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## Operating instructions parameter setting for M200D AS I standard starter with FB19 (ASI\_CTRL)

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## 1. Scope of delivery

### 1.1. Operating range

This function block is written to parameterize a M200D AS-i Standard starter.

#### The example can be used at Step 7 V5.x and Step 7 V13

In this block the data set DS203 will be transferred to the starter. This block is important, if the data set DS203 is expected in the start-up mode.

It has to be used for SIEMENS AS-I Masters, which work with the AS-I Master function „ASi\_CTRL“ (FB19).

The function block can only be used with the communication processors CP342/CP343 and PROFIBUS DP/ASi-Links of SIEMENS.

For the IE/AS-INTERFACE LINK PN IO this function block **cannot** be used. For further information see documentation of the ASi master.

#### 1.1.1. CPUs

All CPUs of the SIEMENS series S7-300/400 can be used.

#### 1.1.2. AS-i Master

This function block can be used for following SIEMENS ASI-Master:

communication processor	MLFB
CP 343-2	6GK7 343-2AH0x-0XA0
CP 343-2 P	6GK7 343-2AH1x-0XA0
DP/AS-i Master	
DP/AS-i LINK Advanced	6GK1 415-2BAxx
DP/AS-Interface Link 20E	6GK1 415-2AAxx

## 1.2. Overview of the S7-blocks

block-number	description	comment
FB19	ASi_CTRL	Integrated in FB 213 as multiple instance
FB213	Parameter setting for motor starter M200D AS-I standard	Block-number can always be changed. FB can be used as a multiple instance.
UDT203	Data type for parameter	The parameter structure is indicated for the M200D AS-I Standard in this data type.

You find the description of the function block FB19 on the Internet:  
<http://support.automation.siemens.com/WW/view/en/51678777>

## 1.3. Necessary Software

- Step 7 from V5.4+SP4

Step 7 V5.5 serves as engineering software.

- Step 7 ab V13

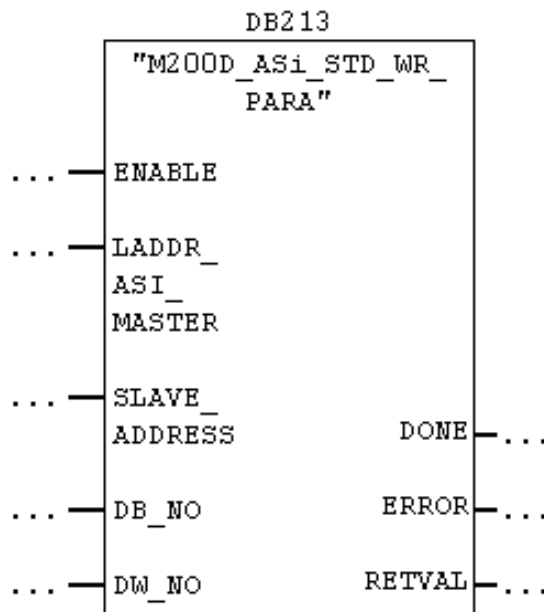
STEP 7 V13+SP1 serves as engineering software.

## 2. Implementation in S7 project

### 2.1. Step 7 blocks

The function block can be called from any block.

<b>Attention</b>	<p>The block can be contained several times in the user programme. Is this the case it must be ensured, that only one function block is active at the same time. This means, that only one „Enable“- Input may have the value „1“ at the same time.</p> <p>Parameter setting only can be executed if the motor starter is in "automatic" mode.</p>
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**The block number of FB213 can always be changed – the name DB213 is arbitrary as well here**

## 2.1.1. Parameter description:

Name : M200D\_ASI\_WR\_PARA

Name	Typ	Art	Memory area	comment
ENABLE	BOOL	I	I,O,M,D,L ,Constant	Trigger Parameter setting
LADDR_ASI_MASTER	INT	I	I,O,M,D,L ,Constant	PII address of respective AS-i Master
SLAVE_ADDRESS	INT	I	I,O,M,D,L ,Constant	AS-i Slave Address of the respective Motor Starter
DB_NO	INT	I	I,O,M,D,L ,Constant	The parameters are deposited detail DB in this
DW_NO	INT	I	I,O,M,D,L ,Constant	The parameters are deposited detail the first bytes in this
DONE	BOOL	O	I,O,M,D,L	Block has submitted parameters
ERROR	BOOL	O	I,O,M,D,L	A error has occurred
RETVAL	DWORD	O	I,O,M,D,L	Parameter setting successful or error.

