

ioPAC 6500 (65M) Switch and Communication Backplane Modules Quick Installation Guide

Version 1.0, November 2024

Technical Support Contact Information
www.moxa.com/support



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P/N: 1802065000131



Package Checklist

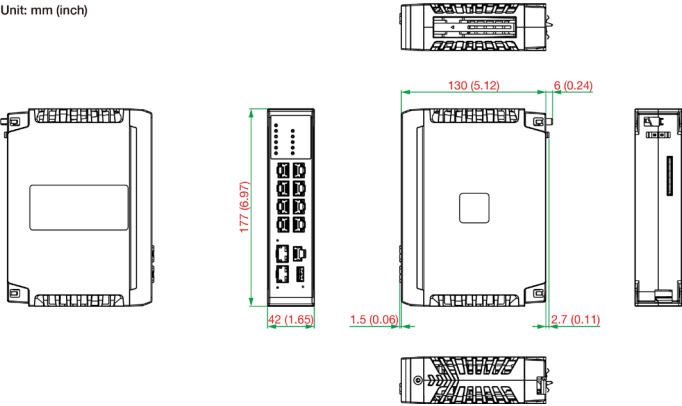
- 1 x 65M module
- 1 x Quick installation guide (printed)
- 1 x Warranty card

NOTE Notify your sales representative if any of the above items is missing or damaged.

Dimensions

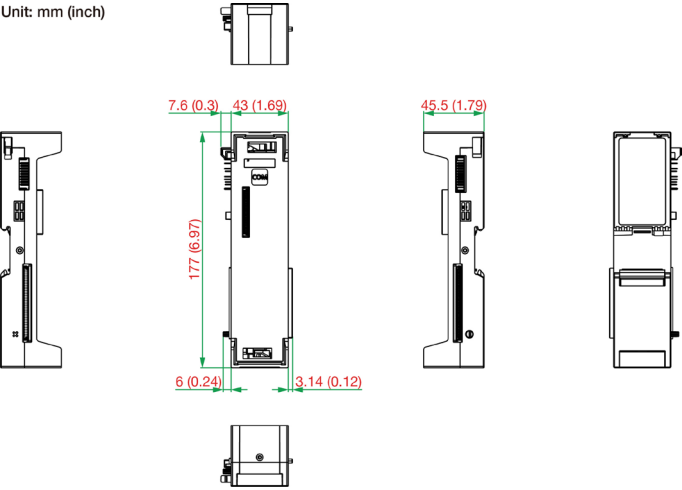
65M-5011M-CT-T

Unit: mm (inch)



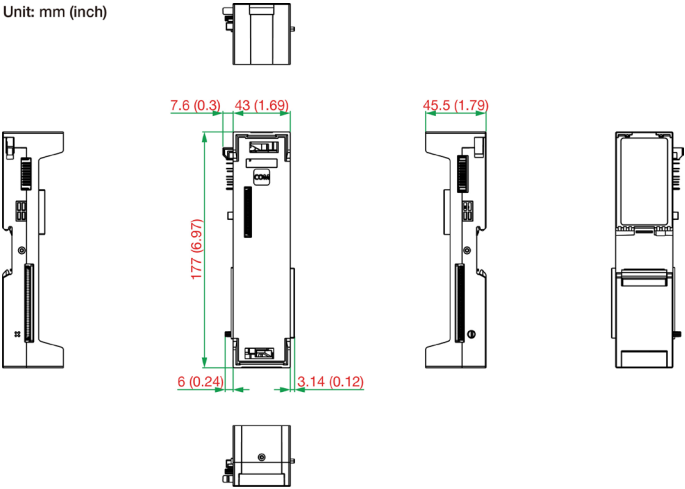
65M-BMCM01-CT-T

Unit: mm (inch)



65M-BMCM02-CT-T

Unit: mm (inch)



LED Description

Switch Module (65M-5011M-CT-T)

