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These products are obsolete.

MISTIC 32-CHANNEL DIGITAL I/O BRICK

Features

> High-I/O capacity digital unit for the Mistic family of PC-based control products

> Single-point on/off control and latching for up to 32 digital I/O points

> Easily accessible mounting rack

> Field wiring simple to install

> Agency Approvals: CE, UKCA

G4D32RS

DESCRIPTION

Note: This product is obsolete and no longer available.

The G4D32RS is a low-cost, high-I/O-capacity digital unit for the Opto 22 family of PC-based control products. Each I/O unit offers flexible, single-point, on/off control and latching for up to 32 digital I/O points. An easily accessible mounting rack makes field wiring simple to install. Communication connections are attached to a 3-wire terminal block and seamlessly integrate with other RS-485 remote brain boards, bricks, and modular controller systems. An onboard regulator ensures power protection to the modules and provides a regulated voltage source.

G4D32RS programming is accomplished with OptoControl or Cyrano, Opto 22's intuitive flowchart-based languages, or using a host computer and Opto 22's MisticWare software driver with the software language of your choice.

Part Numbers

Part	Description
G4RD32 RS **[Obsolete]**	**[Obsolete]** Remote Digital 32-Channel I/O Unit Mistic Protocol

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SPECIFICATIONS [OBSOLETE]

CPU CPU clock frequency	8-bit 87C51 processor 22 MHz

Communications
   Bus speed
   Cable type
Maximum cable length
   Mode
   Protocol
	300-115.2 KBd
	(76.8 K, 150, and 110 baud not supported)
	2 twisted pair + ground (interrupts use 1 pair)
	3,000 ft. (more with repeaters)
	Binary or ASCII RS-485, half-duplex

Typical I/O times (includes communication transfer time)
   Read 16 channels
   Write 16 channels
	1.6 ms
	1.8 ms

Latching (minimum pulse width)	100 µs
Typical operating temperature Storage temperature	-20° to 70° C -40° to 85° C
Humidity	5% to 95% relative humidity
Software	OptoControl, Cyrano, and MisticWare

*Power requirements @ 24 VDC ± 0.5V
  with 32 modules installed
   Terminated (last brick on the bus)
   Non-terminated (all other bricks)
	220 mA
	220 mA

Maximum rack field current rating (32 x G4 digital I/O)	48A

Setup and System Commands

- Identify unit
- Power up clear
- Repeat last response
- Reset
- Set response delay
- Clear output

Digital Read/Write, Latch Commands

- Read and optionally clear input latches (group command)
- Read and optionally clear input latch
- Read module status
- Set output module state (group command)
- Set output

