SIEMENS

SIMATIC HMI

Direct key module

Product Manual

This manual is a component of the direct key module with the order no. 6AV7671-7DA00-0AA0.

Contents

Release 06/01

A5E00100668B-01

Safety notes

This manual includes notes that you must heed for your own personal safety as well as to prevent damage to property. The notes are displayed as follows, in accordance with the degree of risk involved:

Danger

means that death or serious physical injury will occur if the relevant safety precautions are not taken.

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Caution

with a warning triangle means that minor physical injury may occur if the relevant safety precautions are not taken.

Caution

without a warning triangle means that damage to property may occur if the relevant safety precautions are not taken.

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Note

is important information about the product, handling the product or the particular part of the documentation to which your attention is being specially drawn.

Qualified personnel

Only suitably qualified personnel should install and operate a device. Qualified personnel, in the sense of the safety notes in this manual, are people who are authorized to commission, ground and mark devices, systems and electric circuits in accordance with the safety standards.

Use as prescribed

Please note the following:

Warning

The device must only be used as designated in the catalog and in the technical reference manual and only in conjunction with third-party devices and components that are recommended and approved by Siemens.

The machine in which these components are incorporated must not be started up until it has been ascertained that it conforms to the specifications of Directive 98/37 EU .

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Siemens Aktiengesellschaft

Order no. –

Preface

This manual

This product manual is part of SIMATIC HMI documentation.

The present product manual provides information for operators, fitters, members of the project team and system support about installation, function, operator action and the technical design of the direct key module.

Notation

The following notation is used in this product manual:

`Engine off`	Text displayed on the control panel is in typescript.
`Variable`	Symbolic names standing for variable values on the screen are written in italic typescript.
Screens	Selectable functions appear in italic standard print.
ESC	The designations of keys and buttons appear in a different print.

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Shortforms

The shortforms used in this product manual have the following meanings:

DP	Distributed I/Os
ESD	Electrostatic sensitive devices
EMC	Electromagnetic compatibility
HMI	Human-machine interface
DI	Digital input
DO	Digital output
LCD	Liquid crystal display
LED	Light emitting diode
MPI	Multipoint interface (SIMATIC S7)
PLC	Programmable Logic Control
PG	Programming device
SPS	Programmable controller

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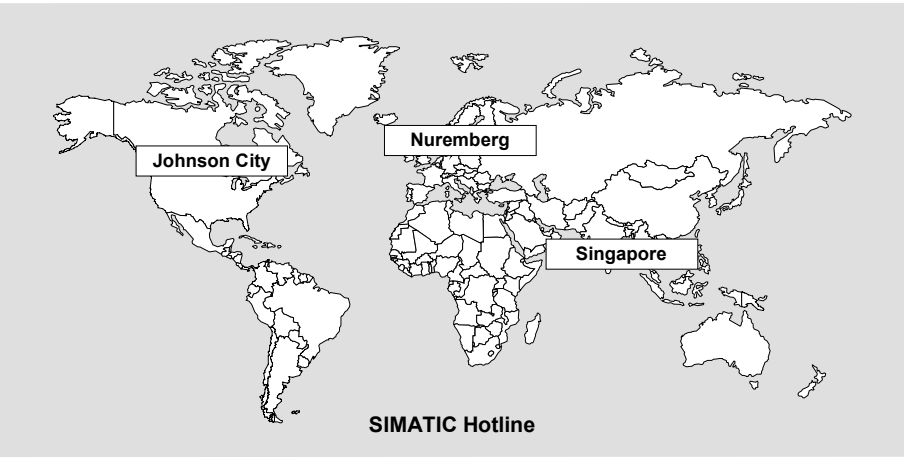

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- You can find your local contact person for Automation & Drives in our contact person database
  - on the **Internet** at http://www3.ad.siemens.de/partner/search.asp

Contents

1 General

The direct key module is a module that can be used in conjunction with a SIMATIC panel PC 670 and 870 with an integrated membrane keyboard (referred to below as a "panel PC").

The direct key module is suitable for use with panel PCs,

- that are assembled as a unit or
- where the front panel and the PC box (see Figure 7–2) are separate.

The direct key module has an interface for connection to an external transfer module (see Chapter 10).

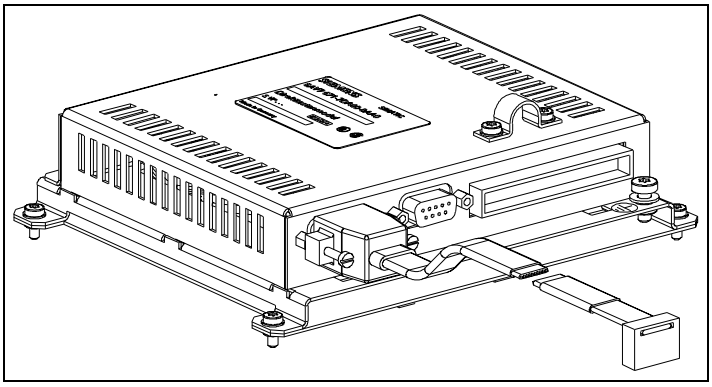


Figure 1–1 Direct key module with cable to panel PC

This module can be used to assign digital events to certain keys of the membrane keyboard on the panel PC. This means that an SPS digital input can be controlled by key operation. The module is implemented as a PROFIBUS-slave – the data is therefore downloaded thro a standard field bus.

The direct key module extends panel PC functionality as follows:

- Up to 32 keys of the panel PC membrane keyboard can be queried by the PROFIBUS as direct keys.
- If required, up to 16 additional keys can be connected from an external control panel.
- 16 digital outputs are available to drive the indicator lights (by SPS via PROFIBUS-DP) in any external control panels that exist.
- All the direct keys can be queried by SPS via PROFIBUS-DP.
- The PROFIBUS-DP interface is designed for baud rates of from 9.6 kBaud to 12 MBaud.

Note

The direct key module is suitable for use with the following panel PC front versions:
– 10" display from version E
– 12" display from version E
– 15" display from version C

2 Description of functions

Usage

The direct key module is used to query keys via PROFIBUS-DP in a defined cycle clock. The direct key module is therefore handled on PROFIBUS-DP as a PROFIBUS standard slave.

