## Industrial I/O

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<td>Comm. Interface</td>
<td>GPRS, 10/100M Ethernet</td>
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<td>10/100M Ethernet</td>
<td>10/100M Ethernet</td>
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<tr>
<td>I/O Combination</td>
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## Modular Type I/Os

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<td>Dual 10/100M Ethernet</td>
<td>10/100M Ethernet</td>
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<td>Max. Expansion Capacity</td>
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<td>Modbus/RTU</td>
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<td>Local Intelligence</td>
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<tr>
<td>Alarm Function</td>
<td>SMS, E-mail, SNMP Traps, TCP/UDP Messaging</td>
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Moxa's ioLogik series of industrial I/O products are intelligent, high-performance, reliable remote I/O solutions that bring the ease of open-standard Ethernet/TCP and serial RS-232/485 communications to automation applications, including data acquisition, and remote monitoring and alarm systems. The ioLogik series also offers greater flexibility by making it easy to install analog, digital, and temperature measurement instruments on the same mounting rack. The ioLogik industrial I/O series is ideal for both stand-alone and high-density mounting on a rack, in a cabinet, or on a panel, and can be easily adapted to industrial applications that require multiple I/O points.

Moxa’s industrial I/O products can be divided into several categories, which include Ethernet I/O, Wireless I/O, and Serial I/O. Features such as built-in local intelligence (Click&Go) and a variety of form factors provide a number of options that users can choose from. The Ethernet I/O products, for example, can also be subdivided into Active Ethernet I/O (ioLogik E2000 series), Modular Active Ethernet I/O (ioLogik E4200 with its slice type modules), and Peer-to-peer I/O (ioMirror E3210). Serial I/O can be subdivided into Stand-alone RS-485 I/O (ioLogik R2000 series), and Modular I/O (ioLogik NA-4020/4021 network adaptors with slice type modules). The Wireless I/O category currently contains one product, the ioLogik W5340 GPRS I/O.
The Most Intelligent I/O for Remote Monitoring and Alarm Applications

IoLogik also supports Active Ethernet I/O, which is a new concept introduced by Moxa that offers proactive, condition-based reporting and the control of I/O devices used for PC-based data acquisition and control. The I/O status of an Active Ethernet I/O device can be reported and controlled automatically on-site based on user specified conditions. This report-by-exception approach, which is new to PC-based monitoring, requires far less bandwidth than traditional polling methods. Critical sensor data can be obtained immediately instead of being confined by the use of polling intervals. This makes network communication between a host computer and Active Ethernet I/O devices concise and efficient, and makes data transmission 20 times faster compared with traditional SCADA systems (50 ms compared to 1 sec).

Why Choose Active Ethernet I/O?

IA and IT-friendly Remote I/O Control

- Moxa’s Active OPC Server can connect an ioLogik to SCADA systems
- Open-standard Modbus/TCP I/O control
- SNMP I/O control for IT-based network management
- CGI command I/O control for surveillance systems
- MXIO Library for WinCE/Linux, C++, VB/VC and .NET platforms

Push Technology for Events and Alarms

- Event-based TCP/UDP messages, SNMP traps, e-mail, SMS, and CGI command output
- Real-time events with time stamp
- Moxa’s Active OPC Server package
- Saves bandwidth with no polling effort

Intelligent Local I/O Control

- IF-THEN-ELSE style programming with no learning curve
- PLC-grade I/O control, timer, schedule, and register functions
- No need for third-party development tools, and no maintenance gaps
- Stand-alone operations require no host control
- Dramatic reduction in project implementation time

Solution-oriented Design

- Easy-to-expand slice-type I/O modules
- Intuitive Windows utility
- Peer-to-peer function
- Dual-LAN redundancy
- Optional LCM module

In addition to Modbus/TCP, the I/O status of an Active Ethernet I/O device can be controlled in various ways. IT engineers can use SNMP and CGI, whereas IA engineers can use open-standard Active OPC Server. In addition, the MXIO library also offers programmers the benefit of fast implementation.
Active Ethernet I/O can be used to generate alarms when an event (user-defined by Click&Go) is triggered. Standard TCP or UDP packets can be sent to a central host, SNMP traps can be sent to IT monitoring systems, and e-mail/SMS messages can be sent to the site maintainer.

Active OPC Server Lite is a free software package provided by Moxa that operates as an OPC driver for an HMI or SCADA system. Active OPC Server Lite offers seamless connection from Moxa’s ioLogik series products to SCADA systems with 7 times the normal response, 50 times faster tag installation, and an 80% reduction of network bandwidth usage compared with other traditional OPC packages on the market.

Active Ethernet I/O can be used for simple output control that is triggered by input status, without a PC controller. For example, a door sensor can be configured to trigger an alarm. Configuration is done through intuitive If/Then statements, with no programming required.

Instead of relying on host computers that continually poll I/O devices for data, Active Ethernet I/O devices can proactively report sensor status using TCP or UDP messages. Proactive messaging allows much faster notification of I/O events and generates much lower network and CPU loads. Message content is fully customizable, and up to 10 simultaneous destinations are supported.
The ioLogik E4200 series of Modular Active Ethernet I/O products come with dual network interfaces, which have separate MACs and IP addresses to connect to different network segments. Redundancy can be easily implemented to improve system reliability by allowing hosts located on different networks to control or monitor your system.

The ioMirror E3000 series of Ethernet I/O products are designed as cable replacement solutions that send input signals to remote outputs over an IP network. ioMirror products can be used to connect remote sensor signals to PLC controllers, DCS systems, or display devices over a network, without installing additional signal wires.

The ioLogik 4000 provides spring type, removable terminal blocks (RTBs) that allow you to preserve field wiring before replacing an I/O expansion module. Each I/O expansion module can be replaced quickly and easily.

ioLogik remote I/O products come with a very user-friendly Windows utility that includes remote configuration, firmware updates, and I/O testing and monitoring functions. These functions can save you many hours of installation and troubleshooting, and all settings can be saved to a file for future reference.

The ioLogik 2000 series of stand-alone remote I/O products provides an optional LCD module for on-site management and configuration. The unique display module can display network and I/O settings. You can change network settings to ensure the speed of installation and future maintenance.
Integrating I/O and GPRS Communications

Active GPRS I/O is a highly integrated solution that combines GPRS communications, front-end intelligence, and a front-end data logging function for information analysis and prediction. By using GPRS technology, the ioLogik W5000 series gives remote monitoring applications maximum coverage. The W5000 series products come with one 3-in-1 serial port (RS-232/422/485) to connect field serial devices such as meters, analyzers, and instruments. The ioLogik W5000 is a perfect fit for remote monitoring and alarm systems for which wired connections are difficult or impossible, such as unmanned site monitoring, riverside monitoring, and pipeline monitoring.

Trouble-free Connections to GPRS Networks

Managing dynamic IP addresses for automation projects that require setting up connections to the GPRS network can be a big headache for engineers. Thanks to Active GPRS I/O with Push Technology and Active OPC Server, dynamic IP addresses can be managed between the Active GPRS I/O product and the Active OPC Server. In this case, SCADA programs can receive data from the Active OPC Server without putting additional effort into managing IP addresses.

Most traditional solutions use DDNS or a purchased service package from an MVNO (Mobile Virtual Network Operator) to make IP management easier. GPRS networks usually offer a dynamic IP environment with the IP address assigned by the cellular service provider, but it is difficult to poll a GPRS device’s data in a dynamic IP environment. Even with DDNS technology, SCADA projects still need to allocate resources to manage the DDNS server.

Moxa’s Active OPC Server makes it easy to install an ioLogik W5000 in a GPRS dynamic IP environment, and since remote Active GPRS I/O automatically establishes communication with Active OPC Server, all remote Active GPRS I/Os can be managed by one centralized Active OPC Server, which itself has a fixed IP address. Active OPC Server receives and registers the ioLogik W5000’s IP address and receives tag updates, and application programs can poll data via Active OPC Server without exerting any effort on IP management.

Front-End Intelligence for Handling Events

The Click&Go software package provides Active GPRS I/O with front-end intelligence for event response and alarms. When a pre-defined event is triggered, a variety of alarms, such as SMS, email, TCP/UDP packets, and SNMP Trap, can be sent actively, and depending on the type of configuration you’re using, real time stamps can also be attached.

Friendly Serial Device Connectivity

Active GPRS I/O devices are equipped with one 3-in-1 (RS-232/485/422) serial port. When GPRS is on line, the Active GPRS I/O device will establish a TCP Client connection with the PC software, and then use this transparent data tunnel to poll or read remote meters. Thanks to the Active GPRS I/O device’s TCP Client support, dynamic IP addresses are no longer a problem.

Data Logging—Store up to 14 Days of I/O Records

ioLogik Active GPRS I/O devices come with an external SD card slot that can be used to store I/O status, with each day’s records stored in a separate file. The files are stored in .CSV file format and use TFTP protocol for exchanging files between the PC and Active GPRS I/O device, making it easy for users to import the records into a database and display in chart format.
The Benefits of Integration

- Easy to Install
- Extra Power Savings
- Caller ID for Security
- Needs only a Sliver of Bandwidth

IoLogik Active Wireless I/O provides an integrated solution with a number of important benefits.

Easy Installation

By supporting Moxa’s powerful Active OPC Server, Active GPRS I/O products can be easily integrated with your SCADA system. Moxa’s Active OPC Server with non-polling architecture supports the standard OPC protocol, but also offers active (or “push”) communication between Moxa’s ioLogik series of Active GPRS I/O products and HM/SCADA systems with instant I/O status.

Unlike the fixed IP requirement for Ethernet I/O with a traditional OPC server, Active OPC Server and ioLogik products deliver the flexibility of using dynamic IP addresses. The ioLogik product can connect directly to the Active OPC Server instead of being polled, which makes the dynamic IP configuration and WAN Access of the GPRS I/O possible. As far as traditional data acquisition applications are concerned, I/O devices are not capable of using this approach. In addition, the flexibility of being able to connect through a firewall is a useful feature.

