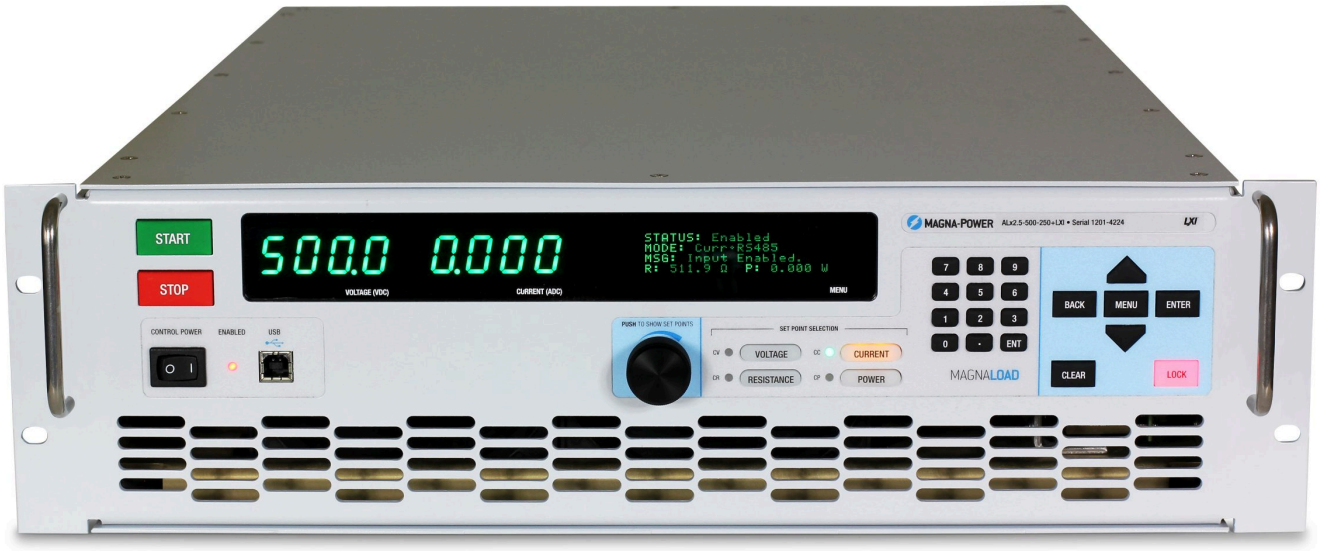
ALx Series

DC Electronic Load

CERTIFICATIONS



POWER	VOLTAGE	CURRENT	MODELS	SIZE
1.25 kW to 20 kW	Up to 1,000 Vdc	Up to 4,800 Adc	27	3U to 24U

1 Description

The ALx Series MagnaLOAD utilizes conventional linear MOSFET-based dissipative elements, allowing the series to achieve a very wide voltage-current operating range within the model's maximum power rating. Using the same heat management innovations developed for Magna-Power's high density programmable DC power supplies, the ALx Series' conservative cooling ensures long product life with continuous full power operation in environments up to 50°C ambient operating temperature.

2 Integrated Options Available

+CAN	CANopen
+ECAT	EtherCAT
+EIP	EtherNet/IP
+LXI	LXI TCP/IP Ethernet
+MTCP	Modbus-TCP
+PB	Pedestal Base
+PROF	PROFINET

3 Specifications

Specifications are subject to change without notice. Unless otherwise noted, all specifications measured at the product's maximum ratings.

3.1 AC Input Specifications

PARAMETER	VALUE	CONDITIONS
AC Input Voltage	100-240 Vac (UI: Universal Input); Available on 1.25 to 17.5 kW Models 200-240 Vac (UI2: Universal Input 2); Available on 20 kW Models	1Φ, 2-wire + ground
AC Input Frequency	50-60 Hz	
AC Input Isolation	±1500 Vac, maximum input voltage to ground	

3.2 Programming Interface Specifications

PARAMETER	VALUE	CONDITIONS
Front Panel Programming	Aluminum rotary knob with encoder, keypad, or up-down arrow for single bit control	
Computer Interfaces	USB Host (Front): Type B USB Host (Rear): Type B RS485 (Rear): RJ-45 MagnaLINK™: RJ-25 x 2	Standard
Computer Interfaces	LXI TCP/IP Ethernet (Rear): RJ-45 GPIB (Rear): IEEE-488	
External User I/O Port	25-pin D-sub DB-25, female Referenced to Earth ground; isolated from the DC input See User Manual for pin layout	Analog and Digital Programming

