Master Catalog

2016-2017

Enabling Connectivity for the Industrial Internet of Things

• Edge Connectivity • Industrial Computing • Network Infrastructure

MOXA®

Reliable Networks ▲ Sincere Service

Moxa: Your Trusted Partner in Automation

As the Industrial Internet of Things (IoT) interconnects our world faster than ever, we rely more than ever on network infrastructures. Since its establishment in 1987, Moxa has had a proven track record of providing customers with the most reliable networks for a variety of industrial applications.

With over 25 years of industry experience, Moxa has connected more than 40 million devices worldwide. These devices have delivered highly reliable communications between people, systems, and processes to achieve all forms of automation and collaboration.

Promise for the Future

Reliable Networks, Sincere Service continues to be Moxa's promise to enable connectivity for the Industrial IoT. Moxa stays ahead of the curve with innovative Ethernet-core technology and solutions to help customers tap into the potential of the Industrial IoT market.

Reliable Networks

Network reliability is the cornerstone of Moxa's commitment to deliver the best value to our customers and partners. Moxa's many solutions share a common set of robust features designed to provide maximum network uptime, especially in harsh environments. Our cutting-edge product portfolio comprises quality and innovative technology to ensure nonstop productivity, operational efficiency, and robust security for complex industrial communications and automation applications.

Sincere Service

At Moxa, we listen carefully to learn more about our customers' expectations and needs before we develop a solution. With extensive experience and innovative technology, we provide premium customization, expert network consulting, and a broad range of technical support services. Through close collaboration with our worldwide partners, we help customers optimize their applications' performance, adapt to fast-changing technologies, and seize opportunities to achieve the best time-to-market results.

Product Offerings

Edge Connectivity

Moxa's edge connectivity products bridge various industrial devices to streamline the acquisition and transmission of data, voice, and video to backbone networks. Customers can enjoy seamless network integration for various cross-system collaborations.

- Serial connectivity
- Industrial Ethernet gateways
- RTU controllers and smart I/O devices
- Industrial IP cameras and video management software

Industrial Computing

Moxa provides RISC- and x86-based industrial computers to work in the most demanding conditions. The world's first wide-temperature-range 4G LTE computer is a perfect example of a device that delivers reliable 4G performance without requiring a fan or a heater.

- Mission-critical computers
- Displays and panel computers
- Compact and wireless computers
- Embedded CPU modules

Network Infrastructure

Moxa's network infrastructure solutions provide comprehensive building blocks to develop robust wired and wireless backbones for mission-critical applications with regard to device reliability, connection availability, cybersecurity, and easy management.

- Industrial Ethernet switches
- Industrial wireless AP/bridge/client and cellular routers
- Industrial secure routers
- Ethernet media converters
- Network management software

Get Connected to Success and Opportunity

Worldwide, Moxa's expert sales team is ready to provide the best quality, support, and services to assist you in all aspects of your projects—from concept to completion—to empower your network operations and applications.

Global Service Coverage

Customer-Oriented Service

Moxa has established a global service network to be closer to our customers to better understand their needs and respond faster to their requirements. Leveraging Moxa's industrial experiences and technological intelligence, our service team provides professional solutions and consulting services, backed by our extensive global resources and solution capabilities.

Extended Teamwork

Through our annual MTSC (Moxa Technical Support Certification) training, Moxa provides the most up-to-date solutions and technologies to our global partners to ensure the best service to customers. Integrating the strengths of our worldwide industry and technology partners, we deliver sincere service and an extended range of innovative solutions to customers.

Total Quality Management

Our commitment to quality is at the heart of Moxa's promise of *Reliable Networks, Sincere Service.* Moxa employs a corporate-wide Total Quality Management System (TQMS) to achieve customer satisfaction and unbeatable results in the following categories:

Robust Technology

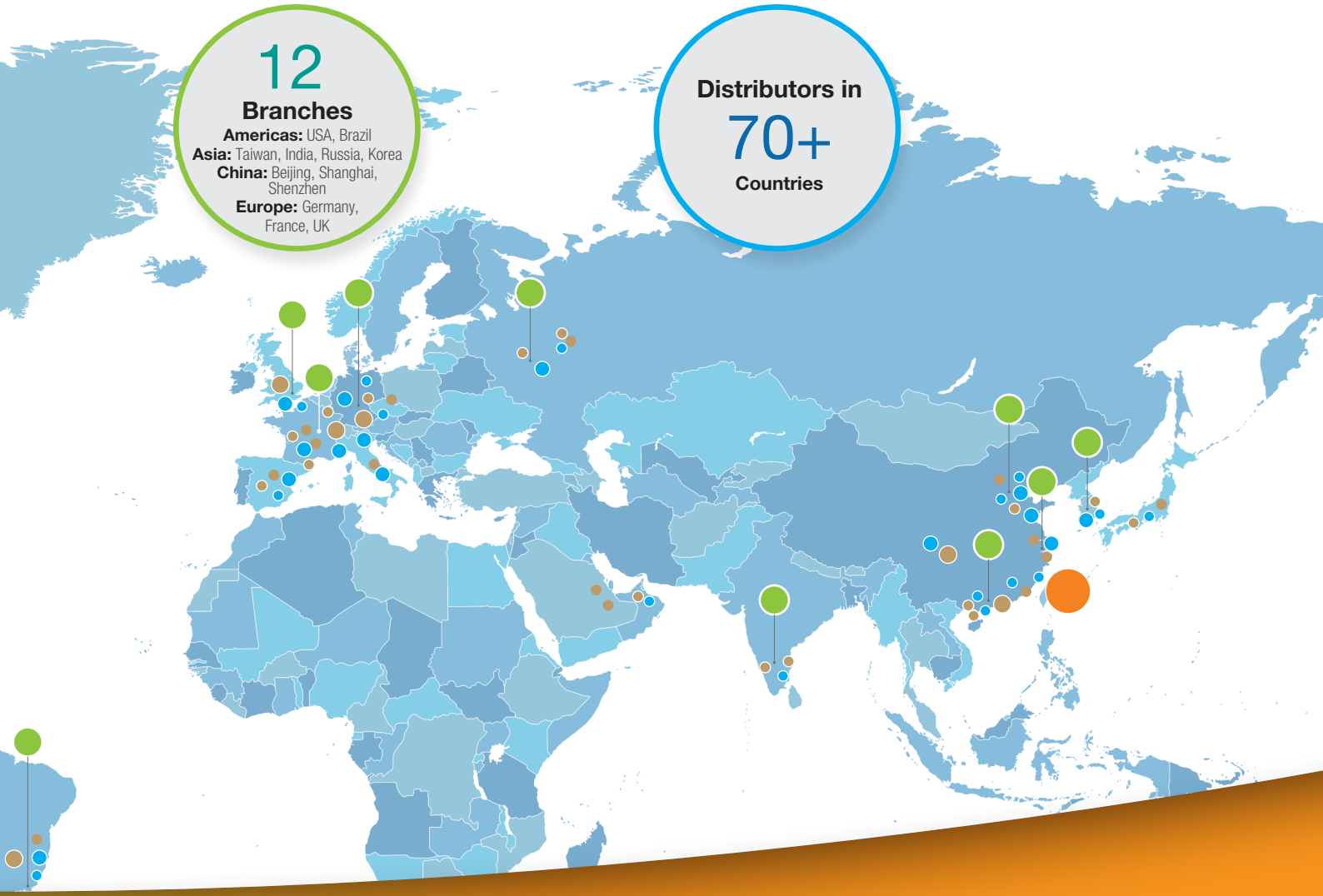
At Moxa, quality starts with concepts that benefit our partners and customers. Moxa attracts a broad spectrum of talent and encourages new ideas to nurture innovation at every level. Following the well-defined New Product Development Process (NPDP), all of Moxa's products must undergo strict tests, verifications, and validations to achieve tangible quality-related benchmarks for various industrial applications.

Project Life-Cycle Management

Moxa is IRIS-certified and implements a rigorous management process to ensure quality and optimal results for long-term projects. Specific RAMS and LCC management guidelines guarantee reliability, longevity, low life-cycle costs, and easy maintenance throughout a project's lifetime.

Continuous Improvement

Moxa motivates each employee to work smarter and find ways for continuous improvement. Our Quality Improvement Team (QIT) and Eight Disciplines Problem-Solving (8D) methodology for solving problems and preventing crises promote continuous progress in the quality of our products, service, and technology, to ensure customer satisfaction.



Technological Innovation

Moxa cultivates continuous technological innovation to meet the constantly changing requirements of industrial environments. To enable the most capable and reliable connectivity required for the Industrial IoT, Moxa strives to achieve application-driven innovations in the following aspects.

■ Performance
High-speed wired/wireless connectivity for future-proof networks

■ Reliability
Proven reliability for continuous productivity

■ Availability
Millisecond-level redundancy for nonstop operations

■ Security
Industrial cybersecurity for critical device protection and secure remote access

■ Manageability
Easy operations in deployment, monitoring, and diagnostics maintenance

■ Interoperability
Leading legacy and versatile fieldbus technologies for seamless automation communication

Industrial Ethernet

Industrial Wireless

Device Connectivity

Remote Automation

IP Surveillance

Industrial Computing

Enabling Connectivity for the Industrial Internet of Things

Moxa's industrial network and automation solutions are ready to take connectivity to new frontiers. With a forecast of more than 50 billion devices connected worldwide by 2020, Moxa focuses on connectivity enablement to expand communication and collaboration between various devices, technologies, and people.

Edge Connectivity

Serial/Fieldbus Connectivity

Serial or fieldbus connectivity bridges legacy, fieldbus, and Ethernet devices to reap the benefits of legacy-to-IP communications and operational efficiency.

I/O Connectivity

Industrial I/Os and controllers enable faster data transfer and SCADA response, as well as programming-free logic control.

Video Connectivity

Extreme weather IP cameras activate 360-degree HD surveillance for extreme applications.

Smart Value for Your Applications

Through our fully converged communication solutions, Moxa helps customers build remote control and monitoring networks suited for highly automated industrial operations and demanding public-safety applications.

Powering Productivity

Our cutting-edge product portfolio delivers superior performance thanks to high bandwidth, reliability, availability, and interoperability in mixed-protocol and legacy environments.

- High-speed transmission
- Maximum uptime and availability
- Video always-on networking
- Reliable mobile communications
- Industry-proven reliability
- Legacy compatibility
- Protocol interoperability

Optimizing Operational Efficiency

Moxa's extensive software solutions are the key to operational efficiency, including intuitive management software for operations that are faster and less error-prone, as well as an API platform for faster development and ease-of-use.

- Faster deployment
- Visualized management
- Easier troubleshooting
- Preventive maintenance
- APIs for easy application deployment
- Seamless integration with SCADA systems

Strengthening Security

A convergence of cybersecurity and physical security systems forge a reinforced network to ensure the full protection of control systems and staff safety in industrial applications.

- Device security with authentication, integrity, and firewall protection
- Secure remote access with IPSec, L2TP, or OpenVPN encryption
- IEC 62443 standard compliance *(Available in Q4, 2016)*
- Industrial-grade IP surveillance systems

Factory Automation

Moxa's factory automation solutions are designed to drive productivity and cost reduction through network convergence from the edge to the core. The solutions deliver optimized process integration and automation-friendly management to improve throughput and performance.

Industrial Computing

Industrial Computers

Embedded computers enable seamless data aggregation, analytics, and reporting from the extreme edge to the cloud/core.

Network Infrastructure

Industrial Ethernet

Industrial Wireless

Industrial Ethernet and WLAN solutions offer leading performance, availability, and reliability to achieve maximum uptime and efficiency for wired and wireless connectivity.

Industrial Routers

Industrial secure and cellular routers enable asset protection and secure access across public networks.

Management

IA-friendly device management and network management address easy deployment, supervision, troubleshooting, and seamless collaboration with SCADA and third-party platforms.

Railway Automation

Moxa's IRIS-certified railway solutions come with the top-notch service, quality, and commitment that industrial customers demand. Moxa's railway solutions deliver EN 50155-compliant control and communications between train, ground, and trackside to ensure safety and uninterrupted passenger services.

Power Automation

Moxa has delivered solutions in more than 300 successful substation networking and computing applications. Moxa's solutions ensure GOOSE compliance and zero-packet-loss performance in compliance with IEC 61850-3 and IEEE 1613 standards.

Oil and Gas Automation

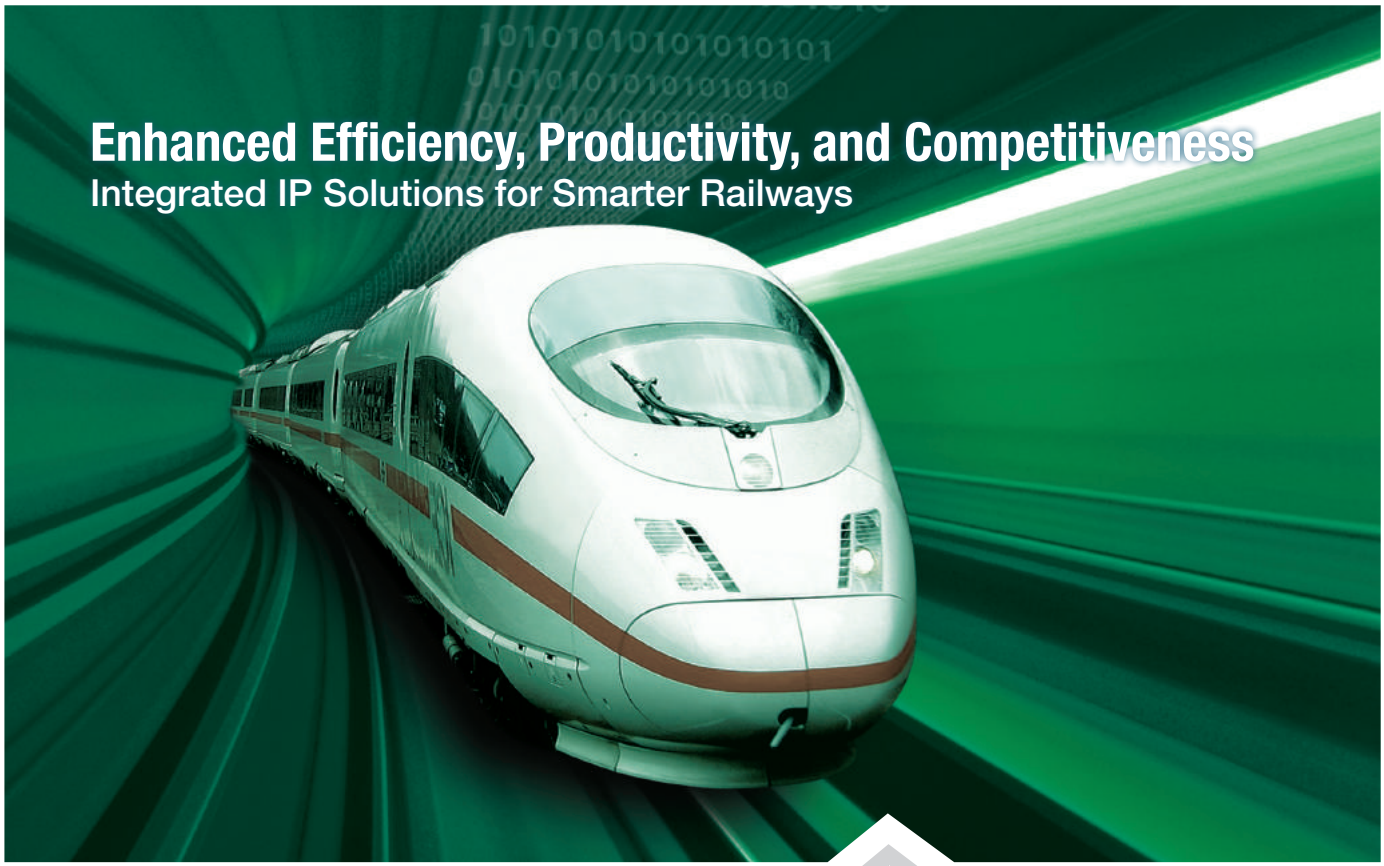
Moxa's oil and gas automation solutions comply with UL Class 1 Division 2, ATEX Zone 2, and IECEx standards, allowing customers to achieve maximum uptime and improved productivity with our oil and gas networking, monitoring, and computing solution portfolio.

Marine Automation

Moxa's marine solutions, compliant with all major maritime certifications, offer a wide range of marine-grade industrial Ethernet and computer products that ensure long-lasting and reliable operations in the challenging environments experienced by ship, offshore oil and gas, and windmill applications.

Intelligent Transportation Systems

Moxa's ITS solutions combine high-bandwidth networks and HD IP video solutions to ensure fast information convergence and nonstop operational continuity, allowing traffic control managers to make decisions quickly in the event of road traffic emergencies.



IRIS-Certified Rail Solutions Verified for Maximum Quality

Moxa is an IRIS-certified global leader in a wide range of IP-based communications solutions. Now, Moxa is contributing its networking expertise to the railway industry through membership in IEC railway committees. Railway operators world-wide have discovered new operational efficiencies by deploying Moxa's unique time and cost-saving railway technologies. By designing for a long MTBF, owning all the core component IPs, and building long-term partnerships, Moxa helps railway integrators create sustainable solutions with low life-cycle costs for passenger comfort and railway operation networks.

Application Focus

- Passenger-oriented service (e.g., onboard Wi-Fi, passenger information systems)
- Railway CCTV
- CBTC (Communication-Based Train Control)
- Wayside data communications systems

Leading Technologies

- Turbo Ring and Turbo Chain: Advanced Ethernet redundancy solutions
- Turbo Roaming: Fast and secure train-to-ground wireless communications
- ACC: Intelligent wireless inter-carriage links
- FLI: Flexible, location-based, intelligent industrial-grade auto-configuration technology

IRIS Certification

Visit www.moxa.com/rail

ACC Auto Carriage Connection · FLI Industrial Auto Configuration · EN 50155 · EN 50121

ToughNet, EDS Series
Industrial Ethernet Switches
▶Page 1-12

TAP, AWK-RCC/RTG Series
Industrial Wireless AP/Bridge/Client
▶Page 8-4

NPort 5000AI-M12 Series
RS-232/422/485 Serial Device Servers
▶Page 10-18

TC-6000, V2000 Series
Industrial Embedded Computers
▶Page 22-4/22-11

VPort Series
Industrial IP Cameras
▶Page 19-19

ioPAC Series
Industrial RTU Controllers
▶Page 15-4

ioLogik E1500 Series
Remote I/Os
▶Page 17-17

Connect to the Smart Grid Today

End-to-End Networking and Computing Solutions for the Power Industry

Many Successful Deployments in Power Projects Worldwide

Create rock-solid and future-proof power networks by partnering with Moxa. Moxa is a Collective Member of CIGRE and has delivered solutions in over 500 successful substation transmission and distribution networking and computing applications around the world. Moxa is now the leading solar energy monitoring supplier in North America with many diverse projects in advanced metering infrastructures worldwide. You can rely on our expertise of more than 25 years in proven solutions in the following industry applications.

Application Focus

- Solar power
- Wind power
- IEC 61850 transmission and distribution substation
- Advanced metering infrastructure

Leading Technologies

- Industry's first IEC 61850 switch with MMS data modeling: SNMP/MMS management with integrated network monitoring solutions for power substation SCADA
- Industry's first integrated PRP/HSR redundancy box for zero recovery time
- Turbo Chain: Different redundant networks can be extended without any ring coupling effort
- Patented computing platform for heat dissipation with wide temperature tolerance
- ThingsPro: Asset management for solar energy monitoring

Visit www.moxa.com/SmartGrid

Turbo Chain | PRP HSR | IEC 61850 IEEE 1613 | ThingsPro

PT-7528 Series
IEC 61850 28-port IEEE 1613 Class 2 Managed Ethernet Switches
▶Page 2-44

PT-7728-PTP Series
IEC 61850 14-port IEEE 1588v2 Managed PRP/HSR Switches
▶Page 2-40

PT-G503-PHR-PTP Series
IEC 61850 3-port Full Gigabit Managed PRP/HSR Redundancy Boxes
▶Page 2-63

DA-820 Series
x86 IEC 61850-3 Certified i7 Rackmount Computers
▶Page 21-4

NPort S8000 Series
Combo Switches / Serial Device Servers
▶Page 10-14

UC-8100 Series
RISC Energy Monitoring Computers
▶Page 21-36

ioLogik E1200 Series
Compact Ethernet Remote I/O
▶Page 17-6

DCU-8620-T Series
Data Concentration Units
▶Available by request

Proven Solutions for the Harshest Oil & Gas Environments

Integrated Networking, Monitoring, and Computing Systems

Your Trusted Partner in Oil & Gas Automation

Moxa is a leading provider of industrial automation solutions and has proven experience in providing networking equipment and service suitable for the harshest oil & gas environments. Moxa's industrial-grade products and well respected technology enable efficient remote monitoring and easy asset management, delivering business value to customers all over the world. To assure the highest level of safety, the computing, networking, and automation products Moxa develops especially for use in oil & gas facilities meet important global certifications, including ATEX Zone 2, Class 1 Division 2, and IECEx.

Application Focus

- Offshore oil drilling control systems
- Onshore drilling / wellhead monitoring
- Pump stations and pipeline monitoring
- Oil refining and gas station operations

Leading Technologies

- Turbo Ring and Turbo Chain: Unrivaled network redundancy solutions with 20 ms recovery
- Dual-Radio and Turbo Roaming: Zero packet loss and millisecond-level wireless roaming
- ISA99/IEC 62443 compliant for industrial security: Layered cybersecurity solution with innovative PacketGuard™ for Modbus TCP deep packet inspection
- World-leading panel computer design: 1000-nit LCD, glove-friendly multi-touch, system bootup within 3 minutes, -40 to 70°C operating temperature without heater
- MXview, MXview ToGo, QuickLink, MX-AOPC UA Server: Efficient network management by smart visualization, automated configuration, and seamless integration with SCADA systems

Visit www.moxa.com/Solutions/Oil_and_gas

EDS/IKS/ICS Series

Edge-to-Core Ethernet Switches

▶Page 1-12

EDR Series

VPN/Firewall Secure Routers

▶Page 5-2

AWK Series

IEEE 802.11a/b/g/n Wireless AP/Bridge/Client

▶Page 6-6

MGate and NPort Series

Industrial Gateways and Device Servers

▶Page 4-5; 10-43

ICF Series

Industrial Serial/PROFIBUS-to Fiber Converters

▶Page 14-32

ioLogik 2500 Series and ioLogik E1200 Series

Smart Remote I/O and Ethernet Remote I/O

▶Page 16-4; 17-6

VPort Series

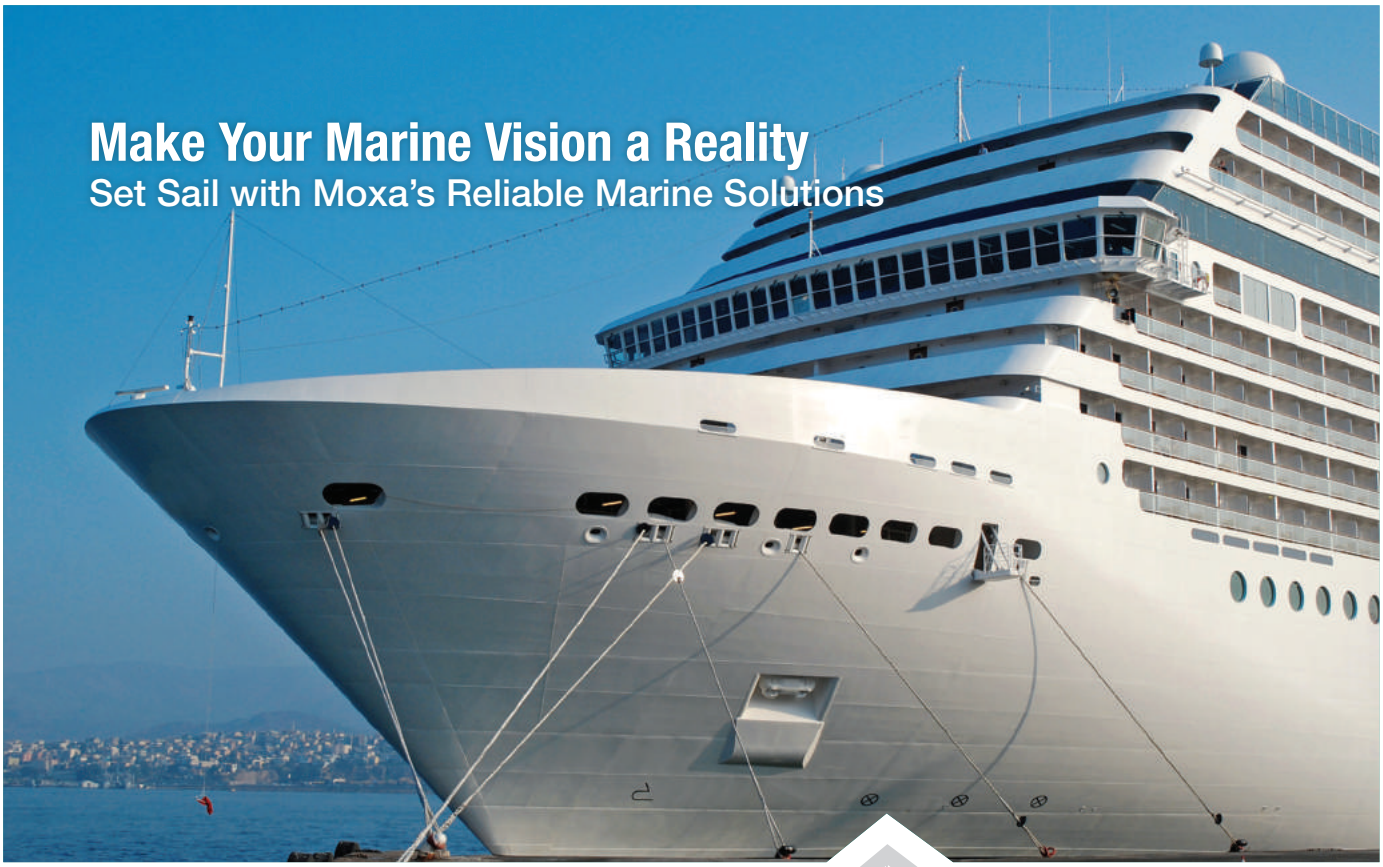
HD IP Cameras

▶Page 19-14

EXPC-1519 Series

Zone 2 Panel Computers

▶Page 25-12



Make Your Marine Vision a Reality

Set Sail with Moxa's Reliable Marine Solutions

Successful Deployment of Integrated Marine Bridge Solutions Worldwide

Moxa provides maritime professionals with industrial-grade marine computers, panel PCs, displays, and Ethernet switches that use leading technologies and reliable designs perfect for applications on docks, marine bridges, open decks, and in control rooms.

Moxa's marine solutions pass strict tests and follow critical industrial standards to ensure compliance with international marine standards, including DNV, ABS, GL, LR, IEC 60945, IEC 61174, IEC 61162, and IACS E10, making Moxa's marine solutions the best option for marine applications.

Application Focus

- Electronic Chart Display and Information System (ECDIS)
- Radar System
- Integrated Navigation System (INS)
- Integrated Platform Management System (IPMS)

Leading Technologies

- Advanced ECDIS color calibration technology: more consistent color rendering for a longer period of use
- Customer initiated smart OSD design: Off-Screen-Display control allows users to easily control the monitor in low light environments
- High performance computing power in a fanless design enhances computers' reliability and reduces customers' maintenance costs

Visit www.moxa.com/marine

MPC-2150/2190/2240/2260 Series
Marine Panel Computers
▶Page 24-9

MD-219/224/226 Series
Marine Displays
▶Page 24-3

MC-7200 Series
Marine ECDIS Computers
▶Page 23-3

MGate 5101-PBM-MN Series
PROFIBUS-to-Modbus TCP Gateways
▶Page 4-18

ioLogik E1200H Series
Ethernet Remote I/O
▶Page 17-13

EDS-408A Series
Managed Ethernet Switches
▶Page 1-46

Your Trusted Partner for Factory Automation

To help manufacturers maximize the benefits of integrating network and automation technology, Moxa has focused on the factory automation market for over 26 years. Moxa provides leading solutions for industrial communications, including wired and wireless infrastructures, industrial computing, remote monitoring, and video surveillance.

Application Focus

- SCADA
- Control system networks
- Wireless infrastructures and machine-to-machine communication
- Packaging equipment
- Cybersecurity
- Industrial video surveillance
- Material handling

Main Benefits

Reliability

- Industry leading communication redundancy for < 20 ms recovery time
- Unique thermal design that supports fanless wide temperature operation (-40 to 75°C)
- High level EMI/EMC shielding
- Redundant power supply with isolation protection
- Continual improvement of total quality management
- ISO 9001 quality management standard recognized

Ease of Integration

- User-friendly network and device management software
- Serial, Ethernet, I/O, and wireless solutions integrated into a single network
- Quick mass configuration tool for 90% time savings (with up to 100 switches)
- OPC server for cost-effective SCADA integration

Global Support

- Access to products and support in over 70 countries
- Customization service

VPort Series
Industrial IP Cameras
▶Page 19-1

EDS Series
Industrial Ethernet Switches
▶Page 1-27

MGate Series
Industrial Ethernet Gateways
▶Page 4-1

NPort Series
Serial-to-Ethernet Device Servers
▶Page 10-1

ioLogik 2500-WL1 Series
Smart Wireless I/O
▶Page 16-4

EDR-810 Series
Industrial 8+2G Multiport Secure Routers
▶Page 5-7

AWK-A Series
Industrial Wireless AP/Bridge/Client
▶Page 6-6

Integrated Network Solutions for Intelligent Transportation

Real-Time Convergence for Non-Stop Safety

Today more than ever before, roadway safety and efficiency depend on real-time information and communication. To increase traffic flow, reduce congestion, and improve incident response times, Moxa's industrial Ethernet solutions facilitate real-time convergence of various sensor data, voice, and video by providing high-speed throughputs and a wide range of network devices. All of these devices emphasize extreme reliability, smart redundancy, easy manageability, and a lower total cost of ownership.

