

OPTO 22

DATA SHEET

Form 664-230124

INTERFACES

CONTROLLER

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*** This product is OBSOLETE and no longer available. ***

Part Number	Description
M4SSER	M4 Serial Adapter Card

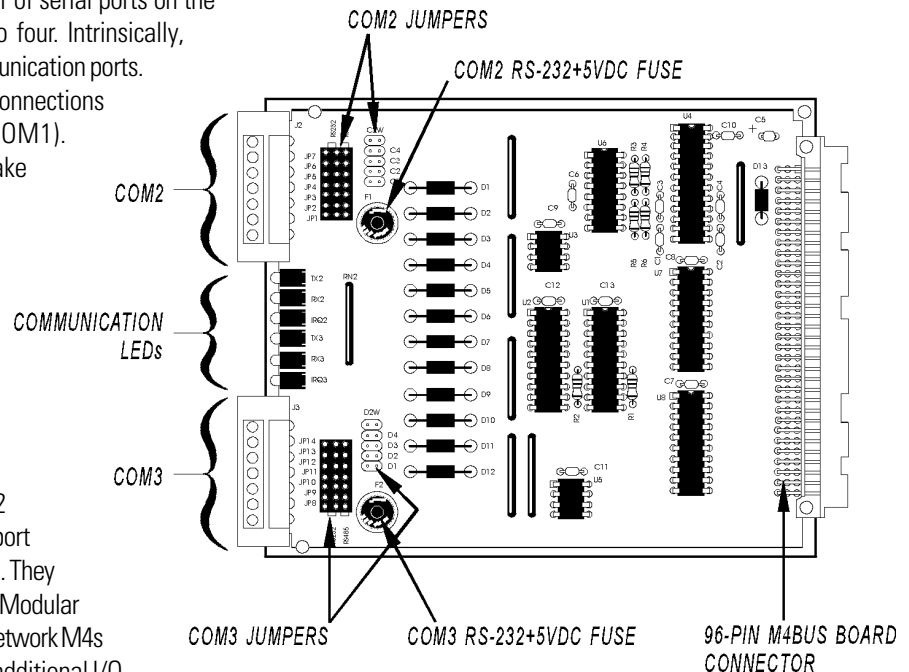
Description

The M4SSER expands the number of serial ports on the M4 Modular Controllers from two to four. Intrinsically, the M4's UART can support four communication ports. However, the M4 base unit provides connections for only two ports (COM0 and COM1). The M4SSER allows the user to take advantage of the two remaining ports (COM2 and COM3). The M4SSER can be used with any of Opto 22's M4 Modular Controllers except the SNAP-LCM4.

The two M4SSER ports are configurable as either RS-232 or RS-485/422 ports. They support communication speeds of up to 115.2 KBd, are modem-compatible, and support both ASCII and binary (Mistic) protocols. They may be used to link a host PC to the M4 Modular Controller, provide multiple host ports, network M4s or other Opto 22 controllers, connect additional I/O, or interface to application-specific third-party hardware.

Configured for RS-232, each port can also supply +5 VDC for powering devices with low current demands, such as barcode readers. This allows connection to a variety of application-specific devices requiring RS-232 capability.

Configured for RS-485/422, each port can be used for a remote serial I/O link, expanding the potential M4 base unit I/O from 4,096 channels to 12,288 channels. With the help of Opto 22 I/O units and AC38 repeaters, the M4SSER can allow a user to develop a robust distributed control system using M4 Modular Controllers. This configuration also allows connection to a variety of application-specific devices requiring RS-485/422 capability — such as a host port network of M4 Modular Controllers, multiple serial I/O links, and intelligent electronic devices. The two M4SSER ports can be configured for either full-duplex (4-wire) or half-duplex (2-wire), terminated, or not terminated operation. Both ports are configurable and addressable through OptoControl or Cyrano.