3.3 Programming Specifications

PARAMETER	VALUE	CONDITIONS
Resolution	16-bit, 0.0015%	All Modes
Accuracy	Voltage: ±0.1% of full scale voltage rating Current: ±0.2% of full scale current rating Power: ±0.3% of full scale power rating Resistance: ±0.3% of full scale resistance rating	Programming and Measurement
Rise/Fall Time	Voltage Mode: 100 ms, 10% to 90% full scale voltage rating Current Mode: 2 ms, 10% to 90% full scale current rating Power Mode: 100 ms, 10% to 90% full scale power rating Resistance Mode: 200 ms, 10% to 90% full scale resistance rating	Maximum
Trip Settings Range	Over Voltage: 10% to 110% of full scale voltage rating Under Voltage: 0% to 110% of full scale voltage rating Over Current: 10% to 110% of full scale current rating Over Power: 10% to 110% of full scale power rating	

3.4 External User I/O Specifications

PARAMETER	VALUE	CONDITIONS
Digital I/O	Digital Input Voltage: 5V Digital Input Impedance: 10 kΩ Digital Monitoring Voltage: 5V, 32 mA capacity Digital Reference Voltage: 5V, 20 mA capacity	

3.4 External User I/O Specifications

PARAMETER	VALUE	CONDITIONS
Analog I/O	Analog Sampling Rate: 2 kHz Analog Programming Voltage: 0-10 V Analog Programming Resolution: 12-bit, 0.025% Analog Monitoring Voltage: 0-10 V, 3 mA capacity Analog Monitoring Impedance: 0.005 Ω Analog Monitoring Accuracy: 0.05% of full scale Analog Reference Voltage: 10 V, 20 mA capacity	

3.5 Physical Specifications

PARAMETER	VALUE	CONDITIONS
Racking Standard	EIA-310	1.25 kW and 2.5 kW Models Only
Size and Weight	3U 5.25” H x 19” W x 24” D (13.34 x 48.26 x 60.96 cm) 40 lbs (18.1 kg)	1.25 kW Models
Size and Weight	3U 5.25” H x 19” W x 24” D (13.34 x 48.26 x 60.96 cm) 65 lbs (29.5 kg)	2.5 kW Models
Size and Weight	12U Cabinet 30.7” H x 24” W x 31.5” D (78.0 x 61.0 x 80.0 cm) 255 lbs (115.7 kg)	5 kW Models
Size and Weight	12U Cabinet 30.7” H x 24” W x 31.5” D (78.0 x 61.0 x 80.0 cm) 320 lbs (145.2 kg)	7.5 kW Models
Size and Weight	12U Cabinet 30.7” H x 24” W x 31.5” D (78.0 x 61.0 x 80.0 cm) 385 lbs (174.6 kg)	10 kW Models
Size and Weight	24U Cabinet 58.25” H x 24” W x 31.5” D (148.0 x 61.0 x 80.0 cm) 500 lbs (226.8 kg)	12.5 kW Models
Size and Weight	24U Cabinet 58.25” H x 24” W x 31.5” D (148.0 x 61.0 x 80.0 cm) 565 lbs (256.3 kg)	15 kW Models
Size and Weight	24U Cabinet 58.25” H x 24” W x 31.5” D (148.0 x 61.0 x 80.0 cm) 630 lbs (285.8 kg)	17.5 kW Models
Size and Weight	24U Cabinet 58.25” H x 24” W x 31.5” D (148.0 x 61.0 x 80.0 cm) 695 lbs (315.3 kg)	20 kW Models

3.6 Environmental Specifications

PARAMETER	VALUE	CONDITIONS
Ambient Operating Temperature	0°C to 50°C	
Storage Temperature	-40°C to +85°C	
Humidity	Relative humidity up to 95% non-condensing	
Air Flow	Front air inlet, rear exhaust	

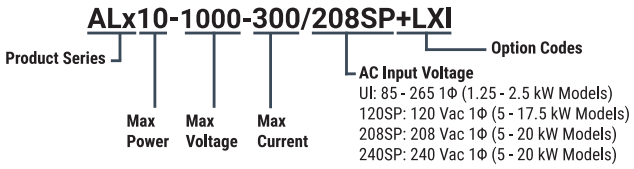
3.7 Regulatory Specifications

PARAMETER	VALUE	CONDITIONS
EMC	Complies with 2014/30/EU (EMC Directive) CISPR 22 / EN 55022 Class A	