Application Focus

- Advanced Transportation Management Systems
- Tunnels
- Intelligent E-Bus
- Electronic Toll Collection (ETC)

Leading Technologies

High Bandwidth

- 1GbE/10GbE switching and routing
- Up to 500 Mbps router throughput
- Up to 300 Mbps wireless transmission
- Up to 150 Mbps VPN traffic

Extreme Reliability

- Turbo Ring and Turbo Chain self-recovery (< 20 ms @ 250 switches)
- V-ON network redundancy under 50 ms for mission-critical IP surveillance
- Turbo Roaming with millisecond-level handoff times for seamless mobility

Efficient Management

- MXstudio network management suite for installation, operation, maintenance, and diagnostics
- OnCell Central Manager for remote cellular device management
- IP surveillance software solutions for easy SCADA surveillance

Visit www.moxa.com/ITS

ICS Series
Industrial 10GbE Ethernet Switches
▶Page 1-12

AWK-A Series
Industrial 802.11n AP/Bridge/Client
▶Page 6-6

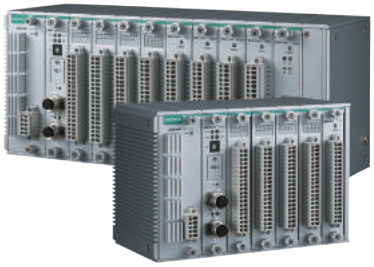
EDS-G512E-8PoE
8-port PoE+ Full Gigabit Managed Switch
▶Page 1-64

VPort Series
Industrial HD IP Cameras
▶Page 19-7

IEX-408E-2VDSL2 Series
Copper Extender Switches
▶Page 3-26

NPort IA5000A Series
2-Port Industrial Serial Device Servers
▶Page 10-43

MXstudio
Industrial Network Management Suite
▶Page 5-11



Programmable RTU Controllers

15

Programmable RTU Controllers

Modular and Compact RTU Controllers

Preliminary




	ioPAC 8600 series	ioPAC 8500 Series	ioPAC 8020 Series	ioPAC 5542 Series
Inputs/Outputs				
Digital Inputs	–	–	–	8
Configurable DIOs	–	–	–	8
Analog Inputs	–	–	–	8
Cellular				
HSPA	–	–	–	✓ (ioPAC 5542-HSPA)
Ethernet				
Ports (Connector)	2 (M12 or RJ45)			2 (RJ45)
Speed	10/100 Mbps			
Switch (Daisy Chain)	✓	–	✓	–
2 MACs	✓	✓	–	✓
Protocols	Modbus TCP (master/slave), SNMP, TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP		Modbus TCP (master/slave), TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP	Modbus TCP (master/slave), SNMP, TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP
Serial				
Ports (Connector)	–	2 (DB9 male)	1 (DB9 male)	2 (DB9 male)
Interface	–	RS-232/422/485		
Protocols	Modbus RTU (master/slave)		Modbus RTU (master)	Modbus RTU (master/slave)
Physical Characteristics				
I/O Module Slots	5/9/12	2/5/9	5/9	–
Environmental Limits				
Operating Temperature	-40 to 75°C (-40 to 176°F)			-40 to 75°C (-40 to 176°F) -30 to 75°C (-22 to 176°F) for HSPA model
Storage Temperature	-40 to 85°C (-40 to 185°F)			
Ambient Relative Humidity	5 to 95% RH (non-condensing)			
Shock	IEC 60068-2-27			
Vibration	IEC 60068-2-6			
Software				
Programmability	C/C++, IEC 61131-3		C/C++	C/C++, IEC 61131-3
MX-AOPC UA Server	✓	✓	✓	✓
Active OPC Server	–	✓	✓	✓
DA Center	–	✓	✓	✓
RTUxpress	✓		–	✓
RTUAdmin	–	–	✓	–
Standards and Certifications				
Safety	UL 508			
EMC	EN 55022, EN 55024			
EMI	FCC Part 15 Subpart B Class A, CISPR 22			
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8			
Radio	–	–	–	NCC (ioPAC 5542-HSPA)
Rail Traffic	EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4	EN 50155**, EN 50121-3-2, EN 50121-4		EN 50121-4
Hazardous Location	–	–	–	Class 1 Division 2
Reliability				
Warranty	5 years			
Page	15-4	15-11	15-19	15-24

*Moxa defines “essential compliance” to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
**Complies with a portion of EN 50155 specifications.

I/O Modules for the ioPAC 8600 Series

Preliminary

	Digital Input		Digital Output		Analog Output	Communication	
	86M-1620D-T	86M-1832D-T	86M-2830D-T	86M-2604D-T	86M-4420-T	86M-5212U-T	86M-5250-T
Module Properties							
Channels/Ports (Connector)	16 (terminal block)	8 (terminal block)	8 (terminal block)	6 (terminal block)	4 (terminal block)	2 (M12)	2 (DB9 male)
Input/Output Mode	24 to 110 VDC	24 VDC ch-to-ch isolation	24 VDC ch-to-ch isolation	Relay	0 to 10 V -10 to 10 V 0 to 20 mA 4 to 20 mA	–	–
Type	sink	sink/source	sink	Form A (N.O.)	–	–	–
Communication Ports	–	–	–	–	–	2-wire Ethernet	CAN
Standards	–	–	–	–	–	100BASE-TX IEEE 802.3u 10BASE-T IEEE 802.3 100 Mbps BroadR-Reach® 10 Mbps BroadR-Reach®	CAN 2.0A CAN 2.0B CANopen DS301 CANopen DS401
Enviromental Limits							
Operating Temperature	-40 to 75°C (-40 to 176°F)						
Storage Temperature	-40 to 85°C (-40 to 185°F)						
Ambient Relative Humidity	5 to 95% RH (non-condensing)						
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						

I/O Modules for the ioPAC 8500 Series

	Digital Input	Digital Output	Analog Input				High Speed Analog Input		Communication
	85M-1602-T	85M-2600-T	85M-3800	85M-3801	85M-6600-T	85M-6810-T	85M-3801-T	85M-3811-T	85M-5401-T
Module Properties									
Channels/Ports (Connector)	16 (terminal block)	16 (terminal block)	8 (terminal block)	8 (terminal block)	6 (terminal block)	8 (terminal block)	8 (terminal block)	8 (terminal block)	4 (DB44 female)
Input/Output Mode	24 VDC	24 VDC	4 to 20 mA	0 to 10 V	RTD	Thermocouple	4 to 20 mA	0 to 10 V	–
Type	sink/source	sink	–	–	–	–	–	–	–
Sampling Rate	–	–	All channels: 100 samples/ sec Per channel: 12.5 samples/ sec	All channels: 100 samples/ sec Per channel: 12.5 samples/ sec	All channels: 12 samples/sec Per channel: 2 samples/sec	All channels: 12 samples/ sec Per channel: 1.5 samples/sec	All channels: 40k samples/ sec Per channel: 5k samples/sec	All channels: 40k samples/ sec Per channel: 5k samples/sec	–
Serial Ports	–	–	–	–	–	–	–	–	RS-232/422/485
Environmental Limits									
Operating Temperature	-40 to 75°C (-40 to 176°F)								
Storage Temperature	-40 to 85°C (-40 to 185°F)								
Ambient Relative Humidity	5 to 95% RH (non-condensing)								
Reliability									
Warranty	5 years (see www.moxa.com/warranty)								

Note: 85M modules can also be used with ioPAC 8600 systems.

I/O Modules for the ioPAC 8020 Series

	Digital Input		Digital Output	Analog Input		Communication
	RM-1050-T	RM-1602-T	RM-2600-T	RM-3802-T	RM-3810-T	KM-2430-T
Module Properties						
Channels/Ports (Connector)	10 (terminal block)	16 (terminal block)	16 (terminal block)	8 (terminal block)	8 (terminal block)	4 (M12)
Input/Output Mode	110 VDC ch-to-ch isolation	24 VDC	24 VDC	4 to 20 mA	0 to 10 VDC	–
Type	sink/source	sink/source	sink	–	–	–
Communication Ports	–	–	–	–	–	Unmanaged Ethernet switch
Standards	–	–	–	–	–	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3x for Flow Control
Environmental Limits						
Operating Temperature	-40 to 75°C (-40 to 176°F)					
Storage Temperature	-40 to 85°C (-40 to 185°F)					
Ambient Relative Humidity	5 to 95% RH (non-condensing)					
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

ioPAC 8600 Series

Preliminary

Rugged modular RTU controllers

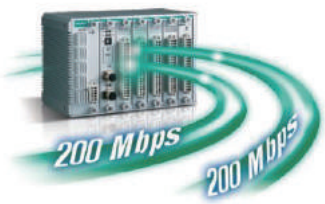
- Modular CPU/Power/Backplane/IO design supporting ioPAC 8500/8600 series I/O modules
- Supports dual power module with dual power inputs
- Supports C/C++ or IEC 61131-3 programming languages with ready-to-run services
- 24 to 110 V power input range and DI/O modules
- Compliant with EN 50121-3, EN 50121-4, and EN 50155 specifications

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

Overview

The ioPAC 8600 modular RTU controllers are 100% modular, giving users the freedom to choose CPU, power, backplane, communication, and I/O modules. In addition, the ioPAC 8600 enhances the hardware system architecture and key features of the ioPAC 8020 and ioPAC 8500 combined. It also adds an Ethernet bus on the backplane to support Ethernet switch modules. The ioPAC 8600 supports the C/C++ and IEC 61131-3 programming languages and ready-to-run services, including Modbus TCP/RTU, SNMP, data logging, and email alarms to fulfill different customers' requirements. With active tag and MX-AOPC data integration software, the ioPAC 8600 series provides a comprehensive solution for data acquisition and control applications in harsh environments.

2-Wire Ethernet Technology



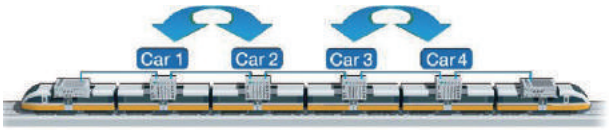
Moxa's 2-wire Ethernet technology offers system integrators an attractive option for upgrading the train's IP network to a 10/100 Mbps* Ethernet backbone with existing 2-wire cable. This innovative 2-wire Ethernet technology supports Ethernet bypass functionality, ensuring that the Ethernet backbone will continue to operate even if one ioPAC is without power. As an added plus, with two 2-wire Ethernet modules in one ioPAC, the network can reach 200 Mbps and provide a redundant architecture.

*Network performance is related to cable quality when using 2-wire technology.

Ready-to-Run Service

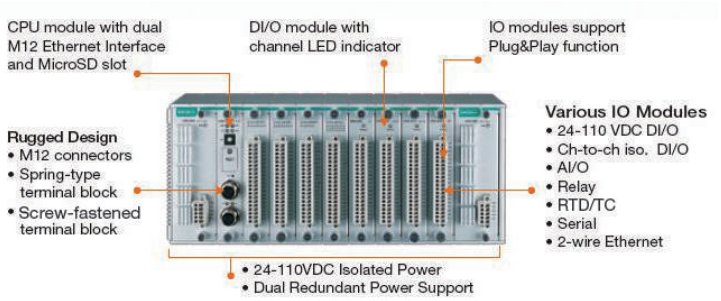
Moxa's ioPAC 8600 programmable controllers allow programmers to rapidly configure services (SNMP, Modbus RTU/TCP, E-mail alarm service, etc.) without writing any programs. The ioPAC can reduce the configuration of massively distributed deployments to a few simple mouse clicks, greatly increasing an engineer's productivity.

Automatic Carriage Sequencing (ACS)



Moxa's Automatic Carriage Sequencing technology quickly and automatically resets the train car sequence, without disrupting network transmissions within the train. This technology greatly reduces the operation effort required for trains that frequently rearrange consists. Onboard passenger information systems can also adjust immediately when changes are made.

Compact Integrated Solution



The compact ioPAC 8600 is equipped with universal dual-power inputs that support all railway power voltages, and new channel-to-channel, wide voltage DI/DO modules are available for use in trains that use different power systems. The ioPAC 8600 supports a variety of communication interfaces, including Ethernet, serial, CAN, and MVB*. System integrators can control or monitor sub-systems with the ioPAC 8600, which saves space and has powerful functions to reduce both the system integrator's budget and installation difficulties.

*MVB available by project request.

Specifications

Power Requirements

Input Voltage: 24 to 110 VDC

Physical Characteristics

Housing: Aluminum

Dimensions:

• 5-slot version: 205.65 x 133.35 x 100 mm (8.1 x 5.25 x 3.94 in)
• 9-slot version: 324.8 x 133.35 x 100 mm (12.79 x 5.25 x 3.94 in)

Weight:

• 5-slot version: 2560 g (5.64 lb)
• 9-slot version: 3690 g (8.14 lb)

Mounting: DIN rail (optional), wall (optional), rack (optional)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
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
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1000 MHz: 3 V/m
1400 MHz to 2100 MHz: 3 V/m
2100 MHz to 2700 MHz: 1 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge:
Power: 2 kV (L-PE), 1 kV (L-L);
Signal: 2 kV (L-PE), 1 kV (L-L)
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8 PFMF: 3 A/m
Rail Traffic: EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Note: Please check Moxa's website for the most up-to-date certification status.

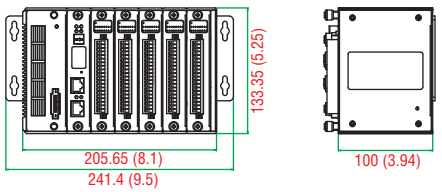
Warranty

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

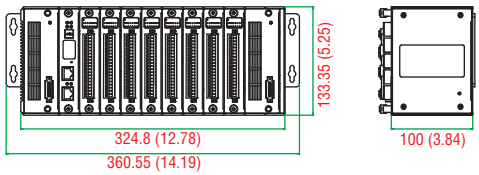
Dimensions

Unit: mm (inch)

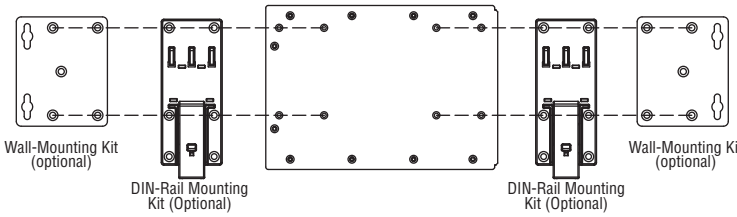
ioPAC 8600 with 5 I/O slots



ioPAC 8600 with 9 I/O slots



Mounting Kits



Ordering Information

CPU Modules

ioPAC 8600-CPU10-M12-C-T: ioPAC 8600 CPU module, C/C++ programmable controller, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8600-CPU10-RJ45-C-T: ioPAC 8600 CPU module, C/C++ programmable controller, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8600-CPU10-M12-IEC-T: ioPAC 8600 CPU module, IEC 61131-3 programmable controller, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8600-CPU10-RJ45-IEC-T: ioPAC 8600 CPU module, IEC 61131-3 programmable controller, RJ45 Ethernet ports, -40 to 75°C operating temperature

Power Modules

ioPAC 8600-PW10-15W-T: ioPAC 8600 power module, dual power input, 24 to 110 VDC, 15W, -40 to 75°C operating temperature

Backplane Modules

ioPAC 8600-BM005-T: ioPAC 8600 backplane module with 5 slots, -40 to 75°C operating temperature
ioPAC 8600-BM009-T: ioPAC 8600 backplane module with 9 slots, -40 to 75°C operating temperature

I/O Modules (can be purchased separately)

86M-1620D-T: 16 DIs, sink, 24 to 110 VDC, channel LED, -40 to 75°C operating temperature
86M-1832D-T: 8 DIs, sink/source, 24 VDC, ch-to-ch isolation, channel LED, -40 to 75°C operating temperature
86M-2604D-T: 6 relays, form A (N.O.), channel LED, -40 to 75°C operating temperature
86M-2830D-T: 8 DOs, sink, 24 VDC, ch-to-ch isolation, channel LED, -40 to 75°C operating temperature
86M-4420-T: 4 AOs, 0 to 10 V, -10 to 10 V, 0 to 20 mA, or 4 to 20 mA, -40 to 75°C operating temperature
86M-5212U-T: 2-port 2-wire Ethernet switch, -40 to 75°C operating temperature
86M-5250-T: 2 CAN ports, -40 to 75°C operating temperature
85M-1602-T: 16 DIs, sink/source, 24 VDC, dry contact, -40 to 75°C operating temperature
85M-2600-T: 16 DOs, sink, 24 VDC, -40 to 75°C operating temperature
85M-3800-T: 8 AIs, 4 to 20 mA, 16 bits, -40 to 75°C operating temperature
85M-3810-T: 8 AIs, 4 to 20 mA, 16 bits, 40 kHz, -40 to 75°C operating temperature
85M-3801-T: 8 AIs, 0 to 10 VDC, 16 bits, -40 to 75°C operating temperature
85M-3811-T: 8 AIs, 0 to 10 VDC, 16 bits, 40 kHz, -40 to 75°C operating temperature
85M-5401-T: 4 serial ports (RS-232/422/485 3-in-1), -40 to 75°C operating temperature
85M-6600-T: 6 RTDs, -40 to 75°C operating temperature
85M-6810-T: 8 TCs, -40 to 75°C operating temperature
Note: Both 86M modules and 85M modules can be used with the ioPAC 8600 series.
Note: Conformal coating available on request.

Optional Accessories (can be purchased separately)

DK-DC50131-01: DIN-rail mounting kit, 50 x 131 mm
WK-75: Wall-mounting kit, 2 plates with 8 screws
CBL-M12D(MM4P)/RJ45-100 IP67: 4-pin D-code M12-to-RJ45 CAT5E UTP Ethernet cable, 100 cm, IP67 waterproof
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9DPF1x4-BK-100: Serial console cable
CBL-M44M9x4-50: DB44 to 4-port DB9 female serial cable
85M-BKTES: Empty slot covers (3 per order)

Package Checklist (CPU Module)
- ioPAC 8600 CPU module
- Serial console cable (C/C++ version only)
- Documentation and software CD

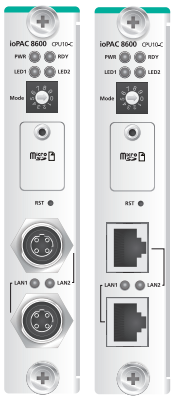
Package Checklist (Power Module)
- ioPAC 8600 power module

Package Checklist (Backplane Module)
- ioPAC 8600 backplane module

Package Checklist (I/O Module)
- 85M/86M module
- Serial cable: CBL-M44M9x4-50 (85M-5401-T only)

ioPAC 8600 Series Modules Preliminary

ioPAC 8600-CPU10 Series: 32-bit ARM9 192 MHz CPU



Computer
CPU Type: 32-bit ARM9 192 MHz CPU
OS: Linux
Clock: Real-time clock with super capacitor (retains charge for 7 days)

Memory
SDRAM: 64 MB
Flash: 32 MB (10 MB reserved for user)
FRAM: 128 KB
microSD™ Slot: Up to 32 GB (SD 2.0 compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature microSD cards are required.

Switches & Buttons
Rotary Switch: 0 to 9
Button: Reset to factory defaults

Ethernet Interface
LAN: 2 x 10/100 Mbps, Ethernet bypass or 2 MACs (IPs), jumper selectable, RJ45 or M12
Protection: 1.5 kV magnetic isolation
Automation Languages: C/C++ or IEC 61131-3
Protocols: Modbus TCP/RTU (master/slave), SNMP, TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current : 200 mA @ 24 VDC

MTBF (mean time between failures)
Time: 1,032,466 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

ioPAC 8600-PW10-15W-T: Dual-power inputs, 24 to 110 VDC, 15 W

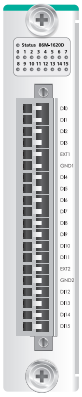
Power
Input Voltage: 24 to 110 VDC (16.8 to 154 VDC)
Note: Compliant with EN 50155 at 24/48/60/72/110 VDC
Wattage: 15 W
Galvanic Isolation: 3k VDC
Dual-Power Input: Yes

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

MTBF (mean time between failures)
Time: 1,579,517 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

86M-1620D-T: 16 digital inputs, 24 to 110 VDC, channel LED, sink type



Inputs and Outputs
Digital Inputs: 16 channels
Isolation:
To system:
3k VDC or 2k Vrms

Digital Input
Type: PNP
I/O mode: DI
Logic Definition:
• On: channel voltage > 0.3 x (external power voltage)
• Off: channel voltage < 0.15 x (external power voltage)
Scan Period: 8 ms (typ.)
Scan on Time: 0.5 ms
Debouncing Function: Software disable/enable
Debouncing Time: 1 to 15 ms (software-selectable)
Common Type: 8 points per COM

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block
Channel LED: Yes

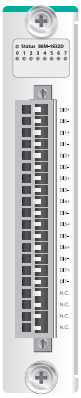
Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 12.6 mA @ 24 VDC

MTBF (mean time between failures)
Time: 1,115,244 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

86M-1832D-T: 8 channel-to-channel isolated DIs, 24 VDC, channel LED, sink/source type



Inputs and Outputs
Digital Inputs: 8 channels
Isolation:
To system: 3k VDC or 2k Vrms
Channel-to-channel: 1k VDC

Digital Input
Sensor Type: Wet contact (NPN or PNP)
I/O Mode: DI, counter, or frequency
Wet Contact (DI+ to DI-):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Counter Frequency: 5 kHz
Digital Filtering Time Interval: Software selectable (by 0.1 ms)

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

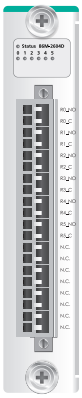
Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 12.6 mA @ 24 VDC

MTBF (mean time between failures)
Time: 1,149,108 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

86M-2604D-T: 6 relays, channel LED, form A (N.O.) type



Inputs and Outputs
Relays: 6 channels
Isolation:
To System: 3k VDC or 2k Vrms

Relay
Type: Form A (N.O.)
I/O mode: DO or PWM
Pulse Output Frequency: 0.33 Hz
Contact Current Rating:
Resistive Load: 5 A @ 30 VDC, 250 VAC
Relay On/Off Time: 10 ms (max.)
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 5,000,000 operations
Electrical Endurance: 60,000 operations @ 5 A resistive load
Contact Resistance: 100 milli-ohms (max.)

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

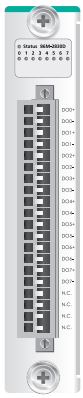
Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 127 mA @ 24 VDC

MTBF (mean time between failures)
Time: 4,173,843 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

86M-2830D-T: 8 channel-to-channel isolated DOs, 24 VDC, channel LED, sink-type



Inputs and Outputs
Digital Outputs: 8 channels
Isolation:
To system: 3k VDC or 2k Vrms
Channel-to-channel: 1k VDC

Digital Output
Type: Sink
I/O Mode: DO or PWM
Pulse Output Frequency: 1 kHz
Short Circuit Protection: 750 mA @ 25°C
Over-Voltage Protection: 41 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

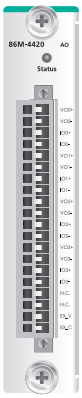
Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 76.7 mA @ 24 VDC

MTBF (mean time between failures)
Time: 1,766,037 hrs
Standard: Telcordia SR332

EN 50155 cULus LISTED RoHS EN 50121 CE FC

86M-4420-T: 4 analog outputs, 0 to 10 V or -10 to 10 V or 0 to 20 mA or 4 to 20 mA



Inputs and Outputs
Analog Outputs: 4 channels
Isolation:
To system: 3k VDC or 2k Vrms

Analog Output
Resolution: 12 bits
Output range: 0 to 10 V, -10 to 10 V, 0 to 20 mA, 4 to 20 mA
I/O mode: Static or Waveform mode
Voltage Output: 10 mA (max.)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Current Load Resistance:
Internal Power: 400 ohms
External 24 VDC Power: 1000 ohms
Update Rate: Software polling or waveform mode
Waveform Type: Sine, Triangle, Square
Wavemode Frequency: 125 Hz

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current:
94.2 mA @ 24 VDC (voltage)
143.8 mA @ 24 VDC (current)

MTBF (mean time between failures)
Time: 2,409,345 hrs
Standard: Telcordia SR332

EN 50155 cULus LISTED RoHS EN 50121 CE FC

86M-5212U-T: 2-port 2-wire Ethernet switch

Ethernet Communication
Interface: Two 2-wire Ethernet ports
Isolation:
To system: 3k VDC or 2k Vrms

Standards
Supported Standards:
100BASE-TX IEEE 802.3u
10BASE-T IEEE 802.3
100 Mbps BroadR-Reach®
10 Mbps BroadR-Reach®

Physical Characteristics
Wiring: CAT 5 standard cable with M12 D-code male connection
Connector: M12 (D-code, female) x 2
Channel LED: Yes

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 578 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 2,498,942 hrs
Standard: Telcordia SR332

EN 50155 cULus LISTED RoHS EN 50121 CE FC

86M-5250-T: 2 CAN ports, channel LED

Serial Communication
Interface: 2 CAN ports
Isolation:
To system: 3k VDC or 2k Vrms

CAN Bus Communication
Protocols:
CAN 2.0A
CAN 2.0B
CANopen DS301, V4.02
CANopen DS401
Speed: 10/20/50/125/250/500/800 kbps, 1 Mbps
Termination Resistor: N/A, 120 ohms (by DIP)

Physical Characteristics
Connector: DB9 male
Channel LED: Yes

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 60 mA @ 24 VDC

MTBF (mean time between failures)
Time: 3,306,609 hrs
Standard: Telcordia SR332

EN 50155 EN 50121

Common Specifications

Power Requirements
Input Voltage: 24 to 110 VDC (16.8 to 154 VDC)

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6

Standards and Certifications
Safety: UL 508
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1000 MHz: 3 V/m
1400 MHz to 2100 MHz: 3 V/m
2100 MHz to 2700 MHz: 1 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV (L-L), 2 kV (L-PE)
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8 PFMF: 3 A/m
Rail Traffic: EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

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

ioPAC 8500 Series

Award-winning Product
TAIWAN EXCELLENCE 2014

Rugged modular RTU controllers

- Dedicated ARM (RISC) CPUs for the main system and each I/O module
- Millisecond timestamp granularity for digital input and analog input
- Supports 5 kHz sampling rate for analog input
- Pre-recording for analog input data logging
- Supports C/C++ or IEC 61131-3 programming languages
- Compliant with EN 50121-3-2, EN 50121-4, and EN 50155 specifications
- Robust and compact design for harsh environments
- Modular I/O for versatility, flexibility, and scalability

RoHS EN 50121 CE FC

Overview

The ioPAC 8500 modular RTU controllers use an ARM9 industrial-grade CPU for the system, and ARM Cortex™ M4 CPUs for the modules. The controllers have 2, 5, or 9 I/O slots for 85M series modules and the dual CPU architecture supports a 5 kHz (per channel) analog input sampling rate, pre-recording of analog input data, and timestamping with millisecond granularity. Moreover, the ioPAC 8500 supports C/C++ or IEC 61131-3 programming, rail-level surge and ESD protection, a -40 to 75°C operating temperature range, vibration protection, hot-swappable modules, two 10/100 Mbps Ethernet ports with two MACs (with port trunking capability), and two 3-in-1 serial ports. Accompanied by Moxa's Active OPC Server and DA-Center data integration software, the ioPAC 8500 series provides a comprehensive solution for data acquisition and control applications in harsh environments.

High Sampling Rate

High sampling rate AI

Moxa's ioPAC 8500 RTUs use an ARM9 industrial-grade CPU, and the dual CPU architecture supports up to a 5 kHz (per channel) analog input sampling rate, giving engineers the analog data precision they need to correctly analyze events after they have occurred.

Analog Input Prerecord Feature

Prerecording

The ioPAC 8500 RTU's prerecord feature allows the RTU controller to continuously record analog input data before an event is triggered. The prerecord feature is a major improvement over products that only start logging data after an event has occurred, because these conventional approaches can often lead to the loss of critical data due to network latency during the event.

Millisecond Timestamp Granularity

Timestamp

Millisecond timestamp granularity is a powerful aid in post-event analysis and troubleshooting. For example, if an emergency triggers 10 separate I/O events within a 10-millisecond time interval, you will still be able to clearly identify the sequence in which the events occurred, even if the I/O events are recorded by different modules.

I/O Module Hot-Swapping


Hot-swap

The ioPAC 8500 RTU controller lets you hot-swap I/O modules, allowing engineers to quickly and easily install and replace modules in the field, reducing maintenance costs and streamlining maintenance procedures.

Specifications

Computer
Main CPU: 32-bit ARM9 192 MHz CPU
I/O CPU: 32-bit ARM Cortex M4 80 MHz CPU
OS: Linux
Clock: Real-time clock with battery backup
Memory:
• SDRAM: 64 MB
• Flash: 32 MB
• SRAM: 256 KB (battery backup lasts for 1 week)
• microSD™ Slot: Up to 32 GB (SD 2.0 compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature microSD cards are required.

