

NPort S8000 Series

4-port device servers with managed Ethernet switch



Features and Benefits

- 4-port RS-232/422/485 serial device server
- Serial QoS for configuring serial data transmission priority
- 2 kV isolation protection for each serial port (S8455I only)
- Adjustable pull high/low resistor for RS-485 ports (S8455I only)
- Built-in managed Ethernet switch
- S8455I fiber models: 2 fiber Ethernet ports and 3 Ethernet ports
- S8455I all-copper models: 5 Ethernet ports
- S8458 models: 4 fiber Ethernet ports and 4 Ethernet ports
- Ethernet redundancy with Turbo Ring and Turbo Chain (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D) supported
- QoS, IGMP-snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
- Surge protection for serial, Ethernet, and power

Certifications



Introduction

The NPort S8000 Series combines an industrial device server with a full-function managed Ethernet switch with 4 RS-232/422/485 serial ports, allowing you to easily install, manage, and maintain the product. Combining a device server and switch in one product allows you to save space in your cabinet, reduce overall power consumption, and reduce costs, since you will not need to purchase a switch and serial device server separately.

Supports the Full Range of NPort 5000 Series Device Server Functions

The NPort S8000 Series supports the complete array of NPort 5000 device server functions. You can network your existing serial devices by connecting up to 4 serial devices through Ethernet ports, with only basic configuration required. In addition, data transmission between the serial and Ethernet interfaces is bidirectional.

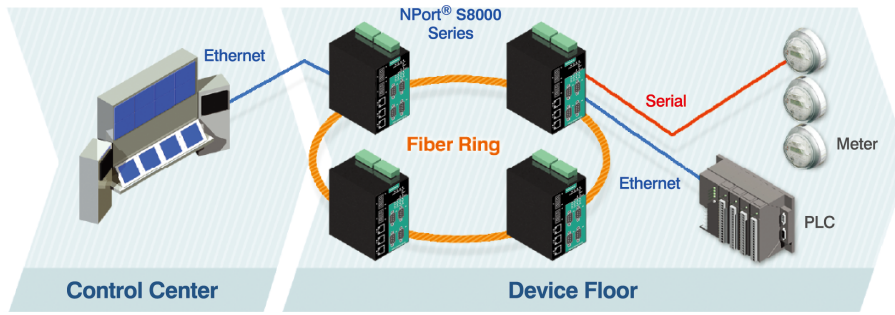
Full-function Managed Ethernet Switch

The NPort S8000 Series has a built-in full-function managed Ethernet switch that supports QoS, IGMP-snooping/GMRP, VLAN, Port Trunking, SNMPv1/v2c/v3, and IEEE 802.1X, allowing you to handle virtually any kind of application. Ethernet redundancy, which is used to increase the reliability and availability of your industrial Ethernet network, is provided by Moxa's Turbo Ring and Turbo Chain technology (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D).

Ring Redundancy at the Device Level

Device-level communication networks for industrial automation are very critical since they are used to control and monitor device processes. The reliability of these communications depends on ring redundancy at the device level, which is designed to provide fast network fault detection and reconfiguration in order to support the most demanding control applications. The NPort S8000 Series integrates a full function NPort device server with an industrial switch to carry serial and Ethernet devices at the same time.

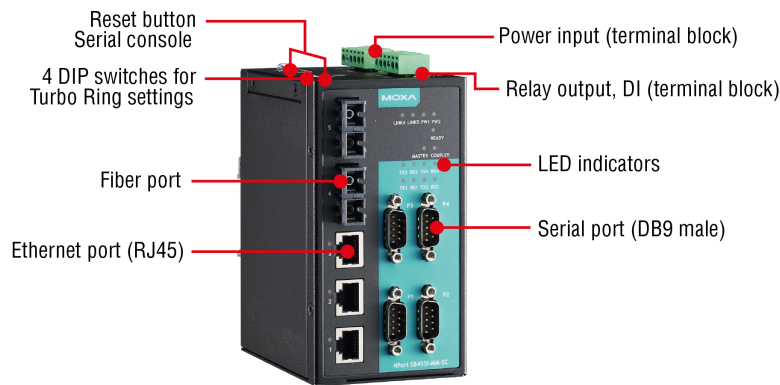
In addition, the NPort S8000 Series can also achieve ring redundancy with standard STP/RSTP and Moxa's proprietary Turbo Ring or Turbo Chain 2 redundancy protocols. This all-in-one design can be used to optimize and simplify your device network and enhance reliability.



Rugged Design with Complete Protection

The NPort S8000 Series complies with the UL 508 standard, which covers safety requirements for industrial control equipment. The NPort S8458 model supports high-level, 8/15 kV, ESD protection to prevent damage from static electricity. This model is also equipped with surge protection for power, Ethernet interface, and serial interface to protect against voltage spikes. With regard to the NPort S8455I, each serial port is protected by 2 kV isolation protection to guard against harmful currents.

Appearance



Specifications

Input/Output Interface

| | |
|------------------------|---|
| Alarm Contact Channels | 2, Resistive load: 1 A @ 24 VDC |
| Digital Input Channels | 2 |
| Digital Inputs | +13 to +30 V for state 1 -30 to +1 V for state 0 Max. input current: 8 mA |

Ethernet Interface

| | |
|--|--|
| 10/100BaseT(X) Ports (RJ45 connector) | NPort S8455I/S8455I-T: 5 NPort S8455I-MM-SC/SS-SC Series: 3 NPort S8458-4S-SC-T: 4 |
| 100BaseFX Ports (multi-mode SC connector) | NPort S8455I-MM-SC Series: 2 |
| 100BaseFX Ports (single-mode SC connector) | NPort S8455I-SS-SC Series: 2 NPort S8458-4S-SC-T: 4 |

Optical Fiber

| | | 100BaseFX | | |
|------------------|---------------|----------------|-------|--------------|
| | | Multi-Mode | | Single-Mode |
| Fiber Cable Type | OM1 | 50/125 μ m | G.652 | |
| | | 800 MHz x km | | |
| Typical Distance | | 4 km | 5 km | 40 km |
| Wavelength | Typical (nm) | 1300 | | 1310 |
| | TX Range (nm) | 1260 to 1360 | | 1280 to 1340 |

| | | 100BaseFX | | |
|---|-------------------------|------------|--------------|--------------|
| | | Multi-Mode | | Single-Mode |
| Fiber Cable Type | | OM1 | 50/125 μm | G.652 |
| | | | 800 MHz x km | |
| | RX Range (nm) | | 1100 to 1600 | 1100 to 1600 |
| Optical Power | TX Range (dBm) | | -10 to -20 | 0 to -5 |
| | RX Range (dBm) | | -3 to -32 | -3 to -34 |
| | Link Budget (dB) | | 12 | 29 |
| | Dispersion Penalty (dB) | | 3 | 1 |
| <p>Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.</p> <p>Note: Compute the “typical distance” of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).</p> | | | | |

| | |
|-------------------------------|---|
| Magnetic Isolation Protection | 1.5 kV (built-in) |
| Standards | IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.1p for Class of Service IEEE 802.1Q for VLAN Tagging IEEE 802.1w for Rapid Spanning Tree Protocol IEEE 802.1X for authentication IEEE 802.3 for 10BaseT IEEE 802.3ad for Port Trunk with LACP IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3x for flow control |

Switch Properties

| | |
|-------------------|---------------|
| IGMP Groups | 256 |
| Max. No. of VLANs | 64 |
| Priority Queues | 4 |
| VLAN ID Range | VID 1 to 4094 |

Ethernet Software Features

| | |
|--------------------------|---|
| Configuration Options | Web Console (HTTP/HTTPS), Windows Utility, Serial Console, Telnet Console |
| Management | BOOTP, Device Search Utility (DSU), DHCP Client, DHCP Option 82, HTTP, IPv4, LLDP, Port Mirror, RMON, SMTP, SNMPv1/v2c/v3, Syslog, TCP/IP, Telnet, Web Console |
| Filter | 802.1Q, GVRP, IGMP v1/v2 |
| Windows Real COM Drivers | Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded |
| Linux Real TTY Drivers | Kernel versions: 2.4.x, 2.6.x, 3.x, 4.x, and 5.x |
| Fixed TTY Drivers | SCO UNIX, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X |
| Android API | Android 3.1.x and later |
| Time Management | SNTP |
| MIB | Bridge MIB, Device Settings MIB, Ethernet-like MIB, MIB-II, P-BRIDGE MIB, Q-BRIDGE MIB, RFC1213, RFC1317, RMON MIB Groups 1, 2, 3, 9, RSTP MIB |
| Redundancy Protocols | RSTP, Turbo Chain, Turbo Ring v1, Turbo Ring v2 |

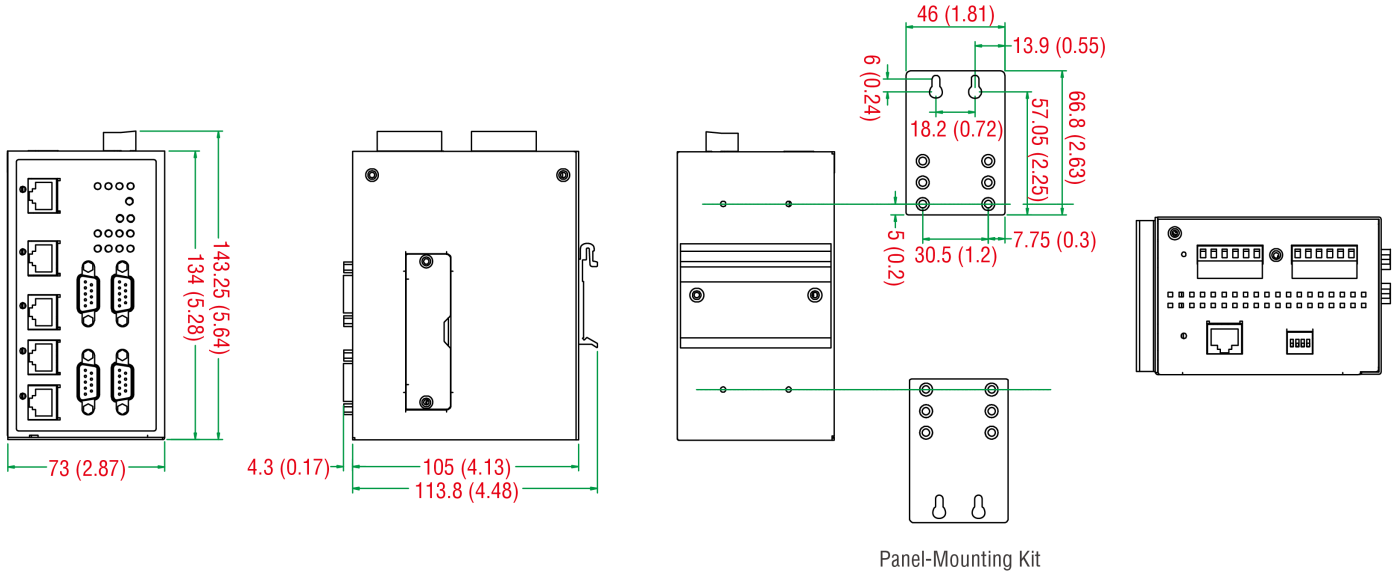
| | |
|-----------------------------------|--|
| Security | HTTPS, SSL, SSH |
| Authentication | Local Account Accessibility, RADIUS |
| Serial Interface | |
| Connector | DB9 male |
| No. of Ports | 4 |
| Serial Standards | RS-232, RS-422, RS-485 |
| Operation Modes | Disabled, Real COM mode, RFC2217 mode, TCP Client mode, TCP Server mode, UDP mode |
| Baudrate | 50 bps to 921.6 kbps |
| Data Bits | 5, 6, 7, 8 |
| Stop Bits | 1, 1.5, 2 |
| Parity | None, Even, Odd, Space, Mark |
| Flow Control | None, RTS/CTS, XON/XOFF |
| Isolation | NPort S8455I Series: 2 kV |
| Surge | NPort S8458-4S-SC-T: 4 kV |
| RS-485 Data Direction Control | ADDC® (automatic data direction control) |
| Pull High/Low Resistor for RS-485 | 1 kilo-ohm, 150 kilo-ohms |
| Terminator for RS-485 | 120 ohms |
| Console Port | RS-232 (TxD, RxD, GND), 8-pin RJ45 (19200, n, 8, 1) |
| Serial Signals | |
| RS-232 | TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND |
| RS-422 | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-4w | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-2w | Data+, Data-, GND |
| DIP Switch Configuration | |
| Ethernet Interface | Coupler, Master, Reserved, Turbo Ring |
| Power Parameters | |
| No. of Power Inputs | 2 |
| Power Connector | 2 removable 6-contact terminal block(s) |
| Input Current | NPort S8455I Series: 935 mA @ 12 VDC NPort S8458-4S-SC-T: 940 mA @ 12 VDC |
| Input Voltage | 12 to 48 VDC |
| Physical Characteristics | |
| Housing | Metal |
| Dimensions | NPort S8455I Series: 73.1 x 134 x 125 mm (2.88 x 5.27 x 4.92 in) NPort S8458-4S-SC-T: 93 x 144 x 125 mm (3.66 x 5.64 x 4.92 in) |