3.7 Regulatory Specifications

PARAMETER	VALUE	CONDITIONS
Safety	NRTL Listed, Nemko Certificate NA202512375 CSA C22.2 No. 61010-1:12; A1:2018 UL 61010-1:Ed.3,2012(R2019)	
CE Mark	Yes	
RoHS Compliant	Yes	

4 Model Ordering Guide



5 Models

Model	Max Power kW	Max Voltage Vdc	Max Current Adc	Package Type	Min Voltage Vdc	Max Resistance Ω
ALx1.25-200-300	1.25	200	300	Rack-mount	2.5	70.40
ALx1.25-500-125	1.25	500	125	Rack-mount	6.0	448.00
ALx1.25-1000-37.5	1.25	1000	37.5	Rack-mount	7.5	1792.00
ALx2.5-200-600	2.5	200	600	Rack-mount	2.5	70.40
ALx2.5-500-250	2.5	500	250	Rack-mount	6.0	448.00
ALx2.5-1000-75	2.5	1000	75	Rack-mount	7.5	1792.00
ALx5-200-1200	5	200	1200	Floor-standing	2.5	35.20
ALx5-500-500	5	500	500	Floor-standing	6.0	224.00
ALx5-1000-150	5	1000	150	Floor-standing	7.5	896.00
ALx7.5-200-1800	7.5	200	1800	Floor-standing	2.5	23.47
ALx7.5-500-750	7.5	500	750	Floor-standing	6.0	149.33
ALx7.5-1000-225	7.5	1000	225	Floor-standing	7.5	597.33
ALx10-200-2400	10	200	2400	Floor-standing	2.5	17.60
ALx10-500-1000	10	500	1000	Floor-standing	6.0	112.00
ALx10-1000-300	10	1000	300	Floor-standing	7.5	448.00
ALx12.5-200-3000	12.5	200	3000	Floor-standing	2.5	14.08
ALx12.5-500-1250	12.5	500	1250	Floor-standing	6.0	89.60
ALx12.5-1000-375	12.5	1000	375	Floor-standing	7.5	358.40
ALx15-200-3600	15	200	3600	Floor-standing	2.5	11.73
ALx15-500-1500	15	500	1500	Floor-standing	6.0	74.67
ALx15-1000-450	15	1000	450	Floor-standing	7.5	298.67
ALx17.5-200-4200	17.5	200	4200	Floor-standing	2.5	10.06
ALx17.5-500-1750	17.5	500	1750	Floor-standing	6.0	64.00
ALx17.5-1000-525	17.5	1000	525	Floor-standing	7.5	256.00
ALx20-200-4800	20	200	4800	Floor-standing	2.5	8.80
ALx20-500-2000	20	500	2000	Floor-standing	6.0	56.00
ALx20-1000-600	20	1000	600	Floor-standing	7.5	224.00

6 Features

Do more with MagnaLINK™ distributed digital control.

Precision control & measurement

DSP-driven precision from setpoint to point-of-load.

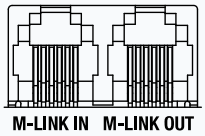


The SLx Series features Magna-Power's xGen MagnaLINK™ digital control platform, which uses a distributed network of DSPs and high-speed board-to-board communications utilizing an internally developed low-level communication protocol. Internal gain scheduling with field-tunable gains supports a broad range of load conditions.

- Voltage, current, and power control with 16-bit resolution.
- Programmable slew-rate controls.
- Native 100 ppm stability.
- Local, remote, and leadless voltage sensing for accurate point-of-load regulation.

Plug-and-play master-slaving

Scale power seamlessly with aggregate system ratings.



Dual MagnaLINK ports provide next-generation digital-hybrid master-slaving, so one unit can command a synchronized stack. Expand current capability by paralleling up to 16 units. A secondary current-sense connection feeds real-time analog current to the master for accurate aggregation and display.

- Parallel up to 16 units with simple inteface wiring.
- One setpoint; synchronized output and protections.
- Secondary current-sense feedback for accurate sharing.
- Auto-configuration and aggregate measurements to a single master display.

From lab scripts to factory PLCs, flexible programming & integration.

Software integration made easy

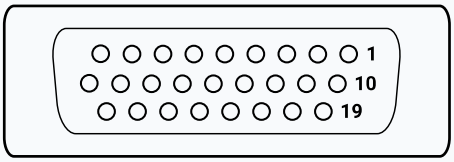
Readable commands, quick results—works with any language.

The SLx Series exposes a clear, text-based API with native SCPI and Modbus. Over 60 well-documented commands cover start/stop, set points for voltage, current & power, slew-rate control, high-accuracy measurements, and full configuration—so your scripts and systems go from proof-of-concept to production fast.

