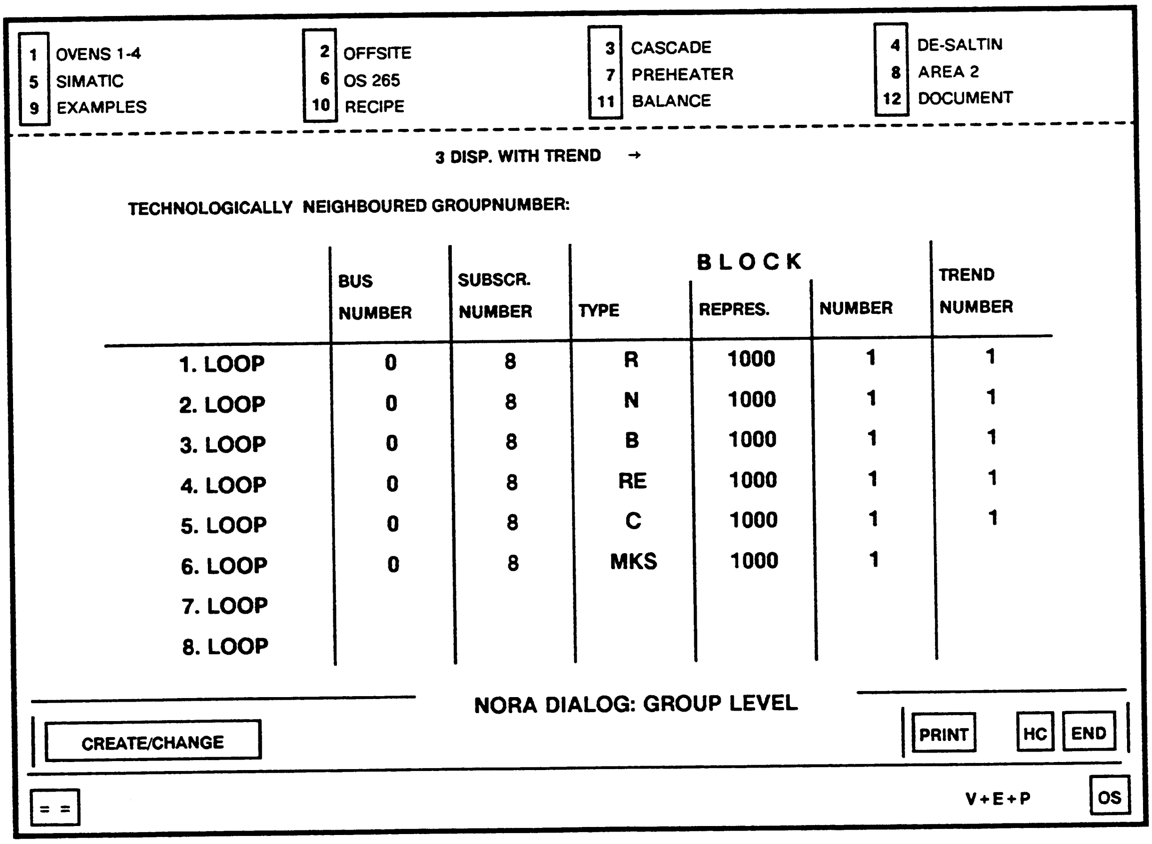
Logging in the CURVE DISPLAY or FREELY CONFIGURABLE DISPLAY design dialog may only be initiated after an active printout has been terminated; otherwise the two logs will be intermixed.

9.1 Hard Copy of the Screen Display

The screen content (without menu field) displayed is printed via the connected printer (Figs. 9-3, 9-5 and 9-7) when the PRINT key in the standardized display design dialog (Fig. 9-2), the PRINT key in the ALARM SEQUENCE DISPLAY configuration menu (Fig. 9-4) or the PRINTOUT ON key in the FREE DISPLAY design dialog (Fig. 9-5) are selected using the light pen.

9.1.1 User-related log

A test printout can be output via the key "SWITCH ON LOG OF DISPLAY". Selecting this key results in the output of the entire scroll image memory. The representation of this test printout corresponds to that of the future user-related log in the on-line phase (Fig. 9-8).



TECHNOLOGICALLY NEIGHBOURED GROUPNUMBER:

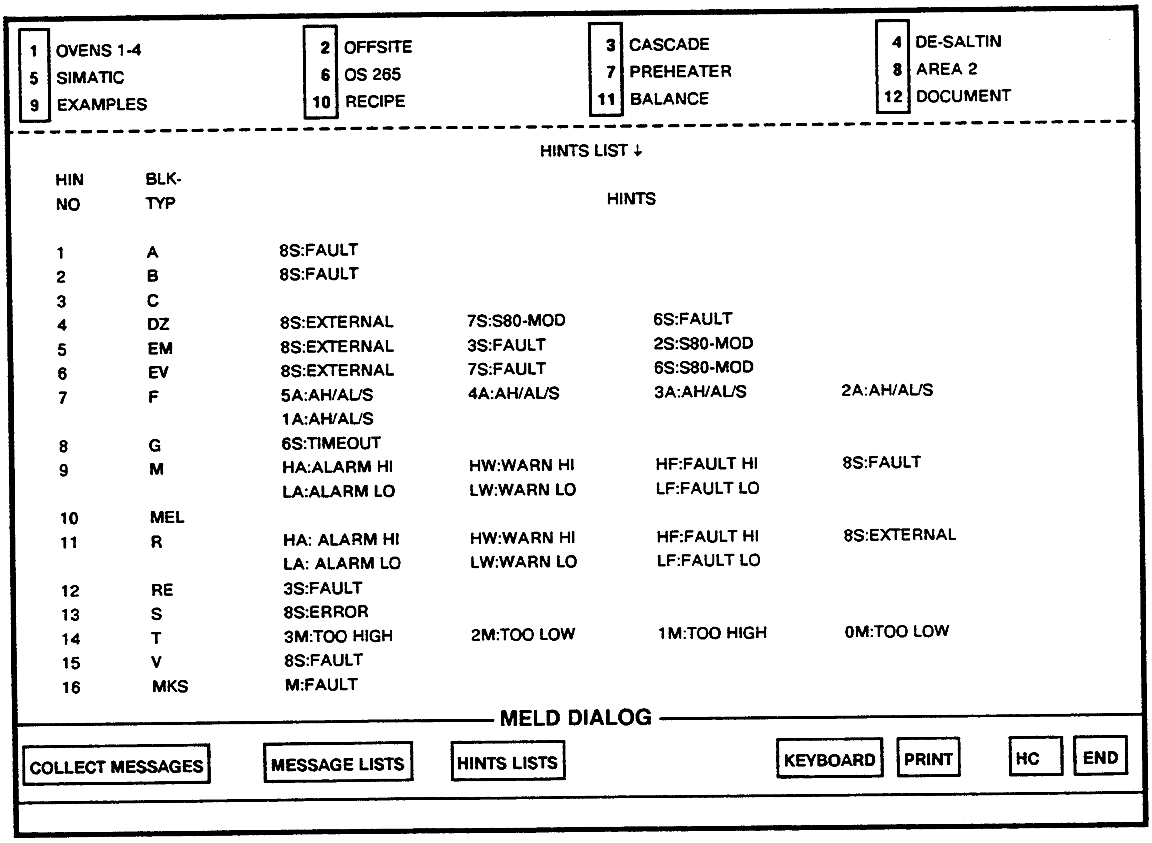
	BUS NUMBER	SUBSCR. NUMBER	BLOCK TYPE	BLOCK REPRES.	BLOCK NUMBER	TREND NUMBER
1. LOOP	0	8	R	1000	1	1
2. LOOP	0	8	N	1000	1	1
3. LOOP	0	8	B	1000	1	1
4. LOOP	0	8	RE	1000	1	1
5. LOOP	0	8	C	1000	1	1
6. LOOP	0	8	MKS	1000	1	
7. LOOP						
8. LOOP						

NORA DIALOG: GROUP LEVEL

Fig. 9-2 Example of a NORA menu

```
  SIEMENS OS 265  DATE:    24.11.89      11:20:02         PAGE:   1
-------------------------------------------------------------------------
1  **OVENS 1-4          2   **OFFSITE          3   **CASCADE         4   **DE-SALTIN
5  **SIMATIC            6   **OS 265           7   **PREHEATER       8   **AREA.2
9  **EXEMPLES           10  **RECIPE           11  **BALANCE         12  **DOCUMENT
=========================================================================
                          3 DISPLAYS WITH TREND  **

    TECHNOLOGICALLY NEIGHBOURED GROUPNUMBER:

             *BUS        *SUBSCR.   *  B  L  O  C  K             *TREND
             *NUMBER     *NUMBER    *TYPE   *REPRES. *NUMBER     *NUMBER
             =========================================================

    1. LOOP  *.0         *.3        *.R      *1000    *1          *1
             *           *          *        *        *           *
    2. LOOP  *.0         *.3        *M       *1000    *1          *1
             *           *          *        *        *           *
    3. LOOP  *.0         *.3        *B       *1000    *1          *1
             *           *          *        *        *           *
    4. LOOP  *.0         *.3        *RE      *1000    *1          *1
             *           *          *        *        *           *
    5. LOOP  *.0         *.3        *V       *1000    *1          *1
             *           *          *        *        *           *
    6. LOOP  *.0         *.3        *MKS     *1000    *1          *
             *           *                            *           *
    7. LOOP  *           *                            *           *
             *           *                            *           *
    8. LOOP  *           *                            *           *
-------------------------------------------------------------------------

   END OF LIST
```

Fig. 9-3 Printout to Fig. 9-2



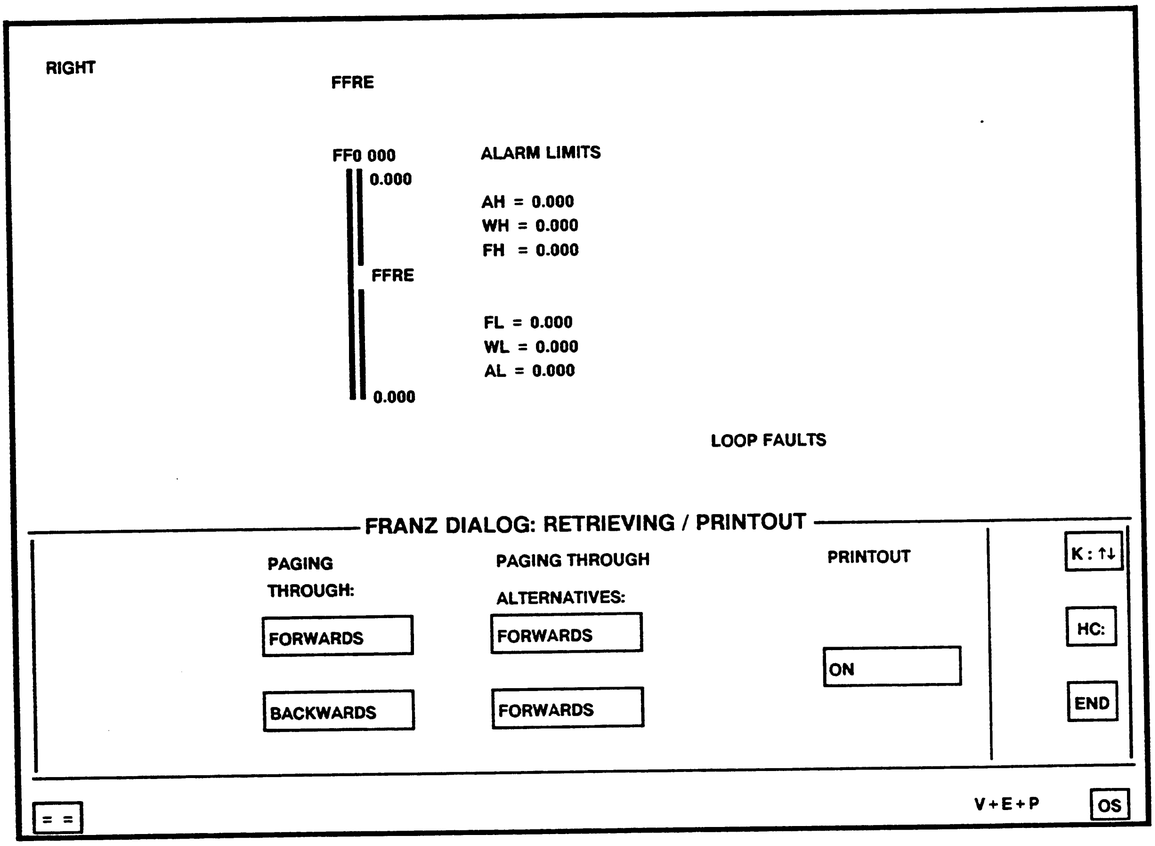
HINTS LIST ↓

HIN NO	BLK-TYP	HINTS			
1	A	8S:FAULT			
2	B	8S:FAULT			
3	C				
4	DZ	8S:EXTERNAL	7S:S80-MOD	6S:FAULT	
5	EM	8S:EXTERNAL	3S:FAULT	2S:S80-MOD	
6	EV	8S:EXTERNAL	7S:FAULT	6S:S80-MOD	
7	F	5A:AH/AL/S 1A:AH/AL/S	4A:AH/AL/S	3A:AH/AL/S	2A:AH/AL/S
8	G	6S:TIMEOUT			
9	M	HA:ALARM HI LA:ALARM LO	HW:WARN HI LW:WARN LO	HF:FAULT HI LF:FAULT LO	8S:FAULT
10	MEL				
11	R	HA: ALARM HI LA: ALARM LO	HW:WARN HI LW:WARN LO	HF:FAULT HI LF:FAULT LO	8S:EXTERNAL
12	RE	3S:FAULT			
13	S	8S:ERROR			
14	T	3M:TOO HIGH	2M:TOO LOW	1M:TOO HIGH	0M:TOO LOW
15	V	8S:FAULT			
16	MKS	M:FAULT			

Fig. 9-4 Example of a MELD configuration menu

```
   SIEMENS OS 265   DATE:    24.11.89        14:15:17       PAGE:    1
-------------------------------------------------------------------------
 1  *OVEN 1-4        2   *OFFSITE       3   *CASCADE          4   *DE-SALTIN
 5  *SIMATIC         6   *OS 265        7   *PREHEATER        8   *AREA  2
 9  *EXAMPLES        10  *RECIPE        11  *BALANCE          12  *DOCUMENT
=========================================================================
                                   HINTS LIST  *
  HIN      BLK-
  NO.      TYP                           HINTS

  .1    A  . .    .8S: EXTERNAL
  .2    B  . .    .8S:EXTERNAL
  .3    C  . .
  .4    DZ  .     .8S: EXTERNAL     .7S: S80-MOD     .6S: FAULT
  .5    EM  .     .8S: EXTERNAL     .3S: FAULT       .2S:  S80-MOD
  .6    EV  .     .8S: EXTERNAL     .7S:FAULT        .6S: S80-MOD
  .7    F  . .    .5A: AH/AL/S      .4A:AH/AL/S  .   3A: AH/AL/S      .2A: AH/AL/S
                  .1A: AH/AL/S
  .8    G  . .    .6S: TIMEOUT
  .9    M  . .    .HA: ALARM HI     .HW:WARN HI      .HF:FAULT HI     .8S:EXTERNAL
                  .LA: ALARM LO     .LW:WARN LO      .LF: FAULT LO
  10    MEL .
  11    R  . .    .HA: ALARM HI     .HW:WARN HI      .HF:FAULT HI     .8S:EXTERNAL
                  .LA: ALARM LO     .LW:WARN LO      .LF:FAULT LO
  12    RE  .     .3S: FAULT
  13    S  . .    .8S: ERROR
  14    T . . .   .3M:TOO HIGH      .2M:TOO LOW      .1M:TOO HIGH     .0M: TOO HIGH
  15    V  . .    .8S: EXTERNAL
  16    MKS       M:FAULT
-------------------------------------------------------------------------

   END OF LIST
```

Fig. 9-5 Printout to Fig. 9-4



AH = 0.000
WH = 0.000
FH = 0.000

FL = 0.000
WL = 0.000
AL = 0.000

Fig. 9-6 Example of a designed image with menu field

```
            SIEMENS OS 265   DATE:    24.11.89 11:26:02 PAGE:   1
-------------------------------------------------------------------

                                 FFRE  . . . .
                                   . . . . . . . .

                                 FF0.000        ALARM LIMITS:
                                   *** 0.000
                                   ***          AH   = 0.000
                                   ***          WH   = 0.000
                                   ***          FH   = 0.000
                                   *** FFRE
                                   ***
                                   ***          FL   = 0.000
                                   ***          WL   = 0.000
                                   ***          AL   = 0.000
                                   *** 0.000

                                                        LOOP FAULTS:
                                                         . . . . . . . . . . . . . . .



                                   +

-------------------------------------------------------------------

  END OF LIST
```

The * character is printed for non-printable characters (symbols).