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ASSEMBLY

The G4D32RS is a high-I/O-capacity digital unit for the Mistic family of PC-based control products. Each unit offers single-point on/off control and latching for up to 32 digital I/O points.
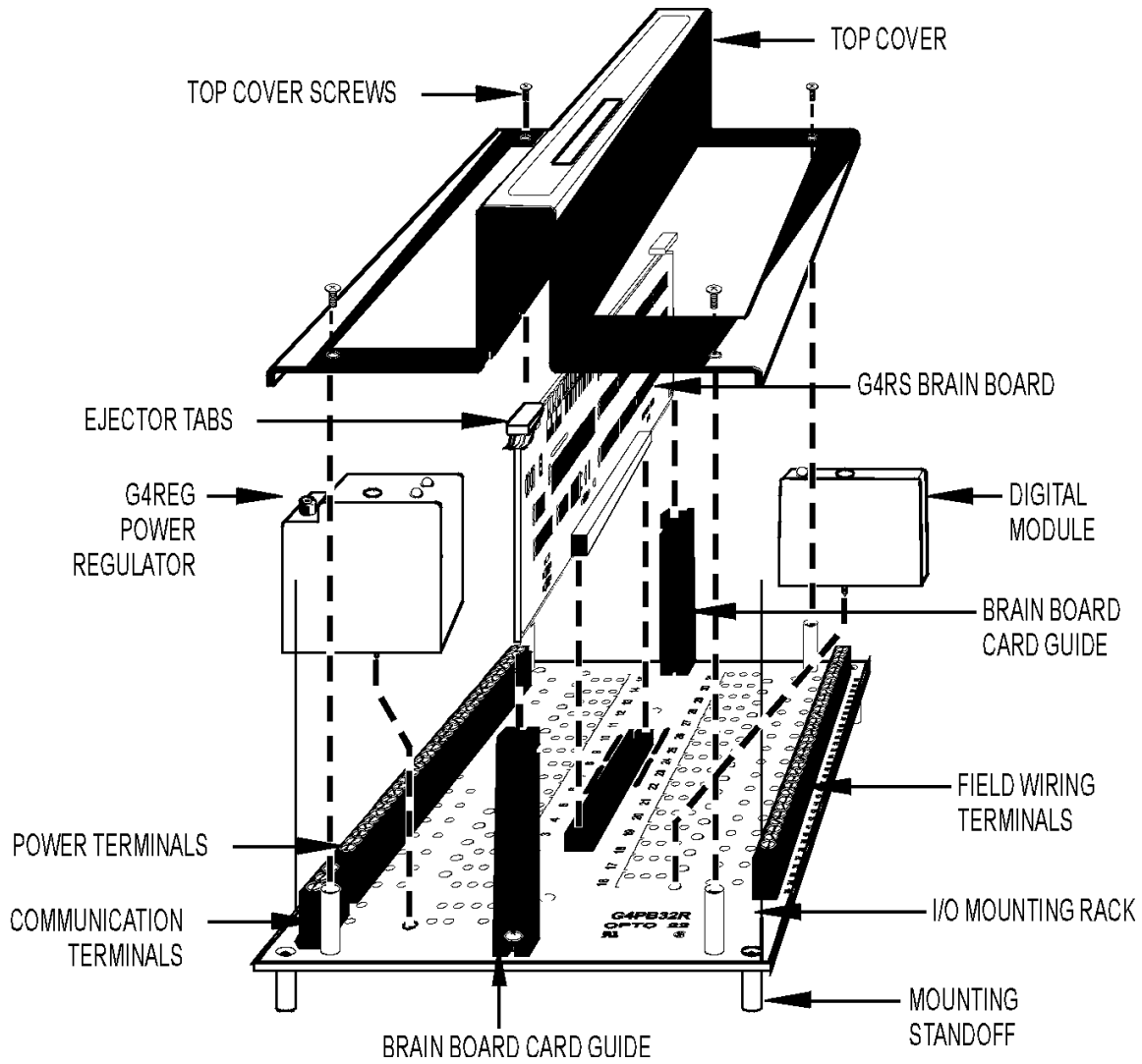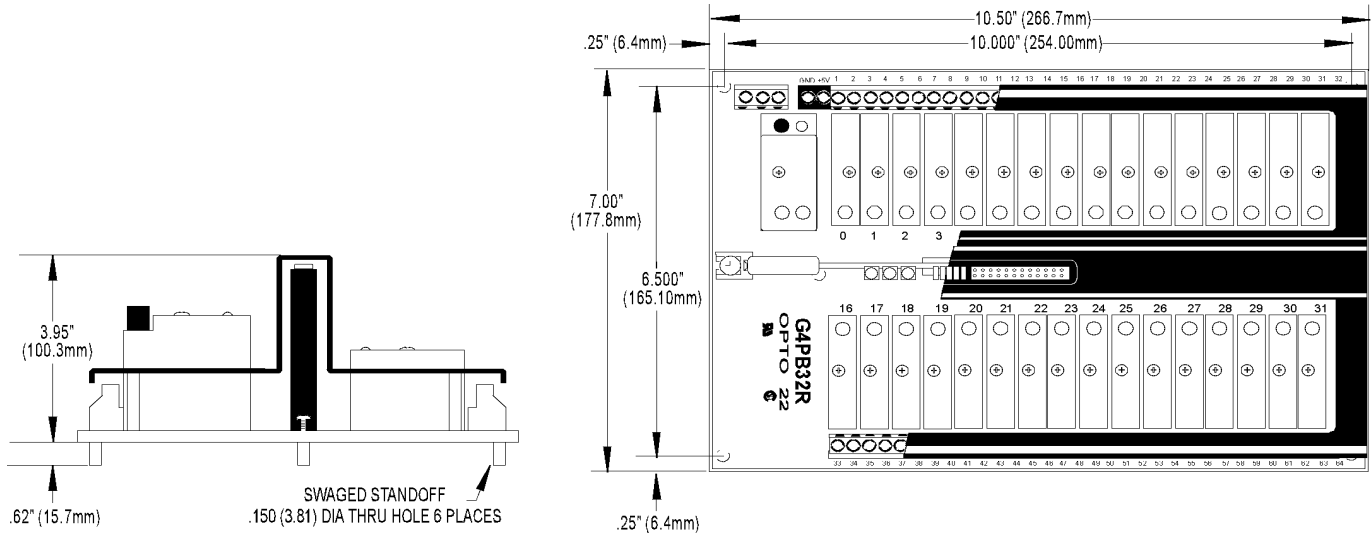