| | |
|-------------------------------------|--|
| Weight | NPort S8455I Series: 578 g (1.27 lb) NPort S8458-4S-SC-T: 1105 g (2.44 lb) |
| Installation | DIN-rail mounting, Wall mounting (with optional kit) |
| Environmental Limits | |
| Operating Temperature | Standard Temp. Models: 0 to 60°C (32 to 140°F) NPort S8455I-T Series: -40 to 75°C (-40 to 167°F) NPort S8458-4S-SC-T: -40 to 85°C (-40 to 185°F) |
| Ambient Relative Humidity | 5 to 95% (non-condensing) |
| Standards and Certifications | |
| EMC | EN 55032/24 |
| EMI | CISPR 32, FCC Part 15B Class A |
| EMS | NPort S8455I Series: IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Signal: 1 kV IEC 61000-4-5 Surge: Power: 1 kV; Signal: 0.25 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 NPort S8458 Series: IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 |
| Environmental Testing | IEC 60068-2-1 IEC 60068-2-3 |
| Hazardous Locations | NPort S8455I Series: Class I Division 2 |
| Safety | EN 60950-1, IEC 60950-1, UL 508, UL 60950-1 |
| Shock | IEC 60068-2-27 |
| Vibration | IEC 60068-2-6 |
| MTBF | |
| Time | NPort S8455I/S8455I-T: 287,354 hrs NPort S8455I-MM-SC/MM-SC-T: 200,951 hrs NPort S8455I-SS-SC/SS-SC-T: 286,993 hrs NPort S8458-4S-SC-T: 163,624 hrs |
| Standards | Telcordia (Bellcore) Standard TR/SR |
| Warranty | |
| Warranty Period | 5 years |
| Details | See www.moxa.com/warranty |
| Package Contents | |
| Device | 1 x NPort S8000 Series device server |
| Documentation | 1 x document and software CD 1 x quick installation guide 1 x warranty card |

Dimensions

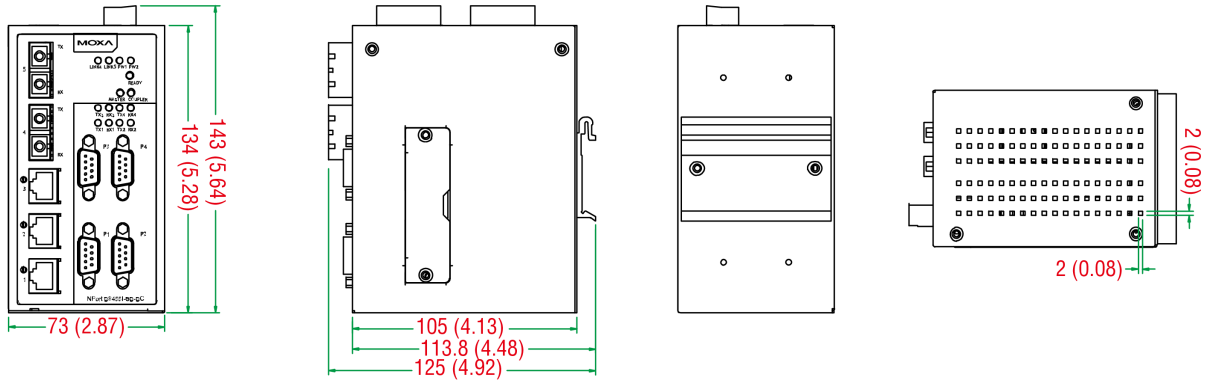
NPort S8455I

Unit: mm (inch)



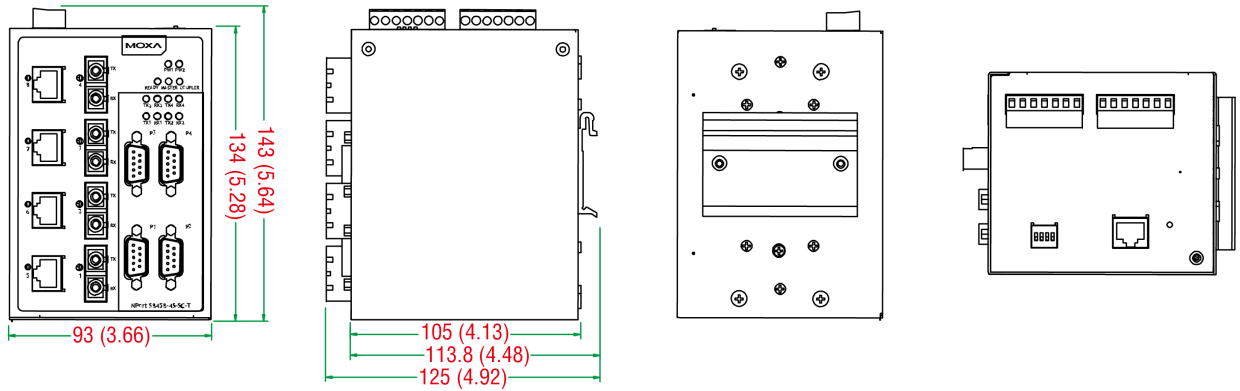
NPort S8455I Fiber

Unit: mm (inch)



NPort S8458

Unit: mm (inch)



Ordering Information

| Model Name | 10/100BaseT(X) Ports RJ45 Connector | 100BaseFX Ports Multi-Mode SC Connector | 100BaseFX Ports Single-Mode SC Connector | Operating Temp. | Input Voltage |
|----------------------|--|---|--|-----------------|---------------|
| NPort S8455I | 5 | – | – | 0 to 60°C | 12-48 VDC |
| NPort S8455I-T | 5 | – | – | -40 to 75°C | 12-48 VDC |
| NPort S8455I-MM-SC | 3 | 2 | – | 0 to 60°C | 12-48 VDC |
| NPort S8455I-MM-SC-T | 3 | 2 | – | -40 to 75°C | 12-48 VDC |
| NPort S8455I-SS-SC | 3 | – | 2 | 0 to 60°C | 12-48 VDC |
| NPort S8455I-SS-SC-T | 3 | – | 2 | -40 to 75°C | 12-48 VDC |
| NPort S8458-4S-SC-T | 4 | – | 4 | -40 to 85°C | 12-48 VDC |

Accessories (sold separately)

Cables

| | |
|--------------|--|
| CBL-F9M9-150 | DB9 female to DB9 male serial cable, 1.5 m |
| CBL-F9M9-20 | DB9 female to DB9 male serial cable, 20 cm |
| CN20070 | 10-pin RJ45 to DB9 female serial cable |

Connectors

| | |
|-----------------|--|
| ADP-RJ458P-DB9F | DB9 female to RJ45 connector |
| Mini DB9F-to-TB | DB9 female to terminal block connector |

Power Cords

| | |
|-------------|--|
| CBL-PJTB-10 | Non-locking barrel plug to bare-wire cable |
|-------------|--|

Power Supplies

| | |
|-----------|---|
| DR-120-24 | 120W/2.5A DIN-rail 24 VDC power supply with universal 88 to 132 VAC or 176 to 264 VAC input by switch, or 248 to 370 VDC input, -10 to 60°C operating temperature |
| DR-4524 | 45W/2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC or 120 to 370 VDC input, -10 to 50°C operating temperature |
| DR-75-24 | 75W/3.2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC or 120 to 370 VDC input, -10 to 60°C operating temperature |

Wall-Mounting Kits

| | |
|-------|---|
| WK-46 | Wall-mounting kit, 2 plates, 8 screws, 46.5 x 66.8 x 1 mm |
|-------|---|

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NPort S9450I Series

4-port rugged device servers with managed Ethernet switch



Features and Benefits

- 4-port RS-232/422/485 serial interface
- Supports up to 5 managed Ethernet switch ports (fiber ports available with some models)
- Supports DNP3 and Modbus protocols
- IEC 61850-3, IEEE 1613-compliant (for power substations)
- Ethernet redundancy with Turbo Ring/Chain and RSTP/STP supported
- Real COM/TTY drivers for Windows and Linux
- Supports IEC 61850 MMS protocol
- Security features based on IEC 62443/NERC CIP
- -40 to 85°C wide operating temperature

Certifications



Introduction

The NPort S9450I Series 4-port RS-232/422/485 device servers, which come with a built-in full-function managed Ethernet switch, are designed specifically for the harsh environmental conditions found in electrical substations. With both fiber and wired Ethernet ports supported, the combination of device server and Ethernet switch gives users the ability to easily install, manage, and maintain the NPort S9450I itself, as well as attached serial devices.

Electromagnetic Compatibility for Harsh Substation Environments

The NPort S9450I Series supports a high level of surge protection to prevent damage from the types of power surges and EMI one finds in electrical substations and industrial automation applications. Combined with a -40 to 85°C operating temperature range and galvanized steel housing, the NPort S9450I is suitable for a wide range of industrial environments.

Another plus is the NPort S9450I's dual power supplies, which provide both redundancy, as well as a wide range of voltage inputs. The WV models accept a power 24/48 VDC power input (ranging from 18 to 72 VDC), and the HV models accept a power input of 88 to 300 VDC and 85 to 264 VAC.

Power SCADA With IEC 61850 MMS for Easy Maintenance

The current trend in power SCADA applications is to control and monitor both IT devices (switches, routers, etc.) and IEDs (sensors, actuators, etc.) with the MMS protocol. Contrast this with the more traditional management approach of using SNMP for IT devices and MMS for IEDs. In fact, SIs may even need to manage a variety of legacy devices that use proprietary communications protocols.

The NPort S9450I device servers are the world's first device servers to integrate MMS into an IT-type device designed specifically for power SCADA applications. The NPort S9450I even supports using MMS to monitor serial communications between the S9450I and legacy devices.

Supports Modbus/DNP3 Protocol Gateway

The NPort S9450I Series provides maximum flexibility for integrating industrial Modbus/DNP3 networks of all types and sizes. The NPort S9450I is designed to integrate Modbus TCP, ASCII, and RTU devices in almost any master/slave combination, including simultaneous serial and Ethernet masters.

The NPort S9450I device servers also support protocol conversion between DNP3 serial and DNP3 IP. All models are ruggedly constructed and are DIN-rail mountable.

