MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6ES5301-5CA12

DISTRIBUTED RACK INTERFACE MODULE

Used with the applicable SIMATIC S5 IM 301-5 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens S5-135U/155U System Manual C79000-G8576-C199-07, IM 301-5 configuration, connections and technical data, plus exact order table.

With the distributed configuration, a distinction is made between parallel and serial communication. The main features of these types of communication are as follows:

- Parallel — Fast data transmission line length of up to 600 m
- Serial — Slower data transmission line length of up to 3000 m

2.2.1 Installing a PLC with Centralized Configuration

The following table shows which interface modules and connecting cables can be used for connecting the various expansion units to the CC in a centralized configuration.

Interface Module in the CC	Expansion Unit	Interface Module in the EU	Connecting Cable Max. Distance
IM 300-3 6ES5 300-3AB11	EU 183U EU 185U (I/O mod. only)	IM 312-3 [2] 6ES5 312-3AB11	fixed to the IM 312 module 0.5 m; 0.95 m
IM 301-3 [1] 6ES5 301-3AB13	EU 183U EU 185U (I/O mod. only)	IM 312-3 [2] 6ES5 312-3AB31	fixed to the IM 312 module 0.5 m; 0.95 m
IM 300-5 6ES5 300-5CA11	EU 184U EU 187U	IM 312-5 6ES5 312-5CA11	fixed to the IM 312 module 0.5 m; 1.5 m
IM 301-5 [1] 6ES5 301-5CA12	EU 184U EU 187U	IM 312-5 6ES5 312-5CA21	fixed to the IM 312 module 0.5 m; 1.5 m
IM 300-5 6ES5 300-5LB11	ER 701-1	IM 306 6ES5 306-7LA11	6ES5 705-0xxxx 0.5 m to 2,5 m

[1] This IM has a second interface for distributed communication.

[2] The last IM 312-3 always requires a 6ES5 760-0AB11 terminator.

To install a PLC in a centralized configuration, you must observe the following conditions:

- A centralized configuration is generally only suitable for connecting I/O modules (DI, DO, AI, AO) and some intelligent I/O modules (IPs) in the EU (see the Configuring Aids in the catalog and Chapter 4).

- The line length between the IM in the CC and the last IM in the EU must not exceed 2 m.

2.2.2 Installing a PLC with Distributed Configuration

To install a PLC in a distributed configuration, you have a choice of parallel/symmetrical and serial communication. The following table shows which interfaces and connecting cables can be used to connect the various expansion units (EUs/ERs) to the CC in a distributed configuration.

Interface Module in the CC	Expansion Unit	Interface Module in the EU	Connecting Cable Max. Permiss. Line Length
IM 301-3 6ES5 301-3AB13 (not for S5-155H) IM 301-5 6ES5 301-5CA12	EU 183U ER 701-2 ER 701-3 EU 183U EU 185U	IM 310 [1] 6ES5 310-3AB11 IM 310 [1] 6ES5 310-3AB11	6ES5 721-0xxxx 1 m to 200 m
IM 304 6ES5 304-3UB11	ER 701-2 ER 701-3 EU 183U EU 185U	IM 314 [1] 6ES5 314-3UA11	6ES5 721-0xxxx 1 m to 600 m
IM 308 6ES5 308-3UA12	ER 701-2 ER 701-3 EU 183U EU 185U	IM 318-3 6ES5 318-3UA11	6ES5 707-5AA00 V45551-F21-B5 up to 3000 m
	ET 100U (Catalog ST 52.1)	IM 318-8 6ES5 318-8MA12	
	ICM 560	–	
IM 308-B 6ES5 308-3UB11	ET 200	IM 318-B 6ES5 318-8MB11	Cable connection
IM 307 6ES5 307-3UA11	ER 701-2 ER 701-3	IM 317 6ES5 317-3UA11	6ES5 722-2xxxx Fiber optic cable up to 1500 m
	EU 183U EU 185U	IM 317 6ES5 317-3UA11	

[1] The last IM 310 or IM 314 always requires a 6ES5 760-1AA11 terminator.

The ER 701-2 and ER 701-3 always additionally require an IM 306 for communication via an IM 304, IM 307 or IM 308.

