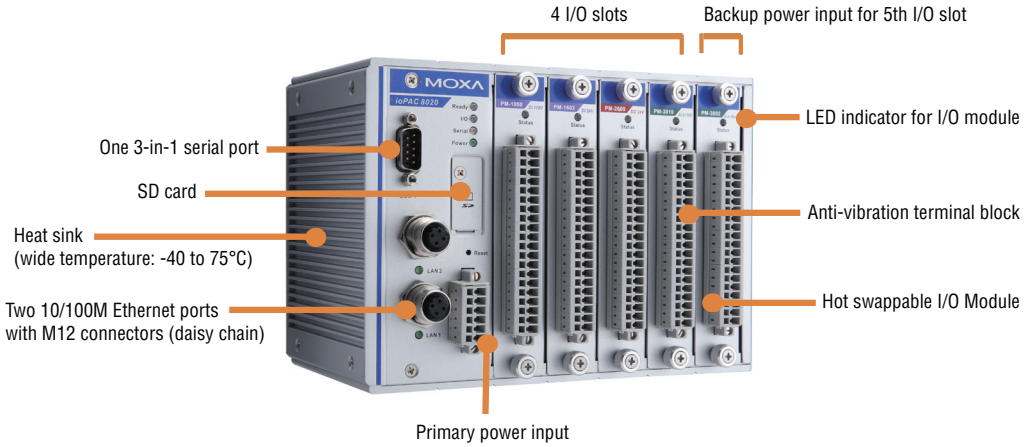
ioPAC 8000 Series

Rugged modular RTU controllers

- Robustness and compact design for harsh environment
- -40 to 75°C operating temperature range
- Redundant power inputs with additional AC/DC modules
- Anti-vibration: EN 50155 and EN 50121-3/4 compliant for rail applications
- Modular, hot-swap design for versatile I/O module connectivity
- 2 Ethernet M12 or RJ45 switch ports with by-pass function
- Front-end intelligence with versatile programming options:
  - Intuitive, menu-driven Click&Go Logic model–ioPAC 8020
  - C programming model–ioPAC 8020-C (coming soon)
  - IEC 61131-3 model–ioPAC 8020-ISaGRAF (coming soon)
- 3-in-1 serial port and SD data logging function for C and isaGraf models (coming soon)