Mode of operation

The direct key module always works on PROFIBUS-DP as a slave. Activation or querying of the direct key module is always done thro a DP master. The DP master addresses the direct key module via layer 2 of the ISO reference model. Once the direct key module has received a successful PROFIBUS message, it automatically generates the requested response messages (under DIN E19245 T3). The organization for the digital inputs and outputs and the type of data communication is fixed at the slave. Data communication to and from the direct key module is always consistent (fixed).

As well as the keyboard query of 32 direct keys (assigned to the digital inputs DI 0.0-0.7, DI 1.0-1.7, DI 4.0-4.7 and DI 5.0-5.7), the PROFIBUS-DP gives you the option with this module of querying or controlling 16 digital outputs (DO 0.0-0.7 and DO 1.0-1.7) with 24V / 100mA and 16 digital inputs (DI 2.0-2.7 and DI 3.0-3.7) with 24V levels.

Once set, the PROFIBUS address (station address) is stored in the direct key module and is retained even after the panel PC has been switched off, or there has been a power failure.

Note

On delivery, the PROFIBUS address (station address) is set to 126. Once it has been incorporated, the user can parameterize a direct key module supplied in accordance with DP rules with the default address 126 with the required address (node assignment). This address setting is essential, as otherwise data cannot be exchanged with the direct key module (by definition, DP stations with the address 126 do not take part in a data exchange).

Address setting

The device must not be open for the address setting. The address of the direct key module is set via the PROFIBUS. However, there must be a device available with DP access software:

- ET200 hand-held device or
- PG/PC with MPI/DP interface or
- SIMATIC PC

The following software must be installed on the device:

- STEP 7 software (hardware config.) or
- COMPROFIBUS software.

For the address setting to be successful, a PROFIBUS-DP connection must be established between the direct key module and the device being used.

Attach the DP connector (9-pin sub D socket connector) of the direct key module to the MPI/DP interface of the device on which the DP access software is installed.

When using STEP 7 software, proceed as follows:

- Start SIMATIC Manager.
- In the SIMATIC Manager *Target System* menu, select the *Assign PROFIBUS Address* function. The SIMATIC Manager then gets in contact with the direct key module. A dialog box displaying the currently set direct key module address appears, in which you can enter a new address (`1, 3-125`).
- Set the required address.
- Exit SIMATIC Manager.

If you want to use other PROFIBUS configuring tools, you need the device master file (GSD file). This is on the direct key module disk, in the *gsd* folder.

Software

For system configuration, we recommend SIMATIC products (e.g. STEP 7 software, COM PROFIBUS or COM LDP) or configuration software from third-party suppliers.

To program the direct keys (S1-S16, F1-F20) on the panel PC, use the *KeyPad* software tool. This tool allows you to change the key codes of all the keys.

Installation

The *KeyPad* software tool is located in the *keypad* folder

- on the installation disk included with the direct key module, as well as
- on the "Documentation & Drivers Panel PC 670/870" CD accompanying every panel PC.

It contains the requisite **.exe* installation file for the 10"-, 12"- or 15" panel PC:

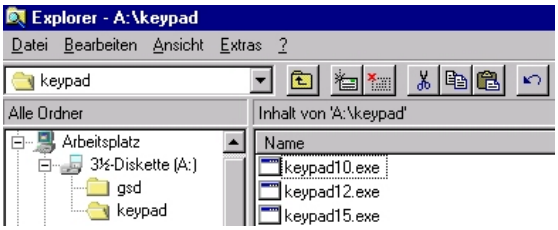


Figure 2–1 Installation files for KeyPad

Operator action

- In the folder that, according to the designation, is suitable for the display size of the panel PC, open the *keypad??.exe* file. This opens the following window.

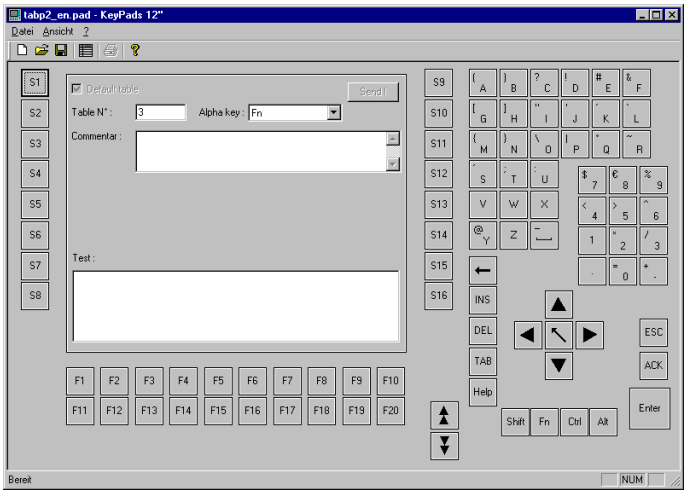


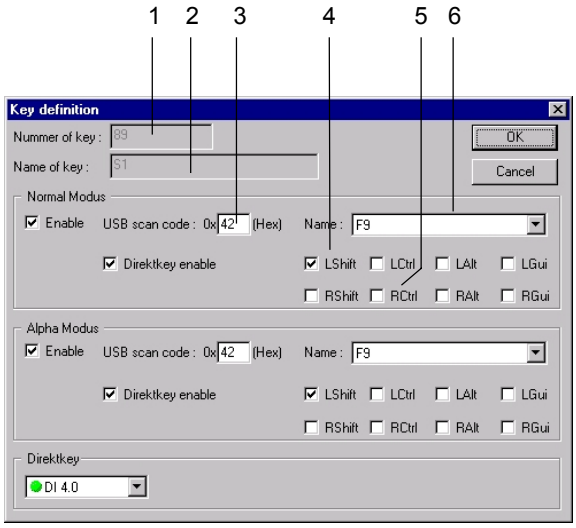
Figure 2–2 KeyPad software tool open

- Select *File* → *Open*.
- Select the PAD file on offer.
  This calls a default key code. Here the keys F1-F16 and S1-S16 are preset as direct keys.

Note

The *Keypad* tool is suitable for use with the Windows 98 or Windows 2000 operating systems.

When you select a function key or a system key, the *Key definition* window appears with the *Directkey* border.



1 … Keyboard number
2 … Keyboard name
3 … Left-hand keyboard keys
4 … Right-hand keyboard keys
5 … Keyboard code as per Table 2–1 and Table 2–2
6 … Direct key selected

Figure 2–3 Window key definition

Figure 2–3 shows the fields *Normal mode* and *Alpha mode*. In the *Normal mode* field, you can assign the keys that are to be entered directly, or by using the Shift key. For *Alpha mode*, you must always press the alpha key specified in Figure 2–2.