Ethernet Interface
LAN: 2 x 10/100 Mbps, 2 MACs (IPs), RJ45 or M12
Protection: 1.5 kV magnetic isolation

Serial Interface
Interface:
• 2 RS-232/422/485 ports, software selectable (DB9 male)
• 1 RS-232 debug port (4-pin connector)
Serial Line Protection: 8 kV ESD for all signals

Serial Communication Parameters
Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 300 bps to 921.6 kbps

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

Software Characteristics
Automation Languages: C/C++ or IEC 61131-3
Protocols: Modbus TCP/RTU (master/slave), SNMP, TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP

Power Requirements
Input Voltage: 24 VDC (9 to 48 VDC)
Input Current: 152 mA @ 24 VDC

Physical Characteristics
Housing: Aluminum
Dimensions:
• 2-slot version: 114.7 x 135 x 100 mm (4.52 x 5.31 x 3.94 in)
• 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)
Weight:
• 2-slot version: 1300 g (2.87 lb)
• 5-slot version: 2000 g (4.41 lb)
• 9-slot version: 2575 g (5.68 lb)
Mounting: DIN rail (standard), wall (optional)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
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
EMC: EN 55022, EN 55024
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1000 MHz: 3 V/m
1400 MHz to 2100 MHz: 3 V/m
2100 MHz to 2700 MHz: 1 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV (L-L), 2 kV (L-PE)
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8 PFMF: 3 A/m
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4
*Complies with a portion of EN 50155 specifications.
Note: Please check Moxa's website for the most up-to-date certification status.

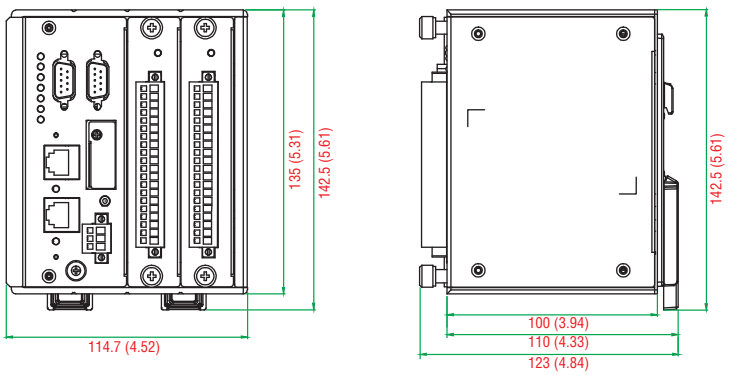
MTBF (mean time between failures)
Time: 859,979 hrs
Standard: Telcordia SR332

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

Dimensions

Unit: mm (inch)

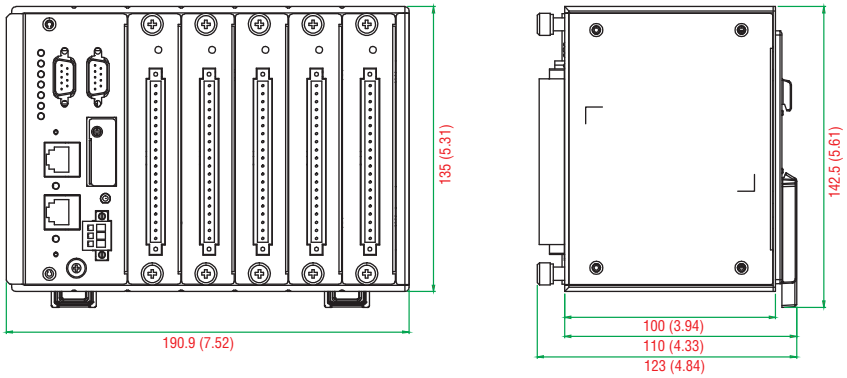
ioPAC 8500-2



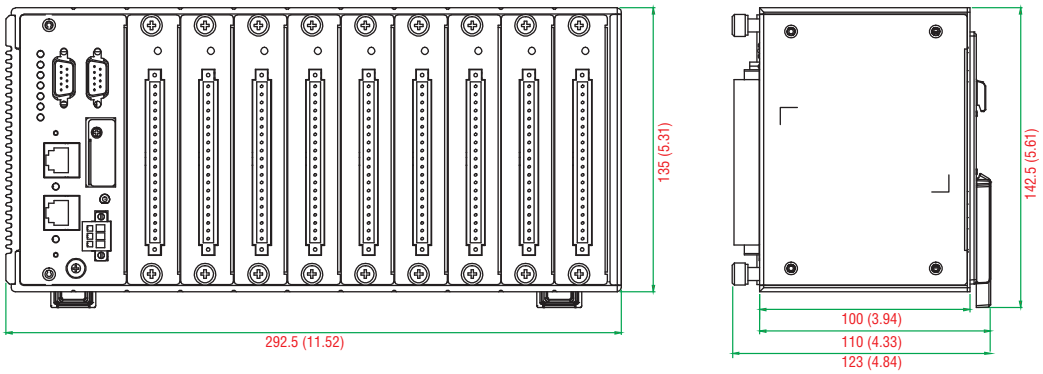
Dimensions

Unit: mm (inch)

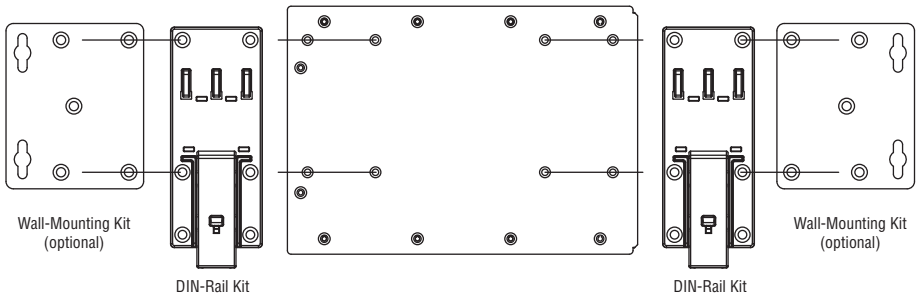
ioPAC 8500-5



ioPAC 8500-9



Mounting Kits



Ordering Information

System Modules

ioPAC 8500-2-M12-C-T: Modular C/C++ programmable controller with 2 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-2-M12-IEC-T: Modular IEC 61131-3 programmable controller with 2 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-2-RJ45-C-T: Modular C/C++ programmable controller with 2 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-2-RJ45-IEC-T: Modular IEC 61131-3 programmable controller with 2 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-5-M12-C-T: Modular C/C++ programmable controller with 5 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-5-M12-IEC-T: Modular IEC 61131-3 programmable controller with 5 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-5-RJ45-C-T: Modular C/C++ programmable controller with 5 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-5-RJ45-IEC-T: Modular IEC 61131-3 programmable controller with 5 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-9-M12-C-T: Modular C/C++ programmable controller with 9 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-9-M12-IEC-T: Modular IEC 61131-3 programmable controller with 9 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-9-RJ45-C-T: Modular C/C++ programmable controller with 9 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-9-RJ45-IEC-T: Modular IEC 61131-3 programmable controller with 9 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature

Package Checklist (ioPAC 8500)

- ioPAC 8500 system module
- Serial console cable (C/C++ version only)
- Documentation and software CD

I/O Modules (can be purchased separately)

85M-1602-T: 16 DIs, sink/source, 24 VDC, dry contact, -40 to 75°C operating temperature
85M-2600-T: 16 DOs, sink, 24 VDC, -40 to 75°C operating temperature
85M-3800-T: 8 AIs, 4 to 20 mA, 16 bits, -40 to 75°C operating temperature
85M-3810-T: 8 AIs, 4 to 20 mA, 16 bits, 40 kHz, -40 to 75°C operating temperature
85M-3801-T: 8 AIs, 0 to 10 VDC, 16 bits, -40 to 75°C operating temperature
85M-3811-T: 8 AIs, 0 to 10 VDC, 16 bits, 40 kHz, -40 to 75°C operating temperature
85M-5401-T: 4 serial ports (RS-232/422/485 3-in-1), -40 to 75°C operating temperature
85M-6600-T: 6 RTDs, -40 to 75°C operating temperature
85M-6810-T: 8 TCs, -40 to 75°C operating temperature
Note: Conformal coating available on request

Package Checklist (85M modules)

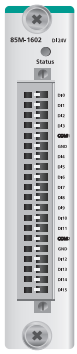
- 85M module
- Serial cable: CBL-M44M9x4-50 (85M-5401-T only)

Optional Accessories (can be purchased separately)

DK-DC50131-01: DIN-rail mounting kit, 50 x 131 mm
WK-75: Wall-mounting kit, 2 plates with 8 screws
CBL-M12D(MM4P)/RJ45-100 IP67: 4-pin D-code M12-to-RJ45 CAT5E UTP Ethernet cable, 100 cm, IP67 waterproof
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9DPF1x4-BK-100: Serial console cable
CBL-M44M9x4-50: DB44 to 4-port DB9 female serial cable
85M-BKTES: Empty slot covers (3 per order)

ioPAC 8500 Series Modules

85M-1602-T: 16 digital inputs, 24 VDC, sink/source type



Inputs and Outputs
Digital Inputs: 16 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet contact (NPN or PNP), dry contact
I/O Mode: DI, Counter or Frequncy
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• Off: 0 to 3 VDC
• On: 10 to 30 VDC
Common Type: 8 points per COM
Counter Frequency: 5 kHz
Digital Filtering Time Interval: Software selectable (by 0.1 ms)

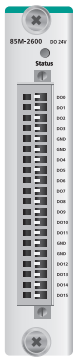
Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 363.6 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 1,132,561 hrs
Standard: Telcordia SR332

85M-2600-T: 16 digital outputs, 24 VDC, sink-type



Inputs and Outputs
Digital Outputs: 16 channels
Isolation: 3k VDC or 2k Vrms

Digital Output
Type: Sink
I/O Mode: DO or PWM
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

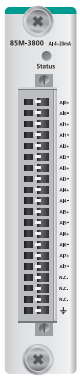
Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 257.6 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 792,571 hrs
Standard: Telcordia SR332

85M-3800-T: 8 analog inputs, 4 to 20 mA



Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Input
Type: Differential
Resolution: 16 bits
I/O Mode: 4 to 20 mA (wire off)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 100 samples/sec
• Per channel: 12.5 samples/sec
Input Impedance: 125 ohms (min.)

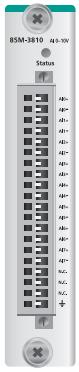
Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 318.2 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 1,512,906 hrs
Standard: Telcordia SR332

85M-3810-T: 8 analog inputs, 0 to 10 VDC



Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Inputs
Type: Differential
Resolution: 16 bits
I/O Mode: 0 to 10 VDC
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 100 samples/sec
• Per channel: 12.5 samples/sec
Input Impedance: 200 kilo-ohms (min.)

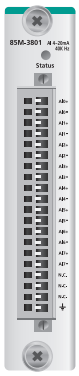
Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 315.2 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 1,530,690 hrs
Standard: Telcordia SR332

85M-3801-T: 8 analog inputs, 4 to 20 mA, 40 kHz



Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Input
Type: Differential
Resolution: 16 bits
I/O Mode: 4 to 20 mA (wire off)
Historical Data Buffering: 60 KB per channel, 6-second data buffer at 5 kHz
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 40k samples/sec
• Per channel: 5k samples/sec
Input Impedance: 125 ohms (min.)

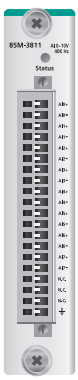
Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 378.8 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 1,426,112 hrs
Standard: Telcordia SR332

85M-3811-T: 8 analog inputs, 0 to 10 VDC, 40 kHz



Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Inputs
Type: Differential
Resolution: 16 bits
I/O Mode: 0 to 10 VDC
Historical Data Buffering: 60 KB per channel, 6-second data buffer at 5 kHz
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 40k samples/sec
• Per channel: 5k samples/sec
Input Impedance: 20 mega-ohms (min.)

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 378.8 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 1,426,112 hrs
Standard: Telcordia SR332

85M-5401-T: 4 serial ports (RS-232/422/485)

Serial Communication

Interface: 4 RS-232/422/485 ports, software selectable (DB44 female)
Isolation: 3k VDC or 2k Vrms
Note: DB44 to 4-port DB9 cable included in the package.

Serial Communication Parameters

Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 300 bps to 921.6 kbps

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

Physical Characteristics

Connector: DB44 female

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements

Input Current: 375.8 mA @ 3.3 VDC

MTBF (mean time between failures)

Time: 596,611 hrs
Standard: Telcordia SR332

85M-6600-T: 6 RTDs

Inputs and Outputs

RTD Inputs: 6 channels
Isolation: 3k VDC or 2k Vrms

RTDs

Input Type:
• PT50, PT100, PT200, PT500 (-200 to 850°C)
• PT1000 (-200 to 350°C)
• JPT100, JPT200, JPT500 (-200 to 640°C)
• JPT1000 (-200 to 350°C)
• NI100, NI200, NI500 (-60 to 250°C)
• NI1000 (-60 to 150°C)
• NI120 (-80 to 260°C)
• Resistance of 310, 620, 1250, and 2200 ohms
Sampling Rate (single channel):
• All channels: 12 samples/sec
• Per channel: 2 samples/sec

Resolution: 0.1°C or 0.1 ohms
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms (min.)
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 176°F)

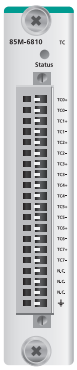
Power Requirements

Input Current: 201.5 mA @ 3.3 VDC

MTBF (mean time between failures)

Time: 571,446 hrs
Standard: Telcordia SR332

85M-6810-T: 8 thermocouples



Inputs and Outputs

Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Thermocouples

Sensor Type: J (0 to 750°C), K (-200 to 1250°C), T (-200 to 350°C), E (-200 to 900°C), R (-50 to 1600°C), S (-50 to 1760°C), B (600 to 1700°C), N (-200 to 1300°C)
Millivolt Type:
- Mode: ±78.126 mV, ±39.062 mV, ±19.532 mV
- Fault and over-voltage protection: -35 to +35 VDC (power off); -25 to +30 VDC (power on)

Sampling Rate (single channel):
- All channels: 12 samples/sec
- Per channel: 1.5 samples/sec

Resolution: 16 bits

Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Input Impedance: 1 mega-ohm (min.)
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements

Input Current: 175.5 mA @ 3.3 VDC

MTBF (mean time between failures)

Time: 2,324,891 hrs
Standard: Telcordia SR332

Common Specifications

Power Requirements

Input Voltage: 24 VDC (9 to 48 VDC)

Environmental Limits

Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1000 MHz: 3 V/m
1400 MHz to 2100 MHz: 3 V/m
2100 MHz to 2700 MHz: 1 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV (L-L), 2 kV (L-PE)
IEC 61000-4-6 CS: 3V
IEC 61000-4-8 PFMF: 3 A/m

Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4
*Complies with a portion of EN 50155 specifications.

Warranty

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

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

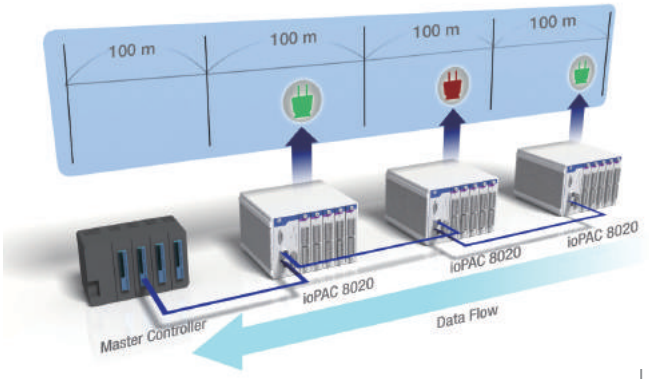
Overview

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 includes 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 a modular design in a compact size to save space in installation cabinets. For modular ioPAC RTU controllers, the hot-swap capability 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 x 10/100 Mbps, Ethernet bypass, RJ45 or M12
Protection: 1.5 kV magnetic isolation

Serial Interface
Serial Ports: RS-232/422/485 (DB9 male)
Serial Debug Port: RS-232 (4-pin connector)

Serial Ports
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
Input Current: 184 mA @ 24 VDC (without I/O modules)
Note: Compliant with EN 50155 at 24 VDC

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)
Weight:
5-slot version: 2,000 g (4.41 lb)
9-slot version: 2,575 g (5.68 lb)
Mounting: DIN rail (standard), wall (optional)
I/O Module Slots: 5 or 9 slots (the 9th slot is reserved)

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)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
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
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1000 MHz: 10 V/m
1400 MHz to 2100 MHz: 3 V/m
2100 MHz to 2700 MHz: 1 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV (9-slot version)
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8 PFMF: 30 A/m
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4
*Complies with a portion of EN 50155 specifications.
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

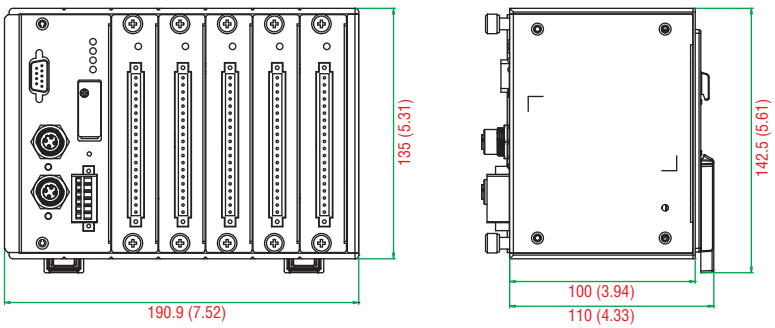
MTBF (mean time between failures)
Time: 690,214 hrs
Standard: Telcordia SR332

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

Dimensions

Unit: mm (inch)

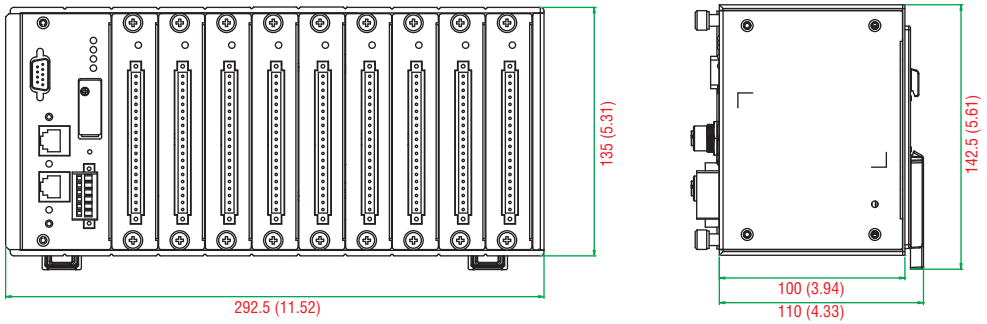
ioPAC 8020-5



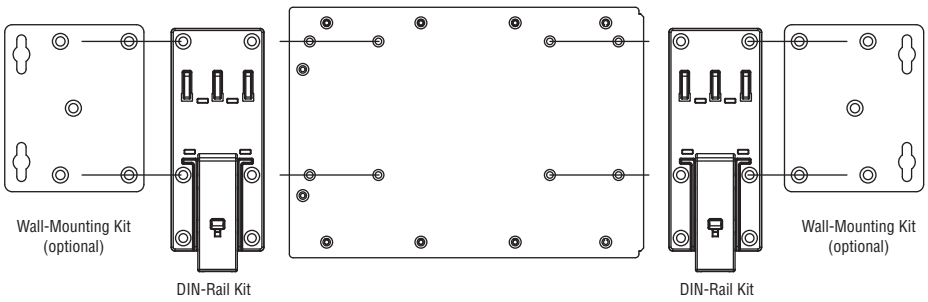
Dimensions

Unit: mm (inch)

ioPAC 8020-9



Mounting Kits



Ordering Information

System Modules

ioPAC 8020-5-M12-C-T: Modular programmable controller with 5 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8020-5-RJ45-C-T: Modular programmable controller with 5 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8020-9-M12-C-T: Modular programmable controller with 9 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8020-9-RJ45-C-T: Modular programmable controller with 9 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature

Package Checklist

- ioPAC 8020-C
- Ethernet cable: CBL-M12D(MM4P)/RJ45-100 IP67
- Serial cable: CBL-F9DPF1x4-BK-100
- Documentation and software CD

I/O Modules (can be purchased separately)

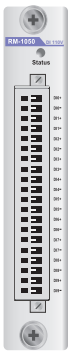
RM-1050-T: 10 DIs, 110 VDC, ch-to-ch isolation, -40 to 75°C operating temperature
RM-1602-T: 16 DIs, sink/source, 24 VDC, -40 to 75°C operating temperature
RM-2600-T: 16 DOs, sink, 24 VDC, -40 to 75°C operating temperature
RM-3802-T: 8 AIs, 4 to 20 mA, 16 bits, -40 to 75°C operating temperature
RM-3810-T: 8 AIs, 0 to 10 V, 16 bits, -40 to 75°C operating temperature
KM-2430-T: 4-port unmanaged Ethernet switch, M12, -40 to 75°C operating temperature
Note: Conformal coating available on request

Optional Accessories (can be purchased separately)

DK-DC50131-01: DIN-rail mounting kit, 50 x 131 mm
WK-75: Wall-mounting kit, 2 plates with 8 screws
CBL-M12D(MM4P)/RJ45-100 IP67: 4-pin D-code M12-to-RJ45 CAT5E UTP Ethernet cable, 100 cm, IP67 waterproof
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9DPF1x4-BK-100: Serial console cable

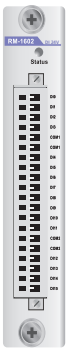
ioPAC 8020 Series Modules

RM-1050-T: 10 channel-to-channel isolated DIs, 110 VDC, sink/source type



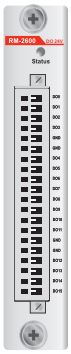
Digital Inputs: 10 channels, 110 VDC, channel-to-channel isolation
On: 50 to 175 VDC
Off: 0 to 15 VDC
Input Impedance: 120 kilo-ohms (typical)
Response Time: 10 ms
Isolation: 3k VDC or 2k Vrms
Channel-to-Channel Isolation: 2.5k VDC
Operating Temperature: -40 to 75°C (-40 to 176°F)
Input Current: 7 mA @ 24 VDC
Wiring: I/O cable, 14 AWG (max.)
MTBF: 3,993,435 hrs (Standard: Telcordia SR332)

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: 3 kilo-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 (-40 to 176°F)
Input Current: 7 mA @ 24 VDC
Wiring: I/O cable, 14 AWG (max.)
MTBF: 4,132,863 hrs (Standard: Telcordia SR332)

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



Digital Outputs: 16 channels, 24 VDC, sink-type
Output Impedance: 120 milli-ohms (typical)
Current Rating: 200 mA per channel
Off-state Resistance: 500 kilo-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 (-40 to 176°F)
Input Current: 10 mA @ 24 VDC
Wiring: I/O cable, 14 AWG (max.)
MTBF: 4,440,241 hrs (Standard: Telcordia SR332)

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

Analog Inputs: 8 channels, differential
Input Range: 4 to 20 mA
Input Impendence: 120 ohms
Resolution: 16 bits, 0.24 μA/bit
Accuracy:
±0.1%, FSR @ 25°C
±0.3%, FSR @ -40°C and 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 (-40 to 176°F)

Input Current: 78 mA @ 24 VDC
Wiring: I/O cable, 14 AWG (max.)
MTBF: 1,222,361 hrs (Standard: Telcordia SR332)

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

Analog Inputs: 8 channels, differential
Input Range: 0 to 10 VDC
Input Impendence: 10 mega-ohms (min.)
Resolution: 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
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 (-40 to 176°F)

Input Current: 78 mA @ 24 VDC
Wiring: I/O cable, 14 AWG (max.)
MTBF: 1,225,957 hrs (Standard: Telcordia SR332)

KM-2430-T: 4-port unmanaged Ethernet switch module

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 (-40 to 176°F)
Input Current: 20 mA @ 24 VDC
MTBF: 3,873,592 hrs (Standard: Telcordia SR332)

ioPAC 5542 Series

Rugged, compact RTU controllers

- Dedicated ARM CPUs for both the main system and I/O channels
- Millisecond timestamp granularity on both digital input and analog input
- Up to 250 Hz sampling rate per analog input channel
- Prerecord feature for analog input data logging
- Supports C/C++ or IEC 61131-3 programming languages
- Compliant with EN 50121-4, UL/cUL Class 1 Division 2
- Robust and compact design for harsh environments

RoHS EN 50121 CE FC c UL us LISTED

Overview

The ioPAC 5500 standalone controllers use an ARM9 industrial-grade CPU for the main system, with ARM Cortex™ M4 based CPUs used for I/O channels. The dual CPU architecture supports up to a 250 Hz per channel analog input sampling rate with millisecond timestamp granularity. The ioPAC 5500 supports C/C++ or IEC 61131-3 programming langauges, rail-level surge and ESD protection, a -40 to 75°C (-30 to 75°C for HSPA models) operating temperature range, UL/cUL Class 1 Division 2 certifications, two 10/100 Mbps Ethernet ports with two MACs (Port Trunking ready), and two 3-in-1 serial ports. With Moxa's Active OPC Server and DA-Center, the ioPAC 5500 series provides a comprehensive solution for data acquisition and control applications in harsh environments.

High Sampling Rate

High sampling rate AI

Moxa's ioPAC 5542 RTUs use an ARM9 industrial-grade CPU, and the dual CPU architecture supports up to a 2000 Hz analog input sampling rate (all channels), giving engineers the analog data precision they need to correctly analyze events, and then formulate the best response.

Prerecorded Analog Input

Prerecording

The ioPAC 5542's prerecord function allows the RTU controller to continuously record analog input data before an event trigger point. The prerecording function is a major improvement over products that only start data logging after an event has occurred, which can lead to the loss of critical data due to the latency between the event and when the data logging actually begins.

Specifications

Computer

Main CPU: 32-bit ARM9 192 MHz CPU
I/O CPU: 32-bit ARM Cortex M4 80 MHz CPU
OS: Linux
Clock: Real-time clock with battery backup
Memory:
• SDRAM: 64 MB
• Flash: 32 MB
• SRAM: 256 KB (battery backup lasts for 1 week)
• microSD™ Slot: Up to 32 GB (SD 2.0 compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature microSD cards are required.

Cellular (for the ioPAC 5542-HSPA Series)

Network:
• Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
• Five-band UMTS/HSPA+ 800/850/AWS/1900/2100 MHz
Internet:
HSPA:
• Up to 5.76 Mbps upload speed
• Up to 14.4 Mbps download speed
UMTS: Up to 384 kbps upload/download speed
EDGE Class 12: Up to 237 kbps upload/download speed
GPRS Class 12: Up to 85.6 kbps upload/download speed
SMS: Point-to-Point Text/PDU mode
SIM Control Voltage: 3/1.8 V

Ethernet Interface

LAN: 2 x 10/100 Mbps, 2 MACs (IPs), RJ45
Protection: 1.5 kV magnetic isolation

Serial Interface

Interface:
• 2 RS-232/422/485 ports, software selectable (DB9 male)
• 1 RS-232 debug port (4-pin connector)
Serial Line Protection: 15 kV ESD for all signals

Serial Communication Parameters

Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 300 bps to 921.6 kbps

Serial Signals

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

Inputs and Outputs

Digital Inputs: 8 channels
Configurable DIOs: 8 channels
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI Counter or Frequency
Dry Contact:
• On: short to GND
• Off: open
Wet Contact:
NPN (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
PNP (DI to GND):
• Off: 0 to 3 VDC
• On: 10 to 30 VDC
Common Type: 4 points per COM
Counter Frequency: 1 kHz
Digital Filtering Time Interval: Software selectable (by 0.5 ms)

Digital Output

Type: Sink
I/O Mode: DO or PWM
Pulse Output Frequency: 1 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Analog Input

Type: Differential Input
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: 0 to 10 VDC, -10 to 10 VDC, 0 to 20 mA, 4 to 20 mA (wire off)
Historical Data Buffering: 60 KB per channel, 120-second data buffer at 250 Hz
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 2000 samples/sec
• Per channel: 250 samples/sec
Input Impedance: 2 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms (min.)

Software Characteristics

Automation Languages: C/C++ or IEC 61131-3
Protocols: Modbus TCP/RTU (master/slave), SNMP TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP

Power Requirements

Input Voltage: 24 VDC (9 to 48 VDC)
Input Current:
• ioPAC 5542-HSPA series: 305 mA @ 24 VDC
• ioPAC 5542 series: 264 mA @ 24 VDC

Physical Characteristics

Housing: Aluminum
Dimensions: 90.05 x 135 x 105.4 mm (3.55 x 5.32 x 4.15 in)
Weight:
• ioPAC 5542-HSPA Series: 1100 g (2.43 lb)
• ioPAC 5542 Series: 1000 g (2.20 lb)
Mounting: DIN rail (standard), wall (optional)
Connector: Spring-type terminal block

Environmental Limits

Operating Temperature:
• ioPAC 5542 Series: -40 to 75°C (-40 to 176°F)
• ioPAC 5542-HSPA Series: -30 to 75°C (-22 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1000 MHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8 PFMF: 1 A/m
Radio: NCC
Rail Traffic: EN 50121-4
Hazardous Location: Class 1 Division 2
Note: Please check Moxa's website for the most up-to-date certification status.