Active OPC Server and ioLogik series products offer “Auto Tag Generation” to eliminate the need to specify target IP addresses, I/O channels, and data formats one by one or edit and import configuration text files. Instead, Active OPC Server creates the tags for the target ioLogik automatically. Simply select the channels that need to be updated, and the tags are generated and configured without needing any input from the user. Generally speaking, tag generation is 50 times faster on Active OPC Server than with traditional OPC server packages, and training on how to install and configure the OPC server is no longer necessary.

Low Power Consumption and Sleep Mode

Due to the high integration of GPRS communication, I/O functions, and data-logging, the power consumption of Moxa’s integrated solution is half that of using separate solutions. You will be able to build a system that uses a smaller solar power panel and lower battery capacity. For example, the ioLogik W5340 provides the optimal solution for riverside monitoring applications, such as monitoring water flow to prevent flood disasters, or monitoring water quality to protect the supply of drinking water. This solution’s power saving feature requires less power, even when the power is supplied by a solar panel or battery. It also provides a data logging function for keeping the necessary data on an SD card, and you can receive active messages automatically when a pre-defined condition is triggered.

When sleep mode is activated, the ioLogik W5340 will turn off GPRS communications, but keep the I/O function working, and the status of all I/O activity will be recorded in a data Log file. The data log function will create a new file every day and can be configured to upload the latest data to a host every night at midnight. In addition to ensuring that all data is sent to your analysis system, you can also extend your I/O operation while using backup battery power.
Secure Wake on Call
There are three ways to wake up an ioLogik Active GPRS I/O. The first is wake up by event, such as with an active message, SMS, email, or SNMP Trap. The second is wake on call. In this case, the ioLogik W5340 can be woken by a secure caller ID. In sleep mode, the ioLogik W5340 will disconnect all communications except GSM. The only way you can connect is with wake on call. If your caller ID is configured in the ioLogik W5340, it will wake up from sleep mode. Once the ioLogik W5340 receives a call, it will identify the caller ID and then hang up the phone without incurring any expense. If the caller ID is in the authorized list, a connection to the Active OPC Server will be initiated and a communication channel will be initiated using the IP address. Since your caller ID must be authorized, you can ensure that your data is secure. The third method is to configure the data log system to upload your data every night at midnight.

Stay Alive with a Small Bandwidth
Compared with the traditional “polling” architecture, which results in a longer response time since more network bandwidth is used, the ioLogik Active GPRS I/O uses “push” technology to report active messages when predefined events occur. This event-driven logic improves the I/O response time and results in I/O access that is more precise. In addition, you will see a big reduction in your communication expense since the system uses a limited amount of bandwidth, and this innovative push-based architecture reduces CPU loading, which means that less maintenance is required and lower level hardware devices can be used.

Serial I/O

Linking Input and Output Signals over a Serial Connection
The ioLogik R2000/4000 series was designed for system integrators to acquire and control remote digital and analog devices over both RS-232 and RS-485 connections. Different types of digital on/off devices can be controlled, including proximity switches, mechanical switches, push buttons, optical sensors, LEDs, and light switches. In addition, different types of analog devices can be controlled, including sensors that read pH, conductivity, temperature, humidity, pressure, and flow, as well as actuators and valves. The ioLogik R2000/4000 series products can be used with the standard Modbus protocol, and SCADA software or the MXIO DLL library can be used to access the server.

More Choices for Stand-alone and Modular Solutions
The ioLogik R2000 is designed as a stand-alone serial I/O solution. Two model groups are available. The ioLogik R2110 has 12 DIs and 8 DOs, and the ioLogik R2140 has 8 AIs and 2 AOs. In addition to being installed separately, two or more ioLogik R2000 devices can be connected together via a system bus that includes sharing the system’s power. The modular ioLogik 4000 system consists of a network adaptor plus up to 31 slice-type I/O modules. The ioLogik connects to the host controller via RS-485, and the ioLogik NA-4020 and NA-4021 support individual RS-485 and RS-232 connections.

Easy Remote Management
Traditionally, it was difficult for users to update firmware over RS-485. Moxa now provides an easy method for updating firmware over an RS-485 network that allows users to perform remote firmware updates, reducing maintenance time and cost.

Snap-On LCD Module
Traditionally, a PC was required to configure a remote I/O. To get around this, Moxa now offers an optional snap-on LCD module to give users a much easier way to configure and monitor ioLogik R2000 series products. The LCD module is hot-pluggable, which means that it can be installed or removed without turning off the server.
Common Specifications for ioLogik E2000 Series Active Ethernet I/O Products

LAN
Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP (MIB for I/O and Network), HTTP, CGI, SMTP

Serial Communication
Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Power Requirements
Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics
Wiring: I/O cable max. 14AWG

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)

Regulatory Approvals
EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty
Warranty Period: 2 years
Details: See www.moxa.com/warranty

Selection Guide for Active Ethernet I/O Products

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<th>I/O</th>
<th>Input</th>
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Dimensions of ioLogik 4000/E4200 Series Modular I/O Products

Dimensions (unit = mm)

I/O Module

Dimensions (unit = mm)
Active OPC Server Lite

Seamlessly connect ioLogik to your SCADA system

- OPC DA 3.0 supported
- Event-driven tag update
  - Save 80% on network bandwidth
  - I/O response that’s 7 times faster
- Patented automatic tag generation
- Firewall-friendly connection from remote ioLogik devices
  - Allows remote I/O to use dynamic IP
  - Allows remote I/O to use private IP
- Download free from Moxa’s website

Introduction

Active OPC Server Lite is a software package provided by Moxa that operates as an OPC driver for an HMI or SCADA system. It offers seamless connection from Moxa’s ioLogik series products to SCADA systems, including Wonderware, Citect, and iFix. Active OPC Server Lite meets the latest standard of OPC DA 3.0, which allows connections to various kinds of devices and host OPC machines.

Smart I/O Connection—Migrating from “Pull” to “Push”

General OPC servers typically use the “poll/response,” or so-called “pull” architecture, to connect to Ethernet I/O devices, which involves an HMI/SCADA system continuously sending out commands to collect relevant data. Moxa’s Active OPC Server, with its non-polling architecture, supports the standard OPC protocol, but also offers active (or “push”) communication with Moxa’s ioLogik series of Active Ethernet I/O products to HMI/SCADA systems, providing instant I/O status reports.

I/O Response that’s 7 Times Faster and Provides 80% off Bandwidth Usage with Event-driven Tag Updates

Adding additional I/O channels will tend to bog down an HMI/SCADA system’s operation, resulting in a longer response time, and high network bandwidth occupation, all because of the traditional “pull” architecture. Active tags created by Active OPC Server Lite and ioLogik series products report the I/O status only when it changes. This type of event-driven tag status update results in an I/O response time that is 7 times faster than other OPC Server packages (using a testing environment with 2,560 I/O channels). In a different test of network bandwidth usage, Active OPC Server Lite and the ioLogik caused an apparent 80% reduction in network traffic. The end result is that I/O access is more precise, and the cost of communicating with remote I/O devices is substantially lower, especially when the remote site has limited bandwidth (e.g., satellite, microwave, and cellular communication). At the same time, the CPU usage of the SCADA/HMI system is also reduced by 35% with this innovative push-based architecture, so that less maintenance effort and lower level hardware devices can be implemented.
**Dynamic IP/WAN Connection**

Unlike the fixed IP requirements of Ethernet I/O with a traditional OPC server, Active OPC Server Lite and ioLogik products provide the flexibility of configuring the ioLogik to use dynamic IP addresses. The ioLogik connects directly to the Active OPC Server Lite instead of being polled, which makes dynamic IP addressing and WAN Access to the Ethernet I/O device possible, and adds even greater flexibility by allowing connections across firewalls. I/O devices for traditional data acquisition applications are not capable of using this approach.

**Automatic Tag Generation**

Active OPC Server Lite and ioLogik series products support “Auto Tag Generation,” which eliminates the headache of specifying target IP addresses, I/O channels, and data formats one by one, or editing and importing configuration text files, since Active OPC Server Lite creates the tags for the target ioLogik automatically. Simply select the channels that you need to update, and the tags are generated and configured automatically. Generally speaking, tag generation is 50 times faster with Active OPC Server Lite than with traditional OPC server packages. One of the biggest payoffs is that users will no longer need to be trained to install and configure your OPC.

**Hardware Requirements**

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

**Software Requirements**

- **Operating System:** Microsoft Windows 2000/XP/2003
- **Editor (optional):** Microsoft Office 2003 (Access 2003) or above

**OPC Server Specifications**

- **OPC Data Access:** 1.0a, 2.0, 2.05a, 3.0
- **Max. No. of Tags:** 256

**Ordering Information**

Available Models

- **Active OPC Server Lite:** Free software package for integrating with SCADA/HMI systems
- **Can be used with the following products:**
  - Active Ethernet I/O: ioLogik E2210/E2212/E2214/E2240/E2242/E2260/E2262 Series
  - Modular Active Ethernet I/O: ioLogik E4200
  - Cellular GPRS I/O: ioLogik WS5340

**Software Versions and Model Support Table**

<table>
<thead>
<tr>
<th>ioLogik Model Name</th>
<th>E2210</th>
<th>E2212</th>
<th>E2214</th>
<th>E2240</th>
<th>E2242</th>
<th>E2260</th>
<th>E2262</th>
<th>E4200*</th>
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<td>v1.1↑</td>
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<td>ioAdmin v3.0↑</td>
<td>ioAdmin v3.0↑</td>
<td>ioAdmin v3.0↑</td>
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<td>v1.1↑</td>
<td>v1.0↑</td>
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</table>

*Note: The version numbers for these models are preliminary. Please see Moxa’s website for the most up-to-date information.*
Click&Go

Easy and intuitive I/O control configuration for the ioLogik Active Ethernet I/O

PC-free Alarm and Control Solution

Moxa’s own Click&Go™ logic turns your ioLogik E2000, E4200, and W5340 remote I/O unit into a compact and powerful RTU by allowing you to configure basic input to output controls, even if users have no programming knowledge. Click&Go™ is such a powerful software solution that when used with the ioLogik series products, Click&Go enables these remote I/O to have local control ability working without the control of a remote PC, or to keep operating when the remote PC or the network is down. Besides the basic local I/O control, alarm messages such as SNMP traps, TCP/UDP messages, e-mails and CGI commands can be triggered when there is an event.

