

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6GK1503-2CA01

PROFIBUS OPTICAL LINK MODULE

Used with the applicable SIMATIC NET OLM/P11 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens SIMATIC NET OLM/P11 technical documentation

Introduction



CAUTION

To prevent injury and damage, read the manual before using the device.

Purpose of the Operating Instructions

These operating instructions support you when commissioning PROFIBUS OLM devices (Optical Link Modules).

Scope of validity

This document is valid for the following devices:

Device	Article number
SIMATIC NET OLM / P11 V4.1	6GK1 503-2CA01
SIMATIC NET OLM / P12 V4.1	6GK1 503-3CA01
SIMATIC NET OLM / P22 V4.1	6GK1 503-4CA01
SIMATIC NET OLM / G11 V4.0	6GK1 503-2CB00
SIMATIC NET OLM / G12 V4.0	6GK1 503-3CB00
SIMATIC NET OLM / G22 V4.0	6GK1 503-4CB00
SIMATIC NET OLM / G12-EEC V4.0	6GK1 503-3CD00
SIMATIC NET OLM / G11-1300 V4.0	6GK1 503-2CC00
SIMATIC NET OLM / G12-1300 V4.0	6GK1 503-3CC00

Audience

These Operating Instructions are intended for personnel involved in the commissioning of PROFIBUS networks with the link modules of the OLM series.

Finding information

To help you to find the information you require more quickly, the manual includes not only the table of contents but also the following aids:

- Abbreviations/acronyms
- Index

2.3 Properties and functions

Device design

Every module has two (OLM P11, G11), three (OLM P12, G12) or four (OLM P22, G22) independent channels (ports) that consist of a transmitter and a receiver part.

The power supply voltage for operation is 24 VDC. To increase operational reliability, a redundant power supply is possible.

Channels

Electrical channels

The electrical channel is designed as a 9-pin D-sub female connector. An RS-485 bus segment complying with the PROFIBUS standard EN 50170 /2/ can be connected to this channel.

Optical channels

The fiber-optic cables are connected via BFOC/2.5 connectors.

Seven multicolor LEDs indicate the current operating mode and any disruptions as well as the level ratios on the optical interfaces.

The following table shows the various connection options of the modules and the maximum possible optical ranges of the individual channels.

		P11	P12	P22	G11 G11 EX	G12 G12 EX G12-EEC G12-EEC EX	G22 G22 EX	G11-130 0	G12-130 0
Number of channels	Electrical	1	1	2	1	1	2	1	1
	Optical	1	2	2	1	2	2	1	2
Usable fiber types	Plastic FO cable 980/1000 µm	80 m	80 m	80 m	-	-	-	-	-
	PCF FO cable fiber (HCS®FO cable) 200/230 µm	400 m	400 m	400 m	-	-	-	-	-
	Quartz glass FO cable ¹ 10/125 µm	-	-	-	-	-	-	15 km	15 km
	Quartz glass FO cable ² 50/125 µm	-	-	-	3 km	3 km	3 km	-	-
	Quartz glass FO cable ² 62.5/125 µm	-	-	-	3 km	3 km	3 km	-	-

Number of electrical and optical ports per module, usable fiber types as well as the maximum achievable fiber-optic cable distances between two modules. For the precise conditions of use, refer to the section "Technical specifications".

¹ Single mode fiber

² Multimode fiber

Installing and removing

5.1 Safety notices for installation

Safety notices

When installing the device, keep to the safety notices listed below.



WARNING

If a device is operated in an ambient temperature of more than 50 °C, the temperature of the device housing may be higher than 70 °C. The device must therefore be installed so that it is only accessible to service personnel or users that are aware of the reason for restricted access and the required safety measures at an ambient temperature higher than 50 °C.



WARNING

Cable

If the cable or conduit entry point exceeds 70 °C or the branching point of conductors exceeds 80 °C, special precautions must be taken. If the equipment is operated in an air ambient in excess of 50 °C, only use cables with admitted maximum operating temperature of at least 80 °C.