Fig. 9-7 Printout to Fig. 9-6

```
  SIEMENS   OS 265-3                    DATE:    24.11.89 10:08:15     PAGE:        1
  OVENBOOK  OVEN 2                                       ISSUE:31.12.89      12:00:00

  STRING 1          FCR 5552  14.53 M3/H             TIR 5511  343.1  DEGC

  STRING 2          FCR 5552  14.22 M3/H             TIR 5512  350.5  DEGC

  STRING 3          FCR 5554  13.87 M3/H             TIR 5513  334.5  DEGC

  STRING 4          FCR 5555  14.30 M3/H             TIR 5514  345.1  DEGC


  TOTAL FLOW            :        FCR   5545  59.68   M3/H

  INLET TEMPERATURE     :        TIR   5551  202.1   DEGC

  OUTLET TEMPERATURE    :        TCR   5558  343.3   DEGC


  MAXIMUM TEMPERATURE  :         TCR   5558  352.6   DEGC

  MAXIMUM FLOW          :        FCR   5545  73.40   M3/H

  MAXIMUM GAS PRESSURE:          PCR   5559  1.810   BAR
```

Fig. 9-8 Example: Test printout of a user-related log

9.2 Logging Function

9.2.1 Logging of the Configuration Data in FRANZ and NORA

The logging function has been implemented in the FRANZ design dialog. A menu field for the various logging functions (Fig. 9-10) is displayed when the LOGS key (Fig. 9-9) is selected using the light pen. Logging is initiated by selecting one of the function keys provided. An object number must be entered if the functions for logging individual key sets, control fields, process displays or windows are implemented (Figs. 9-16 to 9-18). The logging function is initiated when the END key in this menu field has been selected. Logging is not performed and the display returns to Fig. 9-10 if the END key is selected without previous input.

The numeric menu field remains on the screen if an invalid object number is entered. The blinking message prompts the user to enter the object number. The entry must be repeated. A running printout may be aborted by selecting the ABR key. The individual functions and interpretation of the log are discussed below.

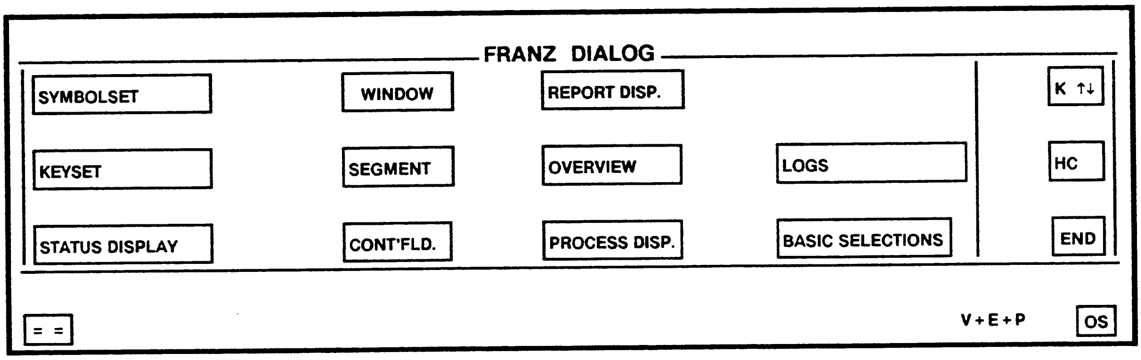


Fig. 9-9 Selection menu field FRANZ DIALOG

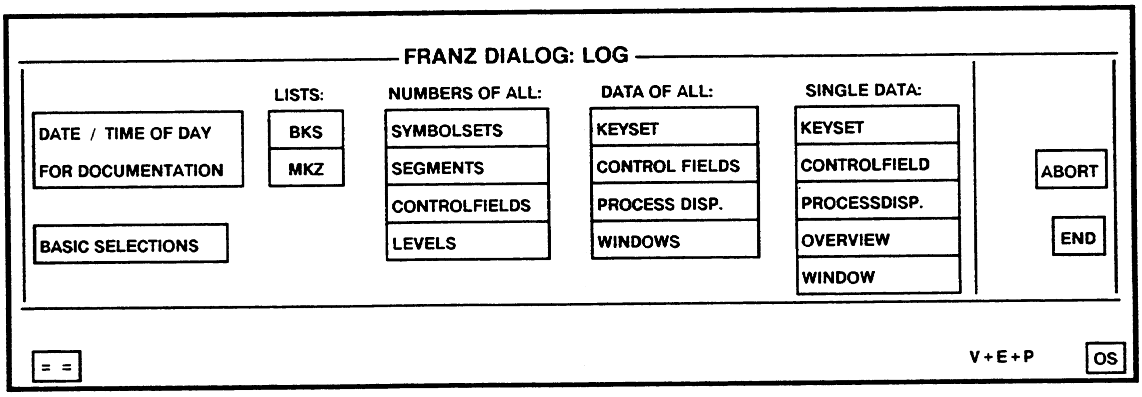


Fig. 9-10 Design selection menu field

9.2.1.1 Date/Time for Logs

The date/time function is used solely for setting the date and time and is not logged.

A numeric menu field is displayed and the program awaits input of the date after the DATE/TIME key has been selected using the light pen. The entered figures appear in the echo line. When the END key is selected, the entered date is accepted and the numeric menu field re-displayed so that the time can be entered. The entered figures also appear in the echo line. After the END key has been selected, the time is accepted and the initial menu field (Fig. 9-9) displayed.

The initial menu field is re-displayed and a message issued if an illegal date/time value has been entered. The date may be entered in national (dd.mm.yy) or international (yy-mm-dd) notation.

The date/time function also exists in the configuration system selection menu field (cf. Chapter 2).

9.2.1.2 Basic Setting

Selecting the BASIC SELECTIONS key in the selection menu field starts a printout of the selections which have been configured in the design function of the same name. The printout also contains data regarding the data sets configured for the FRANZ (NORA), MELD and KURV system blocks.

Example:

```
SIEMENS OS 265        DATE:    24.11.89 13:47:59                 PAGE:   1

 BASIC SELECTIONS

 AUTOMATION SYSTEM:            TELEPERM M
 LENGTH VARIABLE NAME:         4 WORDS
 SIGN OF LIFE MONITORING:      SWITCHED ON
 CYCLE TIME:                   2    S

 DATE:

 NATIONAL
 NOT BLINKING
 GREEN ON BLACK

 LENGTH DATA REGIONS:

 FRANZ:    148  K
 MELD:       3  K
 KURV:       0  K

 FREE MEMORY CAPACITY:  3076  K


 END OF LIST
```

9.2.1.3 BKS List

The BKS list is printed if the BKS LIST key is selected using the light pen.

Note:
The BKS list is only updated after the configuration check has been carried out successfully. Only the BKS numbers printed after this point in time are identical to the stored BKS list.

Example:

```
SIEMENS OS 265        DATE:     24.11.89  15:35:39                    PAGE:    1

  BKS LIST
  BKS NO.        BA        TA      BLOCK TYPE   BLOCK NO.

      1           0        23        BKS              3
      2           0        23        BKS              4
      3         127       127        BKSQ             1

  END OF LIST
```

9.2.1.4 MKZ List

All MKZ numbers are printed if the MKZ LIST key is selected using the light pen. Bus number, device number (number of the automation system), block type, block number and channel number are also listed.

Note:
The MKZ list is only updated after the configuration check has been carried out successfully. Only the MKZ numbers printed after this point in time are identical to the stored MKZ list.

Example:

```
 SIEMENS OS 265       DATE:    24.11.89  15:36:17                      PAGE:    1

MKZ LIST

MKZ NO.     BA       TA      BLOCK TYPE      BLOCK NO.

     1      0        1         R                  1
     2      0       23         A                  1
     3      0       23         A                  2
     4      0       23         A                  3
     5      0       23         A                  8
     6      0       23         A                  5
     7      0       23         A                  6
     8      0       23         A                  7
     9      0       23         C                  8
    10      0       23         B                  1
    11      0       23         B                  2
    12      0       23         B                  3
    13      0       23         B                  4
    14      0       23         B                  5
    15      0       23         B                  6
    16      0       23         B                  7
    17      0       23         B                  8
    18      0       23         C                  1
    19      0       23         C                  2
    20      0       23         C                  3
    21      0       23         C                  4
    22      0       23         C                  5
    23      0       23         C                  6
    24      0       23         C                  7
    25      0       23         DZ                 8
    26      0       23         DZ                 1
    27      0       23         DZ                 2
    28      0       23         DZ                 3
    29      0       23         DZ                 4
    30      0       23         DZ                 5
    31      0       23         DZ                 6
    32      0       23         DZ                 7
    33      0       23         EK                 4
    34      0       23         EG                 1
    35      0       23         EG                 2
    36      0       23         EG                 3
    37      0       23         EG                 4
    38      0       23         EG                 5
    39      0       23         EG                 6
    40      0       23         EG                 7
    41      0       23         EG                 8
    42      0       23         EK                 1
    43      0       23         EK                 2
    44      0       23         EK                 3
```

Note: Do not page during the printout.

9.2.1.5 Numbers of Symbol Sets, Segments, Control Fields, Levels

The numbers of the configured symbol sets, segments, control fields or levels, respectively, are printed if the keys SYMBOL SETS, SEGMENTS, CONTROL FIELDS, or LEVELS are selected using the light pen.

Examples:

```
SIEMENS OS 265  DATE:       24.11.89 09:27:50                        PAGE:   1

LIST OF LEVEL NUMBERS

OVERVIEW

 0. 0.   0.  1
 1. 0.   0.  0

PROCESS LOG DISPLAY

 0.    0.    0.    1
 0.    0.    0.    2
 0.    0.    0.    3
 0.    0.    0.    5
 :     :     :     :
 0.    0.    0.    99     LOG DISPLAY
 0.    0.    0.    100    LOG DISPLAY
 0.    0.    0.    101
 :     :     :     :
 0.    0.    7.    2
 0.    0.    7.    5
 0.    0.    7.    9
 0.    0.    7.    12
 1.    0.    0.    0.
 254.  1.    1.    254


  KEY SET

  0.    1.    7.    0
  0.    1.    8.    0
  0.    10.   11    0
  0.    10.   12.   0
  0.    10.   13.   0
  1.    0.    0.    0
  1.    1.    0.    0
  :     :     :     :
  27.   27.   27.   0
  27.   27.   27.   1
  27.   27.   27.   2
  27.   27.   27.   3


  WINDOW

  0.      0.     0.     89
  0.      0.     0.     90
  0.      0.     0.     91
  0.      0.     0.     92

  END OF LIST
```

Rem.: Process display numbers of area class **0** (e.g. 1.0.0.0) are internal form numbers of the basic data.

Comment
The background images of the system displays are stored in this sequence in the DS 078 memory when the OS 265 is started.

9.2.1.6 Key Sets

The data of all the key sets is printed when the KEYSETS key in the DATA OF ALL column has been selected using the light pen. The data of a specific key set is printed when the KEYSETS key in the SINGLE DATA column is selected and a key set number entered (Fig. 9-10).