- Mark the *Directkey enable* checkbox in the *Normal mode* and *Alpha mode* fields, so that the direct key function is effective for the selected key.

  This calls a default digital input in the *Direct key* border, which can be changed in accordance with the options in the list box. The meaning of the colors is as follows:

  – Green: Assigned to the set key
  – Red: Assigned to another key
  – Grey: Not used yet

- Select the digital input here.

The following table shows the key number and USB scan code assignment to the keyboard key.

Key number Number of key	**USB scan code[1]**	**Keyboard key Name of key**
KEY 1:	43, 15	; F10
KEY 2:	41/s	; F20 (shift F8)
KEY 3:	09	; F
KEY 3a1:	24/s	; &
KEY 4:	08	; E
KEY 4a1:	20/s	; #
KEY 5:	07	; D
KEY 5a1:	1e/s	; !
KEY 6:	06	; C
KEY 6a1:	38/s	; ?
KEY 7:	05	; B
KEY 7a1:	27/s	;)
KEY 8:	04	; A
KEY 8a1:	26/s	; (
KEY 9:	42, 16	; F9
KEY 10:	40/s	; F19 (shift F7)
KEY 11:	0f	; L

[1] The USB Scan Code comprises the :
– USB Scan Code number,
– an s for Shift key or c for Ctrl key or
– the direct key number.

KEY 11a1:	35	; `
KEY 12:	0e	; K
KEY 12a1:	34/A	; ´
KEY 13:	0d	; J
KEY 13a1:	34	; '
KEY 14:	0c	; I
KEY 14a1:	34/s	; "
KEY 15:	0b	; H
KEY 15a1:	30	;]
KEY 16:	0a	; G
KEY 16a1:	2f	; [
KEY 17:	41, 1	; F8
KEY 17a1:	41, 1	; F8
KEY 18:	3f/s	; F18 (shift F6)
KEY 18a1:	3f/s	; F18
KEY 19:	15	; R
KEY 19a1:	35/s	; ~
KEY 20:	14	; Q
KEY 20a1:	33/AS	; °
KEY 21:	13	; P
KEY 21a1:	31/s	; '
KEY 22:	12	; O
KEY 22a1:	31	; \
KEY 23:	11	; N
KEY 23a1:	30/s	; }
KEY 24:	10	; M
KEY 24a1:	2f/s	; {
KEY 25:	40, 2	; F7
KEY 25a1:	40, 2	; F7
KEY 26:	3e/s	; F17 (shift F5)
KEY 26a1:	3e/s	; F17
KEY 27:	26	; 9
KEY 27a1:	22/s	; %

KEY 28:	25	; 8
KEY 28a1:	22/A	; €
KEY 29:	24	; 7
KEY 29a1:	21/s	; $
KEY 30:	18	; U
KEY 30a1:	33/s	; :
KEY 31:	17	; T
KEY 31a1:	33	; ;
KEY 32:	16	; S
KEY 32a1:	36	; ,
KEY 33:	3f, 3	; F6
KEY 33a1:	3f, 3	; F6
KEY 34:	3d/s, 9	; F16 (shift F4)
KEY 34a1:	3d/s, 9	; F16
KEY 35:	23	; 6
KEY 35a1:	23/s	; ^
KEY 36:	22	; 5
KEY 36a1:	37/s	; >
KEY 37:	21	; 4
KEY 37a1:	36/s	; <
KEY 38:	1b	; X
KEY 38a1:	1b	; X
KEY 39:	1a	; W
KEY 39a1:	1a	; W
KEY 40:	19	; V
KEY 40a1:	19	; V
KEY 41:	3e, 4	; F5
KEY 41a1:	3e, 4	; F5
KEY 42:	3c/s, 10	; F15 (shift F3)
KEY 42a1:	3c/s, 10	; F15
KEY 43:	20	; 3
KEY 43a1:	38	; /
KEY 44:	1f	; 2

KEY 44a1:	25/s	; *
KEY 45:	1e	; 1
KEY 45a1:	1e	; 1
KEY 46:	2c	; (BLANK)
KEY 46a1:	2d/s	; _
KEY 47:	1d	; Z
KEY 47a1:	1d	; Z
KEY 48:	1c	; Y
KEY 48a1:	1f/s	; @
KEY 49:	3d, 5	; F4
KEY 49a1:	3d, 5	; F4
KEY 50:	3b/s, 11	; F14 (shift F2)
KEY 50a1:	3b/s, 11	; F14
KEY 51:	56	; -
KEY 51a1:	57	; +
KEY 52:	27	; 0
KEY 52a1:	2e	; =
KEY 53:	37	; .
KEY 53a1:	37	; .
KEY 56:	2a	; (Backspace)
KEY 56a1:	2a	; (Backspace)
KEY 57:	3c, 6	; F3
KEY 57a1:	3c, 6	; F3
KEY 58:	3a/s, 12	; F13 (shift F1)
KEY 58a1:	3a/s, 12	; F13
KEY 61:	52	; (CURSOR UP)
KEY 61a1:	52	; (CURSOR UP)
KEY 62:	4b	; (PAGE UP)
KEY 62a1:	4b	; (PAGE UP)
KEY 63:	4e	; (PAGE DOWN)
KEY 63a1:	4e	; (PAGE DOWN)
KEY 64:	49	; (INSERT)
KEY 64a1:	49	; (INSERT)

KEY 65:	3b, 7	; F2
KEY 65a1:	3b, 7	; F2
KEY 66:	45, 13	; F12
KEY 66a1:	45, 13	; F12
KEY 67:	29	; (ESC)
KEY 67a1:	29	; (ESC)
KEY 68:	4f	; (CURSOR RIGHT)
KEY 68a1:	4f	; (CURSOR RIGHT
KEY 69:	4a	; (HOME)
KEY 69a1:	4a	; (HOME)
KEY 70:	50	; (CURSOR LEFT)
KEY 70a1:	50	; (CURSOR LEFT)
KEY 72:	4c	; (DELETE)
KEY 72a1:	4c	; (DELETE)
KEY 73:	3a, 8	; F1
KEY 73a1:	3a, 8	; F1
KEY 74:	44, 14	; F11
KEY 74a1:	44, 14	; F11
KEY 75:	3a/a	; (ACK - ALT F1)
KEY 75a1:	3a/a	; (ACK - ALT F1)
KEY 76:	28	; (ENTER)
KEY 76a1:	28	; (ENTER)
KEY 77:	51	; (CURSOR DOWN)
KEY 77a1:	51	; (CURSOR DOWN)
KEY 79:	0b/a	; (HELP)
KEY 79a1:	0b/a	; (HELP)
KEY 80:	2b	; (TAB)
KEY 80A1:	2b/s	; (SHIFT TAB)
KEY 81:	00/c	; (CONTROL)
KEY 81a1:	00/c	; (CONTROL)
KEY 82:	00/s	; (SHIFT)