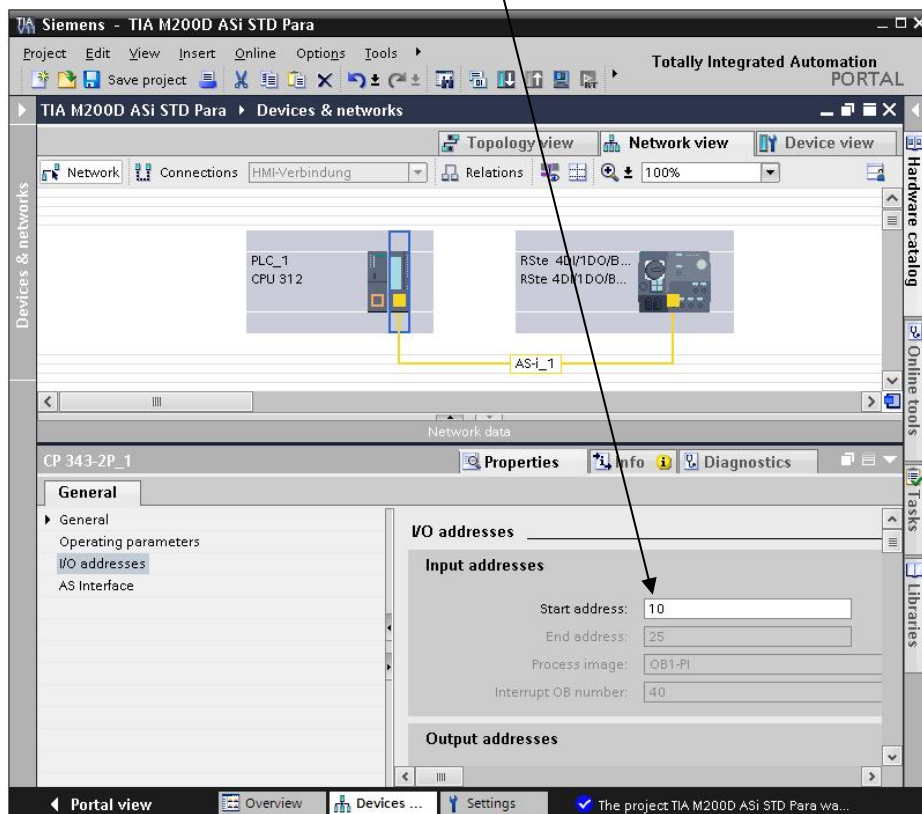
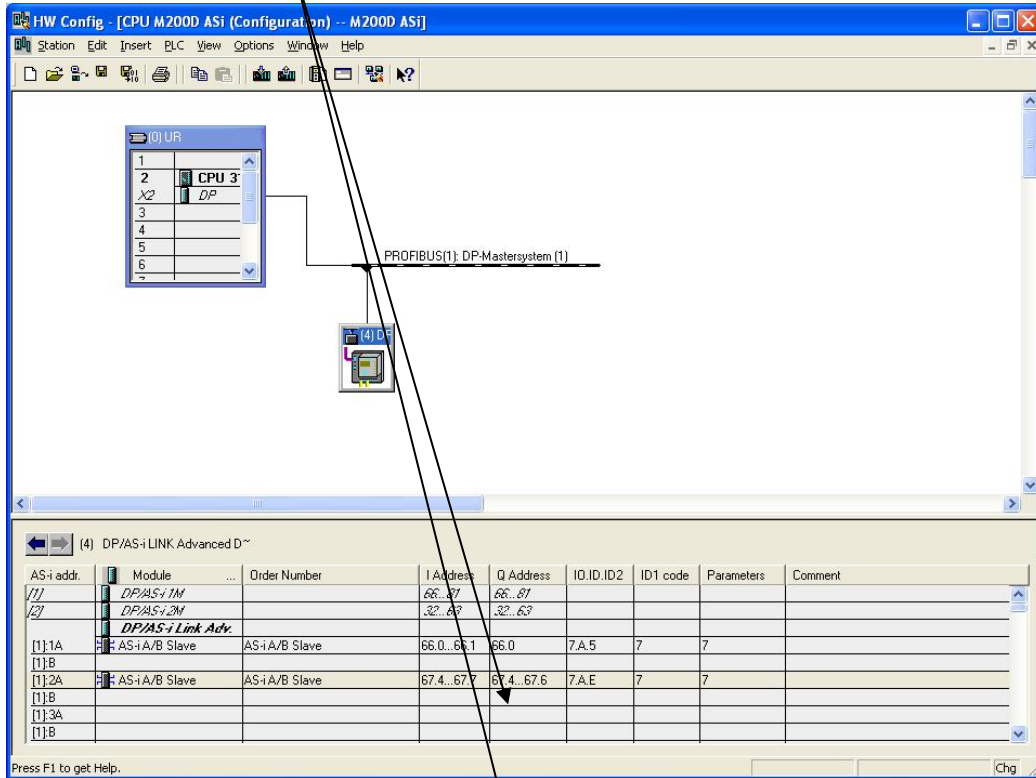
### 2.1.1.1. ENABLE