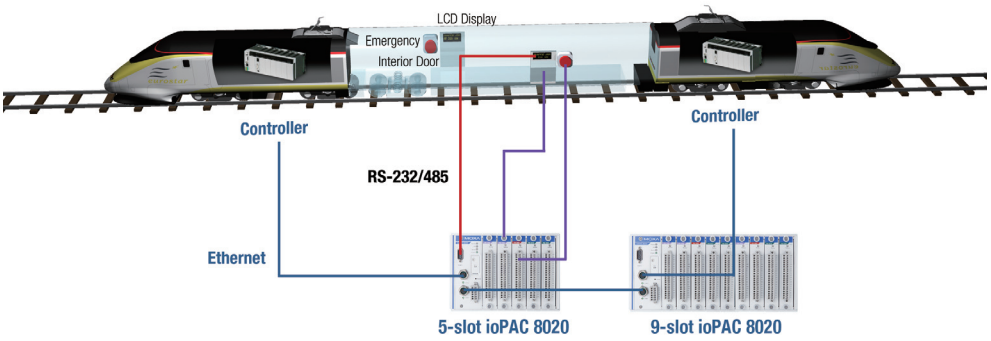
Introduction

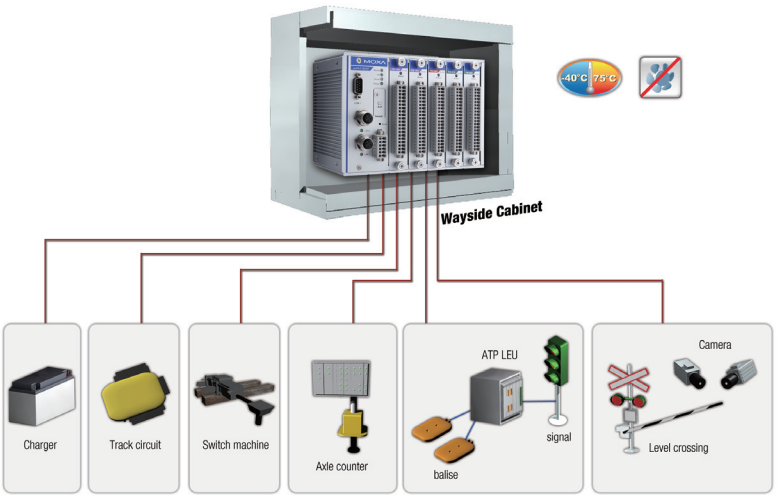
The ioPAC 8000 modular RTU controllers are designed for remote data acquisition and monitoring, and are suitable for applications in harsh environments that require a rugged and reliable design. With a powerful processor and a variety of interfaces, the ioPAC 8000 can connect to devices such as PLCs, smart meters, and other serial devices. In addition, the ioPAC 8000 also supports hot-swappable I/O and power module slots for redundant power inputs and sensor signals, allowing users to choose from a variety of I/O modules accessing sensor signals. The aluminum housing for this product is optimized for robustness and compactness, and provides better protection for rolling stock, wayside, roadside, environmental monitoring, wind turbine, and other outdoor applications. In addition, the ultra-wide temperature design is suitable for both tropical and high altitude environments. With two M12 Ethernet connectors for stress relief, and a spring lock terminal block, the ioPAC 8000 is ideal for high anti-vibration requirements.



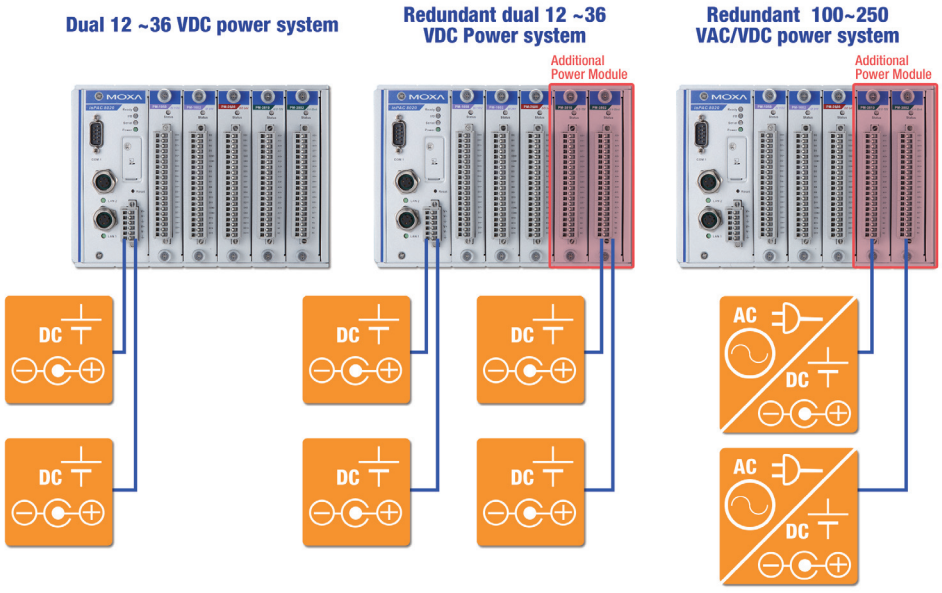
Rugged, Reliable Modular Design

The ioPAC 8000 provides good environmental protection. The metal housing with M12/RJ45 connectors for stress relief and spring-type connectors protect the sensor and network wiring from being damaged by vibrations. The fanless design and wide -40 to 75°C operating temperature range ensure that the ioPAC can be used in wayside cabinets that do not have air conditioning. The modular design not only provides greater flexibility in choosing I/O combinations, but also supports hot-swap capability for replacing defective modules.





In addition, the ioPAC 8000's main CPU adaptor has dual power inputs. By installing additional power modules you can create a 24 VDC or 100/220 VAC/VDC redundant power system to prevent downtime from power failures.



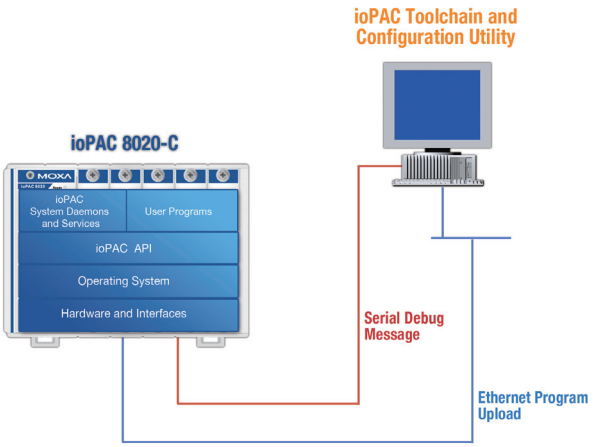
Front-end Intelligence with Versatile Programming Options

ioPAC 8020: Patented menu-driven Click&Go Logic

The ioPAC 8020 benefits from Moxa's patented Click&Go control logic, which bridges the gap between information technology and industrial automation. With this intuitive IF-THEN-ELSE style control logic, configuration is the only thing users need to learn. With the ability to select multiple conditions and actions embedded in the product, users only need a few clicks and a couple of minutes to program simple I/O control tasks, send out messages, or create alarms.