Labeling	Indication	Qty	Color	Behavior	Description
STATUS	System Status	1	Green	On	When the system has passed power-on self-test (POST) and is ready to run.
				Blinking at 1 Hz	1. When pressing the reset button, depress for 1 second to reboot the switch. 2. System service initialization.
				Blinking at 2 Hz	1. When pressing the reset button, depress for 5 seconds to reset to factory default. 2. While external storage is connected to the switch.
			Red	On	System failed in the boot-up process. Reading system info failed or EEPROM info error.
FAULT	Fault indication	1	Red	On	1. Network loop is detected when

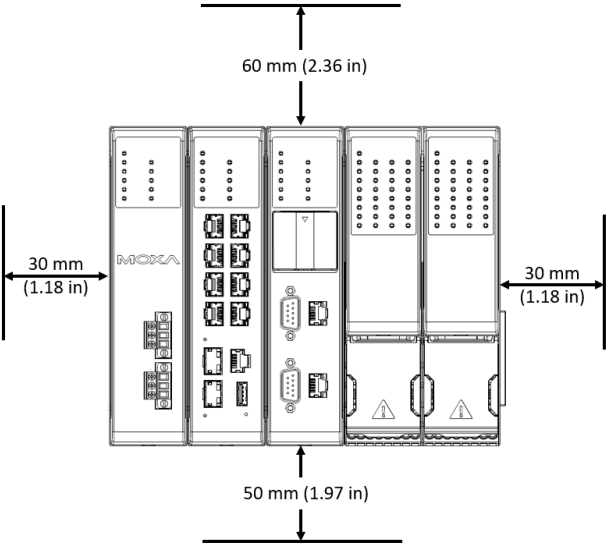
Labeling	Indication	Qty	Color	Behavior	Description
					loop protection is enabled. 2. External storage loading/saving failed. 3. The port is being disabled because exceeding the ingress rate limit of shut down mode. 4. Invalid Ring port connection.
				OFF	When the system boots up and runs correctly or a user-configured event is not triggered.
MSTR/ HEAD	Master or head	1	Green	On	When the switch is master/head of Turbo Ring/Turbo Chain
				Blinking at 4 Hz	1. The switch has become the master of Turbo Ring after Turbo Ring has gone down. 2. The switch is set as head of Turbo Chain and Turbo Chain has gone down. 3. The switch is set as the Turbo Ring's member and the corresponding Ring port is down. 4. The switch is set as the Turbo Chain's member/tail and the corresponding head-end chain port is down.
				Off	When the switch is not the master/head of this Turbo Ring/Turbo Chain.

Labeling	Indication	Qty	Color	Behavior	Description
CPRL/ TAIL	Coupling or Tail	1	Green	On	1. The switch's ring coupling or dual homing function is enabled. 2. The switch is set as the tail of Turbo Chain.
				Blinking at 4 Hz	1. Turbo Chain has gone down. 2. The switch is set as the Turbo Chain's member/head and the corresponding tail-end chain port is down.
				Off	When the switch disables the coupling or tail role of Turbo Chain.
SYNC	Synchronization	1	N/A	N/A	Reserved
3 to 10	10M/100M/ 1000M RJ45 Top LED	1 for each	Green	On	When the port is active and links on 1000 Mbps.
				Blinking	When the port's data is being transmitted at 1000 Mbps.
				Off	When the port is inactive, or link is down.
	10M/100M/ 1000M RJ45 Bottom LED	1 for each	Amber	On	When the port is active and links on 10/100 Mbps.
				Blinking	When the port's data is being transmitted at 10/100 Mbps.
				Off	When the port is inactive, or link is down.
1 to 2	100M/1000M SFP Port	1 for each	Green	On	When the port is active and links on 1,000bvMbps.
				Blinking	When the port's data is being transmitted at 1,000 Mbps.
				Off	When the port is inactive, or link is down.

Labeling	Indication	Qty	Color	Behavior	Description
			Amber	On	When the port is active and links on 100 Mbps.
				Blinking	When the port's data is being transmitted at 100 Mbps.
				Off	When the port is inactive or link is down.