Set Up Your System with Just a Few Clicks

Click&Go™ is a programming-free function set solution that displays the control options you need in an easy to access drop-down menu. This means that you are never more than a few mouse clicks away from getting your system set up and ready to go without a compiler or a debugger. Click&Go’s intuitive IF-THEN-ELSE logic shortens the learning curve and deployment time.

Active Alarm Reports Make Your Monitoring System Real-time

Click&Go™ is designed to provide a simple configuration platform and real-time monitoring capability. For any alarm system, fast response and real-time monitoring is very important. Click&Go™ supports various active communication methods, including TCP, UDP, SNMP Trap, email, and CGI commands, making it very easy to integrate Click&Go™ with any monitoring system. Click&Go™ also supports SNTP for time alignment, making sequential and historical alarm tracking possible. In addition, users can define the content of alarm messages themselves, making Click&Go™ a perfect solution for system users.
**Click&Go™ Provides Time-based Scheduler and Timer Control**

Click&Go™ can be scheduled to perform user defined tasks such as output control, remote actions, and active messaging. This function is useful when applied to energy savings, lighting control, and water pumping systems. The timer function allows users to set a delay period for actions, which is particularly useful when used with alarm systems for which users need an authentication period to avoid false alarms.

**Click&Go™ Function Comparison**

Click&Go™ is now available on all ioLogik products, recent function improvements are shown in the table at the right.

**Input-to-Output Control over IP Networks**

Click&Go™ enables direct input-to-output control over IP networks, without the need for additional PCs. That is, when used in pairs, the ioLogik E2000 units can talk directly to each other, and digital inputs can be reproduced at a remote location over the network. Local analog inputs can also be referenced for remote digital outputs. A typical application can be found in water pumping systems where analog inputs that measure the water level are referenced to activate the pumps On/Off control. By cross referencing the scheduler, less energy will be used to operate the water pumping system.

**Energy Savings for Water Pumping Systems**

Click&Go™ Support Versions

To use the latest version of Click&Go™, simply upgrade the ioLogik’s firmware. But first, be sure to download the latest configuration utility before proceeding to update the firmware.

<table>
<thead>
<tr>
<th>ioLogik Model</th>
<th>E2210</th>
<th>E2212</th>
<th>E2214</th>
<th>E2240</th>
<th>E2242</th>
<th>E2260</th>
<th>E2262</th>
<th>E4200</th>
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<tr>
<td>Configuration Utility</td>
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<td>ioAdmin V3.1†</td>
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<td>modular ioAdmin V1.0†</td>
<td>ioAdmin V3.2†</td>
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<tr>
<td>Firmware</td>
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<td>v3.0†</td>
<td>v3.0†</td>
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<td>v3.0†</td>
<td>v3.0†</td>
<td>v3.0†</td>
<td>v1.0†</td>
<td>v1.0†</td>
</tr>
</tbody>
</table>
ioLogik E2210

Active Ethernet I/O with 12 digital inputs and 8 digital outputs

> Instant event messaging by TCP/UDP/email/SNMP-trap
> Easy-to-use Click&Go™ Logic for local output control
> 12-point 24 VDC digital input with counter
> 8-point 24 VDC digital output with pulse output
> PC-based configuration utility and web console
> I/O control over Modbus/TCP and SNMP protocol
> Windows/WinCE V8/VC.NET and Linux C APIs
> Peer-to-Peer I/O without controller

Simple Applications without Programming
The ioLogik E2210 can convert a trigger event result directly into a digital alarm output. This can be set up using the ioAdmin UI to define an IF-THEN Logic rule, eliminating the need to write programs for PCs or controllers.

Software Event Counter Input and Pulse Output
Each digital input can be independently configured for DI or Event Counter mode, and output can be independently configured for DO or Pulse Output mode.

:* Speciﬁcations*

Digital Input
- Channels: 12, source type
- Sensor Type: NPN, Dry contact
- I/O Mode: DI or Event Counter (up to 900 Hz)
- Dry Contact:
  - Logic 0: short to GND
  - Logic 1: open
- Wet Contact:
  - Logic 0: 0 to 3 VDC
  - Logic 1: 10 to 30 VDC (DI COM to DI)
- Common Type: 12 points per COM
- Isolation: 3K VDC or 2K Vrms
- Counter/Frequency: 900 Hz
- Digital Filtering Time Interval: Software selectable
- Over-voltage Protection: 36 VDC

Digital Output
- Channels: 8, sink type, 36 VDC, 200 mA
- I/O Mode: DO or Pulse Output (up to 100 Hz)
- Pulse Wave Width/Frequency: 10 ms/100 Hz
- Over-voltage Protection: 45 VDC
- Over-current Limit: 400 mA (typical)
- Over-temperature Shutdown: 175°C (min.)
- Output Current Rating: Max. 200 mA per channel
- Isolation: 3K VDC or 2K Vrms

: Pin Assignment

<table>
<thead>
<tr>
<th>I/O (left to right)</th>
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</tbody>
</table>

: Ordering Information

ioLogik E2210: Active Ethernet I/O with 12 digital inputs and 8 digital outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons
# ioLogik E2212

**Active Ethernet I/O with 8 digital inputs, 8 digital outputs, and 4 configurable DIO**

> Selectable digital I/O combination (by software)
> Accepts PNP or NPN sensors
> DI counter saved automatically when power shuts off
> Instant event messaging by TCP/UDP/email/SNMP trap
> Easy-to-use Click&Go Logic for local output control
> PC-based configuration utility and web console
> I/O control over Modbus/TCP and SNMP protocol
> Windows/WinCE VB/VC.NET and Linux C APIs
> Peer-to-Peer I/O without controller

---

## Introduction

### Flexible Digital Input/Output Configuration

The ioLogik E2212 provides system integrators with the flexibility to handle various field demands with channels that can be configured by software for input or output operation. You can configure the I/O channels to suit your needs, for combinations such as 12-inputs/8-outputs, 8-inputs/12-outputs, or 10-inputs/10-outputs.

### Single Ethernet DIO that Accepts 3 Sensor Types

Unlike traditional Ethernet I/O products, the ioLogik E2212 can connect to dry contact, PNP, and NPN sensors at the same time. You can choose the sensor type based on your wiring approach.

---

## Specifications

### Digital Input

- **Channels**: 8, source/sink selectable
- **Sensor Type**: 2 6-point groups for NPN/PNP type
- **I/O Mode**: DI or Event Counter (up to 900 Hz)
- **Dry Contact**:
  - Logic 0: short to GND
  - Logic 1: open
- **Wet Contact**: (For Source Type)
  - Logic 0: 0 to 3 VDC
  - Logic 1: 10 to 30 VDC (DI COM to DI)
- **Common Type**: 6 points per COM
- **Isolation**: 3K VDC or 2K Vrms
- **Counter/Frequency**: 900 Hz, power off storage
- **Digital Filtering Time Interval**: Software selectable
- **Over-voltage Protection**: 36 VDC
- **Poweroff Counter Memory**: 48 bytes

### Digital Output

- **Channels**: 8, sink type, 36 VDC, 200 mA
- **I/O Mode**: DO or Pulse Output (up to 100 Hz)
- **Pulse Wave Width/Frequency**: 10 ms/100 Hz
- **Over-voltage Protection**: 45 VDC
- **Over-current Limit**: 400 mA (typical)
- **Over-temperature Shutdown**: 175°C (min.)
- **Output Current Rating**: Max. 200 mA per channel
- **Isolation**: 2K Vrms or 3K VDC (Magnetic)

### DI/DO Configurable Channels

- **Channels**: 4
- **I/O Mode**:
  - DI or Event Counter (up to 900 Hz)
  - DO or Pulse Output (up to 100 Hz)

---

## Pin Assignment

### I/O (left to right)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| DI COM1 | D0 | D1 | D2 | D3 | D4 | D5 | DI COM2 | DI6 | DI7 | DI8 | DI9 | DI10 | DI11 | GND | DO0 | DO1 | DO2 | DO3 | DO4 | DO5 | DO6 | DO7 | DO PWR |

---

## Ordering Information

- **ioLogik E2212**: Active Ethernet I/O, with 8 digital inputs, 8 digital outputs, and 4 DIOs
- **LDP1602**: LCD module with 16 x 2 text display and 5 buttons

---

The certification logos shown here apply to some or all of the products in this section. For details, see “Regulatory Approvals” under “Specifications” below.
ioLogik E2214

Active Ethernet I/O with 6 digital inputs and 6 relay outputs

> 6 Dis supporting PNP, NPN, and dry contact
> 6 Form A relay outputs (Normal Open)
> Relay specifications: 5 A @ 250 VAC, 5 A @ 30 VDC
> Instant event messaging by TCP/UDP/email/SNMP-trap
> DI and Relay counter saved when the power is shut off
> PC-based configuration utility and web console
> Power On default relay status setting with sequence
> Easy-to-use Click&Go™ Logic for local output control
> Windows/WinCE VB/VC.NET and Linux C APIs
> I/O control over Modbus/TCP and SNMP protocol

Introduction

Remote Ethernet Relay Control

The ioLogik E2214 is a stand-alone Active Ethernet I/O product with 6 digital inputs and 6 relay outputs. The DIN-Rail mountable E2214 can be connected to digital switches, alarm lights, buzzers, and warning sirens over Ethernet and IP-based networks. The ioLogik E2214 also records the built-in relay output usage counter. Even when a sudden power failure is encountered, the ioLogik E2214 will still be able to record the relay output usage counter in its internal memory before the power shuts down completely.