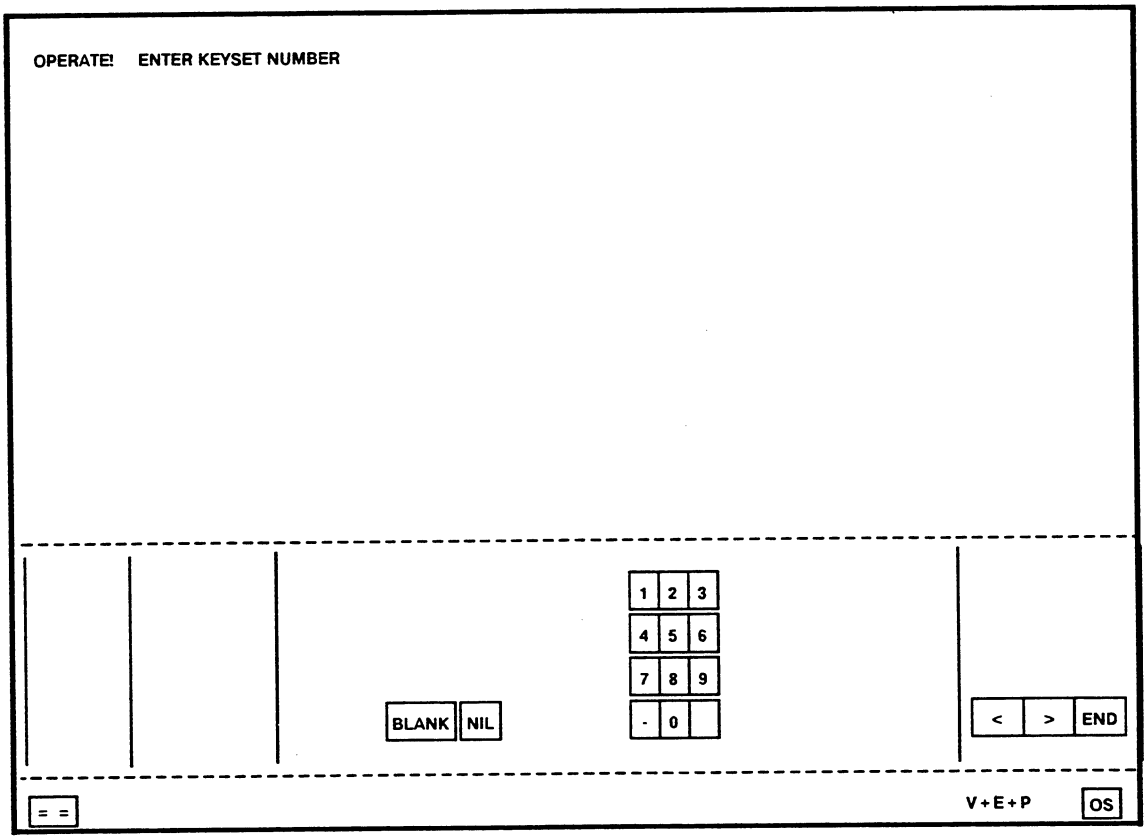

OPERATE! ENTER KEYSET NUMBER

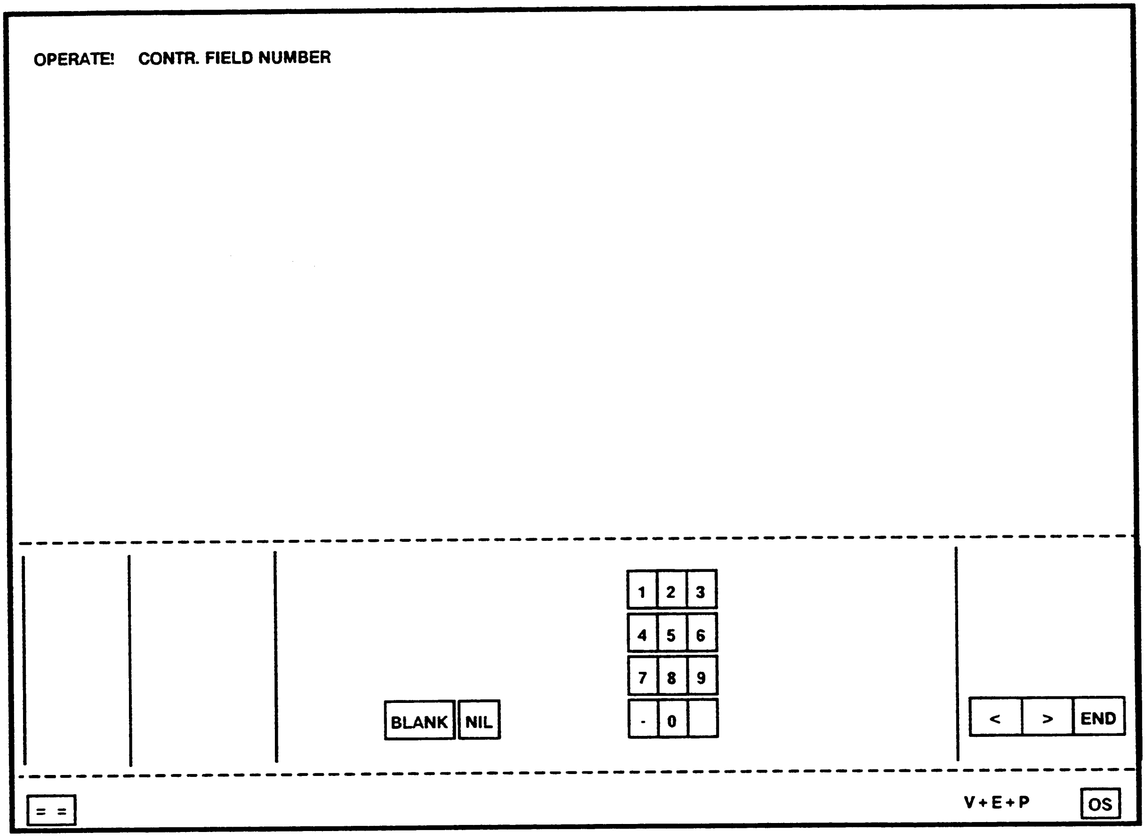
Fig. 9-11 Menu field used for key set number input

Example of a key set printout:

```
SIEMENS OS 265-3   DATE:     24.11.89   13:52:06                        PAGE:        1

L E V E L   D A T A

KEY SET
L E V E L        1.  0.  0.  0

ASSIGNED:

LEVEL NO.     KEYSET:       NO INFO

SYMBOLSET NO. :   1

WINDOW POSITION:

Y:       1
X:       1

NO SEGMENTS

VARIABLE

VAR NO  DISPTYP NO.  FUNCTION          START POSITION   PARAM.     VAL.     OPERAT.
                                       Y    X           IDENT      UPD      AUTHORIZ.

  1       KEY        DISP.KEYS         2    1           SELECT     ----     SWITCH2
  2       KEY        DEL.DISPLAY       2    5           -----      ----     ALWAYS
  3       KEY        MELD PRES.        2    9           -----      ----     ALWAYS
  4       KEY        KURV PRES.        2    15          -----      ----     ALWAYS
  5       KEY        MONITOR 1         2    24          -----      ----     ALWAYS
  6       KEY        MONITOR 2         2    28          -----      ----     ALWAYS
  7       KEY        MONITOR 3         2    32          -----      ----     ALWAYS
  8       KEY        PREV.DISP.        2    36          SELECT     ----     ALWAYS
  9       KEY        DISP.CH.LFT.      2    40          SELECT     ----     ALWAYS
 10       KEY        DISP.CH.UP        2    45          SELECT     ----     ALWAYS
 11       KEY        DISP.CH.RGT       2    50          SELECT     ----     ALWAYS
 12       KEY        QF SELECT         2    73          -----      ----     SWITCH3
 13       KEY        ACK.              2    76          -----      ----     SWITCH2
 14       KEY        ACK.HORN          2    79          -----      ----     ALWAYS

FUNCTION PARAMETERS

VAR NO  DISPTYP NO.  FUNCTION          -----FLD. 1-----  ---FLD. 2---        FLD. 3

  1       KEY        DISP.KEYS              4.  0.  0.  0
  2       KEY        DEL.DISPLAY         NO INFO
  3       KEY        MELD PRES.          NO INFO
  4       KEY        KURV PRES.          NO INFO
  5       KEY        MONITOR 1           NO INFO
  6       KEY        MONITOR 2           NO INFO
  7       KEY        MONITOR 3           NO INFO
  8       KEY        PREV.DISP.          NO INFO
  9       KEY        DISP.CH.LFT.        NO INFO
 10       KEY        DISP.CH.UP          NO INFO
 11       KEY        DISP.CH.RGT.        NO INFO
 12       KEY        QF SELECT           NO INFO
 13       KEY        ACK.                NO INFO
 14       KEY        ACK.HORN            NO INFO

NO PROCESS PARAMETERS
END OF LIST
```

9.2.1.7 Control Fields

The data of all control fields is displayed when the CONTROL FIELDS key in the DATA OF ALL column is selected using the light pen. The data of a specific control field is printed when the CONTROL FIELD key in the SINGLE DATA column is selected and a control field number entered (Fig. 9-12).



OPERATE! CONTR. FIELD NUMBER

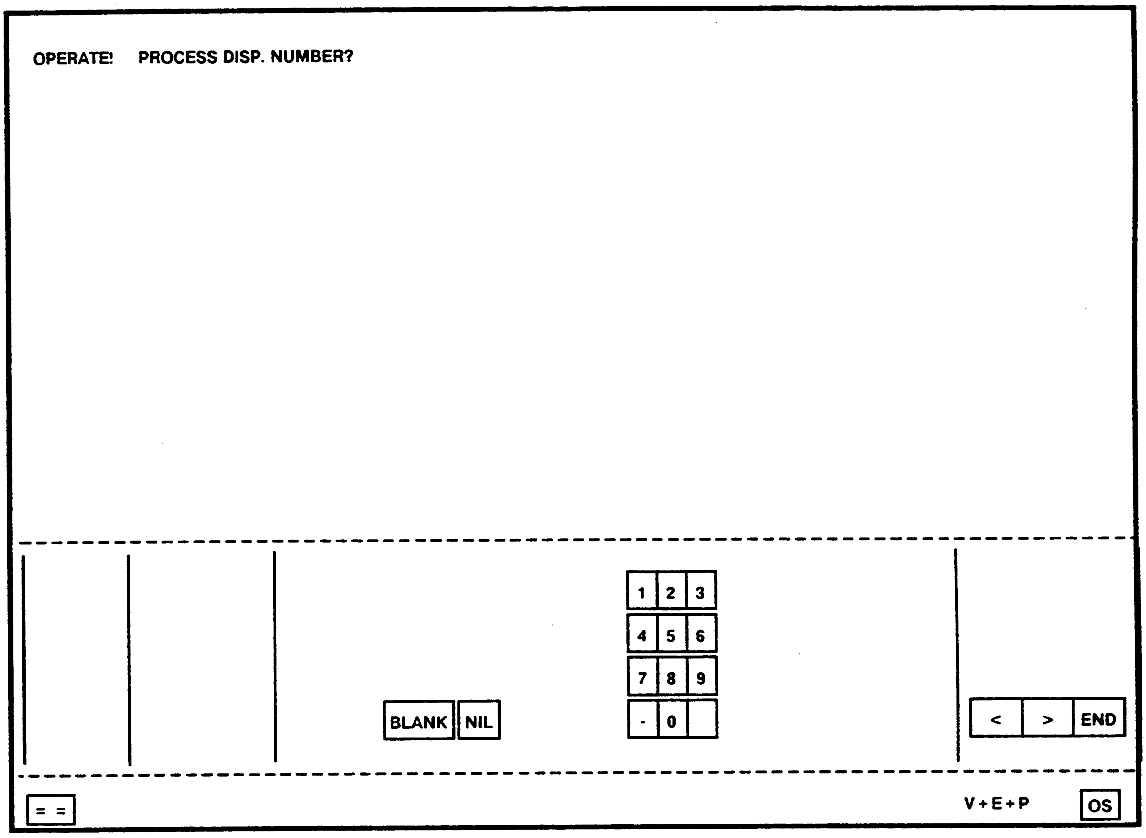
Fig. 9-12 Menu field used for entering a control field number between 1 and 4095

Example of a control field printout:

```
SIEMENS OS 265-3   DATE:     24.11.89   09:36:24                          PAGE:       1

CONTROL FIELD DATA

CONT.FIELD NO.   :   20

HIERARCHY:        GROUP          REPRESENT.:       1000
BLOCK TYPE:       A

SEGMENT NO.      :   54

WINDOW POSITION:

Y:        1
X:        1

VARIABLE

VAR NO  DISPTYP NO  FUNCTION       START POSITION     PARAM.   VAL           OPERAT.
                                     Y     X          IDENT.   UPD           AUTHORIZ.

  1     KEY         CHARACTER        1     1          ----     ----          ALWAYS
  2     KEY         CHARACTER        1     4          ----     ----          ALWAYS
  3     FR.VAR      DISPCHANGE       2     2          ----     CYCL          ALWAYS
  4     KEY         CHARACTER        2    10          ----     ----          ALWAYS
  5     ST.IND 22   --------        10     2          ----     SPOR          NOT
  6     ST.IND 20   DISPCHANGE      10     6          ----     SPOR          SWITCH2
  7     ST.IND 21   DISPCHANGE      12     6          ----     SPOR          SWITCH2
  8     ST.IND 23   DISPCHANGE      23     2          ----     SPOR          SWITCH2
  9     ST.IND 10   --------        23     6          ----     SPOR          NOT

FUNCTION PARAMETERS

VAR NO  DISPTYP NO  FUNCTION       -----FLD. 1-----  ---FLD. 2---           FLD. 3

  1     KEY         CHARACTER      L                    15        10
  2     KEY         CHARACTER      O                     2         2
  3     FR.VAR      DISPCHANGE     0. 0.254.254                                COM
  4     KEY         CHARACTER      R                     1         6
  5     ST.IND 22   --------       NO INFO
  6     ST.IND 20   DISPCHANGE     16. 0.  0.  0                               COM
  7     ST.IND 21   DISPCHANGE     17. 0.  0.  0                               COM
  8     ST.IND 23   DISPCHANGE     11. 0.  0.  0                               COM
  9     ST.IND 10   --------       NO INFO

PROCESS PARAMETERS

VAR NO  DISPTYP NO  FUNCTION       PARTYP E NO.        BINARY ST          BITPO NUMB

  1     KEY         CHARACTER      NO INFO
  2     KEY         CHARACTER      NO INFO
  3     FR.VAR      DISPCHANGE     EX S16  24
  4     KEY         CHARACTER      NO INFO
  5     ST.IND 22   --------                           STATUS              13     4
  6     ST.IND 20   DISPCHANGE                         STATUS              16     1
  7     ST.IND 21   DISPCHANGE                         STATUS              14     1
  8     ST.IND 23   DISPCHANGE                         STATUS               9     1
  9     ST.IND 10   --------                           STATUS               6     2

END OF LIST
```

9.2.1.8 Process Displays

The data of all process displays is printed when the PROCESSDISP key in the DATA OF ALL column is selected using the light pen. The data of a specific process display is printed when the PROCESSDISP key in the SINGLE DATA column is selected and a process display number entered. This also applies to log displays.



OPERATE! PROCESS DISP. NUMBER?