KEY 82A1:	39	; (CAPS LOCK)
KEY 83:	00/a	; (ALT)
KEY 83a1:	00/a	; (ALT)

Table 2–1 Keyboard codes for function keys and alphanumeric keys

Key number Number of key	USB scan code[1]	Keyboard key Name of key
KEY 89:	42/s, 24	; S1
KEY 89a1:	42/s, 24	; S1
KEY 90:	43/s, 23	; S2
KEY 90a1:	43/s, 23	; S2
KEY 91:	44/s, 22	; S3
KEY 91a1:	44/s, 22	; S3
KEY 92:	45/s, 21	; S4
KEY 92a1:	45/s, 21	; S4
KEY 93:	3a/c, 20	; S5
KEY 93a1:	3a/c, 20	; S5
KEY 94:	3b/c, 19	; S6
KEY 94a1:	3b/c, 19	; S6
KEY 95:	3c/c, 18	; S7
KEY 95a1:	3c/c, 18	; S7
KEY 96:	3d/c, 17	; S8
KEY 96a1:	3d/c, 17	; S8
KEY 97:	3e/c, 32	; S9
KEY 97a1:	3e/c, 32	; S9
KEY 98:	3f/c, 31	; S10
KEY 98a1:	3f/c, 31	; S10
KEY 99:	40/c, 30	; S11
KEY 99a1:	40/c, 30	; S11
KEY 100:	41/c, 29	; S12

[1] The USB Scan Code comprises the :
– USB Scan Code number,
– an s for Shift key or c for Ctrl key or
– the direct key number.

KEY 100a1:	41/c, 29	; S12
KEY 101:	42/c, 28	; S13
KEY 101a1:	42/c, 28	; S13
KEY 102:	43/c, 27	; S14
KEY 102a1:	43/c, 27	; S14
KEY 103:	44/c, 26	; S15
KEY 103a1:	44/c, 26	; S15
KEY 104:	45/c, 25	; S16
KEY 104a1:	45/c, 25	; S16

Table 2–2 Keyboard codes for softkeys

Note

The values in the "USB scan code" column in Table 2–2 are the default settings for the *KeyPad* software tool.

3 The logical organization of digital inputs and outputs

Digital inputs DI 0.0-5.7 are defined as a block, on the basis of the slave-controller module used (preset at the slave). The start address for the block, on the other hand, can be chosen freely. The block comprises the 32 direct keys of the SIMATIC PC membrane keyboard (DI 0.0-0.7, DI 1.0-1.7, DI 4.0-4.7 and DI 5.0-5.7) and 16 digital inputs from an external connection (40-pin plug connector) at the connector plate of the direct key module (DI 2.0-2.7 and DI 3.0-3.7)

The digital outputs (DO 0.0-0.7 and DO 1.0-1.7) are also defined as a block and can be connected at the external port (40-pin plug connector).

4 Assignment of direct key numbers to digital inputs

Direct key number	Digital input (DI)	Key on the panel PC	Direct key number	Digital input (DI)	Key on the panel PC
direct key 1	DI 0.0	F1	direct key 17	DI 4.0	S1
direct key 2	DI 0.1	F2	direct key 18	DI 4.1	S2
direct key 3	DI 0.2	F3	direct key 19	DI 4.2	S3
direct key 4	DI 0.3	F4	direct key 20	DI 4.3	S4
direct key 5	DI 0.4	F5	direct key 21	DI 4.4	S5
direct key 6	DI 0.5	F6	direct key 22	DI 4.5	S6
direct key 7	DI 0.6	F7	direct key 23	DI 4.6	S7
direct key 8	DI 0.7	F8	direct key 24	DI 4.7	S8
direct key 9	DI 1.0	F9	direct key 25	DI 5.0	S9
direct key 10	DI 1.1	F10	direct key 26	DI 5.1	S10
direct key 11	DI 1.2	F11	direct key 27	DI 5.2	S11
direct key 12	DI 1.3	F12	direct key 28	DI 5.3	S12
direct key 13	DI 1.4	F13	direct key 29	DI 5.4	S13
direct key 14	DI 1.5	F14	direct key 30	DI 5.5	S14
direct key 15	DI 1.6	F15	direct key 31	DI 5.6	S15
direct key 16	DI 1.7	F16	direct key 32	DI 5.7	S16

Table 4–1 Direct key number assignment

Note

The values in the "Key on panel PC" column in Table 4–1 are the default settings for the *KeyPad* software tool.

The direct key number is specified by keyboard controller parameterization. Parameterization can be reprogrammed at any time. After programming, the settings are saved in non-volatile memory in the keyboard controller, i.e. they are retained even after the power supply is switched off.

5 Interfaces

- 16 digital inputs (DI) non-isolated with 24V level (external interface) for connecting drive switches (external interface)
- 16 digital outputs (DO) with DC 24V, 100mA, short-circuit proof, non-isolated (external interface) for connecting indicator lamps (external interface)
- Isolated DP interface on RS485 basis (external interface)
- Non-isolated DP interface on TTL basis (internal interface)
- Keyboard interface (serial) for 32 direct keys (internal interface)
- Power supply connection (internal interface)

