MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Selected official pages for procurement and maintenance review

PRODUCT BRAND

Siemens

PRODUCT MODEL

6ES7460-1BA01-0AB0

Siemens 6ES7460-1BA01-0AB0 is the S7-400 IM 460-1 send interface for a local 1.5 m link with 5 V supply transfer and without communication-bus transfer. Source PDF pages: M16 pp. 2,325,327,329,333-336. Adjacent model text on shared pages is outside this product reference.

OFFICIAL SOURCE

S7-400 Automation System Module Data; 11/2016

Siemens original documentation and product reference

November 2016 manufacturer reference for the exact send/receive pair. Send-module and receive-module limits are distinct. Whole original pages retain topology and power-transfer restrictions.

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Amikon Limited prepared this independent reference package. Selected manufacturer pages follow with their original content and pagination visible.

Legal information

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This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

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Interface modules

6

6.1 Common features of the interface modules

Function

Interface modules (a send IM and a receive IM) are required if one or more expansion racks (ER) are to be connected to a central rack (CR). This configuration is described in the *Installation manual*.

Configuration

Interface modules must always be used together. The send modules (send IMs) are inserted in the CR, whilst the corresponding receive modules (receive IMs) are plugged into the series-connected ER.

Table 6-1 Interface modules of the S7-400

Partner	Areas of application
IM 460-0	Send IM for local link without PS transfer; with communication bus
IM 461-0	Receive IM for local link without PS transfer; with communication bus
IM 460-1	Send IM for local link with PS transfer; without communication bus
IM 461-1	Receive IM for local link with PS transfer; without communication bus
IM 460-3	Send IM for remote link up to 102.25 m; with communication bus
IM 461-3	Receive IM for remote link up to 102.25 m; with communication bus
IM 460-4	Send IM for remote link up to 605 m; without communication bus
IM 461-4	Receive IM for remote link up to 605 m; without communication bus

Overview of the connections

Note the rules for connections in the section after next.

Table 6-2 Overview of the connections

	Local connection		Remote connection	
Send IM	460-0	460-1	460-3	460-4
Receive IM	461-0	461-1	461-3	461-4
Max. number of connectable EMs per line	4	1	4	4
Max. distance	5 m	1.5 m	102.25 m	605 m
V transfer	No	Yes	No	No
Max. current transfer per interface	-	5 A	-	-
Communication bus transmission	Yes	No	Yes	No

Rules for connection

When you connect a central rack to expansion racks, you must observe the following rules:

- You can connect up to 21 ERs of the S7-400 to one CR.
- The ERs are assigned numbers to identify them. The rack number must be set on the coding switch of the receive IM. Any rack number between 1 and 21 may be assigned. Numbers must not be duplicated.
- You may insert up to six send IMs in one CR. However, only two send IMs with 5 V transfer are allowed in one CR.
- Each line connected to the interface of a send IM can comprise up to four ERs (without 5 V transfer) or one ER (with 5 V transfer).
- The exchange of data via the communication bus is limited to 7 racks, meaning the CR and ER numbers 1 to 6.
- The maximum (total) cable lengths specified for the type of connection must not be exceeded.

Table 6-3 Cable for different connections

Connection type	Maximum (total) line length
Local connection with 5 V transfer via IM 460-1 and IM 461-1	1.5 m
Local connection without 5 V transfer via IM 460-0 and IM 461-0	5 m
Remote connection via IM 460-3 and IM 461-3	102.25 m
Remote connection via IM 460-4 and IM 461-4	605 m

Terminator

The bus must be terminated in the last EU of a line. To do this, plug in the appropriate terminator in the lower front connector of the receive IM in the last EU of the line. Unused front connectors in a send IM do not have to be terminated. The IM 461-1 does not require a terminator.

Table 6-4 Terminators for the Receive IMs

Receive IM	Terminator
IM 461-0	6ES7461-0AA00-7AA0
IM 461-3	6ES7461-3AA00-7AA0
IM 461-4	6ES7461-4AA00-7AA0

The following figure shows you a typical configuration with send IMs, receive IMs and terminators.