ioPAC 8020-C: High Efficient I/O Access with C Programmability

The ioPAC 8020-C delivers the flexibility needed for users to create imaginative user-defined programs that can be uploaded to the ioPAC. The embedded platform with toolchain developing tools not only supports the most standard C programming, but also makes I/O access and control easier and more precise compared to other embedded systems. In addition to the toolchain APIs for system status (e.g., Real Time Clock, RTC) networking, serial port access, SD storage/file systems, and I/O control, you can also make use of daemons for fast installation and configuration. For example, users can configure multiple routes to form a redundant or backup path using the configuration utility instead of batches or configuration text files.



Specifications

Computer
CPU: ARM9 based CPU, 32-bit/160 Mhz
SDRAM/Flash:
• ioPAC 8020: 8 MB / 4 MB
• ioPAC 8020-C: 64 MB / 32 MB
• ioPAC 8020-ISaGRAF: 64 MB / 32 MB
I/O Scan Time: 100 ms
Program Cycle Time: 100 ms

Ethernet Interface
LAN: 2 auto-sensing 10/100 Mbps switch ports (M12 or RJ45)
Ethernet Relay Function: Hardware Normal Close

Serial Interface
Serial COM1: RS-232/422/485 (DB9 male)
Serial Debug Port: RS-232 (4-pin connector for ioPAC 8020-C and 8020-ISaGRAF)

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
Power Consumption:
CPU Module: 4.40 W @ 24 VDC

Physical Characteristics
Housing: Aluminum
Mounting: DIN-Rail, wall, rack mounting (with optional kit)
Dimensions:
5-slot Version: 191 x 135 x 100 mm (7.52 x 5.31 x 3.94 in)
9-slot Version: 292 x 135 x 100 mm (11.52 x 5.31 x 3.94 in)
I/O Module Slots: 5 or 9 slots

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)

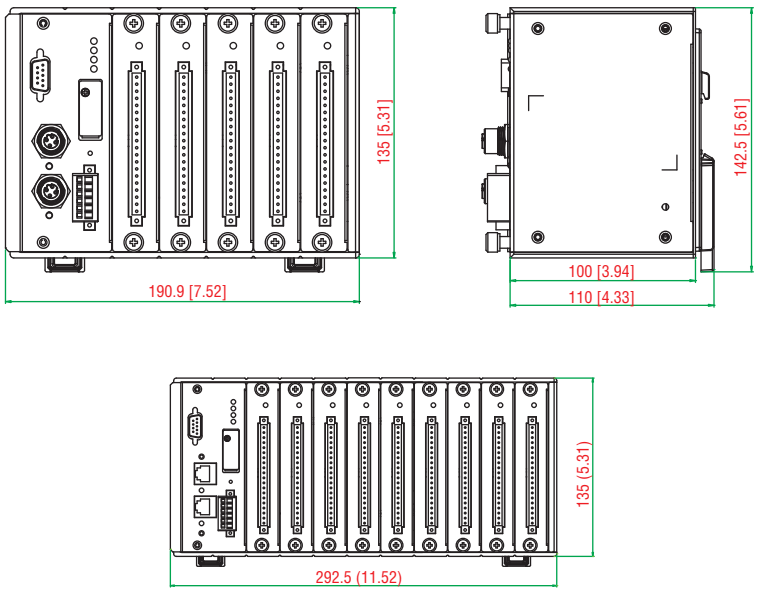
Standards and Certifications
Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 (ESD) Level 2/3,
IEC 61000-4-3 (RS) Level 2,
IEC 61000-4-4 (EFT) Level 2,
IEC 61000-4-5 (Surge) Level 3,
IEC 61000-4-6 (CS) Level 2,
IEC 61000-4-8 (PM) Level 1,
IEC 61000-4-11 (DIPS),
IEC 61000-6-2 (ESD) Level 2/3,
IEC 61000-6-4 (EFT) Level 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
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