Fig. 9-13 Menu field used for process display number input

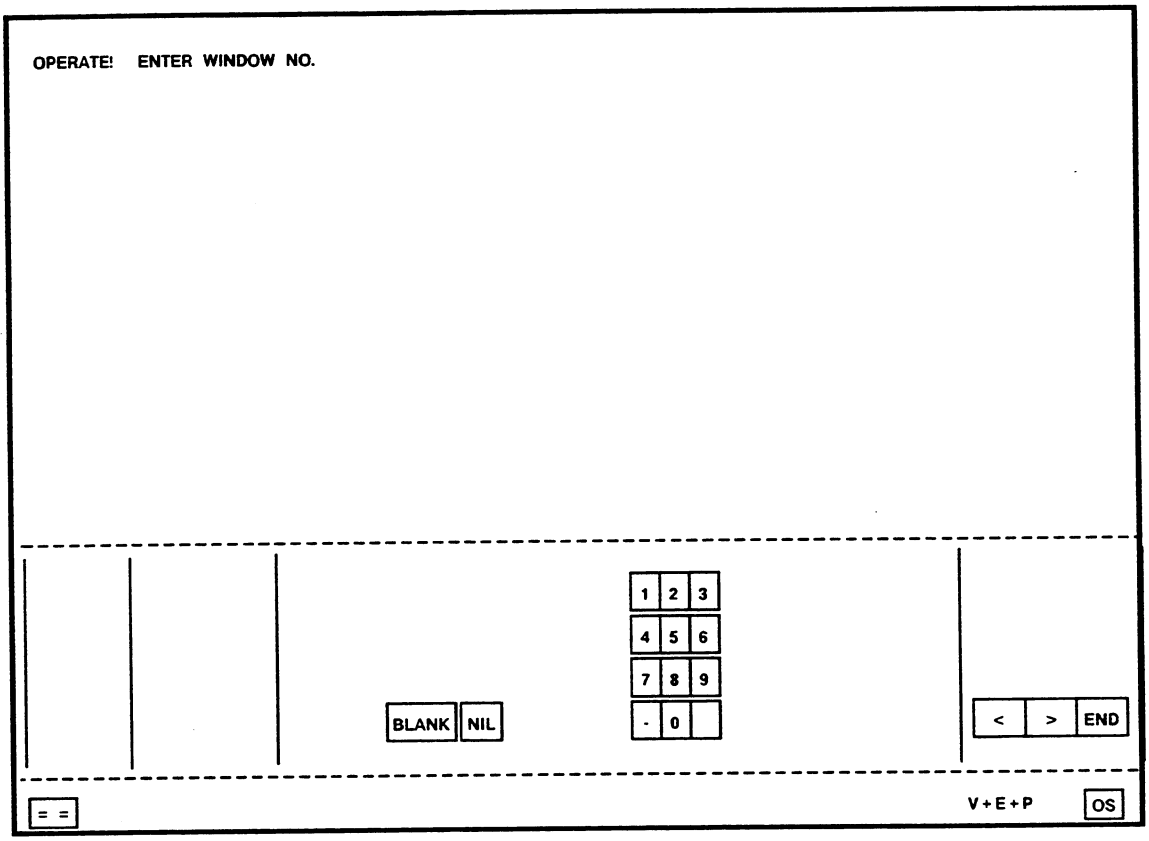
Example of a process display printout:

```
SIEMENS OS 265-3    DATE:     24.11.89   14:02:37                          PAGE:      1

L E V E L   D A T A

PROCESS DISPLAY
LEVEL    0.  0.  1.  1

ASSIGNED:

LEVEL NO. KEYSET:  1.  0.  0.  0

SYMBOL SET NO.:  1

WINDOW POSITION:

Y:      1
X:      1

NO SEGMENTS

VARIABLE
VAR NO.  DISPTYP NO.   FUNCTION         START POSITION     PARAM.    VAL.         OPERAT.
                                          Y     X          IDENT.    UPD.         AUTHORIZ.

   1     KEY           CHARACTER          1    49          -----     ----         SWITCH 2
   2     KEY           DISPCHANGE         1    53          SELECT    ----         ALWAYS
   3     KEY           CHARACTER          2     1          -----     ----         SWITCH 2
   4     CONTFD  20    --------           2     1          -----     ----         NOT
   5     KEY           CHARACTER          2    11          -----     ----         SWITCH 2
   6     CONTFD  22    --------           2    11          -----     ----         NOT
   7     KEY           CHARACTER          2    21          -----     ----         SWITCH 2
   8     CONTFD  24    --------           2    21          -----     ----         NOT
   9     KEY           CHARACTER          2    31          -----     ----         SWITCH 2
  10     CONTFD 126    --------           2    31          -----     ----         NOT
  11     KEY           CHARACTER          2    41          -----     ----         SWITCH 2
  12     CONTFD  38    --------           2    41          -----     ----         NOT
  13     KEY           CHARACTER          2    51          -----     ----         SWITCH 2
  14     CONTFD 138    --------           2    51          -----     ----         NOT
  15     KEY           CHARACTER          2    61          -----     ----         SWITCH 2
  16     CONTFD  36    --------           2    61          -----     ----         NOT
  17     KEY           CHARACTER          2    71          -----     ----         SWITCH 2
  18     CONTFD  50    --------           2    71          -----     ----         NOT

FUNCTION PARAMETERS

VAR NO.  DISPTYP NO.   FUNCTION        -----FLD. 1-----   ---FLD. 2---           FLD. 3

   1     KEY           CHARACTER       24                    1     53
   2     KEY           DISPCHANGE        0.  0.  2.  1     NO INFO                GRA
   3     KEY           CHARACTER       1                     3      1
   4     CONTFD  20    --------        NO INFO
   5     KEY           CHARACTER       2                     3     11
   6     CONTFD  22    --------        NO INFO
   7     KEY           CHARACTER       3                     3     21
   8     CONTFD  24    --------        NO INFO
   9     KEY           CHARACTER       4                     3     31
  10     CONTFD 126    --------        NO INFO
  11     KEY           CHARACTER       5                     3     41
  12     CONTFD  38    --------        NO INFO
  13     KEY           CHARACTER       6                     3     51
  14     CONTFD 138    --------        NO INFO
  15     KEY           CHARACTER       7                     3     61
  16     CONTFD  36    --------        NO INFO
  17     KEY           CHARACTER       8                     3     71
  18     CONTFD  50    --------        NO INFO

PROCESS PARAMETERS
```

```
SIEMENS OS 265-3   DATE:     24.11.89   14:02:37                    PAGE:       2

VAR NO. DISPTYP NO. FUNCTION           MKZ NO.    BKS CONT.   BIT POS.        BIT NO.

   1     KEY          CHARACTER          NO       INFO
   2     KEY          DISPCHANGE         NO       INFO
   3     KEY          CHARACTER          NO       INFO
   4     CONTFD  20  --------             2       ----
   5     KEY          CHARACTER          NO       INFO
   6     CONTFD  22  --------             3       ----
   7     KEY          CHARACTER          NO       INFO
   8     CONTFD  24  --------             4       ----
   9     KEY          CHARACTER          NO       INFO
  10     CONTFD 126  --------             5       ----
  11     KEY          CHARACTER          NO       INFO
  12     CONTFD  38  --------             6       ----
  13     KEY          CHARACTER          NO       INFO
  14     CONTFD 138  --------             7       ----
  15     KEY          CHARACTER          NO       INFO
  16     CONTFD  36  --------             8       ----
  17     KEY          CHARACTER          NO       INFO
  18     CONTFD  50  --------             9       ----

END OF LIST
```

9.2.1.9 Window

The data of all windows is printed when the WINDOW key in the DATA OF ALL column is selected using the light pen. The data of a specific window is printed when the WINDOW key in the SINGLE DATA column is selected and a window number (display level number) entered.



OPERATE! ENTER WINDOW NO.

Fig. 9-14 Menu field used for window number input

Example of a window printout:

```
SIEMENS OS 265-3   DATE:     24.11.89   09:23:13                              PAGE:       1

LEVELDATA

WINDOW
LEVEL    0.  0.  0.  78

ASSIGNED:
LEVEL NO. KEY SET:    1.  1.  0.  0
SYMBOL SET NO.  :     1
CYCLE TIME:  4S
WINDOW POSITION:
Y:       1
X:       1

SEGMENTS

    NR        Y         X

    68        12        1

VARIABLE

VAR NO  DISPTYP  NO  FUNCTION           START POSITION      PARAM.      VALUE       OPERAT.
                                         Y        X          IDENT.      UPD         AUTHORIZ.

   1    KEY          WINDOW OPEN         1        1          SELECT      ----        ALWAYS
   2    KEY          WINDOW CLOSE        1       12          -----       ----        ALWAYS
   3    KEY          DISP CURV GR        1       19          -----       ----        ALWAYS
   4    KEY          DEL CURV GR         1       28          -----       ----        ALWAYS
   5    CONTFD 205   -------             3        1          -----       ----        NOT
   6    DIVALUE      -------             3       24          -----       CYCL        NOT
   7    BAR          -------             5       24          -----       CYCL        NOT
   8    ST.IND  1    -------             7       29          -----       CYCL        NOT
   9    ST.IND  2    -------             7       30          -----       CYCL        NOT
  10    ST.IND  3    -------             7       31          -----       CYCL        NOT
  11    ST.IND  5    -------             7       32          -----       CYCL        NOT
  12    ST.IND  6    -------             7       33          -----       CYCL        NOT
  13    DIVALUE      DISPKEY             9       24          INPUT       ----        ALWAYS

FUNKTIONSPARAMETER

VAR NO  DISPTYP NO   FUNCTION            -----FLD. 1----- ---FLD. 2---             FLD. 3

   1    KEY          WINDOW OPEN          0.  0.  0.  23           1        1
   2    KEY          WINDOW CLOSE        NO INFO
   3    KEY          DISP CURV GR             27
   4    KEY          DEL CURV GR         NO INFO
   5    CONTFD 205   -------             NO INFO
   6    DIVALUE      -------             NO INFO
   7    BAR          -------             NO INFO
                                         VALUE RANGE:  1.000000E 02
   8    ST.IND  1    -------             NO INFO
   9    ST.IND  2    -------             NO INFO
  10    ST.IND  3    -------             NO INFO
  11    ST.IND  5    -------             NO INFO
  12    ST.IND  6    -------             NO INFO
  13    DIVALUE      DISPKEY              6.  0.  0.  0
                                         VALUE RANGE:  2.200000E 02

PROCESS PARAMETERS

VAR NO  DISPTYP NO   FUNCTION           MKZ NO.     BKS CONT.      BIT POS            BIT NUMB

   1    KEY          WINDOW OPEN          NO INFO
```

```
SIEMENS OS 265-3    DATE       24.11.89    09:23:13                        PAGE:        2

    2     KEY          WINDOW CLOSE        NO INFO
    3     KEY          DISP CURV GR        NO INFO
    4     KEY          DEL CURV GR         NO INFO
    5     CONTFD   205-------                12   ----
    6     DIVALUE      -------               10   ----
    7     BAR          -------               10   ----
    8     ST.IND   1   -------               10   ----
    9     ST.IND   2   -------               10   ----
   10     ST.IND   3   -------               10   ----
   11     ST.IND   5   -------               10   ----
   12     ST.IND   6   -------               10   ----
   13     DIVALUE      DISP. KEY             11   ----

END OF LIST
```

