OPTO 22

INSTALLATION NOTES

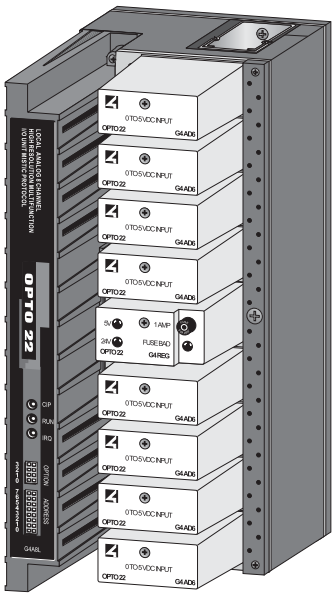
Form 628-970905

Description

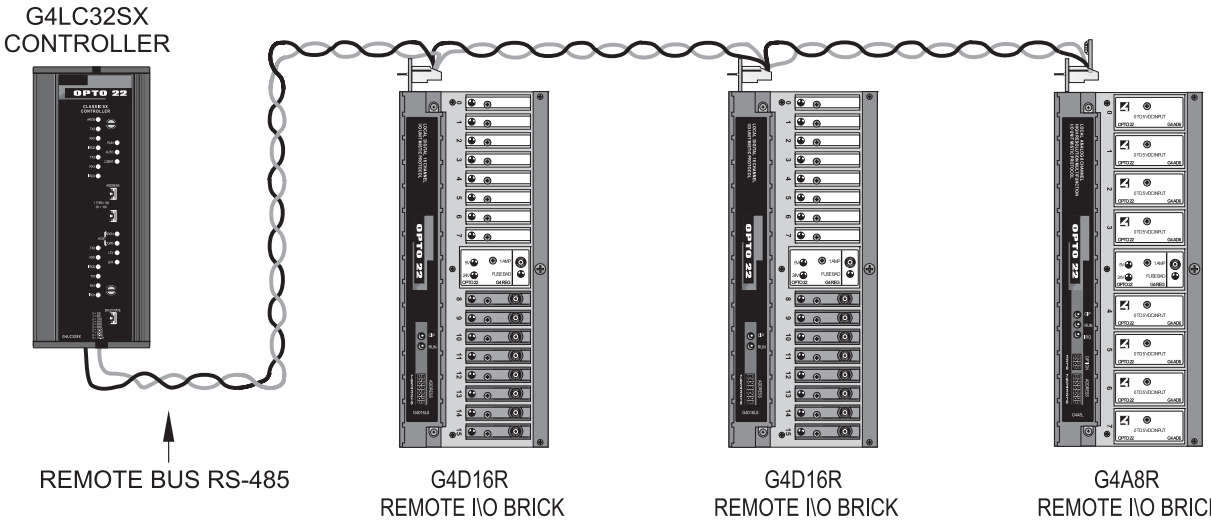
Part Numbers	Description
G4A8L	Local Analog 8-Channel Multifunction I/O Unit Mistic Protocol
G4D16L	Local Digital 16-Channel Multifunction I/O Unit Mistic Protocol

The G4A8L is a high performance analog I/O brick for the Opto 22 family of processors and I/O. It provides intelligent and flexible single point I/O control in a rugged, deadfront, compact package. Customers select the signal type for each of the 8 channels on the brick, in any combination, from the G4 family of isolated analog I/O modules. Up to 16 channels are supported with available expansion options. Each module has channel to channel isolaton and provides 12 bits of resolution. Onboard brick intelligence offers PID loop control, HI/LO limit monitoring, thermocouple linearization, event/reactions, and many other control functions. Event/reactions execute high speed deterministic responses to sophisticated control sequences, alarm monitoring, diagnostics, and host interrupts.

Analog bricks utilize Opto 22's Mistic protocol and high speed serial communications. Programming is accomplished with Opto 22's intuitive multitasking, flowchart-based languages OptoControl or Cyrano. Custom software development is achieved using a host computer and Opto 22's Misticware software driver with the high-level software language of your choice.