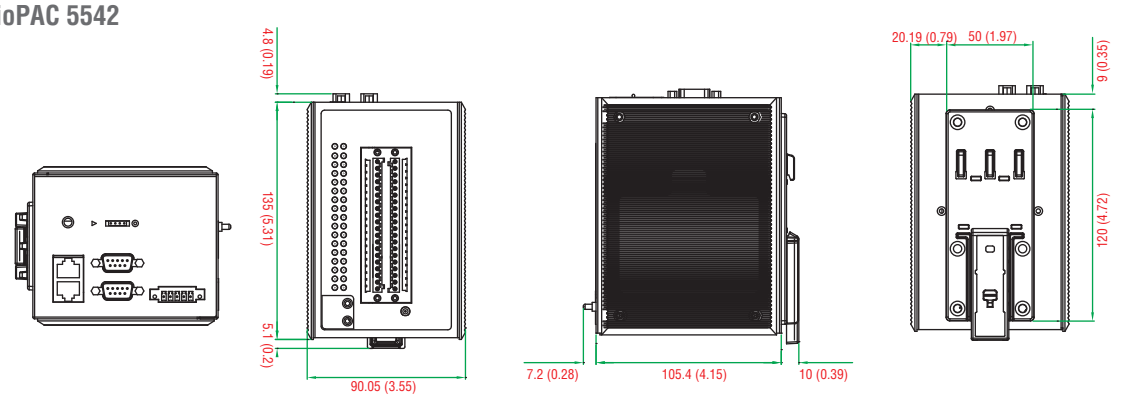
Warranty

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

Dimensions

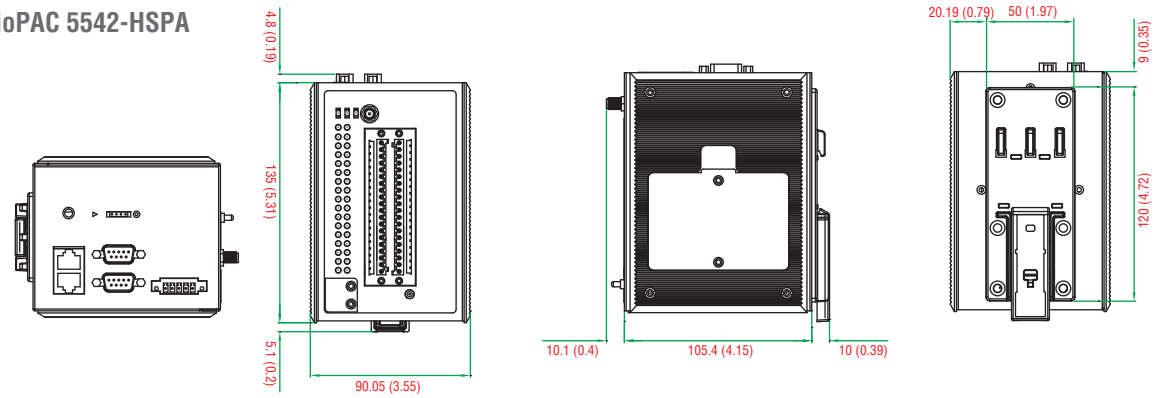
Unit: mm (inch)

ioPAC 5542



Top View | Front View | Side View | Rear View

ioPAC 5542-HSPA



Top View | Front View | Side View | Rear View

Ordering Information

Available Models

ioPAC 5542-C-T: Rugged, compact, Ethernet, C/C++ programmable controller with 8 DIs, 8 DIOs, 8 AIs, -40 to 75°C operating temperature
ioPAC 5542-IEC-T: Rugged, compact, Ethernet, IEC 61131-3 programmable controller with 8 DIs, 8 DIOs, 8 AIs, -40 to 75°C operating temperature
ioPAC 5542-HSPA-C-T: Rugged, compact, HSPA, C/C++ programmable controller with 8 DIs, 8 DIOs, 8 AIs, -30 to 75°C operating temperature
ioPAC 5542-HSPA-IEC-T: Rugged, compact, HSPA, IEC 61131-3 programmable controller with 8 DIs, 8 DIOs, 8 AIs, -30 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-DC50131: DIN-rail mounting kit, 50 x 131 mm
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9DPF1x4-BK-100: Serial console cable
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
ANT-WCDMA-AHSM-04-2.5m Black: 3G cellular antenna

Package Checklist

- ioPAC 5500 controller
- Serial cable: CBL-F9DPF1x4-BK-100
- Cellular 3G antenna: ANT-WCDMA-AHSM-04-2.5m black
- Documentation and software CD

Smart Remote I/O

Smart Remote I/O with Click&Go Plus Logic

	ioLogik 2542-HSPA	ioLogik 2542-GPRS	ioLogik 2542-WL1	ioLogik 2542	ioLogik 2512-HSPA	ioLogik 2512-GPRS	ioLogik 2512-WL1	ioLogik 2512
Inputs/Outputs								
Digital Inputs	–	–	–	–	8	8	8	8
Configurable DIOs	12	12	12	12	8	8	8	8
Analog Inputs	4	4	4	4	–	–	–	–
Cellular								
Band Options	UMTS/HSPA+: five-band 800/850/900/1900/2100 MHz GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz	GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz	–	–	UMTS/HSPA+: five-band 800/850/900/1900/2100 MHz GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz	GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz	–	–
WLAN								
Standard	–	–	IEEE 802.11a/b/g for Wireless LAN IEEE 802.11i for Wireless Security	–	–	–	IEEE 802.11a/b/g for Wireless LAN IEEE 802.11i for Wireless Security	–
Ethernet								
Ports (Connector)	4 switched ports, with 1 optimized port for faster downstream communications with up to 8 daisy-chained ioLogik E1200 units (RJ45)							
Speed	10/100 Mbps							
Protocols	Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, CGI, SNTP, SMTP							
Serial								
Ports (Connector)	2 (RJ45)							
Interface	RS-232/422/485 software-selectable							
Protocols	Modbus/RTU (master/gateway), serial tunnel mode (client/server)							
Environmental Limits								
Standard Operating Temp.	-10 to 60°C (14 to 140°F)							
Wide Operating Temp.	-30 to 70°C (-22 to 158°F)			-40 to 75°C (-40 to 167°F)	-30 to 70°C (-22 to 158°F)			-40 to 75°C (-40 to 167°F)
Storage Temp.	-40 to 85°C (-40 to 185°F)							
Ambient Relative Humidity	5 to 95% (non-condensing)							
Software								
Click&Go Plus	✓	✓	✓	✓	✓	✓	✓	✓
MX-AOPC UA Server	✓	✓	✓	✓	✓	✓	✓	✓
MX-AOPC UA Logger (Data Complement)	✓	✓	✓	✓	✓	✓	✓	✓
MXIO	✓	✓	✓	✓	✓	✓	✓	✓
IOxpress	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications								
Safety	UL 508							
EMC	EN 55022; EN 55024; EN 61000-6-2; EN 61000-6-4							
EMI	CISPR 22, FCC Part 15B Class A							
EMS	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8							
Shock	IEC 60068-2-27							
Vibration	IEC 60068-2-6							
Radio	R&TTE; NCC		R&TTE; NCC; VCCI	–	R&TTE; NCC		R&TTE; NCC; VCCI	–
Hazardous Location	Class I Division 2, ATEX Zone 2							
Green Product	RoHS, CRoHS, WEEE							
Reliability								
Warranty	5 years							
Page	16-4	16-4	16-4	16-13	16-4	16-4	16-4	16-13

Smart Remote I/O with Click&Go Logic

	ioLogik E2210	ioLogik E2212	ioLogik E2214	ioLogik E2240	ioLogik E2242	ioLogik E2260	ioLogik E2262	ioLogik W5340-HSPA
Inputs/Outputs								
Digital Inputs	12	8	6	–	–	–	–	–
Digital Outputs	8	8	–	–	–	4	4	–
Relays	–	–	6	–	–	–	–	2
Configurable DIOs	–	4	–	–	12	–	–	8
Analog Inputs	–	–	–	8	4	–	–	4
Analog Outputs	–	–	–	2	–	–	–	–
RTDs	–	–	–	–	–	6	–	–
Thermocouples	–	–	–	–	–	–	8	–
Ethernet								
Ports (Connector)	1 (RJ45)							1, with up to 3 ioLogik E1200 units daisy-chained (RJ45)
Speed	10/100 Mbps							
Protocols	Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, CGI, SNTP, SMTP							Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, SNTP, SMTP
Serial								
Ports (Connector)	1 (Euroblock terminal)							1 (DB9 male or Euroblock terminal)
Interface	RS-485							RS-232/422/485 software-selectable
Protocols	Modbus/RTU (gateway)							Modbus/RTU (master/gateway), serial tunnel mode (client/server)
Environmental Limits								
Standard Operating Temp.	-10 to 60°C (14 to 140°F)							-10 to 55°C (14 to 131°F)
Wide Operating Temp.	-40 to 75°C (-40 to 167°F)							-30 to 70°C (-22 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)							
Ambient Relative Humidity	5 to 95% RH (non-condensing)							
Software								
Click&Go	✓	✓	✓	✓	✓	✓	✓	✓
Active OPC Server	✓	✓	✓	✓	✓	✓	✓	✓
MX-AOPC UA Server	✓	✓	✓	✓	✓	✓	✓	✓
DA-Center (Data Complement)	–	–	–	–	–	–	–	✓
MXIO	✓	✓	✓	✓	✓	✓	✓	✓
ioAdmin	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications								
Safety	UL 508							
EMC	EN 61000-6-2; EN 61000-6-4							
EMI	CISPR 22, FCC Part 15B Class A							
EMS	EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-8							
Shock	IEC 60068-2-27							
Vibration	IEC 60068-2-6							
Radio	–	–	–	–	–	–	–	R&TTE; NCC
Green Product	RoHS, CRoHS, WEEE							
Reliability								
Warranty	5 years	5 years	2 years*	5 years	5 years	5 years	5 years	2 years*
Page	16-18	16-18	16-18	16-18	16-18	16-18	16-18	16-9

*Because of the limited lifetime of power relays, products using that component are covered by a 2-year warranty.

ioLogik 2500 HSPA/GPRS/WLAN Series

Smart wireless remote I/O with Click&Go Plus Logic

- Front-end intelligence with Click&Go Plus control logic, up to 48 rules
- Using Cellular Data Access software, SCADA systems can directly communicate with cellular devices hidden behind private IP addresses
- Active communication with MX-AOPC UA Server
- Automatically complement disconnection period data with MX-AOPC UA Logger software
- 4-port unmanaged switch built in for linking to Ethernet devices
- I/O expansion port for daisy chaining up to 8 ioLogik E1200 units
- 3-in-1 RS-232/422/485 serial port for connecting to serial devices in the field
- Simplify I/O management with MXIO library for Windows or Linux
- Wide operating temperature range of -30 to 70°C (-22 to 158°F)

CLICK&GO LOGIC

Introduction

The ioLogik 2500 is a smart remote I/O product with unique hardware and software designs, making it an ideal solution for a variety of industrial data acquisition applications.

The ioLogik 2500 HSPA/GPRS series features dual SIM failover, 3-step cellular reconnection, and dynamic IP access. The WLAN series features 802.11a/b/g reliable wireless communication.

The ioLogik 2500's hardware design includes a 4-port unmanaged Ethernet switch and 2 serial ports, enabling the ioLogik 2500 to seamlessly connect to a variety of field devices. One of the Ethernet ports can be used to link to 8 daisy-chained ioLogik E1200 expansion modules to provide more than 100 channels. The ioLogik 2500 acts as the "head" unit, with Click&Go Plus logic used to control the entire I/O array. Most importantly, the ioLogik 2500's single IP is all that's required to connect the entire I/O array to your network, providing the perfect solution for industrial field sites that have an insufficient number of IP addresses.

Dual SIM Failover

The ioLogik 2500 HSPA/GPRS series has dual SIM slots for inserting SIM cards from different carriers. It can switch over to a different carrier automatically when one of the cellular networks gets disconnected, ensuring that your device will always be online.

3-step Cellular Reconnection

If the cellular network is still disconnected after dual SIM failover, the ioLogik 2500 series will first try to reset the cellular modem, then reset the system software if it is still not working, and lastly reboot the entire system after being disconnected for a user-defined period of time.

Based on Moxa's experience, 90% of cellular connection issues can be solved by resetting the cellular modem. 3-step cellular reconnection not only helps prevent data and control loss, but also reduces your cost since your engineers won't need to make as many service calls to reboot devices located at remote sites.

Dynamic IP Access

Most carriers provide dynamic and private IP address SIM cards, and although private IP cards are cheaper, they cannot be used to provide direct access to the cloud. Moxa's Cellular Data Access software enables this type of connection by establishing a special data route between the ioLogik 2500 HSPA/GPRS series and the cloud. Only one public IP address is needed to use Moxa's Cellular Data Access software, allowing you to easily update internal register values, change output channel status, and modify the configurations of devices connected to an ioLogik 2500, all through the cloud.

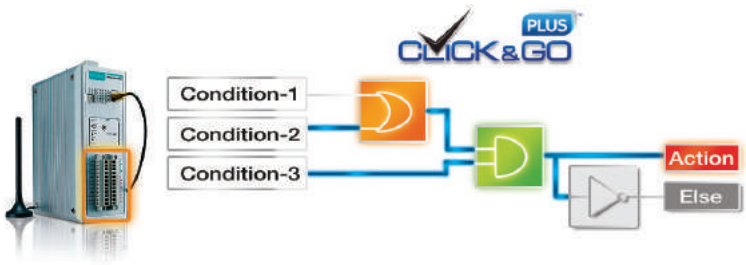
VPN—Build a Reliable and Secure Cellular Communication Network

For security purposes, the ioLogik 2500-GPRS/HSPA also supports IPSec for building a secure VPN tunnel to the host station. With the help of VPNs, cellular devices acting as a VPN client can initiate a connection with a VPN server. Once the connection is established, cellular devices can communicate with other network devices on the same private network.

Powerful Control Logic from the New Click&Go Plus™

The new Click&Go Plus™ control logic now supports up to 48 rules with further upgrades to 8 conditions/actions. In addition, its graphical user interface provides 3 logic gates and 3 multi-layers, helping you build more powerful and efficient IO solutions.

Once you finish setting up your Click&Go Plus™ logic rules, IOxpress's easy-to-use simulation function can be used to find potential errors in your Click&Go Plus™ rules before uploading them to your online devices.



One IP for Multiple Expansion I/Os Gives You a Smarter Data Acquisition Solution

The ioLogik 2500's unique IO expansion hardware design lets you link up to 8 ioLogik E1200 modules into a versatile I/O array with 100+ different I/O channels. The ioLogik 2500 acts as the perfect "head" unit, using Click&Go Plus logic to control the entire I/O array, and providing a single IP to connect the entire I/O array to your network.

ioLogik 2512 Specifications

Inputs and Outputs

Digital Inputs: 8 channels
Configurable DIOs (by software): 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 1.5 A per channel @ 25°C
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 500 mA per channel @ 25°C
DIO Output Leakage Current: < 1 mA @ 30 VDC

Power Requirements

Input Voltage: 9 to 48 VDC
Input Current:
• HSPA Model: 390 mA @ 24 VDC
• GPRS Model: 416 mA @ 24 VDC
• WL1 Model: 328 mA @ 24 VDC

MTBF (mean time between failures)

Time:
• HSPA model: 378,154 hrs
• GPRS model: 403,452 hrs
• WL1 model: 400,469 hrs
Standard: Telcordia SR332

ioLogik 2542 Specifications

Inputs and Outputs

Configurable DIOs (by software): 12 channels
Analog Inputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 6 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 1.5 A per channel @ 25°C
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 500 mA per channel @ 25°C
DIO Output Leakage Current: < 1 mA @ 30 VDC

Analog Input

Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: ±10 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
• ±0.1% FSR @ 25°C
• ±0.3% FSR @ -10 and 60°C
• ±0.5% FSR @ -30 and 70°C
Sampling Rate:
• All channels: 400 samples/sec
• Per channel: 100 samples/sec
Input Impedance: 1M ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements

Input Voltage: 9 to 48 VDC
Input Current:
• HSPA Model: 442 mA @ 24 VDC
• GPRS Model: 494 mA @ 24 VDC
• WL1 Model: 406 mA @ 24 VDC

MTBF (mean time between failures)

Time:
• HSPA model: 378,154 hrs
• GPRS model: 403,087 hrs
• WL1 model: 331,222 hrs
Standard: Telcordia SR332

Common Specifications

Cellular

Standards: GSM/GPRS/EDGE/UMTS/HSPA+
HSPA Model Band Options:
• UMTS/HSPA+: five-band 800/850/900/1900/2100 MHz
• GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz
GPRS Model Band Options: GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz
SIM Control Voltage: 3/1.8 V
SIM Format: Full size

WLAN

Standards:
• IEEE 802.11a/b/g for wireless LAN
• IEEE 802.11i for wireless security
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps

Operating Channels (central frequency):
• US: 2.412 to 2.462 GHz (11 channels), 5.18 to 5.24 GHz (4 channels)
• EU: 2.412 to 2.472 GHz (13 channels), 5.18 to 5.24 GHz (4 channels)
Security:
• 64-bit and 128-bit WEP encryption
• Full WPA/WPA2 Personal
Transmission Rates:
• 802.11b: 1, 2, 5.5, 11 Mbps
• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
TX Transmit Power:
• 802.11b: Typ. 18±1.5 dBm @ 1 to 11 Mbps
• 802.11g: Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 17±1.5 dBm @ 36 Mbps, Typ. 16±1.5 dBm @ 48 Mbps, Typ. 16±1.5 dBm @ 54 Mbps
• 802.11a: Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 Mbps, Typ. 15±1.5 dBm @ 48 Mbps, Typ. 14±1.5 dBm @ 54 Mbps
RX Sensitivity:
• 802.11b: -97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps
• 802.11g: -88 dBm @ 6 to 24 Mbps, -85 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
• 802.11a: -88 dBm @ 6 to 24 Mbps, -85 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

LAN

Ethernet:
• 4 switched 10/100 Mbps RJ45 ports
• 1 optimized port for faster downstream communications with daisy-chained ioLogik E1200 units
Note: The optimized daisy-chain port is not supported by the ioLogik E1261W-T, E1261H-T, or E1263H-T.
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, CGI, SNTP, SMTP

Serial

Interface: 2 RS-232/422/485 (software selectable) RJ45 ports
Parity: None, Odd, Even
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 2
Flow Control: None, RTS/CTS, XON/XOFF
Baudrate: 300 to 115200 bps
Protocols: Modbus/RTU (master/gateway), serial tunnel mode (client/server)

Physical Characteristics

Wiring: I/O cable, 14 AWG (max.)
Dimensions: 61 x 157 x 115 mm (2.4 x 6.18 x 4.53 in)
Weight: Under 1265 g (2.79 lb)
Mounting: DIN rail (standard), wall (optional)

Storage

Expansion Slot: Up to 32 GB microSD™ memory card (SDHC compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature SD cards are required.

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -30 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

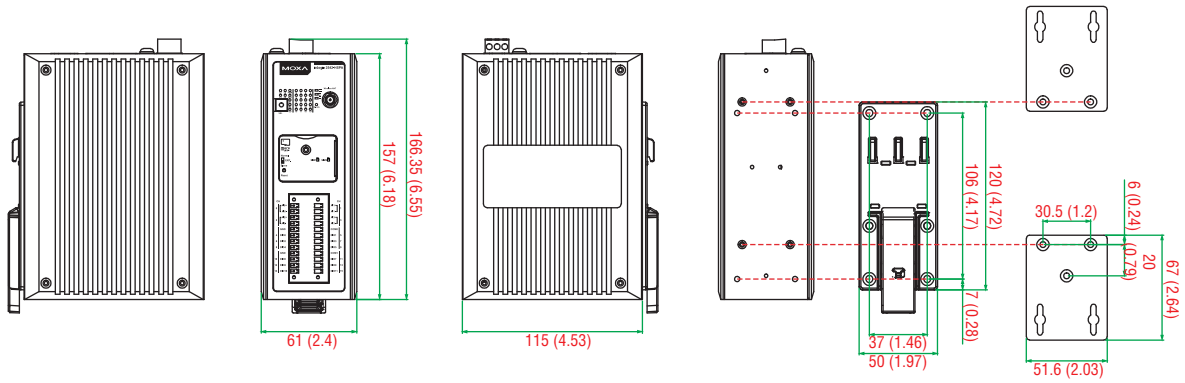
Safety: UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power 2 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Radio: R&TTE: EN 62311, EN 300 328, EN 301 489-1, EN 301 489-17, EN 301 893; NCC; VCCI
Hazardous Location: Class 1 Division 2; ATEX Zone 2
Green Product: RoHS, CRoHS, WEEE
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)



Ordering Information

Available Models

ioLogik 2512-GPRS: Smart GPRS remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -10 to 60°C operating temperature
ioLogik 2512-GPRS-T: Smart GPRS remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -30 to 70°C operating temperature
ioLogik 2512-HSPA: Smart HSPA remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -10 to 60°C operating temperature
ioLogik 2512-HSPA-T: Smart HSPA remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -30 to 70°C operating temperature
ioLogik 2512-WL1: Smart WLAN remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -10 to 60°C operating temperature
ioLogik 2512-WL1-T: Smart WLAN remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -30 to 70°C operating temperature
ioLogik 2542-GPRS: Smart GPRS remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik 2542-GPRS-T: Smart GPRS remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -30 to 70°C operating temperature
ioLogik 2542-HSPA: Smart HSPA remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik 2542-HSPA-T: Smart HSPA remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -30 to 70°C operating temperature
ioLogik 2542-WL1: Smart WLAN remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik 2542-WL1-T: Smart WLAN remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -30 to 70°C operating temperature

Optional Accessories (can be purchased separately)

WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws

Package Checklist

- ioLogik 2500
- RJ45-to-DB9 connection cables x 2
- Documentation and software CD
- Antennas x 1
- Hardware installation guide

ioLogik W5340-HSPA

Smart HSPA remote I/O with Click&Go Logic

- Front-end intelligence with patented Click&Go control logic, up to 24 rules
- Using Active OPC Server software, SCADA systems can directly communicate with cellular devices hidden behind private IP addresses
- Active communication with Active OPC Server
- Automatically complement disconnection period data with DA-Center software
- Daisy chain up to 3 ioLogik E1200 units
- 3-in-1 RS-232/422/485 serial port for connecting to serial devices in the field
- Supports SNMPv1/v2c
- Simplify I/O management with MXIO library for Windows or Linux platforms
- Wide operating temperature range of -30 to 70°C (-22 to 158°F)

CLICK&GO LOGIC

RoHS c UL us LISTED CE FC

Introduction

The ioLogik W5340-HSPA is a hardy, metal-encased remote I/O unit that combines an HSPA cellular modem, a remote I/O module, and a data logger for use in a wide variety of innovative I/O applications. The ioLogik W5340-HSPA also supports Moxa's patented Click&Go programming interface, giving engineers a powerful, simple tool that streamlines installation and setup into a nearly effortless process.

The ioLogik W5340-HSPA delivers local data logging in a storage space expandable up to 32 GB, and comes with Moxa's innovative, patented MX-AOPC UA Server or Active OPC Server software to transform network communications from centralized polling by the control system to event-based notifications that originate at the edge.

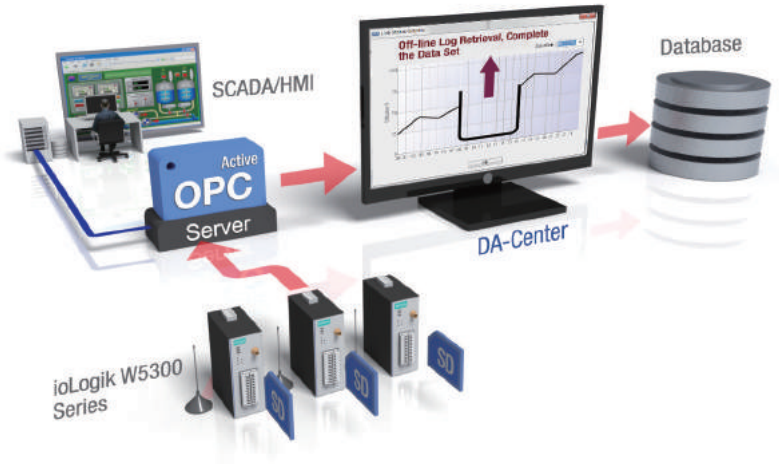
By eliminating constant polling, communications can be brought up to real-time speeds while reducing hardware costs and overall network overhead.

The ioLogik W5340-HSPA provides benefits beyond mere cellular connectivity and remote input/output management; it is an ideal solution for any number of industrial applications, including:

- Pipeline monitoring for water, oil, and gas facilities
- Pump station and lift station monitoring
- Environmental monitoring
- Security and surveillance

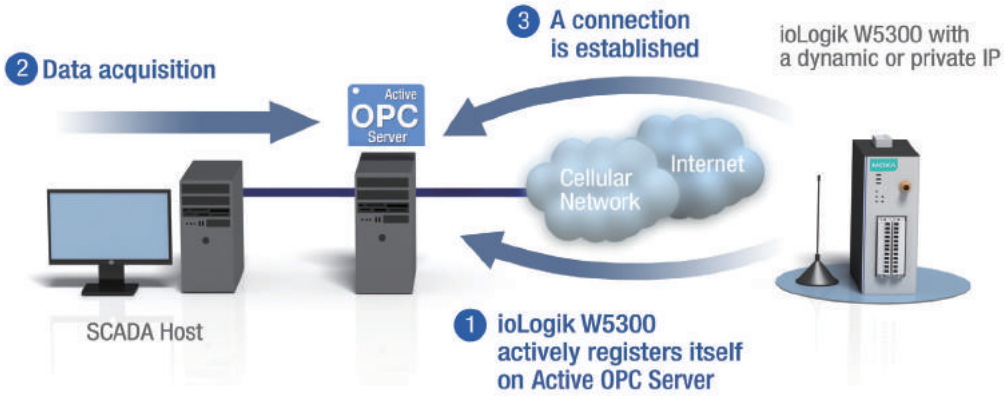
Automatic Data Updates from SD Cards Following Network Failures

When Active OPC Server is used in combination with DA-Center, then following any network failure an ioLogik W5340-HSPA remote client will, upon reconnecting, restore to the central database any data that was accumulated during the downtime. Following a network failure, DA-Center will compare received data stored in the database with the historical data stored locally on the ioLogik W5340-HSPA. If there are any gaps in the database record, DA-Center will restore the missing data by requesting re-transmission from the remote ioLogik client.



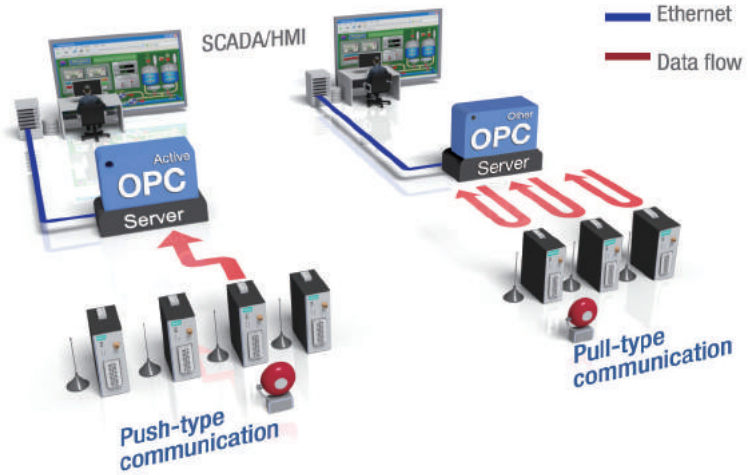
Dynamic IP Assignments

For most cellular solutions, each remote modem is assigned a static public IP when it first associates with a network, and this often causes big headaches when automating devices over cellular connections. Cellular network carriers charge higher monthly fees for static, public IPs than they do for dynamic, private IPs. Moxa's ioLogik W5340-HSPA and patented Active OPC Server allow users to implement dynamic IP assignments for the ioLogik W5340-HSPA. The ioLogik W5340-HSPA can automatically establish communications with the ioLogik W5340-HSPA Server using a fixed IP, and the Active OPC Server will receive and register the ioLogik W5300's IP address and receive or record tag updates accordingly.



Faster, More Accurate Serial Data Collection than Traditional Polling Architectures

The ioLogik W5340-HSPA is equipped with a 3-in-1 serial port that supports RS-232, RS-422, and RS-485, making it more convenient than ever (and saving users money) when connecting field serial devices. ioLogik W5340-HSPA remote I/O units can also create user-defined Modbus tags for conveniently ordering and storing data from remote meters and flow sensors, and then take the initiative to actively update the central MX-AOPC UA Server with the latest tagged data. This results in faster I/O response times and more accurate data collection. Finally, the ioLogik W5340-HSPA uses remote I/O methodology to build transparent serial tunnels for Modbus RTU communications over TCP/IP, allowing for direct connectivity between field devices and central control systems over either cellular wireless or wired Ethernet interfaces.



I/O Expandability

The ioLogik W5340-HSPA comes with a single RJ45 Ethernet port so that it can be linked together with Moxa's ioLogik E1200 units in a daisy-chain network, giving engineers a simple, cost-effective means of extending their I/O capabilities with full peer-to-peer communications. The ioLogik W5340-HSPA can support up to three ioLogik E1200 series I/O devices, which can then be installed to whichever locations are most convenient and effective for the needs of the local station.