- SCPI and Modbus command sets with consistent behavior..
- Start/stop & protections: enable output, set trip limits, query status.
- High-accuracy reads: voltage, current, power, and sense feedback.
- Developer-driven documentation & examples.

External User I/O

Flexible isolated analog-digital controls.



All SLx Series power supplies come standard with a 26-pin D-Sub connector designated as the External User I/O. This connector provides:

- 8 Digital Outputs (5V logic)
- 4 Digital Inputs (5V logic)
- 4 Analog Outputs (0-10V logic)
- 4 Analog Inputs (0-10V logic)

The External User I/O is isolated from the output terminals and referenced to earth ground. The connector's pins are user configurable, allowing users to select the functions needed in their application, while providing future capability for new features. Use the digital outputs to integrate the power supply with, for example, external enable signals or digital fault monitoring logic, or monitor voltage-current using the analog 0-10V outputs. A dedicated high-speed analog input is also provided, sampled at 2 kHz for near real-time control.

Industrial communications & control

From lab networks to PLCs—integrate on your terms.

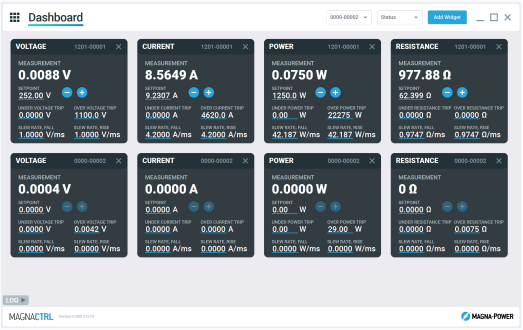


The Series ships ready to connect with dual USB (front & rear) and RS485, with support for SCPI and Modbus. For networks and factory automation, choose fully integrated options with Modbus support, thorough docs—and device description files to speed PLC setup and tag mapping.

- Standard dual USB (front + rear) and RS485.
- TCP/IP networking with LXI TCP/IP Ethernet (+LXI) option
- PLC fieldbuses options: CANopen (+CAN), EtherCAT (+ECAT), EtherNet/IP (+EIP), Modbus-TCP (+MTCP), PROFINET (+PROF).
- Device files included: EDS (CANopen/EtherNet/IP), ESI XML (EtherCAT), GSDML (PROFINET) for quick PLC integration.
- Full command documentation, examples, and diagnostics.

Included MagnaCTRL software

Multi-product dashboard control, diagnostics, and updates—out of the box.



MagnaCTRL is a modern, multi-product control platform included with xGen products. Build dashboards, configure I/O, run updates, and access deep diagnostics—all from one app.

- Configurable dashboard: add/arrange widgets to monitor and control multiple connected units.
- Product Explorer: auto-detect devices, save connections, and auto-reconnect in future sessions.
- External User I/O panel: map 26-pin I/O, export/import pin maps for fast deployments.
- Firmware/software updates: detect new releases automatically; perform manual updates offline if needed (see Changelog)
- Calibration tools: adjust programming/measurement gains/offsets; with guidance, tune control-loop gains.
- Data logging: Graphical output and .csv logging of voltage, current and power measurements and settings over time

State-of-the-art USA manufacturing with worldwide support

Made in the USA

Vertically integrated manufacturing for full quality control.

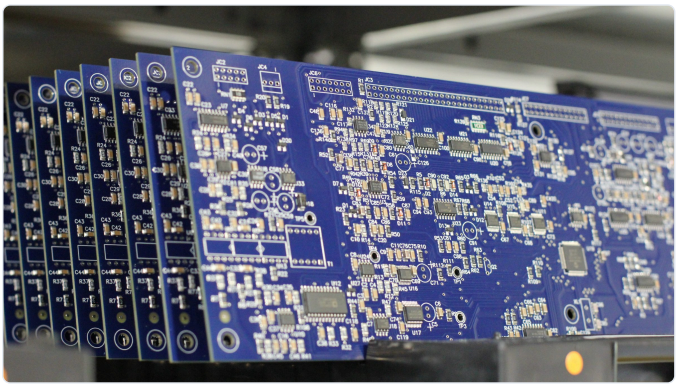


Magna-Power products are designed, built, tested, and serviced at Magna-Power's 73,500 sq-ft headquarters in Flemington, New Jersey, where metalwork, magnetics, PCB assembly, and burn-in are all done in-house for tight control over quality, cost, and lead-time.

