ioPAC 6500 (65M) IO, IO Backplane, and Terminal Block Modules Quick Installation Guide

Version 1.0, November 2024

Technical Support Contact Information
www.moxa.com/support

P/N: 1802065000121

Package Checklist

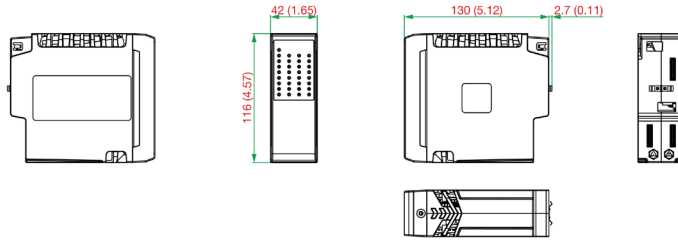
- 1 x 65M module
- 1 x Pin-definition card (65M-TB models)
- 1 x Quick installation guide (printed)
- 1 x Warranty card

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

Dimensions

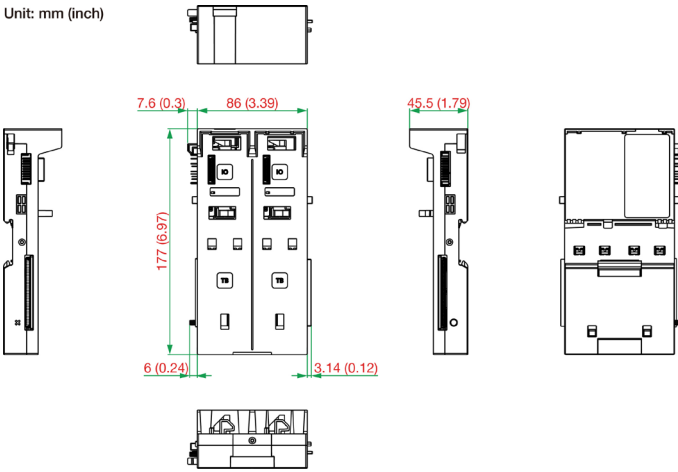
65M-1XXX/2XXX/3XXX/4XXX Models

Unit: mm (inch)



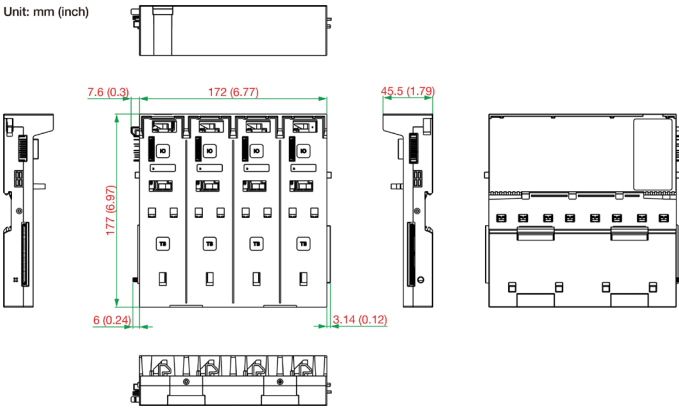
65M-BMIO02 Models

Unit: mm (inch)



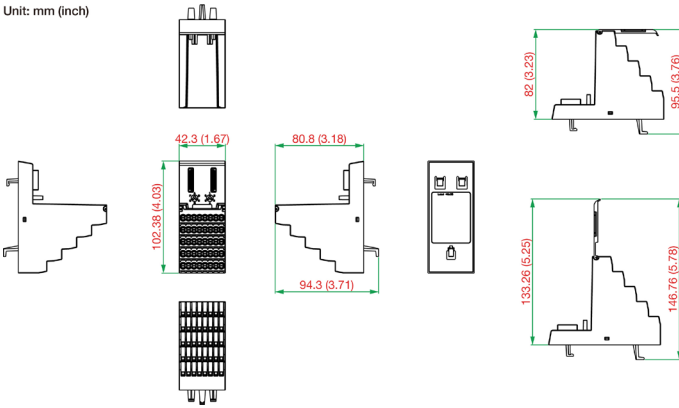
65M-BMIO04 Models

Unit: mm (inch)



65M-TB Models

Unit: mm (inch)



LED Descriptions

DI Module (65M-1900-CT-T)