With this parameter the parameter setting is started. The parameter can to be set with an impulse.

A edge evaluation of the input constituent internally is carried out.

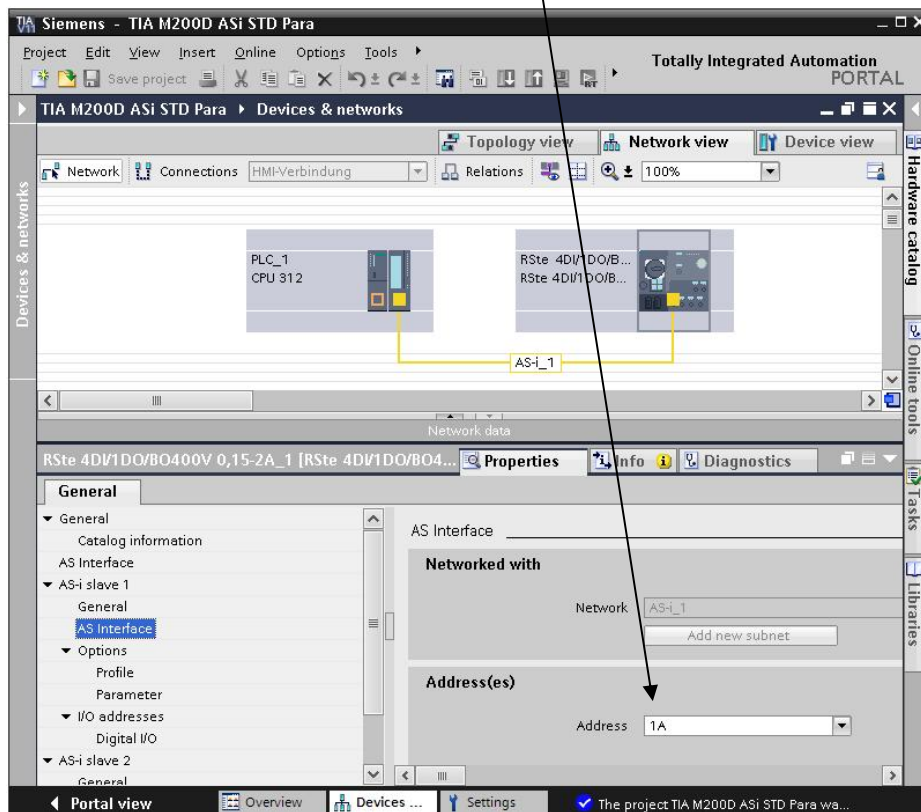
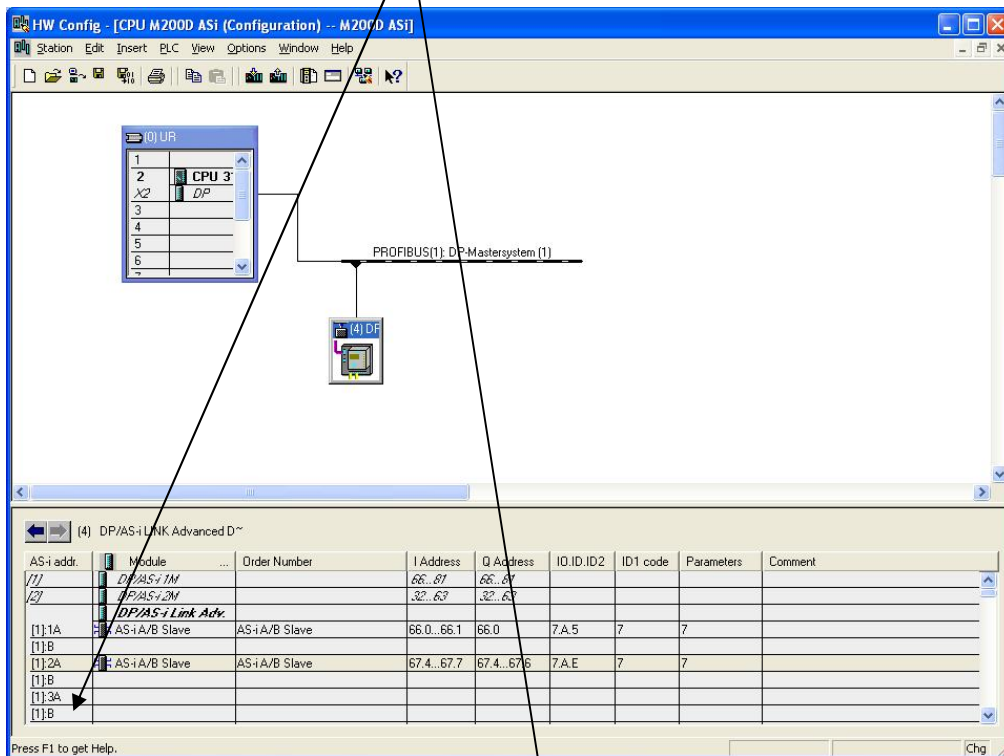
## 2.1.1.2. LADDR\_ASI\_MASTER

