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# System Diagnostics with S7-1500 and TIA Portal

TIA Portal

<https://support.industry.siemens.com/cs/ww/en/view/68011497>

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# 1 Introduction

## 1.1 Overview

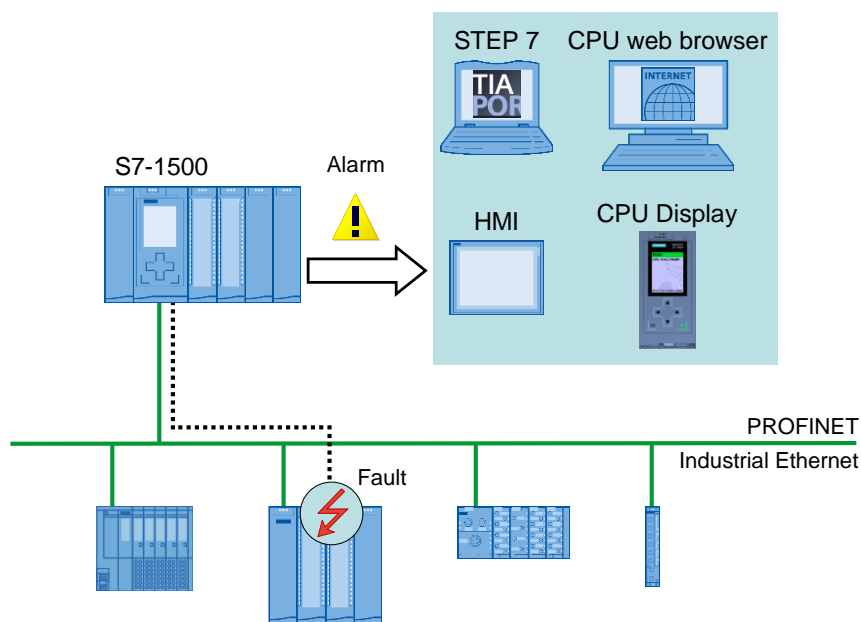
### Introduction

In the automation technology, diagnostics of devices, modules and networks is gaining importance. Diagnostics over the whole system can minimize downtimes. In the SIMATIC environment the complete diagnostics are summarized as system diagnostics.

### Overview of the automation task

The Figure below provides an overview of the automation task.

Figure 1-1: Overview of the automation task



### Description of the automation problem

The automation task consists of monitoring a PROFINET IO peripheral system with various network components. The possibility of an individual diagnosis of the components and a detailed diagnosis of the complete system should be guaranteed. The priority is on the collection and display of the diagnostic information.

### Requirements of the automation task

- Configuration and setting possibilities of the devices and modules
- Evaluation and display of the diagnostic data in the engineering tool
- Evaluation and display of the diagnostic data directly in the controller
- Display of the diagnosis data in an operating panel
- Website access to diagnostic data
- Diagnostics of the topology (combining the devices in a network)
- Consistency of the system diagnostics

## 1.2 Mode of operation

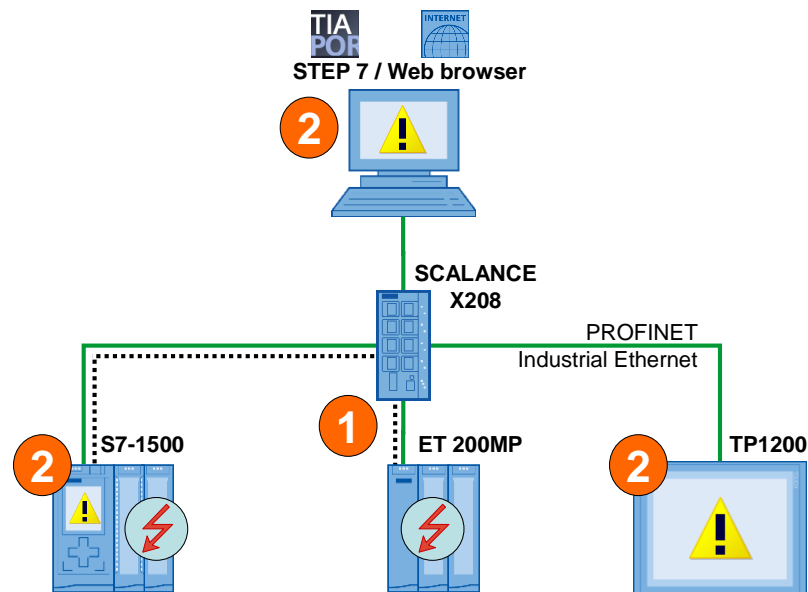
### 1.2.1 Solution Overview

#### Uniform display concept

The integrated system diagnostics of S7-1500 offer the following functions:

- All clients of a system are supplied with diagnostic information through a uniform mechanism.
- Independent of the display medium, the same system diagnostic information is used.
- System diagnostics are also possible in STOP.

Figure 1-2: Overview overall solution



1. The device detects a fault and sends diagnostic data to the assigned CPU.
2. The CPU informs the connected display media. The display of the system diagnostics is refreshed.

#### Delimitation

- This application does not contain a complete discussion of all diagnostic possibilities provided by S7-1500.
- The programmed code does not cover every possible fault. The extension of the present code by the user is therefore possible and necessary.

## 1.2.2 Description of the core functionality

### Consistent system diagnostics

In addition to the status display of the devices with LEDs, the diagnostic data are also sent to the assigned CPU. The CPU reports the faults to the following diagnostic media:

- TIA Portal
- CPU web server
- CPU display
- HMI devices

The diagnostic information is supplied in a uniform display form all over the system.

### Diagnostic possibilities

In the application the possibilities for system diagnostic information is demonstrated with the example of a missing supply voltage L+ at the module DQ32.

The diagnosis of the topology is demonstrated with the faulty interconnection of the ports.

The diagnosis with the user program is described with the example of a missing supply voltage L+ in the module DI32 of an IO-device.

## 1.3 Components used

This application example has been created with the following hardware and software components:

Table 1-1

Component	No.	Order number	Note
PM 1507 LC	1	6EP1332-4BA00	Alternatively, a different power supply can also be used.
CPU 1516F-3 PN/DP	1	6ES7 516-3FN01-0AB0	Alternatively, a different CPU S7-1500 can also be used.
SIMATIC Memory Card	1	6ES7954-8LF03-0AA0	24 MB
DI32	2	6ES7521-1BL00-0AB0	Diagnostics can be configured
DQ32	2	6ES7522-1BL00-0AB0	Diagnostics can be configured
IM 155-5 PN ST	1	6ES7155-5AA00-0AB0	-
SCALANCE X208	1	6GK5208-0BA10-2AA3	-
TP1200 Comfort	1	6AV2124-0MC01-0AX0	-
PG/PC mit Ethernet-Schnittstelle	1	-	Customary PC with operating system Windows
IE FC TP STANDARD CABLE	1	6XV1840-2AH10	IE connection Minimum order quantity 20m
RJ45 Steckverbinder	8	6GK1901-1BB10-2AA0	Can be finished
STEP 7 Professional V16 Update 1	1	6ES7822-1A.06-..	-
SIMATIC WinCC V16 Update 1	1	6AV210-.....6-0	-

This application example consists of the following components:

Table 1-2

Component	File name	Note
Documentation	68011497_S7-1500_Diagnose_DOC_v20_en.pdf	-
STEP 7 Project	68011497_S7-1500_Diagnose_CODE_v20.zip	-



## 2 Core Topics of this Application

### 2.1 Diagnostics with LEDs

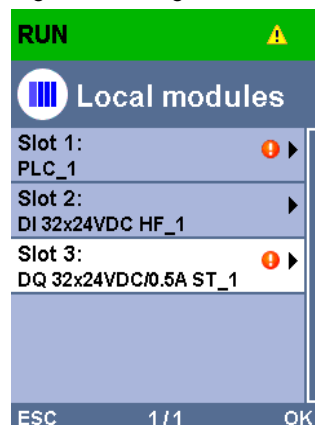
Most of the modules of the SIMATIC family have an LED status and fault display in the housing. Depending on the status and/or fault one or more LEDs light up. The meaning of individual LEDs or the combination of several LEDs is different for every module.

**Note** Please find more information about the meaning of the LED display in the manual of the respective module.

### 2.2 Diagnostics with the display in the CPU S7-1500

The S7-1500 display provides a large variety of diagnostic possibilities. In the menu "Diagnostics" you can directly read out the information in the diagnostic buffer or have the pending diagnostics messages displayed. In the menu "Module", the module status is displayed symbolically.

Figure 2-1: Diagnostics message in the display of the CPU



## 2.3 Diagnostics in the TIA Portal

### 2.3.1 Diagnostics of the hardware in the device and network view














In addition to the diagnostics in the hardware, STEP 7 provides the "Online" view. When the online connection to a device, is built up, its diagnostics status and the diagnostics status of its subordinate component, if any, is also determined. If there is a fault or an error in a module and if there is diagnostic information, the status of the faulty module is displayed by means of diagnostic symbols.

#### Diagnostic symbols



Diagnostic symbols make trouble-shooting easier. If a module has no faults, a green symbol for "no fault" is displayed. But if there is a fault event, the respective symbol for this kind of fault is displayed.

Please find a description of the diagnostic symbols for modules and devices and their meaning in the TIA Portal online help.

Table 2-1: Diagnostic icons for modules and devices

Icon	Meaning
	The connection with a CPU is currently being established.
	The CPU is not reachable at the set address.
	The configured CPU and the CPU actually present are of incompatible types.
	On establishment of the online connection to a protected CPU, the password dialog was terminated without specification of the correct password.
	No fault
	Maintenance required
	Maintenance demanded
	Error
	The module or device is deactivated.
	The module or the device cannot be reached from the CPU (valid for modules and devices below a CPU).
	The functionality of the module or submodule is no longer available (for example. input and output data). Possible causes: <ul style="list-style-type: none"> <li>• Difference between expected and actual configuration.</li> <li>• Access error during updating the process images.</li> </ul>
	Diagnostics not or only partially possible. Possible causes: <ul style="list-style-type: none"> <li>• Difference between actual online and offline configuration data.</li> <li>• You have not executed the command "Compile" for the hardware.</li> <li>• You have not executed the command "Download to device" for the hardware or the hardware configuration.</li> <li>• The object does not support diagnostics.</li> </ul> For HMI devices: No diagnostics data is available.
	The connection is established, but the module status has not yet been determined or is unknown.

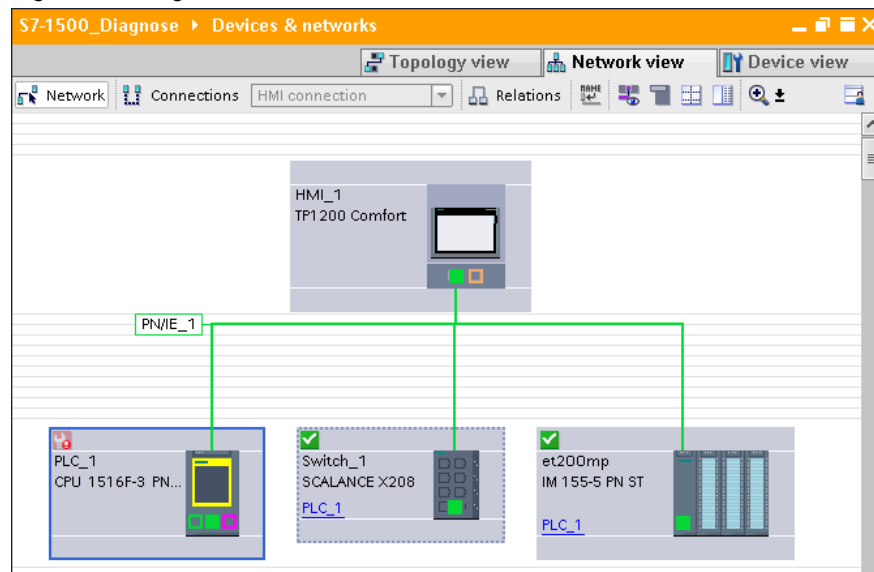
## 2 Core Topics of this Application

Icon	Meaning
	The configured module does not support display of the diagnostics status.
	Hardware error in lower-level component: A hardware fault has occurred in at least one lower-level hardware component (occurs as a separate icon only in the project tree).

### Diagnostic information in the network view

In the network view, the status of the devices connected online is displayed symbolically. The network view provides an overview of the current status of the devices and of your system. Double-click on the device to go to the device view.

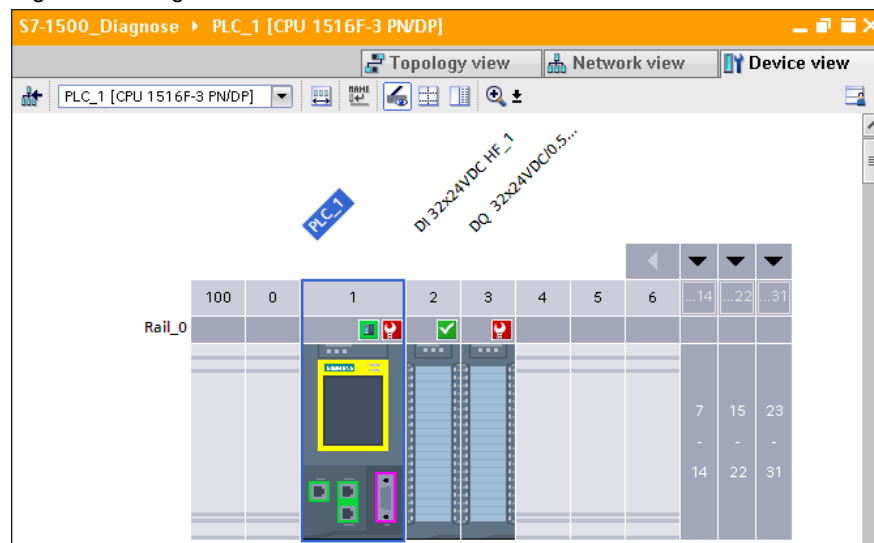
Figure 2-2: Diagnostic information in the network view



### Diagnostic information in the device view

In the device view, the status of the devices connected online, is displayed symbolically. The device view provides an overview of the current status of the devices and of your system. Double-click on the diagnostic symbol of a module to go to the diagnostics view of a module directly.

Figure 2-3: Diagnostic information in the network view

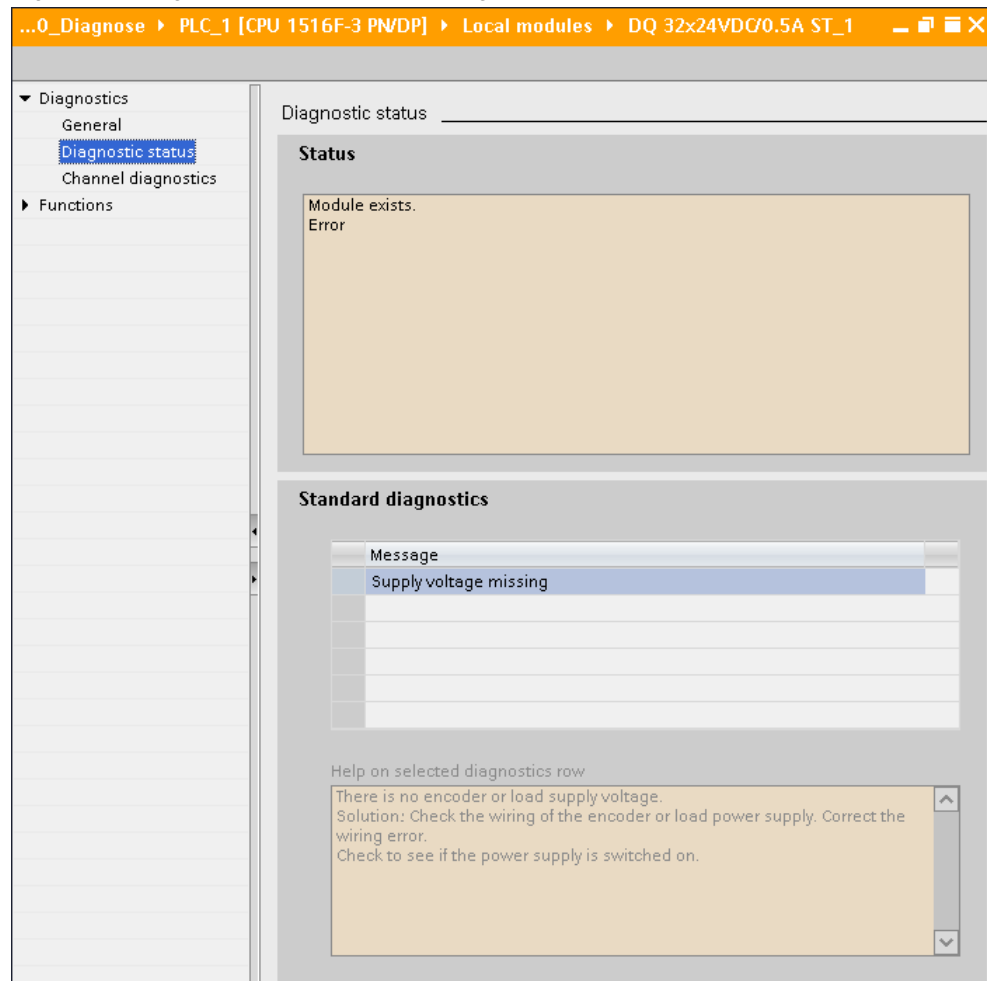


### Diagnostic information in the diagnose view

The diagnose status of a module is displayed in the folder "Diagnostics > Diagnostic status". The "Diagnostic status" is divided into the windows:

- **Status (Status)**  
Here, the status is displayed from the view of the CPU and the difference between configured and connected modules is displayed.
- **Standard diagnostics**  
In this window, the fault of the module is displayed.

