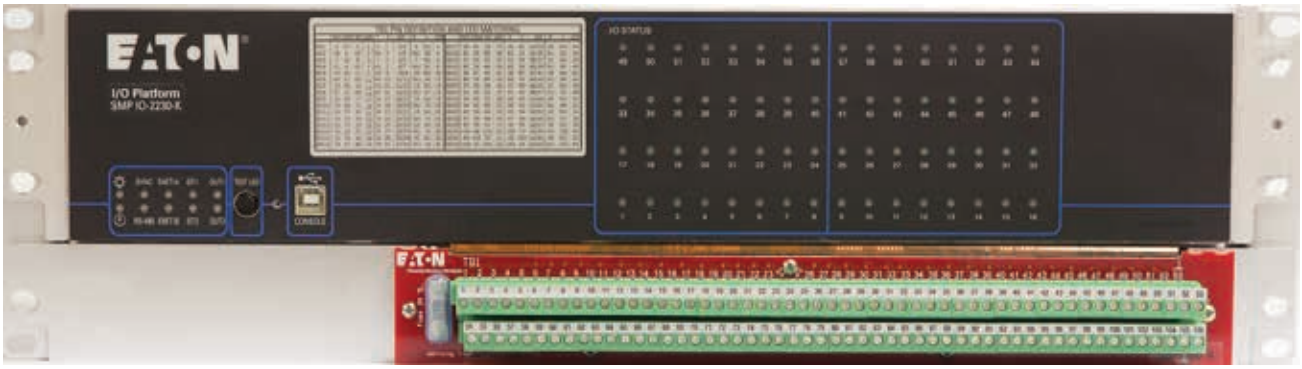
SMP IO-2230-K and KR
Catalog Data
CA912008EN

Effective October 2019
Supersedes September 2019

RTU replacement solution
The SMP™ IO-2230-K and KR control output systems



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Description

This document describes the hardware layout and functionality of the SMP IO-2230-K (KR) system, which is based on the SMP IO-2230 distributed I/O platform.

RTU replacement solution

Eaton's RTU replacement solution provides utilities with a cost-effective answer to upgrading legacy RTUs with cybersecurity as a priority. Based on the utility hardened and proven Eaton's SMP family of substation automation products, the SMP SG-42xx automation platform and the new SMP IO-2230 distributed I/O unit, the basic hardware agnostic replacement solution, supports most legacy RTU configurations. Eaton's RTU replacement solution is easily adaptable to any specific RTU deployment scenario (e.g. GE D20) and allows for great cost savings on field installation man-hours and service interruptions because it keeps the existing field wiring.

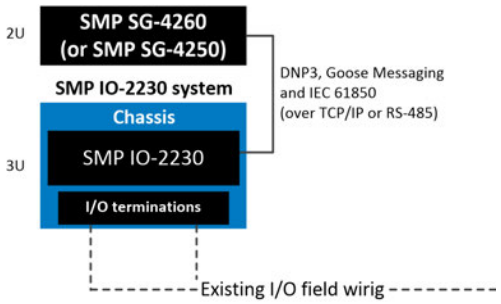


Figure 1. Eaton's RTU replacement solution

SMP Gateway automation platform

Both of Eaton's SMP Gateway automation platform models are substation-grade gateways with a proven history in data acquisition and distribution automation applications, as protocol conversion device and integration solution for secure IED remote access. They are recognized as one of the most efficient and reliable automation platforms on the market and are perfect for distributed automation.

SMP IO-2230 distributed I/O platform

The SMP IO-2230 is Eaton's new generation of substation-grade distributed I/O platforms; it is specially designed to meet modern industry and utility requirements and is fully integrated with the SMP Manager and Tools application for device configuration and maintenance. It integrates seamlessly with the SMP Gateway automation platforms–simplifying both system setup and commissioning.

The SMP IO-2230 distributed I/O platform uses a template-driven configuration tool, SMP Config, and includes numerous cybersecurity features to help utilities meet their compliance requirements, including NERC CIP (certified under UL 2900-2-2).

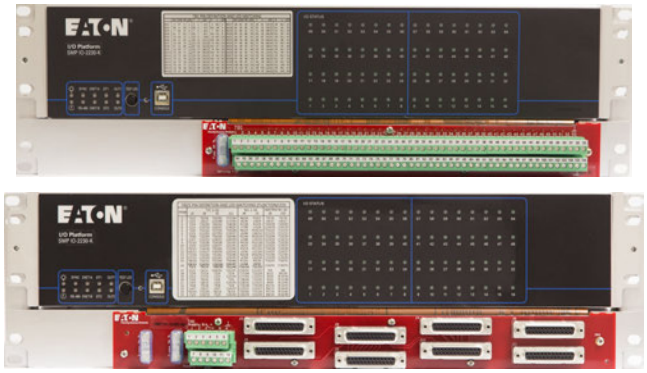


Figure 2. The SMP IO-2230-K (KR) units

General features

Hardware
- Form factor: 3U rackmount
- SMP IO-2230 is servicable without removing the chassis form the rack
- Individual LEDs for each I/O
- No moving part
- Two built-in Form C relays for system alarm (configurable)
- System status LEDs
- Multi-function button
- Front USB 2.0 maintenance port (Type B)
- Custom length cables available
- Supported polarity reversal for power supply and Inputs/Outputs

Protocols
- DNP3, IEC 61850, GOOSE Serial or TCP/IP links
- DNP3 event queue (up to 1000 events/slave)
- Up to 5 slave instances