Here the start address of the process image input of the AS-i Master has to be set.



## 2.1.1.3. SLAVE\_ADDRESS

The slave address of the respective M200D Motor Starter has to be set here, with the IO.ID.ID2 7.A.5.





If the slave address is in B range you have added 32 to the address, for example 2B the address is  $2+32=34$ .

#### 2.1.1.4.DB\_NO

The parameters for a motor starter have to be deposited in a global data block. For the data block the enclosed UDT (UDT203 "DS203\_Parameter") can be used.

**Attention** A false detail of DB\_NO can lead to a STOP of the CPU!

#### 2.1.1.5.DW\_NO

The initial address has to be indicated here for the parameters in the DB\_NO.

**Attention** The length of the data block is not checked. A false detail of DW\_NO can lead to a STOP of the CPU!

#### 2.1.1.6.DONE

Is the motor starter parameters submitted are this parameter on TRUE. With this parameter the "ENABLE" also can be moved back.

#### 2.1.1.7.ERROR

Is the motor starter parameters submitted are this parameter on TRUE or block ends faults. Fault information look at RETVAL. With this parameter the "ENABLE" also can be moved back.

#### 2.1.1.8.RETVAL

In output parameter RETVAL either status information's or error information displayed, which are generated by the function block.

Value <sub>hex</sub>	Meaning
0	Inactive
1	Transmission active
2	Transmission finished without failure
8xyy	Error from SFC 20 (see RET_VAL SFC 20)
02 xx xx xx – 04 yy yy yy	Error from M200D (see manual M200D AS-I Standard Starter)

others	See description FB19
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### 3. Input of the parameters

The parameter data for the motor starter have to be deposited in a global data block. A data area of one's own has to be used for every motor starter with a different parameter setting. For the motor starters with the same Parametrising, the same data area can be used.

The header of the data set 203 (byte 0 – 3) will not be copied outside of the FB.

#### 3.1. Parameter setting

Byte-/Bit-Pos. UDT 203	Parameter	Range	Default
<b>Data (=technology data)</b>			
0...1	rated operational current $I_e$	[15 ... 200] 0,15 .. 2A [150 ... 1200] 1,5 .. 12A	[200] := 2A [1200] := 12A value * 0,01A
2 <sup>0...3</sup>	Tripping class	[0] CLASS 10 [1] CLASS 20 [3] CLASS 5 (10a) [4] CLASS 15 [15] CLASS OFF	[0] CLASS 10
2 <sup>4...6</sup>	Temperature sensor	[0] deactivated [1] Thermoclick [2] PTC Typ A	[0] deactivated
2 <sup>7</sup>	Reserved		
3 <sup>0...1</sup>	Response to overload – thermal motor model	[0] Trip without restart [1] Trip with restart [2] Warning	[0] Trip without restart
3 <sup>2...3</sup>	Response to overload – temperature sensor	[0] Trip without restart [1] Trip with restart [2] Warning	[0] Trip without restart
3 <sup>4...5</sup>	Response to no contact block supply voltage	[0] Group fault [1] Group fault only with ON command [2] Group warning	[0] Group fault
3 <sup>6</sup>	Response to limit violation	[0] Warning [1] Trip	[0] Warning
3 <sup>7</sup>	Response to residual current detection	[0] Warning [1] Trip	[1] Trip
4 <sup>0...1</sup>	Response to circuit breaker OFF	[0] Group fault [1] Group fault only with ON command [2] Group warning	[0] Group fault
4 <sup>2</sup>	Response to asymmetry	[0] Warning [1] Trip	[1] Trip
4 <sup>3</sup>	Connector monitoring	[0]: deactivated [1]: line side	[0] deactivated
4 <sup>4...7</sup>	Reserved		
5 <sup>0...3</sup>	Response when connector is unplugged	[0] Group fault [1] Group fault only with ON command [2] Group warning	[0] Group fault
5 <sup>4</sup>	Group diagnostics	[0] block [1]enable	[0] blocked
5 <sup>5</sup>	Response to CPU/Master-STOP	[0] Switch substitute value [1] Retain last value	[0] Switch substitute value