- USA-built: Engineering, manufacturing, and service under one roof.
- In-house production: Metalwork, magnetics, SMT PCBs, and finishes.
- Proven reliability: Every unit fully tested, calibrated, and burned in.

Worldwide service & OEM parts support

Factory expertise, local response.



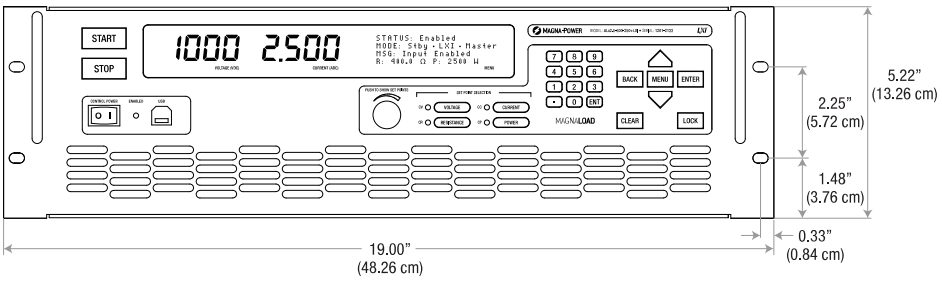
Magna-Power backs its products with factory and authorized service centers across North America, Europe, the UK, Asia-Pacific, East Asia, and South America—using factory procedures and genuine parts to restore units to original specifications, in or out of warranty.

- Global coverage: HQ in New Jersey plus regional authorized service centers.
- Consistent repairs: Factory diagnostics, work instructions, and system diagrams.
- Genuine OEM parts: Tested replacement assemblies for predictable, low-downtime service.

