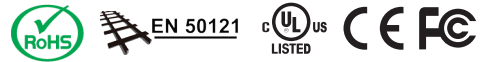


ioPAC 8020 Series

Rugged modular RTU controllers



- > Compliant with EN 50121-3-2, EN 50121-4, and a portion of EN 50155 specifications
- > Supports C/C++ programming languages
- > 2-port Ethernet switch for daisy-chain topologies with bypass function
- > Modular I/O for versatility, flexibility, and scalability
- > Rugged and compact design for harsh environments
- > Wide operating temperature: -40 to 75°C (-40 to 167°F)
- > 3-in-1 RS-232/422/485 serial port
- > Up to 32 GB SDHC data logging function



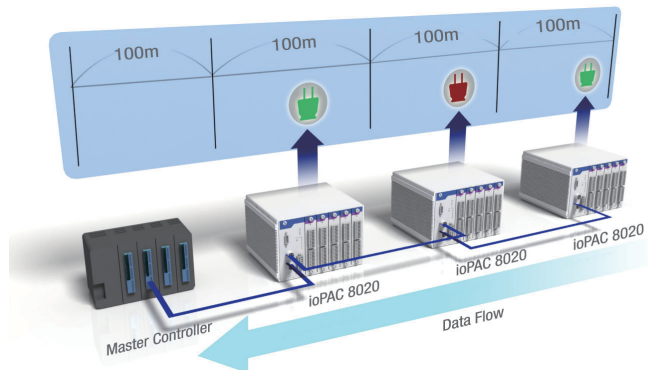
Overview

Sturdy and dependable, ioPAC 8020-C modular RTU controllers are an ideal solution for rolling stock and trackside applications. This series tolerates temperature extremes from -40 to 75°C, is enclosed in a sealed metal casing, and is compliant with EN 50121-3-2, EN 50121-4, and relevant sections of the EN 50155 anti-vibration standard. The ioPAC 8020-C further features a Linux/GNU platform adapted to data acquisition and condition monitoring. The main advantage of this open C platform is its user-friendly SDK, which helps economize on installation and configuration overhead by reducing your programming workload for key areas, including I/O control and condition monitoring, SCADA/DB interoperability, and improving smart communication controls.

The ioPAC-8020-C has a 2-port Ethernet switch that allows system integrators to easily build control networks with open Ethernet standards and daisy-chain topologies. Built-in dual power inputs ensure non-stop data transfer to the controller and uninterrupted communications management on the control network. For train-related applications, spring-type terminal blocks and optional M12 Ethernet connectors deliver reliable operations in high vibration environments. In addition, a rich selection of hot-swap I/O and communication modules is available for any combination of device applications.

Ethernet bypass feature for seamless data transmission

ioPAC RTU controllers also come with an integrated, independent, 2 port Ethernet switch for the convenient daisy-chaining of ioPAC RTU controllers. In distributed Ethernet data acquisition applications, panels, units, and cabinets are often located at remote sites where space is limited. The daisy-chain capability of ioPAC controllers allows ioPAC RTUs to connect in series either to each other or to other nearby Ethernet devices, drastically saving on both space and wiring costs. Because the Ethernet switch is independent of the main RTU and include the power-off bypass mechanism, ioPAC RTU controllers are able to maintain continuous and seamless data transmissions even when a linked device fails.



Hot-swappable modular I/O



Hot-swap

ioPAC RTU controllers offer modular design in a compact size to save space in installation cabinets. For modular ioPAC RTU controllers, the addition of hot-swap capabilities allows users to unplug and then re-plug a module without shutting down the system, so that maintenance engineers can easily complete replacement tasks and reduce system downtime.

Specifications

Computer

CPU: 32-bit ARM9 160 MHz CPU

OS: Linux

Clock: Real-time clock with battery backup

SDRAM: 64 MB

Flash: 32 MB

SD™ Slot: Up to 32 GB (SD 2.0 compatible)

Note: For units operating in extreme temperatures, industrial grade, wide-temperature SD cards are required.

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps switch ports (M12 or RJ45)

Ethernet Relay Function: Hardware Normal Close

Protection: 1.5 kV magnetic isolation

Serial Interface

Serial COM1: RS-232/422/485 (DB9 male)

Serial Debug Port: RS-232 (4-pin connector)

Serial COM1 Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Power Requirements

Input Voltage: 12 to 36 VDC

Note: Compliant with EN 50155 at 24 VDC

Power Consumption: 184 mA @ 24 VDC (without I/O modules)

Physical Characteristics

Housing: Aluminum

Dimensions:

5-slot Version: 190.9 x 135 x 100 mm (7.52 x 5.31 x 3.94 in)

9-slot Version: 292.5 x 135 x 100 mm (11.52 x 5.31 x 3.94 in)

I/O Module Slots: 5 or 9 slots (the 9th slot is reserved)