Figure1: Exploded view of the G4D32RS

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INSTALLATION NOTES

Dimensions

Packing List

When removing the G4D32RS from its packaging, make sure the following components are included:

Component	**Use**
• Extra jumpers	• Can be installed as G4D32RS configuration jumpers
• Screwdriver	• Used to install modules
• G4STRAP product insert	• Explains how G4STRAP may be used with G4D32RS

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INSTALLATION NOTES

Setting Configuration Jumpers

Jumpers are included to allow you to configure the G4D32RS based on individual application requirements. Figure 2 shows the G4D32RS jumper groups.
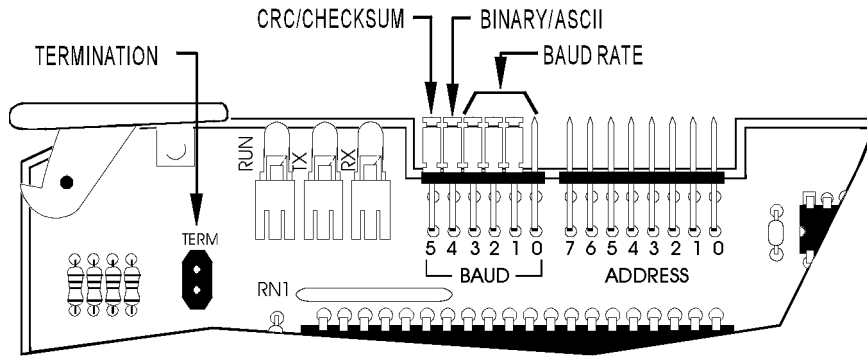

Figure 2: Configuration Jumpers on the G4D32RS

The following sections describe each jumper in detail.

Baud Jumpers (BAUD 0-3)

Use these jumpers to set the baud rate for the G4D32RS. Select the appropriate jumper settings based on the baud rates in Table 1. The I/O unit is shipped with a factory default baud rate of 115.2 KBd.

Table 1: Baud Rate Jumpers

Baud Rate	Jumper Positions			
	0	**1**	**2**	**3**
115.2 KBd	Out	In	In	In
76.8 KBd	Not supported			
57.6 KBd	Out	Out	In	In
38.4 KBd	In	In	Out	In
19.2 KBd	Out	In	Out	In
9600 Bd	In	Out	Out	In
4800 Bd	Out	Out	Out	In
2400 Bd	In	In	In	Out
1200 Bd	Out	In	In	Out
600 Bd	In	Out	In	Out
300 Bd	Out	Out	In	Out

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INSTALLATION NOTES
Setting Configuration Jumpers (cont.)

Termination Jumper (TERM)

Install this jumper if this G4D32RS unit is physically the last I/O unit in the communication link.

Protocol Select Jumper (BAUD 4)

Use this jumper to select whether communication between the host computer/controller and the G4D32RS will be in binary mode (jumper in, the default) or ASCII mode (jumper out).

Data Verification Jumper (BAUD 5)

Use this jumper to select whether the type of data verification method used is Checksum Modulo 256 (jumper out) or CRC16 (jumper in, the default).

CRC16 is typically used when a Mistic controller and Cyrano are used to control the G4D32RS brain boards. If you are using the MisticWARE driver or are sending commands directly from a PC to the brain boards, either data verification method may be used. Make sure the data verification method chosen in the software you are using matches the jumper setting on the brain board.

Address Jumpers (ADDRESS 0-7)

Use these jumpers to select two consecutive eight-bit addresses from 0 to 255 (0 to FF hexadecimal). The 32 channels on the G4D32RS are assigned an even number brick address for channels 0–15, and the next consecutive odd address for channels 16–31. The factory default is 0 (all jumpers out). This setting selects addresses 0 and 1. The most significant bit is 7, and the least significant bit is 0.