Specifications

Digital Input
- Channels: 6, source/sink selectable
- Sensor Type: NPN, PNP, and Dry contact
- I/O Mode: DI or Event Counter (up to 900 Hz)
- Dry Contact:
  - Logic 0: short to GND
  - Logic 1: open
- Wet Contact (for Source Type):
  - Logic 0: 0 to 3 VDC
  - Logic 1: 10 to 30 VDC (DI COM to DI)
- Common Type: 6 points per COM
- Isolation: 3K VDC or 2 Vrms
- Counter/Frequency: 900 Hz, power off storage
- Digital Filtering Time Interval: Software selectable

Over-voltage Protection: 36 VDC
Poweroff Counter Memory: 48 bytes
Relay Counter Saving: Yes

Relay Output
- Channels: 6 Form A (N.O.) relay outputs, 5A
- Contact Rating: 5 A @ 30 VDC, 5 A @ 250 VAC, 5 A @ 110 VAC
- Inductance Load: 2 A
- Resistance Load: 5 A
- Breakdown Voltage: 500 VAC
- Relay On/Off Time: 10 ms, 5 ms (Max.)
- Initial Insulation Resistance: 1G min. @ 500 VDC
- Expected Life: 100,000 times (Typical)
- Initial Contact Resistance: 30 milli-ohms (Max.)
- Pulse Output: 0.3 Hz at rated load

Pin Assignment

I/O (left to right)

| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| DI.COM1 | DI0 | DI1 | DI2 | GND | DI.COM2 | DI3 | DI4 | DI5 | GND | R0 NO | R0 C | R1 NO | R1 C | R2 NO | R2 C | R3 NO | R3 C | R4 NO | R4 C | R5 NO | R5 C | R6 NO | R6 C |

DI Group 1

DI Group 2

Relays 0 to 5

Ordering Information

ioLogik E2214: Active Ethernet I/O with 6 digital inputs and 6 relay outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons
ioLogik E2240

Active Ethernet I/O with 8 analog inputs and 2 analog outputs

The ioLogik E2240 comes with a combination of analog inputs and analog outputs in one module, and supports a wide range of sensors and actuators, including pH, conductivity, pressure, flow, and valves.

Analog Input
- Channels: 8 analog inputs with differential input
- Resolution: 16 bits
- I/O Mode: Voltage / Current
- Input Range: ±150 mV, ±500 mV, ±5 V, ±10 V, 0 to 20 mA, 4 to 20 mA
- Data Format: 16-bit integer (2’s complement)
- Accuracy: ±0.1% FSR @ 25°C, ±0.3% FSR @ -10 and 60°C
- Sampling Rate (all channels):
  - 10 samples/sec for voltage
  - 6 samples/sec for current
- Input Impedance: 900K ohms (min.)
- Built-in Resistor for Current Input: 106 ohms
- CMR @ 50/60 Hz: 95 dB min.
- Zero Drift: ±9 µV/°C
- Span Drift: ±25 ppm/°C
- Isolation: 3K VDC or 2K Vrms

Analog Output
- Channels: 2
- 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
- Zero Drift: ±9 µV/°C
- Span Drift: ±25 ppm/°C
- Load Resistor: Less than 250 ohms

Pin Assignment

<table>
<thead>
<tr>
<th>I/O (left to right)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>Vin0+</td>
</tr>
</tbody>
</table>

Ordering Information

ioLogik E2240: Active Ethernet I/O with 8 analog inputs and 2 analog outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons
**ioLogik E2242**

**Active Ethernet I/O with 4 analog inputs and 12 configurable DIOs**

- 4 fixed differential analog input channels
- 12 configurable digital input/output channels
- DI counter saved automatically when power shuts off
- Instant event messaging by TCP/UDP/email/SNMP-Trap
- PC-based configuration utility and web console
- Easy-to-use Click&Go™ Logic for local output control
- Windows/WinCE VB/VC.NET and Linux C APIs
- I/O control over Modbus/TCP and SNMP protocol
- NIST traceable calibration

---

**Introduction**

Better I/O Matrix for Monitoring—Moxa’s ioLogik E2242 is tailor made for use with remote monitoring and alarm systems. This Active Ethernet I/O product provides 4 analog inputs and 12 configurable DIOs for a 1:3 ratio of analog I/Os to digital I/Os perfectly adapted to water tank monitoring and environmental monitoring applications, in which 1 analog input is used to trigger 3 digital outputs as High-High, High, and Low alarms. Moxa’s ioLogik E2242 lets you set up your monitoring system without the need for a local PC or RTU.

---

**Specifications**

**Analog Input**
- Channels: 4 analog inputs with differential input
- Resolution: 16 bits
- I/O Mode: Voltage / Current
- 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
- Sampling Rate (all channels): 100 samples/sec
- Input Impedance: 200K ohms (min.)
- Built-in Resistor for Current Input: 102 ohms

**DI/DO Configurable Channels**
- Channels: 12
- I/O Mode:
  - DI or Event Counter (up to 900 Hz)
  - DO or Pulse Output (up to 100 Hz)

**Digital Input**
- Channels: Up to 12, source/sink selectable
- Sensor Type: NPN, PNP, and Dry contact

**Digital Output**
- Channels: Up to 12, sink type, 36 VDC, 200 mA
- I/O Mode: DO or Pulse Output (up to 100 Hz)
- Pulse Wave Width/Frequency: 10 ms/100 Hz
- Over-voltage Protection: 45 VDC
- Over-current Limit: 400 mA (typical)
- Over-temperature Shutdown: 175°C (min.)
- Output Current Rating: Max. 200 mA per channel
- Isolation: 2K Vrms or 3K VDC (Magnetic)

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**Pin Assignment**

**I/O (left to right)**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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<td>GND</td>
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</table>

**Ordering Information**

ioLogik E2242: Active Ethernet I/O with 4 analog inputs and 12 configurable DIOs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

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The certification logos shown here apply to some or all of the products in this section. For details, see “Regulatory Approvals” under “Specifications” below.
ioLogik E2260

Active Ethernet I/O with 6 RTD inputs and 4 digital outputs

> Supports PT, JPT, Ni RTD sensor types and resistors
> Adjustable RTD sampling rate
> Instant event messaging by TCP/UDP/email/SNMP-trap
> PC-based configuration utility and web console
> Easy-to-use Click&Go™ Logic for local output control
> Windows/WinCE VB/VC.NET and Linux C APIs
> I/O control over Modbus/TCP and SNMP protocol
> NIST traceable calibration

The certification logos shown here apply to some or all of the products in this section. For details, see “Regulatory Approvals” under “Specifications” below.

Introduction

Bring Intelligence to Temperature Measurement

The ioLogik E2260 brings intelligence to temperature sensors. It comes equipped with virtual channels that are designed to calculate the average value of each channel and the difference between two channels. And it does all this without a controller or PC.

Compatible with Popular RTD Temperature Sensors

The ioLogik E2260 offers PT100, PT1000, JPT, and Ni sensor types and a resistor of up to 2.2 kilo-ohms, and supports using your own resistance sensor, such as PTC or NTC types for your HVAC applications.

Specifications

> RTD
> Channels: 6
> Input Type: Pt, JPt, Ni, RTD sensor, resistor
> Sampling Rate: 12 samples/sec (all channels)
> Resolution: 0.1°C or 0.1 ohm
> Accuracy:
  ±0.1% FSR @ 25°C
  ±0.3% FSR @ -10 and 60°C
> Input Impedance: 625K ohms (min.)

> Digital Output
> Channels: 4, sink, 36 VDC, 200 mA
> I/O Mode: DO or Pulse Output
> Pulse Wave Width/Frequency: 10 ms/100 Hz
> Over-voltage Protection: 45 VDC
> Over-current Limit: 750 mA
> Over-temperature Shutdown: 175°C
> Isolation: 3K VDC or 2K Vrms

Pin Assignment

<table>
<thead>
<tr>
<th>I/O (left to right)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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Ordering Information

ioLogik E2260: Active Ethernet I/O with 6 RTD inputs and 4 digital outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons
ioLogik E2262

Active Ethernet I/O with 8 thermocouple inputs and 4 digital outputs

> Supports J, K, T, E, R, S, B, and N type thermocouple and mV modes
> Conversion Time: Less than 90 ms
> Instant event messaging by TCP/UDP/email/SNMP-Trap
> PC-based configuration utility and web console
> Easy-to-use Click&Go™ Logic for local output control
> Windows/WinCE V8/VC.NET and Linux C APIs
> I/O control over Modbus/TCP and SNMP protocol
> NIST traceable calibration

The ioLogik E2262 can extend the wiring length of your sensors up to 10 fold. For example, whereas the wiring for a J-Type may normally extend only 10 m, the ioLogik E2262 can be used to increase the J-Type TC wiring length up to 100 m.

More Accurate Temperates

The ioLogik E2262 has two cold junction compensation sets and supports digital filtering. Calibration, linearization, and calculation are based on the devices traced by the NIST (National Institute of Standards and Technology), and are stored in memory to eliminate this source of error. The ioLogik E2262 can also detect burnout and disconnection.