Communication and Web interface
- RS-485 serial interface
- 2 x 10/100 Mb/s Ethernet ports or 2 x 100 Mb/s optical Ethernet ports
- Daisy chain Ethernet capabilities
- Web interface for I/O commissioning
- Secured remote maintenance using transparent connection (SMP Gateway and IMS passthrough)

Software
- Linux®-based operating system
- Seamless integration with the SMP Gateway
- Access to SMP Manager's Tools
- Remote management (firmware upgrade, setting changes, license update)
- Configuration with SMP Config (also for standalone units), multi protocols/instances, configurable point mapping
- Offline and template-driven configuration
- Use of SMP Stats, SMP Log and SMP Trace
- Micro PLC for local programmable logic (fast and complete PLC functions)
- Ready for remote management via Enterprise Management Software (IMS)
- System alarms

Mapping
- Predefined mappings
- Configurable mappings
- Serial number, version, internal status, current time, last reset time and more are available in the protocol mapping
- Exportable DNP3 protocol device XML profile

System
- Integrated self-diagnostics
- Integrated watchdog timer
- Real-time clock (with battery backup)
- Internal clock synchronization using IRIG-B, NTP or via protocols
- Local/Remote state (logical points)
- Logs support (Security, System)

Cybersecurity

- UL2900-2-2 compliant: Standard for Software Cybersecurity for Network-Connectable Devices
- IEEE 1686-2013 compliant
- Integrated Ethernet firewall
- Ability to disable any unused port (report enabled-disabled ports)
- Secure maintenance connection (TLS) via SMP Gateway Passthrough or via direct SMP Manager connection
- AES-128/256 encryption
- Secure USB maintenance port
- Secure command shell
- Access management (log, lockup, etc.)
- Account management:
  - Strong passwords
  - Single Admin account
  - User accounts and user groups
  - Detailed group permissions
- All system components digitally signed
- Settings integrity validation
- Factory reset in case of Admin password loss

Benefits

With its robust and scalable design Eaton's RTU replacement solution is flexible and adapts to evolving automation requirements.

Reliability

- Designed to evolve through regular software and firmware updates, ensuring a future-proof automation system
- Helps meet NERC CIP requirements by securing IED remote access and enhancing SCADA communication links

Scalability

- Universal power supply (wide input ac and dc voltage range), for connection flexibility
- Use of open industry protocols (standard DNP3, GOOSE messaging or IEC 61850 over a TCP/IP or RS-485 link) with over 80 protocols to integrate other IEDs in the substation via the automation platform

Easy integration

- Complete support for the SMP Tools
- Easy configuration using SMP Manager's SMP Config
- Simplified pre-loading operation of existing configuration into the SMP Gateway prior to installation

Productivity

- 70% labor cost reduction compared to a traditional RTU replacement solution due to the use of existing wiring
- Offline configuration tools
- Web interface for I/O commissioning
- Uses the same management applications as the SMP Gateway automation platform (SMP Manager)
- Seamless I/O integration between the SMP Gateway and distributed I/O unit
- Enhanced automation capabilities using the IEC 61131-3 Soft PLC of the SMP Gateway automation platform and/or the micro PLC of the SMP IO-2230 distributed I/O unit

System architecture and I/O features

The following I/O features are available for the RTU replacement systems, I/Os types availability depends on the specific model.

Analog inputs

- High/Low warning support
- Deadband, scaling and units
- User calibration at fixed ambient temperature

Binary outputs

- Output protection against single component failure
- Trip/close pair, latch, pulse, pulse pair support
- Persisted operation counter/operation time
- Binary points software polarity reversal
- Control queuing allows up to 10 parallel requests, sequentially processed when the same point is targeted

Binary inputs

- AC and DC inputs
- Tolerance/Intolerance filtering
- Chatter protection
- Fail safe circuit (active level in normal state)
- Binary points software polarity reversal
- Timetag at the beginning or end of the filtering (setting)
- Persisted counters (total transitions, up/down direction), with deadband, scaling and roll over detection.
- Freeze, clear, freeze and clear counters support

Table 1. RTU replacement system, available models

Type	Model	Available I/Os
Rackmount (3U)	SMP IO-2230-A	32 analog inputs: disconnect terminations
Rackmount (3U)	SMP IO-2230-K	32 control outputs: disconnect terminations (K) or DB25 connectors (KR)
Rackmount (3U)	SMP IO-2230-S	64 status and alarm inputs: disconnect terminations

The SMP IO-2230-K (KR) configuration is fixed at 32 control outputs, the following features apply to this SMP IO-2230 system:

- Possible control output configurations:
  - 32 Trip/Close pairs
  - 24 Trip/Close pairs and 4 Raise/Lower pairs
  - 16 Trip/Close pairs and 8 Raise/Lower pairs
  - 8 Trip/Close pairs and 12 Raise/Lower pairs
  - 16 Raise/Lower pairs
  - 32 isolated Form C contact control outputs
- Relays can be configured separately instead of in groups of 8 (K model only)
- Control output methods (hardware and software adjustable):
  - Pulse duration
  - Latched-output (discrete timed/latch relay functionality supported)
- Matrix function supported on the KR model (DB25 connectors)
- Can be configured to be connected to a D20 KI interposing relay or to an LPL

Important: Please note that the operating modes for Raise/Lower, matrix, D20KI and LPL are hardware ready, however the related software functions are coming soon. Please call Technical support if you want to use these configuration modes.

Front panel

This section shows the SMP IO-2230 system front panel and identifies its main components.