Cybersecurity Features Based on IEC 62443/NERC CIP

The NPort S9450I Series has security features based on IEC 62443/NERC CIP to provide a high level of cybersecurity. Protecting mission-critical networks from cyberattacks is a high priority for industrial automation applications, which can suffer large losses due to extended network downtime.

Ring Redundancy at the Device Level

Device-level communication networks for industrial automation are very critical since they are used to control and monitor device processes. The reliability of these communications depends on ring redundancy at the device level, which is designed to provide fast network fault detection and

reconfiguration to support the most demanding control applications. The NPort S9450I Series integrates a full-function NPort device server with an industrial switch to carry serial and Ethernet devices at the same time.

In addition, the NPort S9450I can also achieve ring redundancy with standard STP/RSTP and Moxa's proprietary Turbo Ring or Turbo Chain 2 redundancy protocols. This all-in-one design can be used to optimize and simplify your device network and enhance reliability.

Specifications

Input/Output Interface

| | |
|------------------------|---|
| Alarm Contact Channels | 2, Resistive load: 1 A @ 24 VDC |
| Digital Input Channels | 2 |
| Digital Inputs | +13 to +30 V for state 1 -30 to +1 V for state 0 Max. input current: 8 mA |

Ethernet Interface

| | |
|--|--|
| 10/100BaseT(X) Ports (RJ45 connector) | NPort S9450I: 5 RJ45 ports |
| 100BaseFX Ports (multi-mode SC connector) | NPort S9450I-2M-SC: 3 RJ45 ports, 2 multi-mode SC ports |
| 100BaseFX Ports (multi-mode ST connector) | NPort S9450I-2M-ST: 3 RJ45 ports, 2 multi-mode ST ports |
| 100BaseFX Ports (single-mode SC connector) | NPort S9450I-2S-SC: 3 RJ45 ports, 2 single-mode SC ports |
| 100BaseFX Ports (single-mode ST connector) | NPort S9450I-2S-ST: 3 RJ45 ports, 2 single-mode ST ports |
| Magnetic Isolation Protection | 1.5 kV (built-in) |

Optical Fiber

| | | 100BaseFX | | |
|------------------|-------------------------|--------------|---------------------------|--------------|
| | | Multi-Mode | | Single-Mode |
| Fiber Cable Type | | OM1 | 50/125 μm 800 MHz x km | G.652 |
| | Typical Distance | | 4 km | 5 km |
| Wavelength | Typical (nm) | 1300 | | 1310 |
| | TX Range (nm) | 1260 to 1360 | | 1280 to 1340 |
| | RX Range (nm) | 1100 to 1600 | | 1100 to 1600 |
| Optical Power | TX Range (dBm) | -10 to -20 | | 0 to -5 |
| | RX Range (dBm) | -3 to -32 | | -3 to -34 |
| | Link Budget (dB) | 12 | | 29 |
| | Dispersion Penalty (dB) | 3 | | 1 |

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Standards

IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1p for Class of Service
IEEE 802.1Q for VLAN Tagging
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1X for authentication
IEEE 802.3 for 10BaseT
IEEE 802.3ad for Port Trunk with LACP
IEEE 802.3u for 100BaseT(X) and 100BaseFX

Switch Properties

| | |
|-------------------|---------------|
| IGMP Groups | 256 |
| Max. No. of VLANs | 64 |
| Priority Queues | 4 |
| VLAN ID Range | VID 1 to 4094 |

Ethernet Software Features

| | |
|--------------------------|---|
| Configuration Options | Command Line Interface (CLI) through Serial/Telnet/SSH, Web Console (HTTP/HTTPS), Windows Utility |
| Management | DHCP Client, DHCP Option 82, HTTP, IEC 61850 MMS, IPv4, LLDP, Port Mirror, RARP, RMON, SMTP, SNMPv1/v2c/v3, Syslog, Telnet, TFTP, Web Console |
| Filter | GMRP, GVRP, IGMP v1/v2 |
| Windows Real COM Drivers | Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded |
| Linux Real TTY Drivers | Kernel versions: 2.4.x, 2.6.x, 3.x, 4.x, and 5.x |
| Fixed TTY Drivers | SCO UNIX, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X |
| Android API | Android 3.1.x and later |
| Industrial Protocols | Modbus TCP Server (Slave), DNP3 TCP Outstation |
| Time Management | NTP Server/Client, SNTP |
| MIB | Bridge MIB, Device Settings MIB, Ethernet-like MIB, MIB-II, P-BRIDGE MIB, Q-BRIDGE MIB, RFC1213, RFC1317, RMON MIB Groups 1, 2, 3, 9, RSTP MIB |
| Redundancy Protocols | RSTP, Turbo Chain, Turbo Ring v1, Turbo Ring v2 |
| Security | HTTPS/SSL, Local Account Accessibility, TACACS+, RADIUS, SSH |

Serial Interface

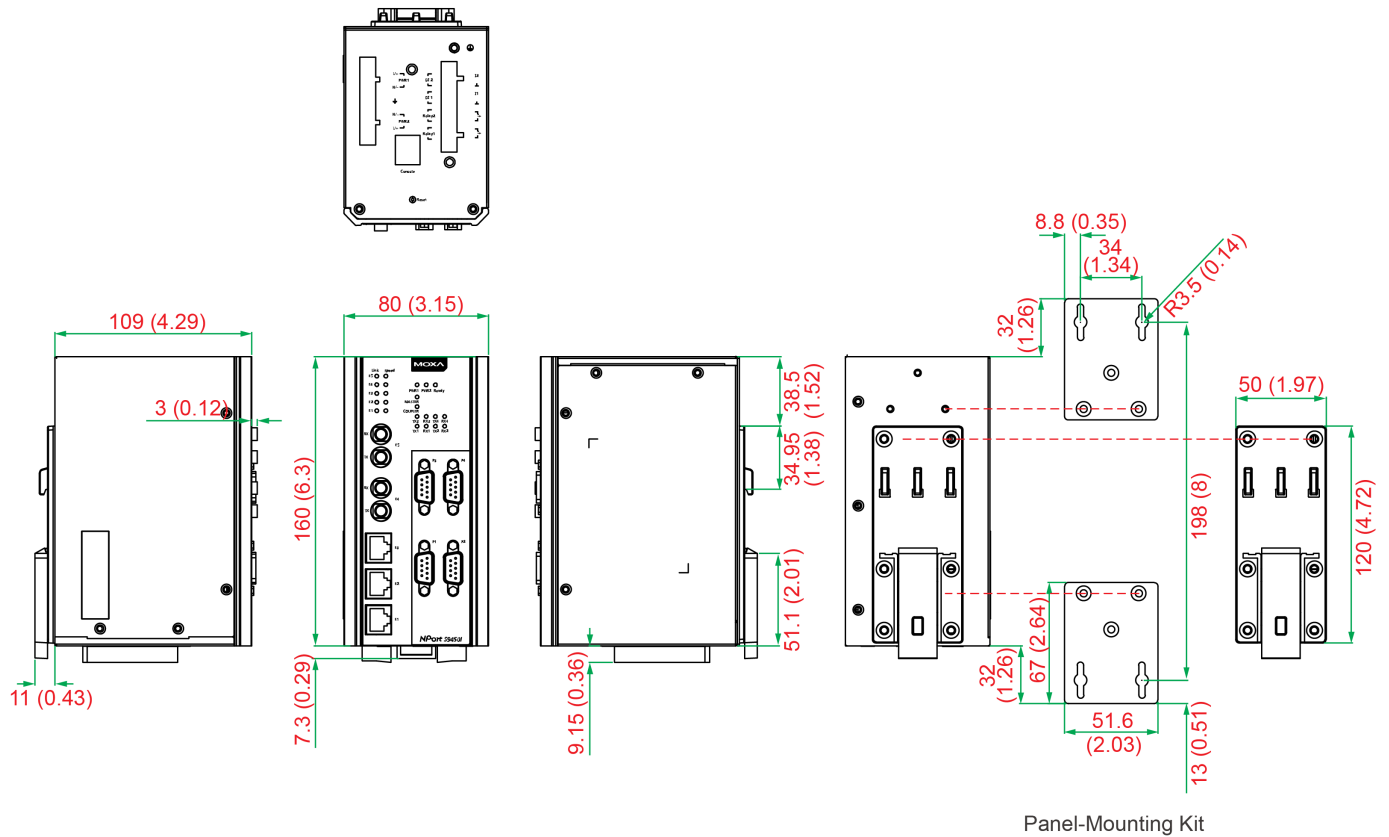
| | |
|-----------------------------------|---|
| Connector | DB9 male |
| No. of Ports | 4 |
| Serial Standards | RS-232, RS-422, RS-485 |
| Operation Modes | Real COM mode, RFC2217 mode, TCP Client mode, TCP Server mode, UDP mode, Modbus mode, DNP3 mode, DNP3 Raw Socket mode, Disabled |
| Baudrate | 50 bps to 921.6 kbps (supports non-standard baudrates) |
| Data Bits | 5, 6, 7, 8 |
| Stop Bits | 1, 1.5, 2 |
| Parity | None, Even, Odd, Space, Mark |
| Flow Control | None, RTS/CTS, XON/XOFF |
| Isolation | 2 kV |
| Surge | 4 kV |
| RS-485 Data Direction Control | ADDC® (automatic data direction control) |
| Pull High/Low Resistor for RS-485 | 1 kilo-ohm, 150 kilo-ohms |

| | |
|--|--|
| Terminator for RS-485 | 120 ohms |
| Console Port | RS-232 (TxD, RxD, GND), 10-pin RJ45 (19200, n, 8, 1) |
| Serial Signals | |
| RS-232 | TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND |
| RS-422 | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-4w | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-2w | Data+, Data-, GND |
| DIP Switch Configuration | |
| Ethernet Interface | Turbo Ring, Master, Coupler, Reserved |
| Modbus TCP | |
| Max. No. of Client Connections | 32 |
| Max. No. of Server Connections | 16 |
| DNP3 (Transparent) | |
| Max. No. of Master Connections | 16 |
| Max. No. of Outstation Connections | 32 |
| Power Parameters | |
| No. of Power Inputs | 2 |
| Power Connector | 1 removable 5-contact terminal block(s) |
| Reverse Polarity Protection | Supported |
| Input Current | NPort S9450I-WV-T Series: 520 mA @ 24 VDC NPort S9450I-HV-T Series: 80 mA @ 110 VDC |
| Input Voltage | NPort S9450I-WV-T Series: 24/48 VDC (18 to 72 VDC) NPort S9450I-HV-T Series: 110/220 VAC/VDC (85 to 264 VAC, 88 to 300 VDC) |
| Physical Characteristics | |
| Housing | Metal |
| Dimensions | 80 x 160 x 109 mm (3.15 x 6.30 x 4.29 in) |
| Weight | Product only: 2.54 kg (5.60 lb) |
| Installation | DIN-rail mounting, Wall mounting (with optional kit) |
| Environmental Limits | |
| Operating Temperature | -40 to 85°C (-40 to 185°F) |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F) |
| Ambient Relative Humidity | 5 to 95% (non-condensing) |
| Standards and Certifications | |
| EMC | EN 61000-6-2/-6-4 |
| EMI | CISPR 32, FCC Part 15B Class A |
| EMS | IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m |

| | |
|-------------------------|--|
| | IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV IEC 61000-4-5 Surge: Power: 6 kV; Signal: 4 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 DIPs |
| Environmental Testing | IEC 60068-2-2 IEC 60068-2-14 |
| Power Substation | IEC 61850-3, IEEE 1613 |
| Hazardous Locations | UL/cUL Class I Division 2 Groups A/B/C/D |
| Safety | EN 61010-2-201, UL 61010-2-201 |
| Shock | IEC 60068-2-27 |
| Vibration | IEC 60068-2-6, IEC 60068-2-64 |
| Declaration | |
| Green Product | RoHS, CRoHS, WEEE |
| MTBF | |
| Time | 347,436 hrs |
| Standards | Telcordia SR332 |
| Warranty | |
| Warranty Period | 5 years |
| Details | See www.moxa.com/warranty |
| Package Contents | |
| Device | 1 x NPort S9450I Series device server |
| Installation Kit | 1 x DIN-rail kit |
| Cable | 1 x DB9 female to RJ45 10-pin |
| Documentation | 1 x quick installation guide 1 x warranty card |