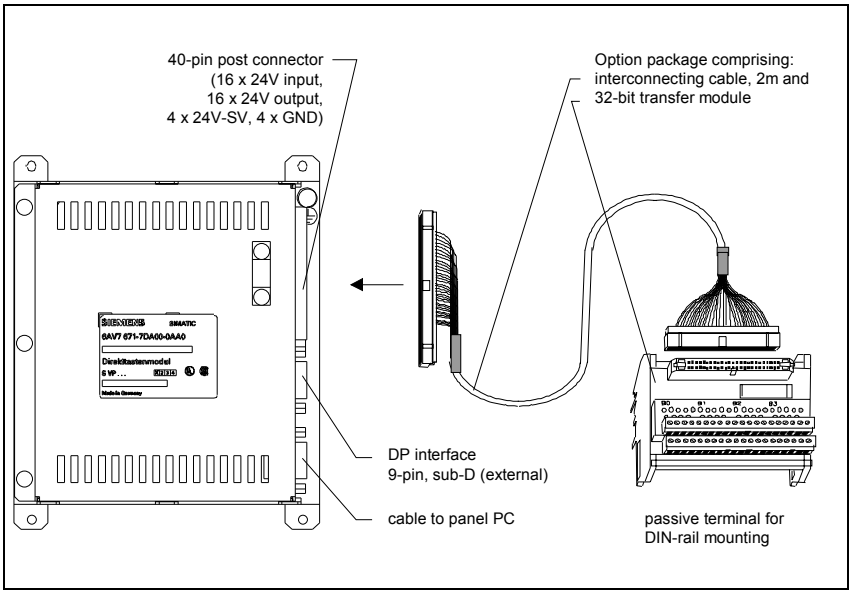


Figure 5–1 Interfaces on the direct key module

6 Interface descriptions

Interfaces

The interface is a 40-pin post connector for 16 digital inputs (DI) with 24V level, for 16 digital outputs (DO) with a 24V, 100mA driver rating and for the external 24-V supply. The outputs are short-circuit proof.

I/O interface – pin assignment

Pin No.	Signal	Meaning	Pin No.	Signal	Meaning
pin 1	DI 2.0	input byte 2, bit 0	pin 2	DI 2.1	input byte 2, bit 1
pin 3	DI 2.2	input byte 2, bit 2	pin 4	DI 2.3	input byte 2, bit 3
pin 5	DI 2.4	input byte 2, bit 4	pin 6	DI 2.5	input byte 2, bit 5
pin 7	DI 2.6	input byte 2, bit 6	pin 8	DI 2.7	input byte 2, bit 7
pin 9	DI 3.0	input byte 3, bit 0	pin 10	DI 3.1	input byte 3, bit 1
pin 11	DI 3.2	input byte 3, bit 2	pin 12	DI 3.3	input byte 3, bit 3
pin 13	DI 3.4	input byte 3, bit 4	pin 14	DI 3.5	input byte 3, bit 5
pin 15	DI 3.6	input byte 3, bit 6	pin 16	DI 3.7	input byte 3, bit 7
pin 17	ground	ground	pin 18	ground	ground
pin 19	+24V	external 24V supply	pin 20	+24V	external 24V supply
pin 21	DO 0.0	output byte 0, bit 0	pin 22	DO 0.1	output byte 0, bit 1
pin 23	DO 0.2	output byte 0, bit 2	pin 24	DO 0.3	output byte 0, bit 3
pin 25	DO 0.4	output byte 0, bit 4	pin 26	DO 0.5	output byte 0, bit 5
pin 27	DO 0.6	output byte 0, bit 6	pin 28	DO 0.7	output byte 0, bit 7
pin 29	ground	ground	pin 30	ground	ground
pin 31	+24V	external 24V supply	pin 32	+24V	external 24V supply
pin 33	DO 1.0	output byte 1, bit 0	pin 34	DO 1.1	output byte 1, bit 1
pin 35	DO 1.2	output byte 1, bit 2	pin 36	DO 1.3	output byte 1, bit 3
pin 37	DO 1.4	output byte 1, bit 4	pin 38	DO 1.5	output byte 1, bit 5
pin 39	DO 1.6	output byte 1, bit 6	pin 40	DO 1.7	output byte 1, bit 7

DP interface (9-pin sub-D connector)

The interface assignment corresponds to the PROFIBUS defaults.

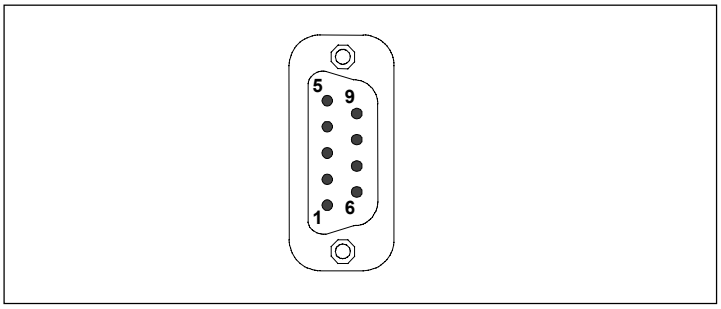


Figure 6–1 DP interface

Pin No.	Signal name	Meaning	Input/Output
pin 1	n.c.	not connected	–
pin 2	n.c.	not connected	–
pin 3	LTG_B	signal line B of the direct key module	input/output
pin 4	RTS	TTL output signal of the direct key module. The signal is ‘1’ if the direct key module is transmitting data.	output
pin 5	M5EXT	Floating 5V supply ground The current load thro an external consumer connected between P5EXT and M5EXT must not exceed 90mA	output
pin 6	P5EXT	+5V of the floating 5V supply The current load thro an external consumer connected between P5EXT and M5EXT must not exceed 90mA	output
pin 7	n.c.	not connected	–
pin 8	LTG_A	signal line A of the direct key module	input/output
pin 9	n.c.	not connected	

7 Installation

Direct key module installation

The following types of installation are possible for the direct key module:

- DIN-rail mounting
- Cabinet mounting

Note

When installing the direct key module, please pay attention to the length of the cable to the panel PC keyboard controller. This is 50 cm.

DIN-rail mounting

A mounting element for a 35mm DIN rail is already attached to the direct key module.

Cabinet mounting

- Remove the mounting plate with the DIN rail from the direct key module.
- Mark out the four screw holes in accordance with the drill drawing below.