Figure 2-4: Diagnostic information in the diagnostics view

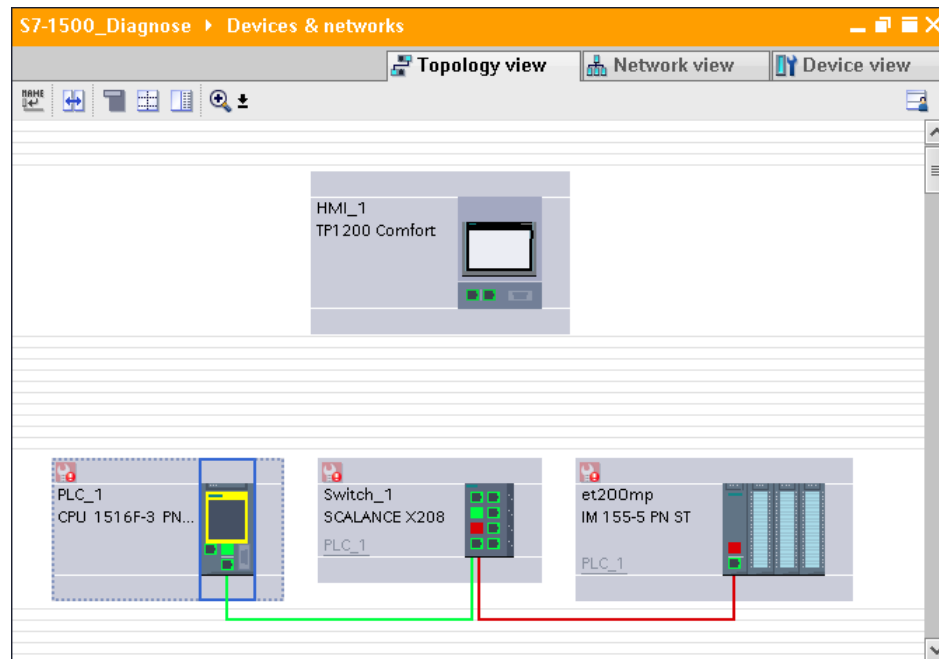


### 2.3.2 Diagnostics in the topology view

The online topology offers following diagnostic possibilities:

- The status of the devices is displayed symbolically.
- Faults of the subordinate components are displayed by additional diagnose symbols in the right lower corner of the device diagnose symbols.
- The states of the ports are displayed in different colors.
- The status of the line between two ports is displayed in color.

Figure 2-5: Diagnostics in the topology view



### 2.3.3 Diagnosis in the project navigation

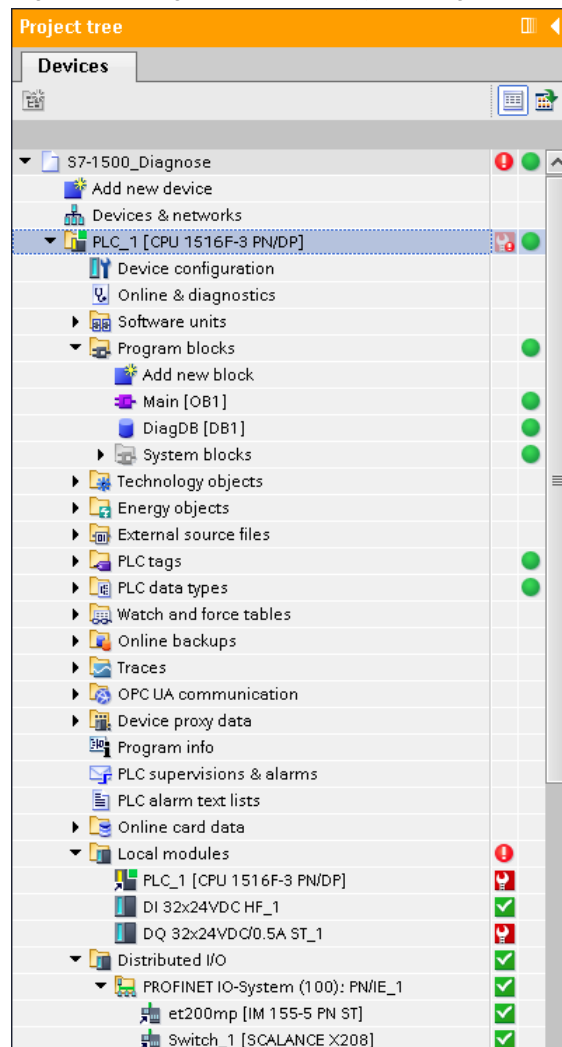
With the project navigation you have a quick and easy access to all the components in your project. If there is an online connection to a device, the following diagnostic status is automatically displayed symbolically in your project navigation.

- The status of the devices is displayed symbolically.
- Faults of the subordinate components are displayed by additional diagnose symbols in the right lower corner of the device diagnose symbols.
- For hardware components with their own operating modes, the operating mode is displayed in color in the right top corner of the hardware symbol.

Double-click on the diagnostic symbol of the respective hardware component to go to the diagnostics view of a component directly.

You can also start the function "Online & diagnostics" of the device (PLC\_1) directly from the project navigation.

Figure 2-6: Diagnostics in the project navigation



### 2.3.4 Diagnostics in the inspection window

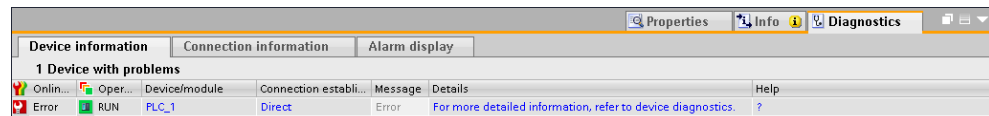
In the tab "Diagnostics" of the inspection window, you get diagnostic information in the following subordinate tabs in form of a table.

#### Tab "Device-information"

In the "Device information" tab, the following information of the devices connected online are displayed.

- Online status
- Operating mode
- Device/module
- Connection established via...
- Message
- Details: contains a link to the diagnostics view of the device
- Help: contains a link to the online help for more information about the message

Figure 2-7: Device Information tab



#### Tab "Connection information"

The "Connection information" tab provides an overview of the connection resources of the device.

Abbildung 2-8: Connection information tab

	Station resources				Module resources		
	Reserved		Dynamic		CPU 151 6F-3 PN/DP (R0/S...		
Maximum number of resources:	Maximum	Configured	Used	Configured	Used	Configured	Used
PG communication:	4	-	2	-	0	-	2
HMI communication:	4	2	0	0	0	2	0
S7 communication:	0	-	0	0	0	0	0
Open user communication:	0	-	0	0	0	0	0
Web communication:	2	-	0	-	0	-	0
OPC UA client/server communicat...	0	-	0	-	0	-	0
Other communication:	-	-	0	0	0	0	0
Total resources used:		2	2	0	0	2	2
Available resources:		8	8	118	118	126	126

#### Tab "Alarm display"

In the "Alarm display" tab the event texts of the devices are listed with Source, Date, Time, Status, Acknowledge, Alarm class name, Event text, Help and Info text. The Status displays whether it is a coming, going or acknowledged alarm.

Figure 2-9: Alarm display tab

Source	Date	Time	Status	Acknowledge	Alarm cl.	Event text	Help	Info text
PLC_1 [CPU ...	7/15/2020	11:49:12:454 AM	Incoming	-	NA	Error: Supply voltage missing PLC_1 / DQ 32x24V...		Short name: DQ 32x24VDC/0.5A ...

### 2.3.5 Diagnostics in the Diagnostics buffer

Each CPU and some other modules have their own diagnostics buffer, in which detailed information on all diagnostic events is entered in the order in which they occurred.

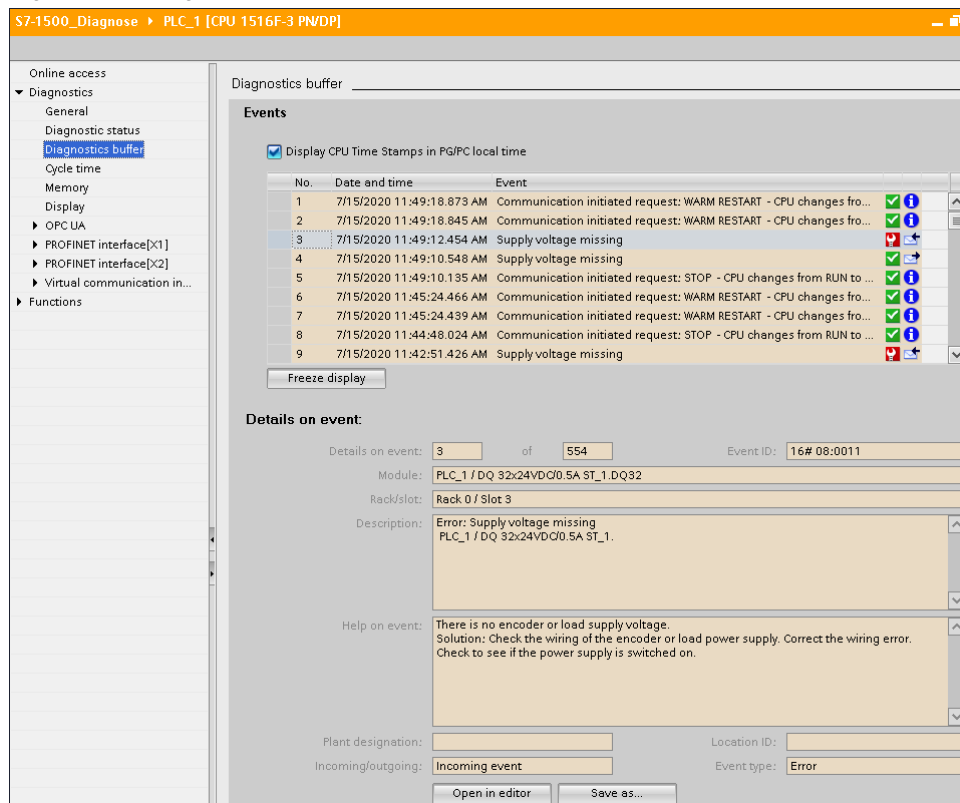
The diagnostics buffer is used as a log file for the diagnostics events that occurred on the CPU and the modules assigned to it. These are entered in the order of their occurrence, with the latest event shown at the top.

The entries available in the diagnostics buffer include:

- Internal and external errors on a module
- System errors in the CPU
- Operating mode transitions (e.g., from RUN to STOP)
- Errors in the user program
- Removal/insertion of modules
- Security events

To display the diagnostics buffer of a CPU in TIA Portal, first establish an online connection to the CPU and start the "Online & Diagnostics" function of the CPU directly from the project tree. In the "Diagnostics" folder, select the "Diagnostics buffer" subfolder.

Figure 2-10: Diagnostics buffer





The "Details on event" area shows detailed information about the event. Clicking the "Open in editor" button opens the device view of the module concerned or the referenced block in the offline view at the point in the program that caused the error.

In the "Settings" area, you can filter diagnostic buffer entries to only display certain types of events.

### 2.3.6 Diagnostics in the Task Card "Online tools"

For modules with their own operating mode (such as CPUs), the "Online tools" task card allows you to read current diagnostics information and commands to the module.

#### "CPU operator panel" pane

This area contains the following displays:

- Station name and CPU type (short designation)
- RUN / STOP (corresponds to the "RUN / STOP" LED of the CPU)
- ERROR (corresponds to the "ERROR" LED on the CPU)
- MAINT (corresponds to the "MAINT" LED on the CPU)

#### "Cycle time " pane

The "Cycle time" pane displays the cycle time diagram and below it the measured cycle times as absolute values.

The following measured cycle times are displayed in the cycle time diagram:

- Shortest cycle time: Duration of the shortest cycle since the last transition from STOP to RUN.
- Current / last cycle time: Duration of the last cycle.
- Longest cycle time: Duration of the longest cycle since the last transition from STOP to RUN.

#### "Memory" pane

This area contains the current memory utilization of the associated module. The available memory is shown both as a bar diagram and as a numerical value (percentage). The numerical value is rounded to an integer value.

The following memory utilizations are shown:

- Load memory  
The load memory is located on the SIMATIC memory card.
- Code work memory:  
work memory for program code
- Data work memory:  
work memory for data blocks
- Retentive memory

To display the operating status of a CPU in TIA Portal, you first have to establish an online connection to the CPU.

Figure 2-11: Task Card "Online tools"

**Online tools**

**Options**

**▼ CPU operator panel**

PLC\_1 [CPU 1516F-3 PN/DP]


RUN / STOP   

ERROR   

MAINT   


Mode selector: RUN


**▼ Cycle time**





Shortest: 1.013 ms  
Current/last: 1.039 ms  
Longest: 4.205 ms

**▼ Memory**

Load memory  
 Free:95 %

Work memory  
Work memory code  
 Free:99.53 %

Work memory data  
 Free:99.97 %

Retain memory  
 Free:100 %

## 2.4 Diagnostics with the web server

With the web server you have the possibility of monitoring the CPU via the Internet or the corporate Intranet. Evaluations and system diagnostics over great distances and from anywhere where there is an Internet access, become possible.

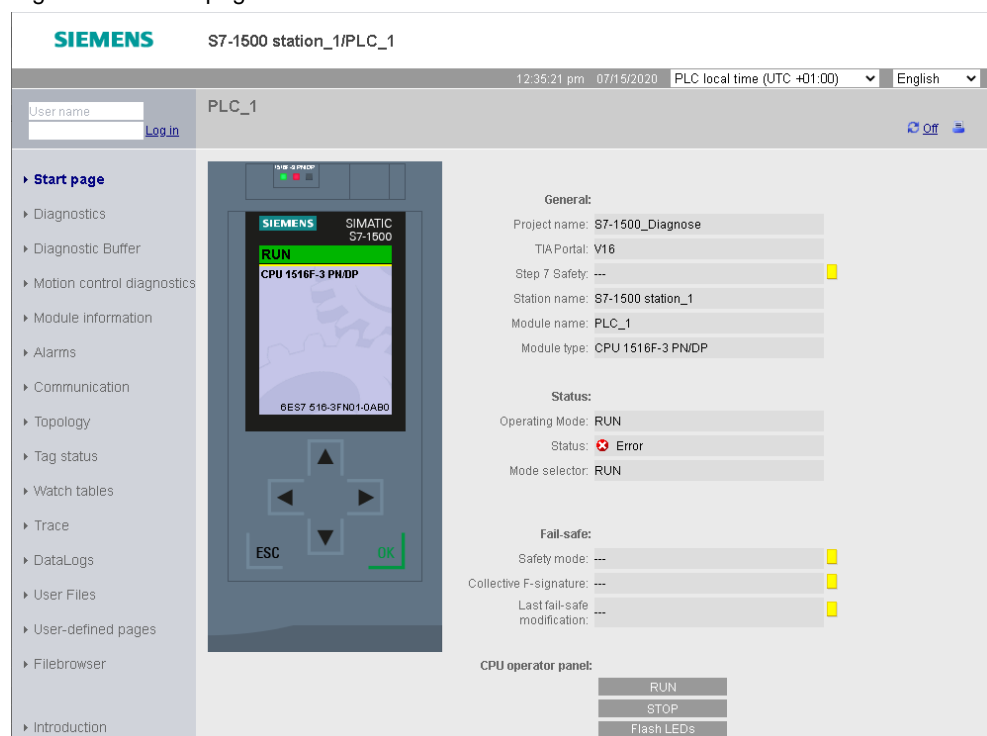
In addition to general information, the web server of the CPU offers the following diagnostics:

- Start page
- Diagnostics
- Diagnostic buffer
- Module information
- Alarms
- Topology

### Start page

On the website "Start page", the representation of the CPU with LEDs shows the current status of the CPU. The "Status" window contains information about the operating mode and the status of the CPU.

Figure 2-12: Start page website



### Diagnostics

The "Diagnostics" web page provides more information about the tabs:

- Identification: This tab contains the characteristics of the CPU (serial number, article number, hardware and firmware version, etc.).
- Program protection: This tab provides information on whether the PLC program contains know-how protection or copy protection.
- Memory: This tab contains current values on the memory currently in use.
- Runtime information: Current information on program/communication load and cycle time can be found in this tab.
- Fail-safe (only with an F CPU)

Figure 2-13: Diagnostics website

The screenshot shows the Siemens S7-1500 station\_1/PLC\_1 Diagnostics website. The page has a header with the Siemens logo and the station name. Below the header, there is a navigation menu on the left with 'Diagnostics' selected. The main content area displays identification information for the CPU, including plant designation, location identifier, serial number, order number, hardware, version, and development info.

Identification	Program protection	Memory	Runtime information	Fail-safe
<b>Identification:</b>				
Plant designation:				
Location identifier:				
Serial number: S C-F8SA04042015				
<b>Order number:</b>				
Hardware: 6ES7 516-3FN01-0AB0				
<b>Version:</b>				
Hardware: 10005				
Firmware: R 2.8.0_30.50				
Bootloader: V 2.2.1				
<b>Development Info:</b>				
Internal FW Version: R28.30.50				
Developer:				
View Name: s7pcpu				
Build Time FW: 2019-10-09 12:37:54				
PCB Number: not supported				
Product Name: CPU 1516F-3 PN/DP				
MiniWeb Core Version: V5.4.3				

### Diagnostic buffer

You can read out the entries in the diagnostic buffer without an engineering tool from the website "Diagnostic buffer". In the "Details" window, the detailed information of a selected event is displayed.

Figure 2-14: Diagnostic buffer website

The screenshot shows the Siemens diagnostic buffer website for station S7-1500 station\_1/PLC\_1. The interface includes a navigation menu on the left, a top status bar with the time (12:48:37 pm) and date (07/15/2020), and a main table of diagnostic buffer entries. The table has columns for Number, Time, Date, Status, and Event. Entry 13 is highlighted, and its details are shown in a pop-up window below the table.

Number	Time	Date	Status	Event
1	12:34:31.108 pm	07/15/2020	outgoing event	Diagnostics available and is being processed
2	12:34:31.106 pm	07/15/2020	incoming event	Error on partner - No neighbor could be detected
3	12:34:31.085 pm	07/15/2020	incoming event	Diagnostics available and is being processed
4	12:34:31.084 pm	07/15/2020	outgoing event	IO device failure - (pending faults indicated)
5	12:34:24.587 pm	07/15/2020	outgoing event	Error on partner - No neighbor could be detected
6	12:34:24.573 pm	07/15/2020	incoming event	Error on partner - Wrong partner port
7	12:34:05.525 pm	07/15/2020	incoming event	IO device failure - IO device not found
8	12:34:05.525 pm	07/15/2020	outgoing event	IO device failure - Watchdog time expired
9	12:34:02.032 pm	07/15/2020	incoming event	Error on partner - No neighbor could be detected
10	12:34:02.018 pm	07/15/2020	incoming event	IO device failure - Watchdog time expired
11	12:21:57.127 pm	07/15/2020	incoming event	Communication initiated request: WARM RESTART - CPU changes from STARTUP to RUN mode
12	12:21:55.933 pm	07/15/2020	incoming event	Communication initiated request: WARM RESTART - CPU changes from STOP to STARTUP mode
13	12:21:53.467 pm	07/15/2020	incoming event	Supply voltage missing
14	12:21:51.657 pm	07/15/2020	outgoing event	Supply voltage missing
15	12:21:51.228 pm	07/15/2020	incoming event	Communication initiated request: STOP - CPU changes from RUN to STOP mode

**Details: 13** Event ID: 16# 08:0011  
 Error: Supply voltage missing  
 PLC\_1 / Dg 32x24VDC/0.5A/ST\_1.

**Module information**

The website "Module information" displays symbols to show whether the components of a station are OK or whether there is a fault. Click to the links of the components to navigate to the detailed information about the fault. The display of the module levels above the table is taken into account. With this link, you can go directly to the higher module level.