9.2.1.10 Area Overview Log

The data of the configured overview (no. 0.0.0.1) is printed when the OVERVIEW key is selected using the light pen. The overview internal to the system (no. 1.0.0.0) is displayed too.

```
SIEMENS OS 265-3   DATE:     24.11.89   09:45:49                          PAGE:        1

L E V E LÖ D A T A

OVERVIEW DISPLAY
LEVEL          0.  0.  0.  1

ASSIGNED:
LEVEL NO.     KEY SET: NO INFO
SYMBOL SET NO. :  1

WINDOW POSITION:
Y:        1
X:        1

NO SEGMENTS

VARIABLE

VAR NO    DISPTYP NO   FUNCTION     START POSITION    PARAM.       VALUE     OPERAT.
                                      Y        X       IDENT.       UPD       AUTHORIZ.

   1      KEY          CHARACTER      2        1       -----        ----      ALWAYS
   2      KEY          DISPCHANGE     2        3       SELECTION    ----      ALWAYS
   3      ST.IND  1    AREA STAT.     2       13       SELECTION    ----      SWITCH2
   4      ST.IND  2    AREA STAT.     2       14       SELECTION    ----      SWITCH2
   5      ST.IND  3    AREA STAT.     2       15       SELECTION    ----      SWITCH2
   6      ST.IND  9    AREA STAT.     2       16       SELECTION    ----      SWITCH2
   7      ST.IND  5    AREA STAT.     2       17       SELECTION    ----      SWITCH2
   8      ST.IND  6    AREA STAT.     2       18       SELECTION    ----      SWITCH2
   9      KEY          CHARACTER      2       21       -----        ----      ALWAYS
  10      KEY          DISPCHANGE     2       23       SELECTION    ----      ALWAYS
  11      ST.IND  1    AREA STAT.     2       33       SELECTION    ----      SWITCH2
  12      ST.IND  2    AREA STAT.     2       34       SELECTION    ----      SWITCH2
  13      ST.IND  3    AREA STAT.     2       35       SELECTION    ----      SWITCH2
  14      ST.IND  9    AREA STAT.     2       36       SELECTION    ----      SWITCH2
  15      ST.IND  5    AREA STAT.     2       37       SELECTION    ----      SWITCH2
  16      ST.IND  6    AREA STAT.     2       38       SELECTION    ----      SWITCH2
  17      KEY          CHARACTER      2       41       -----        ----      ALWAYS
  18      KEY          DISPCHANGE     2       43       SELECTION    ----      ALWAYS
  19      ST.IND  1    AREA STAT.     2       53       SELECTION    ----      SWITCH2
  20      ST.IND  2    AREA STAT.     2       54       SELECTION    ----      SWITCH2
  21      ST.IND  3    AREA STAT.     2       55       SELECTION    ----      SWITCH2
  22      ST.IND  9    AREA STAT.     2       56       SELECTION    ----      SWITCH2
  23      ST.IND  5    AREA STAT.     2       57       SELECTION    ----      SWITCH2
  24      ST.IND  6    AREA STAT.     2       58       SELECTION    ----      SWITCH2
  25      KEY          CHARACTER      2       61       -----        ----      ALWAYS
  26      KEY          CHARACTER      3        1       -----        ----      ALWAYS
  27      KEY          CHARACTER      3       21       -----        ----      ALWAYS
  28      KEY          CHARACTER      3       41       -----        ----      ALWAYS
  29      KEY          CHARACTER      3       61       -----        ----      ALWAYS
  30      KEY          CHARACTER      4        1       -----        ----      ALWAYS
  31      KEY          CHARACTER      4       21       -----        ----      ALWAYS
  32      KEY          CHARACTER      4       41       -----        ----      ALWAYS
  33      KEY          CHARACTER      4       61       -----        ----      ALWAYS
```

```
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FUNCTION PARAMETERS

VAR NO   DISPTYP NO.  FUNCTION    ---FLD. 1---   ---FLD. 2---   ---FLD. 3---

  1      KEY          CHARACTER   1                2      3
  2      KEY          DISPCHANGE   0.  0.  0.  1   NO INFO  1           GRA
  3      ST.IND  1    AREA STAT.   0.  0.  0.  1   1      1
  4      ST.IND  2    AREA STAT.   0.  0.  0.  1   1      2
  5      ST.IND  3    AREA STAT.   0.  0.  0.  1   1      3
  6      ST.IND  9    AREA STAT.   0.  0.  0.  1   1      9             1
  7      ST.IND  5    AREA STAT.   0.  0.  0.  1   1      5
  8      ST.IND  6    AREA STAT.   0.  0.  0.  1   1      6
  9      KEY          CHARACTER   2                2     23
 10      KEY          DISPCHANGE   0.  0.  0.  2   NO INFO  2           GRA
 11      ST.IND  1    AREA STAT.   0.  0.  0.  2   1      1
 12      ST.IND  2    AREA STAT.   0.  0.  0.  2   1      2
 13      ST.IND  3    AREA STAT.   0.  0.  0.  2   1      3
 14      ST.IND  9    AREA STAT.   0.  0.  0.  2   1      9             2
 15      ST.IND  5    AREA STAT.   0.  0.  0.  2   1      5
 16      ST.IND  6    AREA STAT.   0.  0.  0.  2   1      6
 17      KEY          CHARACTER   3                2     43
 18      KEY          DISPCHANGE   0.  0.  0.  3   NO INFO  3           GRA
 19      ST.IND  1    AREA STAT.   0.  0.  0.  3   1      1
 20      ST.IND  2    AREA STAT.   0.  0.  0.  3   1      2
 21      ST.IND  3    AREA STAT.   0.  0.  0.  3   1      3
 22      ST.IND  9    AREA STAT.   0.  0.  0.  3   1      9             3
 23      ST.IND  5    AREA STAT.   0.  0.  0.  3   1      5
 24      ST.IND  6    AREA STAT.   0.  0.  0.  3   1      6
 25      KEY          CHARACTER   4                2     63
 26      KEY          CHARACTER   5                3      3
 27      KEY          CHARACTER   6                3     23
 28      KEY          CHARACTER   7                3     43
 29      KEY          CHARACTER   8                3     63
 30      KEY          CHARACTER   9                4      3
 31      KEY          CHARACTER  10                4     23
 32      KEY          CHARACTER  11                4     43
 33      KEY          CHARACTER  12                4     63

NO PROCESS PARAMETERS
```

```
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L E V E L D A T A

OVERVIEW DISPLAY
LEVEL          1.  0.  0.  0

ASSIGNED:
LEVEL NO.     KEY SET: NO INFO
SYMBOL SET NO. :  1

WINDOW POSITION:
Y:       2
X:       1

NO SEGMENTS

VARIABLE

VAR NO    DISPTYPE NO FUNCTION     START POSITION    PARAM.      VALUE     OPERAT.
                                       Y      X      IDENT.      UPD       AUTHORIZ.

    1     KEY          CHARACTER       2      1      -----       ----      ALWAYS
    2     FR.VAR       DISPCHANGE      2      3      INPUT       ----      ALWAYS
    3     ST.IND  1    AREA STAT.      2     13      SELECTION   ----      SWITCH2
    4     ST.IND  2    AREA STAT.      2     14      SELECTION   ----      SWITCH2
    5     ST.IND  3    AREA STAT.      2     15      SELECTION   ----      SWITCH2
    6     ST.IND  9    AREA STAT.      2     16      SELECTION   ----      SWITCH2
    7     ST.IND  5    AREA STAT.      2     17      SELECTION   ----      SWITCH2
    8     ST.IND  6    AREA STAT.      2     18      SELECTION   ----      SWITCH2
    9     KEY          CHARACTER       2     21      -----       ----      ALWAYS
   10     FR.VAR       DISPCHANGE      2     23      INPUT       ----      ALWAYS
   11     ST.IND  1    AREA STAT.      2     33      SELECTION   ----      SWITCH2
   12     ST.IND  2    AREA STAT.      2     34      SELECTION   ----      SWITCH2
   13     ST.IND  3    AREA STAT.      2     35      SELECTION   ----      SWITCH2
   14     ST.IND  9    AREA STAT.      2     36      SELECTION   ----      SWITCH2
   15     ST.IND  5    AREA STAT.      2     37      SELECTION   ----      SWITCH2
   16     ST.IND  6    AREA STAT.      2     38      SELECTION   ----      SWITCH2
   17     KEY          CHARACTER       2     41      -----       ----      ALWAYS
   18     FR.VAR       DISPCHANGE      2     43      INPUT       ----      ALWAYS
   19     ST.IND  1    AREA STAT.      2     53      SELECTION   ----      SWITCH2
   20     ST.IND  2    AREA STAT.      2     54      SELECTION   ----      SWITCH2
   21     ST.IND  3    AREA STAT.      2     55      SELECTION   ----      SWITCH2
   22     ST.IND  9    AREA STAT.      2     56      SELECTION   ----      SWITCH2
   23     ST.IND  5    AREA STAT.      2     57      SELECTION   ----      SWITCH2
   24     ST.IND  6    AREA STAT.      2     58      SELECTION   ----      SWITCH2
   25     KEY          CHARACTER       2     61      -----       ----      ALWAYS
   26     FR.VAR       DISPCHANGE      2     63      INPUT       ----      ALWAYS
   27     ST.IND  1    AREA STAT.      2     73      SELECTION   ----      SWITCH2
   28     ST.IND  2    AREA STAT.      2     74      SELECTION   ----      SWITCH2
   29     ST.IND  3    AREA STAT.      2     75      SELECTION   ----      SWITCH2
   30     ST.IND  9    AREA STAT.      2     76      SELECTION   ----      SWITCH2
   31     ST.IND  5    AREA STAT.      2     77      SELECTION   ----      SWITCH2
   32     ST.IND  6    AREA STAT.      2     78      SELECTION   ----      SWITCH2
   33     KEY          CHARACTER       3      1      -----       ----      ALWAYS
   34     FR.VAR       DISPCHANGE      3      3      INPUT       ----      ALWAYS
   35     ST.IND  1    AREA STAT.      3     13      SELECTION   ----      SWITCH2
   36     ST.IND  2    AREA STAT.      3     14      SELECTION   ----      SWITCH2
   37     ST.IND  3    AREA STAT.      3     15      SELECTION   ----      SWITCH2
   38     ST.IND  9    AREA STAT.      3     16      SELECTION   ----      SWITCH2
   39     ST.IND  5    AREA STAT.      3     17      SELECTION   ----      SWITCH2
   40     ST.IND  6    AREA STAT.      3     18      SELECTION   ----      SWITCH2
   41     KEY          CHARACTER       3     21      -----       ----      ALWAYS
   42     FR.VAR       DISPCHANGE      3     23      INPUT       ----      ALWAYS
   43     ST.IND  1    AREA STAT.      3     33      SELECTION   ----      SWITCH2
   44     ST.IND  2    AREA STAT.      3     34      SELECTION   ----      SWITCH2
   45     ST.IND  3    AREA STAT.      3     35      SELECTION   ----      SWITCH2
   46     ST.IND  9    AREA STAT.      3     36      SELECTION   ----      SWITCH2
```

```
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  47     ST.IND 5    AREA STAT.     3     37      SELECTION  ----     SWITCH2
  48     ST.IND 6    AREA STAT.     3     38      SELECTION  ----     SWITCH2
  49     KEY         CHARACTER      3     41      -----      ----     ALWAYS
  50     FR.VAR      DISPCHANGE     3     43      INPUT      ----     ALWAYS
  51     ST.IND 1    AREA STAT.     3     53      SELECTION  ----     SWITCH2
  52     ST.IND 2    AREA STAT.     3     54      SELECTION  ----     SWITCH2
  53     ST.IND 3    AREA STAT.     3     55      SELECTION  ----     SWITCH2
  54     ST.IND 9    AREA STAT.     3     56      SELECTION  ----     SWITCH2
  55     ST.IND 5    AREA STAT.     3     57      SELECTION  ----     SWITCH2
  56     ST.IND 6    AREA STAT.     3     58      SELECTION  ----     SWITCH2
  57     KEY         CHARACTER      3     61      -----      ----     ALWAYS
  58     FR.VAR      DISPCHANGE     3     63      INPUT      ----     ALWAYS
  59     ST.IND 1    AREA STAT.     3     73      SELECTION  ----     SWITCH2
  60     ST.IND 2    AREA STAT.     3     74      SELECTION  ----     SWITCH2
  61     ST.IND 3    AREA STAT.     3     75      SELECTION  ----     SWITCH2
  62     ST.IND 9    AREA STAT.     3     76      SELECTION  ----     SWITCH2
  63     ST.IND 5    AREA STAT.     3     77      SELECTION  ----     SWITCH2
  64     ST.IND 6    AREA STAT.     3     78      SELECTION  ----     SWITCH2
  65     KEY         CHARACTER      4      1      -----      ----     ALWAYS
  66     FR.VAR      DISPCHANGE     4      3      INPUT      ----     ALWAYS
  67     ST.IND 1    AREA STAT.     4     13      SELECTION  ----     SWITCH2
  68     ST.IND 2    AREA STAT.     4     14      SELECTION  ----     SWITCH2
  69     ST.IND 3    AREA STAT.     4     15      SELECTION  ----     SWITCH2
  70     ST.IND 9    AREA STAT.     4     16      SELECTION  ----     SWITCH2
  71     ST.IND 5    AREA STAT.     4     17      SELECTION  ----     SWITCH2
  72     ST.IND 6    AREA STAT.     4     18      SELECTION  ----     SWITCH2
  73     KEY         CHARACTER      4     21      -----      ----     ALWAYS
  74     FR.VAR      DISPCHANGE     4     23      INPUT      ----     ALWAYS
  75     ST.IND 1    AREA STAT.     4     33      SELECTION  ----     SWITCH2
  76     ST.IND 2    AREA STAT.     4     34      SELECTION  ----     SWITCH2
  77     ST.IND 3    AREA STAT.     4     35      SELECTION  ----     SWITCH2
  78     ST.IND 9    AREA STAT.     4     36      SELECTION  ----     SWITCH2
  79     ST.IND 5    AREA STAT.     4     37      SELECTION  ----     SWITCH2
  80     ST.IND 6    AREA STAT.     4     38      SELECTION  ----     SWITCH2
  81     KEY         CHARACTER      4     41      -----      ----     ALWAYS
  82     FR.VAR      DISPCHANGE     4     43      INPUT      ----     ALWAYS
  83     ST.IND 1    AREA STAT.     4     53      SELECTION  ----     SWITCH2
  84     ST.IND 2    AREA STAT.     4     54      SELECTION  ----     SWITCH2
  85     ST.IND 3    AREA STAT.     4     55      SELECTION  ----     SWITCH2
  86     ST.IND 9    AREA STAT.     4     56      SELECTION  ----     SWITCH2
  87     ST.IND 5    AREA STAT.     4     57      SELECTION  ----     SWITCH2
  88     ST.IND 6    AREA STAT.     4     58      SELECTION  ----     SWITCH2
  89     KEY         CHARACTER      4     61      -----      ----     ALWAYS
  90     FR.VAR      DISPCHANGE     4     63      INPUT      ----     ALWAYS
  91     ST.IND 1    AREA STAT.     4     73      SELECTION  ----     SWITCH2
  92     ST.IND 2    AREA STAT.     4     74      SELECTION  ----     SWITCH2
  93     ST.IND 3    AREA STAT.     4     75      SELECTION  ----     SWITCH2
  94     ST.IND 9    AREA STAT.     4     76      SELECTION  ----     SWITCH2
  95     ST.IND 5    AREA STAT.     4     77      SELECTION  ----     SWITCH2
  96     ST.IND 6    AREA STAT.     4     78      SELECTION  ----     SWITCH2

 FUNCTION PARAMETERS

 VAR NO   DISPTYP NO  FUNCTION    ---FLD. 1---    ---FLD. 2---    ---FLD. 3---

    1     KEY         CHARACTER   1                  2      3
    2     FR.VAR      DISPCHANGE   0.  0.  0.  1   NO INFO  1             GRA
    3     ST.IND 1    AREA STAT.   0.  0.  0.  1     1      1
    4     ST.IND 2    AREA STAT.   0.  0.  0.  1     1      2
    5     ST.IND 3    AREA STAT.   0.  0.  0.  1     1      3
    6     ST.IND 9    AREA STAT.   0.  0.  0.  1     1      9             1
    7     ST.IND 5    AREA STAT.   0.  0.  0.  1     1      5
    8     ST.IND 6    AREA STAT.   0.  0.  0.  1     1      6
    9     KEY         CHARACTER   2                  2      3
   10     FR.VAR      DISPCHANGE   0.  0.  0.  2   NO INFO  2             GRA
   11     ST.IND 1    AREA STAT.   0.  0.  0.  2     1      1
   12     ST.IND 2    AREA STAT.   0.  0.  0.  2     1      2
   13     ST.IND 3    AREA STAT.   0.  0.  0.  2     1      3
```

```
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  14    ST.IND  9   AREA STAT.    0.  0.  0.  2      1        9         2
  15    ST.IND  5   AREA STAT.    0.  0.  0.  2      1        5
  16    ST.IND  6   AREA STAT.    0.  0.  0.  2      1        6
  17    KEY         CHARACTER   3                    2       43
  18    FR.VAR      DISPCHANGE    0.  0.  0.  3    NO INFO              3  GRA
  19    ST.IND  1   AREA STAT.    0.  0.  0.  3      1        1
  20    ST.IND  2   AREA STAT.    0.  0.  0.  3      1        2
  21    ST.IND  3   AREA STAT.    0.  0.  0.  3      1        3
  22    ST.IND  9   AREA STAT.    0.  0.  0.  3      1        9         3
  23    ST.IND  5   AREA STAT.    0.  0.  0.  3      1        5
  24    ST.IND  6   AREA STAT.    0.  0.  0.  3      1        6
  25    KEY         CHARACTER   4                    2       63
  26    FR.VAR      DISPCHANGE    0.  0.  0.  4    NO INFO              4  GRA
  27    ST.IND  1   AREA STAT.    0.  0.  0.  4      1        1
  28    ST.IND  2   AREA STAT.    0.  0.  0.  4      1        2
  29    ST.IND  3   AREA STAT.    0.  0.  0.  4      1        3
  30    ST.IND  9   AREA STAT.    0.  0.  0.  4      1        9         4
  31    ST.IND  5   AREA STAT.    0.  0.  0.  4      1        5
  32    ST.IND  6   AREA STAT.    0.  0.  0.  4      1        6
  33    KEY         CHARACTER   5                    3        3
  34    FR.VAR      DISPCHANGE    0.  0.  0.  5    NO INFO              5  GRA
  35    ST.IND  1   AREA STAT.    0.  0.  0.  5      1        1
  36    ST.IND  2   AREA STAT.    0.  0.  0.  5      1        2
  37    ST.IND  3   AREA STAT.    0.  0.  0.  5      1        3
  38    ST.IND  9   AREA STAT.    0.  0.  0.  5      1        9         5
  39    ST.IND  5   AREA STAT.    0.  0.  0.  5      1        5
  40    ST.IND  6   AREA STAT.    0.  0.  0.  5      1        6
  41    KEY         CHARACTER   6                    3       23
  42    FR.VAR      DISPCHANGE    0.  0.  0.  6    NO INFO              6  GRA
  43    ST.IND  1   AREA STAT.    0.  0.  0.  6      1        1
  44    ST.IND  2   AREA STAT.    0.  0.  0.  6      1        2
  45    ST.IND  3   AREA STAT.    0.  0.  0.  6      1        3
  46    ST.IND  9   AREA STAT.    0.  0.  0.  6      1        9         6
  47    ST.IND  5   AREA STAT.    0.  0.  0.  6      1        5
  48    ST.IND  6   AREA STAT.    0.  0.  0.  6      1        6
  49    KEY         CHARACTER   7                    3       43
  50    FR.VAR      DISPCHANGE    0.  0.  0.  7    NO INFO              7  GRA
  51    ST.IND  1   AREA STAT.    0.  0.  0.  7      1        1
  52    ST.IND  2   AREA STAT.    0.  0.  0.  7      1        2
  53    ST.IND  3   AREA STAT.    0.  0.  0.  7      1        3
  54    ST.IND  9   AREA STAT.    0.  0.  0.  7      1        9         7
  55    ST.IND  5   AREA STAT.    0.  0.  0.  7      1        5
  56    ST.IND  6   AREA STAT.    0.  0.  0.  7      1        6
  57    KEY         CHARACTER   8                    3       63
  58    FR.VAR      DISPCHANGE    0.  0.  0.  8    NO INFO              8  GRA
  59    ST.IND  1   AREA STAT.    0.  0.  0.  8      1        1
  60    ST.IND  2   AREA STAT.    0.  0.  0.  8      1        2
  61    ST.IND  3   AREA STAT.    0.  0.  0.  8      1        3
  62    ST.IND  9   AREA STAT.    0.  0.  0.  8      1        9         8
  63    ST.IND  5   AREA STAT.    0.  0.  0.  8      1        5
  64    ST.IND  6   AREA STAT.    0.  0.  0.  8      1        6
  65    KEY         CHARACTER   9                    4        3
  66    FR.VAR      DISPCHANGE    0.  0.  0.  9    NO INFO              9  GRA
  67    ST.IND  1   AREA STAT.    0.  0.  0.  9      1        1
  68    ST.IND  2   AREA STAT.    0.  0.  0.  9      1        2
  69    ST.IND  3   AREA STAT.    0.  0.  0.  9      1        3
  70    ST.IND  9   AREA STAT.    0.  0.  0.  9      1        9         9
  71    ST.IND  5   AREA STAT.    0.  0.  0.  9      1        5
  72    ST.IND  6   AREA STAT.    0.  0.  0.  9      1        6
  73    KEY         CHARACTER  10                    4       23
  74    FR.VAR      DISPCHANGE    0.  0.  0. 10    NO INFO             10  GRA
  75    ST.IND  1   AREA STAT.    0.  0.  0. 10      1        1
  76    ST.IND  2   AREA STAT.    0.  0.  0. 10      1        2
  77    ST.IND  3   AREA STAT.    0.  0.  0. 10      1        3
  78    ST.IND  9   AREA STAT.    0.  0.  0. 10      1        9        10
  79    ST.IND  5   AREA STAT.    0.  0.  0. 10      1        5
  80    ST.IND  6   AREA STAT.    0.  0.  0. 10      1        6
```

```
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   81      KEY         CHARACTER  11                   4     43
   82      FR.VAR      DISPCHANGE    0.  0.  0.  11   NO INFO              11   GRA
   83      ST. IND  1  AREA STAT.    0.  0.  0.  11    1      1
   84      ST. IND  2  AREA STAT.    0.  0.  0.  11    1      2
   85      ST. IND  3  AREA STAT.    0.  0.  0.  11    1      3
   86      ST. IND  9  AREA STAT.    0.  0.  0.  11    1      9            11
   87      ST. IND  5  AREA STAT.    0.  0.  0.  11    1      5
   88      ST. IND  6  AREA STAT.    0.  0.  0.  11    1      6
   89      KEY         CHARACTER  12                   4     63
   90      FR.VAR      DISPCHANGE    0.  0.  0.  12   NO INFO              12   GRA
   91      ST. IND  1  AREA STAT.    0.  0.  0.  12    1      1
   92      ST. IND  2  AREA STAT.    0.  0.  0.  12    1      2
   93      ST. IND  3  AREA STAT.    0.  0.  0.  12    1      3
   94      ST. IND  9  AREA STAT.    0.  0.  0.  12    1      9            12
   95      ST. IND  5  AREA STAT.    0.  0.  0.  12    1      5
   96      ST. IND  6  AREA STAT.    0.  0.  0.  12    1      6

 NO PROCESS PARAMETERS
 END OF LIST
```