To install a PLC in a distributed configuration, you must observe the following conditions:

- With the IM 301/IM 310 pair of interface modules, you can only use I/O modules (DI, DO, AI, AO) and IPs without page addressing in the EUs.
- With the IM 304/314 pair of interface modules, you can use all IPs, CPs and I/O modules in the EU 185U.

Note

The IM 307/317, IM 308/318 and IM 308-B/318-B each have their own manual (see catalog).

7.2 The 301 and 310 Interface Modules

The IM 301 is used to connect I/O modules and signal preprocessing modules (IPs) to a CC in a **distributed** arrangement (allowing for possible configurations) via an

- EU 183U
- EU 185U (only input/output modules)

expansion unit.

You can connect up to four EUs to a CC in distributed arrangement via the IM 301. If you use the 721 connecting cable, the total cable length from the CC to the last EU may be up to 200 m. The distributed connection is made via the lower front connector of the module. Use the IM 310 interface module in the EU to be connected in a distributed arrangement:

EU Interface Module	EU Type	CC Interface Module
IM 301	EU 183U, EU 185U (only I/O modules)	IM 310

Apart from the distributed EUs, you can connect the following expansion units in a **centralized** arrangement:

- EU 183U
- EU 184U
- EU 187U

The centralized connection is made via the upper front connector of the module. Use the following interface modules, according to the EU to be connected in a centralized arrangement:

EU Interface Module	EU Type	CC Interface Module
IM 301-5	EU 184U, EU 187U	IM 312-5
IM 301-3	EU 183U	IM 312-3

Unused centralized connections of the IM 301-3 and unused distributed connections of the IM 301-3 and IM 301-5 must be terminated with terminators. The same applies to the last IM 310.

You may only set module addresses in the EU which you are not yet using in the CC. This applies to the normal (P) and extended (O) areas.

7.2.1 Indicators and Controls

IM 301:

Fault LEDs
When the CPU is restarted, the red LED 1 and/or LED 2 lights up if the internal supply voltage (5 V DC) or external load voltage (24 V DC) fails.

The IM 310 has no indicators or controls.