Cables

Precut cables are available in different fixed lengths for connecting the individual interface modules. (See Appendix "Accessories and spare parts").

Table 6-5 Cables for interface modules

Interface modules	Cables
IM 460-0 and IM 461-0 IM 460-3 and IM 461-3	6ES7468-1... (P bus and communication bus are transferred)
IM 460-1 and IM 461-1	6ES7468-3... (P bus is transferred; mounting rack is supplied with current via the IM)
IM 460-4 and IM 461-4	6ES7468-1...

Installation and removal of the modules during operation

Please read the following warning on the insertion and removal of the interface modules and associated cables.

CAUTION

Data may be lost or corrupted.

Removing or inserting the interface modules and/or their associated cables under voltage can result in the loss or corruption of data.

Switch off the power supply modules to the CR and ERs you are working on before you carry out any changes.

6.3 Interface modules IM 460-1 (6ES7460-1BA01-0AB0) and IM 461-1 (6ES7461-1BA01-0AA0)

Function

The interface module pair IM 460-1 (send IM) and IM 461-1 (receive IM) are used for a local link (up to a maximum 1.5 m in total). A 5 V supply voltage is also transferred with these interface modules. Please particularly remember the following points:

- The current requirements of the module plugged into the ER must not exceed 5 V/5 A.
- You can only connect one ER per line.
- The modules in this mounting rack are not supplied with 24 V and are not backed up.
- The communication bus is not transferred with the interface module pair IM 460-1 and IM 461-1.
- You must not use a power supply module in the ER.

Note

If you connect an ER via a local link with 5 V transmission, ungrounded operation is prescribed for the ER (see Installation Manual).