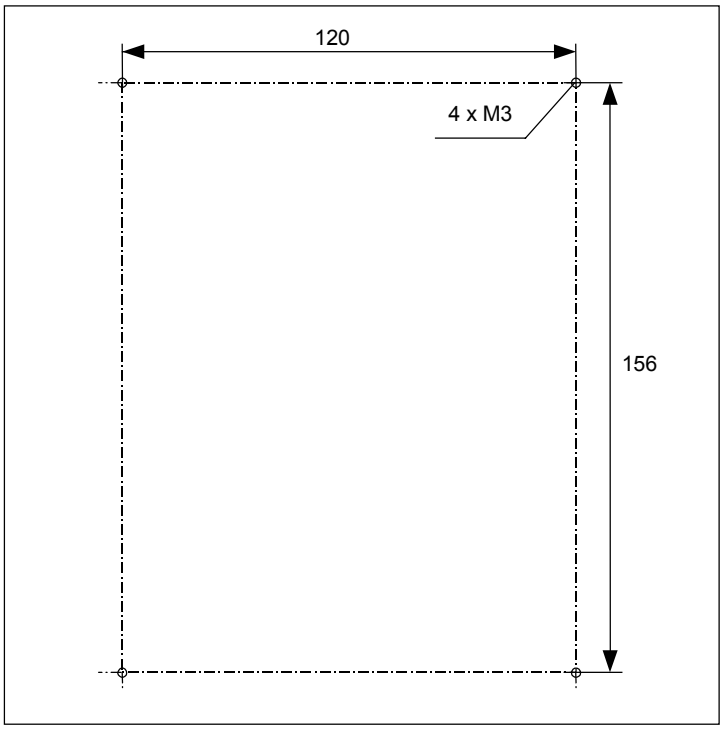


Figure 7–1 Drill drawing dimensions for the cabinet mounting

- Drill four tapped holes.
  Alternatively, you can also drill through-holes and attach the direct key module with screws and nuts.
- Fasten the direct key module with the screws.

Cable mounting to the panel PC

First detach the PC box:

- At the back of the panel PC, remove a total of four screws from the brackets (see Figure 7–2).

Caution

The weight of the PC box can cause the hinged clasp on the PC box from the panel PC 870 to bend. Support the PC box as you swivel it out (see Figure 7–2).

- Swivel the PC box out.
- Loosen the fixing devices on the connectors.
- Take out the connectors.

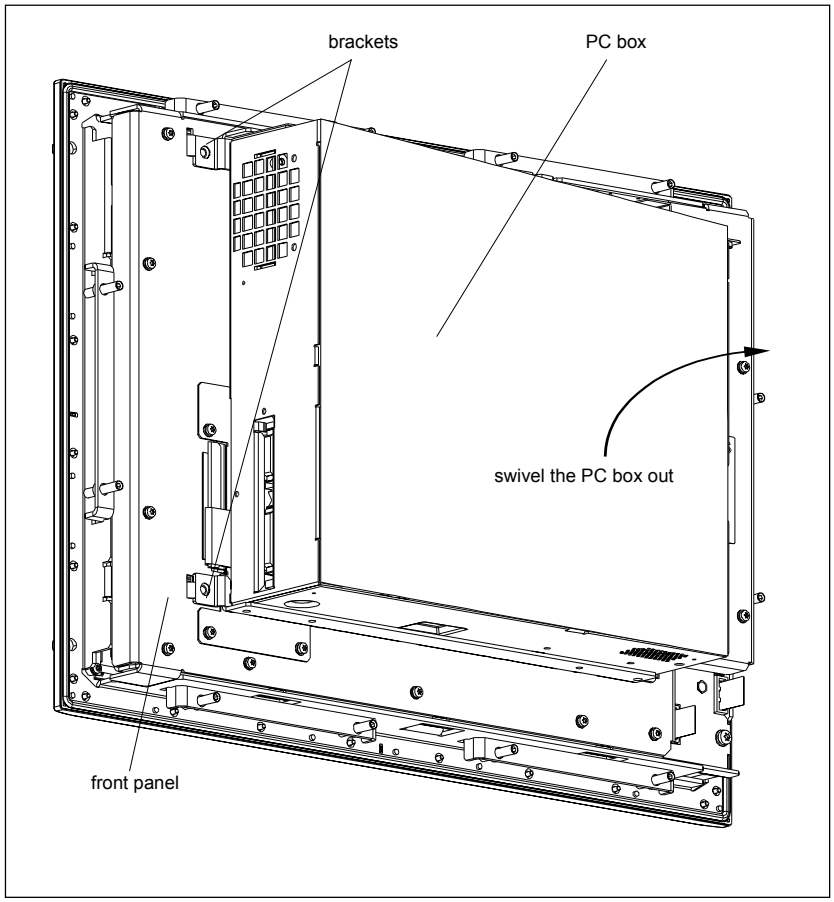


Figure 7–2 Detaching the PC box

- Remove the four screws on the cover to the panel PC keyboard controller (see Figure 7–3).
- Lift off the cover.

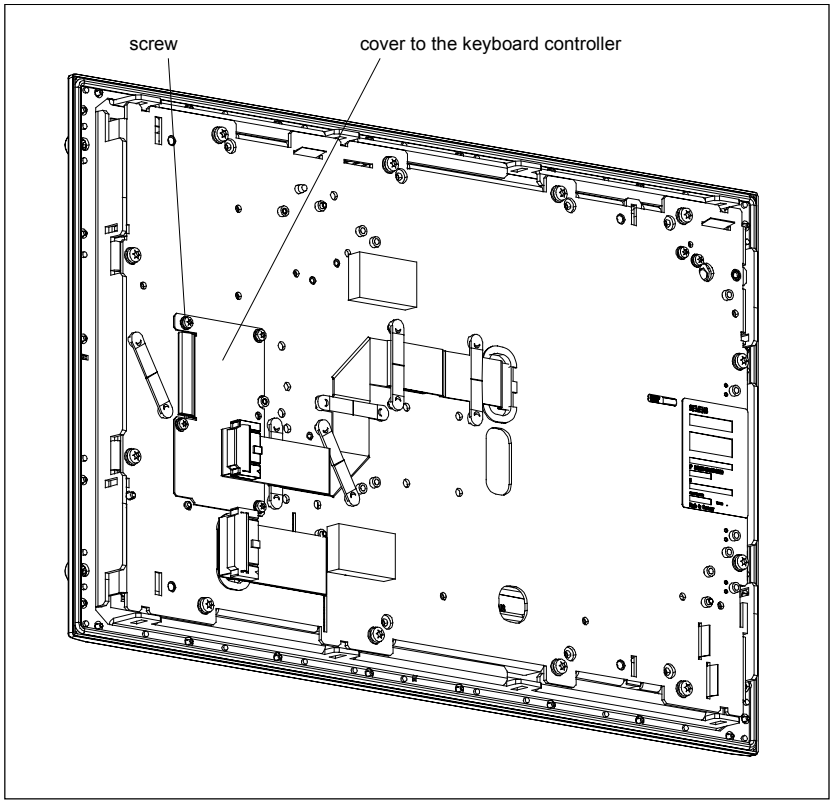


Figure 7–3 Detaching the cover to the keyboard controller

Two socket connectors are available under the cover.