9.2.1.11 Text Editor Printouts

```
                    OS 265

                    TEXTS


              LANGUAGE    :  ENGLISH
              VERSION     :  V 1. 002
              EDITED      :  07.01.1992
              OUTPUT      :  15.06.1992
```

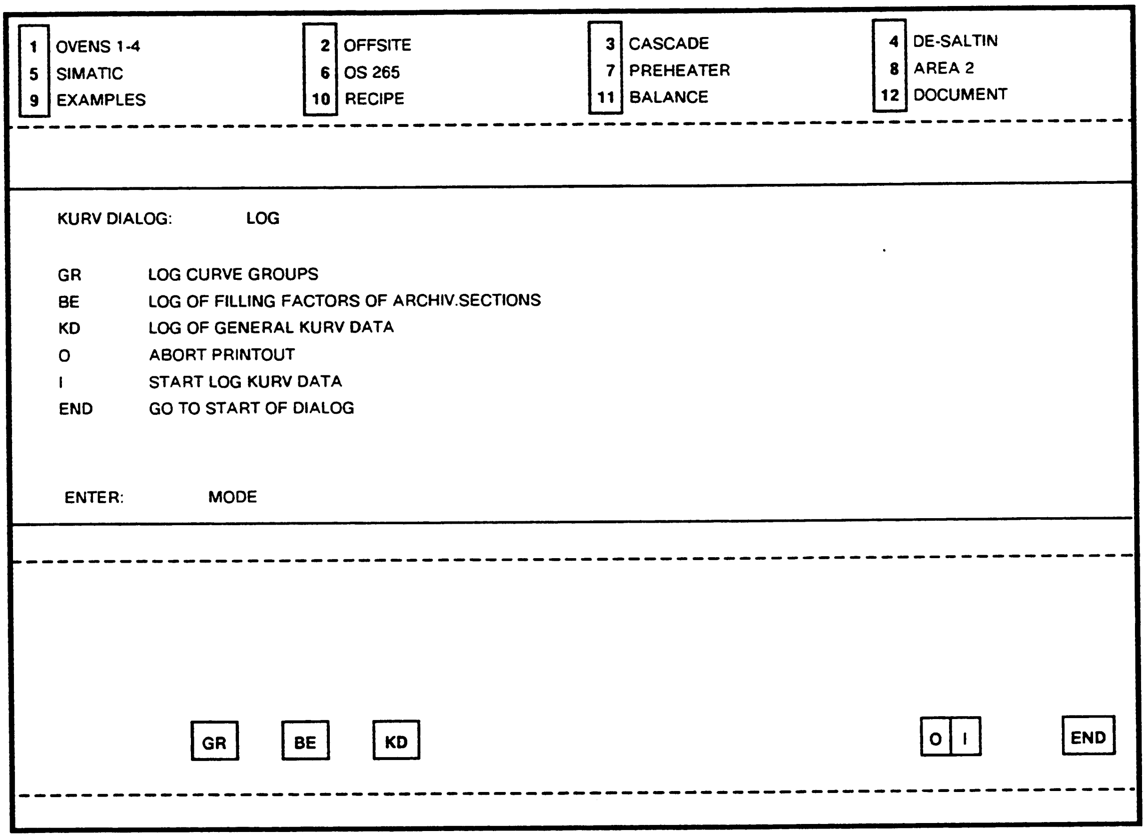
Fig. 9-15 Cover sheet of the text printout

PAGE: 1 *START TEXT NO.:* 1

TEXT:	1	*DESIGN SEGMENT*
LENGTH:	22	*DESIGN SEGMENT*
TEXT:	2	*ENTER SEGMENT EXTENSION*
LENGTH:	24	*ENTER SEGMENT EXTENSION*
TEXT:	3	*ENTER SEGMENT NUMBER*
LENGTH:	20	*ENTER SEGMENT NUMBER*
TEXT:	4	*ENTER SEGMENT ORIGIN*
LENGTH:	30	*ENTER SEGMENT ORIGIN*
TEXT:	5	*IDENTIFY SEGMENT*
LENGTH:	24	*IDENTIFY SEGMENT*
TEXT:	6	*DELETE SEGMENT? ENTER YES/NO.*
LENGTH:	32	*DELETE SEGMENT? ENTER YES/NO.*
TEXT:	7	*ENTER KEY SET NUMBER*
LENGTH:	22	*ENTER KEY SET NUMBER*
TEXT:	8	*DESIGN KEYSET*
LENGTH:	24	*DESIGN KEYSET*
TEXT:	9	*ENTER KEYSET EXTENSION*
LENGTH:	26	*ENTER KEYSET EXTENSION*
TEXT:	10	*DELETE KEYSET? ENTER YES/NO.*
LENGTH:	34	*DELETE KEYSET? ENTER YES/NO.*

9.2.2 Logging the Configured Texts in KURV

The configured texts are logged in the KURV function package. A key menu field is displayed when the LOG mode is selected which enables logging to be started.



```
KURV DIALOG:      LOG

GR       LOG CURVE GROUPS
BE       LOG OF FILLING FACTORS OF ARCHIV.SECTIONS
KD       LOG OF GENERAL KURV DATA
O        ABORT PRINTOUT
I        START LOG KURV DATA
END      GO TO START OF DIALOG


 ENTER:          MODE
```

Fig. 9-17 Screen display after KURV →LOG have been selected

Selecting the corresponding keys enables the user to print

KD : a log of the general KURV data (Chapter 9.2.2.1) or
GR : group logs (Chapter 9.2.2.2) or
BE : area logs (Chapter 9.2.2.3)

of data which has been configured in the KURV system.
During a log output, one of the following texts is displayed in the bottom (32) line:

LOG OF GENERAL CURVE DATA BUSY
GROUP LOG BUSY
LOG OF ARCHIV. SECTION BUSY

This message is not cleared when printout is finished. It can be removed by changing the image (e.g. selecting END). The log output is still in progress if a message appears after PRINT has been selected.

Selecting the I key starts the log, selecting 0 aborts a running printout.

One of the following texts is displayed in the bottom line (32) when a printout is aborted:

LOG OF GENERAL CURVE DATA INTERRUPTED
GROUP LOG INTERRUPTED
LOG OF ARCHIV. SECTION INTERRUPTED

The message

END OF LOG

appears as last line on the logging device.

The basic configuration menu is displayed after the END key has been selected. This is performed automatically after a logging job has been transferred.

9.2.2.1 Log of the General KURV Data

This log outputs the following items:

- System identifier
- Configuration version
- Filing version
- Number of configured
  - groups
  - measuring point
  - curves
  - messages
- Configured cycles
- Per cycle
  - number of measuring points acquired during the cycle
  - number of groups configured in the cycle
- Cyclic filing (save time)
- Configured filing device mnemonic name
- Maximum space available for KURV
- Space required by KURV including history

The number of curves and filing groups specified in the log corresponds to the "real" circumstances, i.e. the free curve grous are not counted.

Example of a system log

```
 GENERAL KURV DATA                                          15.12.89


 SYSTEM LABEL  :                                            1.12.89
 ISSUE         :                                                 68
 ARCHIV VERS.  :
-------------------------------------------------------------------------
              CURR.      ARCHIV                                          FETCH
              GROUPS     GROUPS     MEAS.POINTS CURVES   AKS-TELEGR.    TELEGR.
NUMBER:         329        325         439       1530        21             3
-------------------------------------------------------------------------
                 CYCLE    NUMBER   NUMBER   NUMBER   ARCHIV   HIST.LENGTH
                 TIME     MEA.P.   GROUPS   CURVES   GROUPS   IN DOTS
-------------------------------------------------------------------------
     FG                                                          3200
      1       4 S          28        0         0        0         200
      2      20 S           0        0         0        0          50
      3       1 MIN       176      126       595      126         200
      4       2 MIN         0        0         0        0          50
      5      10 MIN         0        0         0        0          50
      6       1 HR          0        0         0        0          50
      7       2 HR          0        0         0        0          50
      8       2 S          72       13        58       12         200
      9      10 S         159       69       302       67         200
     10       3 MIN         4      120       575      120         150
     11                                                            50
     12                                                            50
     13                                                            50
     14                                                            50
     15                                                            50
-------------------------------------------------------------------------
  ARCHIVING CYCLE:                 30 MIN
-------------------------------------------------------------------------
  MAX.        FREE POSIT (FOR KURV)  :          237 KWORDS
              MEMORY REQUIREMENTS  :            198 KWORDS

  END OF LOG
```

9.2.2.2 Group Log

All data items related to a curve group are printed in a group log. These are:

- group number
- storage cycle
- curve field type
- filing

and for each curve in the group:

- measuring point identifier
- message identifier
- colour, name, type, unit
- data reduction type
- lower and upper display range
- acquisition cycle.

Once all curve groups have been logged, the message END OF LOG is output at the bottom of the log.

The key set changes after the GROUP key has been selected. Selecting I starts the log once all inputs have been terminated.

All curve groups configured in KURV are logged when the GROUP and I keys are selected. In addition, the user can specify the curve group(s) to be logged. To do this, the display is changed after the GROUP key has been selected. The first entered figure specifies the lower limit, selecting the TO key initiates input of the upper limit.

Selecting the numeric keys 1 ... 0 enables the user to specify one or two group numbers which are considered as lower and upper limit.

Examples:
Logging group 563:

```
GROUP   GROUP   5 6 3   ON
GROUP   5 6 3   ON
5 6 3   ON
GROUP   GROUP   5 6 3   TO   5 6 3   ON
GROUP   5 6 3   TO   5 6 3   ON
5 6 3   TO 5 6 3   ON
```

Logging all groups up to and including group number 563:

```
GROUP   GROUP   TO   5 6 3   ON
GROUP   TO   5 6 3   ON
TO   5   6 3   ON
```

Logging all existing groups in the range between 563 and 690:

```
GROUP   GROUP   5 6 3   TO   6 9 O   ON
GROUP   5 6 3   TO   6 9 O   ON
5 6 3   TO 6 9 O   ON
```

- Incorrect entries can be cleared by selecting the TO (clears the second entry) or GROUP (clears both group numbers) key. The input can then be repeated.
- Individual figures can be cleared by selecting the CE key.

Selecting the END key re-displays the basic menu.

Exceptions

The measuring point configured in KURV has been cleared in NORA/FRANZ after KURV configuration if asterisks (*****) or question marks (??) are displayed as measuring point type in the group log instead of the TELEPERM M MKZ designation. This measuring point can only be removed from kurv by selecting group/curve number.

9.2.2.3 Section Log

Selecting the SECTION key displays operator input keys related to the existing filing sections.

Selecting the corresponding key displays the section label. Selecting the I key starts printout.

Selecting END re-displays the section selection keys; data of another section can now be logged. The label of the last section to have been selected remains on the screen until a new section is selected.

Selecting the END key next to the section keys displays the basic menu.

Example of a section log

The logged section has already been used for filing in the operating phase.

```
KURV SECTION LOG                              26.01.90         PAGE   1
= = = = = = = = = = = = = =                   = = = = =

SECTION                                                      2
----------------------------------------------------------------------------------------------------
                         CURVE LABEL
CURVE DESIGN VERSION           :    02.02.89/1
ARCHIV VERSION                 :    2
DATE OF CURRENT VERSION        :    25.01.90 10:31:20
ID-NUMBER                      :    1
DATE OF FIRST ARCHIVING        :    25.01.90 11:00:00
DATE OF LAST ARCHIVING         :    03.02.90 17:18:00
FILLING FACTOR PERC.           :    20.0
----------------------------------------------------------------------------------------------------
ARCHIVED TIMEPERIODS IN:                 4.-SEC.-CYCLE

             FROM:  25.01.90       11:00:00   TO: 03.02.90   17:18:00
----------------------------------------------------------------------------------------------------
END OF LOG
```

Note:
The filed periods of all cycles which have been used for filing are printed in the sequence used for configuring these cycles (i.e. with ascending cycle index). There can be exceptions if filing has been de-activated for a longer time and, due to different history length values in the main memory when filing is activated, all values of one cycle which have not yet been filed are still in the main memory whilst only the last part of other cycles is available.

This means that one cycle can contain values for a specific period whilst another cycle contains a failure period.

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10 Messages During the Design Phase

10.1 Messages Occurring during NORA/FRANZ Design

10.1.1 Create Symbol Set

The messages which are displayed in the message line can be subdivided into two different groups:

- long-term messages
- short-term messages

Long-term messages can be interrupted and overwritten by short-term messages for approximately 2 seconds.

Long-term messages

OPERATE	This message is issued after the start, after a function/position has been selected and after a function has been executed. The program is ready for operator input.
CLEAR SET? YES/NO	Cause: The CLEAR SET function has been selected. Reaction: - Set is to be cleared: select YES. - Set is not to be cleared: select any other function or character key.
DELETE SET? YES/NO	Cause: The DELETE SET function has been selected. Reaction: - Set is to be deleted: select YES. - Set is not to be deleted: select any other function or character key.

Short-term messages

NOT ALLOWED	Cause: An illegal function/position has been selected. Reaction: The program is ready for operator input.
SET CLEARED	Cause: The required set has been cleared. Reaction: The program is ready for operator input.
SET DELETED	Cause: The required symbol set has been deleted from the housekeeping system. Reaction: The program is ready for operator input.
NO FREE SET	Cause: A symbol set is to be created as "new set" although no memory space is available or 99 sets have already been created. Reaction: Clear a symbol set which is not required (old set). Repeat input.
ENTER SET NO.	Cause: The function for the old set has been selected. Reaction: Select the required set number using the numeric menu field. This input can be omitted, the displayed set number will then be accepted.
SET .. NOT AV.	Cause: A set function for the selected old set cannot be executed as the symbol set cannot be found. Reaction: The program is ready for operator input.
END	Cause: The program is finished after the END key has been selected. Reaction: The design dialog design selection menu field is displayed if the END key in the HC display has been selected. Else: prompt for entering a symbol set number in the design dialog.

POSITION WRONG	Cause: The selected screen position is not permitted as operator input or display position. Reaction: Repeat selection.
HC PRINTED	Cause: A hard copy has been output. Reaction: The program is ready for operator input.
HARDCOPY NOT RDY	Cause: The connected hard copy unit is not ready. Reaction: - Set hard copy unit to ready status and select the HC key repeatedly. - Select the BASIC SETTING key (no hard copy output).
HC NOT AVAILABLE	Cause: Hard copy unit has not been connected. Reaction: The program is ready for operator input.
SET LOADED	Cause: A new set has been created and loaded (loaded set) or a set has been cleared (after CREATE SET). Reaction: The program is ready for operator input.

10.1.2 Text Editor

General comments

The messages which are displayed in the message line can be subdivided into three different groups:

- short-term messages
- long-term messages
- permanent messages

Long-term messages can be interrupted and overwritten by short-term messages for approximately 2 seconds.
Permanent messages only refer to the logging function, and are displayed from column 20 in the message line.

Short-term messages

POSITION WRONG	Cause: The selected screen position is not permitted as operator input or display position.
NOT ALLOWED	Cause: Selecting this key is not permitted. Only figures and '-' (in LOG) are valid entries into the command line., The cursor may only be positioned within the maximum length of the editing line.
LINE FULL	Cause: The end of the editing line has been reached.
FIELD FULL	Cause: The command buffer for text number input is full.
END	Cause: TEXT EDITOR function has been terminated.