Specifications

LAN
Ethernet: 1 10/100 Mbps RJ45 port, with up to 3 ioLogik E1200 units daisy-chained
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, SNTP

Serial
Interface: 1 RS-232/422/485 (software selectable) DB9 male or terminal block port
Parity: None, Odd, Even, Space, Mark
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 2
Flow Control: None, Hardware, XON/XOFF
Baudrate: 300 to 115200 bps
Protocols: Modbus/RTU (master/gateway), serial tunnel mode (client/server)

Inputs and Outputs
Configurable DIOs (by software): 8 channels
Relays: 2 channels
Analog Inputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 4 points per COM
Counter Frequency: 900 Hz
Digital Filtering Time Interval: Software configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 1 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 160°C (min.)
Current Rating: 200 mA per channel
DIO Output Leakage Current: 3.6 mA @ 24 VDC

Relay
Type: Form A (N.O.) power relay
Contact Current Rating: Resistive Load: 1 A @ 30 VDC, 250 VAC, 110 VAC
Initial Insulation Resistance: 1000 micro-ohms (min.) @ 500 VDC
Mechanical Endurance: 5,000,000 operations
Electrical Endurance: 600,000 operations @ 1 A resistive load
Contact Resistance: 100 milli-ohms (max.)
Pulse Output: 0.3 Hz at rated load
Note: Ambient humidity must be non-condensing and remain between 5 and 95%. The relays of the ioLogik W5340-HSPA may malfunction when operating in high condensation environments below 0° Celsius.

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: 0 to 10 V, ±10 V, ±5 V, 0 to 20 mA, 4 to 20 mA
Accuracy:
• ±0.1% FSR @ 25°C
• ±0.3% FSR @ -30 and 70°C
Sampling Rate:
All channels: 32 samples/sec
Per channel: 8 samples/sec
Single channel: 100 samples/sec
Input Impedance: 200k ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 196 mA @ 24 VDC

Physical Characteristics
Wiring: I/O cable, 14 AWG (max.)
Dimensions: 46.8 x 135 x 105 mm (1.84 x 5.31 x 4.13 in)
Weight: 495 g (1.09 lb)
Mounting: DIN rail (standard), wall (optional)

Storage
Expansion Slot: Up to 32 GB SD™ memory card (SD 2.0 compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide temperature SD cards are required.

Environmental Limits
Operating Temperature:
Standard Models: -10 to 55°C (14 to 131°F)
Wide Temp. Models: -30 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

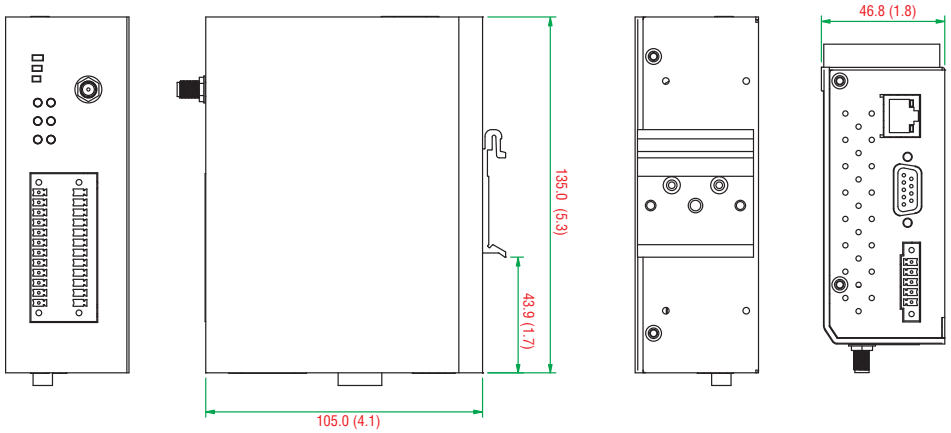
Standards and Certifications
Safety: UL 508, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: Signal: 3 V/m
IEC 61000-4-8 Magnetic Field: 1 A/m
Radio: R&TTE: EN 301 489-1, EN 301 489-7, EN 301 489-24, EN 301 511, EN 301 908-1; NCC
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: 280,739 hrs
Standard: Telcordia SR332

Warranty
Warranty Period: 2 years*
Details: See www.moxa.com/warranty
*Because of the limited lifetime of power relays, products that use that component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Front View | Side View | Rear View | Top View

Ordering Information

Available Models

ioLogik W5340-HSPA: Smart HSPA remote I/O with 8 DIOs, 2 relays, 4 AIs, -10 to 55°C operating temperature

ioLogik W5340-HSPA-T: Smart HSPA remote I/O with 8 DIOs, 2 relays, 4 AIs, -30 to 70°C operating temperature

Optional Accessories (can be purchased separately)

WK-46: DIN-rail/wall-mounting kit, 2 plates with 6 screws

Package Checklist

- ioLogik W5340-HSPA
- Five-band omnidirectional antenna for GSM/GPRS/UMTS/ HSPA/HSPA+, 4 dBi, magnetic SMA, 2.5 meters
- Documentation and software CD

ioLogik 2500 Ethernet Series

Smart Ethernet remote I/O with Click&Go Plus Logic

- Front-end intelligence with Click&Go Plus control logic, up to 48 rules
- Active communication with MX-AOPC UA Server
- Automatically complement disconnection period data with MX-AOPC UA Logger software
- 4-port unmanaged switch built in for linking to Ethernet devices
- I/O expansion port for daisy chaining up to 8 ioLogik E1200 units
- 3-in-1 RS-232/422/485 serial port for connecting to serial devices in the field
- Supports SNMPv1/v2c/v3
- Simplify I/O management with MXIO library for Windows or Linux platforms
- Wide operating temperature range of -40 to 75°C (-40 to 167°F)

Introduction

The ioLogik 2500 is a smart remote I/O product with unique hardware and software designs, making it an ideal solution for a variety of industrial data acquisition applications.

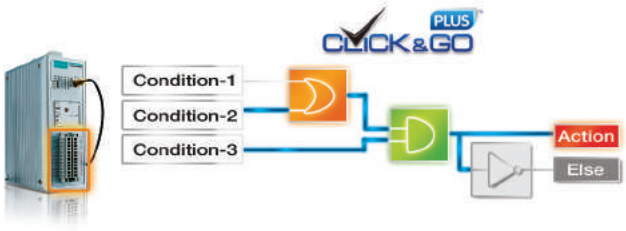
The ioLogik 2500's hardware design includes a 4-port unmanaged Ethernet switch and 2 serial ports, enabling the ioLogik 2500 to seamlessly connect to a variety of field devices. One of the Ethernet ports can be used to link to 8 daisy-chained ioLogik E1200 expansion modules to provide more than 100 channels. The ioLogik 2500 acts as the "head" unit, with Click&Go Plus logic used to control the entire I/O array. Most importantly, the ioLogik 2500's single IP is all that's required to connect the entire I/O array to your network, providing the perfect solution for industrial field sites that have an insufficient number of IP addresses.

Powerful Control Logic from the New Click&Go Plus™

The new Click&Go Plus™ control logic now supports up to 48 rules with further upgrades to 8 conditions/actions. In addition, its graphical user interface provides 3 logic gates and 3 multi-layers, helping you build more powerful and efficient IO solutions.

Once you finish setting up your Click&Go Plus™ logic rules, IOxpress's easy-to-use simulation function can be used to find potential errors in your Click&Go Plus™ rules before uploading them to your online devices.

Peer-to-peer (P2P) mode is widely used for industrial applications. Traditionally, you would need to use P2P devices on both sides of the connection. However, if a configuration mismatch occurred between the P2P devices, the P2P connection would fail, after which you would need to spend extra time and effort to check the P2P settings. With IOxpress, all you need to do is set up the output device, and the P2P connection will be established automatically.



One IP for Multiple Expansion I/Os Gives You a Smarter Data Acquisition Solution

The ioLogik 2500's unique IO expansion hardware design lets you link up to 8 ioLogik E1200 modules into a versatile I/O array with 100+ different I/O channels. The ioLogik 2500 acts as the perfect "head" unit, using Click&Go Plus logic to control the entire I/O array, and providing a single IP to connect the entire I/O array to your network.

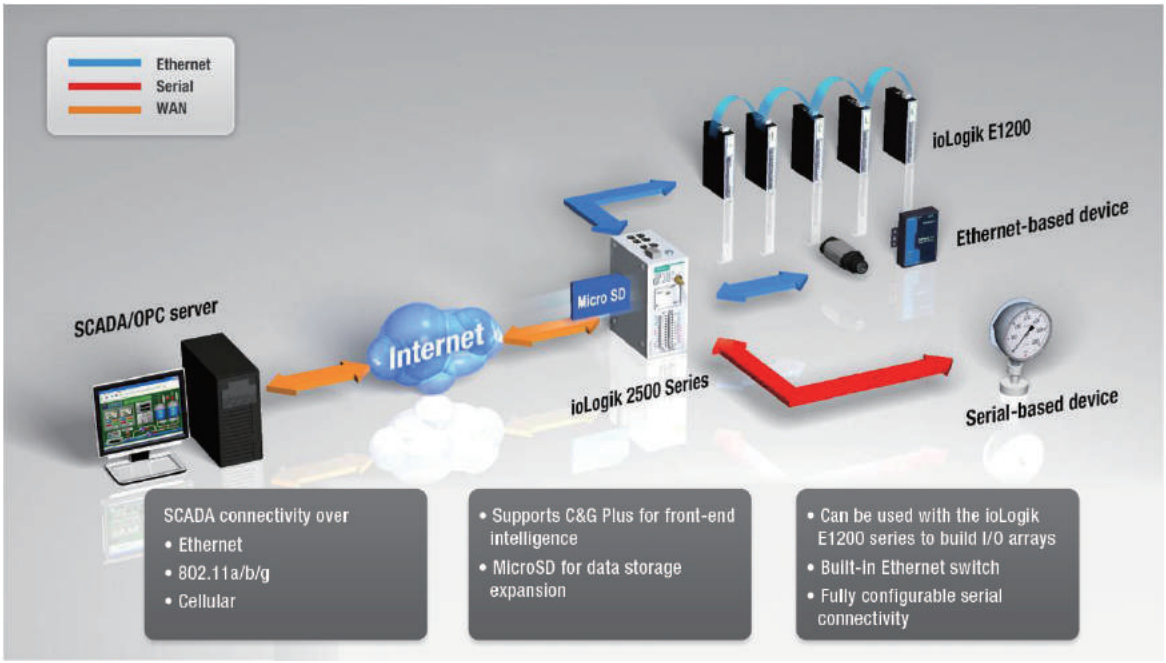
Powerful Datalogger and Value-added MODBUS Gateway

The ioLogik 2500 Series supports micro SD cards with up to 32 GB of memory, turning the ioLogik into a powerful datalogger for storing valuable data. And with a built-in FTP server, important data from field sites can be accessed remotely by different systems. In addition, the 2 serial communication ports can be used to input data from devices using the Modbus RTU protocol, and then transform the data into Modbus TCP or AOPC tag format before sending it out over the Ethernet network.

New MX-AOPC UA Server Efficiently Reduces System Response Time

The new MX-AOPC UA supports both UA server and DA server types. MX-AOPC UA server has a number of strengths. UA server provides a standard, state of the art security model, assuring your system's security, and supports communication channels via the standard UA TCP port. This means that messages can be relayed through third party proxies. In addition, configuring the firewall is be easier, since you won't need to worry about DCOM settings.

In addition, MX-AOPC supports both the traditional Modbus protocol and Moxa's patented Push type communication. Unlike the traditional passive "pull" method, "active" messages are automatically "pushed" from the ioLogik 2500 to the SCADA system when the I/O state changes or pre-configured events occur. In this way, information can be accurately and efficiently pushed to the SCADA system as it becomes available.



ioLogik 2512 Specifications

Inputs and Outputs
Digital Inputs: 8 channels
Configurable DIOs (by software): 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 1.5 A per channel @ 25°C
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 500 mA per channel @ 25°C
DIO Output Leakage Current: < 1 mA @ 30 VDC

Power Requirements
Input Voltage: 9 to 48 VDC
Input Current: 274 mA @ 24 VDC

MTBF (mean time between failures)
Time: 467,032 hrs
Standard: Telcordia SR332

ioLogik 2542 Specifications

Inputs and Outputs
Configurable DIOs (by software): 12 channels
Analog Inputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 6 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 1.5 A per channel @ 25°C
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 500 mA per channel @ 25°C
DIO Output Leakage Current: < 1 mA @ 30 VDC

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: ±10 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
• ±0.1% FSR @ 25°C
• ±0.3% FSR @ -10 and 60°C
• ±0.5% FSR @ -30 and 70°C
Sampling Rate:
• All channels: 400 samples/sec
• Per channel: 100 samples/sec
Input Impedance: 1 mega-ohm (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 9 to 48 VDC
Input Current: 358 mA @ 24 VDC

MTBF (mean time between failures)
Time: 375,439 hrs
Standard: Telcordia SR332

Common Specifications

LAN
Ethernet:
• 4 switched 10/100 Mbps RJ45 ports
• 1 optimized port for faster downstream communications with daisy-chained ioLogik E1200 units
Note: The optimized daisy-chain port is not supported by the ioLogik E1261W-T, E1261H-T, or E1263H-T.
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, CGI, SNTP, SMTP

Serial
Interface: 2 RS-232/422/485 (software selectable) RJ45 ports
Parity: None, Odd, Even
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 2
Flow Control: None, RTS/CTS, XON/XOFF
Baudrate: 300 to 115200 bps
Protocols: Modbus/RTU (master/gateway), serial tunnel mode (client/server)

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 61 x 157 x 115 mm (2.4 x 6.18 x 4.53 in)
Weight: Under 1265 g (2.79 lb)
Mounting: DIN-rail (standard), wall (with optional kit)

Storage
Expansion Slot: Up to 32 GB microSD™ memory card (SDHC compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature SD cards are required.

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -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)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
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
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, 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: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8

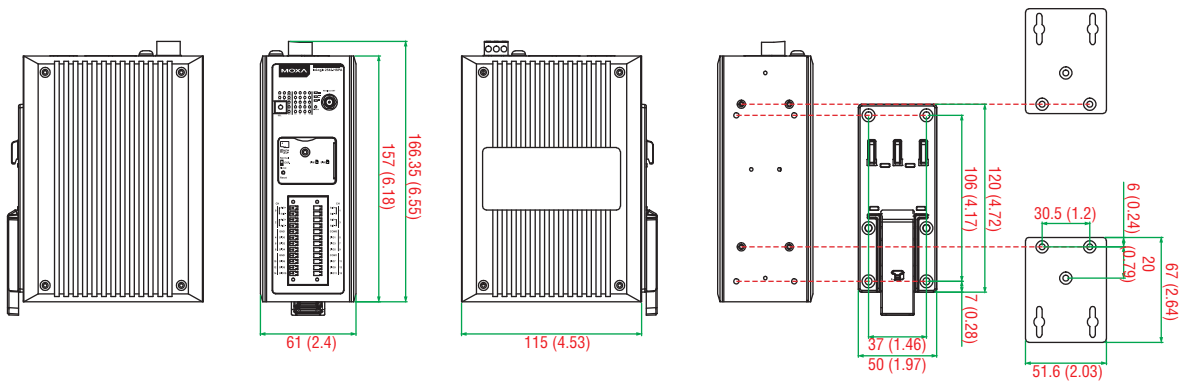
Hazardous Location: Class 1 Division 2; ATEX Zone 2
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

ioLogik 2512: Smart Ethernet remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -10 to 60°C operating temperature
ioLogik 2512-T: Smart Ethernet remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -40 to 75°C operating temperature
ioLogik 2542: Smart Ethernet remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik 2542-T: Smart Ethernet remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws

Package Checklist

- ioLogik 2500
- RJ45-to-DB9 connection cables x 2
- Documentation and software CD
- Hardware installation guide

ioLogik E2200 Series

Smart Ethernet remote I/O with Click&GO Logic

- Front-end intelligence with patented Click&Go control logic, up to 24 rules
- Active communication with MX-AOPC UA Server
- Save time and wiring cost with peer-to-peer communication
- Supports SNMPv1/v2c/v3
- Friendly configuration via web browser
- Simplify I/O management with MXIO library for Windows or Linux platforms
- Wide operating temperature range of -40 to 75°C (-40 to 167°F)

CLICK&GO™ LOGIC

RoHS c UL us LISTED CE FC

Introduction

Moxa's ioLogik E2200 Ethernet Remote I/O features the Click&Go programming interface. The ioLogik E2200 is a PC-based data acquisition and control device that uses proactive, event-based reporting to control I/O devices. Unlike traditional PLCs, which are passive and must poll for data, Moxa's ioLogik E2200 series will, when paired with our MX-AOPC UA Server, communicate with SCADA systems using active messaging that is pushed to the server only when state changes or configured events occur. Additionally, the ioLogik E2200 features SNMP for communications and control using an NMS (Network Management System), allowing IT professionals to configure the device to push I/O status reports according to configured specifications. This report-by-exception approach, which is new to PC-based monitoring, requires far less bandwidth than traditional polling methods.

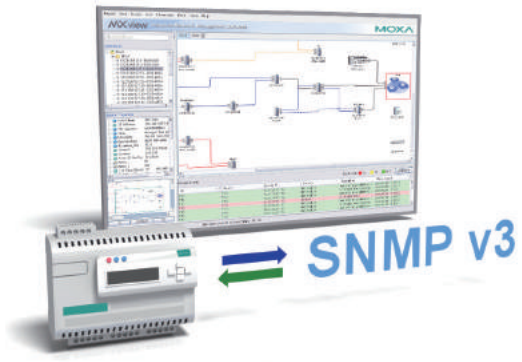
PC-Free Alarm and Control Intelligence

The ioLogik E2200 supports simple and powerful Click&Go™ technology to configure event-driven reports and alarms delivered over email, TCP/UDP, or SNMP traps, giving you a powerful effective, tool for delivering time-stamped status updates in real time.

With built-in Click&Go™ intelligence, the ioLogik E2200 can be configured for simple outputs paired up with simple input triggers without the need for a PC controller. This allows the ioLogik E2200 to be configured to automatically report I/O events according to user-specified conditions.

SNMP Protocol for Ethernet Device Management

In addition to Modbus/TCP, the ioLogik E2200 supports both SNMP and CGI scripting, giving IT engineers familiar tools for controlling and monitoring I/O systems. By using SNMP, IT engineers can configure the ioLogik E2200 to deliver alarms (traps) for specific I/O events, or use it to read or write directly to the I/O registers. For the strongest security, the ioLogik E2200 features SNMP v3, with authentication and encryption. With Moxa's SNMP-capable ioLogik E2200, even IT professionals can easily integrate industrial sensors and servos over an Ethernet backbone, and with its strong network management tools the ioLogik E2200 is ideal for a wide variety of industrial applications, whether in environmental monitoring, telecommunications, power production and delivery, or transportation.



Push Technology for Events and Alarms

The ioLogik E2200 series is designed for use with the Moxa's MX-AOPC UA server. When used with MX-AOPC UA Server, the E2200 is upgraded to use active push communications when communicating state changes and/or events to the SCADA system. Unlike a polling system, when using a push architecture for communications with the SCADA messages will only be delivered when state changes or configured events occur. Active messaging thus allows for big increases in data acquisition and control throughput while also delivering big reductions in network overhead.

ioLogik E2210 Specifications

Inputs and Outputs
Digital Inputs: 12 channels
Digital Outputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 12 points per COM
Counter Frequency: 900 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 1 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 200 mA per channel

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 190 mA @ 24 VDC

MTBF (mean time between failures)
Time: 213,673 hrs
Database: Telcordia SR332

ioLogik E2212 Specifications

Inputs and Outputs
Digital Inputs: 8 channels
Digital Outputs: 8 channels
Configurable DIOs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• OFF: 10 to 30 VDC
Common Type: 6 points per COM
Counter Frequency: 900 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 1 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 200 mA per channel

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 136 mA @ 24 VDC

MTBF (mean time between failures)
Time: 217,722 hrs
Database: Telcordia SR332

ioLogik E2214 Specifications

Inputs and Outputs
Digital Inputs: 6 channels
Relay Outputs: 6 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 3 points per COM
Counter Frequency: 900 Hz
Digital Filtering Time Interval: Software Configurable

Relay Output
Type: Form A (N.O.) power relay
Contact Current Rating:
• Inductive Load: 2 A @ 30 VDC, 250 VAC, 110 VAC
• Resistive Load: 5 A @ 30 VDC, 250 VAC, 110 VAC
Minimum permitted load: 1 A @ 5 VDC
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 1,000,000 operations
Electrical Endurance: 100,000 operations @ 5 A resistive load
Contact Resistance: 100 milli-ohms (max.)
Pulse Output: 0.3 Hz at rated load
Note: Ambient humidity must be non-condensing and remain between 5 and 95%. The relays of the ioLogik E2214 may malfunction when operating in high condensation environments below 0° Celsius.

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 170 mA @ 24 VDC

MTBF (mean time between failures)
Time: 307,239 hrs
Database: Telcordia SR332

ioLogik E2240 Specifications

Inputs and Outputs
Analog Inputs: 8 channels
Analog Outputs: 2 channels

Analog Input
Isolation: 3k VDC or 2k Vrms
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage/Current (software selectable)
Input Range: ±150 mV, ±500 mV, ±5 V, ±10 V, 0 to 20 mA, 4 to 20 mA
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Sampling Rate:
All channels:
• 10 samples/sec for voltage
• 6 samples/sec for current
Per channel:
• 1.25 samples/sec for voltage
• 0.75 samples/sec for current
Single channel:
• 1.25 samples/sec for voltage
• 0.75 samples/sec for current
Input Impedance: 900 kilo-ohms ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Analog Output
Resolution: 12 bits
Output Range: 0 to 10 V, 4 to 20 mA
Drive Voltage: 15 VDC for current output
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Load Resistor: Less than 250 ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 190 mA @ 24 VDC

MTBF (mean time between failures)
Time: 155,941 hrs
Standard: Telcordia SR332

ioLogik E2242 Specifications

Inputs and Outputs
Configurable DIOs (by software): 12 channels
Analog Inputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: Open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 6 points per COM
Isolation: 3k VDC or 2k Vrms
Counter Frequency: 900 Hz
Digital Filtering Time Interval: Software selectable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 1 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 200 mA per channel

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: ±150 mV, 0 to 150 mV, ±500 mV, 0 to 500 mV, ±5 V, 0 to 5 V, ±10 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA

Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Sampling Rate:
All channels: 32 samples/sec
Per channel: 8 samples/sec
Single channel: 100 samples/sec
Input Impedance: 200 kilo-ohms ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 178 mA @ 24 VDC

MTBF (mean time between failures)
Time: 204,391 hrs
Database: Telcordia SR332

ioLogik E2260 Specifications

Inputs and Outputs
Digital Outputs: 4 channels
RTDs: 6 channels
Isolation: 3k VDC or 2k Vrms

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 100 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C
Current Rating: 200 mA per channel

RTD
Sensor Type: PT50, PT100, PT200, PT500, PT1000; JPT100, JPT200, JPT500, JPT1000; NI100, NI120, NI200, NI500, NI1000; Resistance of 310, 620, 1250, and 2200 ohms
Input Connection: 2- or 3-wire
Sampling Rate:
All channels: 12 samples/sec
Per channel: 2 samples/sec
Resolution: 0.1°C or 0.1 ohm
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 95 mA @ 24 VDC

MTBF (mean time between failures)
Time: 327,282 hrs
Standard: Telcordia SR332

ioLogik E2262 Specifications

Inputs and Outputs
Digital Outputs: 4 channels
Thermocouples: 8 channels

Digital Output
Isolation: 3k VDC or 2k Vrms
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 100 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C
Current Rating: 200 mA per channel

Thermocouple
Sensor Type: J (0 to 750°C), K (-200 to 1250°C), T (-200 to 350°C), E (-200 to 900°C), R (-50 to 1600°C), S (-50 to 1760°C), B (600 to 1700°C), N (-200 to 1300°C)
Millivolt Type:
• Mode: ±78.126 mV, ±39.062 mV, ±19.532 mV
• Fault and over-voltage protection: -35 to +35 VDC (power off); -25 to +30 VDC (power on)
Sampling Rate:
All channels: 12 samples/sec
Per channel: 1.5 samples/sec
Resolution: 16 bits
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Input Impedance: 1 mega-ohm ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 160 mA @ 24 VDC

MTBF (mean time between failures)
Time: 341,063 hrs
Database: Telcordia SR332

Common Specifications

LAN
Ethernet: 1 10/100 Mbps RJ45 port
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, CGI, SNTP, SMTP

Serial
Interface: 1 RS-485-2w terminal block port
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocols: Modbus RTU (gateway)

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 115 x 79 x 45.6 mm (4.53 x 3.11 x 1.80 in)
Weight: under 250 g (0.55 lb)
Mounting: DIN-rail or wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -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)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

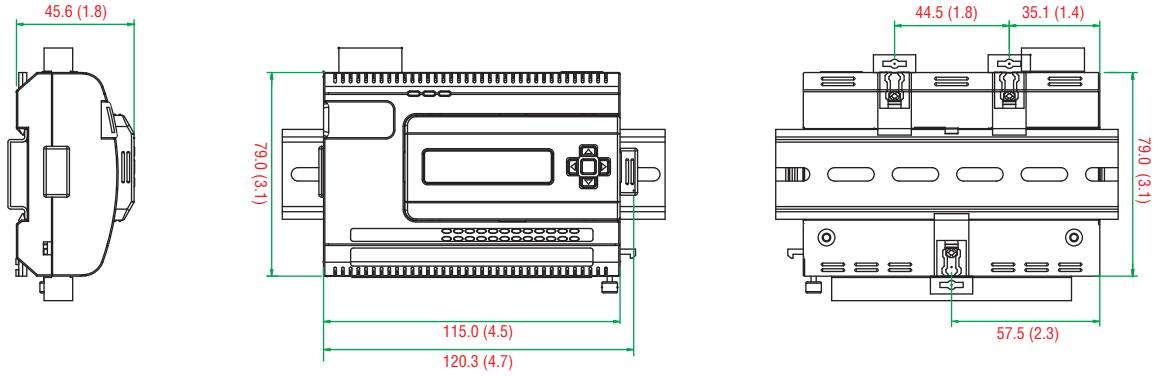
Safety: UL 508
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1 GHz: 10 V/m
1.4 GHz to 2 GHz: 3 V/m
2 GHz to 2.7 GHz: 1 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years (excluding ioLogik E2214*)
Details: See www.moxa.com/warranty
*Because of the limited lifetime of power relays, products that use that component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View

Ordering Information

Available Models

ioLogik E2210: Smart Ethernet Remote I/O with 12 DIs, 8 DOs, -10 to 60°C operating temperature
ioLogik E2210-T: Smart Ethernet Remote I/O with 12 DIs, 8 DOs, -40 to 75°C operating temperature
ioLogik E2212: Smart Ethernet Remote I/O with 8 DIs, 8 DOs, 4 DIOs, -10 to 60°C operating temperature
ioLogik E2212-T: Smart Ethernet Remote I/O with 8 DIs, 8 DOs, 4 DIOs, -40 to 75°C operating temperature
ioLogik E2214: Smart Ethernet Remote I/O with 6 DIs, 6 relays, -10 to 60°C operating temperature
ioLogik E2214-T: Smart Ethernet Remote I/O with 6 DIs, 6 relays, -40 to 75°C operating temperature
ioLogik E2240: Smart Ethernet Remote I/O with 8 AIs, 2 AOs, -10 to 60°C operating temperature
ioLogik E2240-T: Smart Ethernet Remote I/O with 8 AIs, 2 AOs, -40 to 75°C operating temperature
ioLogik E2242: Smart Ethernet Remote I/O with 12 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik E2242-T: Smart Ethernet Remote I/O with 12 DIOs, 4 AIs, -40 to 75°C operating temperature
ioLogik E2260: Smart Ethernet Remote I/O with 4 DOs, 6 RTDs, -10 to 60°C operating temperature
ioLogik E2260-T: Smart Ethernet Remote I/O with 4 DOs, 6 RTDs, -40 to 75°C operating temperature
ioLogik E2262: Smart Ethernet Remote I/O with 4 DOs, 8 TCs, and -10 to 60°C operating temperature
ioLogik E2262-T: Smart Ethernet Remote I/O with 4 DOs, 8 TCs, and -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

LDP1602: LCD module with 16 x 2 text and 5 buttons, 0 to 55°C operating temperature

Package Checklist

- ioLogik E2200
- Documentation and software CD

Remote I/O

Ethernet I/O

	ioLogik E1210	ioLogik E1211	ioLogik E1212	ioLogik E1214	ioLogik E1213**	ioLogik E1240	ioLogik E1241	ioLogik E1242	ioLogik E1260	ioLogik E1262
Input/Output										
Digital Inputs	16	–	8	6	4	–	–	4	–	–
Digital Outputs	–	16	–	–	4	–	–	–	–	–
Relays	–	–	–	6	–	–	–	–	–	–
Configurable DIOs	–	–	8	–	4	–	–	4	–	–
Analog Inputs	–	–	–	–	–	8	–	4	–	–
Analog Outputs	–	–	–	–	–	–	4	–	–	–
RTDs	–	–	–	–	–	–	–	–	6	–
Thermocouples	–	–	–	–	–	–	–	–	–	8
Ethernet										
Ports (Connector)	2 (RJ45)									
Speed	10/100 Mbps									
Switch (Daisy Chain)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Protocols	Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP, SNMP									
Environmental Limits										
Standard Models	-10 to 60°C (14 to 140°F)									
Wide Temp. Models	-40 to 75°C (-40 to 167°F)									
Storage Temperature	-40 to 85°C (-40 to 185°F)									
Operating Humidity	5 to 95% RH (non-condensing)									
Software										
Active OPC Server	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MX-AOPC UA Server	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MXIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ioSearch	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Peer-to-Peer	✓	✓	✓	✓	✓	✓	✓	✓	–	–
Standards and Certifications										
Safety	UL 508									
EMC	EN 55022, EN 55024									
EMI	CISPR 22, FCC Part 15B Class A									
EMS	EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-8									
Shock	IEC 60068-2-27									
Vibration	IEC 60068-2-6									
Hazardous Locations	Class 1 Division 2; ATEX Zone 2									
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Warranty	5 years	5 years	5 years	2 years*	5 years	5 years	5 years	5 years	5 years	5 years

*Because of the limited lifetime of power relays, products using that component are covered by a 2-year warranty.