WARNING

If the device is installed in a cabinet, the inner temperature of the cabinet corresponds to the ambient temperature of the device.



WARNING

Warming and premature aging of the device due to direct sunlight/UV light

Direct sunlight and UV light can heat up the device and can lead to premature aging of the device and its cabling.

Provide suitable shade to protect the device against direct sunlight and UV light.

NOTICE

Damage to the device due to exceeding the maximum permissible temperature

When the device is installed, the following minimum clearances must be observed so that the convection cooling of the device is not impaired:

- At least 10 cm clearance under the device
- At least 10 cm clearance above the device

5.2 Safety notices when using in accordance with UL 61010-2-201/CSA C22.2 No. 61010-2-201

If you use the device under UL 61010-2-201/CSA C22.2 No. 61010-2-201 conditions, you must observe the following safety notices:

 WARNING

Open equipment

The devices are "open equipment" according to the standard IEC 61010-2-201 or UL 61010-2-201 / CSA C22.2 No. 61010-2-201. To fulfill requirements for safe operation with regard to mechanical stability, flame retardation, stability, and protection against contact, the following alternative types of installation are specified:

- Installation in a suitable cabinet.
- Installation in a suitable enclosure.
- Installation in a suitably equipped, enclosed control room.

 WARNING

If the temperature at the cable or housing socket or at the branching points of the cables exceeds 60 °C, special precautions must be taken. If the equipment is operated at ambient temperatures in excess of 40 °C, only use cables with permitted operating temperature of at least 80 °C.

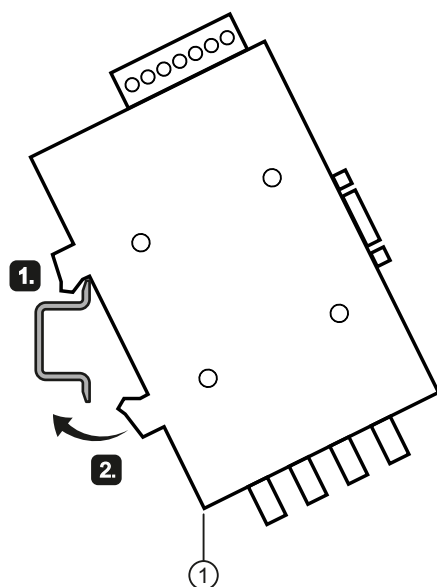
5.3 Installation guide

Electromagnetic compatibility

Electromagnetic compatibility (EMC) includes all questions of electrical, magnetic and electromagnetic immunity and emission. To avoid interference affecting electrical systems, these effects must be reduced to a minimum. The essential limiting measures include the configuration, correct connection of bus cables and the suppression of switching inductances; refer to the notes in the sections "Installation" and "Connecting optical cables".

5.5 Mounting on DIN rails

Mounting



① Locking slide

Figure 5-3 Mounting a module on a DIN rail

To install the module on a 35 mm DIN rail complying with DIN EN 60715, follow the steps below:

1. Fit the upper securing hooks of the module onto the top of rail ①.
2. Push the module down against rail until it locks in place ②.

Removal

To remove the module from a DIN rail, follow the steps below:

1. Pull the locking slide on the bottom of the module downwards.
2. Pull the lower part of the device away from the DIN rail.