Labeling	Indication	Qty	Color	Behavior	Description
STATUS	System status	1	Green	On	Normal
				Blinking at 5 Hz	Firmware upgrade in progress
				Blinking at 0.5 Hz	Booting up
				Double blinking	Module located
			Red	On	System failure
				Blinking at 5 Hz	Lost the connection to CPU
				Blinking at 0.5 Hz	Diagnostic failure
				Double blinking	No field power

Labeling	Indication	Qty	Color	Behavior	Description
1 to 32	DI channels	1 for each	Green	On	ON
			Red	On	Diagnostic error
			Off		OFF/Inactive

DO Module (65M-2901-CT-T)

Labeling	Indication	Qty	Color	Behavior	Description
STATUS	System status	1	Green	On	Normal
				Blinking at 5 Hz	Firmware upgrade in progress
				Blinking at 0.5 Hz	Booting up
				Double blinking	Module located
			Red	On	System failure
				Blinking at 5 Hz	Fail-safe mode
				Blinking at 0.5 Hz	Diagnostic failure
				Double blinking	No field power
1 to 32	DO channels	1 for each	Green	On	ON
			Red	On	Diagnostic error
			Off		OFF/Inactive

AI Module (65M-3600/3610 Models)

Labeling	Indication	Qty	Color	Behavior	Description
STATUS	System status	1	Green	On	Normal
				Blinking at 5 Hz	Firmware upgrade in progress
				Blinking at 0.5 Hz	Booting up
				Double blinking	Module located
			Red	On	System failure
				Blinking at 5 Hz	Lost the connection to CPU
				Blinking at 0.5 Hz	Diagnostic failure
				Double blinking	No field power
1-16	AI channels	1 for each	Green	On	ON
			Red	On	Diagnostic error
			Off		Inactive

AO Module (65M-4820-CT-T)

Labeling	Indication	Qty	Color	Behavior	Description
STATUS	System status	1	Green	On	Normal
				Blinking at 5 Hz	Firmware upgrade in progress
				Blinking at 0.5 Hz	Booting up
				Double blinking	Module located
			Red	On	System failure
				Blinking at 5 Hz	Failsafe mode
				Blinking at 0.5 Hz	Diagnostic failure
				Double blinking	No field power
1-8	AO channels	1 for each	Green	On	ON
			Red	On	Diagnostic error
			Off		Inactive

IO Pin Definitions

65M-TB-1900-CT-T

5	10	15	20	25	30	35	40
FCS	FCS	GND	GND	NC	NC	NC	NC
4	9	14	19	24	29	34	39
DI4	DI8	DI12	DI16	DI20	DI24	DI28	DI32
3	8	13	18	23	28	33	38
DI3	DI7	DI11	DI15	DI19	DI23	DI27	DI31
2	7	12	17	22	27	32	37
DI2	DI6	DI10	DI14	DI18	DI22	DI26	DI30
1	6	11	16	21	26	31	36
DI1	DI5	DI9	DI13	DI17	DI21	DI25	DI29

65M-TB-2901-CT-T

5	10	15	20	25	30	35	40
V+	V+	V-	V-	NC	NC	NC	NC
4	9	14	19	24	29	34	39
DO4	DO8	DO12	DO16	DO20	DO24	DO28	DO32
3	8	13	18	23	28	33	38
DO3	DO7	DO11	DO15	DO19	DO23	DO27	DO31
2	7	12	17	22	27	32	37
DO2	DO6	DO10	DO14	DO18	DO22	DO26	DO30
1	6	11	16	21	26	31	36
DO1	DO5	DO9	DO13	DO17	DO21	DO25	DO29

65M-TB-3600-CT-T

5	10	15	20	25	30	35	40
LS1+	LS1+	LS1-	LS1-	LS2+	LS2+	LS2-	LS2-
4	9	14	19	24	29	34	39
AI4+	AI4-	AI8+	AI8-	AI12+	AI12-	AI16+	AI16-
3	8	13	18	23	28	33	38
AI3+	AI3-	AI7+	AI7-	AI11+	AI11-	AI15+	AI15-
2	7	12	17	22	27	32	37
AI2+	AI2-	AI6+	AI6-	AI10+	AI10-	AI14+	AI14-
1	6	11	16	21	26	31	36
AI1+	AI1-	AI5+	AI5-	AI9+	AI9-	AI13+	AI13-