Horizontal Installation

Before mounting the device onto a DIN rail, ensure that there is enough space around the device so that heat generated can effectively dissipate. The minimum space allowance recommendation around the device is shown in the following diagram:



CAUTION

DO NOT install the device upright because the fanless heat dissipation design will not perform as intended in this position.

Installing the System on a DIN Rail

The ioPAC 6500 Series modules need to be installed from left to right in the following order:

Power Module > Communication (switch) Module (optional) > CPU Module > IO Module (optional)

NOTE LIMITATIONS

The system combinations have the following limitations:

- Maximum unit: 1 (control unit)
- Maximum power backplane in the control unit:
1 (1 slot or 2 slots)
- Maximum CPU backplane in control unit:
1 (1 slot or 2 slots)
- Maximum communication backplane in control unit:
1 (1 slot or 2 slots)
- Maximum IO backplane in the control unit:
2 (2 slots or 4 slots)

To mount the modules on to a DIN rail, do the following:

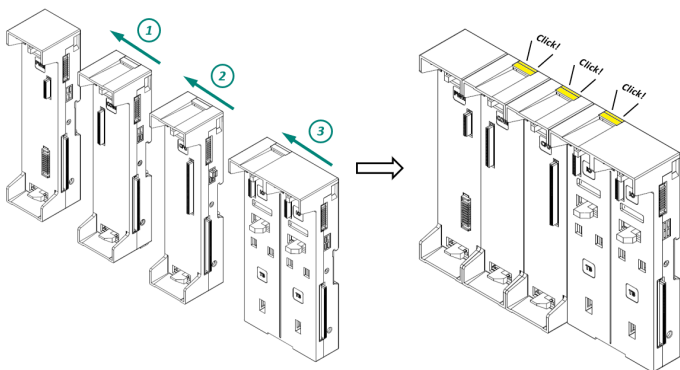
The system configuration shown in this document includes 1 power module, 1 communication module (switch), 1 CPU module, and 2 IO modules.

Step 1: Assemble all the backplane modules that you need before mounting them onto the DIN rail.

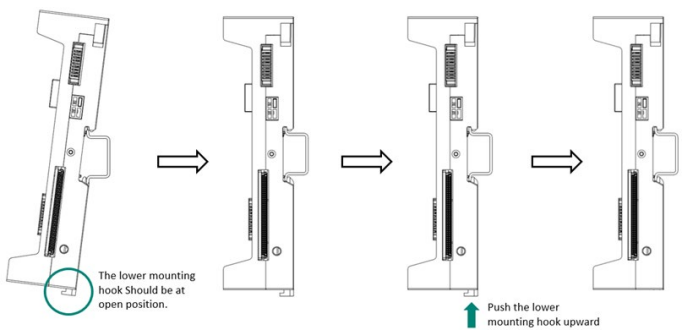
You must assemble the modules in the following order:

Power Module > Communication Module (Switch) > CPU Module > IO Module

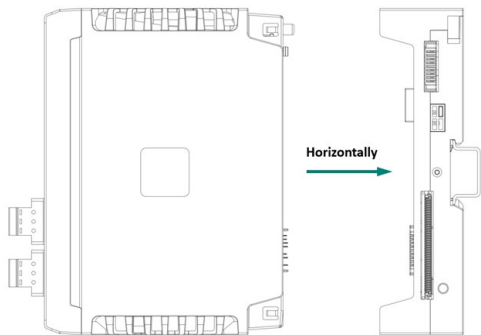
A click sound from the top clip indicates that the backplane modules are connected properly.



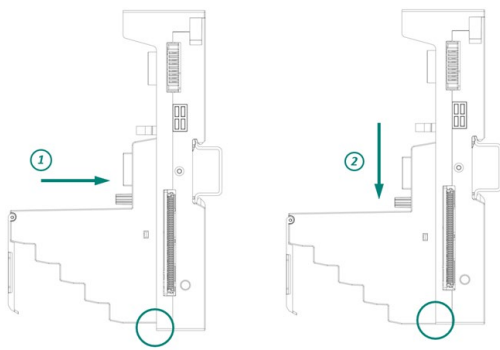
Step 2: Attach the upper mounting hook of all assembled backplanes to the upper lip of the DIN rail, while making sure the lower mounting hooks of all of them are open as shown in the following illustrations (side view), and push the assembled backplane towards the DIN rail, and finally push the lower mounting hooks upwards until the backplane modules are securely latched to the DIN rail.