Weight:

5-slot Version: 2,000 g

9-slot Version: 2,575 g

Mounting: DIN rail (standard), wall (with optional kit)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Altitude: Up to 2000 m

Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 508

EMI:

EN 61000-3-2; EN 61000-3-3; EN 61000-6-4;

FCC Part 15, Subpart B, Class A

EMS:

EN 55024, EN 61000-4-2, EN 61000-4-3,

EN 61000-4-4, EN 61000-4-5, EN 61000-4-6,

EN 61000-4-8, EN 61000-4-11, EN 61000-6-2

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4

**Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.*

Green Product: RoHS, CRoHS, WEEE

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 690,214 hrs

Database: Telcordia (Bellcore)

Warranty

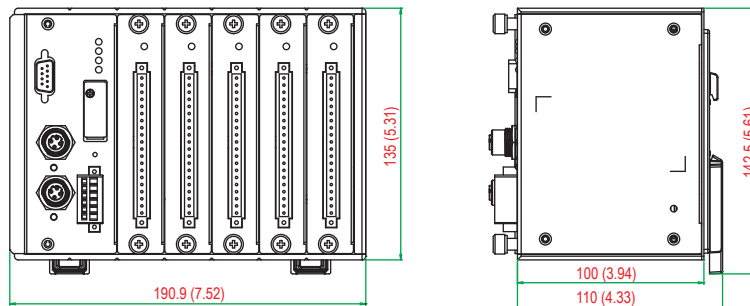
Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

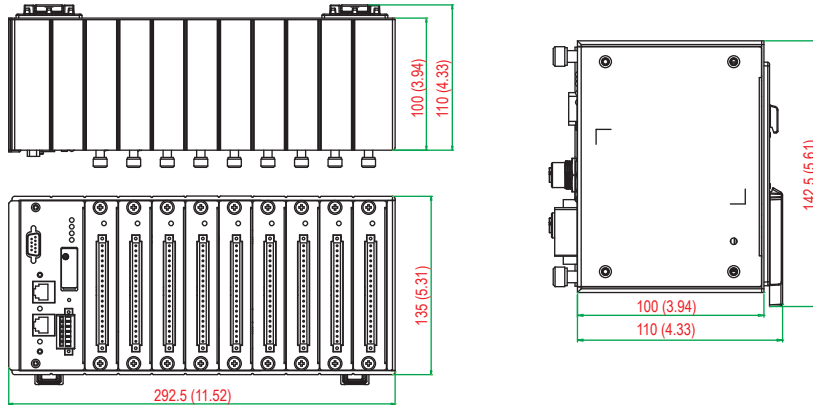
ioPAC 8020-5



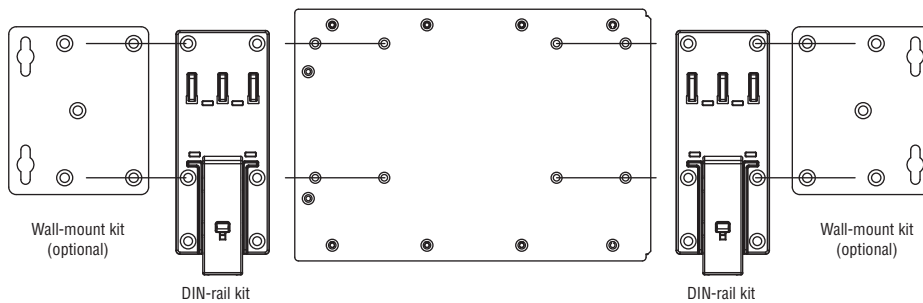
Dimensions

Unit: mm (inch)

ioPAC 8020-9



Mounting Kits



: Ordering Information

Available Models

ioPAC 8020-5-RJ45-C-T: Modular RTU controller with RJ45 connectors, 5 I/O slots, C/C++, -40 to 75°C operating temperature

ioPAC 8020-5-M12-C-T: Modular RTU controller with M12 connectors, 5 I/O slots, C/C++, -40 to 75°C operating temperature

ioPAC 8020-9-RJ45-C-T: Modular RTU controller with RJ45 connectors, 9 I/O slots, C/C++, -40 to 75°C operating temperature

ioPAC 8020-9-M12-C-T: Modular RTU controller with M12 connectors, 9 I/O slots, C/C++, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

WK-75: Wall-mount kit

I/O Modules (can be purchased separately)

RM-1602-T: ioPAC 8020 I/O module with 16 DIs, 24 VDC sink/source type, -40 to 75°C operating temperature

RM-1050-T: ioPAC 8020 I/O module with 10 DIs, 110 VDC isolated type, -40 to 75°C operating temperature

RM-2600-T: ioPAC 8020 I/O module with 16 DOs, 24 VDC sink type, -40 to 75°C operating temperature