Dimensions

Unit: mm (inch)



Panel-Mounting Kit

Ordering Information

| Model Name | 10/100BaseT(X) Ports, RJ45 Connector | 100BaseFX Ports, Multi-Mode SC Connector | 100BaseFX Ports, Multi-Mode ST Connector | 100BaseFX Ports, Single-Mode SC Connector | 100BaseFX Ports, Single-Mode ST Connector | Input Voltage |
|-------------------------|--------------------------------------|--|--|---|---|-----------------|
| NPort S9450I-WV-T | 5 | - | - | - | - | 24/48 VDC |
| NPort S9450I-HV-T | 5 | - | - | - | - | 110/220 VAC/VDC |
| NPort S9450I-2S-ST-WV-T | 3 | - | - | - | 2 | 24/48 VDC |
| NPort S9450I-2S-SC-WV-T | 3 | - | - | 2 | - | 24/48 VDC |
| NPort S9450I-2S-ST-HV-T | 3 | - | - | - | 2 | 110/220 VAC/VDC |
| NPort S9450I-2S-SC-HV-T | 3 | - | - | 2 | - | 110/220 VAC/VDC |
| NPort S9450I-2M-ST-WV-T | 3 | - | 2 | - | - | 24/48 VDC |
| NPort S9450I-2M-SC-WV-T | 3 | 2 | - | - | - | 24/48 VDC |
| NPort S9450I-2M-ST-HV-T | 3 | - | 2 | - | - | 110/220 VAC/VDC |
| NPort S9450I-2M-SC-HV-T | 3 | 2 | - | - | - | 110/220 VAC/VDC |

Accessories (sold separately)

Cables

| | |
|--------------|--|
| CBL-F9M9-150 | DB9 female to DB9 male serial cable, 1.5 m |
| CBL-F9M9-20 | DB9 female to DB9 male serial cable, 20 cm |
| CN20070 | 10-pin RJ45 to DB9 female serial cable |

Connectors

| | |
|-----------------|--|
| Mini DB9F-to-TB | DB9 female to terminal block connector |
| ADP-RJ458P-DB9F | DB9 female to RJ45 connector |

Wall-Mounting Kits

| | |
|----------|---|
| WK-51-01 | Wall mounting kit with 2 plates (51.6 x 67 x 2 mm) and 6 screws |
|----------|---|

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NPort S9650I Series

8/16-port rugged device server with managed Ethernet switch



Features and Benefits

- Supports up to 4 managed Ethernet switch ports (fiber available with some optional network modules)
- 8/16-port RS-232/422/485 serial interface
- Supports DNP3 and Modbus protocols
- Ethernet redundancy with Turbo Ring/Chain and RSTP/STP supported
- Real COM/TTY drivers for Windows and Linux
- IEC 61850-3, IEEE 1613 (power substations) compliant
- IEEE 1588v2 and IRIG-B time synchronization functions
- Supports IEC 61850 MMS protocol
- Security features based on IEC 62443/NERC CIP
- -40 to 85°C wide operating temperature

Certifications



Introduction

The NPort S9650I Series 8/16-port RS-232/422/485 device servers, which come with a built-in full-function managed Ethernet switch, are designed specifically for the harsh environmental conditions found in electrical substations. With both fiber and wired Ethernet ports supported, the combination of a device server and Ethernet switch gives users the ability to easily install, manage, and maintain the NPort S9650I itself, as well as attached serial devices.

Electromagnetic Compatibility for Harsh Substation Environments

The NPort S9650I Series supports a high level of surge protection to prevent damage from the types of power surges and EMI one finds in electrical substations and industrial automation applications. Combined with a -40 to 85°C operating temperature range and galvanized steel housing, the NPort S9650I is suitable for a wide range of industrial environments.

Another plus is the NPort S9650I's dual power supplies, which provide both redundancy, as well as a wide range of voltage inputs. The WV models accept a 24/48 VDC power input (ranging from 18 to 72 VDC), and the HV models accept a power input of 88 to 300 VDC and 85 to 264 VAC.

Power SCADA With IEC 61850 MMS for Easy Maintenance

The current trend in power SCADA applications is to control and monitor both IT devices (switches, routers, etc.) and IEDs (sensors, actuators, etc.) with the MMS protocol. Contrast this with the more traditional management approach of using SNMP for IT devices and MMS for IEDs. In fact, SIs may even need to manage a variety of legacy devices that use proprietary communications protocols.

The NPort S9650I device servers are the world's first device servers to integrate MMS into an IT-type device designed specifically for power SCADA applications. The NPort S9650I even supports using MMS to monitor serial communications between the S9650I and legacy devices.

Supports Modbus/DNP3 Protocol Gateway

The NPort S9650I Series provides maximum flexibility for integrating industrial Modbus/DNP3 networks of all types and sizes. The NPort S9650I is designed to integrate Modbus TCP, ASCII, and RTU devices in almost any master/slave combination, including simultaneous serial and Ethernet masters.

The NPort S9650I device servers also support protocol conversion between DNP3 serial and DNP3 IP, and all models are ruggedly constructed to ensure reliable operation.

Cybersecurity Features Based on IEC 62443/NERC CIP

The NPort S9650I Series has security features based on IEC 62443/NERC CIP to provide a high level of cybersecurity. Protecting mission-critical networks from cyberattacks is a high priority for industrial automation applications, which can suffer large losses due to extended network downtime.

Supports IEEE 1588v2 and IRIG-B Time Synchronization Functions

The NPort S9650I Series, which has a modular design that supports IEEE 1588v2 and IRIG-B time synchronization, is able to interconnect and synchronize multiple types of intelligent electronic devices (IEDs) that use different communication protocols. The time source is provided via IEEE 1588v2 and converted to IRIG-B for distribution to the IEDs via the serial ports or via a dedicated IRIG-B BNC connector.

Ring Redundancy at the Device Level

Device-level communication networks for industrial automation are very critical since they are used to control and monitor device processes. The reliability of these communications depends on ring redundancy at the device level, which is designed to provide fast network fault detection and reconfiguration to support the most demanding control applications. The NPort S9650I Series integrates a full-function NPort device server with an industrial switch to carry serial and Ethernet devices at the same time. In addition, the NPort S9650I Series can achieve ring redundancy with standard STP/RSTP and Moxa's proprietary Turbo Ring or Turbo Chain 2 redundancy protocols. This all-in-one design can be used to optimize and simplify your device network and enhance reliability.

Specifications

Input/Output Interface

| | |
|------------------------|------------------------------|
| Alarm Contact Channels | Resistive load: 1 A @ 24 VDC |
|------------------------|------------------------------|

Ethernet Interface

| | |
|--|---|
| 10/100BaseT(X) Ports (RJ45 connector) | NPort S9650I-E Series: 4 RJ45 ports NPort S9650I-MSC Series: 2 RJ45 ports NPort S9650I-SSC Series: 2 RJ45 ports NPort S9650I-IRIG Series: 2 RJ45 ports |
| 100BaseFX Ports (multi-mode SC connector) | NPort S9650I-MSC Series: 2 multi-mode SC ports |
| 100BaseFX Ports (single-mode SC connector) | NPort S9650I-SSC Series: 2 single-mode SC ports |
| Magnetic Isolation Protection | 1.5 kV (built-in) |

Optical Fiber

| | | 100BaseFX | | |
|------------------|-------------------------|--------------|----------------|--------------|
| | | Multi-Mode | | Single-Mode |
| Fiber Cable Type | | OM1 | 50/125 μ m | G.652 |
| | | | | |
| Typical Distance | | 4 km | 5 km | 40 km |
| Wavelength | Typical (nm) | 1300 | | 1310 |
| | TX Range (nm) | 1260 to 1360 | | 1280 to 1340 |
| | RX Range (nm) | 1100 to 1600 | | 1100 to 1600 |
| Optical Power | TX Range (dBm) | -10 to -20 | | 0 to -5 |
| | RX Range (dBm) | -3 to -32 | | -3 to -34 |
| | Link Budget (dB) | 12 | | 29 |
| | Dispersion Penalty (dB) | 3 | | 1 |

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Standards

IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1p for Class of Service
IEEE 802.1Q for VLAN Tagging
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1X for authentication
IEEE 802.3 for 10BaseT
IEEE 802.3ad for Port Trunk with LACP
IEEE 802.3u for 100BaseT(X) and 100BaseFX

Switch Properties

| | |
|-------------------|---------------|
| IGMP Groups | 256 |
| Max. No. of VLANs | 64 |
| Priority Queues | 4 |
| VLAN ID Range | VID 1 to 4094 |

Ethernet Software Features

| | |
|--------------------------|---|
| Configuration Options | Command Line Interface (CLI) through Serial/Telnet/SSH, Web Console (HTTP/HTTPS), Windows Utility |
| Management | DHCP Client, DHCP Option 82, HTTP, IEC 61850 MMS, IPv4, LLDP, Port Mirror, RARP, RMON, SMTP, SNMPv1/v2c/v3, Syslog, Telnet, TFTP, Web Console |
| Filter | GMRP, GVRP, IGMP v1/v2 |
| Windows Real COM Drivers | Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded |
| Linux Real TTY Drivers | Kernel versions: 2.4.x, 2.6.x, 3.x, 4.x, and 5.x |
| Fixed TTY Drivers | SCO UNIX, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X |
| Android API | Android 3.1.x and later |
| Industrial Protocols | Modbus TCP Server (Slave), DNP3 TCP Outstation |
| Time Management | NTP Server/Client, SNTP, IEEE 1588v2 PTP (hardware-based), IRIG-B |
| MIB | Bridge MIB, Device Settings MIB, Ethernet-like MIB, MIB-II, P-BRIDGE MIB, Q-BRIDGE MIB, RFC1213, RFC1317, RMON MIB Groups 1, 2, 3, 9, RSTP MIB |
| Redundancy Protocols | RSTP, Turbo Chain, Turbo Ring v1, Turbo Ring v2 |
| Security | HTTPS/SSL, Local Account Accessibility, TACACS+, RADIUS, SSH |

IRIG-B Interface

| | |
|-------------------------------|--|
| PWM/PPS Output, BNC Connector | NPort S9650I-IRIG Series: 1 |
| PWM/PPS Output, DB9 Female | NPort S9650I-8B-2HV-IRIG-T: 8 NPort S9650I-16B-2HV-IRIG-T: 16 |
| PWM Input, BNC Connector | NPort S9650I-IRIG Series: 1 |

Serial Interface

| | |
|------------------|--|
| Connector | NPort S9650I-8/-16 Series: DB9 male NPort S9650I-8B/-16B Series: DB9 female NPort S9650I-8F/-16F Series: Multi-mode fiber SC connector |
| No. of Ports | 8 or 16 |
| Serial Standards | RS-232, RS-422, RS-485 |
| Operation Modes | Real COM mode, RFC2217 mode, TCP Client mode, TCP Server mode, UDP mode, Modbus mode, DNP3 mode, DNP3 Raw Socket mode, Disabled |
| Baudrate | 50 bps to 921.6 kbps (supports non-standard baudrates) |
| Data Bits | 5, 6, 7, 8 |
| Stop Bits | 1, 1.5, 2 |

| | |
|-----------------------------------|--|
| Parity | None, Even, Odd, Space, Mark |
| Flow Control | None, RTS/CTS, XON/XOFF |
| Isolation | 2 kV |
| Surge | 4 kV |
| RS-485 Data Direction Control | ADDC® (automatic data direction control) |
| Pull High/Low Resistor for RS-485 | 1 kilo-ohm, 150 kilo-ohms |
| Terminator for RS-485 | 120 ohms |
| Console Port | RS-232 (TxD, RxD, GND), 10-pin RJ45 (19200, n, 8, 1) |