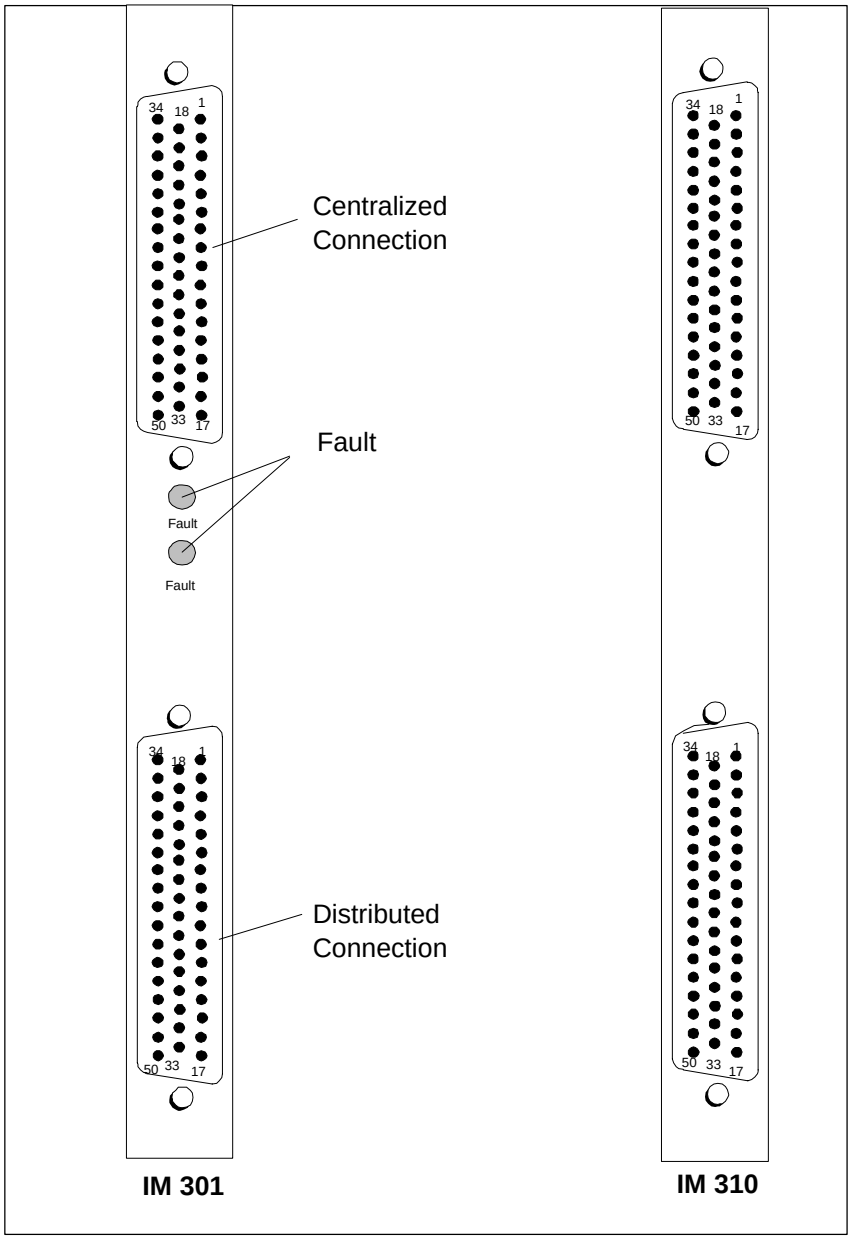


Figure 7-7 Front Plate of the IM 301 and IM 310

7.2.2 Modes/Jumper Assignments of the IM 301

Jumper Assignments

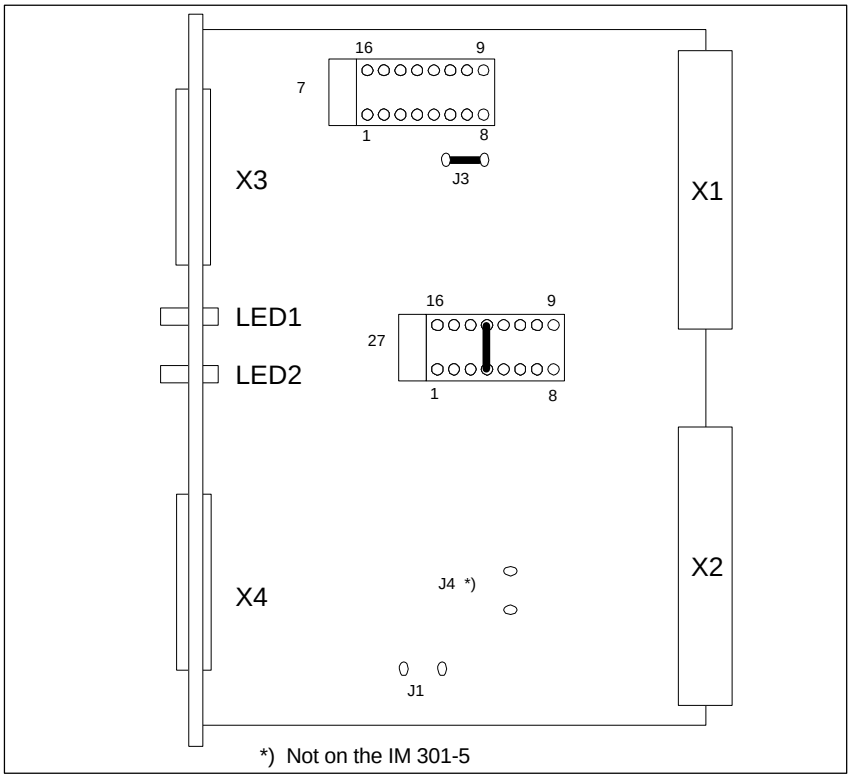


Figure 7-8 Location of Jumpers on the IM 301 (as Delivered)

You must insert jumper 8-9 at location 7 for address setting on the extended I/O area (O area). All other jumpers must remain in the factory settings.

The following figures show distributed communication between central controller and expansion units via the IM 301 and IM 310.