Figure 2-15: Module information website

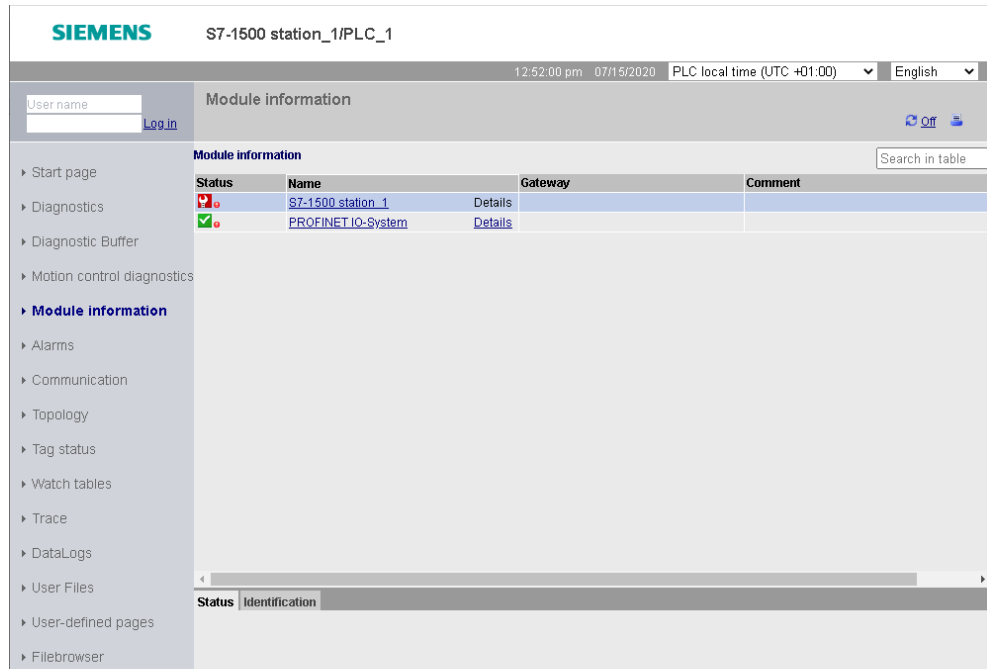
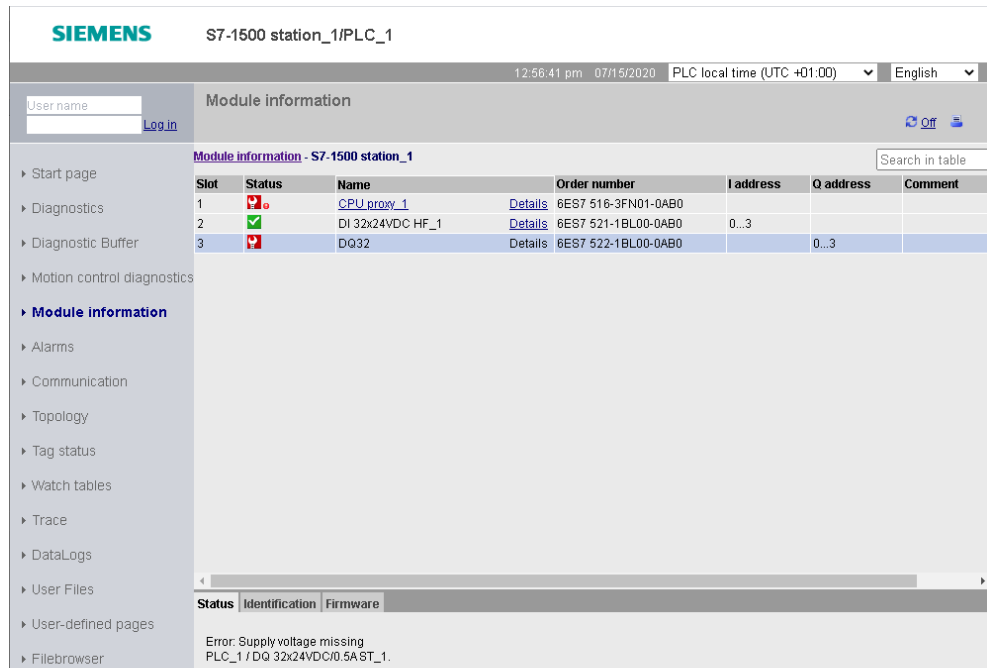


Figure 2-16: Detail view DQ 32 website



## Alarms

Current messages are displayed chronologically in the website "Alarms". The window "Details on alarm number" provides you with detailed information about the selected alarm.

Figure 2-17: Alarms website

AlarmNr.	Date	Time	Alarm text	Status	Acknowledgement
24	07/15/2020	12:21:53.467 pm	Error: Supply voltage missing PLC_1 / DQ 32x24VDC/0.5AST_1.	incoming	
38	07/15/2020	12:34:24.573 pm	Error: Error on partner - Wrong partner port 'Switch_1 / Switch_1.Port_3	incoming	
38	07/15/2020	12:34:31.106 pm	Error: Error on partner - No neighbor could be detected et200mp / et200mp.Port_1	incoming	

**Details on alarm number: 24**  
 Error: Supply voltage missing PLC\_1 / DQ 32x24VDC/0.5AST\_1.  
 incoming event

## Topology

The website "Topology" provides you with information about the topology and the status of the PROFINET devices in your system.

The following views are available:

- Graphic view
- Table view
- Status view

### Topology "Graphic view"

In the graphic view, you can choose between the "Set topology" and the "Actual topology". If a topology is configured, the status of the connections is displayed in colors in the "Set topology" as follows:

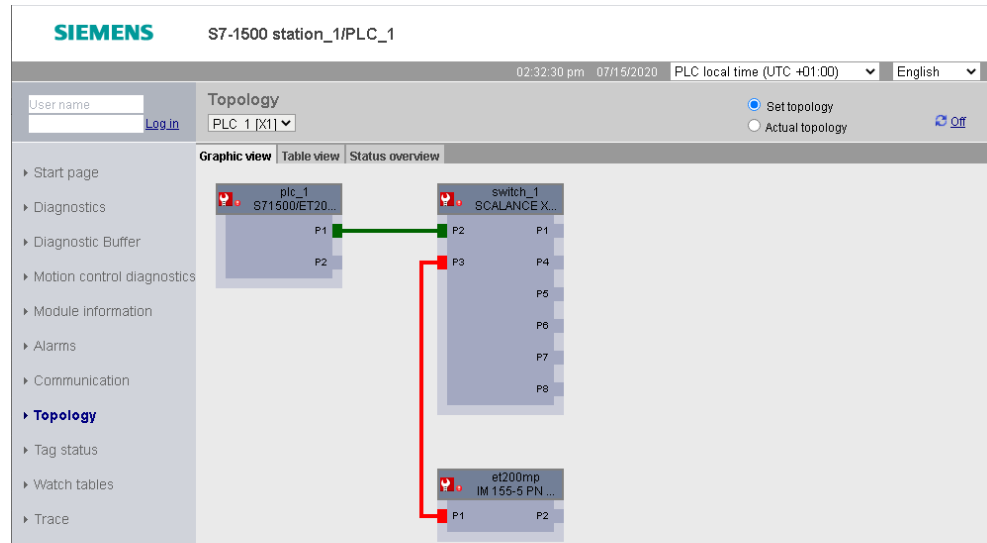
Table 2-2

Color of the connection	Status of the connection
green	The actual connection matches the configured one.
yellow	Diagnostics of the connection are not possible, for example because there is no connection.
red	The actual connection does not match the configured connection, for example because the ports were exchanged.

## 2 Core Topics of this Application

In the "Actual topology", the actual topology is determined. The connections are displayed in green.

Figure 2-18: Topology website - graphic view



### Topology "Table view"

The "Table view" only shows the "Actual topology". In the first column of the table the status of the port and the module status are displayed symbolically.

Figure 2-19: Topology website - table view

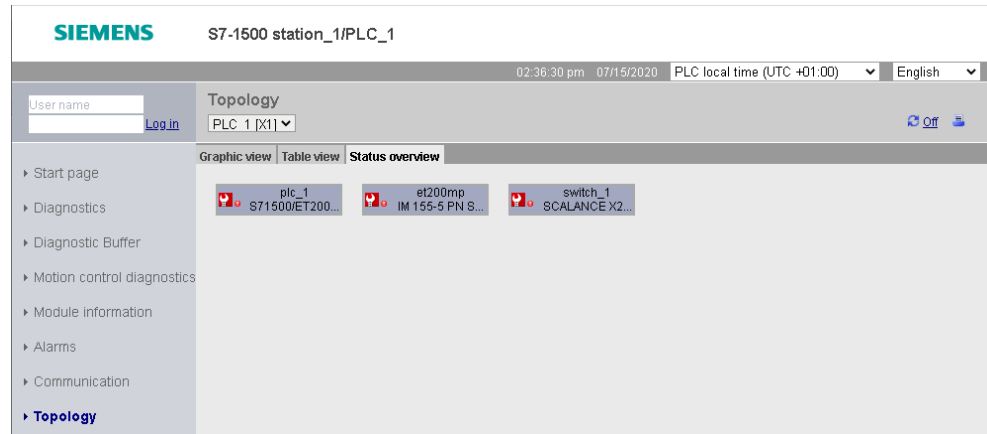
Port	Name	Module type	Port	Partner port	Name	Port
	<a href="#">plc_1</a>	S71500/ET200MP station	port-001	switch_1	port-002	
	<a href="#">et200mp</a>	IM 155-5 PN ST	port-001			
	<a href="#">switch_1</a>	SCALANCE X208	port-002	switch_1	port-003	
			port-001			
			port-002	plc_1	port-001	
			port-003	et200mp	port-002	
			port-004			
			port-005	vmsitrain	port-001	
			port-006			
			port-007			
			port-008			
	<a href="#">vmsitrain</a>		port-001	switch_1	port-005	



### Topology "Status overview"

In the "Status overview", the module status of the PROFINET devices is displayed with symbols. You get a quick overview of the faulty modules.

Figure 2-20: Topology website - status view



**Note** The two websites "Topology" and "Module information" are linked. When you click on the head of a configured module in one of the topology views, you go to this module in the "Module information" website immediately.

**Note** For further information about website, please refer to [S7-1500 Web server Function Manual](#).

## 2.5 Diagnostics with the system diagnostics display in the HMI

### 2.5.1 Basics

For displaying diagnostic information in the HMI, the TIA Portal provides two complete objects for a quick localization of the fault. These objects are only available on Comfort Panels.

#### System diagnostics display

The system diagnostics display provide you with a diagnostic overview of the status of all available devices in your system that can be diagnosed. In case of a fault, please navigate through the different views directly to the cause of the fault in the detailed view of the faulty module.

#### System diagnostics window

The window "System diagnostics" is not substantially different from the "System diagnostics display". The "System diagnostics window" can only be configured in the Global View. Therefore, there is an extra "window" area in the properties. Here you can choose whether the window can be closed.

### 2.5.2 Views of the system diagnostics

The diagnostics information is displayed in the system diagnostics display and in the system diagnostics window in different views.

#### Device view

In the device view, the status of all available devices of one level are displayed.

Figure 2-21: Device view of the system diagnostics display

The screenshot shows the 'System Diagnostics with S7-1500 and TIA Portal' interface. At the top, there is a header bar with 'Operator', 'Date/Time' (7/15/2020 2:35 PM), and 'Language' (English). Below this is a table with columns: Status, Name, Operatin..., Slot, Type, and Address. The table lists several components, with 'S7-1500 station\_1' highlighted in red. Below the table, there is a detailed view of the selected station, showing its status, name, operating state, rack, slot, type, order number, and address.

Status	Name	Operatin...	Slot	Type	Address
<span style="color: red;">✘</span>	S7-1500 station_1			S71500/ET200MP ...	32*
<span style="color: green;">✔</span>	CPU proxy_1		1	CPU 1516F-3 PN/DP	49*
<span style="color: green;">✔</span>	PROFINET IO-System				260*
<span style="color: green;">✔</span>	DI 32x24VDC HF_1		2	DI 32x24VDC HF	258*
<span style="color: red;">✘</span>	DQ32		3	DQ 32x24VDC/0.5...	259*

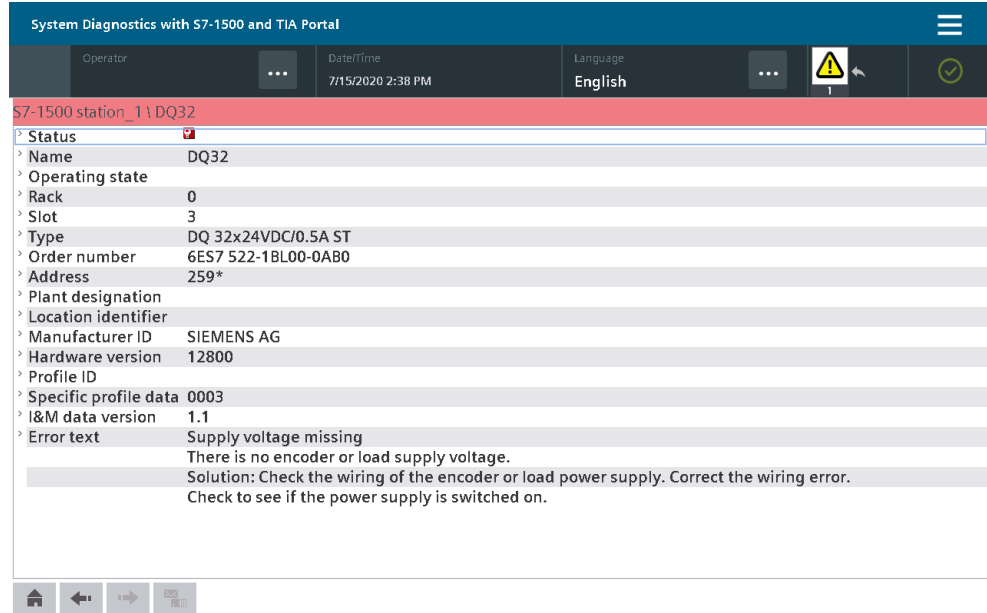
  

> Status	<span style="color: red;">✘</span>
> Name	S7-1500 station_1
> Operating state	
> Rack	0
> Slot	
> Type	S71500/ET200MP station
> Order number	
> Address	32*

**Detailed view**

In the detailed view, the diagnostics information of the selected device is displayed. In addition to general data you will find a description of the fault and possible remedies here.

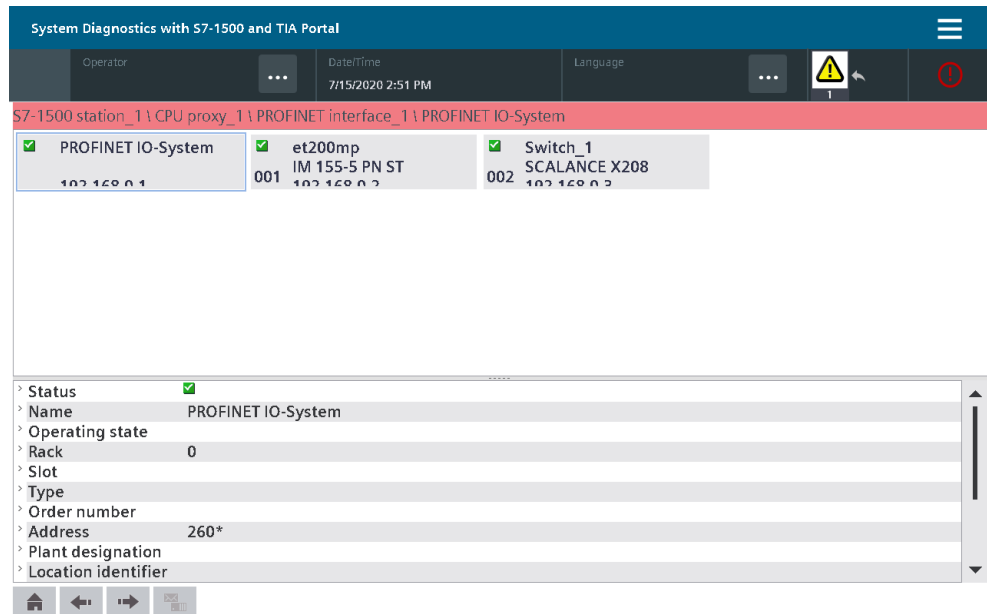
Figure 2-22: Detailed view of the system diagnostics



**Matrix view**

The matrix view only pops up if you have configured a PROFIBUS\_DP or PROFINET IO master system in your system. The matrix view shows the status of the devices in the master system.






Figure 2-23: Matrix view of the system diagnostics



### Navigation buttons

With the navigation buttons you can navigate through the systems diagnosis.

Table 2-3: Navigation buttons in the system diagnostics

Button	Key	Function
	Enter key	Opens the child devices or the detail view if there are no child devices.
	Esc key	Opens the parent device or the device view if there is no parent device.
	Home key	Opens the device view.
	Configured function key, e.g. F1.	Opens the diagnostic buffer view. Only visible in the device view.
	Configured function key, e.g. F2.	Updates the diagnostic buffer view.

### 2.5.3 System diagnostics indicator

The system diagnostics indicator is a graphical object in a global library. The object is inserted in a picture or a picture template and connected to the system diagnostics window. The system diagnostics indicator changes its graphic when there is a fault in the system. With a click on the system diagnostics indicator, the system diagnostics window opens up. The detailed view of the faulty device is automatically displayed.

Figure 2-24: Graphics of the system diagnostics indicator



## 2.6 Diagnostics with alarm view / alarm window in the HMI

With the objects "Alarm view" and/or "Alarm window", the TIA Portal offers you more possibilities of displaying diagnostics information in the HMI.

### Alarm view

The object "Alarm view" shows you the diagnostics information as alarms in the operating panel, if you selected the respective alarm states and alarm classes. Depending on the configuration, different columns with information about a message are displayed in the "alarm view".

Figure 2-25: Alarm view in the HMI

No.	Time	Status	Text
24	3:34:43 PM	1	Error: Supply voltage missing PLC_1 / DQ 32x24VDC/0.5A ST_1.