65M-TB-3610-CT-T

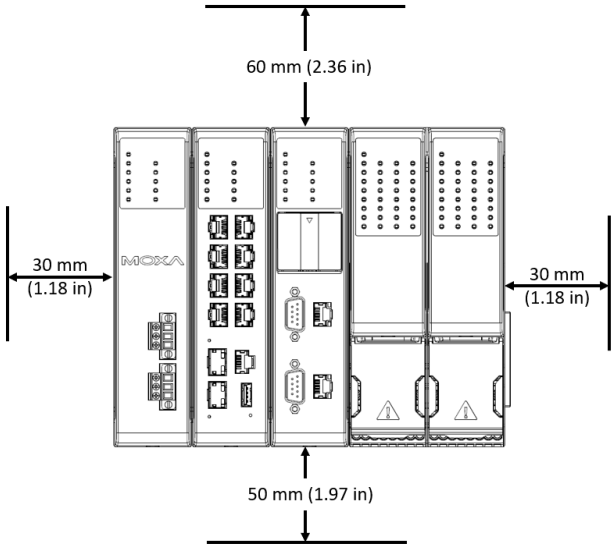
5	10	15	20	25	30	35	40
NC	NC	NC	NC	NC	NC	NC	NC
4	9	14	19	24	29	34	39
AI4+	AI4-	AI8+	AI8-	AI12+	AI12-	AI16+	AI16-
3	8	13	18	23	28	33	38
AI3+	AI3-	AI7+	AI7-	AI11+	AI11-	AI15+	AI15-
2	7	12	17	22	27	32	37
AI2+	AI2-	AI6+	AI6-	AI10+	AI10-	AI14+	AI14-
1	6	11	16	21	26	31	36
AI1+	AI1-	AI5+	AI5-	AI9+	AI9-	AI13+	AI13-

65M-TB-4820-CT-T

5	10	15	20	25	30	35	40
NC	NC	NC	NC	NC	NC	NC	NC
4	9	14	19	24	29	34	39
IO2+	IO2-	IO4+	IO4-	IO6+	IO6-	IO8+	IO8-
3	8	13	18	23	28	33	38
VO2+	VO2-	VO4+	VO4-	VO6+	VO6-	VO8+	VO8-
2	7	12	17	22	27	32	37
IO1+	IO1-	IO3+	IO3-	IO5+	IO5-	IO7+	IO7-
1	6	11	16	21	26	31	36
VO1+	VO1-	VO3+	VO3-	VO5+	VO5-	VO7+	VO7-

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 needs 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:

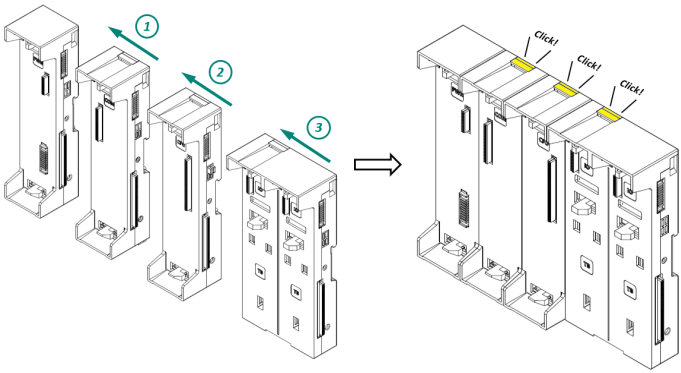
- Maximum units: 1 (control unit)
- Maximum no. of power backplanes in control unit: 1 (1 slot or 2 slots)
- Maximum no. of CPU backplanes in control unit: 1 (1 slot or 2 slots)
- Maximum no. of communication backplanes in control unit: 1 (1 slot or 2 slots)
- Maximum no. of IO backplanes in the control unit: 2 (2 slots or 4 slots)

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

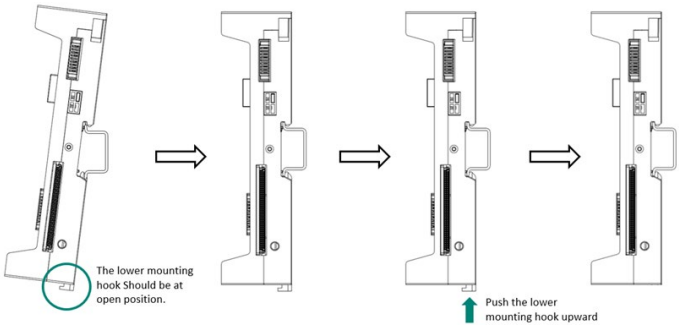
The system configuration shown in this document includes 1 power module, 1 communication module (switch), 1 CPU module, and 2 IO modules.