Thermocouple Input

- Channels: 8
- Sensor Type: J, K, T, E, R, S, B, N type TC and mV mode
- Conversion Time: Less than 90 ms
- Effective Resolution: 16 bits
- Accuracy:
  - ±0.1% FSR @ 25°C
  - ±0.3% FSR @ -10 and 60°C
- Input Impedance: 1 M ohm or better

Digital Output

- Channels: 4, sink type, 36 VDC, 200 mA
- I/O Mode: DO or Pulse Output (up to 100 Hz)
- Pulse Wave Width/Frequency: 10 ms/100 Hz
- Over-voltage Protection: 45 VDC
- Over-current Limit: 750 mA
- Over-temperature Shutdown: 175°C
- Isolation: 3K VDC or 2K Vrms

I/O Pin Assignment

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Ordering Information

ioLogik E2262: Active Ethernet I/O with 8 thermocouple inputs and 4 digital outputs
LDP1602: LCD module with 16 x 2 text and 5 buttons
ioMirror E3210

Ethernet Peer-to-Peer I/O with 8 digital inputs and 8 digital outputs

> Direct input-to-output signal communication over IP
> High speed Peer-to-Peer I/O within 20 ms
> One physical alarm port for connectivity status
> Quick and easy utility and web-based settings
> Local alarm channel
> Remote alarm message
> Supports Modbus/TCP for remote monitoring
> Optional LCD module for simple setting

Introduction

Direct Input-to-Output Communication over IP
ioMirror E3000 Ethernet I/O products are designed as a cable-replacement solution that connects remote digital input signals to output signals over an IP network. The ioMirror E3210 provides 8 digital input channels, 8 digital output channels, and a 10/100M Ethernet interface. Up to 8 pairs of digital input and output signals can be exchanged over Ethernet with another ioMirror E3210, or can be sent to a local PLC or DCS controller. Over a local area network, the ioMirror can achieve a low signal latency (typically less than 20 ms). With ioMirror, remote sensors can now be connected to local controllers or display panels over copper, fiber, or wireless Ethernet infrastructures. Signals can be transmitted over virtually unlimited distances, without noise problems.

Split Sensor Signals to 16 Different Locations
The ioMirror E3000 can split one input signal to two digital output channels at two different IP addresses. Eight tank level signals can be monitored at 16 different display panels, all at the same time.

Local Alarm and Remote Alarm Messages for Monitoring Connectivity
The ioMirror E3210 has a 24 VDC alarm output channel that can activate an attached buzzer or LED display when the connection fails. In addition, both ioMirror modules can send messages to the ioEventLog software, ensuring that at least one of the warning messages will reach the ioEventLog software.

Specifications

LAN
Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, HTTP, SNTP

Digital Input
Channels: 8, source type
Sensor Type: NPN, Dry contact
I/O Mode: Digital Input
Dry Contact:
  • Logic 0: short to GND
  • Logic 1: open
Wet Contact:
  • Logic 0: 0 to 3 VDC
  • Logic 1: 10 to 30 VDC (DI COM to DI)
Common Type: 8 points per COM
Isolation: 3K VDC or 2K Vrms
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC

Digital Output
Channels: 8, sink type, 36 VDC, 200 mA
I/O Mode: Digital Output
Over-voltage Protection: 45 VDC
Over-current Limit: 600 mA
Over-temperature Shutdown: 160°C
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Alarm Port Output
Channels: 1, sink type
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Power Requirements
Power Input: 24 VDC nominal, 12 to 48 VDC
DO Power: 24 VDC nominal, up to 45 VDC
Physical Characteristics

Wiring: I/O cable max. 14 AWG

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)

Regulatory Approvals

EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

I/O Pin Assignment

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Dimensions (unit = mm)

Side View

Front View

Rear View

Ordering Information

ioMirror E3210: Ethernet Peer-to-Peer I/O with 8 digital inputs and 8 digital outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty
The ioLogik E4200 is suitable for remote monitoring and alarm systems, such as are 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 E4200.

**Specifications**

**LAN**
- **Ethernet:** 2 x 10/100 Mbps (2 MACs, 2 IPs, RJ45 connectors)
- **Protection:** 1.5 KV magnetic isolation
- **Protocols:** Modbus/TCP, TCP/IP, UDP, DHCP, Booter, SNMP, SNMP Trap, HTTP, SMTP

**Serial Communication**
- **Interface:** 1 x RS-232/485 (9-pin D-Sub, male)
- **Parameters:** N, 8, 1
- **Baudrate:** 115,200 bps

**Power Requirements**
- **Power Input:** 24 VDC nominal, 12 to 36 VDC
- **Power Consumption:** 60 mA typical @ 24 VDC
- **Current for I/O Modules:** Max. 1.5A @ 5 VDC

**Field Power**
- **Rated Voltage:** 11 to 28.8 VDC, 24 VDC typical
- **Current in Field Power Contact:** Max. 10 A

**Isolation**
- System Power to I/O Driver: Optical isolation

**Physical Characteristics**
- **Dimensions:** 45 x 99.8 x 70 mm

**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)

**Regulatory Approvals**
- **EMI:** FCC part 15, CISPR (EN55022) Class A
- **EMS:** IEC 61000-4-2 (ESD), level 2/3
- IEC 61000-4-3 (RS), level 2
- IEC 61000-4-4 (EFT), level 2
- IEC 61000-4-5 (Surge), level 3
- IEC 61000-4-6 (CS), level 2
- IEC 61000-4-8 (PM), level 1
- IEC 61000-4-11 (DIP)
- IEC 61000-6-2 (ESD), level 2/3
- IEC 61000-6-4 (EFT), level 2

**Safety**
- **UL 508**
- **IEC 60068-2-27**
- **IEC 60068-2-32**
- **IEC 60068-2-6**

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

**Warranty**
- **Warranty Period:** 2 years
- **Details:** See www.moxa.com/warranty

**Ordering Information**
- **Step 1:** Select a network adaptor module
- **Step 2:** Select I/O modules
- **Step 3:** Select power modules

**Available Models**
- **ioLogik E4200:** Active Ethernet network adaptor

**Note:** The ioLogik E4200 Active Ethernet network adaptor can be expanded by adding up to 16 I/O modules. See pages 5-33 to 5-41 to select the M-series modules for your application.
NA-4010

Ethernet network adaptor

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

<table>
<thead>
<tr>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LAN</strong></td>
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<tr>
<td>Ethernet: 1 x 10/100 Mbps, RJ45</td>
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<tr>
<td><strong>Software Features</strong></td>
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<tr>
<td>Protocols: Modbus/TCP, HTTP, Bootp</td>
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<tr>
<td>IP Settings: ARP, Bootp, static IP</td>
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<tr>
<td>Utility: ioAdmin</td>
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<tr>
<td>Programming Library: MXIO DLL library for Windows supporting Visual Basic, Visual C++, Borland C++ Builder, .NET</td>
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<tr>
<td>Number of I/O Modules Supported: Max. of 32</td>
</tr>
<tr>
<td><strong>Power Requirements</strong></td>
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<tr>
<td>Power Input: 11 to 28.8 VDC, 24 VDC typical</td>
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<tr>
<td>Power Consumption: 60 mA typical @ 24 VDC</td>
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<tr>
<td>Current for I/O Modules: Max. 1.5A @ 5 VDC</td>
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<tr>
<td><strong>Field Power</strong></td>
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<tr>
<td>Rated Voltage: 11 to 28.8 VDC, 24 VDC typical</td>
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<tr>
<td>Current in Field Power Contact: Max. 10 A</td>
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</tbody>
</table>

| Isolation |
| System Power to I/O Driver: Optical isolation |

| Physical Characteristics |
| Dimensions: 42 x 99 x 70 mm (1.65 x 3.9 x 2.75 in) |
| Weight: 150 g |

| 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) |

| Regulatory Approvals |
| Safety: UL508 |
| EMC: CE IEC 61000-6-2, IEC 61000-6-4 |
| Vibration: IEC-68-2-6 (2 g’s during operation) |

| Warranty |
| Warranty Period: 2 years |
| Details: See www.moxa.com/warranty |

| Ordering Information |
| Step 1: Select a network adaptor module |
| Step 2: Select I/O modules |
| Step 3: Select power modules (optional) |

Available Models

NA-4010: Ethernet network adaptor (Modbus/TCP)

Note: The NA-4010 Ethernet network adaptor can be expanded by adding up to 32 I/O modules. See pages 5-33 to 5-41 to select the M- series modules for your application.
LDP1602 LCD Module

Snap-on module for the ioLogik 2000 and ioMirror 3000 series

- Hot-pluggable display module for ioLogik Active Ethernet I/O, serial I/O, and Peer-to-Peer I/O
- Easy, portable configuration kit for IP display and configuration
- Direct display for analog value and digital input, counter status
- No battery required (powered through the I/O)

Installing the LCD Module

1. Remove the ioLogik's top cover.
2. Plug in the LCD module.
3. Check and configure the IP address.
4. Check IP and I/O status.

Specifications

- LCD Screen: 16 x 2 text display (in English)
- Operating Temperature: 0 to 55°C (32 to 131°F)
- Storage Temperature: -20 to 70°C (-4 to 158°F)
- Ambient Relative Humidity: 5 to 95% (non-condensing)

Ordering Information

LDP1602: LCD module with 16 x 2 text display and 5 buttons
The ioLogik W5340 is designed for cellular remote monitoring and alarm systems, such as automated river monitoring and pipeline monitoring. The ioLogik W5000 series uses GPRS technology to maximize the coverage of remote monitoring applications. This kind of application needs cellular communications and I/O points connected to various sensors, including rainfall meters, flow meters, and water level detectors, since installing devices is usually difficult. They all enjoy the benefit of the GPRS communication feature of ioLogik W5340.