Long-term messages

OPERATE	Cause: This message is issued after the start, and after a function has been selected.
ENTER POSITION	Cause: A position must be selected when texts are to be copied.
ENTER CHARACTER	Cause: Character input is expected into the editing line.
ENTER TEXT NO.	Cause: Text number input is expected after the function has been selected.
PRINTER NT. READY	Cause: The printer has not been switched on if this message appears immediately after the log output has been initiated. The printer is in off line mode if this message is displayed after approximately 1 minute (the TEXT EDITOR does not accept any inputs during this time). The text edition accepts inputs after this message has been displayed.

Permanent messages

LOG ABORTED	Cause: Log output has been aborted.
END OF LOG	Cause: The complete log output has been aborted.
LOG: text no. - text no.	Cause: Log output is in progress. The first text number is the number of the text which is currently being printed, the second number is the end text number.

10.1.3 Malfunctions/Input Errors

The following error messages are subdivided into five categories:

1 Immediate rectification required; prompt for new input
2 Dialog is repeated with correct input
3 Terminate current dialog and react to prompt afterwards
4 Terminate dialog; retrofit hardware
5 Hardware fault

Messages displayed in the message line

REPRESENT. WRONG (NORA)	Cause: S or G block cannot be configured with representation 1000. Alarm category: 2
BLOCK NOT DESIGNABLE (NORA)	Cause: A block has been selected which cannot be further configured. Configuration can only be continued in G or S blocks. Alarm category: 2
DISPLAY NOT YET STORED (NORA)	Cause: A fault in G or S block has been detected. The message means that data has not yet been modified. Previous entries are only accepted after the fault has been rectified. Alarm category: 2
OVERVIEW NOT AVAILABLE	Cause: A plant overview could not be found when an alarm sequence or a curve display was selected. Alarm category: 3

AUTOMATION SYSTEM ALREADY DESIGNED	Cause: After a variable with variable name had been designed, an attempt was made to specify the automation system via the design data menu field. Alarm category: 3
DISPLAY NOT YET STORED	Cause: The END key has been selected without storing the image already started. Alarm category: 1
ALREADY DISPLAYED	Cause: An image is to be retrieved by selecting the RETRIEVE key, although an image has already been displayed on the screen. Alarm category: 3
BIT RANGE NOT ACCEPTABLE	Cause: The distance between the two bit positions specified is greater than 16 bits. Alarm category: 2
DATE NOT ACCEPTABLE	Cause: An invalid date has been entered. Alarm category: 2
LEVEL NUMBER WRONG	Cause: An invalid level number has been entered. Each level number position must be less than 255. The position for the highest hierarchy level of the process display must not be zero. Alarm category: 1
LEVEL EXISTS ALREADY	Cause: An existing level number has been entered when storing a process display or key set while OVERWRITING: NO was selected. Corrective action: enter different level number or delete this level prior to creating the process display or key set. Alarm category: 1
WRONG (blinking red)	Cause: The selected key was missed. Alarm category: 2

ERROR DURING OP. INHIBIT	Cause: The VDU interface is not ready. Alarm category: 5
ERROR IN HARD COPY DEVICE	Cause: Hard copy device has not be connected, is defective or occupied by a different OS if several OS devices have been connected. Alarm category: 3-5
DISPLAY SIZE NOT ACCEPTABLE	Cause: A large size image extension has been specified which is larger than 40,960 (= number of lines * number of columns) or the number of lines is less than 32 when the number of columns is greater than 80; or the number of columns is less than 80 if the number of lines is greater than 32. Alarm category: 2
NO PARAMETER TYPE ENTERED	Cause: A parameter type for the parameter no. has not been entered. This input is mandatory. Alarm category: 2
NOT INSERTED, BECAUSE OUTSIDE OF WINDOW	Cause: The specified origin position is rejected by the system as the control field/segment to be inserted would be completely outside the window. Alarm category: 2
NOT ACCEPTABLE	Cause: A key has been selected which may not be used in this phase. Alarm category: 2
NO ACCESS AUTHORIZATION	Cause: The selected function key can only be used with the keyswitch. Alarm category: 2
NOT ACCEPTABLE DURING LOGGING	Cause: Design activities are not allowed during log printout. (Design may be continued after logging has been terminated.) Alarm category: 3

NUMBER WRONG	Cause: The image number entered (red blinking) is zero, negative or greater than 4095. Alarm category: 2
ONLY IN REPORTDISP. ACCEPTABLE	Cause: The operator input function selected in the SYSTEM OPERATIONS 3 menu field can only be used for user log design (log display or in related key set). Alarm category: 2
ONLY IN KEYSET ACCEPTABLE	Cause: A system or process operation function must be inserted into a control field or process image which is only permitted in the keyset. Alarm category: 2
ONLY ACCEPTED CREATE. CLEAR. END	Cause: The STORE key has been selected or an attempt was made to introduce a variable or segment in a display without previously selecting the CREATE key for initiating the creation phase. Alarm category: 2
PARAMETER NUMBER NOT ACCEPTABLE	Cause: The parameter number entered is zero, negative or greater than 255. Alarm category: 2
SET NUMBER WRONG	Cause: When selecting the RETRIEVABLE key, a set number has been entered for the variable value which is zero, negative or greater than four. Alarm category: 2
SET NUMBER NOT ACCEPTABLE	Cause: When designing a set retrieval key, a set number has been entered which is zero, negative or greater than four. Alarm category: 2
MEMORY FULL	Cause: No more memory space is available. (extend memory to 8 MB if possible). **Note:** This alarm only refers to the action currently performed. Alarm category: 4

SYMBOL SET NOT LOADED

Cause:
The SYMBOLSET key in the design selection menu field and thus the associated symbol set has not been selected prior to designing a process display, a key set, a window or an overview display.

Alarm category: 3

HEADLINE MISSING-NOT STORED

Cause:
A log display cannot be stored if a name has not been assigned (log display design, Chapter 5.10.4). Assign name to log display.

Alarm category: 1

TIME NOT ACCEPTABLE

Cause:
An invalid time has been entered.

Alarm category: 2

VARIABLE NAME WRONG

Cause:

Bus address (BA):	greater than 254 or less than zero.
Device adress (TA):	greater than 254 or less than zero.
Block type (BLOCK):	Dot or NIL dot in the type characters.
Block number (NO):	Dot or NIL dot in the block number characters.

WINDOWEXTENSION NOT ACCEPTABLE

Cause:
The window format for "any input" is too large (larger than individual display).

Alarm category: 2

WINDOWPOSITION NOT PERMITTED

Cause:
The required position makes it impossible to insert the window on the screen.

Alarm category: 2

WINDOW 1 COLUMN SMALLER

Cause:
If the window size for "any ext." has been entered with an odd number of columns, the system corrects the input and reduces the number of columns by 1. The correction is displayed in the echo line.
Only an even number of columns is permitted with a freely selectable window size.

Alarm category: 2

WINDOW MOVED 1 COLUMN TO THE LEFT	Cause: Only an odd number of columns is permitted for specifying the window position. If the designer specifies an even number of columns, the system corrects the input and moves the window by one column to the left. The correction is displayed in the echo line. Alarm category: 2

10.2 Messages Occurring during KURV Design

The following messages can occur during KURV design.

Each message is described as follows (if required for troubleshooting):

1. Message text
2. Reference to the relevant Chapter in this description, where the message can occur.
3. Possible cause and condition under which the message can occur.
4. Corrective actions and operator reaction required.
5. Comments

Message:

STORAGE CYCLE TOO SHORT	Cause: This message occurs if at least one MKZ exists in a newly configured curve group which has already been configured in a different group and if the specified storage cycle is shorter than the previously specified acquisition cycle. If the new group contains more than one previously configured MKZ, this message refers to the MKZ with the longest acquisition cycle. Corrective action: Re-enter the storage cycle with a time value which is greater than or equal to the longest acquisition time in this group. Note: Repeat the input with the next higher value if the shortest acquisition time of the MKZ configured in this group is unknown.
AKS-POS. OCCUPIED	Cause: An occupied location has been specified when defining the message definition.

AKS-CYCLE MISSING/WRONG

Cause:
This message occurs if during configuration

a) of a curve group a new AKS message has been entered without specifying the AKS cycle repetition time. Corresponds to AKS-CYCLE MISSING.

b) the entered AKS cycle repetition time does not agree with a previous input for this AKS message. Corresponds to AKS-CYCLE WRONG.

c) the entered AKS cycle repetition time is less than 125 ms.

Corrective action:
Select the NO key and repeat input with the correct or missing AKS repetition time.

Note:
ref. a) The AKS repetition time is necessary, the message is repeated after YES has been selected.

ref. b) Selecting YES changes the AKS repetition time.

ref. c) Due to system requirements, the AKS cycle repetition time may not be shorter than 125 ms.

CHANGING AKS-CYCLE

Cause:
This message is displayed if the YES key is selected as a response to the inquiry whether the message definition is to be accepted. This inquiry appears after the message AKS-CYCLE MISSING/WRONG. Please note that the previously entered AKS cycle time will be modified to the new value entered.

Note:
If the cycles are changed (from 8 s to 4 s, for example), cycle selection can cause the AKS messages to not be available to KURV in the required intervals. Measuring point failures will occur more frequently in a display cycle of 4 s, for example.

AKS-CYC. UNFAVOURABLE

Cause:
This message is displayed if an AKS cycle repetition time has been specified during configuration which does not result from multiplying 125 ms with two to the power of a positive integer, and is shorter than the acquisition cycle. Cycle selection is thus not possible.

	Corrective action: Re-enter a AKS cycle repetition time value which complies with the requirements. Note: Select the YES key if the required value cannot be produced within these conditions. A software cycle selection is then necessary which results in a higher CPU load.
AKS-CYC. MISSING/WRONG AND POS. OCCUPIED	Cause: This message is displayed if both messages AKS CYCLE MISSING/WRONG and AKS POS. OCCUPIED are true. Corrective action: See above.
AKS CYC. UNFAVOURABLE AND POS. OCCUPIED	Cause: This message is displayed if both messages AKS-CYCLE UNFAVOURABLE and AKS-POS. OCCUPIED are true. Corrective action: See above.
NO. OF GROUPS > 1000	Cause: This message is displayed if an attempt is made during design to configure more than 1000 different curve groups. This exceeds the specified quantity.
NO. OF CURVES > 2000	Cause: This message is displayed if an attempt is made during design to configure more than 2000 different curve groups. This exceeds the specified quantity.
DISPLAY RANGE WRONG	Cause: This message is displayed if an invalid display range has been specified (e.g. lower display range greater than upper display range, upper range missing, etc.).
ARCHIVING CHANGED	Cause: This message is displayed if, for the first time after the data is read, a) an additional curve group, which is to be filed onto hard disk, is configured or b) a curve group, which was to be filed, is cleared or c) a curve is cleared from a group which is to be filed.

The filing version displayed in the basic menu is increased by one.

Note:
After data has been read, filing to areas, which have been used for filing under a different filing version, is not possible in the operating phase.

PRINTER BUSY	Cause: This message is displayed if a printout has been requested while the printer was running. Corrective action: Wait until the printout is finished or abort printout. Start required printout again. Note: The message LOG BUSY is displayed in the bottom line on the screen after DR has been selected and while printout is running.
PRINTER INACTIVE	Cause: An attempt has been made to abort a running printout.
PRINTER NT. RDY	Cause: This message is displayed if printout has been started while the printer was not ready. Corrective action: Make printer ready and start printout again..
INPUT ERROR	Cause: Incorrect syntax used in an entry via the alphanumeric keyboard. E.g. comma delimiters are missing or letters have been entered instead of figures. Abhilfe: Repeat correct entry. Note: The inquiry ABORTION OF INPUT? is displayed if the END key has been selected without previous input. The user may then abort the configuration dialog.

ACQUIS. CYCLE TOO LONG

Cause:
This message is displayed if an acquisition cycle has been specified during curve group configuration which is longer than the previously entered storage cycle.

Corrective action:
Re-enter an acquisition cycle value which is shorter than or equal to the previously entered storage cycle.

Note:
The cycle time value entered for this curve group is shown in the currently displayed image.

WRONG

Cause:
An attempt has been made to select an undefined key or to enter the password for PK 318 twice.
See message: WRONG KEY OPERATION.

WRONG GROUP INPUT

Cause:
A group log from a to b is required, and a > b.

Corrective action:
Enter correct group numbers.

WRONG KEY OPERATION

Cause:
This message is displayed if a position has been touched using the light pen which is not part of an operator-accessible key or if an operator-accessible key has been missed.

Corrective action:
Select correct key.

CLOSE GROUP

Cause:
This message is displayed if the input sequence COLLECT MKZ and CLEAR (for an MKZ which has not yet been configured) has been performed more than 14 times in curve group configuration. The message is repeated if a further MKZ is defined after the message has been displayed.

Corrective action:

1. Select the EXEC key. This terminates the MKZ collection for this curve group.

2. Only define MKZs which have already been configured.

3. Select the CLEAR key repeatedly, and clear all previously determined MKZs by selecting EXEC Then re-configure this group by selecting CR.

GROUP COLLECTED	Cause: This message is displayed after the 6th MKZ has been determined during curve group configuration. The message is repeated if a further MKZ is defined after the message has been displayed, and the selected MKZs are listed.
NO MEAS. POINT	Cause: This message is displayed if a position configured with MKZ has been touched using the light pen which does not contain an MKZ or if an MKZ position has been missed. Corrective action: Select correct key.
NO MEM-SPACE FOR KURV	Cause: An attempt has been made to store data in the main memory which exceeds the space provided for KURV. There are two reactions: The system shortens the history length dynamically. The operator dialog is aborted if the user continues configuration and the history length becomes very small (e.g. 10 points). KURV configuration cannot be continued in this case. Corrective action: Extend the main memory to 8 MB or clear FRANZ/NORA, KURV or MELD data or terminate curve configuration. Note: Calculate memory requirements before configuration.
CURVE DOES NOT EXIST	Cause: A curve which does not exist has been selected via A group/curve number during modification configuration. Corrective action: Select the key of an existing curve.
MAX.NO.FETCHTEL.	Cause: This message is displayed if the 51st fetch message must be configured during configuration because all locations of the existing messages have been occupied. Corrective action: Specify this MKZ via an AKS message during configuration. Note: CPU load is lower and execution time shorter if measured values are transferred by AKS messages to KURV.

SELECT MKZ	Cause: This message is displayed after the ER key has been selected or the MKZ determined. It informs the user that the maximum number (6) of MKZs has not yet been collected for this curve group. Corrective action: Define additional MKZ or select the END, CLEAR or LIST MKZ key. Note: This message is also displayed if an MKZ must be defined for alteration after MES via SELECT OS IMAGE.
NOT ACCEPTABLE	Cause: The user has entered a key sequence which is not permitted.
NUMBER ALREADY ASSIGNED	Cause: The group number specified for modification has already been assigned.
LOG BUSY	Cause: This message is displayed if a printout has been requested while the printer was running. Corrective action: Wait until the printout is finished or abort printout. Start required printout again.
DIGIT OVERFLOW	Cause: An attempt has been made to enter more figures than are required.
CYCLES INCOMPATIBLE	Cause: This message is displayed if an AKS cycle repetition time has been entered during configuration which is incompatible with the acquisition cycle. This means that the acquisition cycle is not an integer factor of the AKS cycle repetition time.. Corrective action: Select the NO key after the AKS cycle repetition time has been re-entered according to the above-mentioned conditions. Note: Select YES if the AKS cycle repetition time cannot be entered according to the above-mentioned conditions. Please note that the latest time values are not always displayed in the operating phase.

CYCLES INCOMPATIBLE AND POS. OCCUPIED	Cause: This message is displayed if both messages CYCLES INCOMPATIBLE and AKS-POS. OCCUPIED are true. Corrective action: See above.