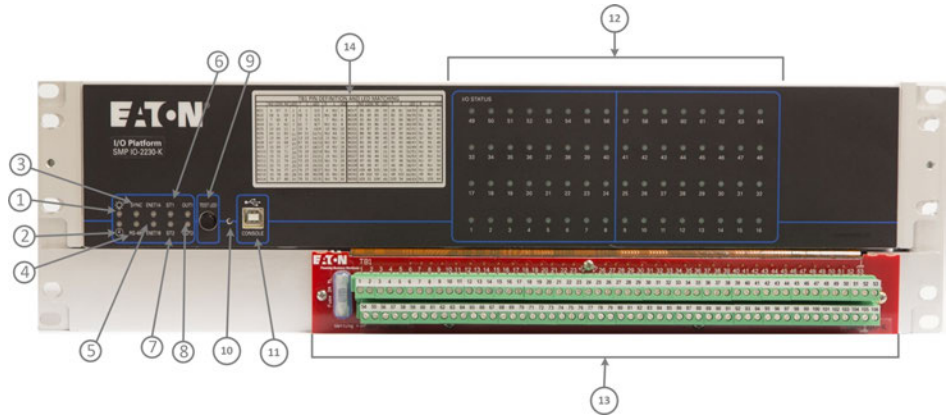


Figure 3. The front panel of the SMP IO-2230-K unit

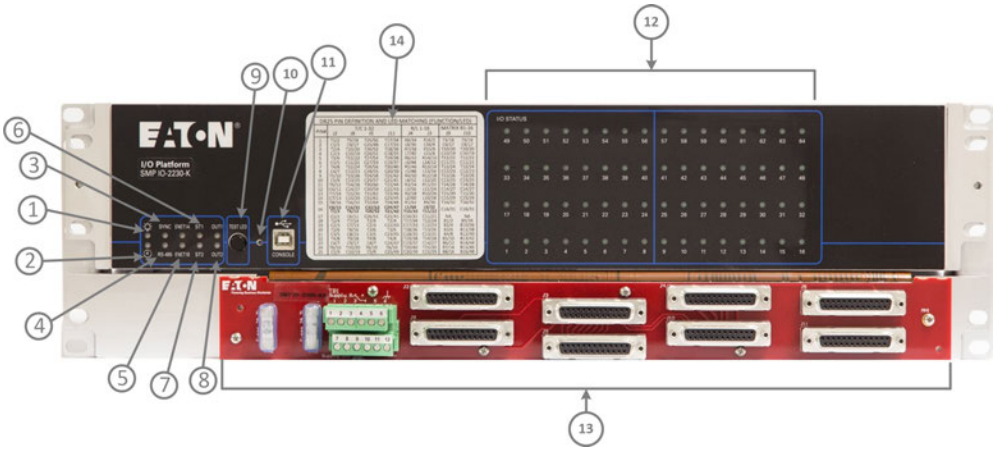


Figure 4. The front panel of the SMP IO-2230-KR unit

The following table describes the front panel components related to the previous figure:

Table 2. Front panel components of the SMP IO-2230-K (KR) unit

ID	Name	Description
1		Power LED. This LED indicates the status of the SMP IO-2230 system internal power supply.
2		Watchdog timer status LED.
3	SYNC	Clock synchronization LED. This LED indicates the synchronization status of the SMP IO-2230 system connected to an IRIG-B synchronization source.
4	RS-485	Built-in RS-485 serial port activity LED.

<table>
<tr><th>ID</th><th>Name</th><th>Description</th></tr>
<tr><td>5</td><td>ENET1A, ENET1B</td><td>Built-in ENET1A and ENET1B2 port activity LEDs.
The two Ethernet ports are used as Ethernet switches for daisy-chain connections. Each LED indicates the speed and activity level of the corresponding Ethernet port (switch).</td></tr>
<tr><td>6</td><td>ST1</td><td>Status LED 1.
This LED indicates the various steps the SMP IO-2230 system goes through during the startup sequence.</td></tr>
<tr><td>7</td><td>ST2</td><td>Reserved for future use.</td></tr>
<tr><td>8</td><td>OUT1, OUT2</td><td>On board relay 1 and relay 2
Each LED indicates the relay status.

Table 3. On board relays LED, color description
<table><tr><th>Color</th><th>Meaning</th></tr><tr><td>Off</td><td>The relay is not energized</td></tr><tr><td>Green</td><td>The relay is energized</td></tr></table></td></tr>
<tr><td>9</td><td>TEST LED</td><td>Multi-function button used:
• To test the SMP IO-2230 system front panel LEDs. When pressed, all LEDs should light.
• To force the system to boot into rescue mode. To do so, press and hold the button during the first five (5) seconds of the boot-up sequence, until the LEDs light up. The SMP IO-2230-K (KR) will then boot in rescue mode.</td></tr>
<tr><td>10</td><td>Reset Button (pinhole)</td><td>This reset button requires the use of a pin to activate the reset of the SMP IO-2230 system. This is necessary in order to prevent accidental use to the button.</td></tr>
<tr><td>11</td><td>CONSOLE</td><td>Type-B USB 2.0 port.
This port is used for maintenance and configuration of the SMP IO-2230 system; it is always enabled. This port is also used to access the SMP IO-2230 system's web interface to monitor and control I/Os for commissioning.</td></tr>
<tr><td>12</td><td>I/O Status LEDs</td><td>I/O activity/state for control outputs 1 to 32. LEDs 9 to 16, 25 to 32, 41 to 48 and 57 to 64 are used (the other LEDs on the device are not used).
Each LED indicates the status of the point.</td></tr>
<tr><td>13</td><td>Terminal blocks or DB25 connectors</td><td>Terminal blocks, compresssion type (K) or DB25 connectors (KR) for connecting up to 32 control outputs. The connectors are used to connect the existing field wiring to the SMP IO-2230-K (KR). When configured in wetting mode (Trip/Close and Raise/Lower output configurations only), a 2A fuse is protecting the circuit for the K model and 2 x 2A fuses are protecting the circuit for the KR model.
Important: The Raise/Lower control output configuration is hardware ready, however its corresponding control output configuration using the pulse train (sofware related) is coming soon. Please call Technical support if you want to use this configuration mode.</td></tr>
<tr><td>14</td><td>Label for terminations versus LED identification</td><td>Label for Terminal Block 1 (TB1) pin matching according to the control output configuration and LED IDs for SMP IO-2230-K (KR).</td></tr>
</table>