Typical Mistic I/O System Architecture With a Classic SX Controller



Specifications

Setup and System Commands

IDENTIFY TYPE
POWER UP CLEAR
REPEAT LAST RESPONSE
RESET
RESET ALL PARAMETERS TO DEFAULT
SET COMM LINK WATCHDOG AND DELAY
SET COMM LINK WATCHDOG TIME-OUT DATA
SET RESPONSE DELAY
SET SYSTEM OPTIONS

Analog I/O Configuration Commands

CALCULATE AND SET ADC MODULE OFFSET
CALCULATE AND SET ADC MODULE GAIN
READ MODULE CONFIGURATION
SET ADC MODULE OFFSET
SET ADC MODULE GAIN
SET AVERAGING SAMPLE WEIGHT (DIGITAL FILTERING)
SET CHANNEL CONFIGURATION
SET ENGINEERING UNIT SCALING PARAMETERS
SET I/O CONFIGURATION-GROUP
SET TOTALIZATION SAMPLE RATE
SET TPO RESOLUTION
STORE SYSTEM CONFIGURATION

Analog Read/Write/Output Commands

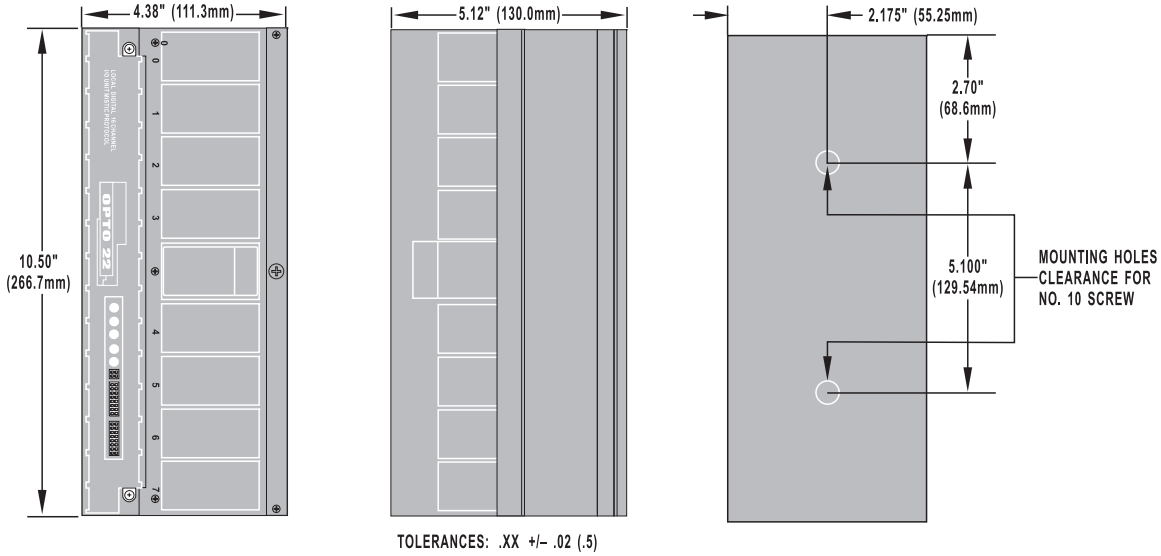
RAMP DAC OUTPUT TO ENDPOINT
READ AND CLEAR I/O MODULE DATA
READ AND CLEAR I/O MODULE DATA-GROUP
READ I/O MODULE MAGNITUDE
READ I/O MODULE MAGNITUDE-GROUP
SET DAC MODULE MAGNITUDE, ENG. UNITS
SET DAC MODULE MAGNITUDE, ENG. UNITS-GROUP
SET DAC MODULE MAGNITUDE, COUNTS
SET DAC MODULE MAGNITUDE, COUNTS-GROUP

Multifunction Analog Brick Specifications

CPU CPU clock Frequency	16-bit, Intel 80C 196 processor 12 MHz processor
Communications Bus speed Cable type Maximum cable length Mode	 1.4 Mbps 34 conductor, ribbon 200 ft Binary
Typical I/O time (includes communication transfer time) Read 16 channels Write 16 channel	 1.03 ms 2.48 ms
Input/output update rate Input Output	 7 ms 50 ms
PID scan rate	100 ms for all 8 PIDs 4 PID loops/brick Up to 8 PID loops with brick expansion option
Typical Event/Reaction time (≤16 Event/Reactions)	4 ms
*System power consumption @ 24 VDC ± 0.1 V (excludes analog modules) Terminated (last brick on the bus) Non-terminated (all other bricks) Analog expansion brick Typical analog module	 276 mA 240 mA 65 mA 45 mA
Isolation Input to output Output to analog supply	 4,000 Vrms 4,000 Vrms
Temperature Operating Storage	 0° C to 70° C -40° C to 80° C
Humidity	5% to 95% relative humidity
Software	OptoControl, Cyrano 200, and Misticware
Expansion options G4LAX Local analog expansion brick	Adds 8 additional analog I/O channels on a separate brick unit