10.3 Messages Occurring With Incorrect Basic Data

FORM 1000/1 NOT AVAILABLE
FORM 1000/2 NOT AVAILABLE
FORM 2000 NOT AVAILABLE
FORM 3000 NOT AVAILABLE
FORM1000/1 WRONG
FORM 1000/2 WRONG
FORM 2000 WRONG
FORM 3000 WRONG
LOOP NUMBER IN F3000 MISS.
CONT. FIELD NOT AVAILABLE
FORM 2000 ARROW EXTENSION
ERROR IN DISPLAY OUTPUT
OBJECT NOT AVAILABLE
FORM NOT AVAILABLE
STRUCTUR/PROGRAM-ERROR

Incorrect basic data notify service staff.

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11 Exceptions

11.1 AKS/BKS Link

DI mode communication is required if an OS 265 is to be linked to AKS/BKS blocks via a bus coupler module. Any CD mode link between these AKS/BKS blocks and other devices must be changed to DI mode in order to facilitate a link via bus coupler modules. This can be achieved in two different manners:

- the original block is cleared and re-configured (now in DI mode); or
- an identical block in DI mode is configured in addition to the block in CD mode.

The following restriction applies for the AKS/BKS blocks:
Only DI mode is permitted for AKS blocks with a number > 16; either DI or CD mode is possible for AKS/BKS blocks with a number between 1 and 16.

Note:

- Using the same numbers for AKS and BKS blocks is not permitted (see Description of the Automation Systems).
- You may not configure more than 16 BKS blocks in one process display. If you configure more than 16 BKS blocks, the variables in the process display will be updated uncorrectly.

11.2 Configuration Hints to Avoid OS Overload

11.2.1 FRANZ: Which Variable Updating Mode is to be Selected?

- Cyclic

Cyclic updating is used for binary values, bars, trends, S2 and S4 strings and status displays which are controlled by a binary parameter in the AS (EB, AB) or by a BKS.

The OS requests all values immediately after an image has been selected. Subsequently, the OS only requests the cyclic values during the image-related updating cycles, not during image selection (exception: BKS-controlled status displays. The AS always transfers the BKS message cyclically, irrespective of the image selection.)

The OS checks after each cycle which cyclic variable has changed since the last cycle. Exception: if binary values, bars or strings are also combined with the status word or the common status (e.g. colour change for alarm limit violation), these variables are always transferred cyclically, irrespective of a change compared with the previous cycle.

- Sporadic

Sporadic updating is only performed for status displays which depend on the function block status word or common status. These items are displayed whenever a change occurs, irrespective of the updating cycle. Frequent changes in a quick succession therefore cause an increased OS activity.

This updating process is maintained as a process image in the OS for all status displays of all images. The AS transfers the status word only if a change has occurred, without initiative by the OS (exception: all status words are read in order to update the process image in the OS when the OS is linked to the process).

- Once

One-time updating is used for binary values, bars, S2, S4 and S16 strings (e.g. fixed parameters, tolerance limits, process-related names).

The OS requests these values once after each image selection. Since from now on these values remain unchanged in the OS, they are displayed only once.

Exception: status word and/or common status combinations, cf. "cyclic".

Consequences: The image-related updating cycle must be adapted to the process-related facts. A slow cycle (e.g. 20 s) is adequate if the image contains variables which change slowly (e.g. temperature of large-volume media or units).

Values which normally remain constant (e.g. parameters, limits, strings) should be configured with one-time updating.

Frequently changing status displays should be cyclically controlled by a binary parameter (EB, AB) in the AS (which is only updated for selected images). This reduces the OS background activities required for controlling the process image for status changes. BKS control should be used if control via EB or AB is not possible.

Status displays which do not change frequently or require acknowledgement should be controlled via the status word or the common status.

BKS blocks in the AS should only be transferred in the cycle in which they are needed in the OS (image-related updating cycle).

Use status word or common status combination only with few variables, since these must be output in each cycle. This is particularly important in an image which contains many variables and has a short updating cycle.

- Notes regarding OS load assessment

Assuming that approximately 25% of the variables change in each cycle, a 2-second updating cycle should be expected for 100 cyclic variables (display activities).

Note: Variables combined with the status word or the common status are displayed in each cycle.

Execution of operator inputs is heavily delayed if the OS is overloaded (too many variables per image-related cycle). In addition, the message KOPANZ S450 can be displayed, curve values be omitted, devices be indicated as having failed, etc., if the OS is overloaded.

The upper limit of the average status load which can be processed by the OS is approximately 100 status messages per second. The OS becomes uncontrollable and messages are lost if this value is exceeded for a longer period of time. (Messages KOPANZ S510, S512, S520, S523, S530, S532; omitted curve values etc.)

11.2.2 MELD: Expedient Configuration

Messages are gained from the status word (see above) or from MKS blocks. Both are transferred to the OS after AS initiative (exception: process initialization). Each change thus causes OS activities, even if MELD has not been selected.

Consequences: Do not configure all technically possible messages; only those which contain important statements.

Adjust the processing cycle of blocks which generate messages in the AS (status word and MKS) to the operator's reaction time (approximately 2 seconds). A flickering signal from a block which transmits every 100 ms overloads the OS without providing any useful information.

Distribute the messages over the 12 existing areas as far as possible (cf. quantities).

Use a suppression function to avoid message bursts (many messages caused by one reason). The suppression function should be implemented in functions which transmit subsequent messages.

- MELD quantities and buffer

MELD is structured in areas.

Each area consists of a new page with 20 messages and a buffer for 100 unacknowledged messages. Each status change is counted as a message (i.e. F, W, A from an M block causes three messages). Each area has four old pages with contain 20 messages each. These messages have been acknowledged but not yet disappeared.

Provided that the messages are equally distributed over all areas, a maximum of 840 unacknowledged and 960 acknowledged messages at the same time are theoretically possible. See above for OS load caused by status.

11.2.3 KURV: Which Messages, Which Cycles?

A fetch message means that the OS initiates retrieval of the values from the AS in the acquisition cycle.

AKS messages are transferred to the OS in the XB processing cycle without any OS activities.

Consequences, configuration notes:

Fetch messages should only be used in exceptional cases (e.g. test configuration avoiding AKS effort in the AS or free curve groups).

The use of fetch messages is also sensible if values need only be acquired relatively rarely, e.g. once per hour.

The actual number of transmitted values for AKS messages must be parametrized in the AS.

AKS blocks should be distributed in the AS over the block sequence or be installed using staggered XB cycles (avoiding message accumulation). The AKS blocks should be installed after the blocks which supply the AKSs with values.

Optimum adjustment of the individual cycles (AS, OS) should be achieved.

Note:

The shorter the cycles, the higher the OS load.
Rough formula for optimum cycle selection (requirement: data reduction between acquisition and display is not necessary).
AZ = EZ = WZ = 2 x BZ

AZ = display cycle
EZ = acquisition cycle
WZ = repetition time
BZ = AKS processing cycle in the AS

If an AKS is used for data transmission between both AS/OS and AS/AS or AS/computer, and is therefore transmitted in a shorter processing cycle (as is required by KURV), two separate AKS blocks with adjusted cycles should be used.

11.3 Notes Regarding the OS Function "BKS-Controlled Control Fields"

The OS 252, OS 262 and OS 265 operator communication and monitoring systems enable BKS-controlled display of control fields. The function can be used for alternately displaying 1-out-of-n control fields on the same location. This requires exactly 1-out-of-n BKS bits to be 1 (see detailed description and Chapter 5.12.1.2).

Detailed description:

The following OS system characteristics must be taken into account when using the function "BKS-controlled control fields":

1. The OS system cyclically reads all cyclic variables contained in the alternative control fields of a process display (not only the currently displayed alternatives). The number of variables must therefore be determined as if all BKS-controlled control fields of an image were displayed simultaneously.

   Corrective action if the number of variables is too high: increase updating time. (Note: The OS system recognizes if the same variable is used repeatedly in an OS process display; this variable is only read once.)

2. The control fields may not contain variables which are updated sporadically/once or these variables must be the same in all control field alternatives.

3. A segment related to the control field (always the segment related to the first control field to have been introduced) is only displayed when the image is selected. This static image remains unchanged, even when the BKS bits change their states.

   Corrective action: If different static images are required for different control fields, these images can be designed as status display and be controlled accordingly.

4. The OS system reacts to operator inputs in the following manner:

   The OS system determines from the light pen co-ordinates and the list of the variables contained in the image the first operator-accessible variable at the screen position concerned (this is not necessarily the currently displayed variable). The value of an operator input is written into the first variable (again not necessarily the currently displayed "accessed" variable).

   This means that operator input is possible to a variable which is not displayed.

   Note: The input to the variable is repeated in the echo line in the colour of the actually accessed variable.

   Corrective action: Structure a control field such that the above-mentioned case cannot happen. Do not use operator-accessible variables if possible.

5. The last (random) output remains on the screen if, due to a BKS-controlled change of the displayed control field, no further information is output at a position where dynamic values have previously been displayed. This position will only be blank after a new image has been selected.

   Corrective action: The second control field must contain blanks instead of NIL dots at the position concerned (status display, item 2).

6a. The last control field to have been displayed remains visible if none of the n BKS bits used for controlling the field is 1. Updating is not performed, however.

   An output is not performed after a new image selection.

6b. The OS system writes the control fields on top of each other if several bits are 1 at the same time (flickering).

   Corrective action: Avoid incorrect configuration.

7. Acyclic (e.g. event-controlled) transmission of the BKS is possible. This can be achieved by installing the BKS block under an XA block.

   The BKS must be transferred at least once after OS initialization as the OS system does not read the BKS block during initialization.

11.4 Messages Used for Heartbeat Monitoring and Device Type Determination

Process computers or personal computers linked to the bus (via N16, N16-M or N-V,24) are not automatically included in the heartbeat monitoring function (Vol. 1, Chapter 2.3.2.5). The heartbeat monitoring function is also effective via bus coupling units.

During initialization, each OS transmits the monitoring message (non-interpretable parameter write message) with the identification (ABLNR) "UA". Only the master OS transmits cyclically the monitoring message with the identification (ABLNR) "UZ". The process computer must reply to the monitoring message with the acknowledgement message for an incorrect write message. The acknowledgement message is interpreted by the master OS as a heartbeat message.

The master OS transmits one system image (new state NZ) to all N16 and N-V.24 bus interfaces if it detects a change in the system configuration. This NZ is only important for the OS. Although this message (system status) can be interpreted by the process computer, interpretation is not recommended.

Monitoring message OS → N-V.24

Word	**Meaning**	**Data** (hex)	**Comment**
1	Flags	A0 00	
2	QBTA	00 13	Source address
3	ZBTS	FF FF	Receiver address to all
4	PBLNR	00 0F	Block no. 15
5	PBLNA	00 6B	O 'k'
6	OPC	00 C1	OPCODE job 1
7	ABLNR	55 5A	555A (H) = 'U'Z' 5541 (H) = 'U'A'
8	ABLNA	00 00	O F
9	Dummy	00 00	
10	Dummy	00 00	
11	Number of parameters	00 01	
12	Block/parameter	00 00	Intentional incorrect Y address
13	Type/no.	00 00	Intentional incorrect Y address
14	Parameter	00 00	

See the CS 275 Bus System Manual (C79000-G8076-C006) for further details on the message description.

Monitoring acknowledgement AS, N-V.24 (PR) → OS

Reply to an incorrect write message from the OS

Word	**Meaning**	**Data** (hex)	**Comment**
1	Mode	60 60	
2	AK	XX XX	
3	ZBTA	00 02	OS target address from corresp. write message
4	PBLNR	55 5A	'U'Z = 55 5A H UZ from the corresp. 'U'A' = UA incorrect write message
5	PBLNA	00 00	
6	OPC	00 C1	OPCODE
7	ABLNR	00 00	
8	ABLNA	00 46	OF
9	Flag	FF FF	Incorrect write job

Modification message (new state) OS → N-V.24

Word	Meaning	Data (hex)	Comment
1	Flags	A0 00	
2	QBTA	01 02	Source address
3	ZBTA	01 1F	Target address
4	PBLNR	55 44	
5	PBLNA	20 21	
6	OPC	00 C1	OPCODE job 1
7	ABLNR	00 00	
8	ABLNA	00 00	
9	Data length	00 38	
10	1 words NZ		Bus 0
11	2 words NZ		Bits 0-99 = TA 0-99
			"1" = ACTIVE
16	7 words NZ		Bit 111 = 1 BA exists with 1 TA
17	8 words NZ		Bus 1
			Bit 0-99 = TA 0-99
24	14 words NZ		Bit 11 = BA exists
25	15 words NZ		Bus 2
			Bit 0-99 = TA 0-99
32	21 words NZ		Bit 111 = 1 BA exists
64	56 words NZ		Bus 7

Device type determination

During process initialization of QF image selection, the OS 262/OS 265 operator communication and monitoring systems inquire the device types of the interfaces connected to the bus. The device is represented in the QF image according to the device identifier in the return message. Due to the N-V.24 module identifier, the process computer (PR) is always shown above the bus line in the QF image. If the PR does not return a message or returns a message with the code 00 00 when it receives the message "determine device type", the host computer (PR) is represented as system OS?PR? in the QF image and is not integrated into the OS system heartbeat monitoring function. It receives the heartbeat messages, however. The host computer is displayed as system PR-CP in the QF image and included in the heartbeat monitoring function if it returns the device code 70 00.

System device identifiers

Unit	Code	
	Decimal	**Hex**
OS? PR? (undefined N16 device)	00	00
OS 250	16	10
AS 220	32	20
AS 220 E	48	30
AS 230/AS 235	64	40
AS 230	65	41
AS 235	66	42
AS 235 H	67	43
AS 220 EAI	72	48
AS 231/MS 236	80	50
OS 252	96	60
PROCESS COMPUTER (PR CMP)	112	70
PROGRAF AS	113	71
OS 250 PC (STRUK-AS 220 EA)	114	72
PROGRAF OS	115	73
IS 300	116	74
KOPIX-TM	117	75
MADAM P	118	76
LR 600	119	77
SIFLOC TM	120	78

Unit	Code	
	Decimal	Hex
WIN TM	121	79
SIMATIC S5	128	80
GATEWAY	144	90
AS 215	160	A0
OS 262	176	B0
TYP ?? (undefined N8/N8-H/N-S5/N-AT (code F1) / N-AS device	192	C0
N clock	208	D0
OS 265	224	E0
OS 520	240	F0

Messages used for device determination OS → PR (N-V.24)

Word	Meaning	Data (hex)	Comment
1	Flags	A0 00	
2	QBTA	00 13	Source address
3	ZBTA	00 0F	Target address (N-V.24)
4	PBLNR	00 08	Block no. 8
5	PBLNA	00 67	"g"
6	OPC	00 88	OPcode
7	ABLNR	47 54	‚G', T'
8	ABLNA	01 01	
9		02 08	
10		80 00	

Return message from PR → OS

Word	Meaning	Data (hex)	Comment
1	Mode	60 60	
2	AK	XX XX	Not relevant
3	ZBTA	00 13	Determine target device from request
4	PBLNR	47 54	,G', T'
5	PBLNA	01 01	Determine ABLNA from request message
6	OPC	00 0D	
7	ABLNR	00 00	
8	ABLNA	00 00	
9	QBTA	00 0A	N-V.24 source address
10	BLNR	00 08	
11	BLNA	00 67	
12	Identifier	70 00	Process computer identifier

11.5 Key Switch Protection

The key switch position for functions protected by key switch may not be modified until the function has been terminated. Otherwise the function won't be carried out.