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Specifications [OBSOLETE]**LED SPECIFICATIONS**

LED	Indication
TX2 (COM2 transmit)	This indicator illuminates whenever Com2 is transmitting serial data. If the LED fails to illuminate, it could indicate that the port is idle or a wiring problem exists.
RX2 (COM2 receive)	This indicator illuminates whenever COM2 is receiving serial data. If the LED fails to illuminate, it could indicate that the port is idle or a wiring problem exists.
IRQ2 (COM2 interrupt)	This indicator illuminates when a hardware interrupt is issued by the serial device.
TX3 (COM3 transmit)	This indicator illuminates whenever COM3 is transmitting serial data. If the LED fails to illuminate, it could indicate that the port is idle or a wiring problem exists.
RX3 (COM3 receive)	This indicator illuminates whenever COM3 is receiving serial data. If the LED fails to illuminate, it could indicate that the port is idle or a wiring problem exists.
IRQ3 (COM2 interrupt)	This indicator illumates when a hardware interrupt is issued by the serial device.

M4SSER GENERAL SPECIFICATIONS

Item	Specification
Communication speed	300-115.2 KBd
Maximum connection distance	Up to 3,000 ft. (more with repeater)
Port configuration: COM2, RS-232 or RS-485/422 COM3, RS-232 or RS-485/422	RS-232: TX, RX, RTS, CTS, DTR (+V), +5V, GND RS-485: 2-wire, half-duplex; RS-422: 4-wire, half- or full-duplex
Cable specifications for RS-232 or RS-485/422	#24 gauge, 7x32 stranded, 100-ohm nominal impedance, 12.5 pF/ft.
Connector: Manufacturer	Plug, 7-position screw terminal Phoenix Contact, P/N: MC1 5/7-ST-3, 81
Power requirement (at 5 VDC)	220 mA
Typical operating temperature	-20° C to 70° C
Storage temperature	-40° C to 85° C

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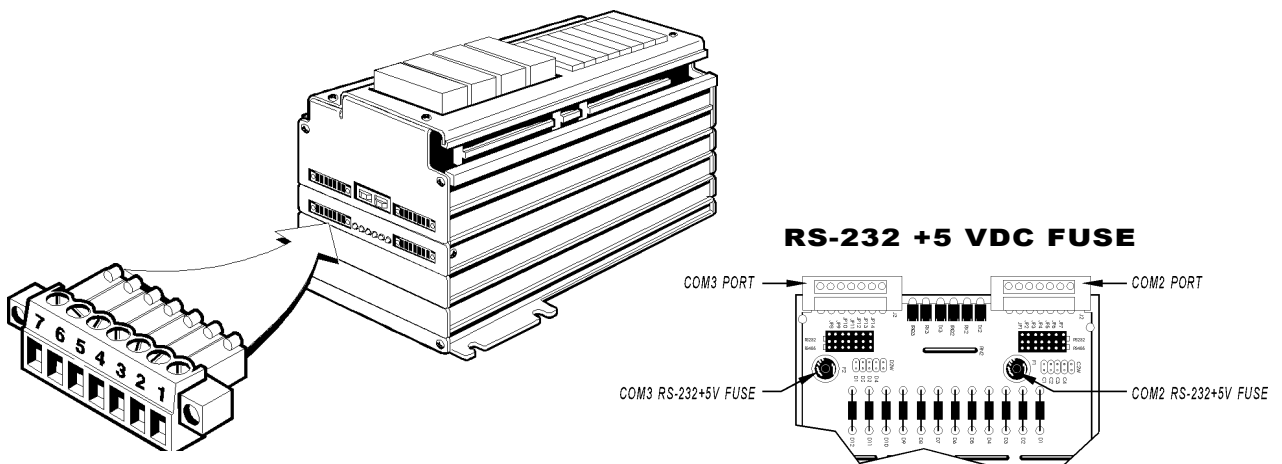
Specifications (CONT.)