Byte-/Bit-Pos. UDT 203	Parameter	Range	Default
5 <sup>6...7</sup>	reserved		
6	Lower current limit	[6 ... 32] 18,75 ... 100 % [0] deactivated	[6] := 18,75% Value * 3,125%
7	Upper current limit	[16 ... 128] 50 % ... 400 % [0] deactivated	[36] :=112,5% value * 3,125%
8 <sup>0</sup>	Input 1 - Level	[0] NC [1] NO	[1] NO
8 <sup>1</sup>	Input 2 - Level	[0] NC [1] NO	[1] NO
8 <sup>2</sup>	Input 3 - Level	[0] NC [1] NO	[1] NO
8 <sup>3</sup>	Input 4 - Level	[0] NC [1] NO	[1] NO
8 <sup>4</sup>	Input 1 - Signal	[0] non-retentive [1] retentive	[0] non-retentive
8 <sup>5</sup>	Input 2 - Signal	[0] non-retentive [1] retentive	[0] non-retentive
8 <sup>6</sup>	Input 3 - Signal	[0] non-retentive [1] retentive	[0] non-retentive
8 <sup>7</sup>	Input 4 - Signal	[0] non-retentive [1] retentive	[0] non-retentive
9 <sup>0...3</sup>	Input 1 - Action	[0] No action	[0] No action
9 <sup>4...7</sup>	Input 2 - Action	[1] Trip without restart	[0] No action
10 <sup>0...3</sup>	Input 3 - Action	[2] Trip with restart	[0] No action
10 <sup>4...7</sup>	Input 4 - Action	[3] Trip end position CW [4] Trip end position CCW [5] Group warning [6] Manual operation local [7] Emergency start [8] Motor CW [9] Motor CCW [11] Quickstop [12] Trip-Reset [13] Cold run	[0] No action
11 <sup>0...1</sup>	Output 1 - Level	[0]: non-inverted [1]: inverted [2 ... 3]: reserved	[0] non-inverted
11 <sup>2...5</sup>	Output 1 - Signal	[0]: continuous [1]: flashing [6 ... 15]: reserved	[0] continuous
11 <sup>6...7</sup>	reserved		
12	Output 1 - Action	[0]: No action [01]: Control source PIO DO2 Slave 1 (Output 1) [06]: Control source Input 1 [07]: Control source Input 2 [08]: Control source Input 3 [09]: Control source Input 4 [10]: Run up [11]: Operating / Shunting [12]: Coasting down [13]: ON time motor (RUN) [14]: Control command motor (ON) [17]: Break output [18]: Device ON (PWR-AUX) [30]: Group prewarning [31]: Group warning [32]: Group fault [33]: Bus error [34]: Device error [38]: Ready for motor on	[1] PIO DO2 (X) Output
13	Starting time	[0 .. 120] 0 ... 30 s [0] minimum ramp (100 ms)	[20] := 5s Value * 0,25s

Byte-/Bit-Pos. UDT 203	Parameter	Range	Default
14	Run-down time	[0 .. 120] 0 ... 30 s [0] Function deactivated	[0] := 0s Value* 0,25s
15	Starting voltage	[4 ... 20] 20 ... 100 %	[8] := 40% Value* 5%
16	Stopping voltage	[4 ... 18] 20 ... 90 %	[8] := 40% Value* 5%
17	Current limit value	[40 ... 192] 125 ... 600 % for $I_e \geq 9 \text{ A} \rightarrow 125 \% \dots 550\%$	[192] 600% value* 3,125%
18 <sup>0..3</sup>	Startup mode	[0] direct [1] Voltage ramp [4] Current limit [5] Voltage ramp + Current limit	[0] Direct
18 <sup>4..7</sup>	Run-down type	[0] Run-down without load [1] Voltage ramp	[0] Run-down without load
19	Prewarning limit motor heading	[0 .. 19] 0 ... 95 %; [0] = deactivated	[0] deactivated Value * 5%
20..21	Release delay time of brake on startup	[-250 ... 250] - 2,5 ... 2,5 s	[0] := 0s Value * 0,01s
22..23	Brake holding time on stopping	[0 ... 2500] 0 ... 25 s	[0] := 0s Value * 0,01s