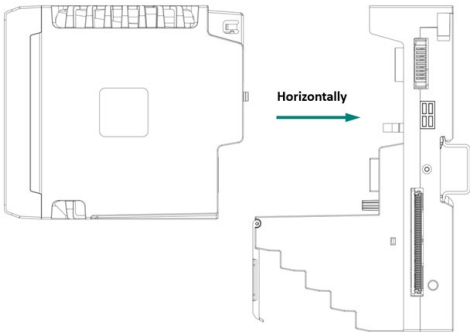
Step 3: Hold the power module with both hands and install it horizontally onto the power backplane module. Do the same with the CPU module and switch module (if applicable).



Step 4: Place the terminal-block module onto the IO backplane module and then pull down the terminal-block module to secure it in its position.



Step 5: Hold the IO module with both hands and install it horizontally onto the IO backplane module. Use the poka-yoke (error-proof) design as a guide to ensure the IO module is installed in the correct slot.

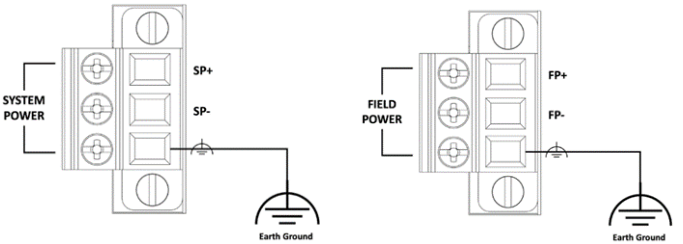


ATTENTION

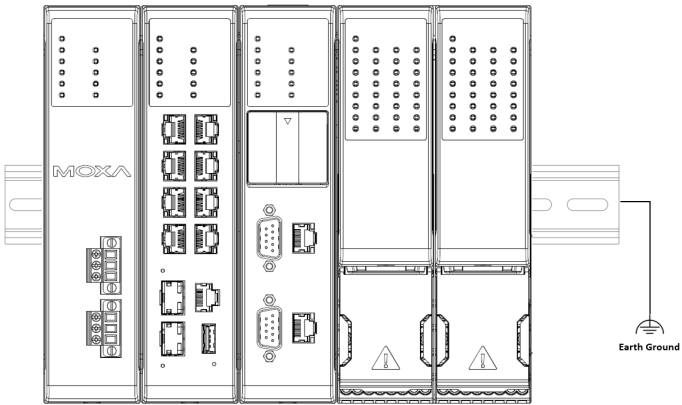
These devices are OPEN-TYPE and are required to be installed in a suitable enclosure so that the devices can only be accessed with the use of a tool.

Grounding the System

You must ensure that the system is properly grounded. The three points that should be connected to the earth ground as shown in the following illustrations.



NOTE The grounding spring on the rear side of the backplane modules will directly connect to the DIN rail when they are successfully mounted.



Wiring the Ethernet Port

The maximum cable length is 100 m (350 feet), but the actual limit for your application could be longer or shorter depending on the amount of electrical noise in the environment. To minimize the amount of noise, Ethernet cables should not run parallel to power cables or other types of cables that generate electrical noise. The following diagram and table show the pin assignments for the RJ45 Ethernet ports:

Pin 8

Pin 1

Pin	Media Direct Interface Signal
1	TRD(0)+
2	TRD(0)-
3	TRD(1)+
4	TRD(2)+
5	TRD(1)-
6	TRD(2)-
7	TRD(3)+
8	TRD(3)-

Wiring the Fiber Port

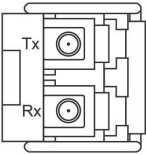
1000BaseSFP (mini-GBIC) Fiber Port

The Gigabit Ethernet fiber ports on the switch are 1000BaseSFP fiber ports, which must use 1G mini-GBIC fiber transceivers to work properly.