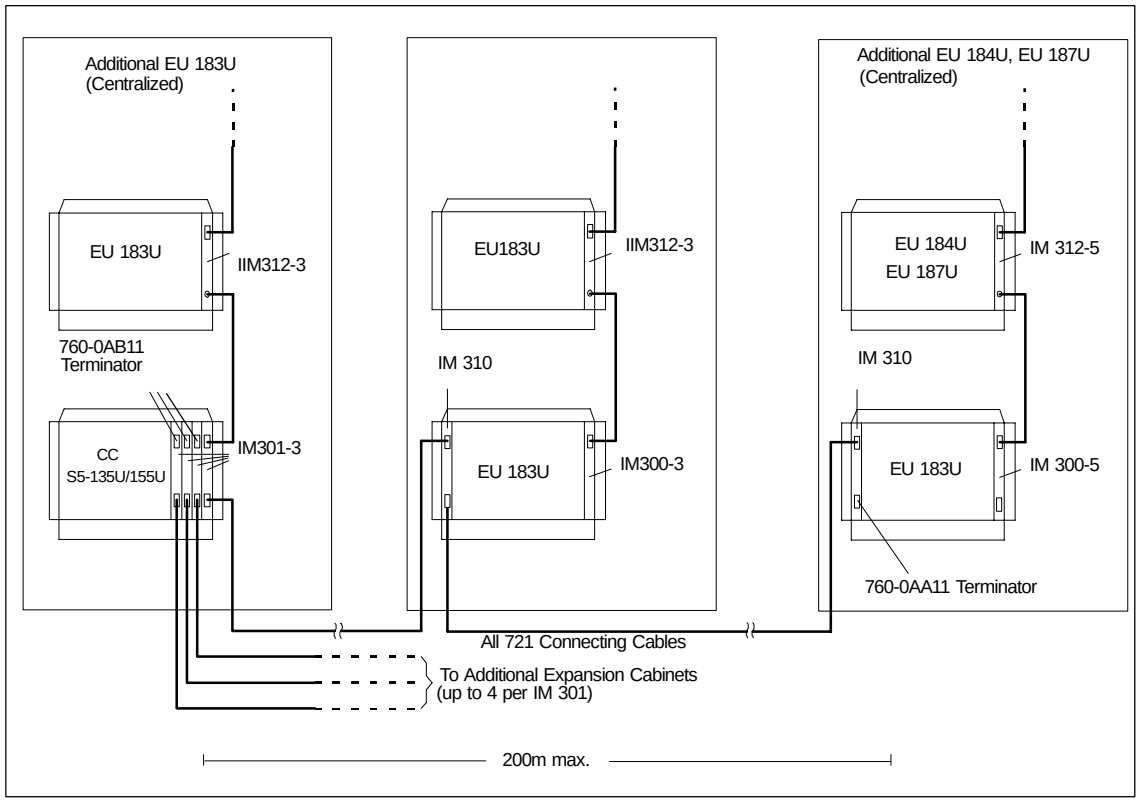


Figure 7-9 Connection of EU 183Us to the Central Controller via the IM-301-3

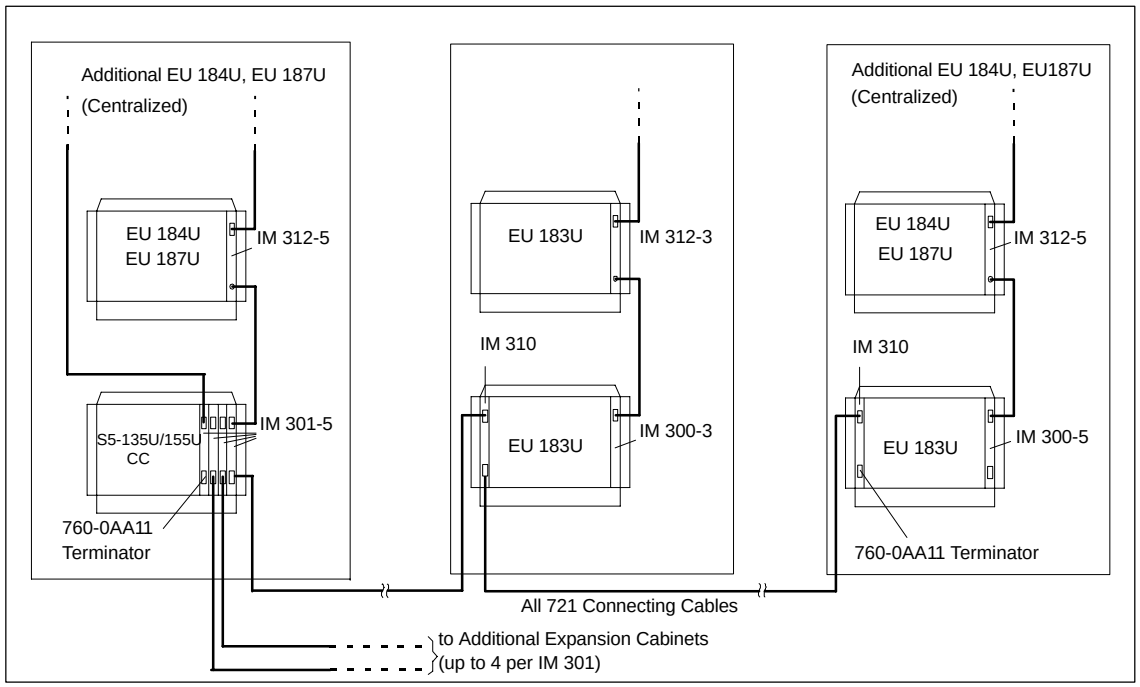


Figure 7-10 Connection of EU 184/EU 187 U to the Central Controller via the M 301-5

7.4 Technical Specifications

Important for the USA and Canada

The following approvals have been obtained:

- UL Listing Mark
  Underwriters Laboratories (UL) to
  Standard UL 508, Report E85972 and E116536 for the IM 300-5LB11
- CSA Certification Mark
  Canadian Standard Association (CSA) to Standard C 22.2 No. 142,
  Report LR 63533C and LR 48323 for the IM 300-5LB11

Given in the following are the technical specifications of the IMs and pin assignments of the connecting cable and terminator.

General Specifications	
Degree of protection	IP 20
Insulation class	C to VDE 0160
Operating temperature	0 to 55 °C
Transportation and storage temperature	- 40 to 70 °C
Relative humidity	95 % max. at 25 °C, no condensation
Mechanical requirements	see description of central controllers
Supply voltage (internal)	5 V $\pm$ 5 %

Specifications for Specific IMs									
Interface module	IM 300	IM 300 (-5CA)	IM 300 (-5LB)	IM 301 (-5CA)	IM 301 (-3AB)	IM 304	IM 310	IM 312	IM 314