### Alarm window

The object "Alarm window" is not substantially different from the "Alarm view". The "Alarm window" can only be configured in the Global View. Therefore, there is an extra "Mode" area in the properties. For example, you can set whether the "Alarm window" is to pop up automatically for every new message.

### Alarm indicator

The "Alarm indicator" is a graphic symbol that indicates pending alarms or messages that have to be acknowledged, depending on the configuration. The "Alarm indicator" can have two states:

- Flashing: At least one alarm that has to be acknowledged is pending.
- Static: At least one of the acknowledged alarm has not yet been sent. The number indicated means the number of alarms still pending.

The "Alarm indicator" can only be configured in the Global View.

Depending on the configuration, an alarm window opens up when the alarm indicator is used. The alarm indicator can only be operated with a mouse or the touch screen.

Figure 2-26: Alarm indicator



## 2.7 System diagnostics with the user program

In the user program you can configure reactions to certain diagnostic messages. With the integrated diagnostics instructions in the TIA Portal, you read out the system diagnostics information from the faulty modules. With the information, you can define to stop the system if certain faults occur, for example.

You can send the system diagnostics information read out to a higher-level station for further evaluation.

### Diagnostics instructions

For the determination of the system diagnostics information in the user program, the following instructions are available in STEP 7.

Table 2-4

Instruction	Description
RD_SINFO	Read out start information of the current OBs
LED	Read LED status
GET_NAME	Read out the name of the module
DeviceStates	Read the module status information of an IO system
ModuleStates	Read the module status information of a module
GEN_DIAG	Generate diagnostics information
GET_DIAG	Read diagnostics information
RDREC	Read data set. The STATUS output parameter contains error information.
RALRM	Receive alarm. The STATUS output parameter contains error information.
DPNRM_DG	Read diagnostics data of a DP slave
T_DIAG	Check connection

#### Note

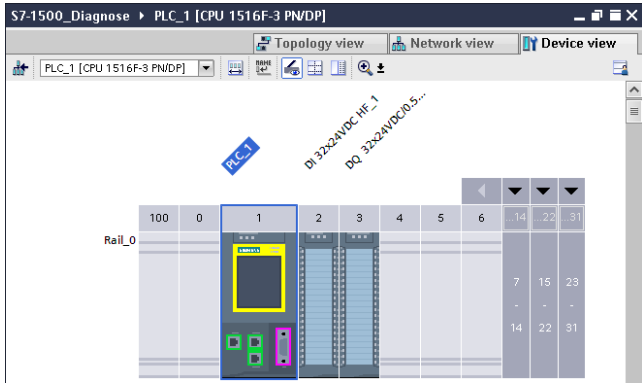
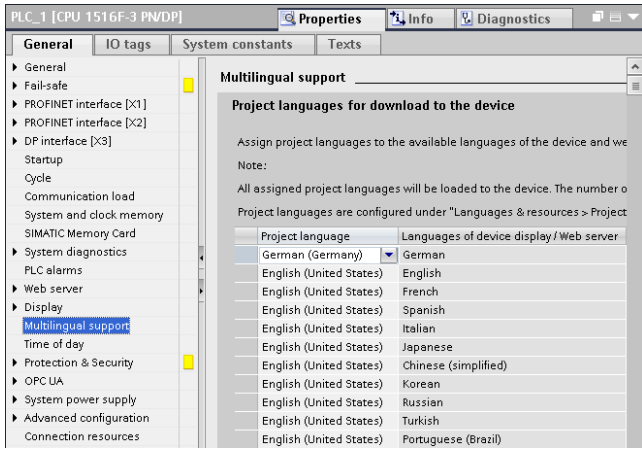
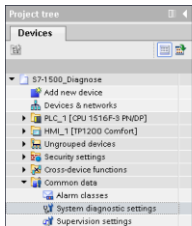
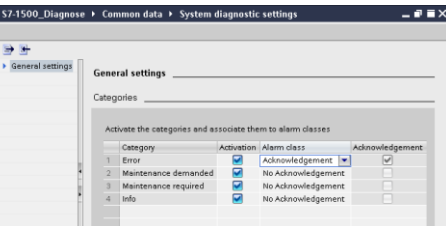
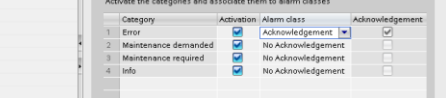
For more detailed information about the instructions, please refer to the TIA Portal Online Help.

# 3 Configuration and Settings

## 3.1 Configuration of the systems diagnostics

The system diagnostics cannot be deactivated for S7-1500. In the "Messages" window you can define which message categories are to be put out and whether they have to be acknowledged. Please proceed as follows:

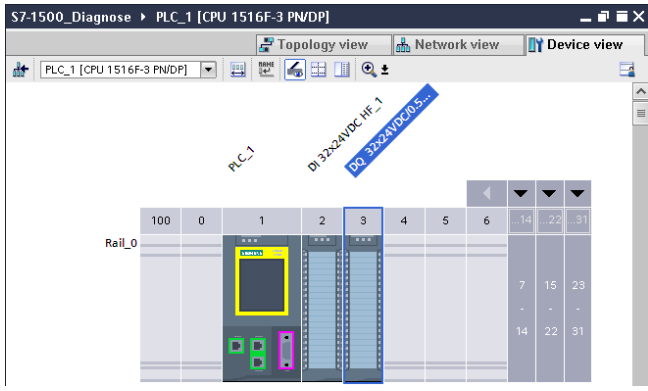
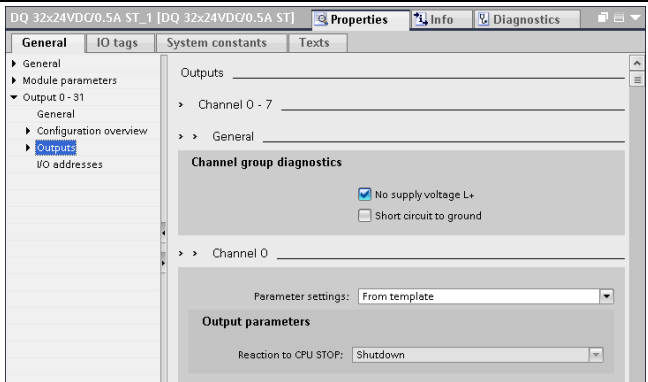
Table 3-1

No.	Action	Remark
1.	In the device view, of "PLC_1", please double-click on "Device Configuration" in the project navigation.	
2.	Click on "Multilingual support" in the inspector window of the "PLC_1" under "Properties>General". Assign the configured project languages to the languages of the device and the web server.	
3.	Double-click the "System diagnostic settings" in the "Common data" folder in the project tree.	
4.	Activate the categories to be displayed.	
5.	Select the "Acknowledgment" alarm class for the "Error" category.	

### 3.2 Configure diagnostic settings of the module DQ32

You can release the module-specific diagnostic settings for every module separately. For displaying the missing supply voltage L+ in the module DQ32, please proceed as follows:

Table 3-2

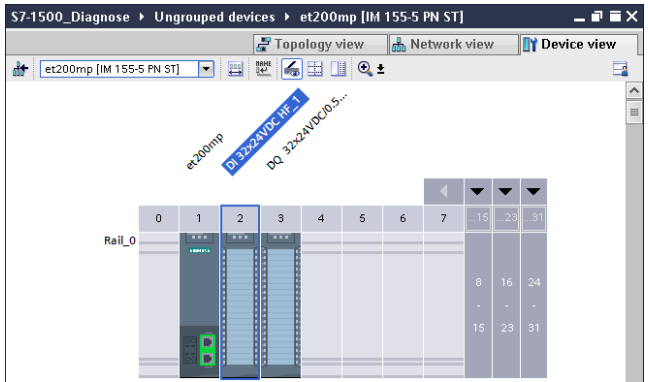
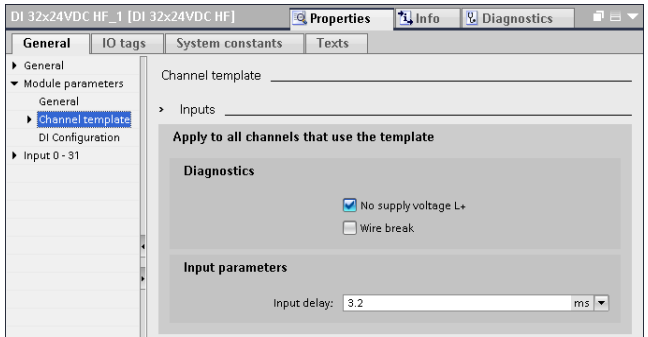
No.	Action	Remark
1.	In the device view, of "PLC_1", please double-click on "Device Configuration" in the project navigation.	
2.	Select the module "DQ32" in the device view.	
3.	Click on "Output 0-31 > Outputs" in the inspector window under "Properties > General".	
4.	Activate the option box "No supply voltage L+"	



### 3.3 Configure diagnostic settings of the module DI32

You can release the module-specific diagnostic settings for every module separately. For displaying the missing supply voltage L+ in the module DI32 of the IO device "et200mp", please proceed as follows:

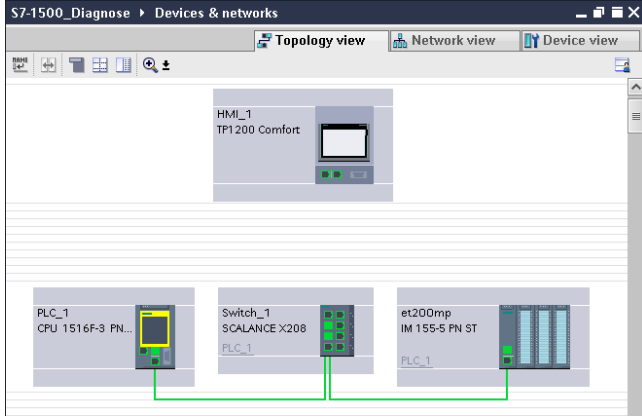
Table 3-3

No.	Action	Remark
1.	The device view is still open. In the device list, select "et200mp".	
2.	Select the module "DI32" in the device view.	
3.	In the inspector window under "Properties > General > Module parameters", click on "Channel template".	
4.	Activate the option box "no supply voltage L+"	

### 3.4 Configure topology

For displaying the faulty interconnection of the ports in our example, the topology must be configured. Please proceed as follows:

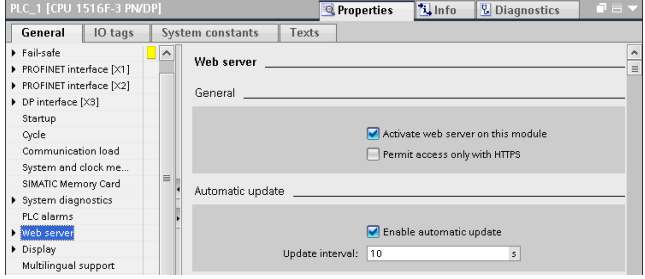
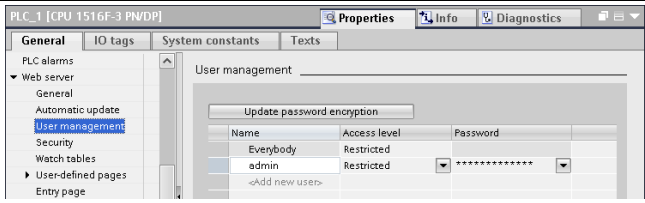
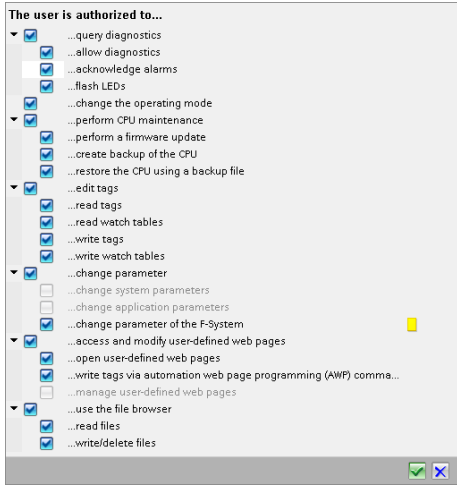
Table 3-4

No.	Action	Remark
1.	Open the device and network editor with a double click on "Devices & networks" in the project navigation.	
2.	Change to the graphic view of the topology view.	
3.	Click on port 1 of "PLC_1" with the left mouse button. Move the mouse cursor while keeping the mouse button pressed to Port 2 of "SCALANCE X208". Release the mouse button.	
4.	Now interconnect port 1 of "et200mp" with port 3 of "SCALANCE X208" in the same way.	

### 3.5 Configure the web server of the CPU

The web server of the CPU allows for system diagnostics via PROFINET IO. For this, the web server must be activated in the following way:

Table 3-5

No.	Action	Remark
1.	In the device view, of "PLC_1", please double-click on "Device configuration" in the project navigation.	
2.	Click on "Web server" in the inspector window of the "PLC_1", under "Properties > General".	
3.	Activate the option box "Activate web server on this module".	
4.	Create a new user "admin" with the password "s7".	
5.	Give the user "admin" the authorizations you need for your project.	

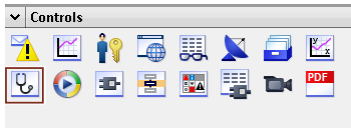
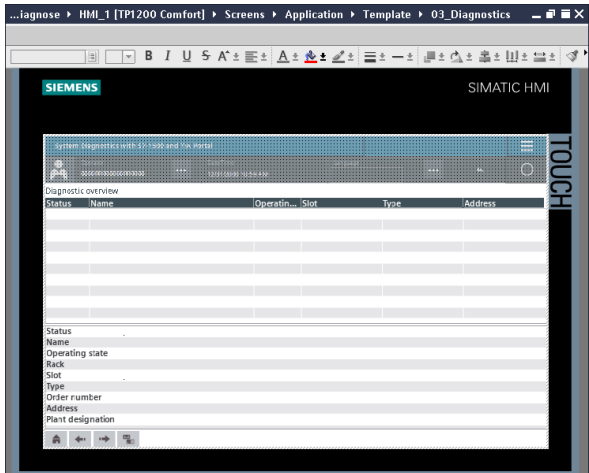
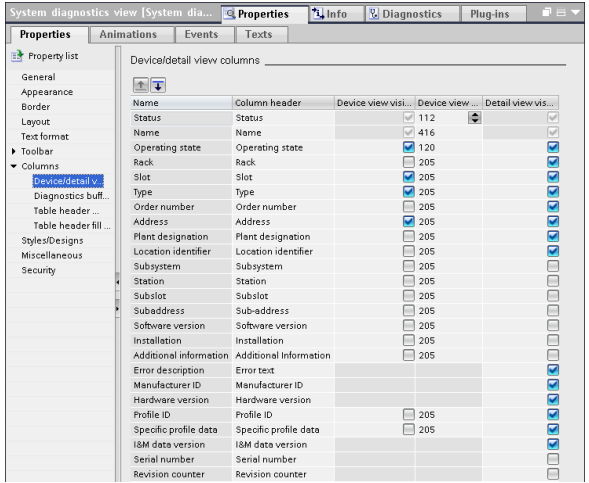
### 3.6 Configure system diagnostics view in the HMI

The template for the SIMATIC TP1200 Comfort was used for the application example. You can find this template at:

<https://support.industry.siemens.com/cs/ww/en/sc/2054>

For displaying the diagnostic information in the HMI, the complete control "Systems diagnostics view" is available in the TIA Portal. The following table shows you how to insert the control into your HMI configuration.

Table 3-6

No.	Action	Remark
1.	Open the screen "03_Diagnostics" from the project navigation under "HMI_1 > Screens > Application > Template"	
2.	Open the TaskCard "Toolbox".	
3.	Drag the Control "Systems diagnostics view" to the screen.	
4.	Adapt the size of the control to the screen.	
5.	Click on "Columns" in the inspector window under "Properties > Properties".	
6.	Activate the columns you want to display in the device/detailed view.	

### 3 Configuration and Settings

No.	Action	Remark
7.	Activate the columns you want to display in the diagnostic buffer detail view.	
8.	Click on "Layout" in the inspector window under "Properties > Properties".	
9.	Activate "Show split view" if you wish to display the device and detailed views at the same time, or deactivate "Show split view" if you only wish to display one view.	

## 3.7 Configure system diagnostics window in the HMI

For displaying the diagnostic information in the HMI, the complete control "System diagnostics window" is available in the TIA Portal. The following table shows you how to insert the control into your HMI configuration.

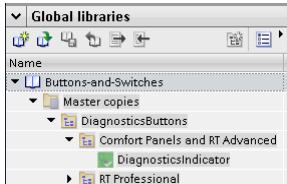

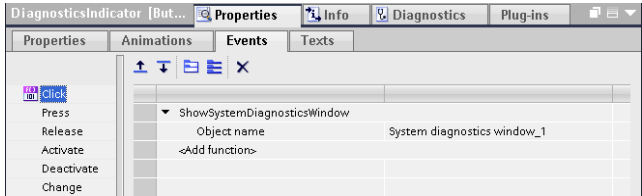
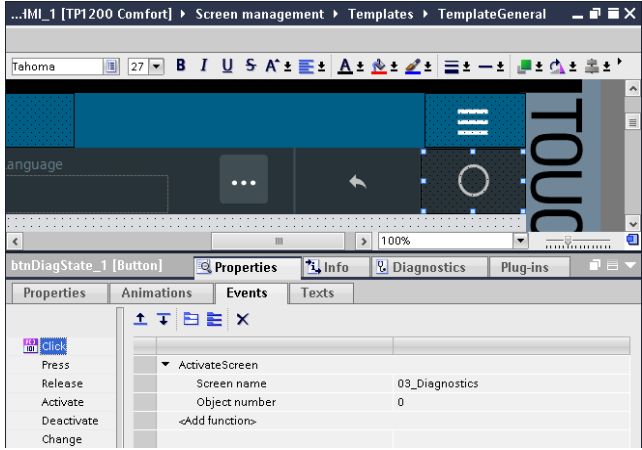
Table 3-7

No.	Action	Remark
1.	Open the "Global Screen" from the project navigation under "HMI_1 > Screen management".	
2.	Open the TaskCard "Toolbox".	
3.	Drag the Control "System diagnostics window" to the Global screen.	
4.	Configure the "System diagnostics window" like a "System diagnostic view" (see chapter 3.6).	
5.	Click on "Window" in the inspector window under "Properties > Properties".	
6.	Activate the window properties "Close button" and "Size adjustable".	