Serial Signals

| | |
|-----------|---|
| RS-232 | NPort S9650I-IRIG Series: TxD, RxD, RTS, CTS, DTR/+IRIG-B, DSR, DCD, GND NPort S9650I Series: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND |
| RS-422 | NPort S9650I-IRIG Series: TxD+, TxD-, RxD+, RxD-, GND, +IRIG-B NPort S9650I Series: Tx+, Tx-, Rx+, Rx- |
| RS-485-4w | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-2w | NPort S9650I-IRIG Series: Data+, Data-, GND, +IRIG-B NPort S9650I Series: Data+, Data-, GND |

DIP Switch Configuration

| | |
|--------------------|---------------------------------------|
| Ethernet Interface | Turbo Ring, Master, Coupler, Reserved |
|--------------------|---------------------------------------|

Modbus TCP

| | |
|--------------------------------|----|
| Max. No. of Client Connections | 32 |
| Max. No. of Server Connections | 16 |

DNP3 (Transparent)

| | |
|------------------------------------|----|
| Max. No. of Master Connections | 16 |
| Max. No. of Outstation Connections | 32 |

Reliability

| | |
|--------------------------|---|
| Automatic Reboot Trigger | Built-in WDT |
| Alert Tools | Built-in buzzer and RTC (real-time clock) |

Power Parameters

| | |
|-----------------------------|--|
| No. of Power Inputs | 2 |
| Reverse Polarity Protection | Supported |
| Input Current | 0.65 A @ 100 VAC, 0.47A @ 100 VDC |
| Input Voltage | 110/220 VAC/VDC (100 to 240 VAC, 100 to 250 VDC) |

Physical Characteristics

| | |
|--------------|--|
| Housing | Metal |
| Installation | 19-inch rack mounting |
| Dimensions | 457 x 32 x 330 mm (18 x 1.25 x 12.99 in) |
| Weight | Product only: 5.15 kg (11.35 lb) |

Environmental Limits

| | |
|--|----------------------------|
| Operating Temperature | -40 to 85°C (-40 to 185°F) |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F) |
| Ambient Relative Humidity | 5 to 95% (non-condensing) |

Standards and Certifications

| | |
|-----------------------|---|
| EMC | EN 61000-6-2/-6-4 |
| EMI | CISPR 32, FCC Part 15B Class A |
| EMS | IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 DIPs |
| Environmental Testing | IEC 60068-2-2 IEC 60068-2-14 |
| Power Substation | IEC 61850-3, IEEE 1613 |
| Safety | EN 61010-2-201, UL 61010-2-201 |
| Shock | IEC 60068-2-27 |
| Vibration | IEC 60068-2-6, IEC 60068-2-64 |

Declaration

| | |
|---------------|-------------------|
| Green Product | RoHS, CRoHS, WEEE |
|---------------|-------------------|

MTBF

| | |
|-----------|---|
| Time | NPort S9650I-8-2HV-E-T: 224,670 hrs NPort S9650I-8-2HV-MS-C-T: 220,944 hrs NPort S9650I-8-2HV-SS-C-T: 220,944 hrs NPort S9650I-8B-2HV-IRIG-T: 213,025 hrs NPort S9650I-8F-2HV-E-T: 311,734 hrs NPort S9650I-8F-2HV-MS-C-T: 304,587 hrs NPort S9650I-8F-2HV-SS-C-T: 304,587 hrs NPort S9650I-16-2HV-E-T: 158,816 hrs NPort S9650I-16-2HV-MS-C-T: 156,949 hrs NPort S9650I-16-2HV-SS-C-T: 156,949 hrs NPort S9650I-16B-2HV-IRIG-T: 157,770 hrs NPort S9650I-16F-2HV-E-T: 261,817 hrs NPort S9650I-16F-2HV-MS-C-T: 256,761 hrs NPort S9650I-16F-2HV-SS-C-T: 256,761 hrs |
| Standards | Telcordia SR332 |

Warranty

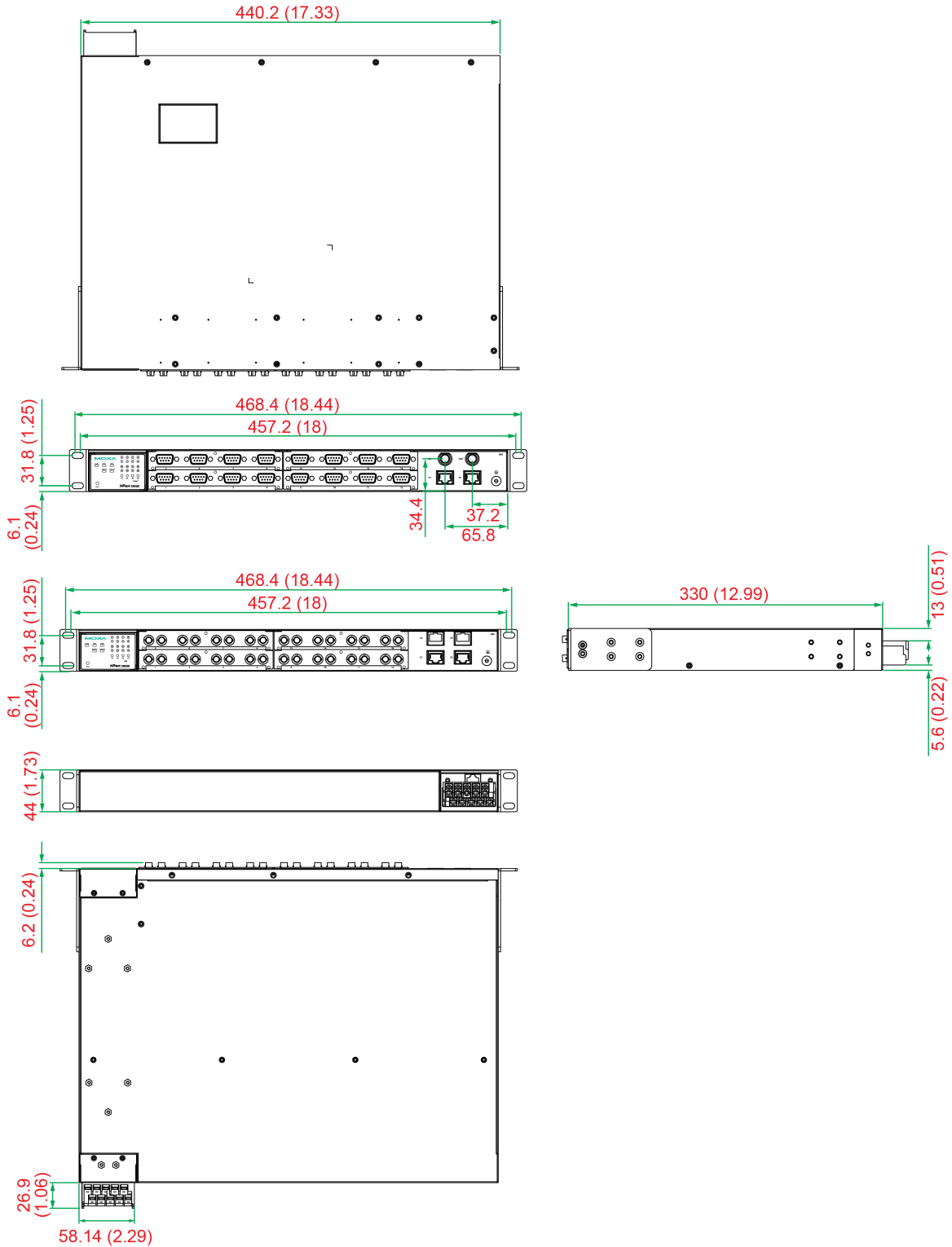
| | |
|-----------------|--|
| Warranty Period | 5 years |
| Details | See www.moxa.com/warranty |

Package Contents

| | |
|---------------|---|
| Device | 1 x NPort S9650I Series device server |
| Documentation | 1 x quick installation guide 1 x warranty card |

Dimensions

Unit: mm (inch)



Ordering Information

| Model Name | No. of Serial Ports | Serial Port Connector | IRIG-B Time Sync | No. of Ethernet Ports | Ethernet Port Connector |
|---------------------------|---------------------|-----------------------|------------------|-----------------------|------------------------------------|
| NPort S9650I-8-2HV-E-T | 8 | DB9 male | - | 4 | 4 x RJ45 |
| NPort S9650I-8-2HV-MS-C-T | 8 | DB9 male | - | 4 | 2 x RJ45, 2 x multi-mode SC fiber |
| NPort S9650I-8-2HV-SS-C-T | 8 | DB9 male | - | 4 | 2 x RJ45, 2 x single-mode SC fiber |

| Model Name | No. of Serial Ports | Serial Port Connector | IRIG-B Time Sync | No. of Ethernet Ports | Ethernet Port Connector |
|-----------------------------|---------------------|-----------------------|------------------|-----------------------|------------------------------------|
| NPort S9650I-8B-2HV-IRIG-T | 8 | DB9 female | ✓ | 2 | 2 x RJ45 |
| NPort S9650I-8F-2HV-E-T | 8 | Multi-mode SC fiber | – | 4 | 4 x RJ45 |
| NPort S9650I-8F-2HV-MS-C-T | 8 | Multi-mode SC fiber | – | 4 | 2 x RJ45, 2 x multi-mode SC fiber |
| NPort S9650I-8F-2HV-SS-C-T | 8 | Multi-mode SC fiber | – | 4 | 2 x RJ45, 2 x single-mode SC fiber |
| NPort S9650I-16-2HV-E-T | 16 | DB9 male | – | 4 | 4 x RJ45 |
| NPort S9650I-16-2HV-MS-C-T | 16 | DB9 male | – | 4 | 2 x RJ45, 2 x multi-mode SC fiber |
| NPort S9650I-16-2HV-SS-C-T | 16 | DB9 male | – | 4 | 2 x RJ45, 2 x single-mode SC fiber |
| NPort S9650I-16B-2HV-IRIG-T | 16 | DB9 female | ✓ | 2 | 2 x RJ45 |
| NPort S9650I-16F-2HV-E-T | 16 | Multi-mode SC fiber | – | 4 | 4 x RJ45 |
| NPort S9650I-16F-2HV-MS-C-T | 16 | Multi-mode SC fiber | – | 4 | 2 x RJ45, 2 x multi-mode SC fiber |
| NPort S9650I-16F-2HV-SS-C-T | 16 | Multi-mode SC fiber | – | 4 | 2 x RJ45, 2 x single-mode SC fiber |

Accessories (sold separately)

Cables

| | |
|----------------|--|
| CBL-F9M9-150 | DB9 female to DB9 male serial cable, 1.5 m |
| CBL-F9M9-20 | DB9 female to DB9 male serial cable, 20 cm |
| CBL-RJ458P-100 | 8-pin RJ45 CAT5 Ethernet cable, 1 m |
| CN20070 | 10-pin RJ45 to DB9 female serial cable |

Connectors

| | |
|-----------------|--|
| ADP-RJ458P-DB9F | DB9 female to RJ45 connector |
| Mini DB9F-to-TB | DB9 female to terminal block connector |