Rear panel

This section shows the SMP IO-2230 system rear panel and identifies its main components.

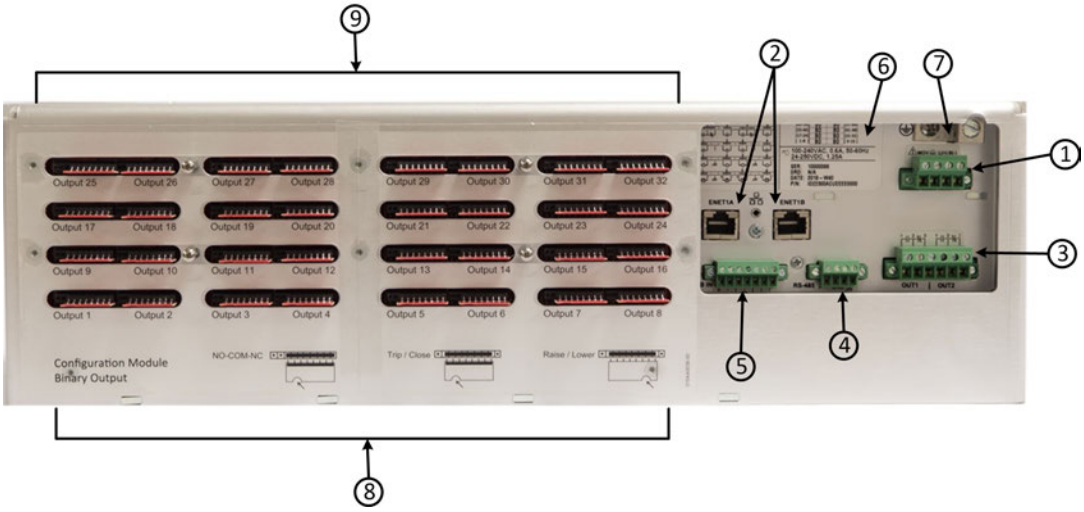


Figure 5. The rear panel of the SMP IO-2230-K unit

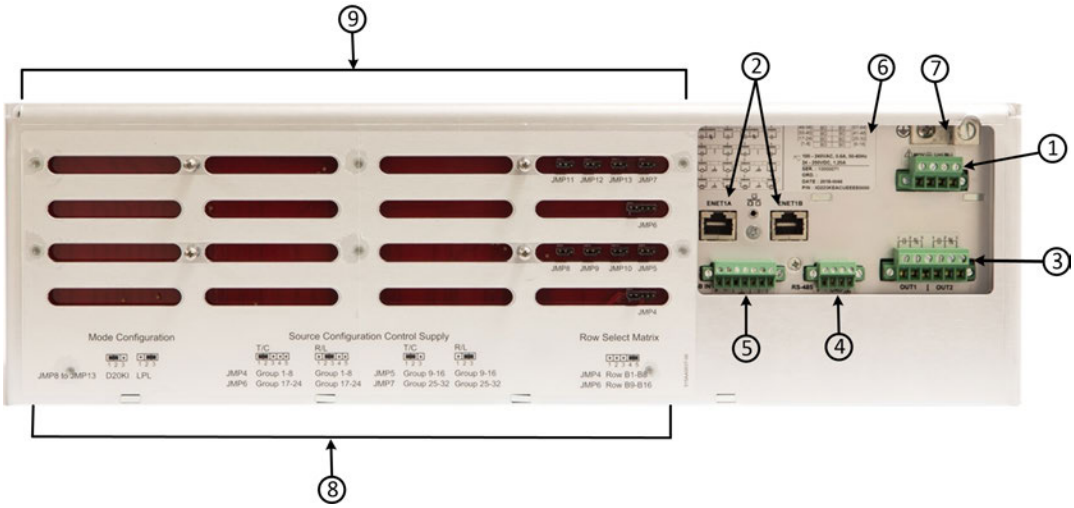


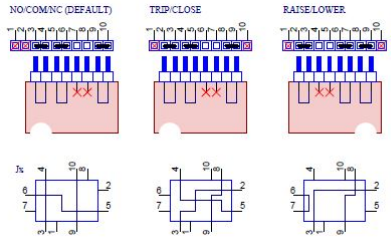
Figure 6. The rear panel of the SMP IO-2230-KR unit

The following table describes the rear panel components related to the previous figure.