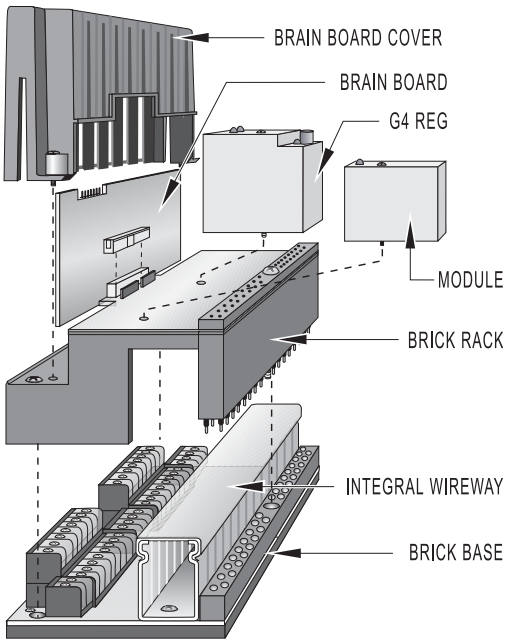
Dimensions

Analog Brick Dimensions



Assembly

Analog Brick Assembly



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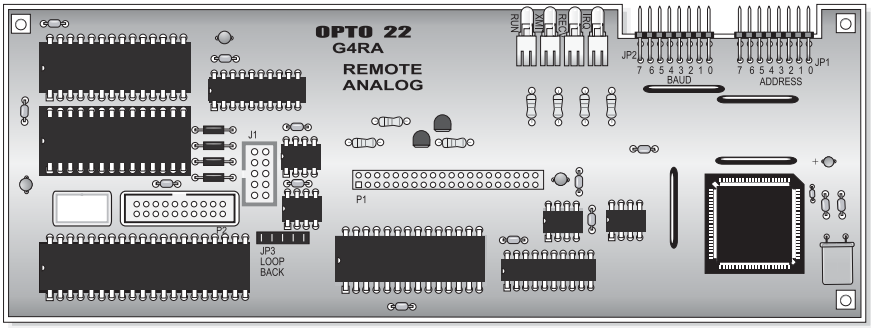
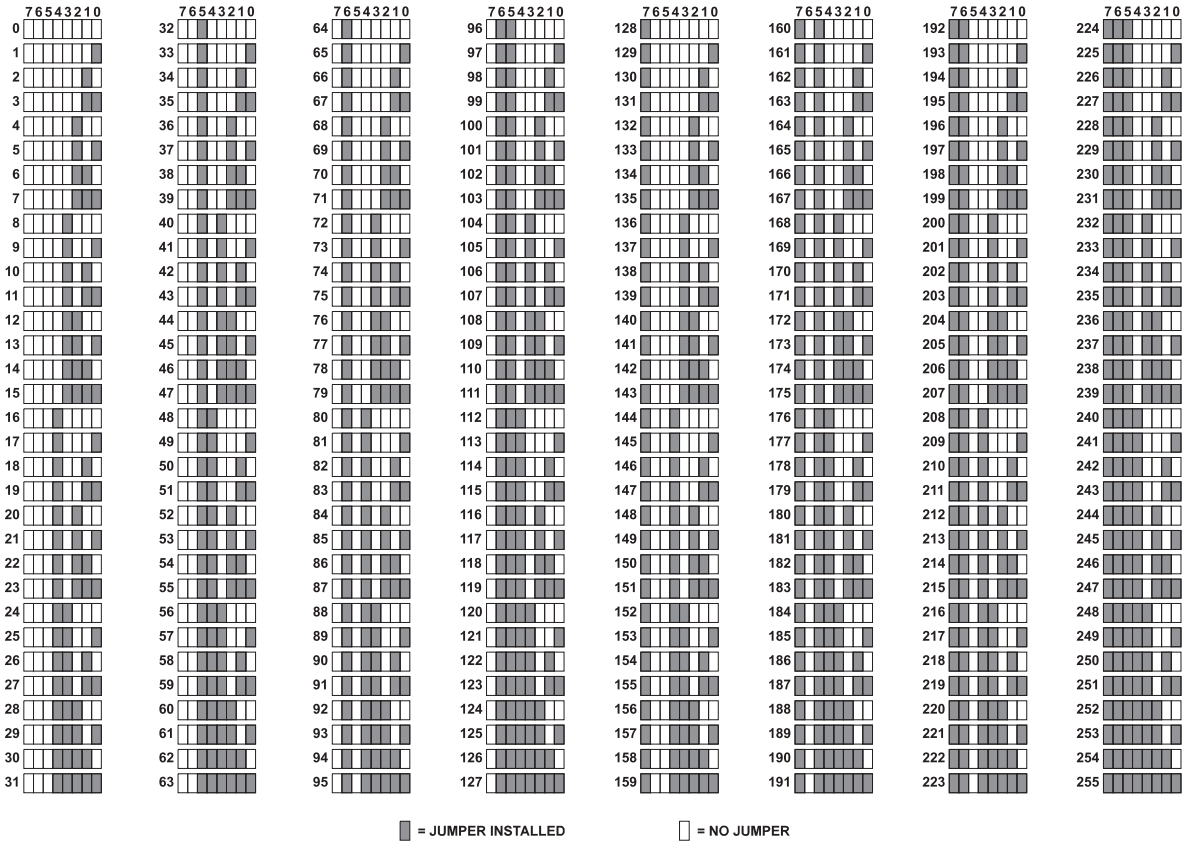
G4LA/G4LD Brain Board