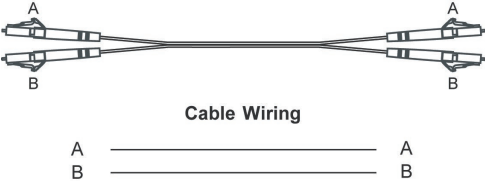
The concept behind the LC port and cable is straightforward. Suppose you are connecting devices I and II; contrary to electrical signals, optical signals do not require a circuit to transmit data. Consequently, one of the optical lines is used to transmit data from device I to device II, and the other optical line is used to transmit data from device II to device I, for full-duplex transmission.

Remember to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II. If you make your own cable, we suggest labeling the two sides of the same line with the same letter (A-to-A and B-to-B, as shown below, or A1-to-A2 and B1-to-B2).

LC-Port Pinouts



LC-Port to LC-Port Cable Wiring



Powering the Units

When all the installation and wiring are complete, you can turn on the power to boot up the system. After turning on the system power supply, it will take 90 seconds for the operating system to boot up. The green Ready LED will stay lit until the operating system is ready.

Specifications

Ethernet Interface	
10/100/1000BaseT(X) Ports (RJ45 connector)	8 Auto MDI/MDI-X connection Auto negotiation speed Full/Half duplex mode
100/1000BaseSFP Ports	2*
Serial Interface	
Console Port	RS-232, RJ45 connector on front
Other Interface	
Backup and Storage Interface	USB Type A; only supports the ABC-02-USB from Moxa
Button	RESET button
Power Parameters	
Input Current	0.9 A @ 12 VDC
Physical Characteristics	
Weight	65M-5011M: 660 g (1.46 lb) 65M-BMCM01: 169 g (0.37 lb) 65M-BMCM02: 330g (0.73 lb)
Mounting Options	DIN-rail mounting (default) Rack mounting (with optional kit)
Environmental Limits	
Operating Temperature	-40 to 75°C (-40 to 167°F) -40 to 65°C (-40 to 149°F) with SFP module installed
Storage Temperature	-40 to 85°C (-40 to 185°F) including the package
Relative Humidity	5 to 95% (non-condensing)
IP Protection	IP20
Operating Altitude	Up to 2000 meters
Standards and Certifications	
EMC	EN 55032/35 EN 61000-6-2/6-4
EMI	CISPR 32 FCC Part 15B Class A

EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: DC Power: 1 kV; Signal: 1 kV IEC 61000-4-5 Surge: DC Power: 0.5 kV L-N, 1 kV L/N-PE Signal: 1 kV; IO: 0.5 kV IEC 61000-4-6 CS: DC Power: 10 Vrms; Signal: 10 Vrms IEC 61000-4-8 PFMF: 30 A/m
Safety	UL 61010-1, UL 61010-2-201
Shock	IEC 60068-2-27 Half Sine Wave Acceleration: 15 g; Duration Time: 11 ms
Vibration	IEC 60068-2-6
Package Vibration / Drop Test	ISTA-1A
Warranty	
Warranty period	5 years
Details	See www.moxa.com/tw/warranty

*The SFP modules supported are listed in the following table:

Model	Description
SFP-1GLHLC-T	SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°C operating temperature
SFP-1GLSXLC-T	SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, -40 to 85°C operating temperature
SFP-1GLXLC-T	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature
SFP-1GSXLC-T	SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, -40 to 85°C operating temperature
SFP-1GZXLC-T	SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature
SFP-1G10ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G10BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature
SFP-1G20ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G20BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature

Model	Description
SFP-1G40ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G40BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature
SFP-1FELLC-T	SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature
SFP-1FEMLC-T	SFP module with 1 100Base multi-mode with LC connector for 2/4 km transmission, -40 to 85°C operating temperature
SFP-1FESLC-T	SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature



ATTENTION

This is a Class 1 Laser/LED product. To avoid causing serious damage to your eyes, do not stare directly into the laser beam.