### 3.8 Configure System diagnostics indicator

The "System diagnostics indicator" is for displaying troubles in the HMI. If you want to be able to use the "System Diagnostic Indicator", a "System diagnostic window" must have been configured in the global screen.

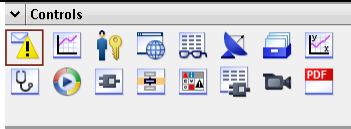
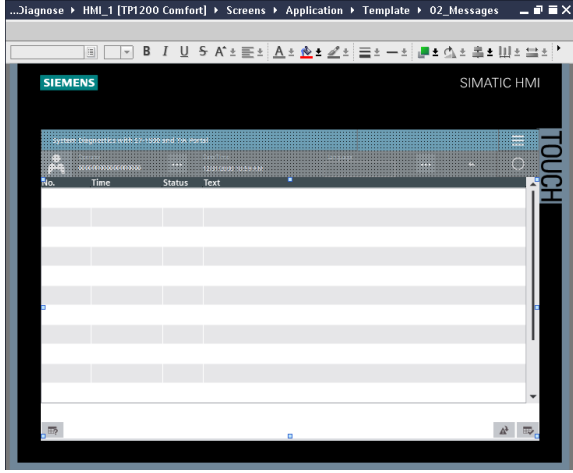
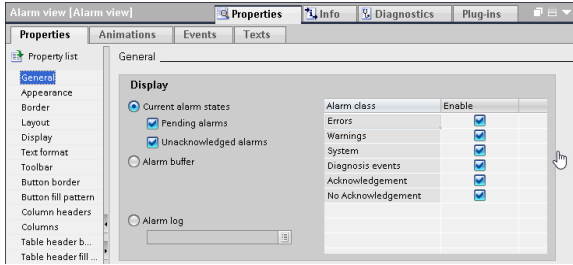
Table 3-8

No.	Action	Remark
1.	Open the screen "11_Module1" from the project navigation under "HMI_1 > Screens > Application > ApplicationName".	
2.	Open the TaskCard "Libraries > Global Libraries".	
3.	Open the folder "Buttons-and-Switches > Master copies > DiagnosticsButtons > Comfort Panels and RT Advanced".	
4.	Drag and drop the object "DiagnosticsIndicator" to the place in the screen where you want it to be.	
5.	Click on "Click" in the inspector window under "Properties > Events".	
6.	Now select the system diagnostic window "System diagnostics window_1" from the global screen for the pre-set system function "ShowSystemDiagnosticsWindow"	
7.	<b>Alternative:</b> In the "TemplateGeneral" screen under "HMI_1> Screen management> Templates" a diagnostic display with a button is configured. In the inspector window under "Properties > Events" the opening of screen "03_Diagnostics" is configured for this button under "Click".	

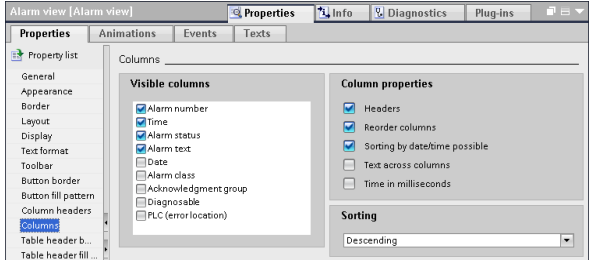
### 3.9 Configure the alarm view

The "Alarm view" is for displaying troubles in the HMI. The following table shows you how to insert the pre-defined control "Alarm view" into your HMI configuration.

Table 3-9

No.	Action	Remark
1.	Open the screen "02_Messages" from the project navigation under "HMI_1 > Screens > Application > Template".	
2.	Open the TaskCard "Toolbox".	
3.	Drag the Control "Alarm View" to the screen.	
4.	Adapt the size of the control to the screen.	
5.	Click on "General" in the inspector window under "Properties > Properties".	
6.	Under "Display > Current alarm states", activate the "Pending alarms" and "Unacknowledged alarms".	
7.	Activate the alarm classes "Acknowledgement" and "No Acknowledgement".	


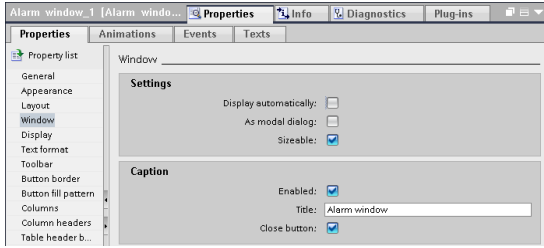
### 3 Configuration and Settings

No.	Action	Remark
8.	Click on "Columns" in the inspector window under "Properties > Properties".	
9.	Under "Visible columns" select the columns you wish to be output in "Alarm view".	

## 3.10 Configure the alarm window

The "Alarm window" is mainly configured like the "Alarm view". The following table shows you how to insert the pre-defined control "Alarm window" into your HMI configuration.

Table 3-10


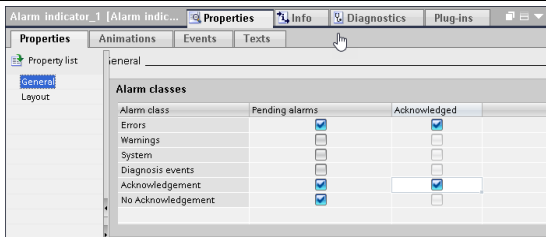
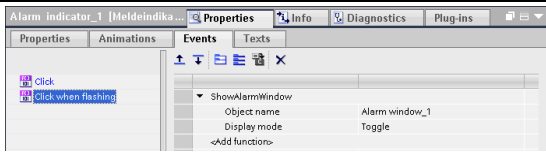

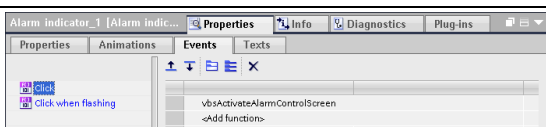
No.	Action	Remark
1.	Open the "Global Screen" from the project navigation under "HMI_1 > Screen management".	
2.	Open the TaskCard "Toolbox".	
3.	Drag the Control "Alarm window" to the global screen.	
4.	Configure the "Alarm window" like an "Alarm view" (see chapter 3.9).	
5.	Click on "Window" in the inspector window under "Properties > Properties".	
6.	Deactivate the window properties "Display automatically" and activate the window properties "Close button" and "Sizeable".	



### 3.11 Configure the alarm indicator

The "Alarm indicator" indicates pending alarms in the HMI. If you want to be able to use the "Alarm indicator", an "Alarm window" must have been configured in the global screen.

Table 3-11

No.	Action	Remark																					
1.	Open the "Global Screen" from the project navigation under "HMI_1 > Screen management".																						
2.	Open the TaskCard "Toolbox".																						
3.	Drag and drop the control "Alarm indicator" to the place in the screen where you want it to be.																						
4.	Select the alarm classes you wish to be displayed by the alarm indicator in the inspector window under "Properties > Properties > General". In the column "Pending alarms" activate the alarm classes "Errors", "Acknowledgment" and "No Acknowledgment". In the column "Acknowledged", activate the alarm classes "Errors" and "Acknowledgment".	 <table border="1"> <thead> <tr> <th>Alarm class</th> <th>Pending alarms</th> <th>Acknowledged</th> </tr> </thead> <tbody> <tr> <td>Errors</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Warnings</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>System</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Diagnosis events</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Acknowledgement</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>No Acknowledgement</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>	Alarm class	Pending alarms	Acknowledged	Errors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Warnings	<input type="checkbox"/>	<input type="checkbox"/>	System	<input type="checkbox"/>	<input type="checkbox"/>	Diagnosis events	<input type="checkbox"/>	<input type="checkbox"/>	Acknowledgement	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	No Acknowledgement	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Alarm class	Pending alarms	Acknowledged																					
Errors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																					
Warnings	<input type="checkbox"/>	<input type="checkbox"/>																					
System	<input type="checkbox"/>	<input type="checkbox"/>																					
Diagnosis events	<input type="checkbox"/>	<input type="checkbox"/>																					
Acknowledgement	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																					
No Acknowledgement	<input checked="" type="checkbox"/>	<input type="checkbox"/>																					
5.	Click on "Click when flashing" in the inspector window under "Properties > Events". The function list opens up.																						
6.	Click on the first line of the function list and choose the system function "ShowAlarmWindow" under "Alarms". The alarm window "Alarm window_1" is selected automatically.																						
7.	<b>Optional:</b> The "vbsActivateAlarmControlScreen" script is configured for the "Click" event. This opens the "O2_Messages" picture.																						

### 3.12 Configure system diagnostics with user programs

For the system diagnostics in user programs, complete instructions are available in the TIA Portal. For more detailed information about the instructions, please refer to the TIA Portal Online Help. The use of several applications in the user program is described below.

No further evaluation of the System Diagnostics information will be described in this example.

In this application the parameter structure of the individual diagnostic instructions is displayed in the data block "DiagDB" (see [Figure 3-1](#)). The parameters of the instructions are not linked to the variables of the data block.

Figure 3-1: Data block "DiagDB"

	Name	Data type	Start value	Retain	Accessible ...	Writable f..
1	Static			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	led	Struct		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	laddr	HW_IO	50	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	led	UInt	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	retVal	Int	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	deviceStates	Struct		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	laddr	HW_IOSYSTEM	260	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	mode	UInt	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9	retVal	Int	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10	state	Array[0..1023] of Bool		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
11	getName	Struct		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12	laddr	HW_IOSYSTEM	260	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
13	stationNr	UInt	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
14	done	Bool	false	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
15	busy	Bool	false	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
16	error	Bool	false	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
17	len	DInt	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
18	status	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
19	data	String	"	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
20	moduleStates	Struct		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
21	laddr	HW_DEVICE	263	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
22	mode	UInt	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
23	retVal	Int	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
24	state	Array[0..127] of Bool		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
25	getDiag	Struct		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
26	laddr	HW_ANY	269	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
27	mode	UInt	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
28	retVal	Int	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
29	cntDiag	UInt	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
30	diagDis	DIS		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
31	MaintenanceState	DWord	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
32	ComponentStateDetail	DWord	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
33	OwnState	UInt	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
34	IOState	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
35	OperatingState	UInt	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Please find the value and/or the symbolic name of the respective parameters "LADDR" (HW-ID) in the tab "System constants" of the "Default tag table" (see [Figure 3-2](#)).

Figure 3-2: System constants

	Name	Data type	Value
35	Local~PROFINET_interface_2~Port_1	Hw_Interface	73
36	OB_Main	OB_PCYCLE	1
37	Local~DI_32x24VDC_HF_1	Hw_SubModule	258
38	Local~DQ_32x24VDC_0_5A_ST_1	Hw_SubModule	259
39	Local~PROFINET_IO-System	Hw_IoSystem	260
40	et200mp~Proxy	Hw_SubModule	265
41	et200mp~IODevice	Hw_Device	263
42	et200mp~PROFINET_interface	Hw_Interface	266
43	et200mp~PROFINET_interface~Port_1	Hw_Interface	267
44	et200mp~PROFINET_interface~Port_2	Hw_Interface	268
45	et200mp~DI_32x24VDC_HF_1	Hw_SubModule	269
46	et200mp~DQ_32x24VDC_0_5A_ST_1	Hw_SubModule	270
47	Switch_1~Proxy	Hw_SubModule	273
48	Switch_1~IODevice	Hw_Device	271
49	Switch_1~SCALANCE_interface	Hw_Interface	275
50	Switch_1~SCALANCE_interface~Port_1	Hw_Interface	276
51	Switch_1~SCALANCE_interface~Port_2	Hw_Interface	277
52	Switch_1~SCALANCE_interface~Port_3	Hw_Interface	278
53	Switch_1~SCALANCE_interface~Port_4	Hw_Interface	279
54	Switch_1~SCALANCE_interface~Port_5	Hw_Interface	280
55	Switch_1~SCALANCE_interface~Port_6	Hw_Interface	281
56	Switch_1~SCALANCE_interface~Port_7	Hw_Interface	282
57	Switch_1~SCALANCE_interface~Port_8	Hw_Interface	283
58	Local	Hw_SubModule	49
59	Local~Exec	Hw_SubModule	52
60	et200mp~Head	Hw_SubModule	262
61	Switch_1~Head	Hw_SubModule	274
62	Local~Display	Hw_SubModule	54
63	Local~MC	Hw_SubModule	51
64	Local~PROFINET_interface_1	Hw_Interface	64
65	Local~PROFINET_interface_2	Hw_Interface	72
66	Local~DP_interface_1	Hw_Interface	60
67	Local~PROFINET_interface_1~Port_1	Hw_Interface	65
68	Local~PROFINET_interface_1~Port_2	Hw_Interface	66
69	Local~Virtual_communication_interface	Hw_Interface	135
70	Local~Common	Hw_SubModule	50
71	Local~Device	Hw_Device	32
72	Local~Configuration	Hw_SubModule	33
73	Local~FExec	Hw_SubModule	55

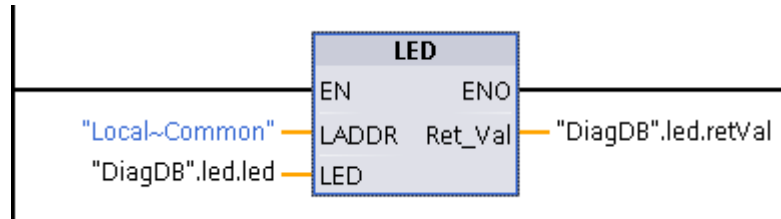
**Note**

Assign the symbolic names of the variable table and the variables of the data block to the parameters of the instructions per drag & drop.

### 3.12.1 Instruction "LED"

With the instruction "LED", you can read out the status of a certain module LED. The following example shows you that your status of the ERROR-LED (parameter LED = 2) of the "PLC\_1".

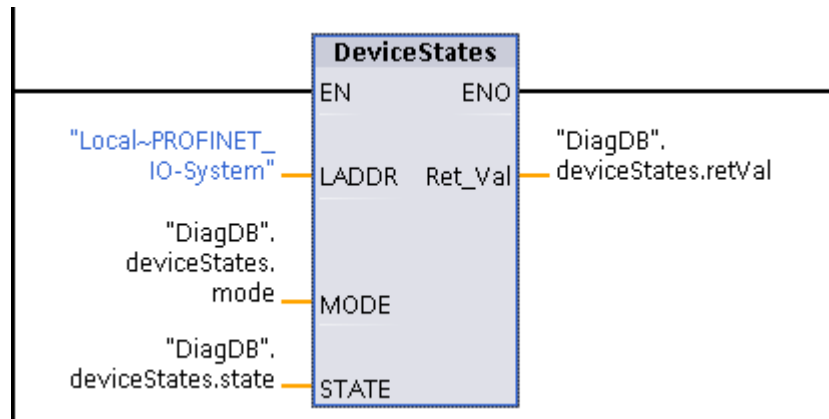
Figure 3-3: Instruction LED



### 3.12.2 Instruction "Device States"

With the instruction "Device States" you put out the status of the modules of an I/O system (PROFIBUS DP or PROFINET IO). The following example detects the trouble modules (Parameter MODE =) of the "PROFINET\_IO\_Systems."

Figure 3-4: Instruction DeviceStates



### 3.12.3 Instruction "GET\_NAME"

With the instruction "GET\_NAME" you can read out the device name of, let's say a faulty module of an IO system (PROFIBUS DP or PROFINET IO) for example. The following example determines the device names of the module with the "Device Number" "1". Please find the "Device number" in the network view under "Properties of the module (see [Figure 3-5](#)). The "Device number" "1" is assigned in the data block "DiagDB" of the variable "STATION\_NR".

Figure 3-5: Device number

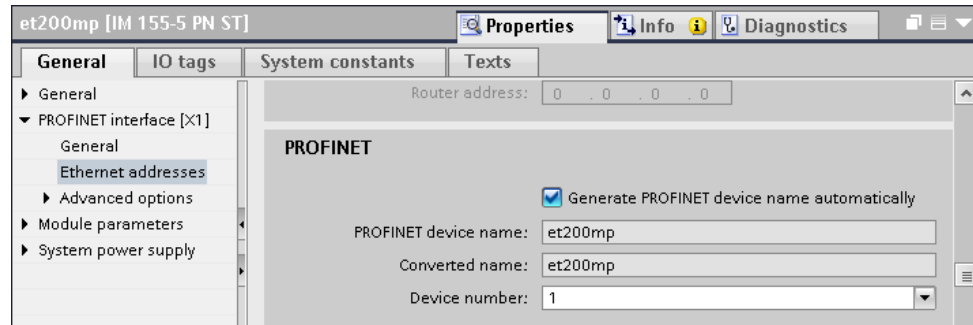
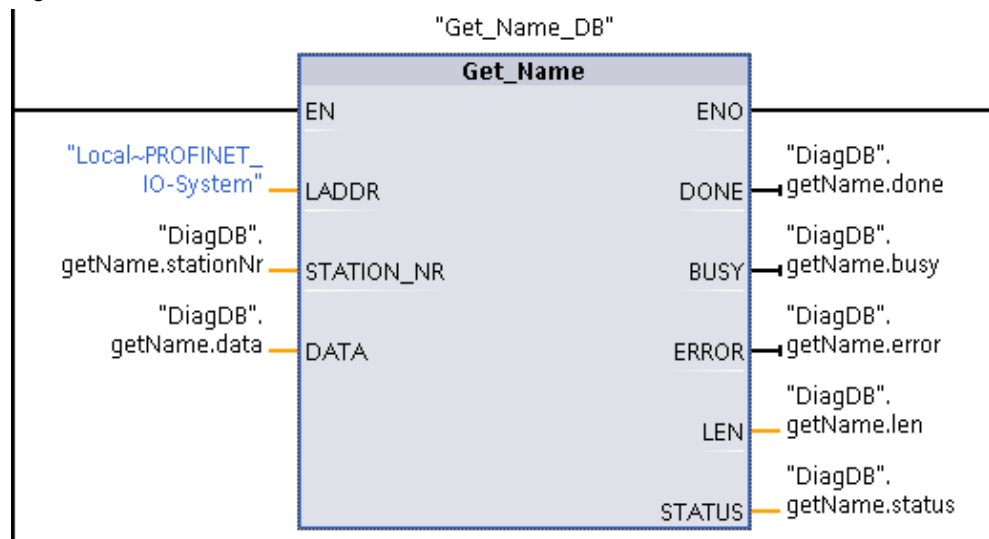


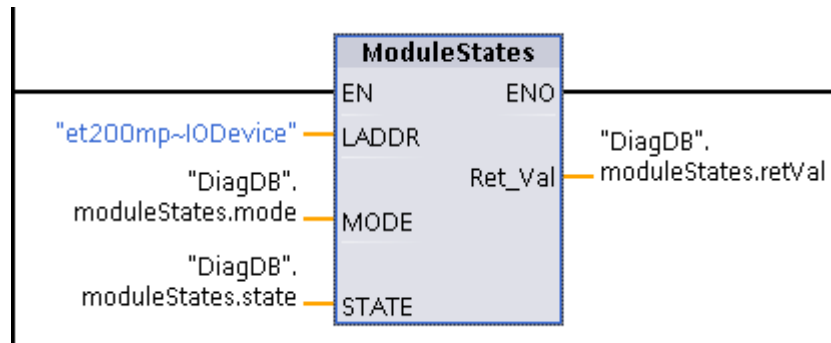
Figure 3-6: Instruction GET\_NAME



### 3.12.4 Instruction "ModuleStates"

With the instruction "ModuleStates" you can read out the module state of a module. The following example detects the trouble modules (Parameter MODE =2) of the IO device "et200mp".