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NPort IA5000A-I/O Series

1/2-port RS-232/422/485 device server with 6 or 12 digital I/Os



Features and Benefits

- 6 or 12 digital I/Os to collect local data for status monitoring
- Connects serial/I/O data to the cloud through generic MQTT
- Supports MQTT connection with built-in device SDKs to Azure/Alibaba Cloud
- Supports MQTT connection with TLS and certificate in JSON and Raw data format
- microSD card for configuration backup/duplication and event logs, and data buffering when cloud connection is lost
- Supports repackaging the serial data size (up to 4K) to save the packet numbers that need to be sent to the cloud platform
- Redundant dual DC power inputs and relay output
- Cascading Ethernet ports for easy wiring
- Warnings and alerts by relay output and email
- 4 kV serial surge protection

Certifications



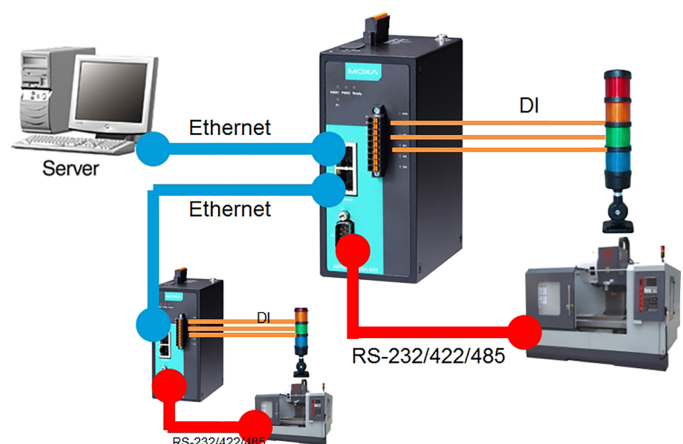
Introduction

The NPort IA5000A-I/O serial device servers, which have built-in digital I/Os, provide maximum flexibility when you need to integrate serial equipment in the field with an Ethernet network or cloud platform. The cloud-ready device server can communicate with IIoT applications, using generic MQTT or third-party cloud services, such as Azure and Alibaba Cloud. The combination of digital I/Os makes the device servers well-suited for a variety of industrial data acquisition applications. The DI/Os on the device can be controlled over TCP/IP using the Modbus TCP protocol and can be configured and secured from a web browser. The device can also be installed as a COM Port (patented Real COM) on a Windows/Linux PC to make it compatible with legacy applications.

All models are ruggedly constructed, DIN-rail mountable, and designed with redundant power inputs to ensure uninterrupted operation for industrial applications.

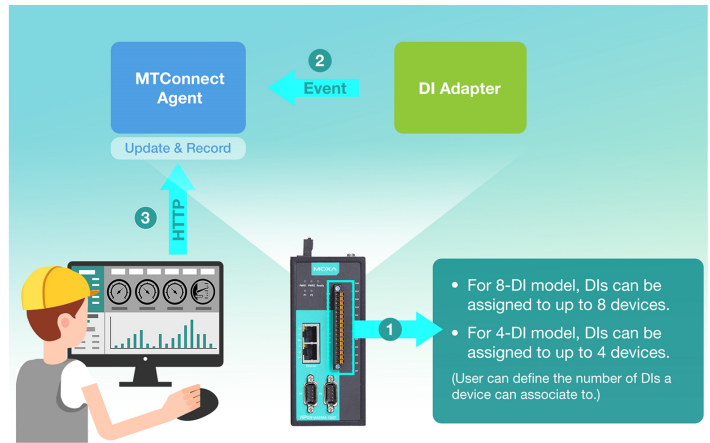
Cascading Ethernet Ports Make Wiring Easy

The NPort IA5000A-I/O device servers come with two Ethernet ports that can be used as Ethernet switch ports. One port connects directly to the network or server, and the other port can be connected to either another NPort IA device server or another Ethernet device. The dual Ethernet ports reduce wiring costs by eliminating the need to connect each device to a separate Ethernet switch.



Supports MTConnect Protocol for Monitoring Digital Inputs

MTConnect is designed specifically for shop-floor applications that aim to convert shop-floor data into a standard format that can be understood by any MTConnect-compliant software applications. Once the data has been defined by an MTConnect-compliant interface (name, type, description, etc.), it eliminates the need to redefine the data within each application. For those legacy machine tools that do not support MTConnect, the common practice is to get machine-related data through sensor connections and I/Os. Moxa NPort IA5000A-I/O supports MTConnect-enabled capability for all digital inputs on the device and provides a configurable interface for users to define what data and appropriate MTConnect tags need to be tied to the digital inputs.



Secure Remote Management and Configuration With SSH/HTTPS

Unauthorized access is one of the biggest headaches for system managers. In addition to IP filtering and password protection, the NPort IA5000A-I/O also supports SSH and HTTPS to provide protection from hackers. To transmit control messages securely, open the web console using a web browser that supports HTTPS (Internet Explorer, for example). You may also open the serial or Telnet console, such as PuTTY, using a terminal emulator that supports SSH.

Select Any Baudrate Between 50 bps and 921.6 kbps

Most device servers only support a fixed number of serial baudrates. However, some applications require special baudrates, such as 250 kbps or 500 kbps. With the NPort IA5000A-I/O, you can use any baudrate between 50 and 921.6 kbps. If your device's baudrate is not a standard baudrate, select "other" from the drop-down list and then enter the baudrate.

Specifications

Input/Output Interface

| | |
|-------------------------|---|
| Digital Input Channels | -6I/O models: 4 -12I/O models: 8 |
| Digital Output Channels | -6I/O models: 2 -12I/O models: 4 |
| Isolation | 3k VDC or 2k Vrms |
| Alarm Contact Channels | Relay output with current carrying capacity of 2 A @ 30 VDC |

Digital Inputs

| | |
|---------------------------------|---|
| Sensor Type | Dry contact Wet contact (NPN or PNP) |
| Dry Contact | On: short to GND Off: open |
| Wet Contact (DI to COM) | On: 10 to 30 VDC Off: 0 to 3 VDC |
| I/O Mode | DI or event counter |
| Counter Frequency | 20 Hz |
| Digital Filtering Time Interval | Software configurable |

Digital Outputs

| | |
|-------------------------|--------------------------|
| I/O Mode | DO or pulse output |
| I/O Type | Sink |
| Over-Current Protection | 2.6 A per channel @ 25°C |

| | |
|---------------------------------------|---|
| Over-Temperature Shutdown | 175°C (typical), 150°C (min.) |
| Over-Voltage Protection | 45 VDC |
| Ethernet Interface | |
| 10/100BaseT(X) Ports (RJ45 connector) | 2 Auto MDI/MDI-X connection |
| Magnetic Isolation Protection | 1.5 kV (built-in) |
| Ethernet Software Features | |
| Industrial Protocols | MQTT, MTConnect |
| Configuration Options | Web Console (HTTP/HTTPS), Windows Utility, Telnet Console, Serial Console |
| Management | DHCP Client, DNS, HTTP, IPv4, SMTP, SNMPv1/v2c/v3, TCP/IP, Telnet, UDP, ICMP |
| Windows Real COM Drivers | Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded |
| Linux Real TTY Drivers | Kernel versions: 2.4.x, 2.6.x, 3.x, 4.x, and 5.x |
| Fixed TTY Drivers | SCO UNIX, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X |
| Android API | Android 3.1.x and later |
| MIB | MIB-II |
| Serial Interface | |
| Connector | DB9 male |
| No. of Ports | NPort IA5150A models: 1 NPort IA5250A models: 2 |
| Serial Standards | RS-232, RS-422, RS-485 |
| Baudrate | 50 bps to 921.6 kbps |
| Data Bits | 5, 6, 7, 8 |
| Stop Bits | 1, 1.5, 2 |
| Parity | None, Even, Odd, Space, Mark |
| Flow Control | None, RTS/CTS, XON/XOFF |
| Pull High/Low Resistor for RS-485 | 1 kilo-ohm, 150 kilo-ohms |
| Terminator for RS-485 | 120 ohms |
| Surge | 4 kV |
| Serial Signals | |
| RS-232 | TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND |
| RS-422 | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-4w | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-2w | Data+, Data-, GND |

MQTT

| | |
|-----------------------|---|
| Mode | Alibaba IoT Platform Device, Azure IoT Hub Device, Publisher/Subscriber of MQTT |
| Version Supported | v3.1.1 |
| QoS Level | QoS 0, 1, 2 |
| Secure Transmission | TLS (1.0, 1.1, 1.2) encryption with user's root CA, Client certificate, Private key |
| MQTT General Features | Retain Message, Clean Session, Keep Alive, Last Will Message |

Memory

| | |
|--------------|---------------------------------|
| microSD Slot | Up to 32 GB (SD 2.0 compatible) |
|--------------|---------------------------------|

Power Parameters

| | |
|---------------|--------------------------|
| Connection | Removable terminal block |
| Input Current | 300 mA @ 12 VDC |
| Input Voltage | 12 to 48 VDC |

Reliability

| | |
|--------------------------|---|
| Automatic Reboot Trigger | Built-in WDT |
| Alert Tools | Built-in buzzer and RTC (real-time clock) |

Physical Characteristics

| | |
|--------------|---|
| Housing | Metal |
| Dimensions | 59.6 x 101.4 x 134 mm (2.35 x 4 x 5.28 in) |
| Weight | <p>Packaged:</p> <p>NPort IA5150A-6I/O: 910 g (2.01 lb) NPort IA5150A-12I/O: 920 g (2.03 lb) NPort IA5250A-6I/O: 920 g (2.03 lb) NPort IA5250A-12I/O: 930 g (2.05 lb)</p> <p>Product only:</p> <p>NPort IA5150A-6I/O: 740 g (1.63 lb) NPort IA5150A-12I/O: 750 g (1.65 lb) NPort IA5250A-6I/O: 750 g (1.65 lb) NPort IA5250A-12I/O: 760 g (1.68 lb)</p> |
| Installation | DIN-rail mounting, Wall mounting (with optional kit) |

Environmental Limits

| | |
|--|----------------------------|
| Operating Temperature | 0 to 55°C (32 to 131°F) |
| Storage Temperature (package included) | -40 to 75°C (-40 to 167°F) |
| Ambient Relative Humidity | 5 to 95% (non-condensing) |