Addressing

Install a jumper where indicated by the following table to set a unique system address on each I/O brick. The factory default is address 0.



Baud Jumper Group

Install jumpers according to the following table.

Table 1 - Remote Brick Jumpers

Jumper	Jumpers for use with Cyrano	Description
0	In	Selects the data transmission protocol. An installed jumper selects binary protocol and is the factory default. Install on all local brick brain boards.
1	In	Selects the data verification method. An installed jumper selects CRC-16 and is the factory default. If the jumper is out, an 8-bit checksum is selected.
2	Out	Reserved for future use.
3	Out	Reserved for future use.

Table 2 - Baud Rate Jumpers

Baud Rate	3	2	1	0
115.2 KBd	In	In	In	Out
76.8 KBd	In	In	Out	In
57.6 KBd	In	In	Out	Out
38.4 KBd	In	Out	In	In
19.2 KBd	In	Out	In	Out
9,600	In	Out	Out	In
4,800	In	Out	Out	Out
2,400	Out	In	In	In
1,200	Out	In	In	Out
600	Out	In	Out	In
300	Out	In	Out	Out
150	Out	Out	In	In
110	Out	Out	In	Out
Reserved	In	In	In	In
Reserved	Out	Out	Out	In
Reserved	Out	Out	Out	Out

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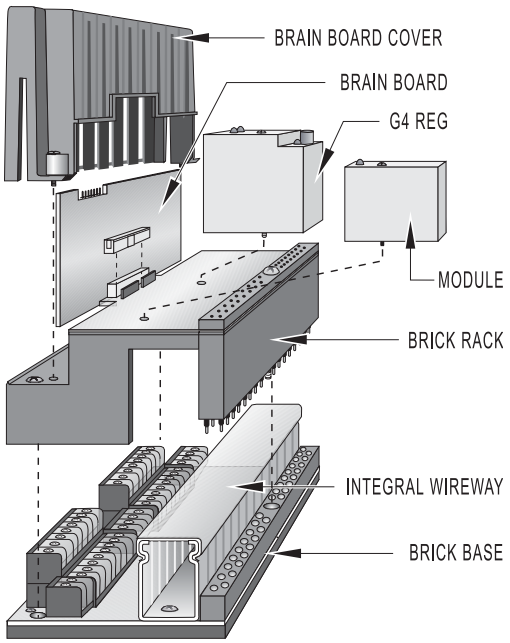
Installation

1. Disassemble the brick unit and attach the brick base to the mounting surface.
2. Connect field and power wiring to the brick base. Refer to Form 595, "Mistic 200 System Installation Guide" for specific wiring information.