7 Diagrams

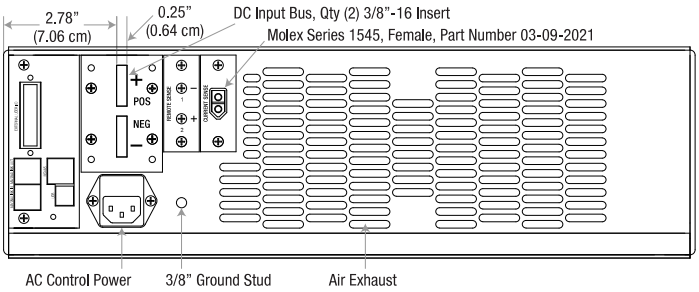
Front Panel

1.25 kW and 2.5 kW Models



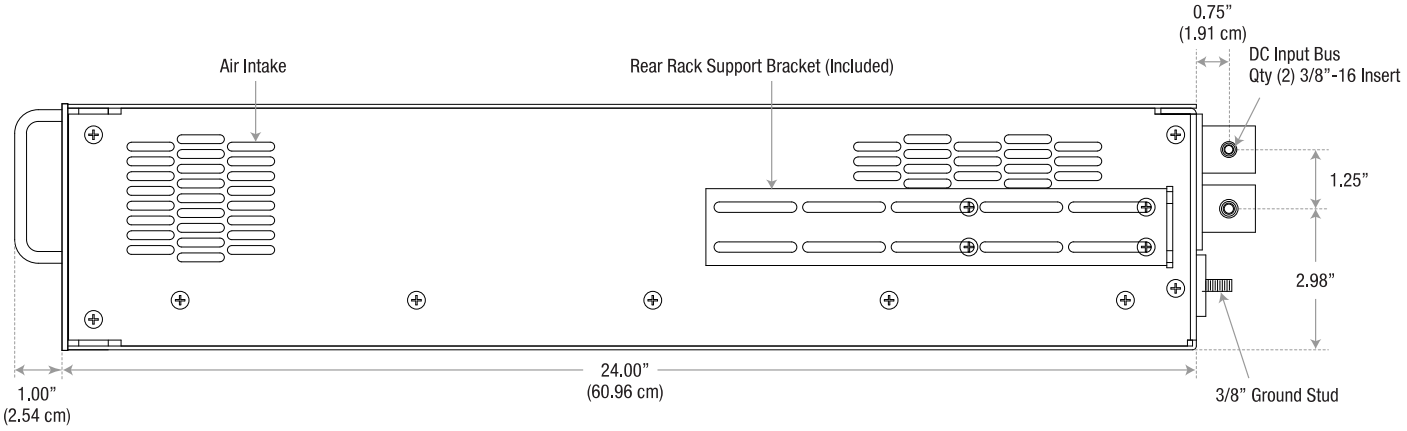
Rear Panel

1.25 kW and 2.5 kW Models

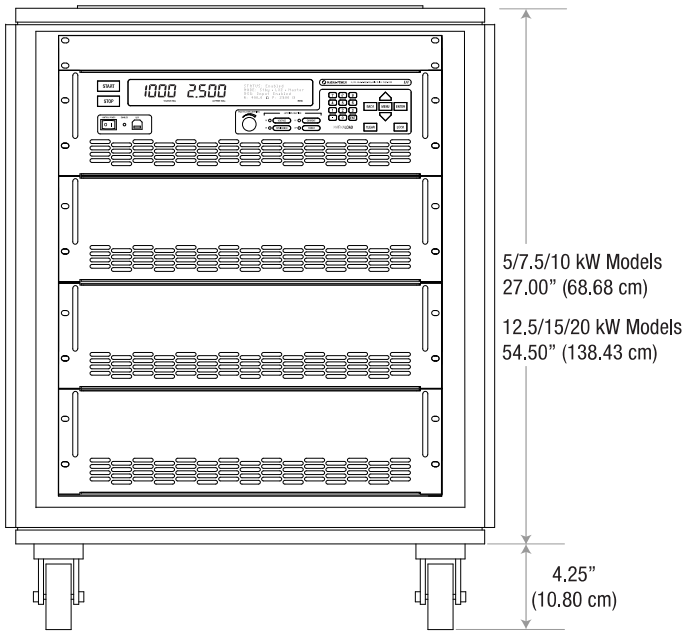


Side Panel

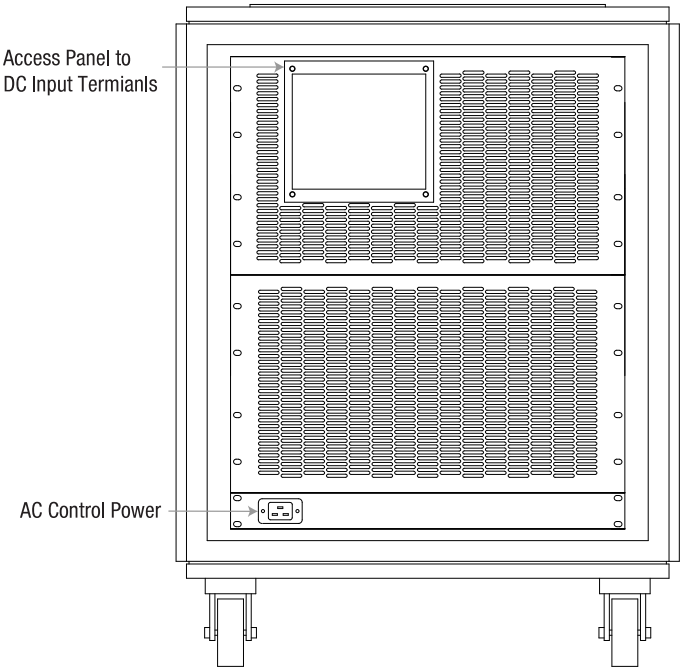
1.25 kW and 2.5 kW Models



Front Panel
5 kW to 20 kW Models



Rear Panel
5 kW to 20 kW Models



8 Integrated Options Available

+CAN CANopen
CANopen communication protocol and dual RJ-45 interface enabling CAN bus communications, popular within automotive applications

CANopen is a high-level communication protocol that is widely used in industrial automation and embedded systems. It is based on the Controller Area Network (CAN) bus, a robust and efficient serial communication bus commonly found in automotive and industrial applications.

CANopen defines a set of communication protocols and application layer services built on top of the CAN physical layer. It provides a standardized way for devices to communicate and exchange data. CANopen devices communicate using an Object Dictionary, which defines the data structure and parameters that can be exchanged between devices. This dictionary is essential for device configuration and data exchange. It includes objects like PDOs (Process Data Objects) for real-time data exchange and SDOs (Service Data Objects) for parameterization and configuration. Each CANopen device on the network has a unique Node ID, which allows devices to address each other for communication. This addressing scheme simplifies the setup of multi-device networks.