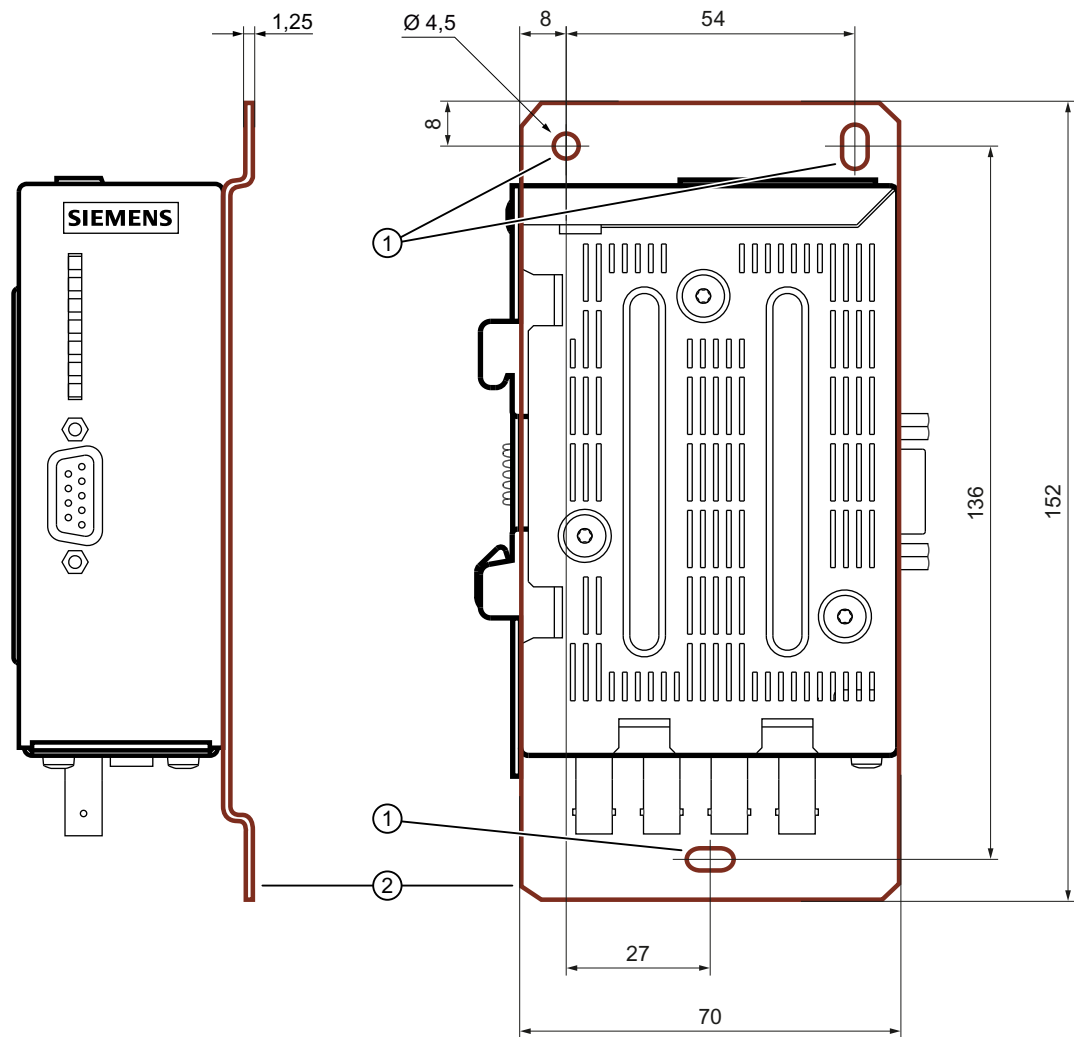
5.6 Wall mounting

Mounting

To mount the module on a wall, follow the steps below:

1. Unscrew the 3 screws on the right side of the OLM (the side with the type label).
2. Use these 3 screws to secure the mounting plate (MLFB: 6GK1503-8AA00).
3. Secure the OLM to the wall or a cabinet plate.

The mounting plate must provide low-resistance and low-inductance grounding.