- Attach the cable to the panel PC in accordance with the following diagram.

Note

The metallic shield can break if the cable is kinked more than 5 times in the same place.

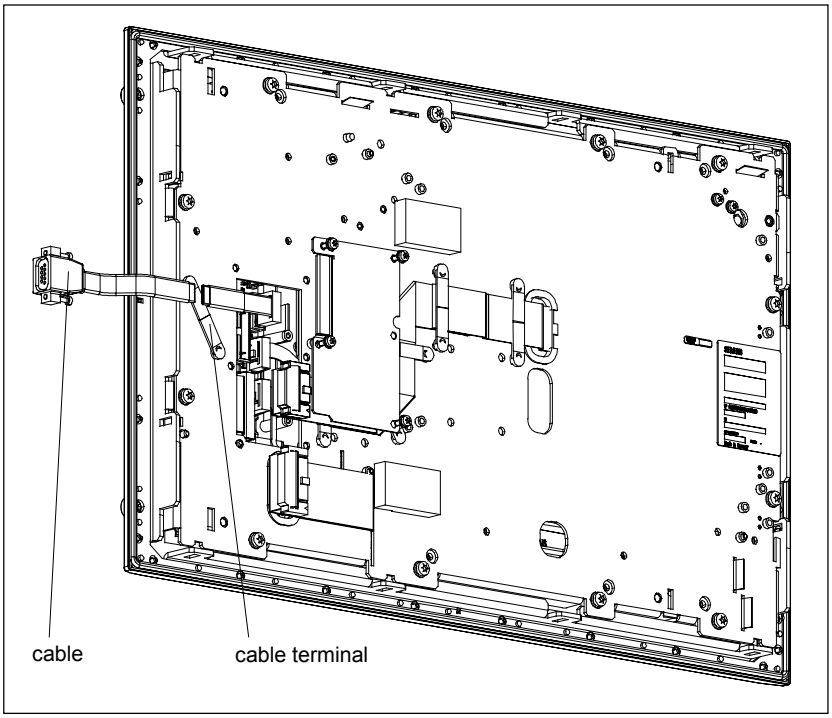


Figure 7–4 Inserting the cable to the panel PC

- Clamp the cable to the panel PC under the white cable clamp that is located on the front of the panel PC to the left of the cover to the keyboard controller.

  The cable is then installed.
- Attach the cover to the keyboard controller.
- Attach the PC box.

8 Electrical installation

Appropriate EMC installation

The basis for trouble-free operation is appropriate EMC attachment of the direct key module and the use of cables that are immune to interference.

Caution

- Only shielded cables are acceptable for all signal links.
- All plug connectors must be screwed or fixed in position.
- Signal lines must not be run in the same cable pit as power lines.
- Siemens AG cannot be held responsible in any way for malfunctions and damage resulting from the use of homemade cables or the cables of third-party manufacturers.

Attach the direct key module grounding terminal to the control cabinet grounding terminal. Use a cable with a conductor cross section of >2.5mm^2 corresponding to the grounding terminal Figure 8–1.

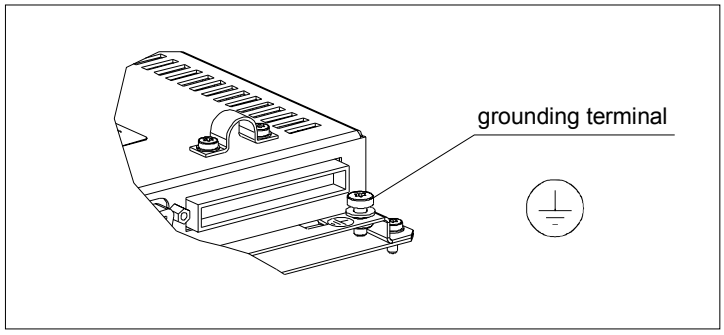


Figure 8–1 Grounding terminal

9 Technical data

Order number	6AV7671-7DA00-0AA0
dimensions	110 x 110 x 20 (W x H x D in mm)
Electrical parameters	
voltage supply	DC 5V
power consumption at 5V	approx. 400mA
power demand at the 9-pin sub-D socket connector (5V, floating)	max. 90mA
Module connector (external)	
DP interface	9-pin, sub-D socket connector
I/O interface (16 x DO 24 V / 100mA, 16 x DI 24V)	40-pin plug connector, angled
Input for 24V supply	
External source requirement	24V; continuous current 1.6A; max. 4A, transient, SELV
Keyboard interface (internal)	
signal level	CMOS
key code transfer	USB
Climatic conditions	
Temperature	**tested under DIN EN 60068-2-2:1994, DIN IEC 68-2-1, DIN IEC 68-2-14**
- in operation	+0°C to +45°C
- storage/transportation	–20°C to +60°C
- gradient	max. 10 °C/h, no condensation
Relative humidity	**tested under DIN IEC 68-2-3, DIN IEC 68-2-30, DIN IEC 68-2-56**
- in operation	5% to 85% at 25°C (no condensation)
- storage/transportation	5% to 95% at 25°C (no condensation)

Mechanical environmental conditions	
Vibration	**tested under DIN IEC 68-2-6**
- operation	10 to 58 Hz: 0.075mm, 58 to 500 Hz: 10m/s^2
- transportation	5 to 9 Hz: 3.5mm, 9 to 500 Hz: 10m/s^2
Shock resistance	**tested under DIN IEC 68-2-29**
- operation	50m/s^2, 30ms, 100 shocks
- storage	250m/s^2, 6ms, 1000 shocks

Dimensions

The dimensions of the direct key module relate to the DIN-rail mounting. With the cabinet mounting, the mounting height is 9.5mm less.