Table 4. Rear panel components of the SMP IO-2230-K (KR) unit

ID	Name	Description
1	Power supply terminal block	Wiring terminals for power supply. Eaton recommends the use of a shielded cable with twisted 18 to 12 AWG wires for the SMP IO-2230 system power supply terminal block. **Note:** If the SMP IO-2230 system is intended for use at ambient temperatures greater than 140°F (60°C), use a cable with a suitable temperature rating. Recommended torque for this terminal block is 0.49 N*m (4.3 lbf*in).

ID	Name	Description
2	ENET1A, ENET1B	Built-in Ethernet connectors (switch). The following connector types are available for these built-in ports (both connectors are of the same type): • Shielded metallic RJ45 (standard) • Fiber-optic LC (option)
3	OUT1, OUT2	2 NO/NC (normally open / normally closed) Form C relays: The OUT1 relay's NC contact is pre-configured for system health monitoring (application). Both relays are available for system applications and can be activated through a system data output point, if configured. When configured for system health monitoring, the OUT1 relay's NC contact operates as follows: The relay's NC contact remains closed until the SMP IO-2230 system is started. Thereafter, the contact is opened if the SMP IO-2230 system is working properly. In case of failure, the watchdog timer resets the SMP IO-2230 system and the NC contact closes during the restart. Eaton recommends the use of a shielded cable with twisted 28-14 AWG wires for this terminal block. Recommended torque for this terminal block is 0.25 N*m (2.2 lbf*in).
4	RS-485 serial port	Terminal block reserved for the serial RS-485 communication (COM1) • 2-wire RS-485 support (multidrop) • Up to 1200 m (4000 ft.) • Up to 32 devices (multidrop) Baud rates supported on this port: 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
5	IRIG-B IN	Terminal block reserved for the reception of a demodulated IRIG-B signal. Eaton recommends the use of a shielded cable with twisted 22-16 AWG wires for the IRIG-B terminal block. Recommended torque for this terminal block is 0.25 N*m (2.2 lbf*in).
6	System configuration	When Eaton delivers an SMP IO-2230 system, an I/O configuration sticker is placed on the rear panel.
7	Grounding screw	Screw-in protective earth ground connection terminal. Eaton recommends the use of 14-2 AWG wires for the protective earth ground screw.

ID	Name	Description
8	Configuration module installation for version with terminal blocks (K) OR Jumpers configuration for version with DB25 connectors (KR)	**For SMP IO-2230-K system (using terminal blocks):** The Identification for the configuration module installation into the **Output x** ports for the SMP IO-2230-K (KR). The three possible binary outputs mode of operation, for each output are : • NO-COM-NC (Form C) • Trip/Close • Raise/Lower **Important:** The Raise/Lower control output configuration is hardware ready, however its corresponding control output configuration using the pulse train (sofware related) is coming soon. Please call Technical support if you want to use this configuration mode. There is only one configuration module for all control types, it is however inserted in different positions and orientation for the control types (pay attention to the semi-circle located on the module's handle).  **For the SMP IO-2230-KR system (using the DB25 connectors):** **Important:** Please note that the operating modes for Raise/Lower, matrix, D20KI and LPL are hardware ready, however the related software functions are coming soon. Please call Technical support if you want to use these configuration modes. Jumpers 8 to 13 are used for configuring the SMP IO-2230-KR operating mode, which are: • D20KI • LPL Jumpers 4 to 7 are used to configure the binary output modes of operation or the matrix row selection, which are: • Trip/Close • Raise/Lower • Matrix row selection (used with the D20KI interposing relay panel)

ID	Name	Description
9	Output x ports x = 1 to 32 for version with terminal blocks (K) or Jumper configuration area for version with DB25 connectors (KR)	**For the SMP IO-2230-K system (using terminal blocks):** Binary output ports used for inserting the configuration modules in order for the outputs to operate in NO-COM-NC, Trip/Close or Raise/Lower mode. **Note:** A protective plexiglass is normally covering the entire Output x ports area. The plexiglass was removed for the picture in order to clearly show the configuration modules inserted into the ports. **Important:** The Raise/Lower control output configuration is hardware ready, however its corresponding control output configuration using the pulse train (sofware related) is coming soon. Please call Technical support if you want to use this configuration mode. **For the SMP IO-2230-KR system (using DB25 connectors):** The right area is used to set the jumpers for the configuration mode, source configuration control supply and matrix row selection. **Important:** Please note that the operating modes for Raise/Lower, matrix, D20KI and LPL are hardware ready, however the related software functions are coming soon. Please call Technical support if you want to use these configuration modes.

Note: Conformal coating is available upon request.

Specifications

Table 5. General specifications

General specifications		
	Details	**Additional information**
Dimensions	Height: 5.52 in. (140 mm) Width: 19 in. (482 mm) Length: 9.75 in. (248 mm) 15 lb max (6.8 kg)	
Warranty	10-year limited	
Operating temperature	-40°F to +185°F* (-40°C to 85°C) Typical use	* Safety marking is based on temperature derating table
Storage temperature	-40°F to +185°F (-40°C to 85°C)	
Humidity	5 to 95%, non-condensing	
Degrees of protection provided by enclosure	IP30 (applicable on the SMP IO-2230 device only)	IEC60529: 2013
MTBF	Real MTBF (practical): > 100 years	The MTBF value is obtained from the ratio of the number of devices in operation over the actual number of failures observed on devices of the same SMP family.
Maximum altitude	Up to 6561.7 feet (2000 meters)	

General specifications		
	Details	**Additional information**
Status LED display	Power Watchdog Clock synchronization (SYNC) Build-in serial port (RS-485) Build-in Ethernet ports (ENET1A, ENET1B) Status (ST1, ST2) Relay state (OUT1, OUT2) I/Os activity/state (1-64)	
Internal Battery	Lifetime: > 20 years (Rechargeable lithium battery)	Not serviceable Battery autonomy > 20 days Battery charging time < 24 hrs