**DO of ioLogik E1213 is source type

Ethernet I/O





	ioLogik E1261W-T	ioLogik E1263H-T	ioLogik E1261H-T	ioLogik E1510-M12-T	ioLogik E1512-M12-T
Input/Output					
Digital Inputs	–	–	–	12	4
Configurable DIOs	12	24	12	–	4
Analog Inputs	5	10	5	–	–
RTDs	3	3	3	–	–
Ethernet					
Ports (Connector)	1 (RJ45)	2 (RJ45)		1 (M12)	
Speed	10/100 Mbps				
Switch (Daisy Chain)	–	✓	✓	–	–
Protocols	Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP				
Environmental Limits					
Operating Temperature	-40 to 75°C (-40 to 167°F)			-40 to 85°C (-40 to 185°F)	
Storage Temperature	-40 to 85°C (-40 to 185°F)				
Operating Humidity	5 to 95% RH (non-condensing)				
Software					
Active OPC Server	✓	✓	✓	✓	✓
MX-AOPC UA Server	✓	✓	✓	✓	✓
MXIO	✓	✓	✓	✓	✓
ioSearch	✓	✓	✓	✓	✓
Standards and Certifications					
Safety	UL 508				
EMC	EN 55022, EN 55024			EN 61000-6-2, EN 61000-6-4	
EMI	CISPR 22, FCC Part 15B Class A				
EMS	EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-8				
Shock	IEC 60068-2-27				
Vibration	IEC 60068-2-6				
Rail Traffic	–	–	–	EN 50155; EN 50121-3-2; EN 50121-4	
Marine Communications	–	IEC 60945		–	–
Green Product	RoHS, CRoHS, WEEE				
Reliability					
Warranty	5 years				

RS-485 I/O

	ioLogik R1210	ioLogik R1212	ioLogik R1214	ioLogik R1240	ioLogik R1241
Input/Output					
Digital Inputs	16	8	6	–	–
Relays	–	–	6	–	–
Configurable DIOs	–	8	–	–	–
Analog Inputs	–	–	–	8	–
Analog Outputs	–	–	–	–	4
Serial					
Ports (Connector)	2 (5-wire Euroblock terminal)				
Interface	Dual RS-485				
Protocols	Modbus/RTU (slave)				
Environmental Limits					
Standard Models	-10 to 75°C (14 to 167°F)				
Wide Temp. Models	-40 to 85°C (-40 to 185°F)				
Storage Temperature	-40 to 85°C (-40 to 185°F)				
Operating Humidity	5 to 95% RH (non-condensing)				
Software					
MXIO	✓	✓	✓	✓	✓
ioSearch	✓	✓	✓	✓	✓
Standards and Certifications					
Safety	UL 508				
EMC	EN 55022, EN 55024				
EMI	CISPR 22, FCC Part 15B Class A				
EMS	EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-8				
Shock	IEC 60068-2-27				
Vibration	IEC 60068-2-6				
Green Product	RoHS, CRoHS, WEEE				
Reliability					
Warranty	5 years	5 years	2 years*	5 years	5 years

*Because of the limited lifetime of power relays, products using that component are covered by a 2-year warranty.

Modular I/O




	NA-4010	NA-4020	NA-4021	ioLogik E4200
Inputs/Outputs				
Digital Inputs	–	–	–	–
Digital Outputs	–	–	–	–
Analog Inputs	–	–	–	–
Analog Outputs	–	–	–	–
Ethernet				
Ports (connector)	1 (RJ45)	–	–	2 MACs (RJ45)
Speed	10/100 Mbps	–	–	10/100 Mbps
Protocols	Modbus/TCP (slave), BOOTP, HTTP	–	–	Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, SNTP
Serial				
Ports (connector)	–	1 (terminal block)	1 (DB9 female)	1 (DB9 male)
Interface	–	RS-485	RS-232	RS-232
Protocols	–	Modbus/RTU (slave), Modbus/ASCII (slave)		For Moxa OnCell only
Physical Characteristics				
I/O Module Slots	32	32	32	16
Environmental Limits				
Operating Temperature	-10 to 60°C (14 to 140°F)			
Storage Temperature	-40 to 85°C (-40 to 185°F)			
Ambient Relative Humidity	5 to 95% RH (non-condensing)			
Software				
Click&Go	–	–	–	✓
Active OPC Server	–	–	–	✓
MXIO	✓	✓	✓	✓
ioAdmin	✓	✓	✓	–
Modular ioAdmin	–	–	–	✓
Standards and Certifications				
Safety	UL 508			
EMC	EN 61000-6-2, EN 61000-6-4			
EMI	CISPR 22, FCC Part 15B Class A			
EMS	EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-8			
Shock	IEC 60068-2-27			
Vibration	IEC 60068-2-6			
Reliability				
Warranty	2 years	2 years	2 years	2 years

Digital I/O Modules

	M-1450	M-1451	M-1600	M-1601	M-1800	M-1801	M-2450	M-2600	M-2601	M-2800	M-2801
Inputs/Outputs											
Digital Inputs	4 (110 VAC)	4 (220 VAC)	16 (Sink)	16 (Source)	8 (Sink)	8 (Source)	–	–	–	–	–
Digital Outputs	–	–	–	–	–	–	–	16 (Sink)	16 (Source)	8 (Sink)	8 (Source)
Relays	–	–	–	–	–	–	4	–	–	–	–
Warranty	2 years										

Analog I/O Modules

	M-3802	M-3810	M-4402	M-4410	M-6200	M-6201
Inputs/Outputs						
Analog Inputs	8 (4 to 20 mA)	8 (00 to 10 V)	–	–	–	–
Analog Outputs	–	–	4 (4 to 20 mA)	4 (0 to 10 V)	–	–
RTDs	–	–	–	–	2	–
Thermocouples	–	–	–	–	–	2
Warranty	2 years					

Power Modules

	M-7001	M-7002	M-7804	M-7805
Power				
VDC	24	5/24/48	0	24
VAC	–	110/220	–	–
Purpose	System	Field	Field	Field
Warranty	2 years			

ioLogik E1200 Series

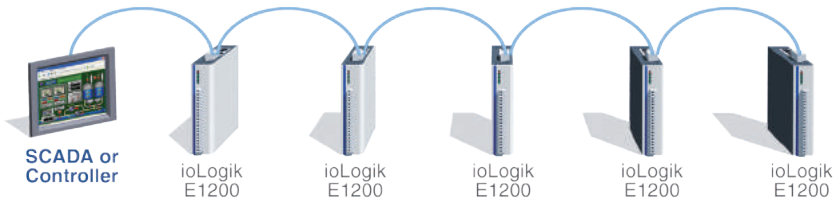
Ethernet remote I/O with 2-port Ethernet switch

- User-definable Modbus/TCP Slave addressing
- 2-port Ethernet switch for daisy-chain topologies
- Save time and wiring cost with peer-to-peer communications
- Active communications with MX-AOPC UA Server
- Supports SNMPv1/v2c
- Easy mass deployment and configuration with ioSearch utility
- Friendly configuration via web browser
- Simplify I/O management with MXIO library on either a Windows or Linux platform
- Class I Division 2, ATEX Zone 2 certification
- Wide operating temperature range: -40 to 75°C (-40 to 167°F)

Introduction

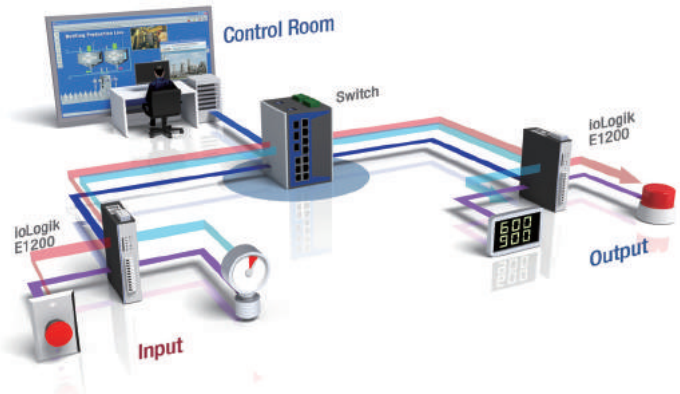
Daisy-Chained Ethernet I/O Connection

A new era of extensible Ethernet I/O arrays is here. The ioLogik E1200 industrial Ethernet remote I/O comes with two switched Ethernet ports to allow for the free flow of information downstream, to another local Ethernet device, or upstream, to a control server. Applications such as factory automation, security and surveillance systems, and tunnelled connections can make use of daisy-chained Ethernet for building multidrop I/O networks over standard Ethernet cables. Many industrial automation users are familiar with multidrop as the configuration most typically used in fieldbus solutions. The daisy-chain capabilities supported by ioLogik E1200 Ethernet remote I/O units not only increase the extensibility and installation possibilities for your remote I/O applications, but also lower overall costs by reducing the need for separate Ethernet switches. Daisy-chaining devices in this way will also reduce overall labor and cabling expenses. For example, if a production facility contains 700 stations with 20 I/O points per station, the savings on wiring costs can reach as much as 15% of the total expense.



Saving Time and Wiring Costs with Peer-to-Peer Communications

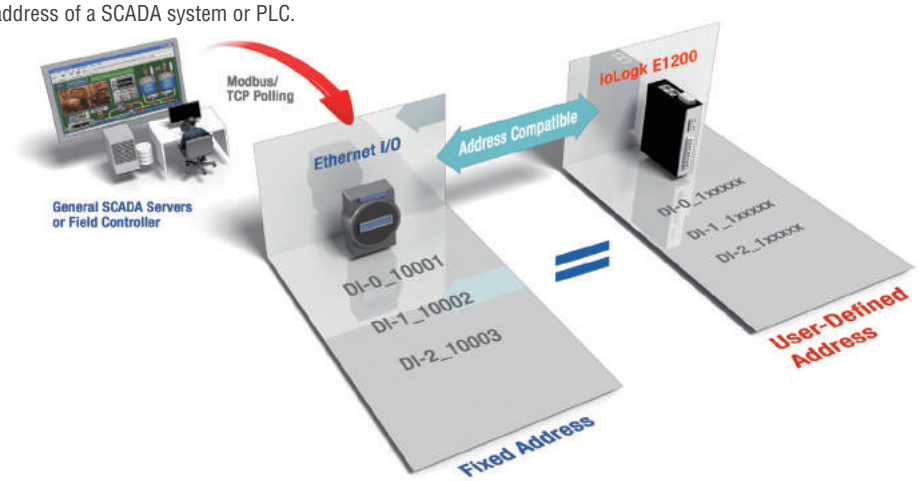
In remote automation applications, the control room and sensors are often far removed, making wiring over long distances a constant challenge. With peer-to-peer networking, users may now map a pair of ioLogik E1200 series modules so that input values will be directly transferred to output channels, greatly simplifying the wiring process and reducing wiring costs.



User-Definable Modbus/TCP Addressing for Painless Upgrading of Existing Systems

For Modbus devices that are controlled and detected by fixed addresses, users need to spend a vast amount of time researching and verifying initial configurations. Users need to locate each device's networking details, such as I/O channels or vendor-defined addresses, to enable the initial or start address of a SCADA system or PLC.

The ioLogik E1200, with user-definable Modbus/TCP addressing, offers greater flexibility, and setup is easy. Instead of worrying about individual devices, users simply configure the function and address map to fit their needs.



ioLogik E1210 Specifications

Inputs and Outputs

Digital Inputs: 16 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

Power Requirements

Input Voltage: 12 to 36 VDC
Input Current: 110 mA @ 24 VDC

MTBF (mean time between failures)

Time: 671,345 hrs
Standard: Telcordia SR332

ioLogik E1211 Specifications

Inputs and Outputs

Digital Outputs: 16 channels
Isolation: 3k VDC or 2k Vrms

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Power Requirements

Input Voltage: 12 to 36 VDC
Input Current: 200 mA @ 24 VDC

MTBF (mean time between failures)

Time: 923,027 hrs
Standard: Telcordia SR332

ioLogik E1212 Specifications

Inputs and Outputs

Digital Inputs: 8 channels
Configurable DIOs (by jumper): 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Power Requirements

Input Voltage: 12 to 36 VDC
Input Current: 155 mA @ 24 VDC

MTBF (mean time between failures)

Time: 561,930 hrs
Standard: Telcordia SR332

ioLogik E1213 Specifications

Inputs and Outputs
Digital Inputs: 8 channels
Digital Outputs: 4 channels
Configurable DIOs (by jumper): 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 12 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

Digital Output
Type: Source
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 41 VDC
Over-current Protection: 1.5 A per channel @ 25°C
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 500 mA per channel

Power Requirements
Output Voltage Rating: 15 to 30 VDC (12 or 9 VDC configurable by jumper on the 4 DO channels)
Input Voltage: 12 to 36 VDC
Input Current: 130 mA @ 24 VDC

MTBF (mean time between failures)
Time: 715,256 hrs
Standard: Telcordia SR332

ioLogik E1214 Specifications

Inputs and Outputs
Digital Inputs: 6 channels
Relays: 6 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 6 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

Relay
Type: Form A (N.O.) power relay
Contact Current Rating:
Resistive Load: 5 A @ 30 VDC, 250 VAC, 110 VAC
Breakdown Voltage: 500 VAC
Relay On/Off Time: 1500 ms (max.)
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 5,000,000 operations
Electrical Endurance: 100,000 operations @ 5 A resistive load
Contact Resistance: 100 milli-ohms (max.)
Pulse Output: 0.3 Hz at rated load
Note: Ambient humidity must be non-condensing and remain between 5 and 95%. The relays of the ioLogik E1214 may malfunction when operating in high condensation environments below 0°C.

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 188 mA @ 24 VDC

MTBF (mean time between failures)
Time: 808,744 hrs
Standard: Telcordia SR332

ioLogik E1240 Specifications

Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (jumper selectable)
Input Range: 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
• Only one channel enabled: 12 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 121 mA @ 24 VDC

MTBF (mean time between failures)
Time: 474,053 hrs
Standard: Telcordia SR332

ioLogik E1241 Specifications

Inputs and Outputs
Analog Outputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Analog Output
Resolution: 12 bits
Output Range: 0 to 10 VDC, 4 to 20 mA
Drive Voltage: 10 mA (max.)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Load Resistor: Internal register, 400 ohms
Note: 24 V of external power required when loading exceeds 1000 ohms.

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 194 mA @ 24 VDC

MTBF (mean time between failures)
Time: 888,656 hrs
Standard: Telcordia SR332

ioLogik E1242 Specifications

Inputs and Outputs
Digital Inputs: 4 channels
Configurable DIOs (by jumper): 4 channels
Analog Inputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 4 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (jumper selectable)
Input Range: 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 3 samples/sec
• Only one channel enabled: 12 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 139 mA @ 24 VDC

MTBF (mean time between failures)
Time: 502,210 hrs
Standard: Telcordia SR332

ioLogik E1260 Specifications

Inputs and Outputs
RTDs: 6 channels
Isolation: 3k VDC or 2k Vrms

RTD
Sensor Type:
• PT50, PT100, PT200, PT500 (-200 to 850°C)
• PT1000 (-200 to 350°C)
• Resistance of 310, 620, 1250, and 2200 ohms
Input Connection: 2- or 3-wire
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 2 samples/sec
• Only one channel enabled: 12 samples/sec
Resolution: 0.1°C or 0.1 ohm
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 110 mA @ 24 VDC

MTBF (mean time between failures)
Time: 660,260 hrs
Standard: Telcordia SR332

ioLogik E1262 Specifications

Inputs and Outputs
Thermocouples: 8 channels
Isolation: 3k VDC or 2k Vrms

Thermocouple
Sensor Type: J (0 to 750°C), K (-200 to 1250°C), T (-200 to 350°C), E (-200 to 900°C), R (-50 to 1600°C), S (-50 to 1760°C), B (600 to 1700°C), N (-200 to 1300°C)
Millivolt Type:
• Mode: ±78.126 mV, ±39.062 mV, ±19.532 mV
• Fault and over-voltage protection:
-35 to +35 VDC (power off)
-25 to +30 VDC (power on)
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
• Only one channel enabled: 12 samples/sec
Resolution: 16 bits
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Input Impedance: 10 mega-ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 118 mA @ 24 VDC

MTBF (mean time between failures)
Time: 631,418 hrs
Standard: Telcordia SR332

Common Specifications

LAN
Ethernet: 2 switched 10/100 Mbps RJ45 ports
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 27.8 x 124 x 84 mm (1.09 x 4.88 x 3.31 in)
Weight: Under 200 g (0.44 lb)
Mounting: DIN rail or wall

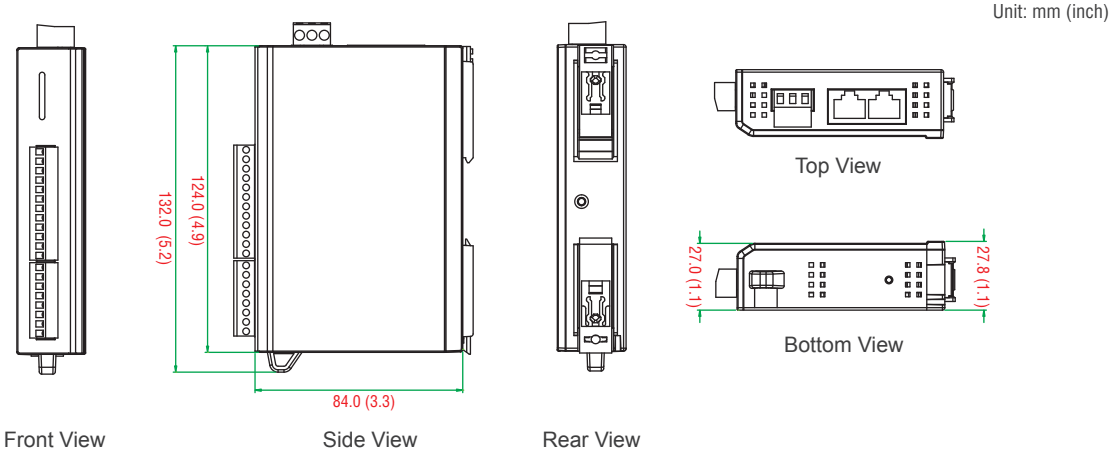
Environmental Limits
Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications
Safety: UL 508
EMC: EN 55022, EN 55024
EMI: CISPR 22, 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: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Hazardous Location: Class 1 Division 2, ATEX Zone 2
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty
Warranty Period: 5 years (excluding the ioLogik E1214)
Details: See www.moxa.com/warranty
Note: Because of the limited lifetime of power relays, products that use this component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Ordering Information

Available Models
ioLogik E1210: Ethernet remote I/O with 2-port Ethernet switch, 16 DIs, -10 to 60°C operating temperature
ioLogik E1210-T: Ethernet remote I/O with 2-port Ethernet switch, 16 DIs, -40 to 75°C operating temperature
ioLogik E1211: Ethernet remote I/O with 2-port Ethernet switch, 16 DOs, -10 to 60°C operating temperature
ioLogik E1211-T: Ethernet remote I/O with 2-port Ethernet switch, 16 DOs, -40 to 75°C operating temperature
ioLogik E1212: Ethernet remote I/O with 2-port Ethernet switch, 8 DIs, 8 DIOs, -10 to 60°C operating temperature
ioLogik E1212-T: Ethernet remote I/O with 2-port Ethernet switch, 8 DIs, 8 DIOs, -40 to 75°C operating temperature
ioLogik E1213: Ethernet remote I/O with 2-port Ethernet switch, 8 DIs, 4 DOs, 4 DIOs, source-type DO, -10 to 60°C operating temperature
ioLogik E1213-T: Ethernet remote I/O with 2-port ethernet switch, 8 DIs, 4 DOs, 4 DIOs, source-type DO, -40 to 75°C operating temperature
ioLogik E1214: Ethernet remote I/O with 2-port Ethernet switch, 6 DIs, 6 relays, -10 to 60°C operating temperature
ioLogik E1214-T: Ethernet remote I/O with 2-port Ethernet switch, 6 DIs, 6 relays, -40 to 75°C operating temperature
ioLogik E1240: Ethernet remote I/O with 2-port Ethernet switch, 8 AIs, -10 to 60°C operating temperature
ioLogik E1240-T: Ethernet remote I/O with 2-port Ethernet switch, 8 AIs, -40 to 75°C operating temperature
ioLogik E1241: Ethernet remote I/O with 2-port Ethernet switch, 4 AOs, -10 to 60°C operating temperature
ioLogik E1241-T: Ethernet remote I/O with 2-port Ethernet switch, 4 AOs , -40 to 75°C operating temperature
ioLogik E1242: Ethernet remote I/O with 2-port Ethernet switch, 4 DIs, 4 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik E1242-T: Ethernet remote I/O with 2-port Ethernet switch, 4 DIs, 4 DIOs, 4 AIs, -40 to 75°C operating temperature
ioLogik E1260: Ethernet remote I/O with 2-port Ethernet switch, 6 RTDs, -10 to 60°C operating temperature
ioLogik E1260-T: Ethernet remote I/O with 2-port Ethernet switch, 6 RTDs, -40 to 75°C operating temperature
ioLogik E1262: Ethernet remote I/O with 2-port Ethernet switch, 8 TCs, -10 to 60°C operating temperature
ioLogik E1262-T: Ethernet remote I/O with 2-port Ethernet switch, 8 TCs, -40 to 75°C operating temperature

Package Checklist
- ioLogik E1200
- Documentation and software CD
- Quick installation guide (printed)

ioLogik E1261W-T

Ethernet remote I/O for wind power applications

- **User-definable Modbus/TCP Slave addressing**
- **Active communications with MX-AOPC UA Server**
- **Easy mass deployment and configuration with ioSearch utility**
- **Friendly configuration via web browser**
- **Simplify I/O management with MXIO library on either Windows or Linux platform**
- **Wide operating temperature range: -40 to 75°C (-40 to 167°F)**

Introduction

Moxa's ioLogik E1261W-T is designed for Ethernet-based remote condition monitoring systems. With 3 RTD, 5 AI, and 12 DIO channels, the ioLogik E1261W-T's I/O combination is ideal for monitoring wind turbines and environmental conditions. Unlike other remote I/O products, which are passive and must poll for data, the ioLogik E1261W-T supports active communication with Moxa's MX-AOPC UA Server to enable real time communications capabilities with remote monitoring and control systems.

Specifications

LAN

Ethernet: 1 10/100 Mbps RJ45 port
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP

Serial

Interface: 1 RS-485-2w terminal block port
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocols: Modbus RTU (slave)

Inputs and Outputs

Configurable DIOs (by software): 12 channels
Analog Inputs: 5 channels
RTDs: 3 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 12 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channe

Analog Input

Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
• ±0.1% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 2.4 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

RTD

Sensor Type: PT100 (-200 to 850°C)
Input connection: 2- or 3-wire
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 4 samples/sec
Resolution: 16 bits
Accuracy:
• ±0.1% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms (min.)

Power Requirements

Input Voltage: 12 to 36 VDC
Input Current: 143 mA @ 24 VDC

Physical Characteristics

Wiring: I/O cable, 14 AWG (max.)
Dimensions: 115 x 79 x 40.4 mm (4.53 x 3.11 x 1.59 in)
Weight: Under 250 g (0.55 lb)
Mounting: DIN-rail or wall

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)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, 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: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

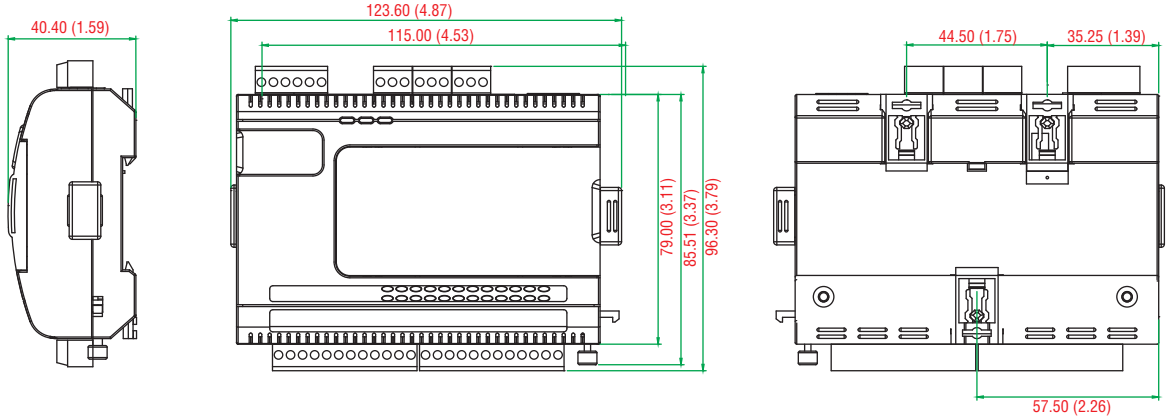
Time: 367,508 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View

Ordering Information

Available Models

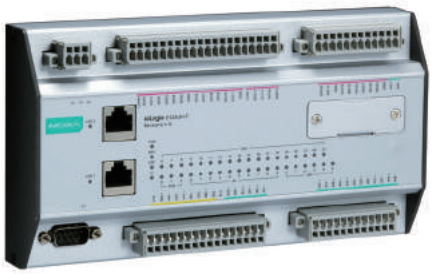
ioLogik E1261W-T: Ethernet remote I/O with 12 DIOs, 5 AIs, 3 RTDs, -40 to 75°C operating temperature

Package Checklist

- ioLogik E1261W-T
- Documentation and software CD
- Quick installation guide (printed)

ioLogik E1200H Series

Ethernet remote I/O for offshore wind power applications



- User-definable Modbus/TCP Slave addressing
- 2-port Ethernet switch for daisy-chain topologies
- Active communications with MX-AOPC UA Server
- Easy mass deployment and configuration with ioSearch utility
- Friendly configuration via web browser
- Simplify I/O management with MXIO library on either Windows or Linux platform
- IEC 60945 approval for harsh offshore environments
- Wide operating temperature range: -40 to 75°C (-40 to 167°F)

Introduction

Industry-Proven Rugged Design

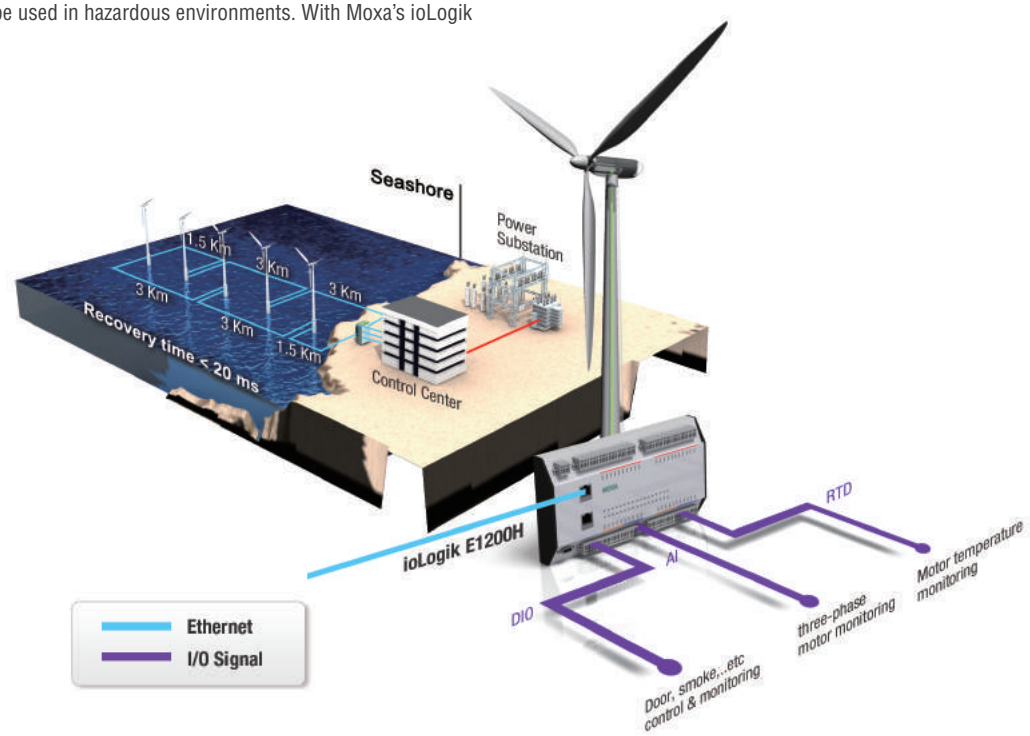
Installation of remote Ethernet I/O in offshore environments is a real challenge. It is critical to find devices properly designed for protected, safe use in these environments. Moxa's ioLogik E1200H series with IEC 60945 certifications fulfills the need for devices suitable for such demanding industrial applications. Compactly packaged in a metal housing, this rugged hardware supports operating temperatures ranging from -40 to 75°C, meeting the stringent demands of IEC 60945 for harsh offshore applications.