Figure 3-7: Instruction ModuleStates



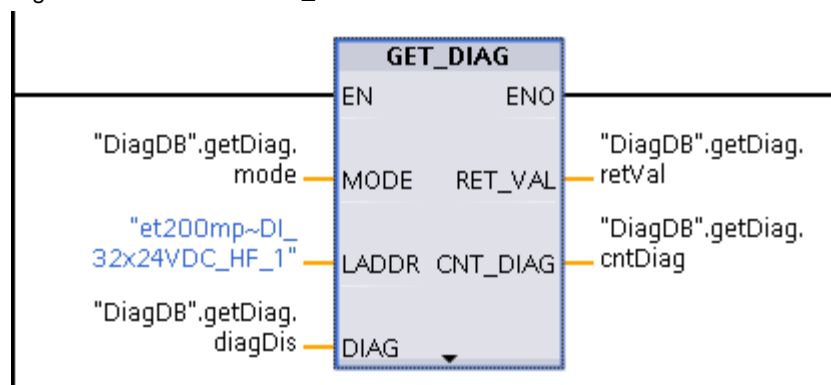
### 3.12.5 Instruction "GET\_DIAG"

With the instruction "GET\_DIAG" you can read out the diagnose information of a module. In the following example the diagnostic status of the DI module "DI32x24VDC\_HF\_1" is put out according to the structure "DIS" (Parameter MODE = 1) in the parameter "DIAG".

**Note**

The structure "DIS" is already integrated in TIA Portal and does not need to be created. However, variables with the data type "DIS" can only be defined in the block interface or in data blocks (see [Figure 3-1](#)).

Figure 3-8: Instruction GET\_DIAG



## 4 Operating the Application

### 4.1 Diagnostics with LEDs

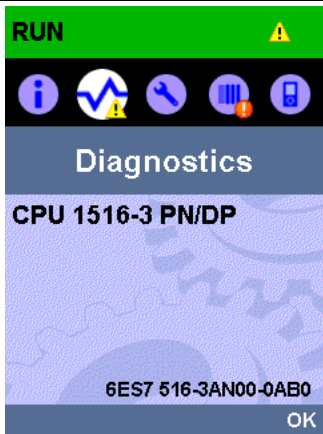

The missing supply voltage L+ in the module DQ32 is displayed by a flashing red LED in the module and in the CPU.

### 4.2 Diagnostics with the display in the CPU S7-1500

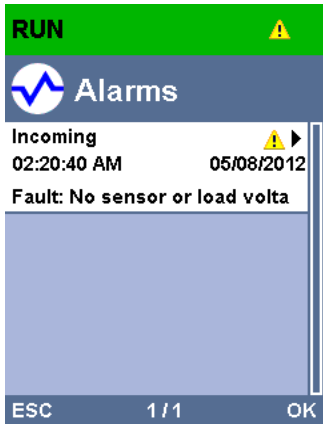
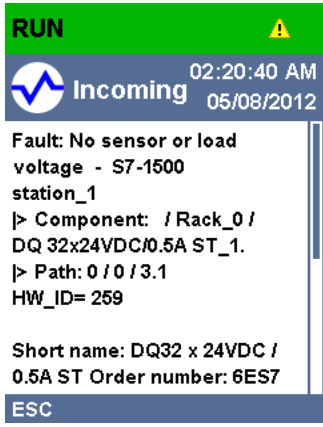
The S7-1500 display has a large variety of diagnostic possibilities. The missing supply voltage L+ in the module DQ32 is displayed in various places in the display.

#### 4.2.1 Diagnostics menu: Alarms

Table 8-1

No.	Action	Remark
1.	Navigate to the "Diagnostics" menu with the arrow buttons and open it with the "OK" button.	
2.	Select "Alarms" and open it with the "OK" button.	

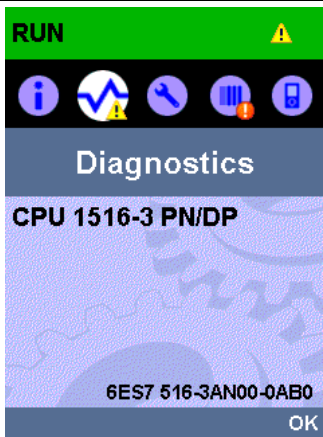
## 4 Operating the Application

No.	Action	Remark
3.	Select the alarm and open the message details with "OK".	
4.	Check the message.	

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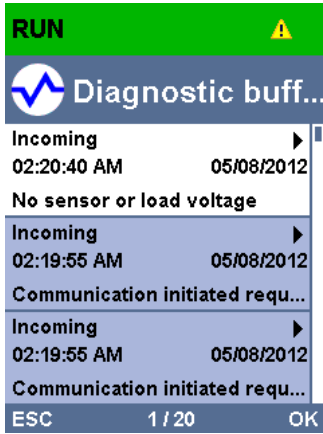
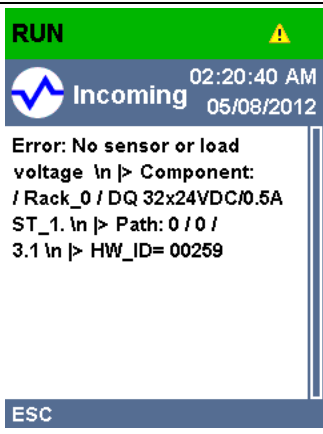
### 4.2.2 Diagnostics menu: Diagnostic buffer

Table 4-2

No.	Action	Remark
1.	Navigate to the "Diagnostics" menu with the arrow buttons and open it with the "OK" button.	

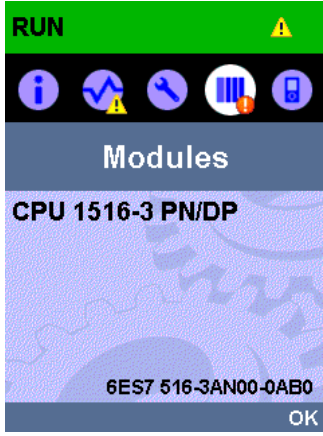
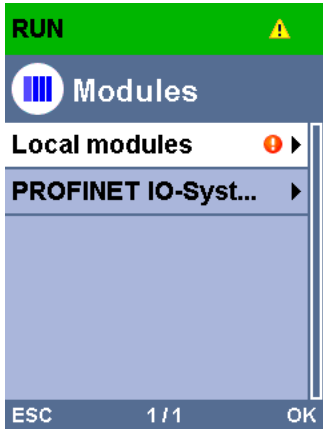
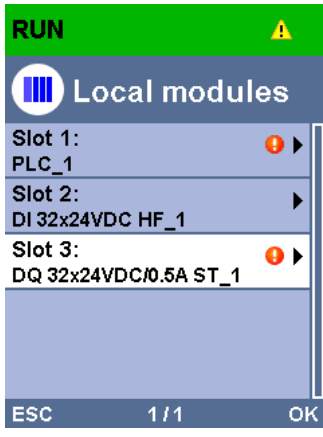


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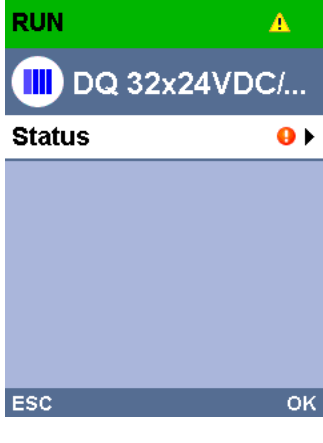
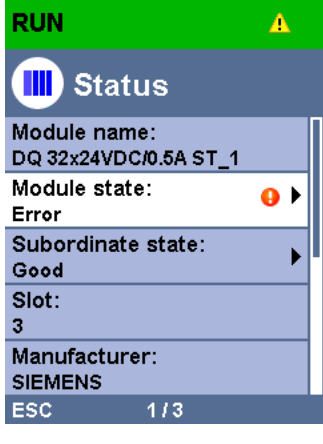
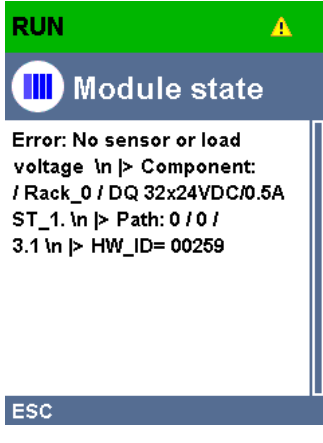
No.	Action	Remark
2.	Select "Diagnostic buffer" and open it with the "OK" button.	
3.	Select the alarm and open the message details with "OK".	
4.	Check the message in the diagnostic buffer.	

### 4.2.3 The "Modules" menu

Table 4-3

No.	Action	Remark
1.	Navigate to the "Modules" menu with the arrow buttons and open it with the "OK" button.	
2.	Select "Local modules" and open it with the "OK" button.	
3.	Select the faulty module DQ32 on "Slot3" and open the status with "OK" button.	

## 4 Operating the Application

No.	Action	Remark
4.	Select "Status" and open it with the "OK" button.	
5.	Select the "Module state" and open the message details with "OK".	
6.	Check the message.	

**Note** Quit the currently selected menu by hitting the "ESC" button.

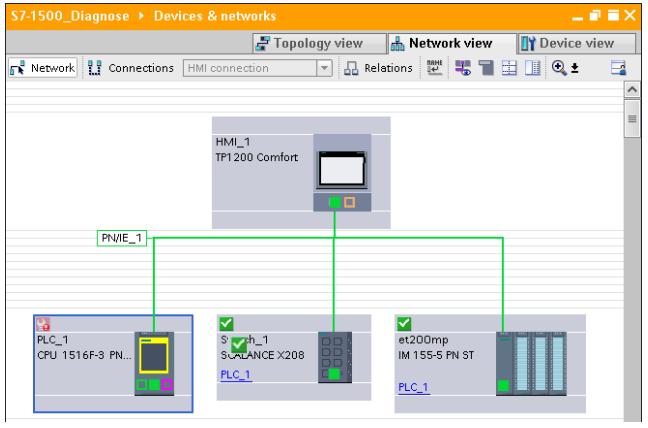
### 4.3 Diagnostics in the TIA Portal

#### 4.3.1 Diagnostics of the hardware in the device and network view

For the diagnostics of the missing supply voltage L+ in the module DQ32 in the device and network view, please proceed as follows:

#### Diagnostic information in the network view

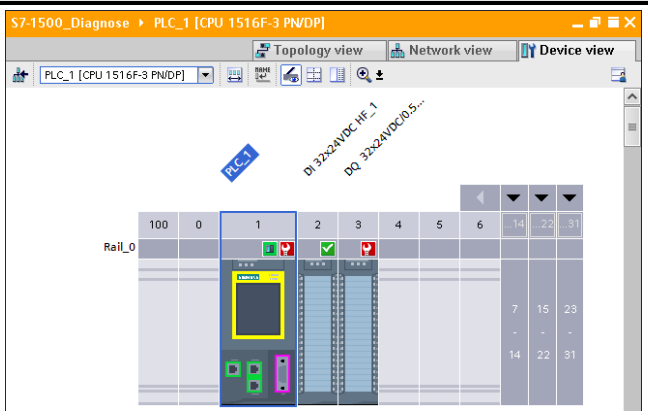
Table 4-4

No.	Action	Remark
1.	Open the device and network editor with a double click on "Devices & networks" in the project navigation.	
2.	Select the "PLC_1" in the network view.	
3.	In the toolbar, click the "Connect online" button.	When a connection is first established, the dialog "Connect online" opens up. Select the PG/PC interface with which the PLC is connected to the PG/PC and click on "Connect".
4.	In the network view, the diagnostic symbol "Fault" is displayed at "PLC_1". The additional diagnostic symbol in the lower right hand corner of the diagnostic symbol indicates that a fault has occurred in a lower-level component.	

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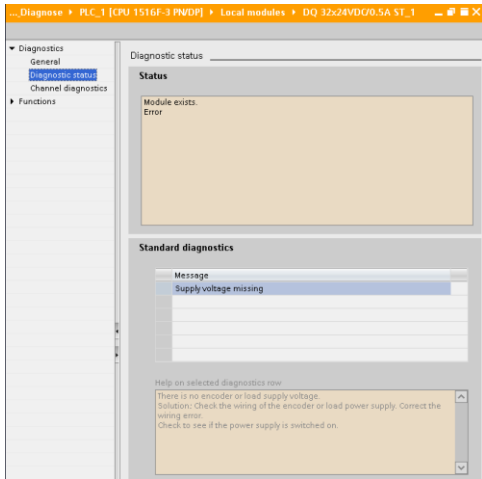
#### Diagnostic information in the device view

Table 4-5

No.	Action	Remark
1.	Double-click on the device "PLC_1" in the network view. The online device view opens up. For every hardware component, the corresponding diagnostic symbol is displayed. Therefore, the faulty module can be detected immediately in the display.	

**Diagnostic information in the diagnostics view**

Table 4-6

No.	Action	Remark
1.	Double-click on the diagnostic symbol of the module "DQ32". The diagnostics view of the module is displayed.	
2.	Open the folder "Diagnostics > Diagnostic status". The diagnostic message is displayed in the window "Standard diagnostics".	

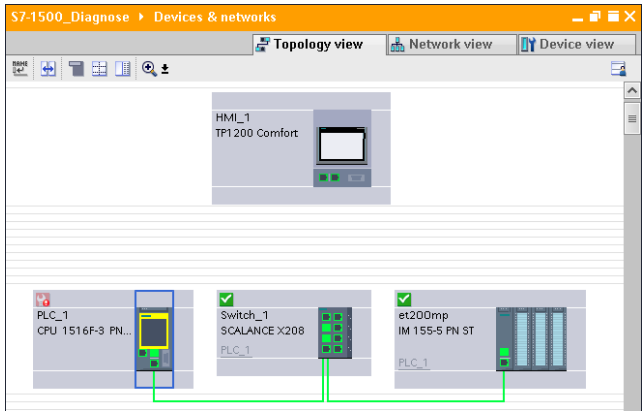
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**4.3.2 Diagnosis in the topology view**

**Fault scenario: Missing supply voltage**

For the diagnostics of the missing supply voltage L+ in the module DQ32 in the topology view, please proceed as follows:

Table 4-7

No.	Action	Remark
1.	The online connection to PLC_1 has already been established. Change to the topology view of the device and network editor. In the topology view, the diagnostic symbol "Fault" is displayed at "PLC_1". The additional diagnostic symbol in the lower right hand corner of the diagnostic symbol indicates that a fault has occurred in a lower-level component.	
2.	Double-click on the device to change the device view, see <a href="#">Diagnostic information in the device view</a>	

**Fault scenario: Faulty interconnection of the port**

For this fault scenario, remove the Ethernet cable from port 1 of the ET 200MP and insert it into port 2 of the ET 200MP.

For the diagnostics of the faulty interconnection in the topology view, please proceed as follows

Table 4-8

No.	Action	Remark
1.	<p>The online connection to PLC_1 has already been established. Change to the topology view of the device and network editor. In the topology view, the diagnostic symbol "Fault" is displayed at "PLC_1" and faults in the lower-level component are displayed at "Switch_1" and "et200mp". The faulty interconnection and the respective port at "Switch_1" and "et200mp" are displayed in red.</p>	<p>The screenshot shows the 'Topology view' of the 'S7-1500_Diagnose' project. It displays a network diagram with three main components: 'PLC_1 CPU 1516F-3 PN...', 'Switch_1 SCALANCE X208', and 'et200mp IM 155-5 PN ST'. A red line indicates a fault in the interconnection between the PLC and the switch. The PLC icon itself also has a red fault symbol.</p>

**4.3.3 Diagnosis in the project navigation**

For the diagnostics of the missing supply voltage L+ in the module DQ32 in the device and network view, please proceed as follows:

Table 4-9

No.	Action	Remark
1.	<p>The online connection to PLC_1 has already been established. Go to the project navigation. In the project navigation, view, the diagnostic symbol "Fault" is displayed at "PLC_1". The additional diagnostic symbol in the lower right hand corner of the diagnostic symbol indicates that a fault has occurred in a lower-level component.</p>	<p>The screenshot shows the 'Project tree' for 'S7-1500_Diagnose'. The 'PLC_1 [CPU 1516F-3 PN/DP]' folder is selected and highlighted in blue. To its right, a red fault symbol is visible. Below it, the 'Local modules' folder is expanded, showing 'DI 32x24VDC HF_1' and 'DQ 32x24VDC/0.5A ST_1', both with green checkmarks, indicating they are healthy.</p>
2.	<p>Open the "PLC_1" folder. The symbol for the fault in lower-level components is displayed in the folder "Local modules".</p>	
3.	<p>Open the folder "Local modules". In the module "DQ32", the diagnostic symbol "Fault" is displayed.</p>	

## 4 Operating the Application

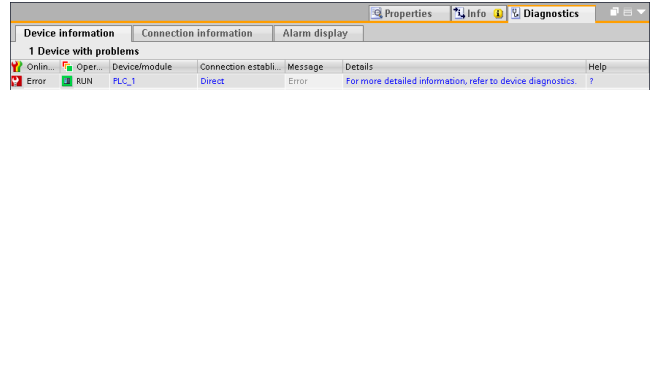
No.	Action	Remark
4.	Double-click on the module "DQ32 to go to the device view, see <a href="#">Diagnostic information in the device view</a>	
5.	Double-click on the diagnostic symbol of a module to go to the diagnostics view of a module, see <a href="#">Diagnostic information in the diagnostics view.</a>	

### 4.3.4 Diagnostics in the inspection window

For the diagnostics of the missing supply voltage L+ in the module DQ32 in the inspector window, please proceed as follows:

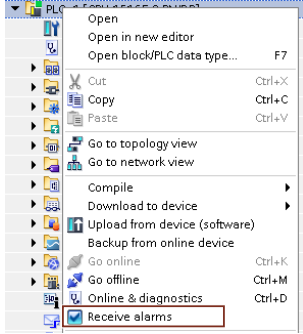
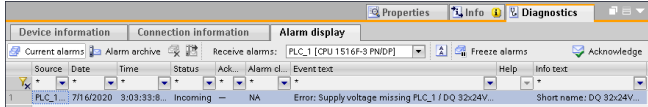
#### "Device information" tab

Table 4-10

No.	Action	Remark
1.	The online connection to PLC_1 has already been established. Change to the inspector window.	
2.	Open the "Diagnostics" tab.	
3.	Open the lower-level tag "Device information". The "Online status" shows you that a fault has occurred in a lower-level component. The "Device/module" "PLC_1" has the "operating mode" "RUN". Click on the link under "Details" to go to the diagnostics view of a module. Click on the link under "Help" to receive online help and further information about the message.	