Position of the operator controls and indicators of the IM 460-1 and IM 461-1

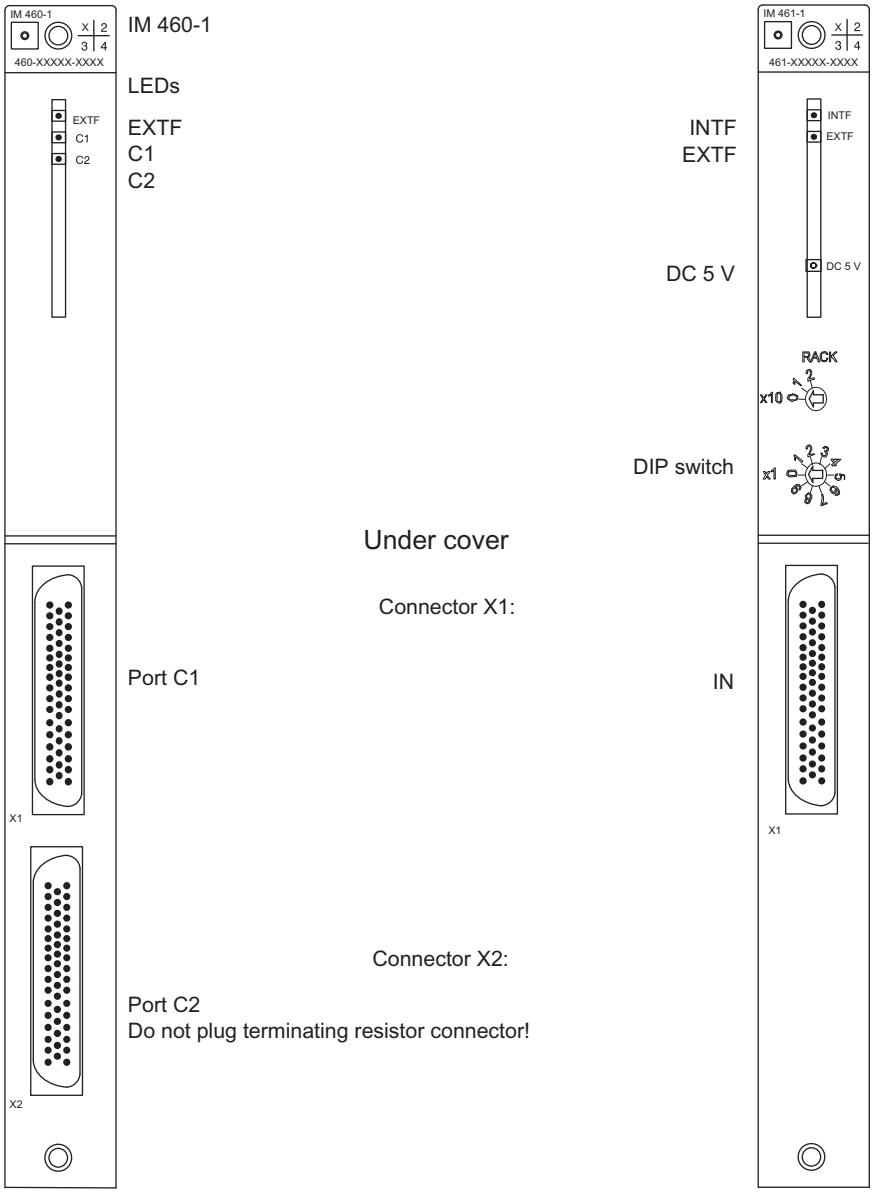


Figure 6-3 Position of the operator controls and indicators of the IM 460-1 and IM 461-1

Operator controls and indicators on the send IM

Table 6-8 Operator controls and indicators on the send IM

LEDs	Meaning
EXTF LED (red)	Lights up in the event of an external fault. Line 1 or line 2 is faulty (broken cable)
C1 LED (green)	Line 1 (via front connector X1, connection 1) is correct.
C1 LED (flashing green)	A module has not yet completed the initialization process.

LEDs	Meaning
C2 LED (green)	Line 2 (via front connector X2, connection 2) is correct.
C2 LED (flashing green)	A module has not yet completed the initialization process.
Front connectors X1 and X2	Connector (output) for line 1 and line 2 X1 = upper front connector; X2 = lower front connector

The LEDs EXTF, C1 and C2 do not light up if the line is interrupted when in POWER ON mode. In this case the IM 460 identifies an unoccupied interface.

Operator controls and indicators of the receive IM

Table 6-9 Operator controls and indicators of the receive IM

LEDs	Meaning
INTF LED (red)	Lights up if a rack number > 21 or = 0 was set. Lights up if you have changed the rack number under voltage.
EXTF LED (red)	Lights up in the event of an external fault (line fault, for example, if a module has not yet completed the initialization process but not when the CC is switched off)
5 VDC (green)	Power supply in the ER is correct.
DIP switch	DIP switch to set the number of the mounting rack.
Front connector X1	Upper connector (input) for the cable from the previous interface module.

⚠ CAUTION

Modules can be damaged.

If you want to connect an ER via the IM 461-1 interface module and use a power supply module in this ER, you might damage the modules.

Do not use a power supply module in an ER that you want to connect to the CR via the IM 461-1 interface module.

Parameter assignment for the mounting rack number

Using the DIP switch on the front panel of the module, you must set the number of the mounting rack in which the receive IM is installed. The permitted range is 1 to 21.

Setting/changing the number

Proceed as follows:

1. Set the power supply module in the CR to the ⏻ position (Output voltage 0 V).
2. Enter the number using the DIP switch.
3. Switch the power supply module on again.

Specifications of the IM 460-1 and IM 461-1

Maximum line length (total)	1.5 m
Dimensions W x H x D (mm)	25 x 290 x 280
Weight	
• IM 460-1 • IM 461-1	600 g 610 g
Current consumption from the S7-400 bus 5 VDC	
• IM 460-1 • IM 461-1	Typ. 50 mA, max. 85 mA Typ. 100 mA, max. 120 mA
Power loss	
• IM 460-1 • IM 461-1	Typ. 250 mW, max. 425 mW Typ. 500 mW, max. 600 mW
Power supply for ER	V/5 A per line
Backup current	None