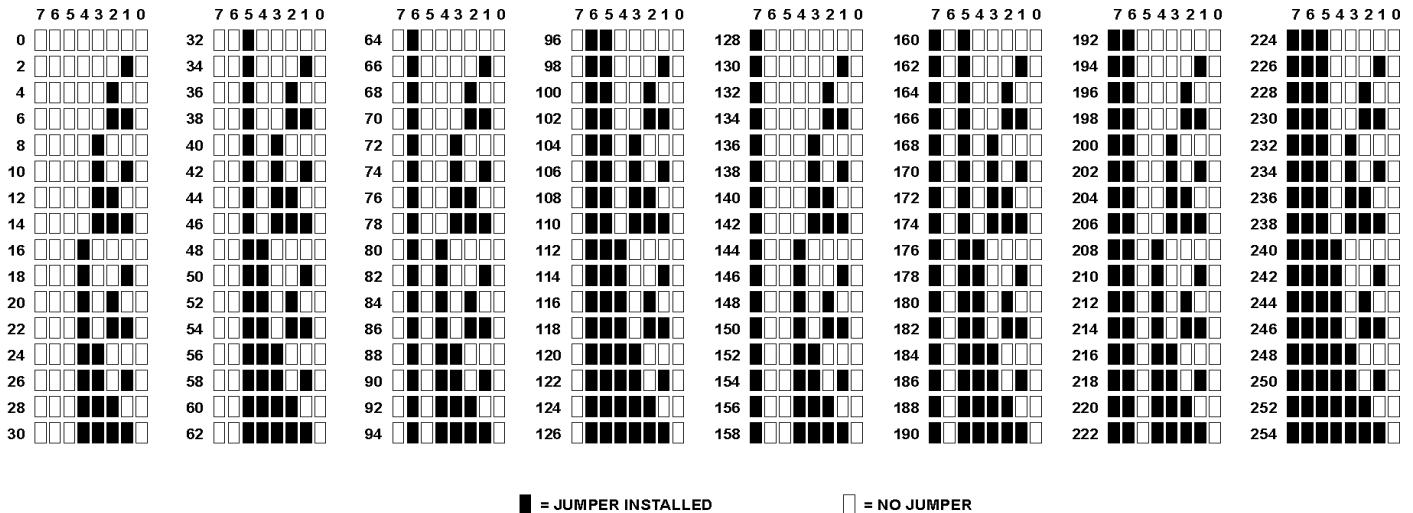To set the jumpers based on a predetermined address, refer to Figure 3.

= JUMPER INSTALLED   = NO JUMPER

Figure 3: G4D32RS Address Jumper Configurations

These products are obsolete.