**NOTE** The default values are deposited in the UDT 203!

### 3.1.1. Examples of parameter setting

Since several parameters are summarized in some bytes, these bytes are declared in the UDT as BOOL.

#### Tripping class

	CLASS 10 (default)	CLASS 20	CLASS 5 (10a)	CLASS 15	CLASS OFF
Bit 2 <sup>0</sup>	0	1	1	0	1
Bit 2 <sup>1</sup>	0	0	1	0	1
Bit 2 <sup>2</sup>	0	0	0	1	1
Bit 2 <sup>3</sup>	0	0	0	0	1

#### Temperature sensor

	Deactivated (default)	Thermoclick	PTC Typ A
Bit 2 <sup>4</sup>	0	1	0
Bit 2 <sup>5</sup>	0	0	1
Bit 2 <sup>6</sup>	0	0	0

#### Response to overload – thermal motor model

	Trip without restart <b>(default)</b>	Trip with restart	Warning
<b>Bit 3<sup>0</sup></b>	0	1	0
<b>Bit 3<sup>1</sup></b>	0	0	1

Response to overload – temperature sensor

	Trip without restart <b>(default)</b>	Trip with restart	Warning
<b>Bit 3<sup>2</sup></b>	0	1	0
<b>Bit 3<sup>3</sup></b>	0	0	1

Response to no contact block supply voltage

	Group fault <b>(default)</b>	Group fault only with ON command	Group warning
<b>Bit 3<sup>4</sup></b>	0	1	0
<b>Bit 3<sup>5</sup></b>	0	0	1

Response to circuit breaker OFF

	Group fault <b>(default)</b>	Group fault only with ON command	Group warning
<b>Bit 4<sup>0</sup></b>	0	1	0
<b>Bit 4<sup>1</sup></b>	0	0	1

Response when connector is unplugged

	Group fault <b>(default)</b>	Group fault only with ON command	Group warning
<b>Bit 5<sup>0</sup></b>	0	1	0
<b>Bit 5<sup>1</sup></b>	0	0	1

Input Action (all inputs)

The parameter setting of the initial actions has to be carried out in the bytes 9 and 10. The detail is carried out as hexadecimal value.

	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[11]	[12]	[13]
<b>Byte 9 IN1</b>	00	01	02	03	04	05	06	07	08	09	0B	0C	0D
<b>Byte 9 IN2</b>	00	01	02	03	04	05	06	07	08	09	0B	0C	0D
<b>Byte 10 IN3</b>	00	10	10	30	40	50	60	70	80	90	B0	C0	D0
<b>Byte 10 IN4</b>	00	10	10	30	40	50	60	70	80	90	B0	C0	D0

- [0] No action (0<sub>hex</sub>) **(default)**
- [1] Trip without restart (1<sub>hex</sub>)
- [2] Trip with restart (2<sub>hex</sub>)
- [3] Trip end position CW (3<sub>hex</sub>)
- [4] Trip end position CCW (4<sub>hex</sub>)
- [5] Group warning (5<sub>hex</sub>)
- [6] Manual operation local (6<sub>hex</sub>)
- [7] Emergency start (7<sub>hex</sub>)
- [8] Motor CW (8<sub>hex</sub>)
- [9] Motor CCW (9<sub>hex</sub>)
- [11] Quickstop (B<sub>hex</sub>)
- [12] Trip-Reset (C<sub>hex</sub>)
- [13] Cold run (D<sub>hex</sub>)

### Startup mode

The parameter setting of the startup mode has to be carried out in byte 18. The detail is carried out as hexadecimal value.

	Direct <b>(default)</b>	Voltage ramp	Current limit	Voltage ramp + Current limit
<b>Byte 18</b>	00	01	02	05

### Run-down type

The parameter setting of the run-down type has to be carried out in byte 18. The detail is carried out as hexadecimal value.

	Run-down without load <b>(default)</b>	Voltage ramp
<b>Byte 18</b>	00	10