PIN CONNECTIONS FOR THE M4SSER COM2/COM3 PORTS

PIN	RS-232	RS-485/422 (2 Wire)	RS-485/422 (4 Wire)
1	Fused +5 VDC (1A)	Transmit/Receive Plus (TX/RX+)	Transmit Plus (TX+)
2	Transmit (TX)	Transmit/Receive Minus (TX/RX-)	Transmit Minus (TX-)
3	Receive (RX)	Common Ground (GND)	Common Ground (GND)
4	Request-to-Send (RTS)	No Connection (NC)	Receive Plus (RX+)
5	Clear-to-Send (CTS)	No Connection (NC)	Receive Minus (RX-)
6	Passive DTR (pulled up to +9 V)	Interrupt Plus (IRQ+)	Interrupt Plus (IRQ+)
7	Ground (GND)	Interrupt Plus (IRQ-)	Interrupt Plus (IRQ-)

Important: Connectors wired for other Opto 22 controllers may not be compatible with the M4SSERs. Use the connectors provided with the M4SSER and refer to the pin connection label for wiring information.

The figure and the table show the location and function of each pin on the 7-position terminal block.



RS-232 +5 VDC Fuse

A +5 VDC fused source is available on Pin 1 from both the COM2 and COM3 ports. A maximum 0.5A load can be drawn through the 1-Amp rated fuse. The replacement part number for this fuse is Opto 22 P/N FUSE01G4 (Wickmann P/N 19373A).

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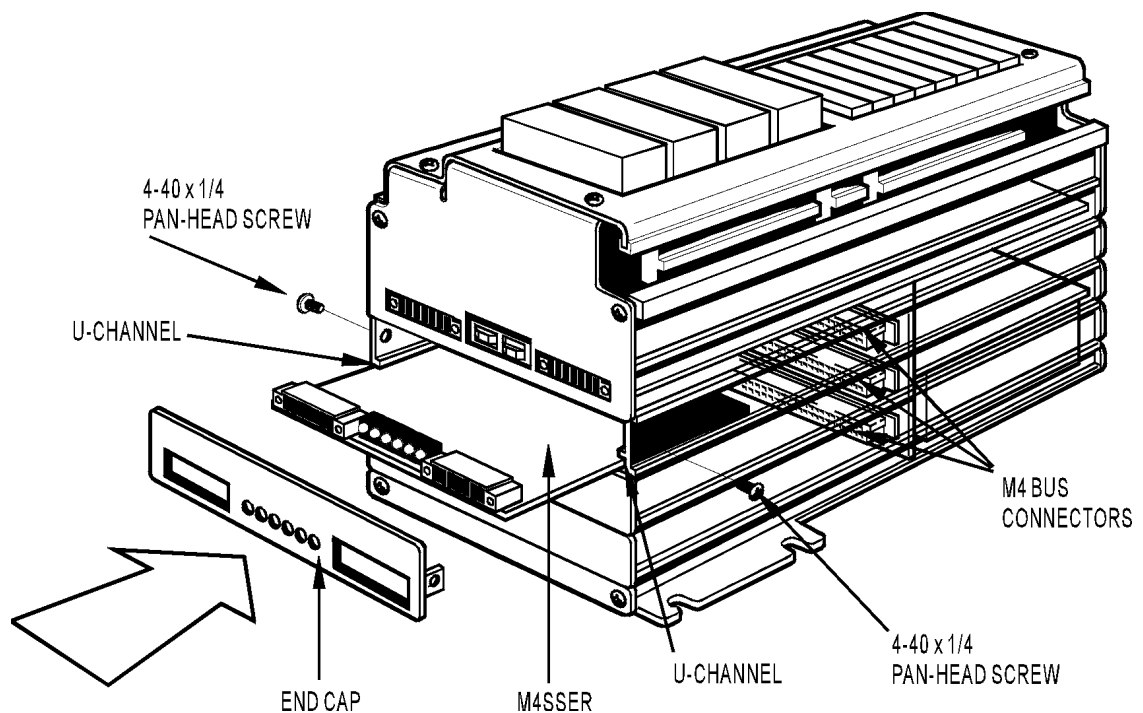
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Installation [OBSOLETE]