INSTALLATION NOTES

Mounting the G4D32RS

1. Remove the four top cover screws and lift off the top cover.
2. Affix the G4D32RS to an enclosure or panel, using the mounting standoffs shown in Figure 4.
3. Connect power, field, and communication wiring. Refer to the appropriate sections in this document for instructions.
4. Replace the top cover and secure to the mounting rack with the top cover screws.
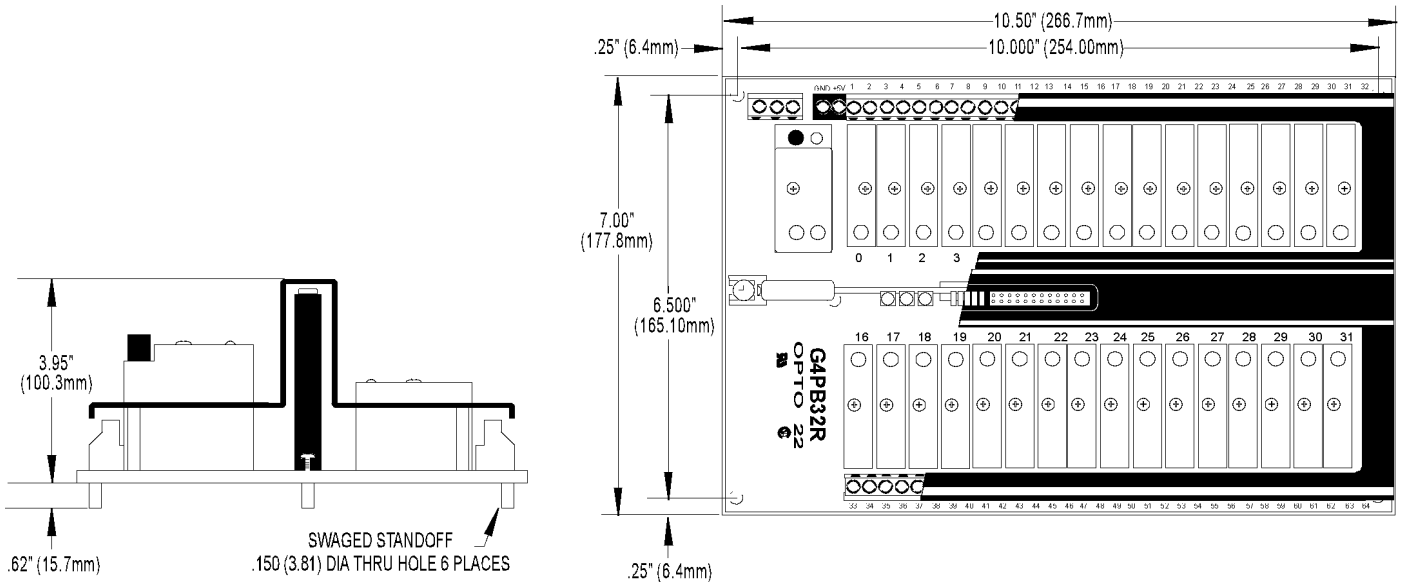

Figure 4: G4D32RS Dimensions and Mounting Information

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INSTALLATION NOTES

Connecting Power to the G4D32RS

The G4D32RS requires 250 mA @ 24 ±0.5 VDC.

Follow the instructions below to wire power to the I/O unit.

1. Turn off the power supply switch.
2. Make sure all power supply terminal block connections are completely open by turning the power terminal screw counterclockwise.
3. Prepare each power supply wire, being careful not to strip back the insulation too far.
4. Refer to Figure 5 and insert the power supply's "+" wire into the "+24V" terminal and the power supply's "−" wire into the "−24V" terminal. Tighten down each wire by turning the power terminal screw clockwise. Make sure the terminal block is clamping the wire and not the insulation.

G4REG

The onboard regulator (Opto 22 P/N G4REG) converts the 24 VDC to the 5 VDC required by the I/O unit's brain board and modules. Three LED indicators are on the regulator. A lit "24V" LED indicates the G4REG is receiving adequate 24 VDC power; an unlit LED indicates it is not receiving adequate power. A lit "5V" LED indicates the G4REG is properly converting the 24 VDC to 5 VDC; an unlit LED indicates power is not being converted properly. The "FUSE BAD" LED lights when the 1 A fuse (Opto 22 P/N FUSE01G4 or Wickman P/N 19373-1A) in the regulator needs to be replaced.
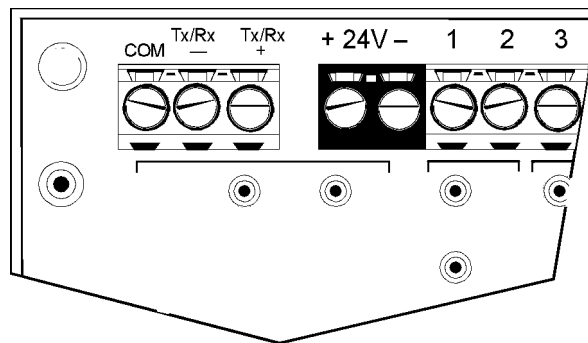

Figure 5: Connecting Power to the G4D32RS

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INSTALLATION NOTES

Connecting Field Wiring

Caution: TURN OFF POWER to the G4D32RS before connecting or removing field wiring.

Figure 6 shows the location of the field wiring terminals on the G4D32RS and the layout of the terminal points as they correspond to each channel. Field wiring terminals accept up to 10 AWG wire.