Magna-Power's CANopen Implementation

Magna-Power has designed its CANopen (+CAN) option to allow for seamless integration into a variety of automation and industrial environments. The following are some of the key features for Magna-Power's +CAN option:

- Magna-Power developed CANopen Electronic Data Sheet (EDS), used by network configuration software tools to help set up devices on the network.
- Support for the product's full command set
- Extensive HTML- and PDF-based documentation, detailing connection setup and commands
- D-Sub 9-pin male connector

+ECAT EtherCAT
EtherCAT communication protocol and dual RJ-45 interface for high-performance communication in factory automation, motion control, and robotics

EtherCAT is a real-time Ethernet network protocol developed by Beckhoff Automation for communicating among multiple nodes. EtherCAT networks are formed using CAT cabling, where master and nodes can be directly wired together through RJ-45 ports, in a daisy chain configuration, without need for external networking switches. The protocol is standardized in IEC 61158 and is popular for demanding high-speed communication requirements in automation technology. As a result of its flexibility and scalability, EtherCAT can be found in a wide range of applications, including factory automation, motion control, robotics, and more.

One of the key advantages of EtherCAT is its ability to handle large amounts of data at very high speeds. It uses a unique "processing on the fly" technique, in which each node in the network can add or remove data from the data stream as it passes through, without interrupting the overall data flow. This allows for very low latency and high precision in control applications. It can support a wide range of different

communication topologies, from simple point-to-point connections to complex multi-node configurations. It is also highly customizable, with support for different data formats, communication protocols, and network configurations.

Magna-Power's EtherCAT Implementation

Magna-Power has designed its EtherCAT (+ECAT) option to allow for seamless integration into a variety of automation and industrial environments. The following are some of the key features for Magna-Power's +ECAT option:

- Support for EtherCAT protocol and Ethernet over EtherCAT
- Support for the product's full command set
- Extensive HTML- and PDF-based documentation, detailing connection setup and commands
- Dual RJ-45 connectors with bi-color activity and error LEDs

+EIP EtherNet/IP

EtherNet/IP communication protocol and dual RJ-45 interface with EIS profile for industrial automation, commonly used in Allen Bradley, Schneider Electric, and Omron PLCs

The EtherNet/IP standard (EIP) is the application layer protocol for industrial automation developed by four independent groups: ODVA, the Industrial Open Ethernet Association (IOANA), Control Net International (CI) and the Industrial Ethernet Association (IEA). EtherNet/IP provides wide-ranging, comprehensive, certifiable standard in the public domain that is suitable to a wide variety of automation devices. EtherNet/IP is used by Ethernet modules for several programmable logic controllers including Allen Bradley, Schneider Electric, and Omron

EtherNet/IP uses a client-server model, where the client sends requests to the server, and the server responds with the requested information. The information is transmitted in the form of messages, which are divided into two types: Explicit and Implicit messages.

Explicit messages are used for data exchange and are initiated by the client. The client sends a request for data to the server, and the server responds with the requested data. Implicit messages, on the other hand, are used for real-time control and monitoring. They are sent by the server to the client without any request from the client.

One of the key advantages of EtherNet/IP is its high speed and bandwidth. It allows for real-time data exchange, which is essential in many industrial applications, such as motion control, where high-speed communication is required for precise control of machines and processes.

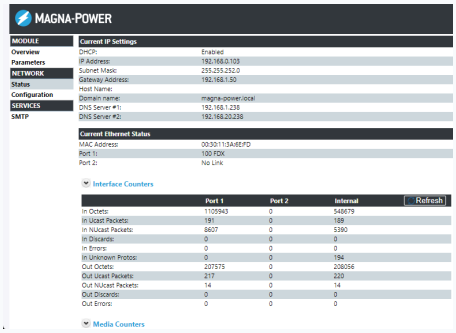
Another advantage is its flexibility and scalability. EtherNet/IP allows for easy integration of devices and systems from different vendors, making it an ideal choice for multi-vendor environments. It also allows for easy expansion of the network, with the ability to add or remove devices without affecting the rest of the network.

EtherNet/IP also provides robust security features to ensure the integrity and confidentiality of data. It uses standard Ethernet security protocols, such as IPsec and SSL/TLS, to protect data in transit.

Magna-Power's EtherNet/IP Implementation

Magna-Power has designed its EtherNet/IP (+EIP) option to allow for seamless integration into Allen Bardley, Schneider Electric and Omron PLCs. The following are some of the key features for Magna-Power's +EIP option:

- Support for the product's full command set
- Extensive HTML- and PDF-based documentation, detailing connection setup and commands
- Dual RJ-45 connectors with bi-color activity and error LEDs
- Magna-Power developed electronic data sheet (EDS) for device discovery and network setup
- Hosted a EtherNet/IP web page for easily accessing local network settings, device parameters, and operation status (figure below)



EtherNet/IP webpage hosted in Magna-Power's +EIP option

+LXI LXI TCP/IP Ethernet

TCP/IP Ethernet communication protocol and single RJ-45 interface, certified to the LXI Class C standard, for socket communications using conventional computer networks

Certified to the LXI Standard (Class C), version 1.4, this option allows the product to be fully controlled over an integrated TCP/IP Ethernet interface. LXI is an instrumentation platform based on industry standard Ethernet technology designed to provide modularity, flexibility, and performance to small- and medium-sized systems. All of the product's standard SCPI commands are supported over the +LXI option, along with all provided software and drivers.