Before installing the M4SSER into the M4 Modular Controller expansion slot, make sure all jumpers have been properly set for RS-232 or RS-485/422 communications. Then follow the instructions below:

1. Remove all power from the M4 Modular Controller.
2. Remove the blank end cap for any of the three M4BUS expansion slots, located below the serial I/O connectors. Each end cap is held in place by two screws located on the side panel, adjacent to each end cap. (You may also need to remove one or two additional end caps to achieve proper card alignment.)
3. Align the edges of the M4SSER with the selected expansion slot U-channels located on the sides of the expansion bus cavity. Slide the card all the way in until it seats into the M4BUS connector.
4. Use the original screws to attach the new end cap (included with the M4SSER) to the end of the M4 Modular Controller unit.
5. Only one M4SSER may be added to an M4 controller.



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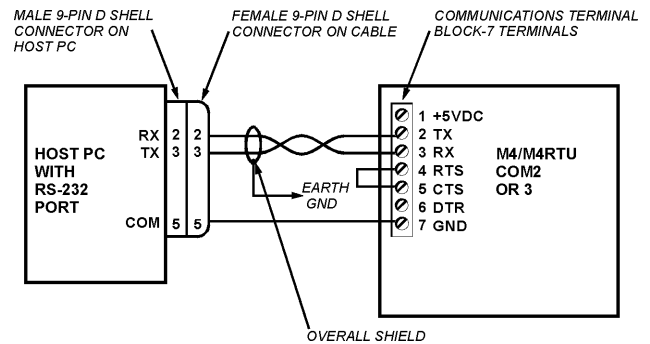
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Installation (WIRING)

Wiring to a PC

The figure on the right presents an example of RS-232 wiring between a host PC and the COM2 or COM3 port of an M4SSER installed on an M4. Verify that the pin connections at the host PC are the same as those called out in the diagram.

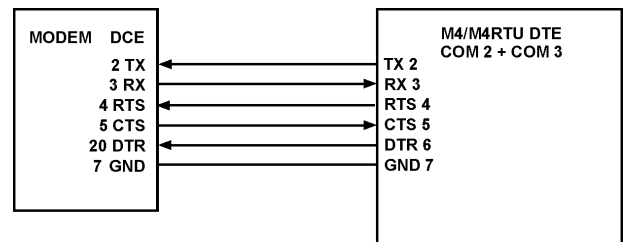


Wiring to a Modem

The figure on the right illustrates a connection from a generic modem to COM2 or COM3 on the M4SSER serial card of an M4 that does not use a carrier detect.

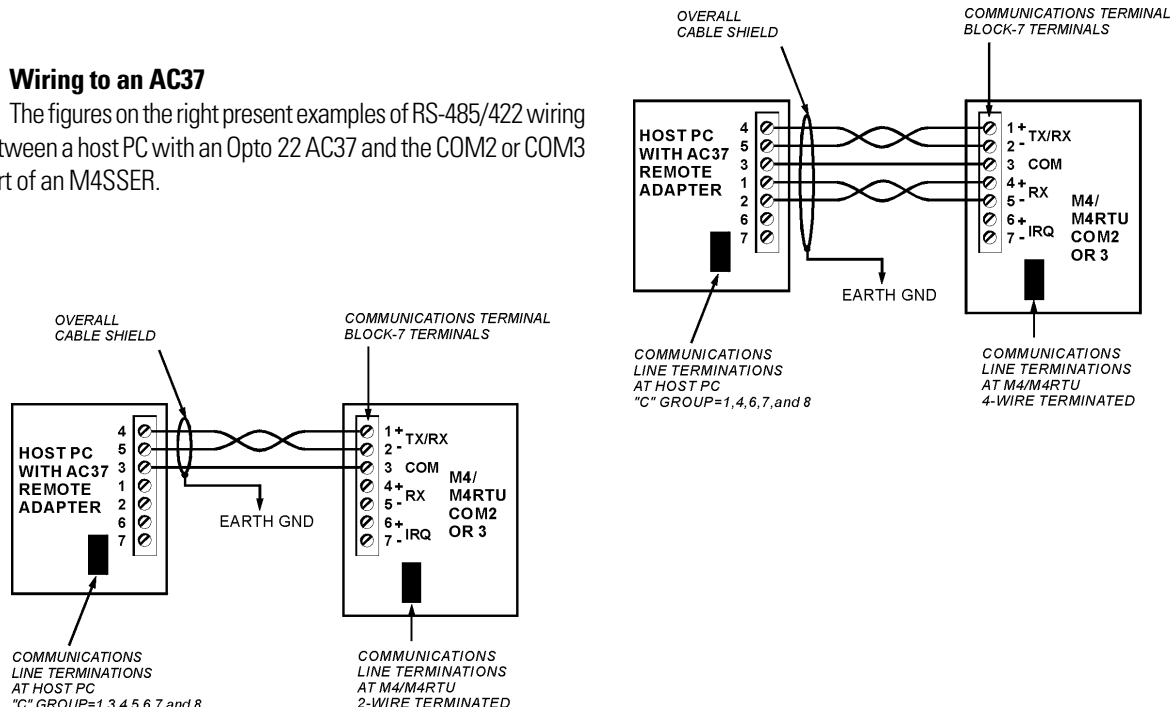
Refer to your modem documentation for detailed wiring information, possible jumper configuration, and initialization setup.