Daisy-Chain Topology Reduces Deployment Costs

Thanks to its two embedded Ethernet switch ports, the ioLogik E1200H remote Ethernet I/O allows you to create daisy-chain topologies for easy cabling. 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 the ioLogik E1200H series allows ioLogik E1200H units to connect in series either to each other or to other nearby Ethernet devices, drastically saving on both space and wiring costs.

Application: Offshore Remote Monitoring

Have you ever wondered where to find a rugged remote Ethernet I/O device for offshore facilities? You need something with the ability to withstand extreme weather conditions, wide temperature changes, and that can be used in hazardous environments. With Moxa's ioLogik E1200H, you get a robust design that will meet your most stringent demands, ensuring your remote data acquisition applications are reliable, consistent, and safe.



ioLogik E1261H Specifications

Inputs and Outputs

Configurable DIOs (by software): 12 channels
Analog Inputs: 5 channels
RTDs: 3 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter (channels 0 to 3)
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 12 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output (channels 0 to 3)
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Analog Input

Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: 0 to 10 V, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
• ±0.5% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°
Sampling Rate (all channels):
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

RTDs

Sensor Type:
PT100 (-200 to 850°C)
Input Connection: 2- or 3-wire
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
Resolution: 0.5°C
Accuracy:
• ±0.5% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 235 mA @ 24 VDC

Physical Characteristics

Dimensions: 140 x 113 x 36.3 mm (5.51 x 4.45 x 1.43 in)
Weight: 825 g (1.82 lb)

MTBF (mean time between failures)

Time: 296,094 hrs
Standard: Telcordia SR332

ioLogik E1263H Specifications

Inputs and Outputs
Configurable DIOs (by software): 24 channels
Analog Inputs: 10 channels
RTDs: 3 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter (channels 0 to 7)
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 12 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output (channels 0 to 7)
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: 0 to 10 V, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
• ±0.5% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°
Sampling Rate (all channels):
• All channels: 12 samples/sec
• Per channel: 0.9 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

RTDs
Sensor Type:
• PT100 (-200 to 850°C)
Input connection: 2- or 3-wire
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 0.9 samples/sec
Resolution: 0.5°C
Accuracy:
• ±0.5% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 343 mA @ 24 VDC

Physical Characteristics
Dimensions: 204 x 113 x 36.3 mm (8.03 x 4.45 x 1.43 in)
Weight: 945 g (2.08 lb)

MTBF (mean time between failures)
Time: 180,390 hrs
Standard: Telcordia SR332

Common Specifications

LAN
Ethernet: 2 switched 10/100 Mbps RJ45 ports
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP

Serial
Interface: 1 RS-232/422/485 (software selectable) DB9 male port
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 300 to 115200 bps
Protocols: Modbus RTU (slave)

Physical Characteristics
Wiring: I/O cable max. 14 AWG
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)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

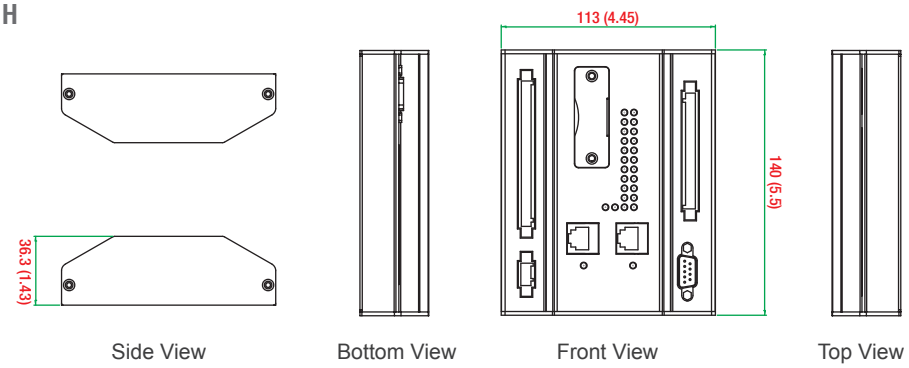
Standards and Certifications
Safety: UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Maritime: IEC 60945
Green Product: RoHS, CRoHS, WEEE
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

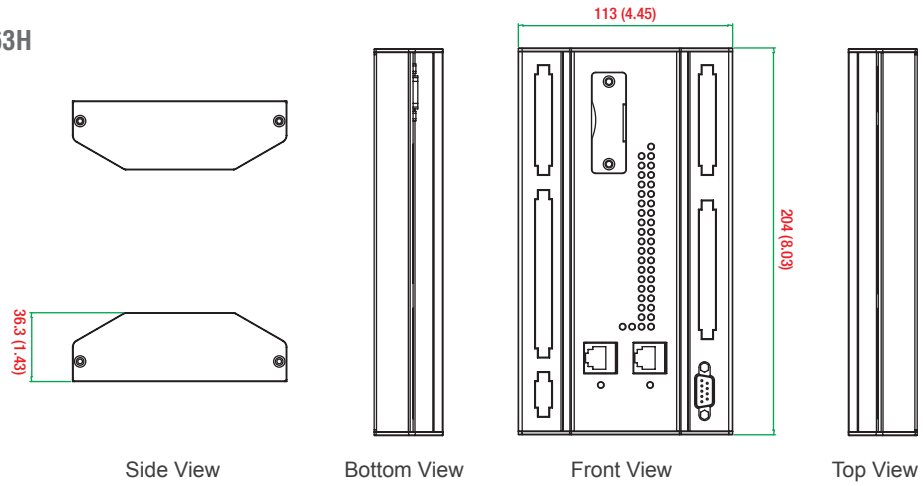
Dimensions

Unit: mm (inch)

ioLogik E1261H



ioLogik E1263H



Ordering Information

Available Models

ioLogik E1261H-T: Ethernet remote I/O with 2-port Ethernet switch, 12 DIOs, 5 AIs and 3 RTDs, -40 to 75°C operating temperature.

ioLogik E1263H-T: Ethernet remote I/O with 2-port Ethernet switch, 24 DIOs, 10 AIs and 3 RTDs, -40 to 75°C operating temperature.

Optional Accessories (can be purchased separately)

WK-90: Wall-mounting kit, BKTx2 FMSx6 NI Nylok M3x6

Package Checklist

- ioLogik E1200H-T
- Documentation and software CD
- Quick installation guide (printed)

ioLogik E1500 Series

Ethernet remote I/O for railway applications

- User-definable Modbus/TCP Slave addressing
- Active communications with MX-AOPC UA Server
- Easy mass deployment and configuration with ioSearch utility
- Friendly configuration via web browser
- Simplify I/O management with MXIO library on either Windows or Linux platform
- EN 50121-3-2, EN 50121-4, and EN 50155* approval for harsh railway environments
- Wide operating temperature range: -40 to 85°C (-40 to 185°F)

*Complies with a portion of EN 50155 specifications

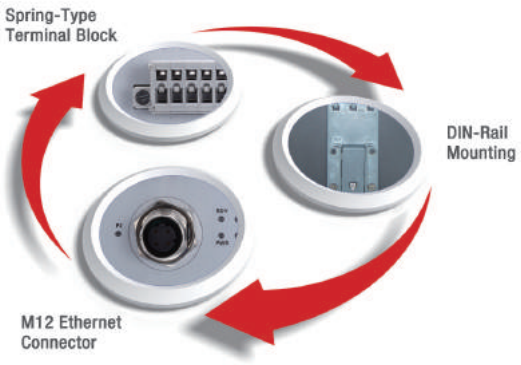
EN 50121 RoHS c UL us LISTED CE FC

Introduction

The ioLogik E1500 series is designed to withstand the severe vibrations experienced in rolling stock and wayside applications. These products come with a threaded M12 Ethernet port to ensure wired connectivity, a spring-type terminal block for vibration-resistant cabling, and a convenient DIN-rail mounting assembly. Carefully engineered DI channel-to-channel isolation helps maintain stable data communications by providing protection against cross-line power surges and crosstalk. In addition, this remote I/O product is compliant with EN 50121-3-2, EN 50121-4, and a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making the products suitable for a variety of industrial applications, including electronic equipment used on or around railway vehicles.

Ruggedly Designed for Monitoring Rolling Stock

The ioLogik E1500 Ethernet remote I/O devices have a durable aluminum housing and are compliant with EN 50121-3-2, EN 50121-4, and essential sections of EN 50155, all of which are essential for electronic equipment used in railway applications. The ioLogik E1500 design strictly conforms to EN standards, including not only EMC requirements but also with regards to shock, vibration, extended temperature range, humidity, and power supply variations.

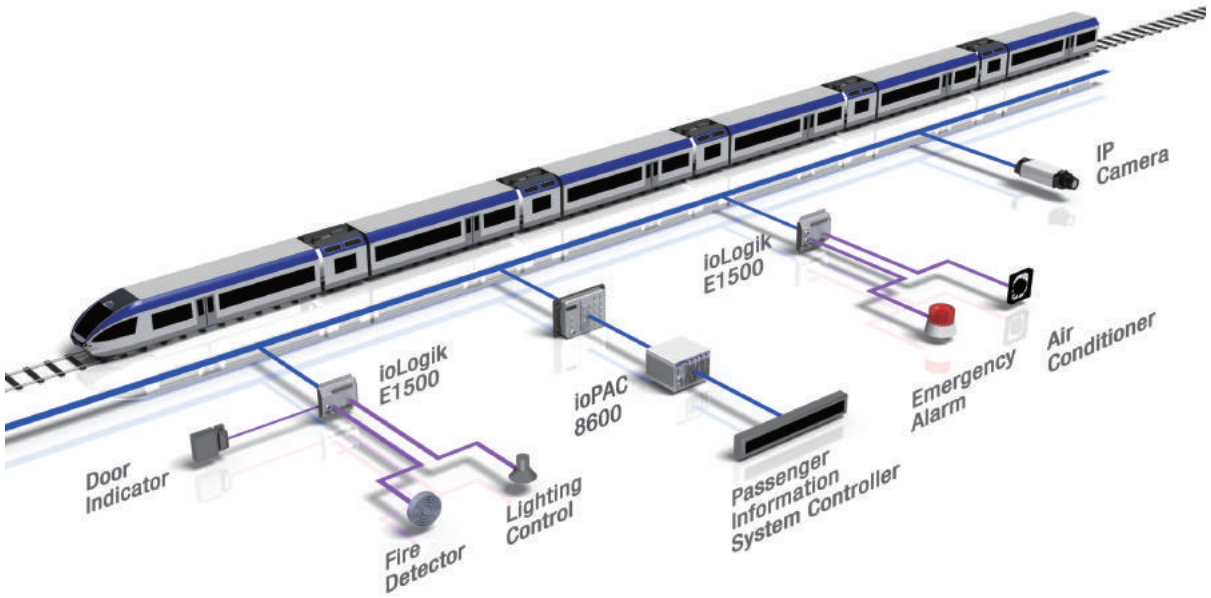


Channel-to-Channel Isolation

With this topology, I/O channels on the ioLogik E1500 are individually isolated from one another to ensure that data communication is highly stable. For example, a lightning strike that affects one channel will not affect devices connected to other channels on the same ioLogik E1500.

Application: Enhanced Efficiency for Remote Monitoring on Rolling Stock

Do you need an EN 50155/50121 compliant remote Ethernet I/O device for use on rolling stock? The ioLogik E1500 railway I/O module features an anti-vibration design, channel isolation, and operates reliably in temperatures ranging from -40 to 85°C, making it the ideal solution for data acquisition on rolling stock. Capable of both monitoring system status and triggering I/O events, the ioLogik E1500 is your best choice when you want to simultaneously enhance system reliability and maintenance efficiency in rolling stock environments.



ioLogik E1510-T Specifications

Inputs and Outputs

Digital Inputs: 12 channels (channel-to-channel isolation)
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

MTBF (mean time between failures)

Time: 507,064 hrs
Standard: Telcordia SR332

ioLogik E1512-T Specifications

Inputs and Outputs

Digital Inputs: 4 channels (channel-to-channel isolation)
Configurable DIOs (by software): 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 2 points per COM (Configurable DIOs)
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

MTBF (mean time between failures)

Time: 554,122 hrs
Standard: Telcordia SR332

Common Specifications

LAN
Ethernet: 1 10/100 Mbps, M12
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 150 mA @ 24 VDC
Note: Compliant with EN 50155 at 24 VDC

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 144 x 124 x 30 mm (5.67 x 4.88 x 1.18 in)
Weight: Under 825 g (1.82 lb)
Mounting: DIN-rail (standard), wall (with optional kit)

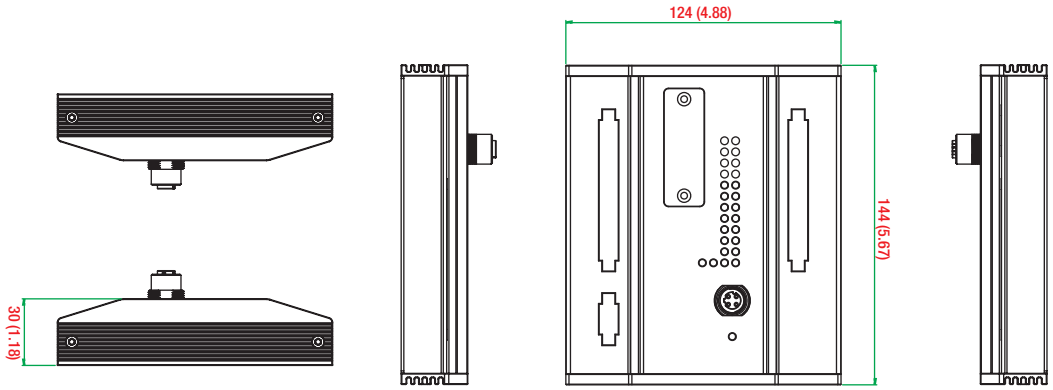
Environmental Limits
Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.
Conformal Coating: Applies only to -CT models

Standards and Certifications
Safety: UL 508
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, 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
1.4 GHz to 2 GHz: 3 V/m
2 GHz to 2.7 GHz: 1 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4
*Complies with a portion of EN 50155 specifications.
Green Product: RoHS, CRoHS, WEEE
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)



Side View | Bottom View | Front View | Top View

Ordering Information

Available Models
ioLogik E1510-M12-T: Ethernet remote I/O with M12 connector, 12 DIs, -40 to 85°C operating temperature
ioLogik E1510-M12-CT-T: Ethernet remote I/O with M12 connector, 12 DIs, coating, -40 to 85°C operating temperature
ioLogik E1512-M12-T: Ethernet remote I/O with M12 connector, 4 DIs, 4 DIOs, -40 to 85°C operating temperature
ioLogik E1512-M12-CT-T: Ethernet remote I/O with M12 connector, 4 DIs, 4 DIOs, coating, -40 to 85°C operating temperature

Package Checklist
- ioLogik E1500
- Documentation and software CD
- Quick installation guide (printed)

Optional Accessories (can be purchased separately)
WK-90: Wall-mounting kit, BKTx2 FMSx6 NI Nylok M3x6

ioLogik R1200 Series

RS-485 remote I/O

- Dual RS-485 remote I/O with built-in repeater
- Supports the installation of multidrop communications parameters
- Install communications parameters and upgrade firmware via USB
- Upgrade firmware through an RS-485 connection
- Wide operating temperature range: -40 to 85°C (-40 to 185°F)

Introduction

The ioLogik R1200 RS-485 serial remote I/O devices are perfect for establishing a cost-effective, dependable, and easy-to-maintain remote process control I/O system. Remote serial I/O products offer process engineers the benefit of simple wiring, as they only require two wires to communicate with the controller and other RS-485 devices while adopting the EIA/TIA RS-485 communication protocol to transmit and receive data at high speed over long distances. In addition to communication configuration by software or USB and dual RS-485 port design, Moxa's remote I/O devices eliminate the nightmare of extensive labor associated with the setup and maintenance of data acquisition and automation systems. Moxa also offers different I/O combinations, which provide greater flexibility and are compatible with many different applications.

ioLogik R1200 Series Selection Table

Models	I/O Combinations				
	Digital Inputs	Configurable DIOs	Relays	Analog Inputs	Analog Outputs
ioLogik R1210	16	–	–	–	–
ioLogik R1212	8	8	–	–	–
ioLogik R1214	6	–	6	–	–
ioLogik R1240	–	–	–	8	–
ioLogik R1241	–	–	–	–	4

ioLogik R1210 Specifications

Inputs and Outputs

Digital Inputs: 16 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software Configurable

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 154 mA @ 24 VDC

ioLogik R1212 Specifications

Inputs and Outputs

Digital Inputs: 8 channels
Configurable DIOs (by jumper): 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open

Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software Configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 187 mA @ 24 VDC

ioLogik R1214 Specifications

Inputs and Outputs
Digital Inputs: 6 channels
Relays: 6 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 6 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software Configurable

Relay
Type: Form A (N.O.) power relay
Contact Current Rating: Resistive load: 5 A @ 30 VDC, 250 VAC, 110 VAC
Breakdown Voltage: 500 VAC
Relay On/Off Time: 1500 ms (max.)
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 5,000,000 operations
Electrical Endurance: 100,000 operations @ 5 A resistive load
Contact Resistance: 100 milli-ohms (max.)
Pulse Output: 0.3 Hz at rated load
Note: Ambient humidity must be non-condensing and remain between 5 and 95%. The relays of the ioLogik R1214 may malfunction when operating in high condensation environments below 0°C.

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 207 mA @ 24 VDC

ioLogik R1240 Specifications

Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (jumper selectable)
Input Range: 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burn-out mode)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
• Only one channel enabled: 12 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 216 mA @ 24 VDC

ioLogik R1241 Specifications

Inputs and Outputs
Analog Outputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Analog Output
Resolution: 12 bits
Output Range: 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA
Voltage Output: 10 mA (max.)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Load Resistor: Internal register: 400 ohms
Note: 24 V of external power required when loading exceeds 1000 ohms.

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 343 ma @ 24 VDC

Common Specifications

Serial
Interface: 2 RS-485-2w terminal block ports
Serial Line Protection:
• ESD Protection: 15 kV
• Surge Protection: 1 kV
• High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Parity: None, Even, Odd
Data Bits: 8
Stop Bits: 1, 2
Baudrate: 1200 to 921600 bps
Protocols: Modbus RTU (slave)

Physical Characteristics
Wiring: I/O cable max. 16 AWG
Dimensions: 27.8 x 124 x 84 mm (1.09 x 4.88 x 3.31 in)
Weight: Under 200 g (0.44 lb)
Mounting: DIN-rail or wall

Environmental Limits
Operating Temperature:
Standard Models: -10 to 75°C (14 to 167°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
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
EMC: EN 55022/24
EMI: CISPR 22, 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: 3 V/m
IEC 61000-4-4 EFT: Power: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8

Green Product: RoHS, CRoHS, WEEE
Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

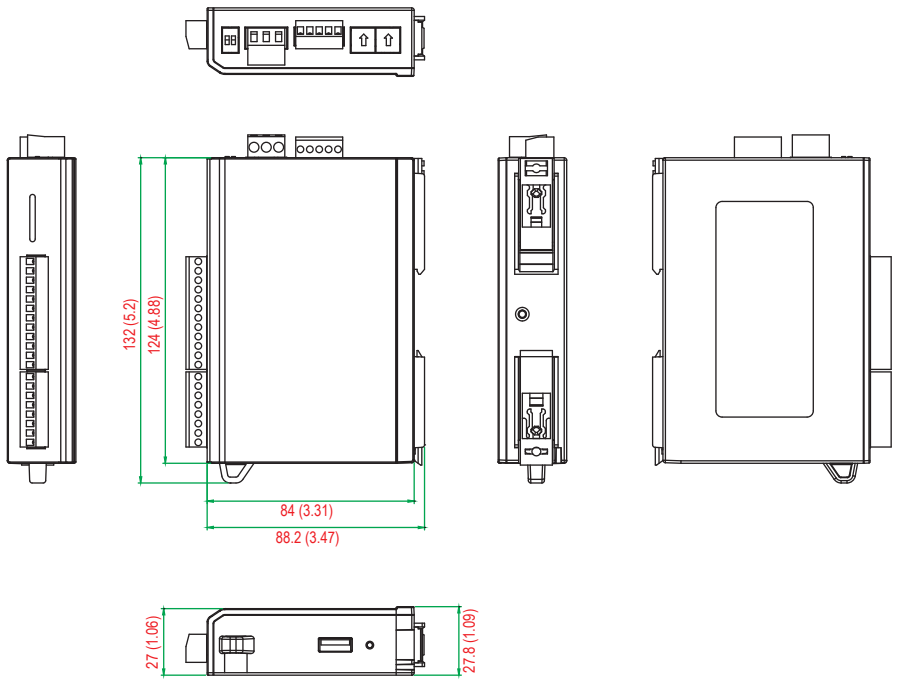
Time: 1,239,293 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years (excluding the ioLogik R1214)
Details: See www.moxa.com/warranty
Note: Because of the limited lifetime of power relays, products that use this component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

ioLogik R1210: RS-485 remote I/O with 16 DIs, -10 to 75°C operating temperature
ioLogik R1210-T: RS-485 remote I/O with 16 DIs, -40 to 85°C operating temperature
ioLogik R1212: RS-485 remote I/O with 8 DIs, 8 DIOs, -10 to 75°C operating temperature
ioLogik R1212-T: RS-485 remote I/O with 8 DIs, 8 DIOs, -40 to 85°C operating temperature
ioLogik R1214: RS-485 remote I/O with 6 DIs, 6 relays, -10 to 75°C operating temperature
ioLogik R1214-T: RS-485 remote I/O with 6 DIs, 6 relays, -40 to 85°C operating temperature
ioLogik R1240: RS-485 remote I/O with 8 AIs, -10 to 75°C operating temperature
ioLogik R1240-T: RS-485 remote I/O with 8 AIs, -40 to 85°C operating temperature
ioLogik R1241: RS-485 remote I/O with 4 AOs, -10 to 75°C operating temperature
ioLogik R1241-T: RS-485 remote I/O with 4 AOs, -40 to 85°C operating temperature

Package Checklist

- ioLogik R1200
- Documentation and software CD
- Quick installation guide (printed)

ioLogik 4000 Series

Modular remote I/O

- I/O expansion without a backplane
- Active communications with MX-AOPC UA Server
- Supports SNMPv1/v2c
- Easy configuration with Modular ioAdmin utility
- Friendly configuration via web browser
- Simplify I/O management with MXIO library on either a Windows or Linux platform

Introduction

The ioLogik 4000 series is suitable for remote monitoring and alarm systems, such as those used for water treatment systems, water supply systems, wastewater treatment systems, and power monitoring systems. These kinds of applications need more I/O points and a variety of I/O types, including temperature sensors, gas detectors, and water quality detectors, all of which can benefit from the versatile mixture of I/O features supported by the ioLogik 4000 series.

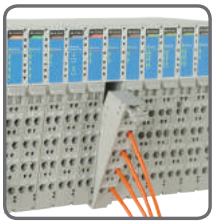
Slice Form Factor and Flexible I/O Variety

The unique modular construction of the ioLogik 4000 series allows the mixing and matching of modules to achieve the best combination of I/O modules to meet the needs of a wide range of remote automation applications. The ioLogik 4000 series features an industrial modular housing that allows I/O modules to be added to the base unit without a backplane. The width of each module is only 12 mm, perfect for space-limited applications. The ioLogik 4000 series provides high density I/O points for greater flexibility and expandability. The modules can connect to virtually any type of sensor, including but not limited to those for temperature, pressure, flow, voltage, current, and contact closure.

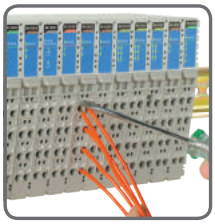
Easy Maintenance

The ioLogik 4000 series comes with removable spring-type terminal blocks (RTBs) that allow you to conserve field wiring for future use. Each I/O expansion module can be quickly and easily replaced.

Slice-Type I/O Modules



Removable Terminal Block



Spring-Type Terminal Block

Module Coding Tag

ioLogik E4200 Specifications

LAN

Ethernet: 2 MACs, 10/100 Mbps RJ45 ports
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, SNTP, SMTP

Serial

Interface: 1 RS-232 DB9 male port
Parity: None
Stop Bits: 1
Flow Control: 115200 bps
Protocols: For Moxa OnCell only

Power Requirements

Input Voltage: 11 to 28.8 VDC
Input Current: 175 mA @ 24 VDC
Current for I/O Modules: 1.5 A (max.) @ 5 VDC

Physical Characteristics

Weight: 180 g (0.40 lb)

MTBF (mean time between failures)

Time: 357,000 hrs
Standard: Telcordia SR332

NA-4010 Specifications

LAN
Ethernet: 1 10/100 Mbps RJ45 port
Protocols: Modbus/TCP (slave), HTTP, BOOTP
IP Settings: ARP, BOOTP, static IP

Power Requirements
Input Voltage: 11 to 28.8 VDC
Input Current: 60 mA @ 24 VDC
Current for I/O Modules: 1.5 A (max.) @ 5 VDC

Physical Characteristics
Weight: 150 g (0.33 lb)

MTBF (mean time before failures)
Time: 4,739,300 hrs
Standard: Telcordia SR332

NA-4020/4021 Specifications

Serial
Interface:
• NA-4020: 1 RS-485-2w terminal block port
• NA-4021: 1 RS-232 DB9 female port
Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Baudrate: 1200 to 115200 bps
Protocols: Modbus/RTU (slave), Modbus/ASCII (slave)

Power Requirements
Input Voltage: 11 to 28.8 VDC
Input Current: 70 mA @ 24 VDC
Current for I/O Modules: 1.5 A (max.) @ 5 VDC

Physical Characteristics
Weight: 150 g (0.33 lb)

MTBF (mean time between failures)
NA-4020 Time: 4,694,800 hrs
NA-4021 Time: 5,208,300 hrs
Standard: Telcordia SR332

Common Specifications

Field Power
Rated Voltage: 11 to 28.8 VDC
Current in Field Power Contact: 10 A (max.)

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 45 x 99 x 70 mm (1.77 x 3.90 x 2.76 in)
Mounting: DIN rail

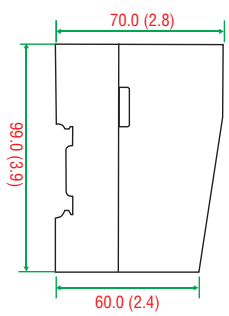
Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications
Safety: UL 508
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, 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
1.4 GHz to 2 GHz: 3 V/m
2 GHz to 2.7 GH: 1 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8

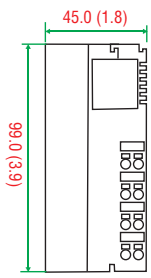
Dimensions

Unit: mm (inch)

I/O Network Adapter

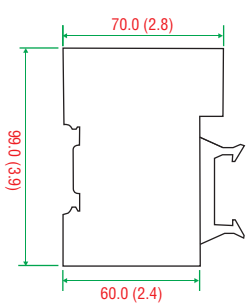


Side View

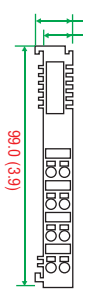


Front View

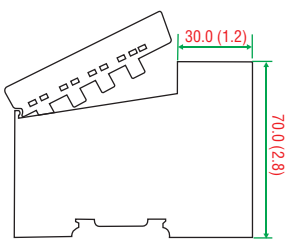
I/O Module



Side View



Front View



Removable View

Ordering Information

Step 1: Select a network adapter module

ioLogik E4200 or NA-4000 series

Step 2: Select I/O modules

M-1000/2000/3000/4000/6000 series

Step 3: Select power modules (optional)

M-7000 series

Available Models

ioLogik E4200: Modular Ethernet remote I/O adapter with Click&Go, up to 16 I/O modules, -10 to 60°C operating temperature
NA-4010: Modular Ethernet remote I/O adapter with up to 32 I/O modules, -10 to 60°C operating temperature
NA-4020: Modular RS-485 remote I/O adapter with up to 32 I/O modules, -10 to 60°C operating temperature
NA-4021: Modular RS-232 remote I/O adapter with up to 32 I/O modules, -10 to 60°C operating temperature
Note: The ioLogik E4200 Modular Ethernet remote I/O adapter can be expanded with up to 16 I/O modules. The NA-4010 and NA-4020/4021 network adapters can be expanded with up to 32 I/O modules.

