10.12 Input and Output Modules

For the appertaining software function blocks refer to the description of the used operating system.

10.12.1 Digital Input Modules

Contact	Prox. switch	safety-related SIL 3	Line Control	(Ex)i	Counter	Space requirement	Type	Channels	Slot detection
•						4 SU	F 3221	16	-
•	•					4 SU	F 3222	8	-
•	•			•		4 SU	F 3224A	4	-
•		•				4 SU	F 3236	16	•
	•	•	•			4 SU	F 3237	8	•
	•	•	•	•		8 SU	F 3238	8	•
•	•	•				4 SU	F 3240	16	•
• 48 V		•				4 SU	F 3248	16	•
•					•	4 SU	F 5203	1	-
	•	•			•	4 SU	F 5220	2	•

Table 7: Digital Input Modules

SU = spacing units (width)

10.12.2 Analog Input Modules

0/4... 20 mA	Voltage	safety-related SIL 3	Pt 100	(Ex)i	Space requirement	Type	Channels	Slot detection
•	0...1/5/10 V	•			4 SU	F 6214	4	•
•	0...1/5/10 V		•		4 SU	F 6215	8	-
•	0...1/5/10 V		•		8 SU	F 6216A	8	-
•	0...5/10 V	•			4 SU	F 6217	8	•
	TC, -100...100 mV	•	•	•	4 SU	F 6220	8	•
•	0...1 V	•		•	4 SU	F 6221	8	•

Table 8: Analog Input Modules

TC = Thermocouple SU = spacing units (width)

10.12.3 Digital Output Modules

24 VDC	> 24 V	safety-related SIL 3	Line Control	Load	Space requirement	Type	Channels	Slot detection
•				≤ 0.5 A	4 SU	F 3322	16	•
		only with F 6221 •		Transmitter supply (Ex)i ≤ 22 V, ≤ 60 mA	4 SU	F 3325	6	-
•		•		≤ 0.5 A	4 SU	F 3330	8	•
•		•	•	≤ 0.5 A	4 SU	F 3331	8	•
•				≤ 2 A	4 SU	F 3332	4	•
•		•		≤ 2 A	4 SU	F 3333	4	•
•		•	•	≤ 2 A	4 SU	F 3334	4	•
		•		(Ex)i ≤ 24 V, 12 mA	4 SU	F 3335	4	•
	•	•		≤ 0.5 A, 48 V	4 SU	F 3348	8	•
•	•	•	•	≤ 0.5 A, 24 V or 48 V	4 SU	F 3349	8	•
	•			≤ 4 A, ≤ 60 V	4 SU	F 3422	8	•
	•	•		≤ 4 A, ≤ 110 VDC, ≤ 250 VAC	4 SU	F 3430	4	•

Table 9: Digital Output Modules

SU = spacing units (width)

10.12.4 Analog Output Modules

24 VDC	> 24 V	safety-related SIL 3	Line Control	Load	Space requirement	Type	Channels	Slot detection
		•		0...20 mA	4 SU	F 6705	2	•
				0...20 mA	4 SU	F 6706	2	•

Table 10: Analog Output Modules

SU = spacing units (width)

10.13 General Notes on the Data Sheets

10.13.1 I/O Modules

The block diagrams in the data sheets always show the direction of signal flow from top to bottom.

For input modules the input signal (from sensor, proximity switch etc.) is lead via the cable connector and input module to the I/O bus or in the mechanical principle from the front to the rear side of the I/O subrack.

For output modules the result of the logic operation in the user program is connected from the I/O bus to the output amplifier via the cable connector to the actuator (relay, solenoid valve etc.). The mechanical principle is from the rear to the front side of the I/O subrack.

In the block diagrams the 5 V and 24 V operating voltages connections are shown.

10.13.2 Modules within the Central Subrack

Here you can see the essential components and the positions of switches and jumpers. Additionally the front plate is shown. The essential functions are described in the system descriptions (chapter 3 for the H41q and chapter 4 for the H51q as well as the data sheets of the systems/assembly kits).

10.13.3 Communication Modules

Applications for the using of the communication modules are described in the appertaining data sheets.

10.13.4 Symbols in the Data Sheet Diagrams

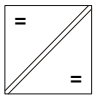
Function unit and signal converter

Function unit and signal converter with galvanic isolation

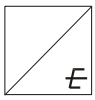
Function unit and signal converter with safe isolation

Trigger stage (threshold input)

Amplifier in direction of signal flow



DC/DC converter



Transmitter

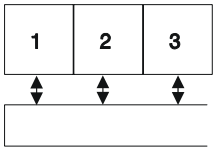
Analog/Digital converter

Digital/Analog converter

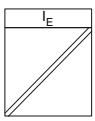
Automatic testing for operation

Signal contraction

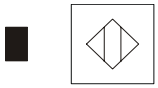
Channel numbers according to "Modify Cabinet“ in ELOP II



Module with automatical test functions



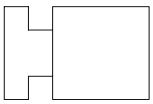
Threshold input for line break and line short-circuit monitoring



Proximity switch without attenuation, high current to the amplifier

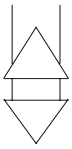
Proximity switch with attenuation, low current to the amplifier

Input filter, testable



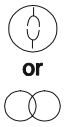
Control block for registers

Multiplexer

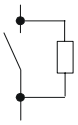


I/O bus

Indicator light (LED), off
no. of the channel
Indicator light (LED), on (in function tables)



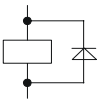
Current source



Sensor with resistor as near as possible at the contact

Diode

Light-emitting diode (LED)



Relay with reverse current diode

Resistance thermometer Pt 100

Fuse

Power source

4 F	At inputs: Load of the signal 4 F = 8 mA at 24 V signal range: +13...+33 V
100 F	At outputs: Loadability of the signal 100 F = 200 mA
≤ 15 W	Loadability of the output ≤ 15 W
L+	Positive pole of the 24 VDC supply voltage
L-	Reference pole of the 24 VDC supply voltage
+5 V	Positive pole of the microprocessor system
GND	Reference pole of the microprocessor system

10.13.5 Color Code for Lead Marking in Accordance to DIN IEC 60757

BK	black	VT	violet
BN	brown	GY	gray
RD	red	WH	white
OG	orange	PK	pink
YE	yellow	GD	gold
GN	green	TQ	turquoise
BU	blue	SR	silver

10.13.6 Description of the Order Code for Cable Plugs

Standard cable plugs: see HIMA price list