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

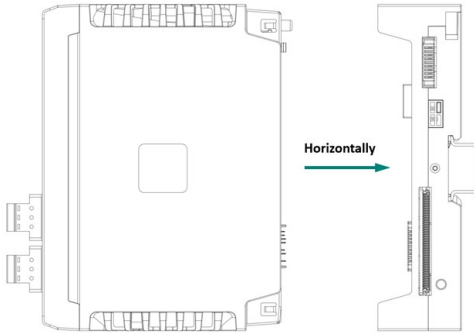
You must assemble the modules in the following order:
Power Module > Communication Module (Switch) > CPU Module > IO Module.
A click sound from the top clip indicates that the backplane modules are connected properly.



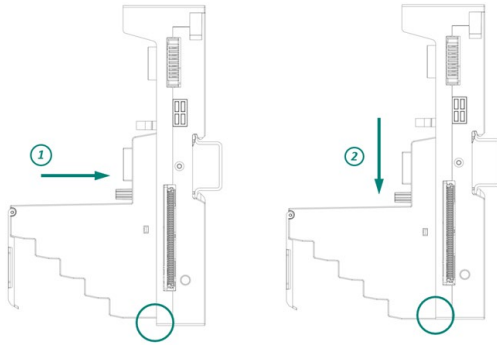
Step 2: Attach the upper mounting hook of all assembled backplanes to the upper lip of the DIN rail, while making sure the lower mounting hooks of all of them are open as shown in the following illustrations (side view), and push the assembled backplane towards the DIN rail, and finally push the lower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



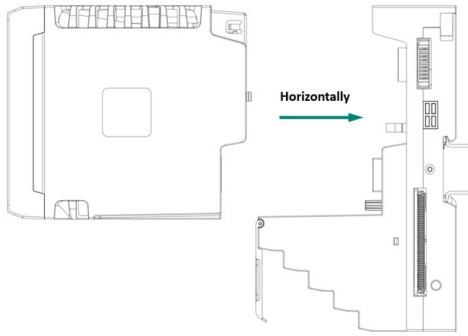
Step 3: Hold the power module with both hands and install it horizontally onto the power backplane module. Do the same with the CPU module and switch module (if applicable).



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.

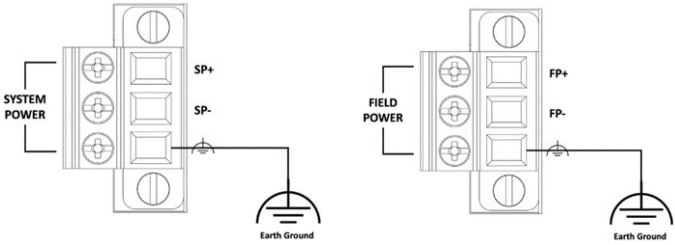


ATTENTION

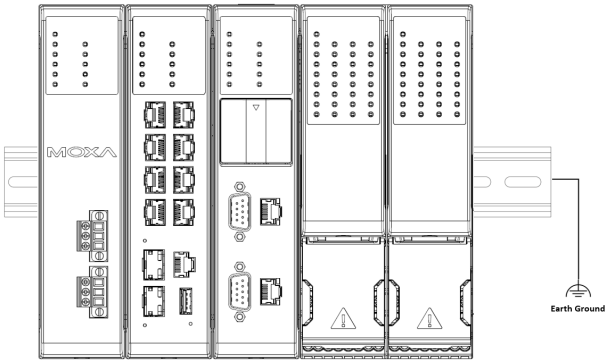
These devices are OPEN-TYPE and are required to be installed in a suitable enclosure so that the devices can only be accessed with the use of a tool.

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.