Package Checklist

- ioLogik 4000 series
- I/O modules (sold separately)
- Power modules (sold separately)
- Documentation and software CD
- Quick installation guide (printed)

ioLogik 4000 Expansion Modules

Digital Input Modules

M-1800: 8 digital inputs, sink type, 24 VDC

Digital Inputs: 8 channels
Type: sink
On-state Voltage: 24 VDC nominal, 11 to 28.8 VDC
Off-state Voltage: 0 to 5 VDC
On-state Current: 6 mA/point @ 28.8 VDC (max.)
Input Impedance: 5.1 kilo-ohms (typical)
Filtering Time: 1.5 ms (typical)
Common Type: External common (single common)
Input Current: 35 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 15,759,240 hrs (Standard: Telcordia SR332)

M-1801: 8 digital inputs, source type, 24 VDC

Digital Inputs: 8 channels
Type: source
On-state Voltage: 24 VDC nominal, 11 to 28.8 VDC
Off-state Voltage: 0 to 5 VDC
On-state Current: 6 mA/point @ 28.8 VDC (max.)
Input Impedance: 5.1 kilo-ohms (typical)
Filtering Time: 1.5 ms (typical)
Common Type: External common (single common)
Input Current: 35 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 15,811,800 hrs (Standard: Telcordia SR332)

M-1600: 16 digital inputs, sink type, 24 VDC

Digital Inputs: 16 channels
Type: sink
On-state Voltage: 24 VDC nominal, 11 to 28.8 VDC
Off-state Voltage: 0 to 5 VDC
On-state Current: 6 mA/point @ 28.8 VDC (max.)
Input Impedance: 5.1 kilo-ohms (typical)
Filtering Time: 1.5 ms (typical)
Common Type: 16 channels for 2 COMs (single common)
Input Current: 40 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O flat cable 20-pin
MTBF: 11,659,560 hrs (Standard: Telcordia SR332)

M-1601: 16 digital inputs, source type, 24 VDC

Digital Inputs: 16 channels
Type: source
On-state Voltage: 24 VDC nominal, 11 to 28.8 VDC
Off-state Voltage: 0 to 5 VDC
On-state Current: 6 mA/point @ 28.8 VDC (max.)
Input Impedance: 5.1 kilo-ohms (typical)
Filtering Time: 1.5 ms (typical)
Common Type: 16 channels for 2 COMs (single common)
Input Current: 40 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O flat cable 20-pin
MTBF: 11,694,600 hrs (Standard: Telcordia SR332)

M-1450: 4 digital inputs, 110 VAC

Digital Inputs: 4 channels, 110 VAC
On-state Voltage: 120 VAC nominal, 85 to 132 VAC
Off-state Voltage: 0 to 45 VAC
On-state Current: 8 mA/point @ 132 VAC (max.)
Input Impedance: 11 kilo-ohms (typical)
Common Type: 4 channels for 2 COMs (single common)
Input Current: 35 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 19,482,240 hrs (Standard: Telcordia SR332)

M-1451: 4 digital inputs, 220 VAC

Digital Inputs: 4 channels, 220 VAC
On-state Voltage: 240 VAC nominal, 170 to 264 VAC
Off-state Voltage: 0 to 45 VAC
On-state Current: 12 mA/point @ 264 VAC (max.)
Input Impedance: 22 kilo-ohms (typical)
Common Type: 4 channels for 2 COMs (single common)
Input Current: 35 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 19,727,520 hrs (Standard: Telcordia SR332)

Digital Output Modules

M-2800: 8 digital outputs, sink type, 24 VDC, 0.5 A

Digital Outputs: 8 channels
Type: sink
Output Range: 24 VDC nominal
On-state Voltage Drop: 0.3 VDC @ 25°C (max.)
On-state Current: 1 mA per channel (min.)
Off Leakage Current: 50 μA (max.)
Current Rating: 0.5 A per channel
Common Type: 8 channels per external common (single common)
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 13,884,600 hrs (Standard: Telcordia SR332)

M-2801: 8 digital outputs, source type, 24 VDC, 0.5 A

Digital Outputs: 8 channels
Type: source
Output Range: 24 VDC nominal
On-state Voltage Drop: 0.3 VDC @ 25°C (max.)
On-state Current: 1 mA per channel (min.)
Off Leakage Current: 50 μA (max.)
Current Rating: 0.5 A per channel
Common Type: 8 channels per external common (single common)
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 14,340,120 hrs (Standard: Telcordia SR332)

M-2600: 16 digital outputs, sink type, 24 VDC, 0.3 A

Digital Outputs: 16 channels
Type: sink
Output Range: 24 VDC nominal
On-state Voltage Drop: 0.3 VDC @ 25°C (max.)
On-state Current: 1 mA per channel (min.)
Off Leakage Current: 50 µA (max.)
Current Rating: 0.5 A per channel
Common Type: 8 channels per external common (single common)
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O flat cable 20-pin
MTBF: 9,732,360 hrs (Standard: Telcordia SR332)

M-2601: 16 digital outputs, source type, 24 VDC, 0.3 A

Digital Outputs: 16 channels
Type: source
Output Range: 24 VDC nominal
On-state Voltage Drop: 0.3 VDC @ 25°C (max.)
On-state Current: 1 mA per channel (min.)
Off Leakage Current: 50 µA (max.)
Current Rating: 0.5 A per channel
Common Type: 8 channels per external common (single common)
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O flat cable 20-pin
MTBF: 9,749,880 hrs (Standard: Telcordia SR332)

Analog Input Modules

M-3802: 8 analog inputs, 4 to 20 mA, 12 bits

Analog Inputs: 8 channels
Resolution in Ranges: 12 bits, 3.91 µA/bit
Input Current Range: 4 to 20 mA (single-ended)
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Input Impedance: 120 ohms
Conversion Time: 4 ms for all channels
Input Current: 80 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 7,375,920 hrs (Standard: Telcordia SR332)

M-3810: 8 analog inputs, 0 to 10 V, 12 bits

Analog Inputs: 8 channels
Resolution in Ranges: 12 bits, 2.44 mV/bit
Input Current Range: 0 to 10 VDC (single-ended)
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Input Impedance: 500 kilo-ohms
Conversion Time: 4 ms for all channels
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 7,288,320 hrs (Standard: Telcordia SR332)

Analog Output Modules

M-4402: 4 analog outputs, 4 to 20 mA, 12 bits

Analog Outputs: 4 channels
Resolution in Ranges: 12 bits, 3.91 µA/bit
Output Current Range: 4 to 20 mA (single-ended)
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Output Impedance: 500 ohms (max.)
Conversion Time: 2 ms for all channels
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 7,840,200 hrs (Standard: Telcordia SR332)

M-4410: 4 analog outputs, 0 to 10 V, 12 bits

Analog Outputs: 4 channels
Resolution in Ranges: 12 bits, 2.44 mV/bit
Output Current Range: 0 to 10 VDC (single-ended)
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Output Impedance: 5 kilo-ohms (max.)
Conversion Time: 2 ms for all channels
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 6,219,600 hrs (Standard: Telcordia SR332)

Temperature Input Modules

M-6200: 2 analog inputs, RTD: PT100, JPT100

RTDs: 2 channels
Sensor Types:
• PT50, PT100, PT200, PT500, PT1000 (resistance 100 milli-ohms/bit)
• JPT100, JPT200, JPT500, JPT1000 (resistance 10 milli-ohms/bit)
• NI100, NI200, NI500, NI1000, NI120, CU10 (resistance 20 milli-ohms/bit)
Resolution: 0.1°C per 10 milli-ohms
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Input Impedance: 500 kilo-ohms
Conversion Time: 200 ms for all channels
Diagnostics: Range over (if range over, data=Dx8000)
Input Current: 80 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 3,644,160 hrs (Standard: Telcordia SR332)

M-6201: 2 analog inputs, thermocouple

Thermocouples: 2 channels
Sensor Types: Type J/K/T/E/R/S/B/N/L/U/C/D (mV input 10 µV/bit, 2 µV/bit)
Resolution: 0.1°C/10 µV
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Input Impedance: 500 kilo-ohms
Conversion Time: 200 ms for all channels
Diagnostics: Range over (if range over, data=Dx8000)
Input Current: 80 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 3,828,120 hrs (Standard: Telcordia SR332)

Power Modules

M-7001: System power module

System Input Voltage: 24 VDC, 11 to 28.8 VDC
Field Power Input Voltage: 24 VDC (±20%)
Current for I/O Modules: 1.5 A @ 5 VDC (max.)
System Bus Output Voltage: 5 VDC (max.)
Field Power Contacts Current: 10 A (max.)
MTBF: 19,569,840 hrs (Standard: Telcordia SR332)

M-7002: Field power module

Field Power Input Voltage:
• DC: 5 VDC, 24 VDC, 48 VDC
• AC: 110 VAC, 220 VAC
Current for Field Power Contacts: 10 A (max.)
MTBF: 75,528,720 hrs (Standard: Telcordia SR332)

M-7804: 0 VDC

Channels: 8
Mode: 0 VDC
MTBF: 73,750,440 hrs (Standard: Telcordia SR332)

M-7805: 24 VDC

Channels: 8
Mode: 24 VDC
MTBF: 73,750,440 hrs (Standard: Telcordia SR332)

Modular I/O Accessories

TB 1600: Screw-locking terminal block with 20-pin connector for DIN-rail mounts

Pins: 20 pins, one-to-one assignment
Connector Pitch: 3.81 mm
Mounting Type: DIN-rail
Dimensions: 77.5 x 67.5 x 51 mm (3.05 x 2.66 x 2.01 in)
Compliance: RoHS compliant

Cable: 20-to-20-pin flat cable

Usage: Connects between the TB 1600 and ioLogik 4000 series
Length: 500 mm
Number of Pins: 20

M-8001-PK: Removable terminal block

Usage: Terminal block for the ioLogik 4000 series
Packaging: 9 pcs in one box

Markers: For the ioLogik 4000 series

M-8003-PK: Markers with 0 to 9 numbering; 100 pcs per box
M-8004-PK: Blank markers; 100 pcs per box

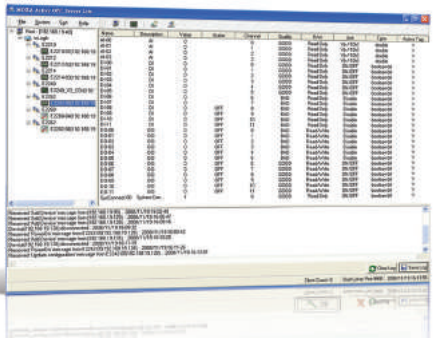
Ordering Information

Available Models

M-1800: Modular remote I/O module with 8 DIs, sink type, 24 VDC, RTB, -10 to 60°C operating temperature
M-1801: Modular remote I/O module with 8 DIs, source type, 24 VDC, RTB, -10 to 60°C operating temperature
M-1600: Modular remote I/O module with 16 DIs, sink type, 24 VDC, 20-pin, -10 to 60°C operating temperature
M-1601: Modular remote I/O module with 16 DIs, source type, 24 VDC, 20-pin, -10 to 60°C operating temperature
M-1450: Modular remote I/O module with 4 DIs, 110 VAC, RTB, -10 to 60°C operating temperature
M-1451: Modular remote I/O module with 4 DIs, 220 VAC, RTB, -10 to 60°C operating temperature
M-2800: Modular remote I/O module with 8 DOs, sink type, 24 VDC, RTB, -10 to 60°C operating temperature
M-2801: Modular remote I/O module with 8 DOs, source type, 24 VDC, RTB, -10 to 60°C operating temperature
M-2600: Modular remote I/O module with 16 DOs, sink type, 24 VDC, 20-pin, -10 to 60°C operating temperature
M-2601: Modular remote I/O module with 16 DOs, source type, 24 VDC, 20-pin, -10 to 60°C operating temperature
M-2450: Modular remote I/O module with 4 relays, 230 VAC/24 VDC, RTB, -10 to 60°C operating temperature
M-3802: Modular remote I/O module with 8 AIs, 4 to 20 mA, RTB, -10 to 60°C operating temperature
M-3810: Modular remote I/O module with 8 AIs, 0 to 10 VDC, RTB, -10 to 60°C operating temperature
M-4402: Modular remote I/O module with 4 AOs, 4 to 20 mA, RTB, -10 to 60°C operating temperature
M-4410: Modular remote I/O module with 4 AOs, 0 to 10 VDC, RTB, -10 to 60°C operating temperature
M-6200: Modular remote I/O module with 2 RTDs, RTB, -10 to 60°C operating temperature
M-6201: Modular remote I/O module with 2 TCs, RTB, -10 to 60°C operating temperature
M-7001: Modular remote I/O module with 24 VDC system power input, RTB, -10 to 60°C operating temperature
M-7002: Modular remote I/O module with 5/24/48 VDC or 110/220 VAC field power input, RTB, -10 to 60°C operating temperature
M-7804: Modular remote I/O module with 8 channels 0 VDC output, RTB, -10 to 60°C operating temperature
M-7805: Modular remote I/O module with 8 channels 24 VDC output, RTB, -10 to 60°C operating temperature

Optional Accessories

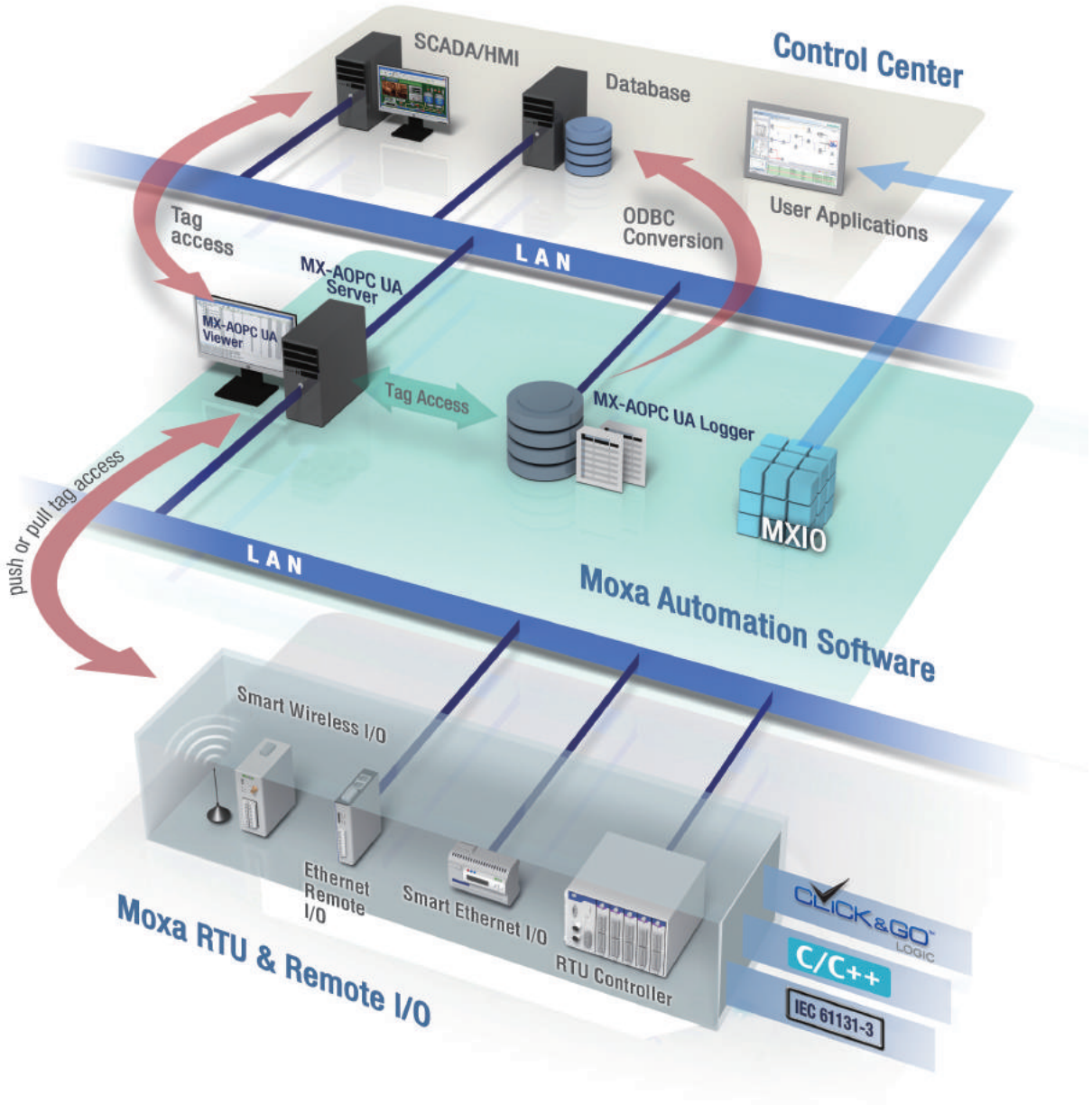
TB 1600: Screw-locking terminal block with 20-pin connector for DIN-rail mounting
20-to-20-pin flat cable: 20-pin to 20-pin flat cable, 500 mm
M-8001-PK: Removable terminal block, 9 pcs per pack
M-8003-PK: Marker with 0 to 9 numbering, white color, 100 pcs
M-8004-PK: Black marker, 100 pcs



Automation Software

Introduction to Automation Software

Moxa's automation software includes the MX-AOPC UA Suite and the MXIO programming library. The MX-AOPC UA Suite consists of MX-AOPC UA Server, MX-AOPC UA Viewer, and MX-AOPC UA Logger; it is a unified architecture that brings together remote industrial control systems from discrete stations and unifies them under a single, centralized monitoring and control system. MX-AOPC UA Server expands upon Moxa's patented Active OPC monitoring technology, bringing Modbus protocol support, and providing a secure and reliable gateway between local devices and a remote SCADA system. MX-AOPC UA Viewer is an OPC client that allows users to easily view tag values and MX-AOPC UA Server status. MX-AOPC UA Logger is another handy client, which allows users to convert and upload data logs into a database. The MXIO Library offers a large repository of code for users to easily manage Moxa's RTU or remote I/O devices over an Ethernet network.



MX-AOPC UA Suite

Cohesive, secure, and reliable connection between device, database, and SCADA

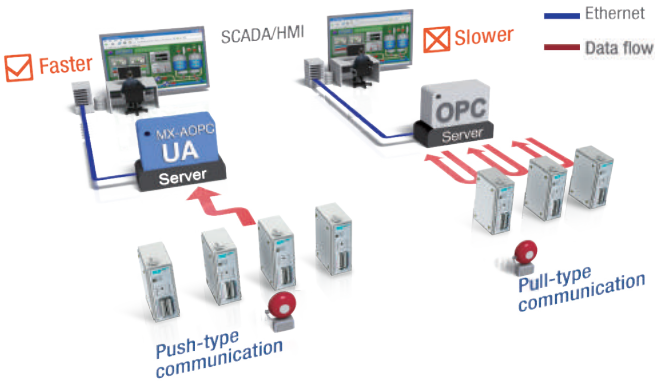
- First OPC UA server for industrial automation supporting both push and pull communication
- One-click active tag creation
- Efficient database uploads
- Automatic data updates from SD cards following network failures
- Simple and easy viewing of tag values and UA server status
- OPC UA: The next generation of interoperability, reliability, and security

Introduction

The MX-AOPC UA Suite includes MX-AOPC UA Server, Viewer, and Logger, which are all based on the OPC UA (Unified Architecture) standard. OPC UA is the next generation OPC standard (IEC 62541), which provides a cohesive, secure, and reliable framework for accessing real-time and historical data. MX-AOPC UA Server not only inherits Moxa's patented active monitoring technology, but also supports Modbus protocol for polling data, to provide a secure and reliable gateway bridging edge devices to the SCADA system. MX-AOPC UA Viewer is an OPC UA client that allows users to easily view tag values and server statuses. MX-AOPC UA Logger is another handy client for converting and uploading data logs to the central database. With Moxa's MX-AOPC UA Suite, users can now instantly receive alarms, real-time updates, and save historical data, allowing for both timely risk prevention and solid maintenance response.

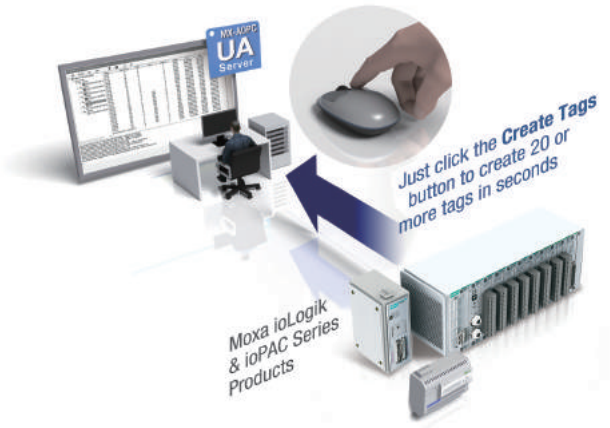
First OPC UA Server for Industrial Automation Supporting both Push and Pull Communication

Moxa has pioneered the concept of "active type" OPC software in the automation industry. The patented MX-AOPC UA Server offers both polling and non-polling architectures alongside the standard OPC UA protocol, giving users the alternative of pull- or push-based communication from Moxa's devices. With push technology, I/O status is updated to MX-AOPC UA Server only when there is an I/O status change, a pre-configured interval is reached, or when a request is issued by a user. This application of push technology cuts metadata overhead, resulting in faster I/O response times and more accurate data collection than traditional pull-based architectures. With Moxa's "active technology" advantage, users can now instantly receive alarms and real time updates, allowing for timely risk response.



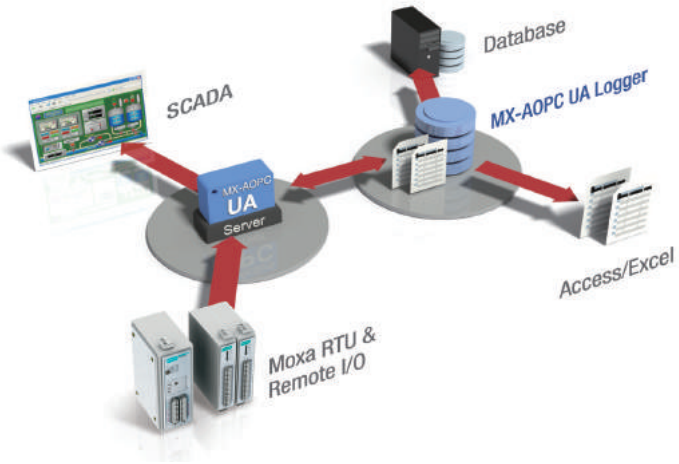
One-Click Active Tag Creation

MX-AOPC UA Server supports automatic tag generation, which eliminates the headache of specifying individual target IP addresses, I/O channels, and data formats, and does away with the need to edit and import configuration files. Working from Moxa's utilities, users only need to select specific tags, set the update criteria, and then click a single button for their active tags to be automatically generated and configured.



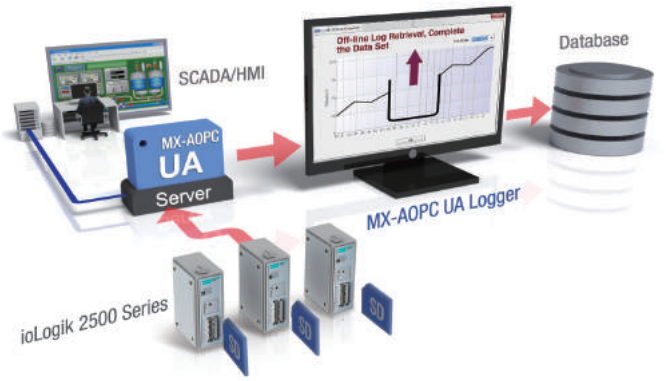
Efficient Database Uploads

With most remote data acquisition systems, during daily operations additional human resources are needed to collect data manually from remote storage devices for loading into a database. Even with RTUs remotely collecting data over the network, software must be developed to handle the task of converting and uploading these data logs. Moxa's MX-AOPC UA Logger not only makes real-time data collection much easier, it also simplifies the conversion of historical data into database-ready formats. MX-AOPC UA Logger interacts directly with our MX-AOPC UA Server, working as a bridge between field data and stored databases or spreadsheets. Furthermore, the MX-AOPC client converts and uploads data logs to the central database. The MX-AOPC UA Logger can collate tags from individual Moxa RTUs or remote I/O devices into the same database or spreadsheet, freeing users from the need to manipulate data after processing.



Automatic Data Updates from SD Cards Following Network Failures

One of the benefits of using RTUs is that data can be collected over a network from a central site. In an ideal operation, following a network failure RTUs should be able to transmit data logs that were collected while the network was offline. Moxa's MX-AOPC UA Logger makes this not only possible, but easy. MX-AOPC UA Logger provides a standard OPC interface that interacts with MX-AOPC UA Server for real-time data collection. After each network connection, MX-AOPC UA Logger will compare historical data stored on the SD cards located in individual devices with the real time data it has already stored locally, and then supplement any missing data by requesting that the RTU retransmit the lost data.



Simple and Easy Viewing of Tag Values and UA Server Status

MX-AOPC UA Viewer is an OPC UA client that allows developers, testers, and integrators to easily view tag values and test MX-AOPC UA Server and connections. The viewer's intuitive user interface makes it easy to read data and server status. With this handy client tool, users can complete OPC server settings sooner than ever.

OPC UA: The Next Generation of Interoperability, Reliability, and Security

Moxa's MX-AOPC UA Suite is designed based on the OPC Foundation's UA (Unified Architecture) specification. OPC UA is a new technology that features more secure and reliable data communication between OPC servers and clients. It ensures protection against unauthorized access or sabotage of process data, as well as against errors due to careless operation. In addition, OPC UA defines a robust architecture with reliable communication mechanisms, configurable timeouts, and automatic error detection/recovery mechanisms. By using Moxa's MX-AOPC UA Suite, users can enjoy more secure and reliable data exchange and control.

Specifications

Hardware Requirements

CPU: Intel Pentium 4 or above
RAM: 512 MB (1024 MB recommended)
Communication Interface: Ethernet or serial

Software Requirements

Operating System: Microsoft Windows 7/8/10, Microsoft Windows Server 2003/2008/2012
Editor (optional): Microsoft Office 2003 (Access or Excel) or later
Database (optional): Oracle database, Microsoft SQL Server

OPC UA Server Specifications

OPC Unified Architecture: 1.01
OPC Data Access: 1.0a, 2.0, 2.05a, 3.0
Device Protocols: Moxa AOPC, Modbus/TCP (master), Modbus/RTU (master)

OPC UA Logger Specifications

OPC Unified Architecture: 1.01

Products that Support the AOPC Protocol

Series Names: ioLogik 2500 series, ioLogik E1200 series, ioLogik E1500 series, ioLogik E2200 series, ioLogik E4200, ioLogik W5300 series
Note: Please check Moxa's website for the most up-to-date list of supported products.

Ordering Information

Available Versions

MX-AOPC UA Server (trial version): 30-day trial version that supports up to 30 device connections (now available for download from Moxa's website)
MX-AOPC UA Server (free version): Free version that supports up to 30 device connections, with unlimited runtime operations (download trial version first; requires registering your PC User Code* on Moxa's website at http://license.moxa.com/)
MX-AOPC UA Server (paid version): Unlimited device connections and runtime operations (requires purchasing a registration code from Moxa)
MX-AOPC UA Logger (trial version): 30-day trial version that supports up to 1 MX-AOPC UA Server connection and up to 1 data logger (now available for download from Moxa's website)
MX-AOPC UA Logger (free version): Free version that supports up to 1 MX-AOPC UA Server connection and up to 1 data logger, with unlimited runtime operations (download trial version first; requires registering your PC User Code* on Moxa's website at http://license.moxa.com/)
MX-AOPC UA Logger (paid version): Up to 2 MX-AOPC UA Server connections and up to 10 data loggers and runtime operations (requires purchasing a registration code from Moxa)

***How to Obtain a PC User Code:**

1. Select the Help menu from MX-AOPC UA Server or Logger, and then click Licensing > License Info
2. After registering, save the license file to your PC.
3. Unzip the file and then import it into MX-AOPC UA Server or Logger from Help > Licensing > Add License File

MXIO Programming Library

For handy management of I/O devices

An Intuitive Method for Obtaining Remote I/O Data

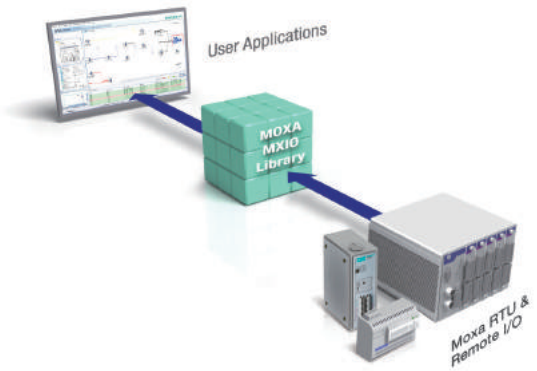
The MXIO Library is a set of programming tools for developing data management applications for use on Ethernet or RS-485 networks linking Moxa's RTUs and remote I/O devices. It includes direct I/O command sets that provide a more intuitive method for obtaining I/O data. Software developers no longer need to study the complex Modbus protocol to manage I/O monitoring and control functions, and engineers can obtain I/O data by using MXIO's direct I/O commands to access any I/O point or channel with ease.

Reduce Development Times with a Large Code Repository

The MXIO library includes many examples of sample code to help programmers reduce software development time and quickly get familiar with the API. Developers can call MXIO functions and demo programs as soon as they have installed the library.

Fully Exploit Active Communications

The MXIO Library provides active functions for receiving I/O configurations and status updates from Moxa's RTU and remote I/O products. With revolutionary push technology, users can benefit from faster and more accurate data collection than traditional polling servers.



Specifications

Hardware Requirements

CPU: Intel Pentium 4 or above
RAM: 512 MB (1024 MB recommended)
Network Interface: 10/100M Ethernet

Software Requirements

Operating System: Microsoft Windows 7/8/10, Microsoft Windows Server 2003/2008/2012, Linux Debian 7.8
Note: Please check Moxa's website for the most up-to-date supported operating systems.

Supported Products

Series Names: ioLogik 2500 series, ioLogik E1200 series, ioLogik R1200 series, ioLogik E1500 series, ioLogik E2200 series, ioLogik R2140, ioLogik E4200, ioLogik W5300 series
Note: Please check Moxa's website for the most up-to-date supported products.

Your Trusted Partner in Automation

Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things. With over 25 years of industry experience, Moxa has connected more than 40 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for industrial communications infrastructures.

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