### Specifications

#### Cellular
- **Interface**: GPRS
- **Band Options**: Quad-band 850/900/1800/1900 MHz
- **GPRS Multi-Slot Class**: Class 10
- **GPRS Terminal Device Class**: Class B
- **SIM Control Voltage**: 3 V
- **Ethernet**: 1 x 10/100 Mbps, RJ45
- **Protocols**: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP, SNTP

#### Serial Communication
- **Interface**: 1 x RS-232/422/485, software selectable (9-pin D-Sub, male or 5-contact terminal block)
- **Baudrate**: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps

#### Analog Input
- **Channels**: 4 analog inputs with differential input
- **Resolution**: 16 bits
- **I/O Mode**: Voltage / Current
- **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 @ -10 and 55°C
- **Sampling Rate (all channels)**: 100 samples/sec
- **Input Impedance**: 200K ohms (min.)
- **Built-in Resistor for Current Input**: 102 ohms

#### DI/DO Configurable Channels
- **Channels**: 8
- **I/O Mode**:
  - DI or Event Counter (up to 900 Hz)
  - DO or Pulse Output (up to 100 Hz)
- **Digital Input**
  - **Channels**: Up to 8, source/sink selectable
  - **Sensor Type**: NPN/PNP type
  - **I/O Mode**: DI or Event Counter (up to 900 Hz)
  - **Dry Contact**:
    - Logic 0: short to GND
    - Logic 1: open
  - **Wet Contact** (For Source Type)
    - Logic 0: 0 to 3 VDC
    - Logic 1: 10 to 30 VDC (DI COM to DI)
  - **Common Type**: 4 points per COM
  - **Isolation**: 3K VDC or 2K Vrms
  - **Counter/Frequency**: 900 Hz, power off storage
  - **Digital Filtering Time Interval**: Software selectable
  - **Over-voltage Protection**: 36 VDC
  - **Poweroff Counter Memory**: 48 bytes
- **Digital Output**
  - **Channels**: Up to 8, sink type, 36 VDC, 200 mA
  - **I/O Mode**: DO or Pulse Output (up to 100 Hz)
  - **Pulse Wave Width/Frequency**: 10 ms/100 Hz
  - **Over-voltage Protection**: 45 VDC
  - **Over-current Limit**: 600 mA

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.
Remote Monitoring Solutions

**5-28 [Image] Remote Monitoring Solutions**

**Industrial I/O > ioLogik W5340**

**Pin Assignment**

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<th>I/O (left to right)</th>
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</table>

**Ordering Information**

**Available Models**

ioLogik WS340: Active GPRS I/O device with 4 AIs, 8 DI0s, and 2 relay outputs

**Relay Output**

- **Channels**: 2 Form A (N.O.) relay outputs, 5 A
- **Contact Rating**: 5 A @ 30 VDC, 5 A @ 240 VAC, 5 A @ 110 VAC
- **Inductance Load**: 2 A
- **Resistance Load**: 5 A
- **Breakdown Voltage**: 500 VAC
- **Relay On/Off Time**: 10 ms, 5 ms (max.)
- **Initial Insulation Resistance**: 1 G min. @ 500 VDC
- **Expected Life**: 100,000 times (Typical)
- **Initial Contact Resistance**: 30 milli-ohms (max.)
- **Pulse Output**: 20 operation times per minutes at rated load
- **Isolation**: 3 K VDC or 2 K Vrms

**Power Requirements**

- **Power Input**: 24 VDC nominal, 12 to 36 VDC
- **Power Consumption**:
  - GPRS Always On (Communication): 4.2 W

**Environmental Limits**

- **Operating Temperature**: -10 to 55°C (14 to 131°F)
- **Storage Temperature**: -40 to 85°C (-40 to 185°F)
- **Ambient Relative Humidity**: 5 to 95% (non-condensing)

**Dimensions (unit = mm)**

[Image of dimensions]

**Regulatory Approvals**

- **EMI**: FCC part 15, CISPR (EN55022) Class A
- **EMS**:
  - IEC 61000-4-2 (ESD), level 2/3
  - IEC 61000-4-3 (RS), level 2
  - IEC 61000-4-4 (EFT), level 2
  - IEC 61000-4-5 (Surge), level 3
  - IEC 61000-4-6 (CS), level 2
  - IEC 61000-4-8 (PM), level 1
  - IEC 61000-4-11 (DIP)
  - IEC 61000-6-2 (ESD), level 2/3
  - IEC 61000-6-4 (EFT), level 2

**Safety**: UL 508

**Shock**: IEC 60068-2-27

**Freefall**: IEC 60068-2-32

**Vibration**: IEC 60068-2-6

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

**Warranty**

- **Warranty Period**: 2 years
- **Details**: See www.moxa.com/warranty

**Over-temperature Shutdown**: 160°C

**Output Current Rating**: Max. 200 mA per channel

**Isolation**: 3 K VDC or 2 K Vrms
**ioLogik R2110**

**RS-485 remote I/O with 12 digital inputs and 8 digital outputs**

> 12-channel 24 VDC digital inputs with DI Event Counter mode, and software selectable filtering time
> 8-channel 24 VDC digital outputs with pulse output mode and software selectable pulse width
> LED indicators for all I/O channels
> Over-temperature protection (up to 175°C)
> Over-current protection (400-mA/channel)
> Easy-to-use, quick programming library for VB, VC++, BCB, .NET
> Firmware upgradable over RS-485

---

### Specifications

#### Digital Input
- **Channels:** 12, source type
- **I/O Mode:** DI or Event Counter (up to 50 Hz)
- **Dry Contact:**
  - Logic 0: short to GND
  - Logic 1: open
- **Wet Contact:**
  - Logic 0: 0 to 3 VDC
  - Logic 1: 10 to 30 VDC
  - (DI COM to DI)
- **Common Type:** 12 points per COM
- **Isolation:** 3K VDC or 2K Vrms

#### Digital Output
- **Channels:** 8, sink type, 36 VDC, 200 mA
- **I/O Mode:** DO or Pulse Output (up to 50 Hz)
- **Output Current Rating:** Max. 200 mA per channel
- **Isolation:** 3K VDC or 2K Vrms
- **Output Frequency:** 50 Hz

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### Pin Assignment

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<td>DI24</td>
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</tbody>
</table>

---

### Ordering Information

- **ioLogik R2110:** RS-485 remote I/O with 12 digital inputs and 8 digital outputs
- **LDP1602:** LCD module with 16 x 2 text display and 5 buttons
ioLogik R2140

RS-485 remote I/O with 8 analog inputs and 2 analog outputs

> 8 analog input channels for millivolts (mV), voltage, and current signal with wire-off detection (at 4 to 20 mA)
> 2-channel analog outputs for voltage, current actuator control
> 16-bit resolution analog inputs, 12-bit resolution analog output
> Easy-to-use, quick programming library for VB, VC++, BCB, .NET
> NIST-Traceability calibration for analog I/O channels
> Firmware upgradable over RS-485

---

The certification logos shown here apply to some or all of the products in this section. For details, see “Regulatory Approvals” under “Specifications” below.

### Specifications

#### Analog Input
- **Channels**: 8, sink type, 45 VDC, 200 mA
- **Resolution**: 16-bit
- **I/O Mode**: Voltage / Current
- **Input Range**: ±150 mV, ±500 mV, ±5 V, ±10 V, 0 to 20 mA, 4 to 20 mA
- **Data Format**: 16-bit integer
- **Accuracy**:
  - ±0.1% FSR @ 25°C
  - ±0.3% FSR @ -10 and 60°C
- **Sampling Rate (all channels)**:
  - 10 samples/sec (voltage)
  - 6 samples/sec (current)
- **Built-in Resistor for Current Input**: 106 ohms
- **CMR @ 50/60 Hz**: 95 dB min.
- **Isolation**: 3K VDC or 2K Vrms

#### Analog Output
- **Channels**: 2
- **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
- **Zero Drift**: ±9 µV/°C
- **Span Drift**: ±25 ppm/°C
- **Load Resistor**: Less than 250 ohms

### Pin Assignment

<table>
<thead>
<tr>
<th>I/O (left to right)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>Vin0+</td>
</tr>
</tbody>
</table>

### Ordering Information

- ioLogik R2140: RS-485 remote I/O with 8 analog inputs and 2 analog outputs
- LDP1602: LCD module with 16 x 2 text display and 5 buttons
NA-4020/4021
RS-485 or RS-232 network adaptors

The certification logos shown here apply to some or all of the products in this section. For details, see “Regulatory Approvals” under “Specifications” below.

Specifications

Serial Communication Parameters
Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Baudrate: 1200 to 115200 bps
Signals:
• NA-4020: Data+, Data-, Gnd, DIR
• NA-4021: TxD, RxD, Gnd

Software Features
Protocols: Modbus/RTU, Modbus/ASCII
Modbus Address: 00 to 99 (set by rotary switches)
Utility: ioAdmin
Programming Library: MXIO DLL library for Windows; Supports Visual Basic, Visual C++, Borland C++ Builder
Number of I/O Modules Supported: Max. of 32

Power Requirements
Power Input: 11 to 28.8 VDC, 24 VDC typical
Power Consumption: 70 mA typical @ 24 VDC
Current for I/O Modules: Max. 1.5 A @ 5 VDC

Field Power
Rated Voltage: 11 to 28.8 VDC, 24 VDC typical
Current in Field Power Contact: Max. 10 A

Isolation
System Power to I/O Driver: Optical isolation

Physical Characteristics
Dimensions: 42 x 99 x 70 mm (1.65 x 3.9 x 2.75 in)
Weight: 150 g

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)

Regulatory Approvals
Safety: UL508
EMC: CE IEC 61000-6-2, IEC 61000-6-4
Vibration: IEC-68-2-6 (2 g’s during operation)

Warranty
Warranty Period: 2 years
Details: See www.moxa.com/warranty

Ordering Information
Step 1: Select a network adaptor module
Step 2: Select I/O modules
Step 3: Select power modules (optional)