IO wiring

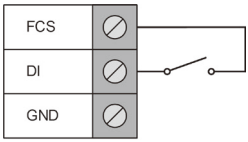
Wire range: 14 to 20 AWG (2.5 to 0.75 mm^2)

Wire strip length: 8 mm (0.315 in)

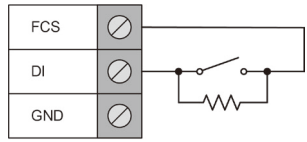
Recommend Tightening Torque: 4.6 kg-cm (4 lb-in)

65M-TB-1900-CT-T

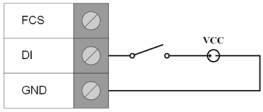
Dry Contact



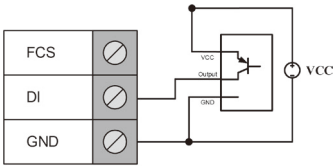
Dry Contact
(with Wire Break Diagnostic)



Dry Contact (External Power)

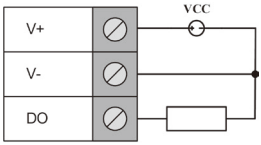


Wet Contact

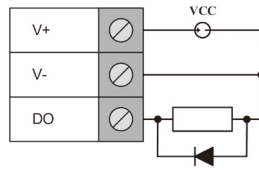


65M-TB-2901-CT-T

Resistive Load

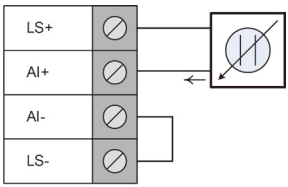


Inductive Load

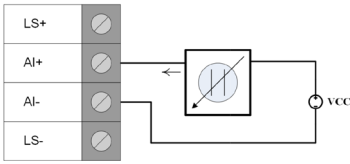


65M-TB-3600-CT-T

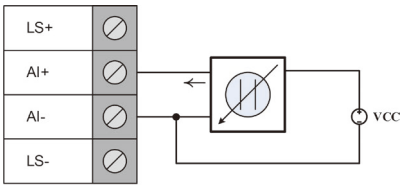
2-wire Current Sensor (Internal Loop Power)



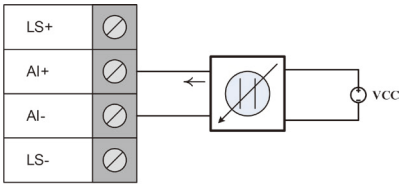
2-wire Current Sensor (External Loop Power)



3-wire Current Sensor

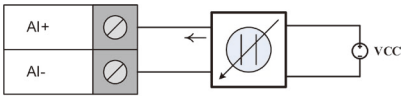


4-wire Current Sensor



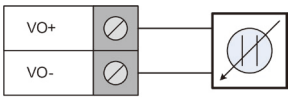
65M-TB-3610-CT-T

4-wire Voltage Sensor

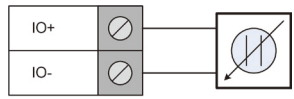


65M-TB-4820-CT-T

Voltage Output



Current Output



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

General

Mounting Options	
DIN-rail Mounting	Default
Rack Mounting	Supported (with optional kit)
Environmental Limits	
Operating Temperature	-40 to 75°C (-40 to 167°F)
Storage Temperature (including package)	-40 to 85°C (-40 to 185°F)
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
Vibration	IEC 60068-2-6 DIN-rail Mounted: 7 mm peak-peak (p-p) (2 to 8.42 Hz), 1 g (8.42 to 150 Hz)

	Rack Mounted (with optional kit): 7 mm peak-peak (p-p) (2 to 8.42 Hz), 0.5 g (8.42 to 150 Hz)
Package Vibration / Drop Test	ISTA-1A
Warranty	
Warranty period	5 years
Details	See www.moxa.com/tw/warranty

65M-1900-CT-T

Digital Input	
Number of Channels	32
Input Type	Current sink (internal or external field-circuit supply for dry contact)
Input ON Voltage	11 to 30 VDC
Input OFF Voltage	0 to 5 VDC
Internal Field Circuit Supply	Voltage: 24 VDC, 22.8 to 25.2 VDC Current: 125 mA (max.) (Only for dry contact)
Counter	
Number of Counter Channels	8 (Channel 1-8, group configurable by software)
Counting Frequency	Square wave 0 to 10 kHz
Power Consumption	
System Power	0.068 A @ 12 VDC
Field Power	0.019 A @ 24 VDC (without using internal field-circuit supply) 0.115 A @ 24 VDC (32 channel dry contact using the internal field circuit supply)
Physical Characteristics	
Weight	253 g (0.56 lb)