LXI's advantages are exemplified in its compact, flexible package providing high-speed I/O and reliable measurements. The Magna-Power Electronics LXI TCP/IP Ethernet option includes an embedded web-server, allowing web browser power supply control and monitoring from virtually anywhere.

Note: For xGen products, only the SCPI command protocol is available when LXI TCP/IP Ethernet interface is installed. Modbus communication protocol is not available through any interface when the LXI TCP/IP Ethernet interface is installed.

+MTCP Modbus-TCP

Modbus-TCP communication protocol and dual RJ-45 interface with full command set support as Modbus commands

Modbus-TCP is a communication protocol that enables communication between industrial devices over Ethernet

networks. It is an extension of the Modbus protocol, which was originally developed in the 1970s for communication between programmable logic controllers (PLCs) and other devices. Modbus-TCP uses the same protocol as Modbus, but it is transmitted over Ethernet rather than serial communication.

Modbus-TCP is a widely used protocol in industrial control and automation applications because it is open and simple to implement. It supports a wide range of devices, including PLCs, sensors, and actuators. Modbus-TCP provides fast and reliable communication, with data rates of up to 100 Mbps. It also supports multiple connections and can handle up to 65,535 devices on a single network.

Magna-Power's Implementation of Modbus-TCP

Magna-Power has designed its Modbus-TCP (+MTCP) option to allow for seamless integration into a variety of automation and industrial environments. The following are some of the key features for Magna-Power's +MTCP option:

- Support for the product's full command set as Modbus commands
- Extensive HTML- and PDF-based documentation for all the commands and interfacing
- Dual RJ-45 connectors with bi-color activity and error LEDs

+PB Pedestal Base

A heavy-duty, floor-mountable platform base for the rack enclosure that replaces the standard casters, designed for fixed installations.

Engineered for maximum durability, the Pedestal Base replaces the standard locking casters with a rigid, welded assembly, which can be anchored directly to the floor. Built from 0.25" thick 1018 cold rolled steel and fortified with 0.25" x 4" x 2" steel rectangle tube, this robust construction ensures support in demanding industrial environments. At each end of the steel rectangle tube, 0.1875" steel angles are welded in place, providing convenient mounting holes for secure placement.

Once the pedestal frame is welded, it undergoes a powder-coating process, resulting in a rugged, corrosion-resistant finish.

The pedestal base is secured directly to the rack enclosure's frame to provide maximum mechanical support and to minimize vibrations and movement even under heavy loads.

+PROF PROFINET

PROFINET communication protocol and dual RJ-45 interface for industrial automation, commonly used in Siemens PLCs

PROFINET is a widely-used industrial Ethernet protocol for communication between automation systems and devices in manufacturing and process industries. It was developed by PROFIBUS & PROFINET International (PI), an organization that oversees the development and maintenance of the protocol. PROFINET is used mainly by Siemens PLCs.

PROFINET provides a high-speed and real-time communication capability that enables efficient data exchange and control between various automation components such as PLCs, robots, sensors, and drives. It supports both TCP/IP and UDP/IP communication, and offers a wide range of features such as integrated safety, motion control, and diagnostics.

PROFINET also provides a flexible network topology that can be configured to suit different industrial applications. It supports various physical media such as copper, fiber optic, and wireless, and allows for the use of different network topologies including star, ring, and line.

PROFINET is widely adopted by many leading manufacturers and system integrators in different industries due to its reliability, flexibility, and interoperability. It has a large ecosystem of compatible products and tools, and is supported by a global network of PI-certified experts and service providers.

Magna-Power's PROFINET Implementation

Magna-Power has designed its PROFINET (+PROF) option to allow for seamless integration into Siemens PLCs. The following are some key features for Magna-Power +PROF option:

- Support for the product's full command set
- Extensive HTML- and PDF-based documentation, detailing connection setup and commands
- Dual RJ-45 connectors with bi-color activity and error LEDs

9 Product Images



10 Downloads

https://magna-power.com/products/magnaload/alx#downloads

11 Contact

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