**"Alarm display" tab**

Table 4-11

No.	Action	Remark
1.	The online connection to PLC_1 has already been established.	
2.	Click on "PLC_1" in the project navigation with the right mouse button. The context menu opens up.	
3.	Activate "Receive alarms" in the context menu.	
4.	Go to the inspector window and open the tab "Diagnostics > Alarm display".	
5.	Click on the symbol "Current alarms". The alarm about the faulty module "DQ32" is displayed with the source, date and time. The status "I" indicates that it is a coming alarm.	


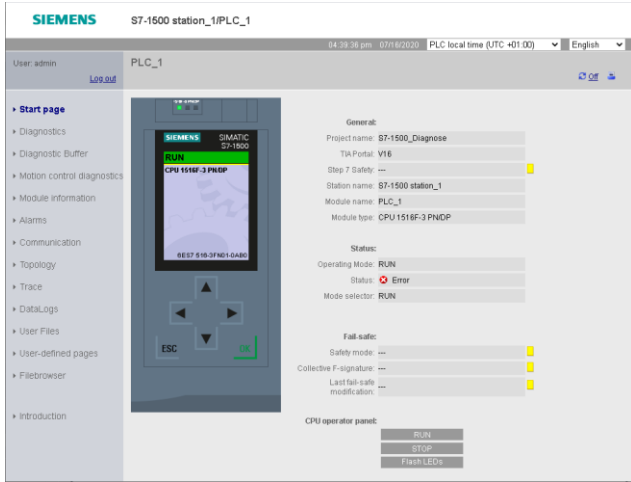


## 4.4 Diagnostics with the Web server

For the diagnostics of the missing supply voltage L+ in the module DQ32 with the web server, please proceed as follows:

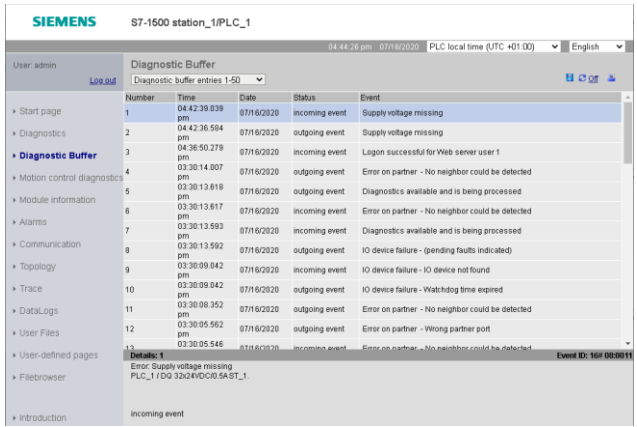
### 4.4.1 Login at the web server / website "Start page"

Table 4-12

No.	Action	Remark
1.	Open the web browser, for example the Internet Explorer.	
2.	Enter IP address of "PLC_1" as address, for example <a href="http://192.168.0.1">http://192.168.0.1</a> . The intro page opens up.	
3.	Click "ENTER". The start page of "PLC_1" opens up.	
4.	Enter the name "admin" and the password "s7". Then click on "Log in". The complete start page of "PLC_1" opens up. The pending fault is displayed at the status LED and in the box "Status".	

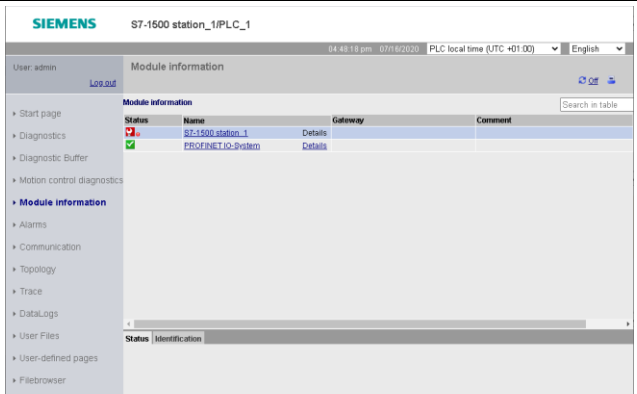
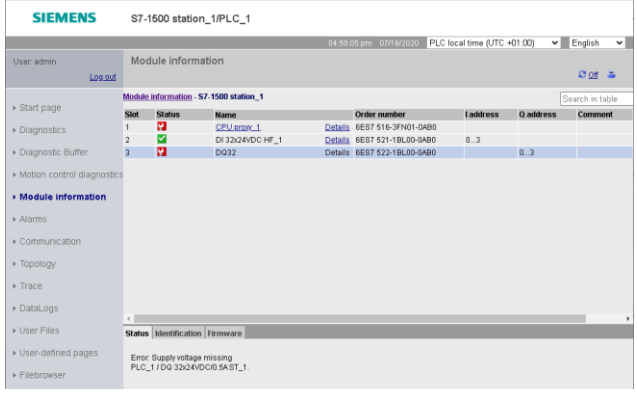
### 4.4.2 Website "Diagnostic buffer"

Table 4-13

No.	Action	Remark
1.	Click on "Diagnostic Buffer" to open the website.	
2.	Select the alarm. Under "Details" you get more diagnostic information about the alarm.	

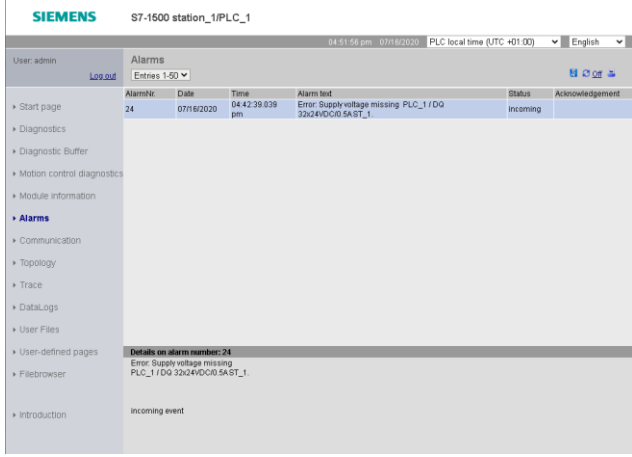
### 4.4.3 Website "Module information"

Table 4-14

No.	Action	Remark
1.	Click on "Module information" to open the website. In "S7-1500-station_1", the diagnostic symbol "Fault" is displayed. The additional diagnostic symbol in the lower right hand corner of the diagnostic symbol indicates that a fault has occurred in a lower-level component.	
2.	Click on the link "S7-1500-station_1" to get an overview of the status of the local modules. In the faulty module "DQ32", the diagnostic symbol "Fault" is displayed.	
3.	Click on the link "Details" of the module "DQ32". Under "Status" you get more diagnostic information about the alarm.	

### 4.4.4 Website "Alarms"

Table 4-15

No.	Action	Remark
1.	Click on "Alarms" to open the website.	
2.	Select the alarm. Under "Details" you get more diagnostic information about the alarm.	

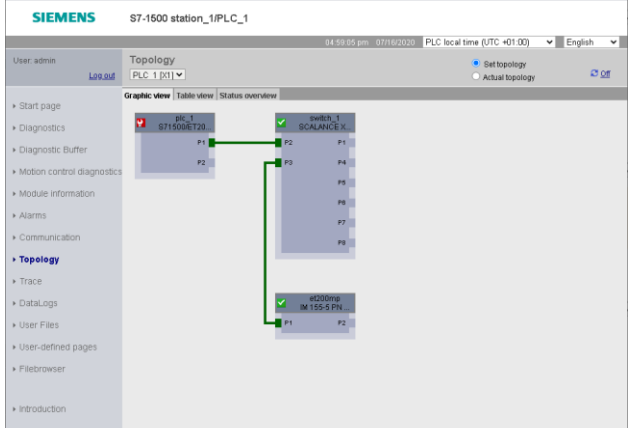
### 4.4.5 Website "Topology"

#### 4.4.5.1 1<sup>st</sup> fault scenario: Missing supply voltage

For the diagnostics of the missing supply voltage L+ in the module DQ32 in the device and network view, please proceed as follows:

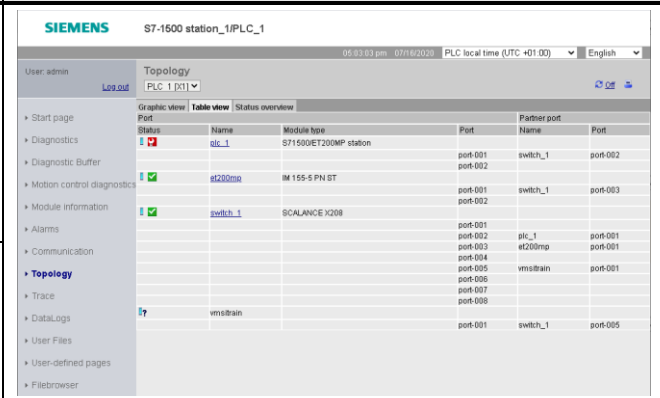
#### Topology "Graphic view"

Table 4-16

No.	Action	Remark
1.	Click on "Topology" to open the website. The "Graphic view" of the "Set topology" is displayed. The red diagnostic symbol at "plc_1" shows you that a fault has occurred in a lower-level component.	
2.	With a click on "plc_1" you can call the website "Module information".	

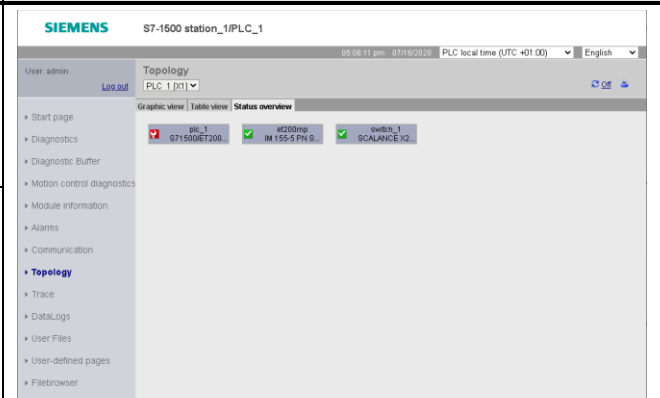
**Topology "Table view"**

Table 4-17

No.	Action	Remark
1.	Click on "Table view" in the website "Topology" to have a table view displayed in the actual topology. The red diagnostic symbol at "plc_1" shows you that a fault has occurred in a lower-level component.	
2.	With a click on "plc_1" you can call the website "Module information".	

**Topology "Status overview"**

Table 4-18

No.	Action	Remark
1.	Click on "Status overview" in the website "Topology" The red diagnostic symbol at "plc_1" shows you that a fault has occurred in a lower-level component.	
2.	With a click on "plc_1" you can call the website "Module information".	

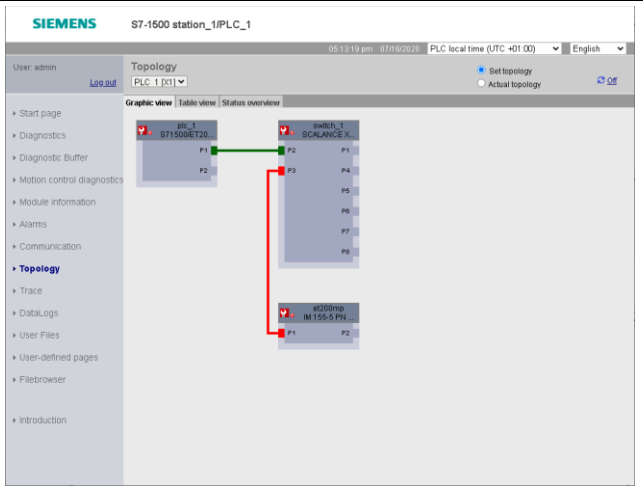
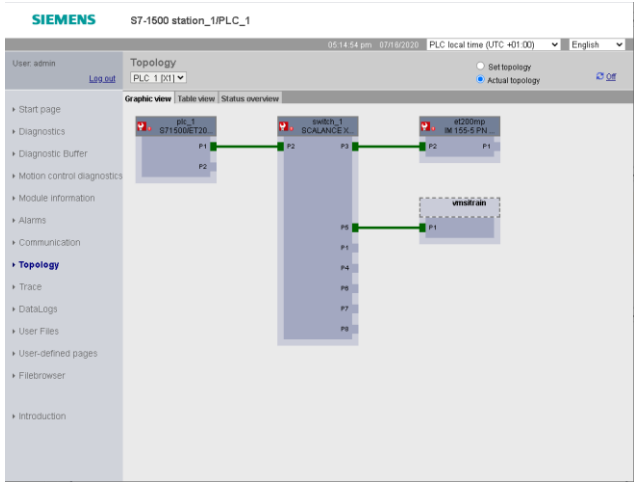
## 4 Operating the Application

### 4.4.5.2 2<sup>nd</sup> fault scenario: Faulty interconnection of the port

For this fault scenario, remove the Ethernet cable from port 1 of the ET 200MP and insert it into port 2 of the ET 200MP.

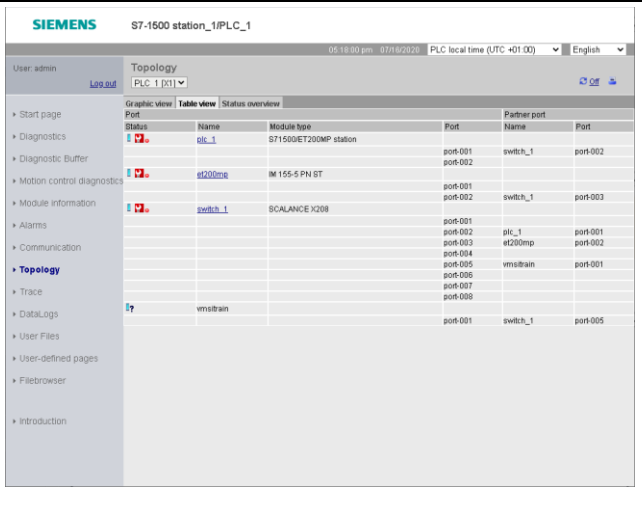
#### Topology "Graphic view"

Table 4-19

No.	Action	Remark
1.	<p>Click on "Topology" to open the website.</p> <p>The "Graphic view" of the configured "Set topology" is displayed.</p> <p>The diagnostic symbol at the devices shows you that a fault has occurred in a lower-level component.</p> <p>The missing connection is displayed in red.</p>	 <p>The screenshot shows the 'Topology' window in 'Graphic view' mode. It displays three main components: 'PLC 1 ST1500ET20...', 'switch 1 SCALANCE X...', and 'et200mp M 155-S PN...'. A green line connects port P2 of the PLC to port P3 of the switch. A red line connects port P3 of the switch to port P1 of the ET200MP, indicating a fault. The interface includes a navigation menu on the left and a top bar with user information and system settings.</p>
2.	<p>Click on "Actual topology" to display the actual interconnection of the ports.</p>	 <p>The screenshot shows the same 'Topology' window, but now the 'Actual topology' view is selected. The interconnections are shown in green. A green line connects port P2 of the PLC to port P3 of the switch. Another green line connects port P3 of the switch to port P1 of the ET200MP. A dashed box labeled 'unstrahl' is visible near the ET200MP component. The interface elements are consistent with the previous screenshot.</p>

**Topology "Table view"**

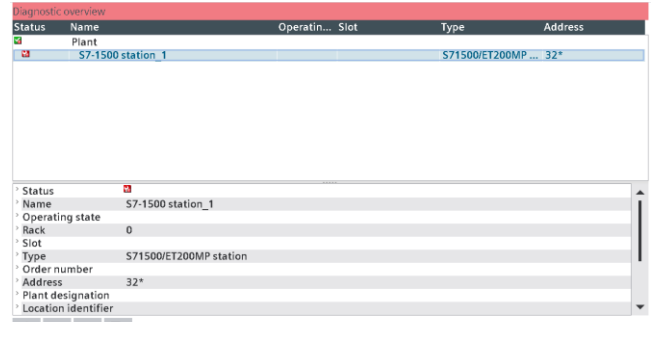
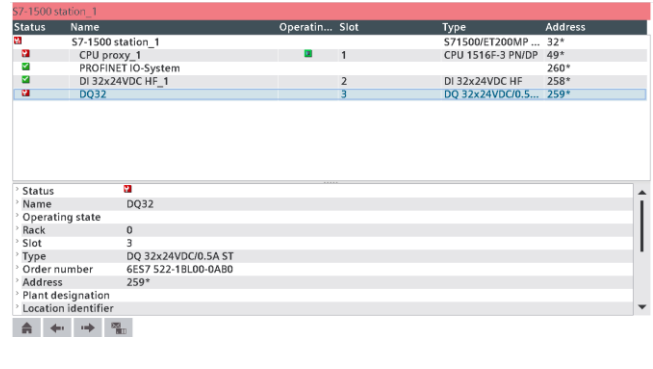
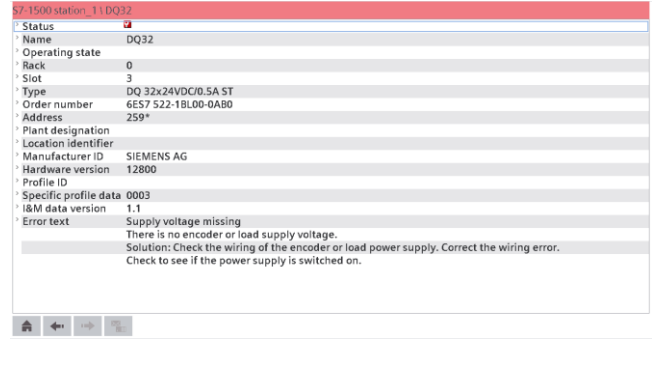
Table 4-20