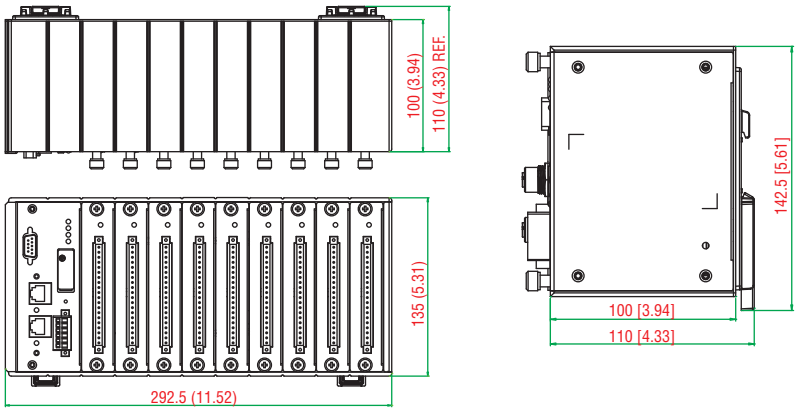
ioPAC 8020-5



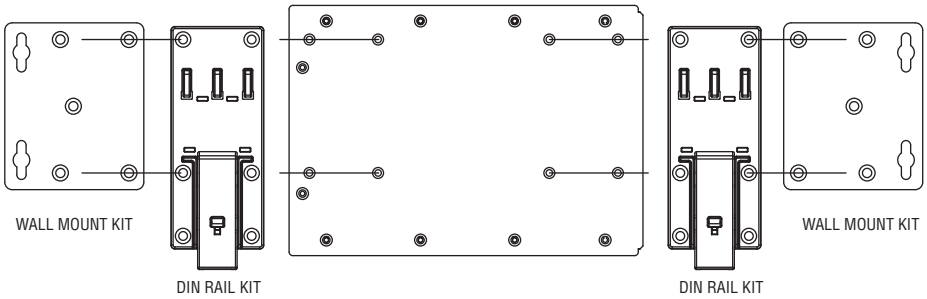
Dimensions

Unit: mm (inch)

ioPAC 8020-9



DIN-Rail mounting kit (optional)



Ordering Information

Available Models

ioPAC 8020-5-RJ45-T: Modular RTU controller with RJ45 connectors and 5 I/O slots, -40 to 75°C operating temperature
ioPAC 8020-5-M12-T: Modular RTU controller with M12 connectors and 5 I/O slots, -40 to 75°C operating temperature
ioPAC 8020-9-RJ45-T: Modular RTU controller with RJ45 connectors and 9 I/O slots, -40 to 75°C operating temperature
ioPAC 8020-9-M12-T: Modular RTU controller with M12 connectors and 9 I/O slots, -40 to 75°C operating temperature
ioPAC 8020-5-RJ45-C: Modular RTU controller with RJ45 connectors and 5 I/O slots, supports C programming, -40 to 75°C operating temperature
ioPAC 8020-5-M12-C: Modular RTU controller with M12 connectors and 5 I/O slots, supports C programming, -40 to 75°C operating temperature
ioPAC 8020-9-RJ45-C: Modular RTU controller with RJ45 connectors and 9 I/O slots, supports C programming, -40 to 75°C operating temperature
ioPAC 8020-9-M12-C: Modular RTU controller with M12 connectors and 9 I/O slots, supports C programming, -40 to 75°C operating temperature

Accessories (can be purchased separately)

RK-4U: Rack mounting kit for 19" rack

I/O Modules (can be purchased separately)

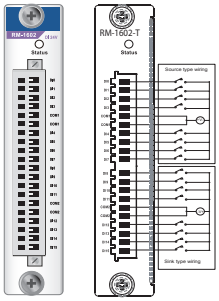
RM-1602-T: ioPAC I/O module with 16 digital inputs, 24 VDC sink/source type, -40 to 75°C operating temperature
RM-1050-T: ioPAC I/O module with 10 digital inputs, 110 VDC sink type, -40 to 75°C operating temperature
RM-2600-T: ioPAC I/O module with 16 digital outputs, 24 VDC sink type, -40 to 75°C operating temperature
RM-3802-T: ioPAC I/O module with 8 analog inputs, 4 to 20 mA, -40 to 75°C operating temperature
RM-3810-T: ioPAC I/O module with 8 analog inputs, 0 to 10 V, -40 to 75°C operating temperature
RM-7200: ioPAC power module, dual 24 VDC inputs (available Q2, 2011)
RM-7250: ioPAC power module, isolated 110/220 VAC input (available Q2, 2011)