Available Models
NA-4020: RS-485 network adaptor (Modbus)
NA-4021: RS-232 network adaptor (Modbus)

Note: The NA-4020/4021 RS-485/232 network adaptors can be expanded by adding up to 32 I/O modules. See pages 5-33 to 5-41 to select the M-series modules for your application.
## Modular Remote I/O Selection Guide

### I/O Modules

#### DC-Digital Inputs

<table>
<thead>
<tr>
<th>Model</th>
<th>M-1800</th>
<th>M-1801</th>
<th>M-1600</th>
<th>M-1601</th>
<th>M-1450</th>
<th>M-1451</th>
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<tbody>
<tr>
<td>Channels</td>
<td>8</td>
<td>8</td>
<td>16</td>
<td>16</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Sink/Source</td>
<td>Sink</td>
<td>Source</td>
<td>Sink</td>
<td>Source</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Connector</td>
<td>RTB</td>
<td>RTB</td>
<td>20-pin</td>
<td>20-pin</td>
<td>RTB</td>
<td>RTB</td>
</tr>
<tr>
<td>Voltage</td>
<td>24 VDC</td>
<td>24 VDC</td>
<td>24 VDC</td>
<td>24 VDC</td>
<td>110 VAC</td>
<td>220 VAC</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Optical isolation</td>
<td></td>
</tr>
</tbody>
</table>

#### AC-Digital Inputs

<table>
<thead>
<tr>
<th>Model</th>
<th>M-2800</th>
<th>M-2801</th>
<th>M-2600</th>
<th>M-2601</th>
<th>M-2450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channels</td>
<td>8</td>
<td>8</td>
<td>16</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>Sink/Source</td>
<td>Sink</td>
<td>Source</td>
<td>Sink</td>
<td>Source</td>
<td>Relay</td>
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<tr>
<td>Connector</td>
<td>RTB</td>
<td>RTB</td>
<td>20-pin</td>
<td>20-pin</td>
<td>RTB</td>
</tr>
<tr>
<td>Voltage</td>
<td>24 VDC</td>
<td>24 VDC</td>
<td>24 VDC</td>
<td>24 VDC</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Current</td>
<td>0.5 A</td>
<td>0.5 A</td>
<td>0.3 A</td>
<td>0.3 A</td>
<td>0.5 A</td>
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<tr>
<td>Isolation</td>
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<td></td>
<td></td>
<td>Optical isolation</td>
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</table>

### Digital Outputs

#### Analog Inputs

<table>
<thead>
<tr>
<th>Model</th>
<th>M-3802</th>
<th>M-3810</th>
<th>M-6200</th>
<th>M-6201</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channels</td>
<td>8</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Current</td>
<td>4 to 20 mA</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Voltage</td>
<td>---</td>
<td>0 to 10V</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Resolution</td>
<td>12-bit</td>
<td>12-bit</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Isolation</td>
<td></td>
<td></td>
<td>Optical isolation</td>
<td></td>
</tr>
<tr>
<td>Sensor Input</td>
<td>---</td>
<td>---</td>
<td>RTD(ohm)</td>
<td>Thermo-couple (mV)</td>
</tr>
</tbody>
</table>

#### Analog Outputs

<table>
<thead>
<tr>
<th>Model</th>
<th>M-4402</th>
<th>M-4410</th>
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</thead>
<tbody>
<tr>
<td>Channels</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Current</td>
<td>4 to 20 mA</td>
<td>---</td>
</tr>
<tr>
<td>Voltage</td>
<td>---</td>
<td>0 to 10 V</td>
</tr>
<tr>
<td>Connector</td>
<td>RTB</td>
<td>RTB</td>
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<tr>
<td>Resolution</td>
<td>12-bit</td>
<td>12-bit</td>
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<tr>
<td>Isolation</td>
<td></td>
<td>Optical isolation</td>
</tr>
</tbody>
</table>

### Power Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>M-7001</th>
<th>M-7002</th>
<th>M-7804</th>
<th>M-7805</th>
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<tbody>
<tr>
<td>Channels</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Voltage</td>
<td>24 VDC</td>
<td>DC: 5, 24, 48 VDC</td>
<td>AC: 110/220 VAC</td>
<td>0 VDC</td>
</tr>
<tr>
<td>Purpose</td>
<td>System Power</td>
<td>Field Power</td>
<td>Field Power</td>
<td>Field Power</td>
</tr>
</tbody>
</table>
Digital Input Modules

8-channel 24 VDC digital input modules

**M-1800: 8 digital inputs, sink, 24 VDC**
- Inputs per Module: 8 channels, sink type
- On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
- Min. Off-state Voltage: Max. 5 VDC
- On-state Current: Max. 6 mA/point @ 28.8 VDC
- Input Impedance: Typ. 5.1K ohms
- Filtering Time: Typ. 1.5 ms
- Common Type: External common
- Power Consumption: Max. 35 mA @ 5 VDC

16-channel 24 VDC digital input modules

**M-1801: 8 digital inputs, source, 24 VDC**
- Inputs per Module: 8 channels, source type
- On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
- Min. Off-state Voltage: Max. 5 VDC
- On-state Current: Max. 6 mA/point @ 28.8 VDC
- Input Impedance: Typ. 5.1K ohms
- Filtering Time: Typ. 1.5 ms
- Common Type: External common
- Power Consumption: Max. 35 mA @ 5 VDC

**M-1600: 16 digital inputs, sink, 24 VDC**
- Inputs per Module: 16 channels, sink type
- On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
- Min. Off-state Voltage: Max. 5 VDC
- On-state Current: Max. 6 mA/point @ 28.8 VDC
- Input Impedance: Typ. 5.1K ohms
- Filtering Time: Typ. 1.5 ms
- Common Type: 16 channels for 2 COMs
- Power Consumption: Max. 40 mA @ 5 VDC
4-channel AC digital input modules

**M-1450: 4 digital inputs, 110 VAC**
- Inputs per Module: 4 channels
- On-state Voltage: 120 VAC nominal, min. 85 VAC to max. 132 VAC
- Min. Off-state Voltage: Max. 5 VDC
- On-state Current: Max. 8 mA/point @ 132 VAC
- Input Impedance: Typ. 11K ohms
- Common Type: 4 channels for 2 COMs (single common)
- Power Consumption: Max. 35 mA @ 5 VDC

**M-1451: 4 digital inputs, 220 VAC**
- Inputs per Module: 4 channels
- On-state Voltage: 240 VAC nominal, min. 170 VAC to max. 264 VAC
- Min. Off-state Voltage: Max. 5 VDC
- On-state Current: Max. 12 mA/point @ 264 VAC
- Input Impedance: Typ. 22K ohms
- Common Type: 4 channels for 2 COMs (single common)
- Power Consumption: Max. 35 mA @ 5 VDC

---

**M-1601: 16 digital inputs, source, 24 VDC**
- Inputs per Module: 16 channels, source type
- On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
- Min. Off-state Voltage: Max. 5 VDC
- On-state Current: Max. 6 mA/point @ 28.8 VDC
- Input Impedance: Typ. 5.1K ohms
- Filtering Time: Typ. 1.5 ms
- Common Type: 16 channels for 2 COMs
- Power Consumption: Max. 40 mA @ 5 VDC

---

**Ordering Information**

<table>
<thead>
<tr>
<th>DC-Digital Input Modules</th>
<th>AC-Digital Input Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>M-1800</td>
</tr>
<tr>
<td><strong>Channels</strong></td>
<td>8</td>
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<tr>
<td><strong>Sink/Source</strong></td>
<td>Sink</td>
</tr>
<tr>
<td><strong>Connector</strong></td>
<td>RTB</td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>24 VDC</td>
</tr>
<tr>
<td><strong>Isolation</strong></td>
<td>Optical Isolation</td>
</tr>
</tbody>
</table>
Digital Output Modules

8-channel 24 VDC digital output modules

**M-2800**
- **8 digital outputs, sink, 24 VDC, 0.5 A**
- **Outputs per Module:** 8 channels, sink type
- **Output Voltage Range:** 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
- **On-state Voltage Drop:** Max. 0.3 VDC @ 25°C
- **On-state Current:** Min. 1 mA per channel
- **Off Leakage Current:** Max. 50 µA
- **Output Current Rating:** Max. 0.5 A per channel
- **Common Type:** 8 channels per external common (single common)
- **Power Consumption:** Max. 60 mA @ 5 VDC

16-channel digital output modules

**M-2600**
- **16 digital outputs, sink, 24 VDC, 0.3 A**
- **Outputs per Module:** 16 channels, sink type
- **Output Voltage Range:** 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
- **On-state Voltage Drop:** Max. 0.3 VDC @ 25°C
- **On-state Current:** Min. 1 mA per channel
- **Off Leakage Current:** Max. 50 µA
- **Output Current Rating:**
  - Max. 0.3 A per channel
  - Max. 4 A per common
- **Common Type:** 16 channels for 2 COMs (single common)
- **Power Consumption:** Max. 80 mA @ 5 VDC
**Remote Monitoring Solutions**

**Industrial I/O > Digital Output Modules**

### 4-channel relay output modules

**M-2450: 4 relay outputs, 24-VDC/230-VAC, 2 A**
- **Outputs per Module:** 2 channels, relay
- **Relay Type:**
  - Form A, Normally Open (N.O.)
  - Single Pole, Single Throw (SPST)
- **Output Voltage Range:** Load dependent
  - 5 to 28.8 V DC @ 2 A resistive
  - 48 V DC @ 0.8 A resistive
  - 110 V DC @ 0.3 A resistive
  - 250 VAC @ 2 A resistive
- **Output Current Rating:** At rated power
  - 2 A @ 5 to 28.8 V DC
  - 0.8 A @ 48 V DC
  - 0.5 A @ 110 V DC
  - 2 A @ 250 VAC
- **Min. Load:** 100 µA, 100 m VDC per point
- **Max. On-state Voltage Drop:** 0.3 VDC @ 25°C
- **On-state Current:** Min. 1 mA per channel
- **Off Leakage Current:** Max. 50 µA
- **Output Current Rating:**
  - Max. 0.3 A per channel
  - Max. 4 A per common
- **Common Type:** 16 channels for 2 COMs (single common)
- **Power Consumption:** Max. 65 mA @ 5 V DC