No.	Action	Remark																																																																								
1.	<p>Click on "Table view" in the website "Topology" to have a table view displayed in the actual topology.</p> <p>The diagnostic symbol at the devices shows you that a fault has occurred in a lower-level component.</p> <p>The actual interconnection of the ports is displayed in a table.</p>	 <p>The screenshot shows the Siemens TIA Portal interface for 'S7-1500 station_1/PLC_1'. The 'Topology' section is active, and the 'Table view' is selected. The table displays the following data:</p> <table border="1"> <thead> <tr> <th>Port</th> <th>Name</th> <th>Module type</th> <th>Port</th> <th>Partner port</th> <th>Port</th> </tr> </thead> <tbody> <tr> <td>plc_1</td> <td>plc_1</td> <td>S71500ET200MP station</td> <td>port-001</td> <td>switch_1</td> <td>port-002</td> </tr> <tr> <td>et200mp</td> <td>et200mp</td> <td>IM 155-5 PN BT</td> <td>port-002</td> <td>switch_1</td> <td>port-003</td> </tr> <tr> <td>switch_1</td> <td>switch_1</td> <td>SCALANCE X208</td> <td>port-001</td> <td>plc_1</td> <td>port-001</td> </tr> <tr> <td></td> <td></td> <td></td> <td>port-002</td> <td>et200mp</td> <td>port-002</td> </tr> <tr> <td></td> <td></td> <td></td> <td>port-003</td> <td>et200mp</td> <td>port-002</td> </tr> <tr> <td></td> <td></td> <td></td> <td>port-004</td> <td>et200mp</td> <td>port-002</td> </tr> <tr> <td></td> <td></td> <td></td> <td>port-005</td> <td>vmsstrain</td> <td>port-001</td> </tr> <tr> <td></td> <td></td> <td></td> <td>port-006</td> <td>vmsstrain</td> <td>port-001</td> </tr> <tr> <td></td> <td></td> <td></td> <td>port-007</td> <td>vmsstrain</td> <td>port-001</td> </tr> <tr> <td></td> <td></td> <td></td> <td>port-008</td> <td>vmsstrain</td> <td>port-001</td> </tr> <tr> <td>vmsstrain</td> <td>vmsstrain</td> <td></td> <td>port-001</td> <td>switch_1</td> <td>port-005</td> </tr> </tbody> </table>	Port	Name	Module type	Port	Partner port	Port	plc_1	plc_1	S71500ET200MP station	port-001	switch_1	port-002	et200mp	et200mp	IM 155-5 PN BT	port-002	switch_1	port-003	switch_1	switch_1	SCALANCE X208	port-001	plc_1	port-001				port-002	et200mp	port-002				port-003	et200mp	port-002				port-004	et200mp	port-002				port-005	vmsstrain	port-001				port-006	vmsstrain	port-001				port-007	vmsstrain	port-001				port-008	vmsstrain	port-001	vmsstrain	vmsstrain		port-001	switch_1	port-005
Port	Name	Module type	Port	Partner port	Port																																																																					
plc_1	plc_1	S71500ET200MP station	port-001	switch_1	port-002																																																																					
et200mp	et200mp	IM 155-5 PN BT	port-002	switch_1	port-003																																																																					
switch_1	switch_1	SCALANCE X208	port-001	plc_1	port-001																																																																					
			port-002	et200mp	port-002																																																																					
			port-003	et200mp	port-002																																																																					
			port-004	et200mp	port-002																																																																					
			port-005	vmsstrain	port-001																																																																					
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			port-007	vmsstrain	port-001																																																																					
			port-008	vmsstrain	port-001																																																																					
vmsstrain	vmsstrain		port-001	switch_1	port-005																																																																					

## 4.5 Diagnostics with the system diagnostics display in the HMI

For the diagnostics of the missing supply voltage L+ in the module DQ32 in the system diagnostics view, please proceed as follows:

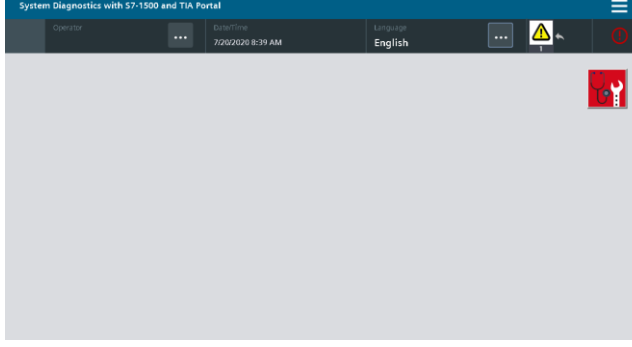
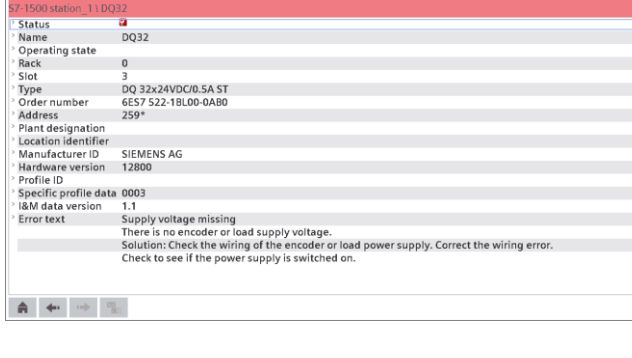

Table 4-21

No.	Action	Remark
1.	Open the "Diagnostics" screen by clicking the corresponding button in the slide-in menu.	
2.	The additional diagnostic symbol in the lower right hand corner of the diagnostic symbol at "S7-1500 station_1" indicates that a fault has occurred in a lower-level component. Double-click on "S7-1500 station_1" to go to the device view.	
3.	In the device view you get an overview of the status of the local modules. In the faulty module "DQ32", the diagnostic symbol "Fault" is displayed. Double-click on "DQ32" to go to the detailed view.	
4.	The detailed view shows you the cause of the fault and possible remedies.	

## 4.6 Diagnostics with the System diagnostics indicator and the system diagnostics window in the HMI

For the diagnostics of the missing supply voltage L+ in the module DQ32 with the system diagnostics indicator in the operating device, please proceed as follows:

Table 4-22

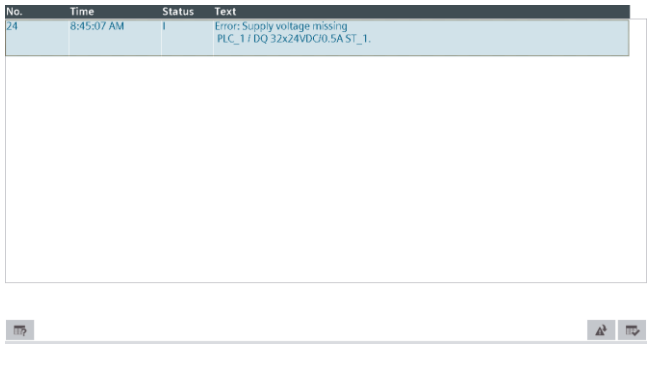
No.	Action	Remark
1.	<p>Open the "Module 1" screen. If a fault occurs, the button of the system diagnostics indicator changes its status from green (no fault) to red (fault). Click on the button of the System diagnostics indicator. The System diagnostics window opens in the detailed view of the faulty module "DQ32".</p>	
2.	<p>The detailed view shows you the cause of the fault and possible remedies.</p>	
3.	<p>Alternatively, an error is also displayed in the diagnostic display of the template. Clicking on its button opens the "Diagnostics" screen with the system diagnostics display. (see chapter 4.5)</p>	



## 4.7 Diagnostics with alarm view in the HMI

For the diagnostics of the missing supply voltage L+ in the module DQ32 in the system diagnostics view, please proceed as follows:


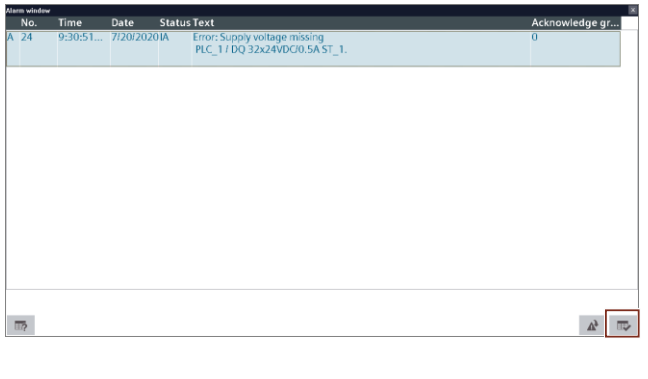
Table 4-23

No.	Action	Remark
1.	Open the "Messages" screen by clicking the corresponding button in the slide-in menu.	
2.	The alarm about the faulty module "DQ32" is displayed with the source, date and time.	

## 4.8 Diagnostics with alarm indicator and alarm window in the HMI

For the diagnostics of the missing supply voltage L+ in the module DQ32 with the alarm indicator and the alarm window in the operating device, please proceed as follows:

Table 4-24

No.	Action	Remark
1.	In case of a fault, the alarm indicator is displayed. The alarm indicator flashes, since the alarm must still be acknowledged. The number indicates the number of pending alarms. Click on the button of the alarm indicator. The alarm window opens up.	
2.	The alarm about the faulty module "DQ32" is displayed with the source, date and time.	
3.	Acknowledge the alarm by clicking on the "Acknowledge" button. The status of the alarm changes from "I" (incoming) to "IA" (incoming and acknowledged). The alarm indicator stops flashing.	

## 4.9 System diagnostics with the user program

The system diagnostics with the user program is only described as to the principle. The individual evaluation of the system diagnostic information of the diagnostic blocks has to be programmed by the user.

The meaning of the system diagnostic information of the respective diagnostics blocks are described with the example of a missing supply voltage L+ in the module DI32 of the IO device "et200mp". Please refer to the data block "DiagDB" in the online overview for system diagnostics information.

### 4.9.1 Diagnostic information "LED"

The parameter "Ret\_Val" of the instruction "LED" puts out the status "4" of the CPU ERROR LED. Please find the description of the parameter "Ret\_Val" in the TIA Portal online help. "LED Status 4 = color 1 flashes with 2Hz"

This means that the ERROR LED flashes red and that an error has occurred.

Figure 4-1: Diagnostic information LED

led	Struct		
laddr	HW_IO	50	50
led	UInt	2	2
retVal	Int	0	4

### 4.9.2 Diagnostic information "DeviceStates"

With the parameter STATE, the status of the module selected by means of the parameter MODE is put out. The status information is put in form of a bit character string. The bit "0" of the bit character string contains the status information for all modules of an I/O system.

- Bit 0 = 0: No error encountered for any module.
- Bit 0 = 1: An error occurred for at least one module.

Bits "1" to "127" (PROFIBUS DP) or "1023" (PROFINET IO) indicate the status of the respective modules selected by the mode. In this example, the status was set to Bit 1. For MODE = 2 (error in the module), this means that an error occurred in the module with the "Device number" "1".

Figure 4-2: Diagnostic information DeviceStates

deviceStates	Struct		
laddr	HW_IOSYSTEM	260	260
mode	UInt	2	2
retVal	Int	0	0
state	Array[0..1023] of Bool		
state[0]	Bool	false	TRUE
state[1]	Bool	false	TRUE
state[2]	Bool	false	FALSE

### 4.9.3 Diagnostic information "GET\_NAME"

The device number of the module with the device number "1" (see [Figure 3-5](#)) is "et200mp".

Figure 4-3: Diagnostic information GET\_NAME

getName	Struct		
laddr	HW_IOSYSTEM	260	260
stationNr	UInt	1	1
done	Bool	false	TRUE
busy	Bool	false	FALSE
error	Bool	false	FALSE
len	DInt	0	7
status	Word	16#0	16#0000
data	String	"	'et200mp'

### 4.9.4 Diagnostic information "ModuleStates"

With the parameter STATE, the status of the module selected by means of the parameter MODE is put out. The status information is put in form of a bit character string. The bit "0" of the bit character string contains the status information for all modules.

- Bit 0 = 0 No error encountered for any module.
- Bit 0 = 1 An error occurred for at least one module.

The status of the ET 200MP interface module occupies bits "1" and "2". Bits "3" to "127" indicate the status of the module of ET 200MP selected with Mode. In this example, the status was set to Bit 3. For MODE = 2 (error in the module), this means that an error occurred in the first module ("DI32x24VDC\_HF\_1").

Figure 4-4: Diagnostic information ModuleStates

moduleStates	Struct		
laddr	HW_DEVICE	263	263
mode	UInt	2	2
retVal	Int	0	0
state	Array[0..127] of Bool		
state[0]	Bool	false	TRUE
state[1]	Bool	false	FALSE
state[2]	Bool	false	FALSE
state[3]	Bool	false	TRUE
state[4]	Bool	false	FALSE

### 4.9.5 Diagnostic information "GET\_DIAG"

In the following example the diagnostic status of the DI module "DI32x24VDC\_HF\_1" is put out according to the structure "DIS" (Parameter MODE = 1) in the parameter "DIAG". For the meaning of the individual parameter values of the structure "DIS", please refer to the TIA Portal online help. You will receive the following diagnostic information:

Table 4-25

Parameters	Value	Meaning
MaintenanceState	7	Error
ComponentStateDetail	Bit 6 = 1	Error in at least one channel or one component
OwnState	4	Error
IOState	Bit 4 = 1 Bit 15 = 1	Error Hardware error
OperatingState	0	-

Figure 4-5: Diagnostic information GET\_DIAG

getDiag	Struct		
laddr	HW_ANY	269	269
mode	UInt	1	1
retVal	Int	0	0
cntDiag	UInt	0	0
diagDis	DIS		
MaintenanceState	DWord	16#0	16#0000_0007
ComponentStateDetail	DWord	16#0	16#0000_8040
OwnState	UInt	0	4
IOState	Word	16#0	16#8010
OperatingState	UInt	0	0

**Note**

Further information on system diagnostics can be found in the application example "Diagnostics in the user program with S7-1500".

<https://support.industry.siemens.com/cs/ww/en/view/98210758>

## 5 Basics

### Basics for the system diagnosis

In the SIMATIC environment the diagnostics of devices and modules are summarized in the expression system diagnostics. The monitoring functions are automatically derived from the hardware configuration.

All the SIMATIC products refer to integrated diagnostic functions with which you can detect and repair faults. The components automatically report operational faults and supply additional detailed information. Diagnostics over the whole system can minimize downtimes.

In the running system, the following states are monitored by the system:

- Failure of a device
- Pull out/push in fault
- Module fault
- Periphery access fault
- Channel fault
- Configuration fault
- No supply voltage L+
- Broken wire
- Short circuit to ground

### System diagnostics are also possible in STOP

The system diagnostics are integrated in the firmware of the CPU S7-1500 and works independently from cyclic user programs. Therefore it is also available in the CPU operating mode STOP. Any faults are detected immediately and reported to the higher-level HMI devices, the web server, the display of the CPU S7-1500, the LED displays in the module concerned and in the TIA Portal even in the operating mode STOP. Therefore, the system diagnostics are always synchronous with the actual system status.

### Uniform diagnostic and display concept

All the connected diagnostic display media are supplied with the same system diagnostic information by a uniform mechanism.

### **Diagnostics in different languages**

The display of the system diagnostics is available in several languages:

- German
- English
- French
- Spanish
- Italian
- Japanese
- Chinese (simplified)
- Korean
- Russian
- Turkish
- Portuguese (Brazil)

## 6 Appendix

### 6.1 Service and support

#### Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

[support.industry.siemens.com](https://support.industry.siemens.com)

#### Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts. Please send queries to Technical Support via Web form:

[www.siemens.com/industry/supportrequest](https://www.siemens.com/industry/supportrequest)

#### SITRAIN – Digital Industry Academy

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

[www.siemens.com/sitrain](https://www.siemens.com/sitrain)

#### Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:

[support.industry.siemens.com/cs/sc](https://support.industry.siemens.com/cs/sc)

#### Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for iOS and Android:

[support.industry.siemens.com/cs/ww/en/sc/2067](https://support.industry.siemens.com/cs/ww/en/sc/2067)

## 6.2 Links and literature

Table 6-1

No.	Topic
\1\	Siemens Industry Online Support <a href="https://support.industry.siemens.com">https://support.industry.siemens.com</a>
\2\	Link to this entry page of this application example <a href="https://support.industry.siemens.com/cs/ww/en/view/68011497">https://support.industry.siemens.com/cs/ww/en/view/68011497</a>
\3\	SIMATIC S7-1500, ET 200MP, ET 200SP, ET 200AL, ET 200pro Diagnostics Function Manual <a href="https://support.industry.siemens.com/cs/ww/en/view/59192926">https://support.industry.siemens.com/cs/ww/en/view/59192926</a>
\4\	SIMATIC S7-1500, ET 200MP Automation system System Manual <a href="https://support.industry.siemens.com/cs/ww/en/view/59191792">https://support.industry.siemens.com/cs/ww/en/view/59191792</a>
\5\	SIMATIC S7-1500, SIMATIC Drive Controller, ET 200SP, ET 200pro Web server Function Manual <a href="https://support.industry.siemens.com/cs/ww/en/view/59193560">https://support.industry.siemens.com/cs/ww/en/view/59193560</a>
\6\	SIMATIC NET: Industrial Ethernet Switches SCALANCE X-200 Operating Instructions <a href="https://support.industry.siemens.com/cs/ww/en/view/102051962">https://support.industry.siemens.com/cs/ww/en/view/102051962</a>
\7\	Application example "Diagnostics in User Program with S7-1500" <a href="https://support.industry.siemens.com/cs/ww/en/view/98210758">https://support.industry.siemens.com/cs/ww/en/view/98210758</a>
\8\	HMI Templates for application examples <a href="https://support.industry.siemens.com/cs/ww/en/sc/2054">https://support.industry.siemens.com/cs/ww/en/sc/2054</a>

## 6.3 Change documentation

Table 6-2

Version	Date	Modifications
V1.0	05/2013	First version
V2.0	09/2020	Update to TIA Portal V16 Update 1