65M-2901-CT-T

Digital Output	
Number of Channels	32
Output Type	Current Source
Field Power Input Voltage	24 VDC, 19.2 to 28.8 VDC
Field Power Input Current	6.4 A (max.)
Load Current	200 mA / 1 channel (typ.) 500 mA / 1 channel (max.)
Pulse	
Number of Pulse Channels	8 (Channel 1-8, group configurable by software)
Pulse Duration	500 μs (min.)
Power Consumption	
System Power	0.068 A @ 12 VDC
Field Power	0.005 A @ 24 VDC
Physical Characteristics	
Weight	254 g (0.56 lb)

65M-3600-CT-T

Analog Input	
Number of Channels	16 (8 channels per group)
Input Mode	0 to 20 mA 4 to 20 mA
Permitted Overload on Inputs	±30 mA
IO type	Differential
Internal Loop Power Supply	Voltage: 24 VDC, 22.8 to 25.2 VDC Current: 200 mA / Group (max.) (only for 2-wire connection)
ADC Resolution	16 bits
Measurement Resolution	2 µA (0 to 20 mA) 1.6 µA (4 to 20 mA)
Conversion Time	100 ms
Accuracy	± 0.1% Full Scale Range @ 25°C; ± 0.3% Full Scale Range @ -40 to 75°C
Power Consumption	
System Power	0.073 A @ 12 VDC
Field Power	0.053 A @ 24 VDC (without using internal loop power) 0.466 A @ 24 VDC (16 channels 4 to 20 mA input using internal loop power all 20 mA)
Physical Characteristics	
Weight	267 g (0.59 lb)

65M-3610-CT-T

Analog Input	
Number of Channels	16 (8 channels per group)
Input Mode	0 to 10 V 1 to 5 V
Permitted Overload	±12 V
IO type	Differential
ADC Resolution	16 bits
Measurement Resolution	1 mV (0 to 10V) 0.4 mV (1 to 5V)
Conversion Time	100 ms
Accuracy	± 0.1% Full Scale Range @ 25°C ± 0.3% Full Scale Range @ -40 to 75°C
Power Consumption	
System Power	0.069 A @ 12 VDC
Field Power	0.038 A @ 24 VDC
Physical Characteristics	
Weight	250 g (0.55 lb)

65M-4820-CT-T

Analog Output	
Number of Channels	8 (4 channels per group)
Output Mode	0 to 10 V 1 to 5 V 0 to 20 mA 4 to 20 mA
IO type	Differential
Resolution	16 bits
Output Resolution	0.1 mV (0 to 10 V) 0.4 mV (1 to 5 V) 2 µA (0 to 20 mA) 1.6 µA (4 to 20 mA)
Output Refresh Time	16 ms
Accuracy	± 0.1% Full Scale Range @ 25°C ± 0.3% Full Scale Range @ -40 to 75°C
Power Consumption	
System Power	0.069 A @ 12 VDC
Field Power	0.022 A @ 24 VDC (without external load) 0.266 A @ 24 VDC (8 channels with 20 mA current output)
Physical Characteristics	
Weight	257 g (0.57 lb)

65M-BMIO02-CT-T

Power Consumption	
System Power	0.093 A @ 12 VDC
Physical Characteristics	
Dimensions	86 x 177 x 45.5 mm (3.39 x 6.97 x 1.79 in)
Weight	205 g (0.45 lb)

65M-BMIO04-CT-T

Power Consumption	
System Power	0.117 A @ 12 VDC
Physical Characteristics	
Dimensions	172 x 177 x 45.5 mm (6.77 x 6.97 x 1.79 in)
Weight	395 g (0.87 lb)

65M-TB-XXXX-CT-T

Physical Characteristics	
ID	1900: D1 2901: D2 3600: A1 3610: A2 4820: A5
Dimensions	42 x 116 x 130 mm (1.65 x 4.57 x 5.12 in)
Weight	164 g (0.36 lb)