Each channel has a positive (+), odd numbered terminal and a negative (–), even numbered terminal for each channel. Connect the positive wire from your field device to the channel's positive terminal, and then connect the negative wire to the negative terminal. Table 2 on page 7 lists the channel numbers, their respective field terminals, and pinouts to the header connector
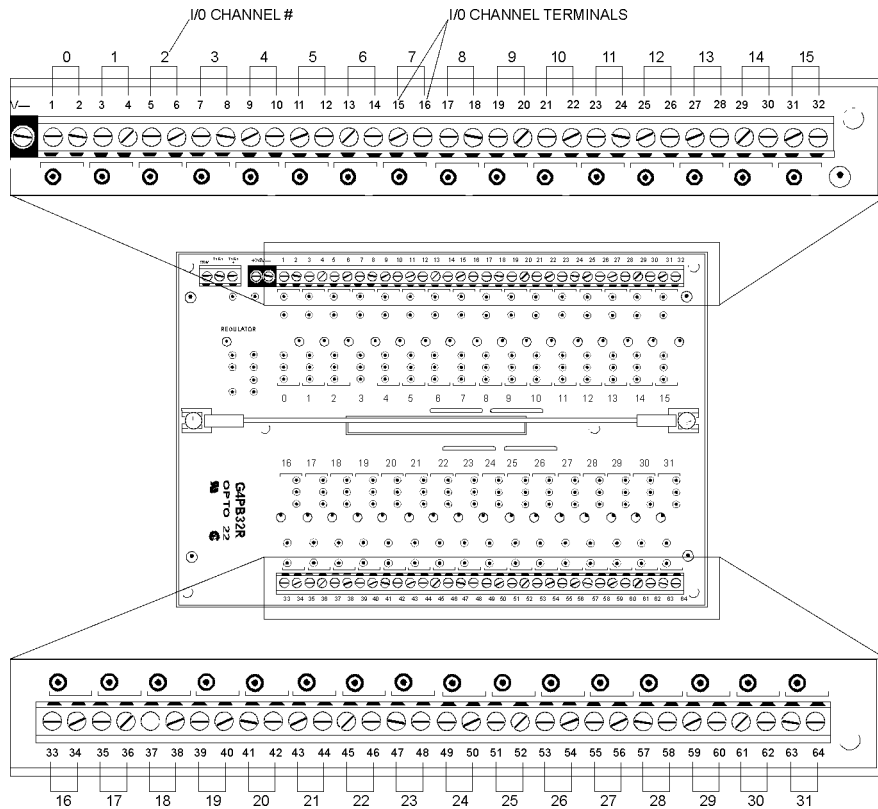

Figure 6: Location of Terminals on the G4D32RS

Bussing Points Together

Several field terminals may be bussed together by using Opto 22 P/N G4STRAP. One G4STRAP may jumper up to 16 positions. It may also be trimmed to jumper fewer points together.

See Figure 7 on page 11 for an example of how the G4STRAP is used on the G4D32RS.

INSTALLATION NOTES

Connecting Field Wiring (cont.)

Table 2: Channel Positions and Field Terminals

Module Position	Control (Header Connector)	Field (Terminal Strip) + and -
0	40	1 and 2
1	39	3 and 4
2	42	5 and 6
3	41	7 and 8
4	44	9 and 10
5	43	11 and 12
6	46	13 and 14
7	45	15 and 16
8	48	17 and 18
9	47	19 and 20
10	50	21 and 22
11	49	23 and 24
12	52	25 and 26
13	51	27 and 28
14	54	29 and 30
15	53	31 and 32
16	56	33 and 34
17	55	35 and 36
18	58	37 and 38
19	57	39 and 40
20	60	41 and 42
21	59	43 and 44
22	62	45 and 46
23	61	47 and 48
24	64	49 and 50
25	63	51 and 52
26	66	53 and 54
27	65	55 and 56
28	68	57 and 58
29	67	59 and 60
30	70	61 and 62
31	69	63 and 64

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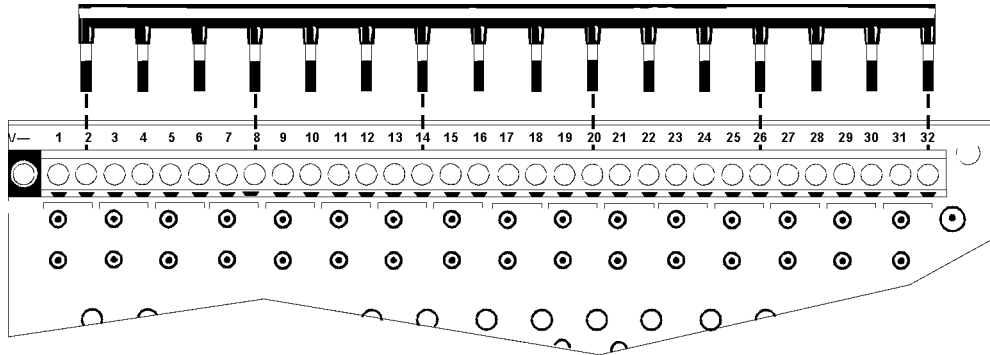MADE IN THE
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INSTALLATION NOTES