Important: For radio modems, connect RTS from the M4 to RTS on the radio. Do not use DTR on the M4.



Wiring to an AC37

The figures on the right present examples of RS-485/422 wiring between a host PC with an Opto 22 AC37 and the COM2 or COM3 port of an M4SSER.



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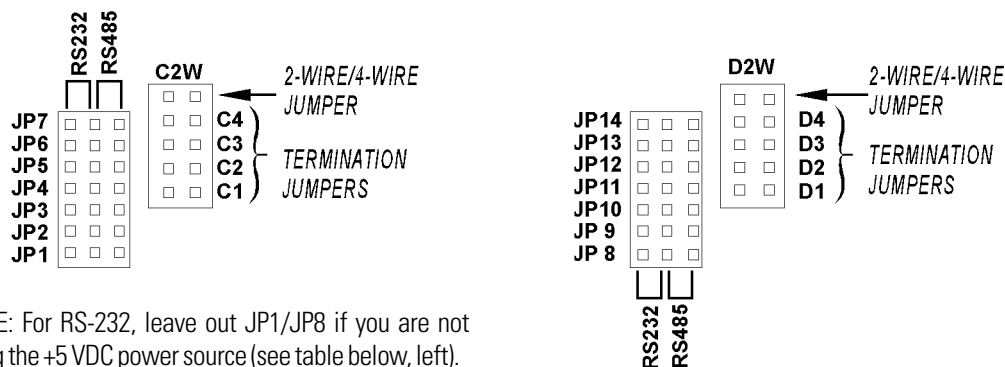
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Installation JUMPERS

The two serial ports (COM2 and COM3) of the M4SSER may be configured by setting jumpers for either RS-232 or RS-485/422. Only one serial mode may be used at a time per port. Each communication port includes a set of 12 jumpers divided into two columns. These jumpers must be set according to the serial mode desired.

The figure below shows the two sets of jumpers as they appear on the M4SSER. Note that the two sets are identical except for the labeling (some jumpers are labeled with C designations for COM2 and D designations for COM3). In this figure, no jumpers have been installed.

- **For RS-232**, install all jumpers to the left. In addition, install all termination jumpers (C1–C4 or D1–D4) to ensure reliable communications, and remove the 2-wire/4-wire jumper (C2W or D2W).
- **For RS-485/422**, install all jumpers to the right. Choose jumper location for 2-wire/4-wire and for termination based on your system (see table below, right).



NOTE: For RS-232, leave out JP1/JP8 if you are not using the +5 VDC power source (see table below, left).