Caution: *Turn OFF all power before wiring to the brick base.*

3. Install the brick rack.
4. Install the I/O modules, G4REG, and brain board to the brick rack.
5. Set the jumpers and connect a remote cable or SBTA communications adapter to the 10-pin header.
6. If this is physically the last brick on the remote I/O network, install jumpers on the "JP3 LOOPBACK" jumper group.
7. Attach the brain board cover.

Brick Diagram



System Power Consumption

G4A8L	G4D16L
24 VDC ± 0.5 V @ 220 mA	24 VDC ± 0.5 V @ 375 mA
Excludes module requirements	Includes module requirements

Add 50 mA for a terminated brick.

Products

Opto 22 produces a broad array of reliable, flexible hardware and software products for industrial automation, remote monitoring, enterprise data acquisition, and machine-to-machine (M2M) applications.

SNAP Ethernet Systems

Based on the Internet Protocol (IP), SNAP Ethernet systems offer flexibility in their network connectivity and in the software applications they work with. The physical network may be a wired Ethernet network, a cellular wireless network, or a modem. A wide variety of software applications can exchange data with SNAP Ethernet systems, including:

- Opto 22's own ioProject™ suite of control and HMI software
- Manufacturing resource planning (MRP), enterprise management, and other enterprise systems
- Human-machine interfaces (HMIs)
- Databases
- Email systems
- OPC client software
- Custom applications
- Modbus/TCP software and hardware.

SNAP Ethernet system hardware consists of controllers and I/O units. Controllers provide central control and data distribution. I/O units provide local connection to sensors and equipment.

SNAP OEM Systems

Opto 22 SNAP OEM I/O systems are highly configurable, programmable processors intended for OEMs, IT professionals, and others who need to use custom software with Opto 22 SNAP I/O modules.

Linux® applications running on these systems can read and write to analog, simple digital, and serial I/O points on SNAP I/O modules using easily implemented file-based operations. Applications can be developed using several common development tools and environments, including C or C++, Java, and shell scripts.

M2M Systems

Machine-to-machine (M2M) systems connect your business computer systems to the machines, devices, and environments you want to monitor, control, or collect data from. M2M systems often use wireless cellular communications to link remote facilities to central systems over the Internet, or to provide monitoring and control capability via a cellular phone.

Opto 22's Nvio™ systems include everything you need for M2M—interface and communications hardware, data service plan, and Web portal—in one easy-to-use package. Visit nvio.opto22.com for more information.

Opto 22 Software

Opto 22's ioProject and FactoryFloor® software suites provide full-featured and cost-effective control, HMI, and OPC software to power your Opto 22 hardware. These software applications help you develop control automation solutions, build easy-to-use operator interfaces, and expand your manufacturing systems' connectivity.

Quality

In delivering hardware and software solutions for worldwide device management and control, Opto 22 retains the highest commitment to quality. We do no statistical testing; each product is made in the U.S.A. and is tested twice before leaving our 160,000 square-foot manufacturing facility in Temecula, California. That's why we can guarantee solid-state relays and optically-isolated I/O modules *for life*.

Product Support

Opto 22's Product Support Group offers comprehensive technical support for Opto 22 products. The staff of support engineers represents years of training and experience, and can assist with a variety of project implementation questions. Product support is available in English and Spanish from Monday through Friday, 7 a.m. to 5 p.m. PST.

Opto 22 Web Sites

- www.opto22.com
- nvio.opto22.com
- www.internetio.com (live Internet I/O demo)

Other Resources

- OptoInfo CDs
- Custom integration and development
- Hands-on customer training classes.

About Opto 22

Opto 22 manufactures and develops hardware and software products for industrial automation, remote monitoring, enterprise data acquisition, and machine-to-machine (M2M) applications. Using standard, commercially available Internet, networking, and computer technologies, Opto 22's input/output and control systems allow customers to monitor, control, and acquire data from all of the mechanical, electrical, and electronic assets that are key to their business operations. Opto 22's products and services support automation end users, OEMs, and information technology and operations personnel.

Founded in 1974 and with over 85 million Opto 22-connected devices deployed worldwide, the company has an established reputation for quality and reliability.

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