Max. current consumption	0.2 A	0.2 A	50 mA	0.75 A	0.75 A	1.2 A	0.7 A	0.2 A	1.0 A
Max. current per interface	-	5 A	2 A	5 A	-	-	-	-	-
Weight, approx.	0.25 kg	0.30 kg	0.25 kg	0.3 kg	0.3 kg	0.35 kg	0.3 kg	0.35 kg	0.3 kg

7.4.1 6ES5 721 Connecting Cable

The 6ES5 721-xxx connecting cable is intended for interconnection of the CC/EUs. Refer to the catalog for the SIMATIC length codes.

For Chapter 6

Coordinators	
923A coordinator	6ES5 923-3UA11
923C coordinator	6ES5 923-3UC11
Coding plug Front cover Connecting cable for CP 530, 143 and 5430 0.9 m 2.5 m	C79334-A3011-B12 C79451-A3079-C251 6ES5 725-0AK00 6ES5 725-0BC50

For Chapter 7

Interface Modules	
IM 300-3	6ES5 300-3AB11
IM 300-5C	6ES5 300-5CA11
IM 300-5L	6ES5 300-5LB11
IM 301-3	6ES5 301-3AB13
IM 301-5	6ES5 301-5CA12
IM 304	6ES5 304-3UB11
IM 310	6ES5 310-3AB11
IM 312-3 (0.5 m) IM 312-3 (0.95 m)	6ES5 312-3AB11 6ES5 312-3AB31
IM 312-5 (0.5 m) IM 312-5 (1.5 m)	6ES5 312-5CA11 6ES5 312-5CA21
IM 314	6ES5 314-3UA11
IM 314R	6ES5 314-3UR11
Connecting cable (xxx = SIMATIC length code, see Catalog)	6ES5-721-0xxx
Connecting cable for IM 300-5LB11 Length 0.5 m Length 1.5 m	 6ES5 705-0AF00 6ES5 705-0BB0
Terminator for IM 314 for IM 312 and IM 301-3 for IM 301-3	 6ES5 760-1AA11 6ES5 760-0AB11 6ES5 760-0AA11