Comm. Terminals (Com 2 or Com 3)	RS-232 (Jumpers in Left 2 Columns)	RS-485 (Jumpers in Right 2 columns)	
		2-Wire (C2W/D2W Jumper In)	4-Wire (C2W/D2W Jumper Out)
1	+ 5 VDC ¹	TX/RX+	TX +
2	TX	TX/RX-	TX -
3	RX	GND	GND
4	RTS	NC	RX +
5	CTS	NC	RX -
6	DTR	IRQ +	IRQ +
7	GND	IRQ -	IRQ -

¹ With RS-232, the +5 VDC may be used to power devices with light current demands such as barcode readers or hand-held terminals. Leave this jumper out if you do not need this voltage source.

Jumper	Function when Jumper In	Function When Jumper Out
C2W/D2W	2-Wire	4-Wire
C1/D1 ²	Terminated	Not Terminated
C2/D2 ²	Terminated	Not Terminated
C3/D3 ²	Terminated	Not Terminated
C4/D4 ²	Terminated	Not Terminated

² For RS-232, remove the C2W/D2W jumper and install jumpers on C1 through C4 or D1 through D4. For RS-485/422, set jumpers C1 through C4 or D1 through D4 all the same, depending on whether the M4RTU/DAS is physically the last unit in the communication link (jumpers in) or not (jumpers out).

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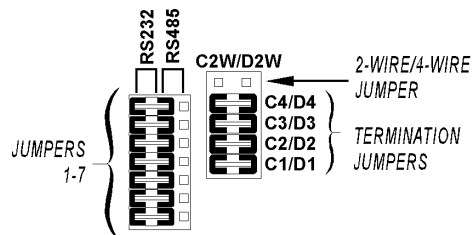
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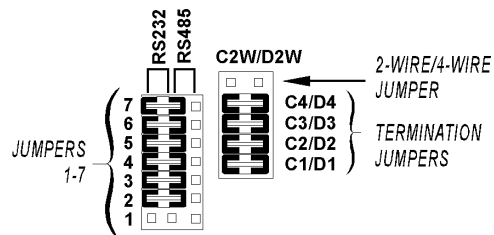
Installation JUMPERS (CONT.)

EXAMPLES OF JUMPER SETTINGS

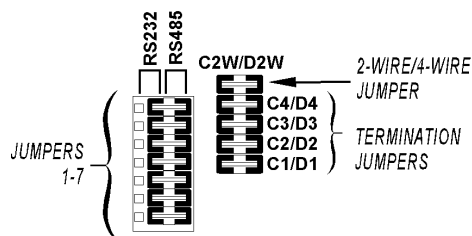
RS-232 with +5 VDC Enable



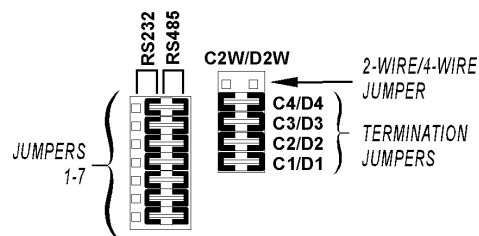
RS-232 with +5 VDC Disabled



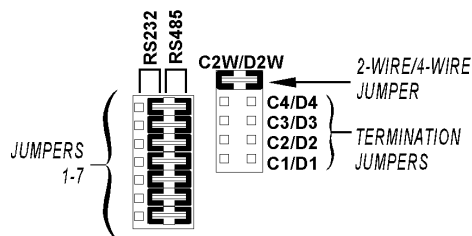
RS-485/422, 2-Wire Terminated



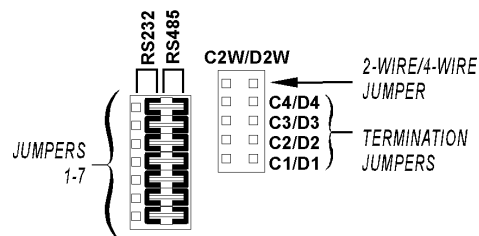
RS-485/422, 4-Wire Terminated



RS-485/422, 2-Wire Non-Terminated



RS-485/422, 4-Wire Non-Terminated



PRODUCTS

Opto 22 develops and manufactures reliable, easy-to-use, open standards-based hardware and software products. Industrial automation, process control, remote monitoring, data acquisition, and industrial internet of things (IIoT) applications worldwide all rely on Opto 22.

groov RIO®

[groov RIO edge I/O](#) offers a single, compact, PoE-powered industrial package with web-based configuration and IIoT software built in, support for multiple OT and IT protocols, and security features like a device firewall, data encryption, and user account control.