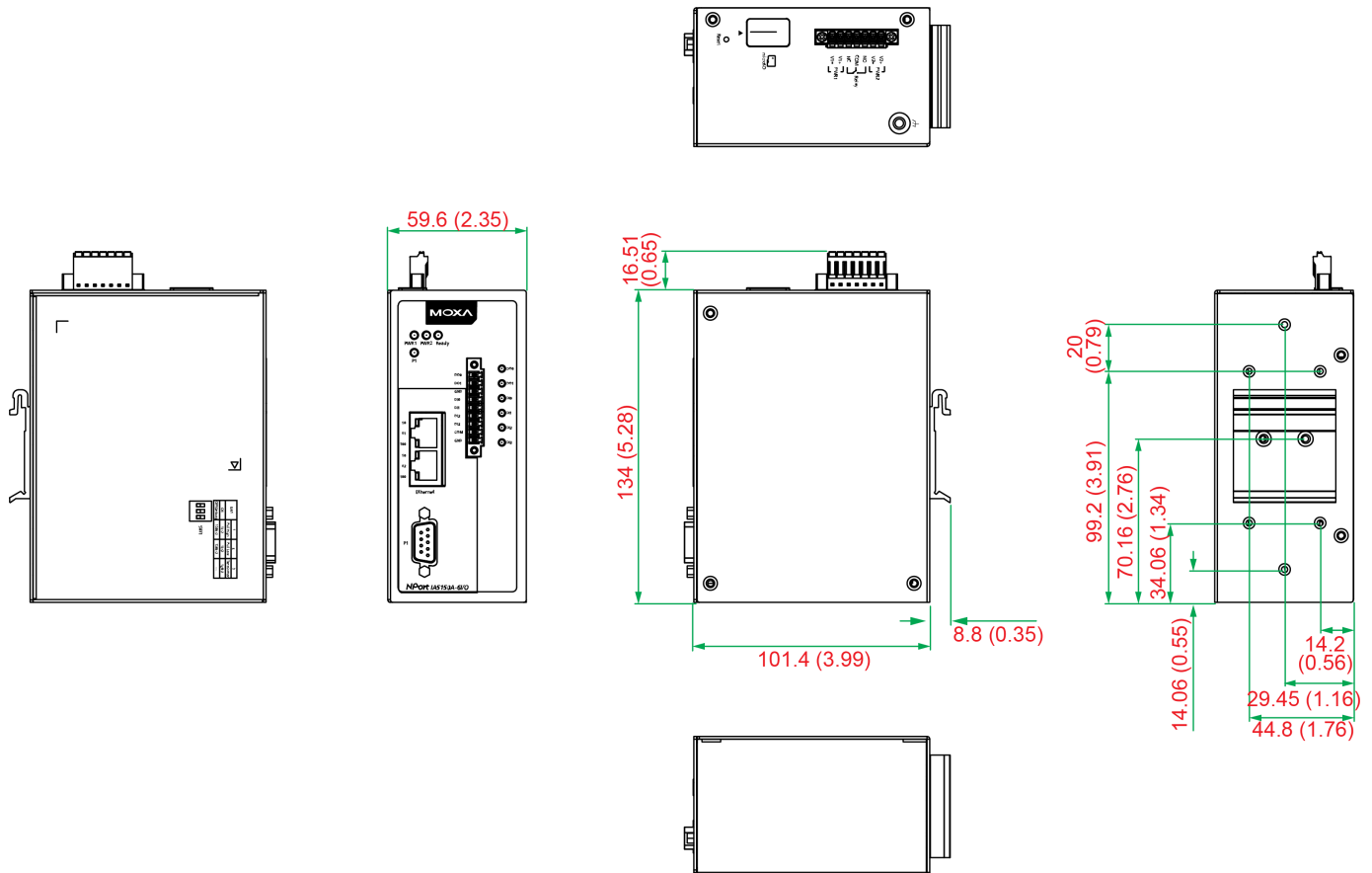
Standards and Certifications

| | |
|-----|--------------------------------|
| EMC | 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: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 1 kV; Signal: Ethernet: 2 kV, Serial: 4 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF |
| Safety | EN 60950-1, UL 60950-1 |
| Declaration | |
| Green Product | RoHS, CRoHS, WEEE |
| MTBF | |
| Time | NPort IA5150A-6I/O: 456,558 hrs NPort IA5150A-12I/O: 337,987 hrs NPort IA5250A-6I/O: 433,352 hrs NPort IA5250A-12I/O: 325,408 hrs |
| Standards | Telcordia (Bellcore) Standard TR/SR |
| Warranty | |
| Warranty Period | 5 years |
| Details | See www.moxa.com/warranty |
| Package Contents | |
| Device | 1 x NPort IA5000A-I/O Series device server |
| Documentation | 1 x quick installation guide 1 x warranty card |

Dimensions

Unit: mm (inch)



Ordering Information

| Model Name | No. of Serial Ports | No. of DIs | No. of DOs |
|---------------------|---------------------|------------|------------|
| NPort IA5150A-6I/O | 1 | 4 | 2 |
| NPort IA5250A-6I/O | 2 | 4 | 2 |
| NPort IA5150A-12I/O | 1 | 8 | 4 |
| NPort IA5250A-12I/O | 2 | 8 | 4 |

Accessories (sold separately)

Cables

| | |
|--------------|--|
| CBL-F9M9-150 | DB9 female to DB9 male serial cable, 1.5 m |
| CBL-F9M9-20 | DB9 female to DB9 male serial cable, 20 cm |

Connectors

| | |
|-----------------|--|
| ADP-RJ458P-DB9F | DB9 female to RJ45 connector |
| Mini DB9F-to-TB | DB9 female to terminal block connector |

Power Supplies

| | |
|-----------|---|
| DR-120-24 | 120W/2.5A DIN-rail 24 VDC power supply with universal 88 to 132 VAC or 176 to 264 VAC input by switch, or 248 to 370 VDC input, -10 to 60°C operating temperature |
| DR-4524 | 45W/2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC or 120 to 370 VDC input, -10 to 50°C operating temperature |

DR-75-24

75W/3.2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC or 120 to 370 VDC input, -10 to 60°C operating temperature

Wall-Mounting Kits

WK-51-01

Wall mounting kit with 2 plates (51.6 x 67 x 2 mm) and 6 screws

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NPort IAW5000A-I/O Series

1/2-port RS-232/422/485 IEEE 802.11a/b/g/n wireless device server with 6 or 12 digital I/Os



Features and Benefits

- Serial device server with 6 or 12 digital I/Os
- Links serial and Ethernet devices to an IEEE 802.11a/b/g/n network
- Connects serial/I/O data to the cloud through generic MQTT
- Supports MQTT connection with built-in device SDKs to Azure/Alibaba Cloud
- Supports MQTT connection with TLS and certificate in JSON and Raw data format
- microSD card for configuration backup/duplication and event logs, and data buffering when cloud connection is lost
- Supports repackaging the serial data size (up to 4K) to save the packet numbers that need to be sent to the cloud platform
- Supports redundant dual DC power inputs and 1 relay output
- Secure data access with WEP, WPA, WPA2
- Wireless Client function for flexible integration
- 4 kV serial surge protection

Certifications



Introduction

The NPort IA5000A-I/O serial device servers, which have built-in digital I/Os, provide maximum flexibility when you need to integrate serial equipment in the field with an Ethernet network or cloud platform. The cloud-ready device server can communicate with IIoT applications, using generic MQTT or third-party cloud services, such as Azure and Alibaba Cloud. The combination of digital I/Os makes the device servers well-suited for a variety of industrial data acquisition applications. The DI/Os on the device can be controlled over TCP/IP using the Modbus TCP protocol and can be configured and secured from a web browser. The device can also be installed as a COM Port (patented Real COM) on a Windows/Linux PC to make it compatible with legacy applications.

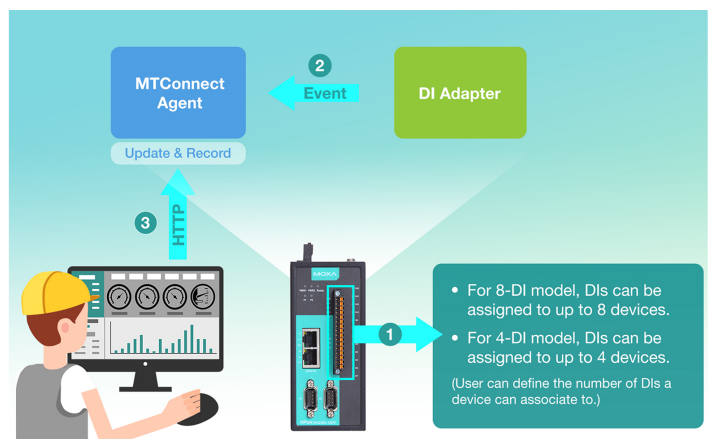
All models are ruggedly constructed, DIN-rail mountable, and designed with redundant power inputs to ensure uninterrupted operation for industrial applications.

Wireless Client

The device servers are equipped with one Ethernet port that allows data to be transferred seamlessly between the serial line, LAN, and WAN, allowing the LAN and WLAN interfaces to be bridged together using a single IP address.

Supports MTConnect Protocol for Monitoring Digital Inputs

MTConnect is designed specifically for shop-floor applications that aim to convert shop-floor data into a standard format that can be understood by any MTConnect-compliant software applications. Once the data has been defined by an MTConnect-compliant interface (name, type, description, etc.), it eliminates the need to redefine the data within each application. For those legacy machine tools that do not support MTConnect, the common practice is to get machine-related data through sensor connections and I/Os. Moxa NPort IAW5000A-I/O supports MTConnect-enabled capability for all digital inputs on the device and provides a configurable interface for users to define what data and appropriate MTConnect tags need to be tied to the digital inputs.



Secure Remote Management and Configuration with SSH/HTTPS

Unauthorized access is one of the biggest headaches for system managers. In addition to IP filtering and password protection, the NPort IAW5000A-I/O Series also supports SSH and HTTPS to provide protection from hackers. To transmit control messages securely, open the web console using a web browser that supports HTTPS (Internet Explorer, for example). You may also open the serial or Telnet console, such as PuTTY, using a terminal emulator that supports SSH.

Select Any Baudrate Between 50 bps and 921.6 kbps

Most device servers only support a fixed number of serial baudrates. However, some applications require special baudrates, such as 250 kbps or 500 kbps. With the NPort IAW5000A-I/O Series, you can use any baudrate between 50 and 921.6 kbps. If your device's baudrate is not a standard baudrate, select "other" from the drop-down list and then enter the baudrate.

Specifications

Input/Output Interface

| | |
|-------------------------|---|
| Digital Input Channels | 6I/O models: 4 12I/O models: 8 |
| Digital Output Channels | 6I/O models: 2 12I/O models: 4 |
| Isolation | 3k VDC or 2k Vrms |
| Alarm Contact Channels | Relay output with current carrying capacity of 2 A @ 30 VDC |

Digital Inputs

| | |
|---------------------------------|---|
| Sensor Type | Dry contact Wet contact (NPN or PNP) |
| Dry Contact | On: short to GND Off: open |
| Wet Contact (DI to COM) | On: 10 to 30 VDC Off: 0 to 3 VDC |
| I/O Mode | DI or event counter |
| Counter Frequency | 20 Hz |
| Digital Filtering Time Interval | Software configurable |

Digital Outputs

| | |
|---------------------------|-------------------------------|
| I/O Mode | DO or pulse output |
| I/O Type | Sink |
| Over-Current Protection | 2.6 A per channel @ 25°C |
| Over-Temperature Shutdown | 175°C (typical), 150°C (min.) |
| Over-Voltage Protection | 45 VDC |

Ethernet Interface

| | |
|---------------------------------------|--------------------------------|
| 10/100BaseT(X) Ports (RJ45 connector) | 1 Auto MDI/MDI-X connection |
| Magnetic Isolation Protection | 1.5 kV (built-in) |

Ethernet Software Features

| | |
|-----------------------|--|
| Industrial Protocols | MQTT, MTCConnect |
| Configuration Options | Web Console (HTTP/HTTPS), Windows Utility, Telnet Console, Serial Console |
| Management | DHCP Client, DNS, HTTP, IPv4, SMTP, SNMPv1/v2c/v3, TCP/IP, Telnet, UDP, ICMP |

| | |
|--------------------------|---|
| Windows Real COM Drivers | Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded |
| Linux Real TTY Drivers | Kernel versions: 2.4.x, 2.6.x, 3.x, 4.x, and 5.x |
| Fixed TTY Drivers | SCO UNIX, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X |
| Android API | Android 3.1.x and later |
| MIB | MIB-II |

MQTT

| | |
|-----------------------|---|
| Mode | Alibaba IoT Platform Device, Azure IoT Hub Device, Publisher/Subscriber of MQTT |
| Version Supported | v3.1.1 |
| QoS Level | QoS 0-2 |
| Secure Transmission | TLS (1.0, 1.1, 1.2) encryption with user's root CA, Client certificate, Private key |
| MQTT General Features | Clean Session, Keep Alive, Last Will Message, Retain Message |