### Ordering Information

<table>
<thead>
<tr>
<th>Model</th>
<th>M-2800</th>
<th>M-2801</th>
<th>M-2600</th>
<th>M-2601</th>
<th>M-2450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channels</td>
<td>8</td>
<td>8</td>
<td>16</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>Sink/Source</td>
<td>Sink</td>
<td>Source</td>
<td>Sink</td>
<td>Source</td>
<td>Relay</td>
</tr>
<tr>
<td>Connector</td>
<td>RTB</td>
<td>RTB</td>
<td>20-pin</td>
<td>20-pin</td>
<td>RTB</td>
</tr>
<tr>
<td>Voltage</td>
<td>24 VDC</td>
<td>24 VDC</td>
<td>24 VDC</td>
<td>24 VDC</td>
<td>230 VAC/24 VDC</td>
</tr>
<tr>
<td>Current</td>
<td>0.5A</td>
<td>0.5A</td>
<td>0.3A</td>
<td>0.3A</td>
<td>2.0A</td>
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<td>Isolation</td>
<td>Optical isolation</td>
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<tr>
<td>Diagnostics</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
</tbody>
</table>
Analog Input Modules

8-channel analog input modules, 12-bit resolution

**M-3802**: 8 analog inputs, 4 to 20 mA, 12 bits
- Resolution in Ranges: 12 bits, 3.91 µA/bit
- Input Current Range: 0 to 20 mA
- 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
- Power Consumption: Max. 150 mA @ 5 VDC
- Isolation: I/O to logic (photocoupler isolation)
- Wiring: I/O cable max. AWG14

**M-3810**: 8 analog inputs, 0 to 10 V, 12 bits
- Resolution in Ranges: 12 bits, 2.44 mV/bit
- Input Current Range: 0 to 10 VDC
- Data Format: 16-bit integer (2’s complement)
- Accuracy:
  - ±0.1%, FSR @ 25°C
  - ±0.3%, FSR @ 0°C, 60°C
- Input Impedance: 500K ohms
- Conversion Time: 4 ms for all channels
- Power Consumption: Max. 150 mA @ 5 VDC
- Isolation: I/O to logic (photocoupler isolation)
- Wiring: I/O cable max. AWG14
Temperature Input Modules

2-channel temperature input modules, RTD or thermocouple input

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

- **Sensor Types**:
  - PT50, PT100, PT200, PT500, PT1000 (resistance 100 milli-ohms/bit)
  - JPT100, JPT200, JPT500, JPT1000 (resistance 10 milli-ohms/bit)
  - N100, N1200, N1500, N1000, N1120, CU10 (resistance 20 milli-ohms/bit)
- **Resolution**: 0.1°C/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**: 500K ohms
- **Conversion Time**: 200 ms for all channels
- **Diagnostics**: Range over (if range over, data=Dx8000)
- **Power Consumption**: Max. 80 mA @ 5 VDC
- **Isolation**: I/O to logic (photocoupler isolation)
- **Wiring**: I/O cable max. AWG14

**M-6201**: 2 analog inputs, thermocouple

- **Sensor Types**:
  - Type J/K/T/E/R/S/B/N/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**: 500K ohms
- **Conversion Time**: 200 ms for all channels
- **Diagnostics**: Range over (if range over, data=Dx8000)
- **Power Consumption**: Max. 80 mA @ 5 VDC
- **Isolation**: I/O to logic (photocoupler isolation)
- **Wiring**: I/O cable max. AWG14

---

**Ordering Information**

<table>
<thead>
<tr>
<th>Model</th>
<th>Channels</th>
<th>Current</th>
<th>Voltage</th>
<th>Connector</th>
<th>Resolution</th>
<th>Isolation</th>
<th>Sensor Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-3802</td>
<td>8</td>
<td>4 to 20 mA</td>
<td>0 to 10V</td>
<td>RTB</td>
<td>12-bit</td>
<td>Optical isolation</td>
<td>(ohm)</td>
</tr>
<tr>
<td>M-3810</td>
<td>8</td>
<td>---</td>
<td>---</td>
<td>RTB</td>
<td>12-bit</td>
<td>---</td>
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<td>M-6200</td>
<td>2</td>
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<td>---</td>
<td>RTB</td>
<td>12-bit</td>
<td>---</td>
<td>RTD (ohm)</td>
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<tr>
<td>M-6201</td>
<td>2</td>
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<td>RTB</td>
<td>12-bit</td>
<td>---</td>
<td>Thermocouple (mV)</td>
</tr>
</tbody>
</table>
## Analog Output Modules

### 4-channel analog output modules, 12-bit resolution

#### M-4402: 4 analog outputs, 4 to 20 mA, 12 bits
- Resolution in Ranges: 12 bits, 3.91 µA/bit
- Output Current Range: 4 to 20 mA
- Data Format: 16-bit integer (2’s complement)
- Accuracy:
  - ±0.1%, FSR @ 25°C
  - ±0.3%, FSR @ 0°C, 60°C
- Output Impedance: Max. 500 ohms
- Conversion Time: 2 ms for all channels
- Power Consumption: Max. 65 mA @ 5 VDC
- Isolation: I/O to logic (photocoupler isolation)
- Wiring: I/O cable max. AWG14

#### M-4410: 4 analog outputs, 0 to 10 V, 12 bits
- Resolution in Ranges: 12 bits, 2.44 mV/bit
- Output Current Range: 4 to 20 mA
- Data Format: 16-bit integer (2’s complement)
- Accuracy:
  - ±0.1%, FSR @ 25°C
  - ±0.3%, FSR @ 0°C, 60°C
- Output Impedance: Max. 500 ohms
- Conversion Time: 2 ms for all channels
- Power Consumption: Max. 65 mA @ 5 VDC
- Isolation: I/O to logic (photocoupler isolation)
- Wiring: I/O cable max. AWG14

### Ordering Information

<table>
<thead>
<tr>
<th>Specifications</th>
<th>M-4402</th>
<th>M-4410</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>M-4402</td>
<td>M-4410</td>
</tr>
<tr>
<td><strong>Channels</strong></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Current</strong></td>
<td>4 to 20 mA</td>
<td>---</td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>---</td>
<td>0 to 10V</td>
</tr>
<tr>
<td><strong>Connector</strong></td>
<td>RTB</td>
<td>RTB</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>12-bit</td>
<td>12-bit</td>
</tr>
<tr>
<td><strong>Isolation</strong></td>
<td>Optical Isolation</td>
<td></td>
</tr>
</tbody>
</table>
Power Modules

When to Use a Power Module

<table>
<thead>
<tr>
<th>System Power Distributor</th>
</tr>
</thead>
<tbody>
<tr>
<td>The system power expansion module is designed to provide extra power for connected I/O expansion modules. Each NA-4000 series network adaptor can provide 1.5 A @ 5 VDC. If you need more power for your installed I/O expansion modules, you will need to use an M-7001 module. However, note that the M-7001 can only provide 1.5 A @ 5 VDC.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field Power Distributor</th>
</tr>
</thead>
<tbody>
<tr>
<td>The field power distributor is designed to isolate different field voltages. For example, before you connect a 48 VDC or 110 VAC DI/O module to a 24 VDC DI/O module, you will need an M-7002 field power distributor.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential Power Distributor</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are three types of potential distributor modules that provide extra wiring points, such as shielding ground, 0 V field power, and 24 V field power. For example, the 8-channel digital input (sink type) module by itself does not have a 24 V wiring point. In this case, you can add an M-7805 for easier wiring.</td>
</tr>
</tbody>
</table>
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.)

**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.)
- Field Power ranging from 24/48 VDC to 110/220 VAC

**M-7804: 0 VDC**
- Channels: 8
- Mode: 0 VDC

**M-7805: 24 VDC**
- Channels: 8
- Mode: 24 VDC

---

### Ordering Information

<table>
<thead>
<tr>
<th>Power Modules</th>
<th>M-7001</th>
<th>M-7002</th>
<th>M-7804</th>
<th>M-7805</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>M-7001</td>
<td>M-7002</td>
<td>M-7804</td>
<td>M-7805</td>
</tr>
<tr>
<td>Channels</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Voltage</td>
<td>24 VDC</td>
<td>DC: 5, 24, 48 VDC</td>
<td>0 VDC</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Purpose</td>
<td>System Power</td>
<td>Field Power</td>
<td>Field Power</td>
<td>Field Power</td>
</tr>
</tbody>
</table>
Modular I/O Accessories

**TB 1600** DIN-Rail mounting screw terminal module with 20-pin connector
- 20 pins, one-to-one assignment
- Connector pitch: 3.81 mm
- DIN-Rail mounting type
- Dimensions: 77.5 x 67.5 x 51 mm (3.05 x 2.66 x 2.01 in)
- RoHS compliant

**20-to-20-pin flat cable**
- Connects between the TB 1600 and ioLogik 4000 series
- Length: 500 mm
- Number of Pins: 20

**M-8001-PK** Removable terminal block
- Terminal block for the ioLogik 4000 series
- Packaging: 9 pcs in one box

**M-8003-PK** Marker with 0 to 9 numbering
- Marker for the ioLogik 4000 series
- Packaging: 100 pcs in one box

**M-8004-PK** Blank marker
- Packaging: 100 pcs in one box

**Ordering Information**
- TB 1600: DIN-Rail mounting screw terminal module with 20-pin connector
- 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: Blank marker, 100 pcs