Standing alone, *groov* RIO connects to sensors, equipment, and legacy systems, collecting and securely publishing data from field to cloud. Choose a universal I/O model with thousands of possible field I/O configurations, with or without Ignition from Inductive Automation®, or a [RIO EMU energy monitoring unit](#) that reports 64 energy data values from 3-phase loads up to 600 VAC, Delta or Wye.

You can also use *groov* RIO with a Modbus/TCP master or as remote I/O for a *groov* EPIC system.

groov EPIC® System

Opto 22's [groov Edge Programmable Industrial Controller \(EPIC\)](#) system gives you industrially hardened control with a flexible Linux®-based processor with gateway functions, guaranteed-for-life I/O, and software for your automation and IIoT applications.

groov EPIC Processor

The heart of the system is the *groov* EPIC processor. It handles a wide range of digital, analog, and serial functions for data collection, remote monitoring, process control, and discrete and hybrid manufacturing.

In addition, the EPIC provides secure data communications among physical assets, control systems, software applications, and online services, both on premises and in the cloud. No industrial PC needed.

Configuring and troubleshooting I/O and networking is easier with the EPIC's integrated high-resolution color touchscreen. Authorized users can manage the system locally on the touchscreen, on a monitor connected via the HDMI or USB ports, or on a PC or mobile device with a web browser.

groov EPIC I/O

groov I/O connects locally to sensors and equipment. Modules have a spring-clamp terminal strip, integrated wireway, swing-away cover, and LEDs indicating module health and discrete channel status. *groov* I/O is hot swappable, UL Hazardous Locations approved, and ATEX compliant.

groov EPIC Software

The *groov* EPIC processor comes ready to run the software you need:

- Programming: Choose flowchart-based PAC Control, CODESYS Development System for IEC61131-3 compliant programs, or secure shell access (SSH) to the Linux OS for custom applications
- Node-RED for creating simple IIoT logic flows from pre-built nodes
- Efficient MQTT data communications with string or Sparkplug data formats
- Multiple OPC UA server options
- HMI: *groov* View to build your own HMI viewable on touchscreen, PCs, and mobile devices; PAC Display for a

Windows HMI; Node-RED dashboard UI

- Ignition or Ignition Edge® from Inductive Automation (requires license purchase) with OPC-UA drivers to Allen-Bradley®, Siemens®, and other control systems, and MQTT communications

Older products

From solid state relays, to world-famous G4 and SNAP I/O, to SNAP PAC controllers, older Opto 22 products are still supported and working hard at thousands of installations worldwide. You can count on us for the reliability and service you expect, now and in the future.

QUALITY

Founded in 1974, Opto 22 has established a worldwide reputation for high-quality products. All are made in the U.S.A. at our manufacturing facility in Temecula, California.

Because we test each product twice before it leaves our factory rather than testing a sample of each batch, we can afford to guarantee most solid-state relays and optically isolated I/O modules for life.

FREE PRODUCT SUPPORT

Opto 22's California-based Product Support Group offers free technical support for Opto 22 products from engineers with decades of training and experience. Support is available in English and Spanish by phone or email, Monday–Friday, 7 a.m. to 5 p.m. PST.

Support is always available on our website, including [free online training](#) at OptoU, how-to [videos](#), [user's guides](#), the Opto 22 KnowledgeBase, and [OptoForums](#).

PURCHASING OPTO 22 PRODUCTS

Opto 22 products are sold directly and through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at **800-321-6786** (toll-free in the U.S. and Canada) or **+1-951-695-3000**, or visit our website at www.opto22.com.