Table 6. Power supply specifications

Universal Power Supply		
Specifications		
Rated supply voltage	100 – 240 VAC / 24 – 250 VDC	
Input voltage range	88 – 264 VAC / 19.2 – 287.5 VDC	
Frequency range	50 / 60 Hz	
Inrush current	40A at 28 VDC (t<1 ms) 110A at 125 VDC (t<1 ms) 160A at 120 VAC (t<1 ms)	
Power consumption	30W (max)	100 – 240 VAC, 0.6A 24 – 250 VDC, 1.25A
Dielectric	2000 Vrms	
Terminal block power	4-pin	
Wire size	12 – 30 AWG solid wire 12 – 30 AWG stranded wire	Jumper MOV are installed at the factory on power supply's terminal block connectors (pin 1-2)
Wire screw	max torque 4 lbf-in (0.44 N-m)	
Internal fuses	2 x 3.15A TL fuses	Not serviceable
External fuses	2 x 2A for the KR model 1 x 2A for the K model	Located on the front panel of the chassis, next to the terminal blocks.
Ground lug	External ground lug on rear panel	
Wire size	14 – 2 AWG	

Universal Power Supply		
Protection	300 VAC/385 VDC, 60J Differential MOV Protection 300 VAC/385 VDC, 60J Common MOV Protection by external jumper placed on terminal block connectors (pin 1-2)	The SMP IO-2230 system requires the MOV protection to be installed to be compliant with product standards. The SMP IO-2230 system is shipped with the MOV already installed on the power supply terminal block (pin 1-2).

Table 7. Communication ports

Communication ports		
Ethernet **Note:** Both connectors of the built-in Ethernet ports are of the same type.		
2 ports	Rear access	
Metallic connectors (standard)	2 x 10/100/BASE-T/TX	RJ-45 connectors
Fiber-optic (option)	2 x 100BASE-FX, up to 2 km	LC connectors Multimode 1300 nm
Serial		
2-wire RS-485 support (multidrop) Protection	Up to 1200m (4000 ft.) 32 devices and 115200 b/s	
Protection	Common mode TVS	40A 8.3 ms
Wire size	16 – 28 AWG	
Wire screw	max torque 2.2 lbf-in (0.25 N-m)	

Table 8. Auxiliary port

Auxiliary port		
USB		
USB 2.0 client (CONSOLE)	Type B connector (front panel)	

Table 9. Time synchronization

Time Synchronization		
Demodulated IRIG-B		
Input	Via terminal block (rear panel)	Isolated
	2V high-level detection	Current sink at 5V IRIG-B 5 mA
		Current sink at 10V IRIG-B; 11 mA
	Vin max up to 12 VDC, Opto-isolated IEEE 1344, C37.118, B002, B003, B004, B006, B007	Input impedance = 1000Ω ± 10%
	Accuracy: ± 100 µs	
Protection	Differential mode TVS	

Time Synchronization		
Terminal block IRIG-B		
Wire size	16 - 28 AWG	
Wire screw	Max torque 2.2 lbf-in (0.25 N-m)	
Real-time clock (with battery backup)	Drift: < 3 sec/day on all temperature ranges when unit is running. Drift: ± 10 sec/day on normal operating temperature range and ± 20 sec/day outside the operating temperature range, when unit is powered off.	

Table 10. Auxiliary relays (alarm relays)

Auxiliary relays (alarm relays)		
2 Form C relays	Normally open and normally closed relays contacts (NO/NC) 1st relay is pre-configured for system health monitoring. Both relays are available for system applications and can be activated through a system data point.	8 A 250 VAC / 24 VDC resistive 0.2A at 250 VDC resistive 2500 Vrms dielectric 300 VAC / 385 VDC, 60J MOV Protection across contacts
Terminal block Auxiliary relays	6-pin connector	2 Form C contacts
Wire size	12 – 30 AWG solid wire 12 – 30 AWG stranded wire	
Wire screw	max torque 4 lbf-in (0.44 N-m)	

Table 11. CPU

CPU	
Processor architecture	ARM
Operating system	LINUX
Processor	ARM® Cortex® - A8 600 MHz
Memory	2 GBit NAND Flash 256 MB DDR3 RAM

Table 12. Binary output (relays)

Binary outputs, relays (control outputs)		
Output relays	Form C relays (32) and Form A relays (depending on the control output mode)	
Protection	1000 Vrms dielectric 300 VAC/ 385 VDC, 60J MOV protection across contact pairs	
Operating time	Pickup 10 ms maximum Dropout 6 ms maximum	
Rating		
	3A at 24 VDC resistive 3A at 250 VAC resistive 3A at 30 VDC resistive 0.4A at 125 VDC resistive 0.2A at 250 VDC resistive 3A at 250 VAC cos# 0.7 ½ HP at 250 VAC, 1/3 HP at 125 VAC	All relay types
Rated insulation voltage	250 Vrms	All relay types
Maximum voltage	400 VAC / 250 VDC	All relay types
Minimum load	10 mA at 5 VDC	All relay types
Cycling capacity (1 cycle/second) per IEC 60255-0-20:1974		
	24 VDC / 0.8A L/R= 40 ms 48 VDC / 0.5A L/R= 40 ms 125 VDC / 0.3A L/R= 40 ms	All relay types
Breaking capacity (10 000 operations) per IEC 60255-0-20:1974		
	24 VDC / 0.8A L/R= 40 ms 48 VDC / 0.5A L/R= 40 ms 125 VDC / 0.3A L/R= 40 ms	All relay types
Terminal Block Binary Output		
Wire size Wire screw	12 – 30 AWG solid wire maximum torque 4 lbf-in (0.44 N-m)	
External fuse for wetting	2 x 2A TL fuse for the KR model 1 x 2A TL fuse for the K model	Serviceable (accessible on the front of the device)

Certifications and compliancy notes

The SMP IO-2230 platform, which is inserted into the chassis, is substation-grade and comply to several standards, refer to the SMP IO-2230 platform Catalog Data (CA912004EN) for details. The chassis itself did not undergo tests for substation-grade compliancy.