- ① Holes for wall mounting
- ② Mounting plate with OLM fitted

Figure 5-4 Mounting a module using a mounting plate

Technical specifications

Properties		Device type		
		OLM P11 V4.1	OLM G11 V4.0	OLM G11-1300 V4.0
		OLM P12 V4.1	OLM G12 V4.0	OLM G12-1300 V4.0
		OLM P22 V4.1	OLM G22 V4.0	
			OLM G12-EEC V4.0	
Power supply				
Operating voltage		24 V DC safety extra-low voltage Permitted voltage range 18..32 V DC		
Current consumption		Max. 200 mA		
Output voltage for bus termination		5 V DC+5/-10%		
RS-485 (D-sub female connector, pin 6)				
Signaling contact				
Function		Floating contact, opens if error/ fault occurs		
Power		CE: Max. 50 V DC/30 V AC safety extra-low voltage cULus: Max. 30 V DC/30 V AC safety extra-low voltage		
Current		Max. 1.0 A		
Signal transmission				
Transmission speed		9.6; 19.2; 45.45; 93.75; 187.5; 500 kbps 1.5; 3; 6; 12 Mbps		
Transmission speed setting		Automatic		
Bit error rate		<10 ⁻⁹		
Signal delay time (any input/output)		≤ 6.5 t _{Bit}		
Retimer				
Input (all channels)	Signal distortion	± 30%		
	Bit length	± 0.12%		
Output (all channels) - average bit length		± 0.01%		
Status signaling				
Device		LED "System", red/green together with signaling contact		
Electrical channels		LED yellow/red		
Optical channels		LED yellow/red		
Optical level		Level display with green/yellow/red LED		
Safety				
IEC standard		IEC 60950 (corresponds to EN 60950 and VDE 0805)		
UL approval		According to type plate		
CSA approval		According to type plate		
C-Tick approval		According to type plate		
FM approval		According to type plate		

Properties		Device type		
		OLM P11 V4.1	OLM G11 V4.0	OLM G11-1300 V4.0
		OLM P12 V4.1	OLM G12 V4.0	OLM G12-1300 V4.0
		OLM P22 V4.1	OLM G22 V4.0	OLM G12-EEC V4.0
Electrical channels				
Type		RS-485		
Input dielectric strength		-7 V to +12 V		
Optical channels				
Wavelength		660 nm	860 nm	1310 nm
Launchable optical power				
In glass fiber E 10/125 (9/125)		-	-	-19 dBm
In glass fiber G 50/125	Transmit power factory setting	-	-20.5 dBm	-
	Transmit power increased	-	-16 dBm	-
In glass fiber G 62.5/125	Transmit power factory setting	-	-17.5 dBm	-
	Transmit power increased	-	-13 dBm	-
IN PCF fiber S 200/230	Transmit power factory setting	-	-	-
	Transmit power increased	-17 dBm	-	-
In plastic fiber S 980/1000	Transmit power factory setting	-9.5 dBm	-	-
	Transmit power increased	-5 dBm	-	-
Sensitivity of receiver		-23 dBm	-28 dBm	-29 dBm
Overdrive limit receiver (typical)		-7 dBm	-11 dBm	-14 dBm
Coverable distance ¹				
With glass fiber E 10/125 (9/125) (0.5 dB/km)		-	-	0 to 15 km
With glass fiber G 50/125 (3 dB/km @ 860 nm, 1 dB/km @ 1310 nm)	Transmit power factory setting	-	0 to 1 km	-
	Transmit power increased	-	0.5 to 3 km	-
With glass fiber G 62.5/125 (3.5 dB/km @ 860 nm, 1 dB/km @ 1310 nm)	Transmit power factory setting	-	0 to 1 km	-
	Transmit power increased	-	0.5 to 3 km	-
With PCF fiber S 200/230 (10 dB/km)	Transmit power factory setting	-	-	-
	Transmit power increased	0 to 400 m	-	-