Figure 7: G4STRAP Used on the G4D32RS

Connecting Communication Wiring

Caution: TURN OFF POWER to the G4D32RS before connecting or removing communication wiring.

There are three terminals for communication wiring on the G4D32RS I/O unit. The unit communicates using two-wire, RS-485 protocol. Refer to Figure 8 for wiring connections.
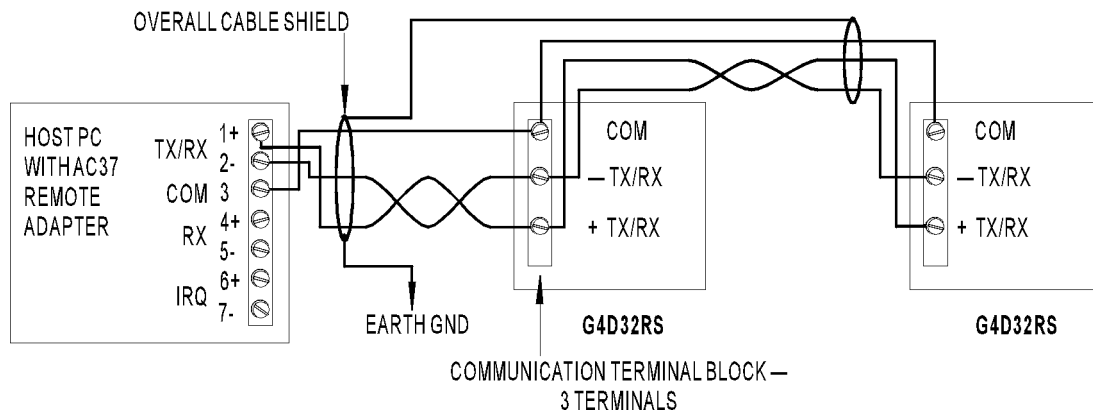

Figure 8: Two-Wire Communication Wiring to the G4D32RS I/O Unit

Programming

The G4D32RS may be controlled directly from a PC or with a Mistic controller and the Cyrano programming language. Refer to the Analog and Digital Commands Manual (Opto 22 form 270) or the MisticWARE Driver Reference Manual (Opto 22 form 522) for programming information if you are using a PC to control the I/O unit. Refer to the Cyrano User's Guide (Opto 22 form 702) for programming information if you are using a Mistic controller to control the I/O unit.

When configuring the G4D32RS in software, remember it occupies two consecutive eight-bit addresses. An even I/O address is assigned to channels 0–15, and the next consecutive address is assigned to channels 16–31.

Refer to page 4 for more information about addressing.

INSTALLATION NOTES

LED Indicators

Three LEDs are located on the G4D32RS brain board. These LEDs perform the functions described in Table 3.

Table 3: LED Functions

LED	Indication
RUN (Brain board status)	This indicator shows brain board status. When the brain board is functioning normally, the light stays on. When the brain board is powered down, the light goes off. If the light begins to blink, it could indicate a brain board malfunction or low power supply voltage.
TX (Transmit)	This indicator illuminates (and appears to flash on and off) whenever the serial port is transmitting data. If the LED fails to illuminate, it could indicate the port is idle. Check Figure 8 for the appropriate wiring configuration.
RX (Receive)	This indicator illuminates whenever the serial port is receiving data. If the LED fails to illuminate, it could indicate that the port is idle. An LED that is constantly on may indicate receive communication wires are connected to the opposite polarity. Check Figure 8 for the appropriate wiring configuration.

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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.

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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.

OPTO 22 • www.opto22.com
43044 Business Park Dr. Temecula, CA 92590-3614

SALES • sales@opto22.com
800-321-6786 • 1-951-695-3000

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