Temperature derating

Several configurations are possible, so Eaton provides a Microsoft Excel™ calculator tool in order to enable our customers to easily calculate the total power in the device as well as the operational maximum temperature allowed, according to a specificSMP IO-2230-K (KR) configuration. The calculator tool can be downloaded from Eaton's Web site, (**Resources** page of the SMP IO-2230 distributed I/O platform).

Following is a capture taken from the tool for a typical SMP IO-2230-K (KR) configuration. The blue fields correspond to values entered or selected by the customer and the grey fields on the right side of the table contain the calculated results.

To be compliant with the IEC 61010-1 certification, the SMP IO-2230-K (KR) can be used within the temperature range that is function of the total power dissipated in the unit, as per the result of the table or in the Microsoft Excel™ calculator tool. According to the standard, the SMP IO-2230-K (KR) can support operating temperatures between -40 °C and +70 °C.

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SMP IO-2230 temperature derating calculator

Description	Configuration	Power dissipation (W)
Main Supply Voltage SMPIO	48V	1.15
Ethernet	Copper	0.65
IO Row [1-8] [9-16]	16 BO	0.12
IO Row [17-24] [25-32]	16 BO	0.12
IO Row [33-40] [41-48]	16 BO	0.12
IO Row [49-56] [57-64]	16 BO	0.12
	SMP IO-2230 power (Watt)	**2.28**
Wetting voltage for input	48V	
Maximum number of Binary Inputs available	0	
Binary Input steady ON in same time	0	0
Maximum number of outputs available	64	
Output steady ON in same time	0	
Average Current per Output stay ON	0.00	0
	Total power in device (Watt)	**3.4**
	Operational maximum ambient temprature	**70°C**
	Power Supply efficiency	**1.5**

Figure 7. Temperature derating and power for a typical SMP IO-2230-K (KR) application

Dimension drawings

Following are the top and side views for the SMP IO-2230-K (KR).

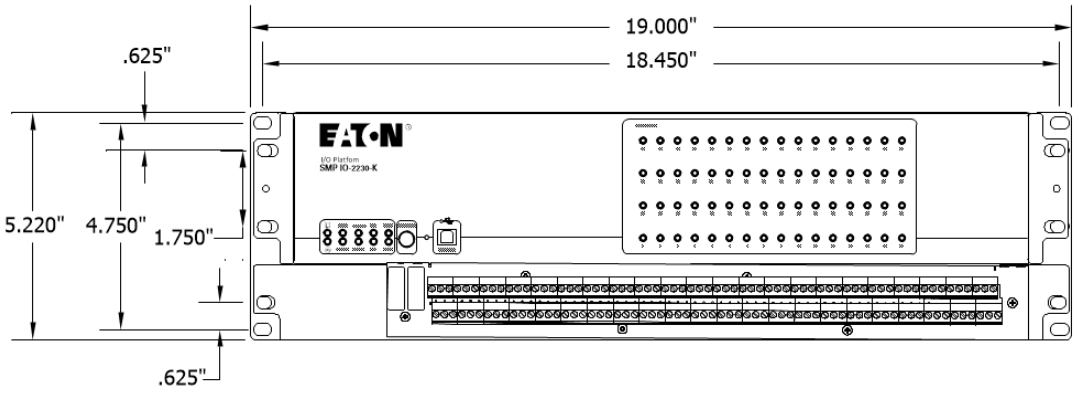

Figure 8. Front view

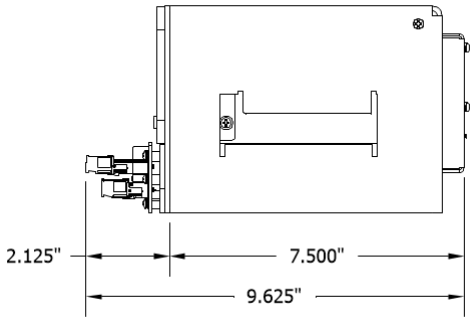

Figure 9. Side view

Ordering information

The packing slip you received with the device refers to an SMP IO-2230-K (KR) system number which is based on a configuration chart.

The configuration chart table for the SMP IO-2230-K (KR) provides information to verify that the received product corresponds to your requirements.

The following table details all characteristics to match the expected features of the SMP IO-2230-K (KR) unit.