Package Checklist

- ioPAC 8000
- Documentation and software CD
- Quick installation guide (printed)

I/O Modules for ioPAC Products

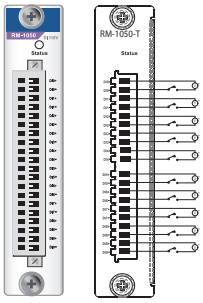
16-channel 24 VDC digital input module



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

Inputs per Module: 16 channels, sink/source type
On-state Voltage: 24 VDC nominal, 10 VDC min.
OFF-state Voltage: 0 to 3 VDC, 3 VDC max.
Input Impedance: 3K ohms (typical)
Common Type: 16 channels / 2 DI_COMs
Response Time: 100 ms
Over Current Protection: 200 mA per channel
Isolation: I/O to logic (photocoupler isolation)
Operating Temperature: -40 to 75°C
Power Consumption: 7 mA @ 24 VDC (typical)
I/O Cable Wire: AWG 14 (2.0 mm x mm) max.

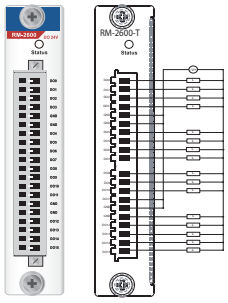
10-channel 110 VDC digital input module



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

Inputs per Module: 10 channels, 110 VDC, channel-to-channel isolated
On-state Voltage: 72 VDC nominal, 50 VDC (min.) to 175 VDC (max.)
Off-state Voltage: 0 to 15 VDC, 15 VDC max.
Input Impedance: 120K ohms (typical)
Common Type: None
Response Time: 100 ms
Over Current Protection: 200 mA per channel
Isolation: I/O to logic (photocoupler isolation)
Channel-to-Channel Isolation: 2.5K VDC
Operating Temperature: -40 to 75°C
Power Consumption: 7 mA @ 24 VDC (typical)
I/O Cable Wire: AWG 14 (2.0 mm x mm) max.

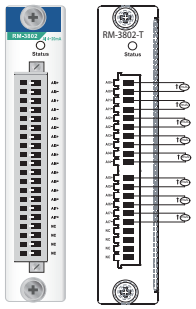
16-channel digital output module



RM-2600-T: 16 digital outputs, 24 VDC, sink type, 0.2 A

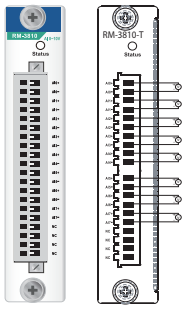
Outputs per Module: 16 channels, 24 VDC, sink type
Output Impedance: 120m ohms (typical)
Off-state Resistance: 500K ohms (typical)
Response Time: 100 ms
Over Current Protection: 200 mA per channel
Isolation: I/O to logic (photocoupler isolation)
Channel-to-Channel Isolation: 2.5K VDC
Operating Temperature: -40 to 75°C
Power Consumption: 10 mA @ 24 VDC (typical)
I/O Cable Wire: AWG 14 (2.0 mm x mm) max.

8-channel analog input modules, 16-bit resolution



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

Inputs per Module: 8 channels, differential
Input Current Range: 4 to 20 mA
Input Impendence: 120 ohms
Resolution Range: 16 bits, 0.24 μA/bit
Accuracy:
±0.1%, FSR @ 25°C
±0.3%, FSR @ -40°C, 75°C
Response Time: 100 ms for all channels
Over Current Protection: 200 mA per channel
Isolation: I/O to logic (photocoupler isolation)
Channel-to-Channel Isolation: 2.5K VDC
Operating Temperature: -40 to 75°C
Power Consumption: 78 mA @ 24 VDC (typical)
I/O Cable Wire: AWG 14 (2.0 mm x mm) max.



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

Inputs per Module: 8 channels, differential
Input Current Range: 0 to 10 VDC
Input Impendence: > 10M ohms
Resolution Range: 16 bits, 0.15 μA/bit
Data Format: 16-bit integer (2's complement)
Accuracy:
±0.1%, FSR @ 25°C
±0.3%, FSR @ -40°C, 75°C
Response Time: 100 ms for all channels
Over Current Protection: 200 mA per channel
Isolation: I/O to logic (photocoupler isolation)
Channel-to-Channel Isolation: 2.5K VDC
Operating Temperature: -40 to 75°C
Power Consumption: 78 mA @ 24 VDC (typical)
I/O Cable Wire: AWG 14 (2.0 mm x mm) max.