Serial Interface

| | |
|-----------------------------------|--|
| Connector | DB9 male |
| No. of Ports | NPort IAW5150A Series: 1 NPort IAW5250A Series: 2 |
| Serial Standards | RS-232, RS-422, RS-485 |
| Baudrate | 50 bps to 921.6 kbps (supports non-standard baudrates) |
| Data Bits | 5, 6, 7, 8 |
| Stop Bits | 1, 1.5, 2 |
| Parity | None, Even, Odd, Space, Mark |
| Flow Control | None, RTS/CTS, XON/XOFF |
| Pull High/Low Resistor for RS-485 | 1 kilo-ohm, 150 kilo-ohms |
| Terminator for RS-485 | 120 ohms |
| Surge | 4 kV |

Serial Signals

| | |
|-----------|--|
| RS-232 | TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND |
| RS-422 | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-4w | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-2w | Data+, Data-, GND |

WLAN Interface

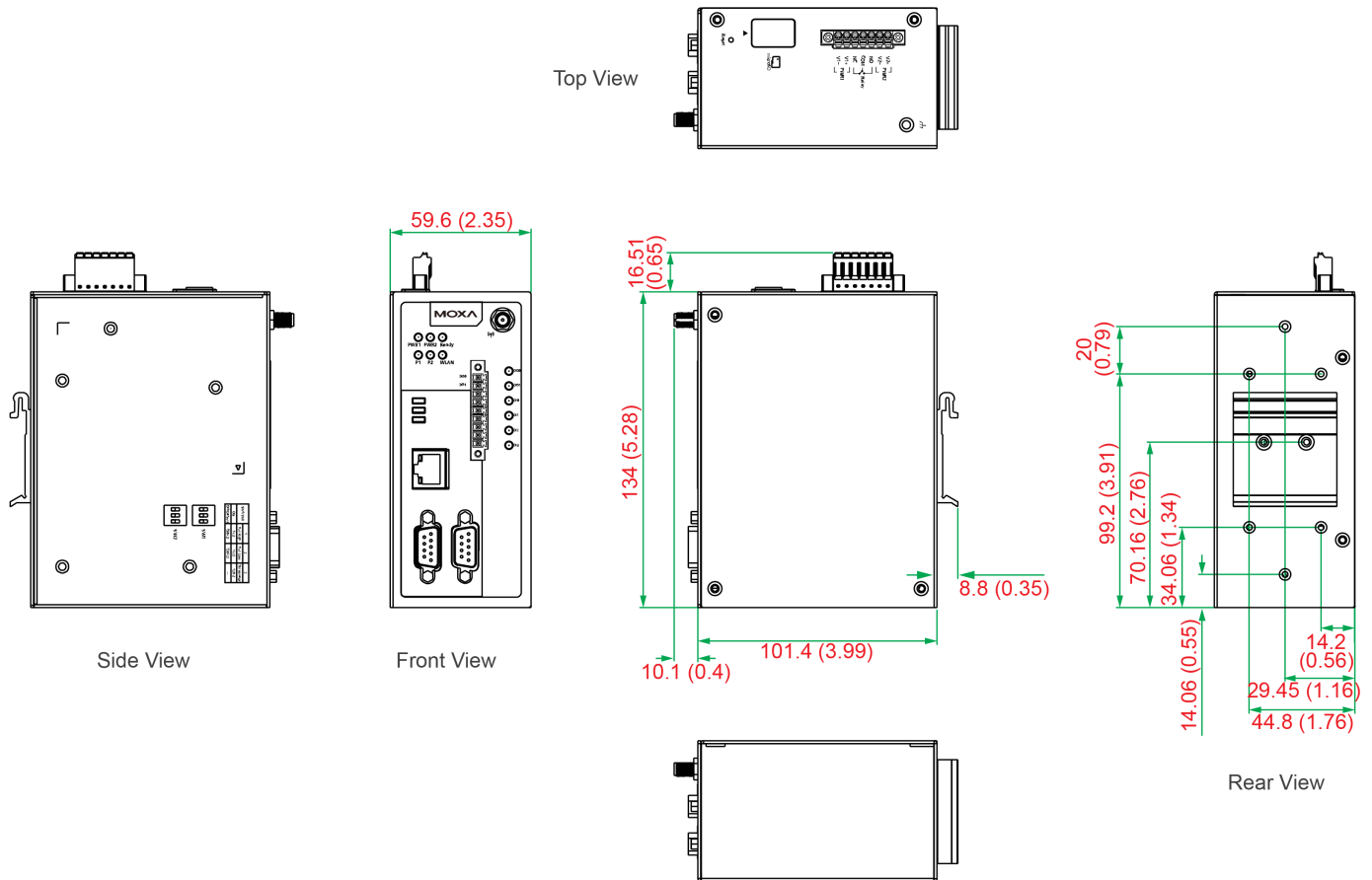
| | |
|--|---|
| WLAN Standards | 802.11a/b/g/n |
| Receiver Sensitivity for 802.11a (measured at 5.680 GHz) | Typ. -91 @ 6 Mbps Typ. -74 @ 54 Mbps |
| Receiver Sensitivity for 802.11b (measured at 2.437 GHz) | Typ. -92 dBm @ 1 Mbps Typ. -84 dBm @ 11 Mbps |

| | |
|---|--|
| Receiver Sensitivity for 802.11g (measured at 2.437 GHz) | Typ. -91 dBm @ 6 Mbps Typ. -73 dBm @ 54 Mbps |
| Receiver Sensitivity for 802.11n (2.4 GHz; measured at 2.437 GHz) | Typ. -89 dBm @ 6.5 Mbps (20 MHz) Typ. -71 dBm @ 72.2 Mbps (20 MHz) |
| Receiver Sensitivity for 802.11n (5 GHz; measured at 5.680 GHz) | Typ. -89 dBm @ 6.5 Mbps (20 MHz) Typ. -71 dBm @ 72.2 Mbps (20 MHz) Typ. -85 dBm @ 13.5 Mbps (40 MHz) Typ. -67 dBm @ 150 Mbps (40 MHz) |
| Spread Spectrum | DSSS, OFDM |
| Transmission Distance | Up to 100 meters (in open areas) |
| Transmission Rate | 802.11a/g: 54 Mbps 802.11b: 11 Mbps 802.11n: 6.5 to 150 Mbps |
| Transmitter Power for 802.11b | 16±1.5 dBm @ 1 Mbps 16±1.5 dBm @ 11 Mbps |
| Transmitter Power for 802.11g | 16±1.5 dBm @ 6 Mbps 14±1.5 dBm @ 54 Mbps |
| Transmitter Power for 802.11a | 15±1.5 dBm @ 6 Mbps 14±1.5 dBm @ 54 Mbps |
| Transmitter Power for 802.11n (2.4 GHz) | 16 dBm @ 1.5 Mbps (6.5 MHz) 12 dBm @ 1.5 Mbps (72.2 MHz) |
| Transmitter Power for 802.11n (5 GHz) | 15 dBm @ 1.5 Mbps (6.5 MHz) 12 dBm @ 1.5 Mbps (150 MHz) |
| Wireless Security | WEP encryption (64-bit and 128-bit) WPA/WPA2-Enterprise (IEEE 802.1X/RADIUS, TKIP, AES) WPA/WPA2-Personal |
| WLAN Modes | Ad-hoc Mode, Infrastructure mode |
| Antenna Characteristics | |
| Antenna Connectors | QMA |
| Antenna Type | Omni-directional |
| Memory | |
| microSD Slot | Up to 32 GB (SD 2.0 compatible) |
| Power Parameters | |
| Connection | Removable terminal block |
| Input Voltage | 12 to 48 VDC |
| Input Current | 300 mA @ 12 VDC |
| Reliability | |
| Automatic Reboot Trigger | Built-in WDT |
| Alert Tools | Built-in buzzer and RTC (real-time clock) |
| Physical Characteristics | |
| Housing | Metal |
| Dimensions | 59.6 x 101.7 x 134 mm (2.35 x 4 x 5.28 in) |

| | |
|---|--|
| Weight | Packaged: NPort IAW5150A-6I/O: 940 g (2.07lb) NPort IAW5250A-6I/O: 960 g (2.12lb) NPort IAW5150A-12I/O: 960 g (2.12lb) NPort IAW5250A-12I/O: 980 g (2.16lb) Product only: NPort IAW5150A-6I/O: 740 g (1.63lb) NPort IAW5250A-6I/O: 760 g (1.68lb) NPort IAW5150A-12I/O: 760 g (1.68lb) NPort IAW5250A-12I/O: 780 g (1.72lb) |
| Installation | Wall mounting (with optional kit), DIN-rail mounting |
| Environmental Limits | |
| Operating Temperature | 0 to 55°C (32 to 131°F) |
| Storage Temperature (package included) | -40 to 75°C (-40 to 167°F) |
| Ambient Relative Humidity | 5 to 95% (non-condensing) |
| Standards and Certifications | |
| EMC | 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: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 1 kV; Signal: Ethernet: 2 kV, Serial: 4 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF |
| Radio Frequency | EN 300 328, EN 301 893 |
| Safety | EN 60950-1, UL 60950-1 |
| Declaration | |
| Green Product | RoHS, CRoHS, WEEE |
| MTBF | |
| Time | NPort IAW5150A-6I/O: 282,087 hrs NPort IAW5150A-12I/O: 277,975 hrs NPort IAW5250A-6I/O: 237,037 hrs NPort IAW5250A-12I/O: 234,130 hrs |
| Standards | Telcordia (Bellcore) Standard TR/SR |
| Warranty | |
| Warranty Period | 5 years |
| Details | See www.moxa.com/warranty |
| Package Contents | |
| Device | 1 x NPort IAW5000A-I/O Series device server |
| Antenna | 1 x 2.4/5 GHz antenna |
| Documentation | 1 x quick installation guide 1 x warranty card |

Dimensions

Unit: mm (inch)



Ordering Information

| Model Name | No. of Serial Ports | No. of DIs | No. of DOs | Wi-Fi Standards |
|----------------------|---------------------|------------|------------|-----------------|
| NPort IAW5150A-6I/O | 1 | 4 | 2 | 802.11a/b/g/n |
| NPort IAW5250A-6I/O | 2 | 4 | 2 | 802.11a/b/g/n |
| NPort IAW5150A-12I/O | 1 | 8 | 4 | 802.11a/b/g/n |
| NPort IAW5250A-12I/O | 2 | 8 | 4 | 802.11a/b/g/n |

Accessories (sold separately)

Antennas

| | |
|----------------|---|
| ANT-WDB-ARM-02 | 2.4/5 GHz, omni-directional rubber duck antenna, 2 dBi, RP-SMA (male) |
|----------------|---|

Cables

| | |
|--------------|--|
| CBL-F9M9-150 | DB9 female to DB9 male serial cable, 1.5 m |
| CBL-F9M9-20 | DB9 female to DB9 male serial cable, 20 cm |

Connectors

| | |
|-----------------|--|
| Mini DB9F-to-TB | DB9 female to terminal block connector |
| ADP-RJ458P-DB9F | DB9 female to RJ45 connector |

Power Supplies

| | |
|-----------|---|
| DR-120-24 | 120W/2.5A DIN-rail 24 VDC power supply with universal 88 to 132 VAC or 176 to 264 VAC input by switch, or 248 to 370 VDC input, -10 to 60°C operating temperature |
| DR-4524 | 45W/2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC or 120 to 370 VDC input, -10 to 50° C operating temperature |
| DR-75-24 | 75W/3.2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC or 120 to 370 VDC input, -10 to 60°C operating temperature |

Wall-Mounting Kits

| | |
|----------|---|
| WK-51-01 | Wall mounting kit with 2 plates (51.6 x 67 x 2 mm) and 6 screws |
|----------|---|

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