RM-3802-T: ioPAC 8020 I/O module with 8 AIs, 4 to 20 mA, -40 to 75°C operating temperature

RM-3810-T: ioPAC 8020 I/O module with 8 AIs, 0 to 10 V, -40 to 75°C operating temperature

KM-2430-T: ioPAC 8020 communication module with 4-port Ethernet switch, M12 connectors, -40 to 75°C operating temperature

Note: Conformal coating available on request

Package Checklist

- ioPAC 8020-C
- Ethernet cable (M12 to RJ45 or RJ45 to RJ45)
- Serial console cable
- Documentation and software CD

I/O Modules for ioPAC 8020 Products

16-channel 24 VDC digital input module



RM-1602-T: 16 digital inputs, 24 VDC, sink/source type

Digital Inputs: 16 channels, 24 VDC, sink/source type

On: 10 to 30 VDC

Off: 0 to 3 VDC

Input Impedance: 3k ohms (typical)

Common Type: 8 points per 2 COMs

Response Time: 10 ms

Isolation: 3k VDC or 2k Vrms

Operating Temperature: -40 to 75°C

Power Consumption: 7 mA @ 24 VDC

Wiring: I/O cable, max. 14 AWG

MTBF: 4,132,863 hrs (Database: Telcordia/Bellcore)



10-channel 110 VDC digital input module



RM-1050-T: 10 digital inputs, 110 VDC, isolated

Digital Inputs: 10 channels, 110 VDC, channel-to-channel isolated

On: 50 to 175 VDC

Off: 0 to 15 VDC

Input Impedance: 120k ohms (typical)

Response Time: 10 ms

Isolation: 3k VDC or 2k Vrms

Channel-to-Channel Isolation: 2.5k VDC

Operating Temperature: -40 to 75°C

Power Consumption: 7 mA @ 24 VDC

Wiring: I/O cable max. 14 AWG

MTBF: 3,993,435 hrs (Database: Telcordia/Bellcore)



16-channel digital output module



RM-2600-T: 16 digital outputs, 24 VDC, sink type

Digital Outputs: 16 channels, 24 VDC, sink type

Output Impedance: 120m ohms (typical)

Current Rating: 200 mA per channel

Off-state Resistance: 500k ohms (typical)

Response Time: 10 ms

Over Current Protection: 2.6 A (4 channels @ 650 mA)

Isolation: 3k VDC or 2k Vrms

Operating Temperature: -40 to 75°C

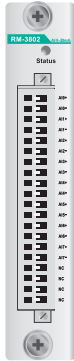
Power Consumption: 10 mA @ 24 VDC

Wiring: I/O cable max. 14 AWG

MTBF: 4,440,241 hrs (Database: Telcordia/Bellcore)



8-channel analog input modules, 16-bit resolution



RM-3802-T: 8 analog inputs, 4 to 20 mA, 16 bits

Analog Inputs: 8 channels, differential

Input Range: 4 to 20 mA

Input Impedance: 120 ohms

Resolution: 16 bits, 0.24 μ A/bit

Accuracy:

$\pm 0.1\%$, FSR @ 25°C

$\pm 0.3\%$, FSR @ -40°C, 75°C

Sampling Rate:

- All channels: 12 samples/sec

- Per channel: 1.5 samples/sec

Isolation: 3k VDC or 2k Vrms

Operating Temperature: -40 to 75°C

Power Consumption: 78 mA @ 24 VDC

Wiring: I/O cable max. 14 AWG

MTBF: 1,222,361 hrs (Database: Telcordia/Bellcore)



RM-3810-T: 8 analog inputs, 0 to 10 V, 16 bits

Analog Inputs: 8 channels, differential

Input Range: 0 to 10 VDC

Input Impedance: 10M ohms (min.)

Resolution: 16 bits, 0.15 μ A/bit

Data Format: 16-bit integer (2's complement)

Accuracy:

$\pm 0.1\%$, FSR @ 25°C

$\pm 0.3\%$, FSR @ -40°C, 75°C

Sampling Rate:

- All channels: 12 samples/sec

- Per channel: 1.5 samples/sec

Isolation: 3k VDC or 2k Vrms

Operating Temperature: -40 to 75°C

Power Consumption: 78 mA @ 24 VDC

Wiring: I/O cable max. 14 AWG

MTBF: 1,225,957 hrs (Database: Telcordia/Bellcore)



4-port unmanaged Ethernet switch module



KM-2430-T: 4-port unmanaged Ethernet switches, M12 connector

Standards:

IEEE 802.3 for 10BaseT

IEEE 802.3u for 100BaseT(X)

IEEE 802.3x for Flow Control

Processing Type: Store and Forward

Interface: Front cabling, M12 connector, 10/100BaseT(X) auto negotiation speed

Operating Temperature: -40 to 75°C

Power Consumption: 20 mA @ 24 VDC