Table 13. SMP IO-2230-K (KR) configuration chart

Description	123	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Family																
[IO2] Substation IO	IO2															
Format																
[1] Rackmount		2														

Description	123	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Model / Application																
[3] Basic - I/O Acquisition (Monitoring & Control)			3													
Special / Customer Custom Configuration #1																
[K] D20K - Control Output Module				K												
Special / Customer Custom Configuration #2																
[E] DB-25 termination (LV Only)					E											
[G] Compression disconnect termination (w plug)					G											
[H] Compression disconnect termination (w/o plug)					H											
Internal Flash Memory																
[A] 2 Gb NAND Flash						A										
Basic Ethernet Option																
[C] 2 Ethernet 10/100 Base-T							C									
[L] 2 Ethernet 100 Optical, LC connectors							L									
Power Supply																
[U] 100-240 Vac, 24-250 Vdc								U								
I/O 1 to 16																
[E] 16 Binary Output									E							
I/O 17 to 32																
[E] 16 Binary Output										E						
I/O 33 to 48																
[E] 16 Binary Output											E					
I/O 49 to 64																
[E] 16 Binary Output												E				
Internal - Analog Input Mode																
[0] None													0			
Internal - Wetting																
[0] None / External Wetting Only														0		
Internal - BI configuration																
[0] None															0	

Description	123	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
I/O Software package options																
[0] SMP IO-2200 Basic profile / NONE																0
[A] SMP IO-2200 61850 profile																A
[B] SMP IO-2200 Controller profile*																B
[C] SMP IO-2200 61850 Controller profile*																C

*: Coming soon option

Accessories and cables

Table 14. Accessories

Part number	Description
SMP-BOM-0001 (Set of 32)	Binary Output Module: Configuration Adaptor
SMP-BOM-0001 (Set of 16)	Binary Output Module: Configuration Adaptor
SMP-PSU-2001	External Wetting Power supply: IN: 48VDC; OUT: 24 VDC
SMP-PSU-2002	External Wetting Power supply: IN: Univ. 125V; OUT: 24 VDC

Table 15. Cables

Part number	Description
Shielded Power Cable	
P-CABC-0303-00	AC Power Cable Shielded Nema 5-15-Wire **Important:** Must be used for Demo or laboratory only
P-CABC-0306-00	Power Cable Shielded Wire-Wire 1.8m
P-CABC-0318-10	Power Cable Shielded Wire-Wire 10m
P-CABC-0318-03	Power Cable Shielded Wire-Wire 3m
P-CABC-0318-01	Power Cable Shielded Wire-Wire 1m
P-CABC-0318-xx	Power Cable Shielded Wire-Wire xm
USB cable	
600AB0008R	Replacement USB Cable, Shielded **Note:** For USB Console Port
Ethernet Multimode Fiber	
-LC-LC	
P-CABC-0315-0050	Multimode Fiber OM1 62.5/125um LC-LC 50m
P-CABC-0315-0025	Multimode Fiber OM1 62.5/125um LC-LC 25m
P-CABC-0315-0010	Multimode Fiber OM1 62.5/125um LC-LC 10m
P-CABC-0315-0003	Multimode Fiber OM1 62.5/125um LC-LC 3m
P-CABC-0315-0001	Multimode Fiber OM1 62.5/125um LC-LC 1m
P-CABC-0315-xxxx	Multimode Fiber OM1 62.5/125um LC-LC xm

Part number	Description
-ST-LC	
P-CABC-0316-0050	Multimode Fiber OM1 62.5/125um LC-LC 50m
P-CABC-0316-0025	Multimode Fiber OM1 62.5/125um LC-LC 25m
P-CABC-0316-0010	Multimode Fiber OM1 62.5/125um LC-LC 10m
P-CABC-0316-0003	Multimode Fiber OM1 62.5/125um LC-LC 3m
P-CABC-0316-0001	Multimode Fiber OM1 62.5/125um LC-LC 1m
P-CABC-0316-xxxx	Multimode Fiber OM1 62.5/125um LC-LC xm
Ethernet RJ45 Shielded cable	
P-CABC-0310-025	Copper Ethernet Cable RJ45 CAT6 25m
P-CABC-0310-010	Copper Ethernet Cable RJ45 CAT6 10m
P-CABC-0310-03	Copper Ethernet Cable RJ45 CAT6 3m
P-CABC-0310-01	Copper Ethernet Cable RJ45 CAT6 1m
P-CABC-0310-xxx	Copper Ethernet Cable RJ45 CAT6 xm
DB9 Serial Shielded Cable	
RS-485 2-wires + IRIG-B, shielded cable, DB9 to Wires	
P-CABC-0309-0010	RS485 2-wires Serial Cable DB9M to Wire 10m
P-CABC-0309-0003	RS485 2-wires Serial Cable DB9M to Wire 3m
P-CABC-0309-0001	RS485 2-wires Serial Cable DB9M to Wire 1m
P-CABC-0309-xxxx	RS485 2-wires Serial Cable DB9M to Wire xm
Time Synchronization Shielded Cable	
4 Twisted Pairs Shielded cable: Irig-B; RS-485 4-Wires/2-Wires Wire-Wire	
P-CABC-0320-25	4 Twisted Pairs Cable Wire-Wire 25 m
P-CABC-0320-10	4 Twisted Pairs Cable Wire-Wire 10 m
P-CABC-0320-03	4 Twisted Pairs Cable Wire-Wire 3 m
P-CABC-0320-01	4 Twisted Pairs Cable Wire-Wire 1 m
P-CABC-0320-xx	4 Twisted Pairs Cable Wire-Wire xm

Some cables can be provided with custom lengths, according to customer request. For a custom length-cable, use the required length to create your own cable code.

Contact your Eaton representative to validate the maximum length for your application. Example: a cable P-CABC-0310-xxx with 2 meters length will be P-CABC-0310-002 (always use length in meters). Contact Eaton for other cable requirements.

To learn more, visit
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