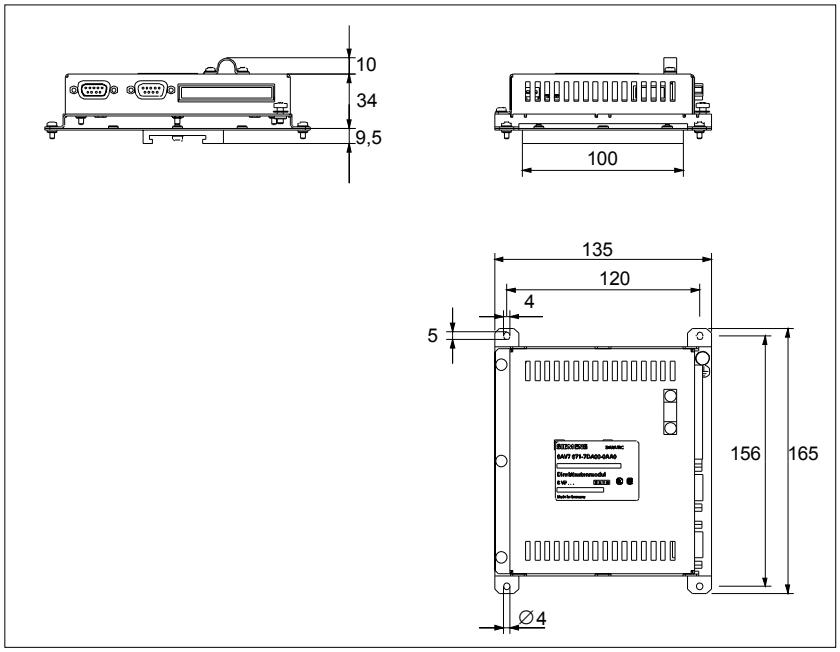


Figure 9–1 Dimensions

10 Option package for the direct key module

Note

The option package for the direct key module must be ordered separately.

Scope of supply

Interconnecting cable (2m long) to connect the direct key module to the transfer module, 32-bit for the DIN-rail mounting.

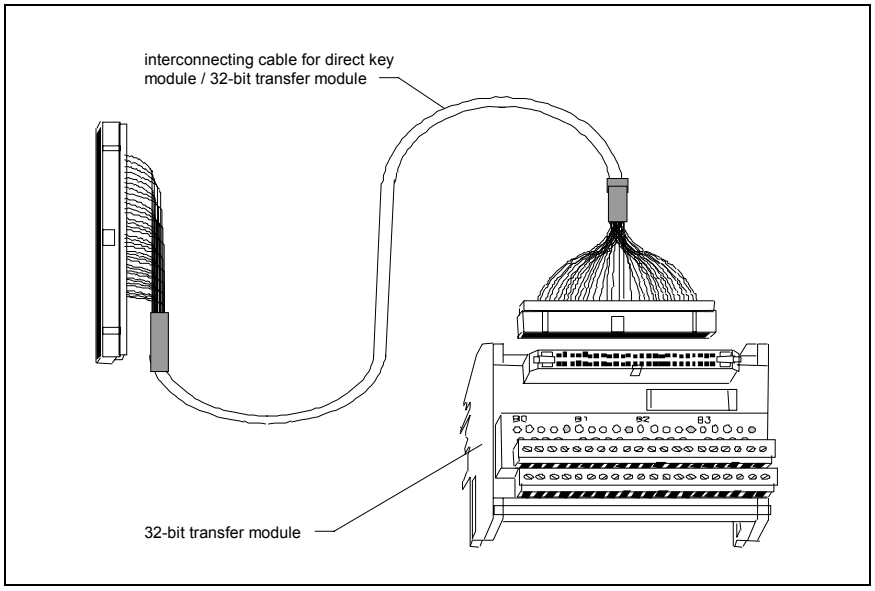


Figure 10–1 Interconnecting cable and transfer module

Order no.

6ES7 648-0AA00-0XA0

Terminal assignments

The assignment of the transfer module terminals to the digital inputs and outputs (DI 2.0-2.7, DI 3.0-3.7, DO 0.0-0.7 and DO 1.0-1.7) of the direct key module is described below.

The transfer module is identified by the following labeling B0 (0-7), +, –, B1 (0-7), +, –, B2 (0-7), +, –, B3 (0-7), +, –. The digital 24V inputs/outputs of the direct key module are connected as follows:

Direct key module 40-pin connector	Input/output designations	32-bit transfer module, terminal
Digital inputs		
pin 1	DI 2.0	B0 (0)
pin 2	DI 2.1	B0 (1)
pin 3	DI 2.2	B0 (2)
pin 4	DI 2.3	B0 (3)
pin 5	DI 2.4	B0 (4)
pin 6	DI 2.5	B0 (5)
pin 7	DI 2.6	B0 (6)
pin 8	DI 2.7	B0 (7)
pin 9	DI 3.0	B1 (0)
pin 10	DI 3.1	B1 (1)
pin 11	DI 3.2	B1 (2)
pin 12	DI 3.3	B1 (3)
pin 13	DI 3.4	B1 (4)
pin 14	DI 3.5	B1 (5)
pin 15	DI 3.6	B1 (6)
pin 16	DI 3.7	B1 (7)

Direct key module, 40-pin connector	Input/output designations	32-bit transfer module, terminal
Digital outputs		
pin 21	DO 0.0	B2 (0)
pin 22	DO 0.1	B2 (1)
pin 23	DO 0.2	B2 (2)
pin 24	DO 0.3	B2 (3)
pin 25	DO 0.4	B2 (4)
pin 26	DO 0.5	B2 (5)
pin 27	DO 0.6	B2 (6)
pin 28	DO 0.7	B2 (7)
pin 33	DO 1.0	B3 (0)
pin 34	DO 1.1	B3 (1)
pin 35	DO 1.2	B3 (2)
pin 36	DO 1.3	B3 (3)
pin 37	DO 1.4	B3 (4)
pin 38	DO 1.5	B3 (5)
pin 39	DO 1.6	B3 (6)
pin 40	DO 1.7	B3 (7)
40-pin connector	24V power supply	terminal
pins 17, 18, 29, 30	GND	– on transfer module
pins 19, 20, 31, 32	+24V	+ on transfer module

The power supply on the transfer module must be connected to all terminals marked + and –. The +24V supply is connected to the terminals marked +, terminals marked – are connected to the grounding of the 24V supply.

Note

A shielded interconnecting cable is included in the option package. The shield must be extensively connected to the device grounding on the panel PC and on the terminal strip. Follow the appropriate EMC installation section in Chapter 8.