Properties		Device type		
		OLM P11 V4.1	OLM G11 V4.0	OLM G11-1300 V4.0
		OLM P12 V4.1	OLM G12 V4.0	OLM G12-1300 V4.0
		OLM P22 V4.1	OLM G22 V4.0	OLM G12-EEC V4.0
In plastic fiber S 980/1000 (0.2 dB/m)	Transmit power factory setting	0 to 50 m	-	-
	Transmit power in- creased	30 to 80 m	-	-
Plug-in cable		BFOC/2.5		
Electromagnetic compatibility				
Radiated emission		EN 55022, limit class A		
Conducted emission		EN 55022, limit class A		
Electrostatic discharge (ESD)		EN 61000-4-2, ± 6 kV contact discharge		
Radiated RF		EN 61000-4-3, 10 V/m 80 MHz..1 GHz		
Conducted RF		EN 61000-4-6, 10 V 10 kHz .. 80 MHz		
Burst		EN 61000-4-4, ± 2 kV on power supply, signaling contact and RS-485		
Surge (with Blitzductor)		EN 61000-4-5, On power supply cables	±1 kV balanced ±2 kV unbalanced	
		On RS-485 bus cables	±2 kV unbalanced	
Voltage interruptions		EN 61000-4-11		
Voltage dips		Voltage reduction by >95% for 5 s Voltage reduction by 30% for 10 s Voltage reduction by 60% for 100 ms and 1000 ms		
Climatic environmental conditions				
Ambient temperature during operation		-20 °C..+60 °C for OLM G12-EEC 0 °C to +60 °C for all other OLMs		
Storage and transportation temperature		-40 °C to +70 °C		
Relative humidity		Max. 100%, condensing for OLM G12-EEC <95%, non-condensing for all other OLMs		
Mechanical environmental conditions				
Oscillation in operation		10 to 58 Hz, 0.075 mm deflection 58 to 150 Hz, 1 g acceleration		
Oscillation during transportation		5 to 9 Hz, 3.5 mm deflection 9 to 500 Hz, 1 g acceleration		
Vibration during operation		40 m/s²		
Shock in operation		150 m/s², 10 ms		
Shock packed		250 m/s², 6 ms		
Free fall unpacked		10 cm		
Free fall packed		30 cm in product packaging 1 m in dispatch packaging		
Miscellaneous information				

10.1 Resistance to harmful gases according to ISA-71.04

Properties	Device type		
	OLM P11 V4.1	OLM G11 V4.0	OLM G11-1300 V4.0
	OLM P12 V4.1	OLM G12 V4.0	OLM G12-1300 V4.0
	OLM P22 V4.1	OLM G22 V4.0	OLM G12-EEC V4.0
Degree of protection	IP40		
Dimensions	39.5 x 112 x 74.5 mm		
Housing material	Stainless steel, 1.4016		
Ground	approx. 340 g		
Silicone	The device is free of silicone.		
MTBF at 40 °C	145.96 years (P11)	157.87 years (G11)	157.24 years (G11-1300)
	108.02 years (P12)	118.16 years (G12-EEC)	
	99.85 years (P22)	108.69 years (G22)	117.69 years (G12-1300)
MTBF at 60 °C	68.65 years (P11)	73.95 years (G11)	73.82 years (G11-1300)
	51.32 years (P12)	56.05 years (G12-EEC)	
	46.98 years (P22)	50.96 years (G22)	55.94 years (G12-1300)

¹ The following distances between two OLMs must not be exceeded regardless of the optical power budget.

Note

The resistance to ground (RTG) for operation of an ungrounded PROFIBUS OLM V4.0 is 830 kohm.

The resistance to ground (RTG) for operation of an ungrounded PROFIBUS OLM V4.1 is 990 kohm.

10.1 Resistance to harmful gases according to ISA-71.04

The devices listed in the scope of validity meet the following requirements regarding resistance to harmful gases:

Corrosive gases as airborne contaminants Reactive species H ₂ S and SO ₂	ISA-71.04 severity level	G1, G2, G3 RH ≤ 75%, no condensation
	Test according to	IEC 60068-2-42 (SO ₂ 10ppm)
		IEC 60068-2-43 (H ₂ S 1ppm)