

This product is obsolete.

OPTO 22

DATA SHEET

Form 730-230112

BRAINS CLASSIC/MISTIC 16-CHANNEL ANALOG

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Description

This product is obsolete and no longer available.

The B200 is an analog brain board used to control up to 16-channels of remote analog I/O using Opto 22's Classic analog I/O mounting racks and modules. On-board intelligence enables many distributed control features. The B200 and its digital counterpart, the B100, can be used with either an Opto 22 controller or a host computer.

The B200 communicates serially via RS-485 at communication speeds up to 115K baud using the Mistic® protocol. The B200 brain board is physically interchangeable with the traditional B2 Optomux brain boards for Opto 22 Classic I/O and is plug-compatible with Classic racks. This compatibility makes it possible for a "Classic I/O customer" using Standard analog I/O to take advantage of the increased performance of Opto 22's Mistic communications protocol. The compatibility also allows Optomux users to migrate to Opto 22's FactoryFloor® software without modifying existing field or communication wiring.

Utilizing the Mistic protocol, faster communication speed is combined with advanced I/O processing to provide unmatched performance and power at the I/O level. Time-critical functions such as temperature conversion and linearization, digital filtering, max/min tracking, and averaging can be off-loaded from your host processor to the B200's intelligent I/O processor. Distributed control functions include event/reactions, which execute high-speed, deterministic responses to sophisticated control sequences, alarm monitors, or diagnostic conditions. In addition, the B200 can generate an interrupt signal to an Opto 22 controller or host computer notifying the controller that an event has occurred.

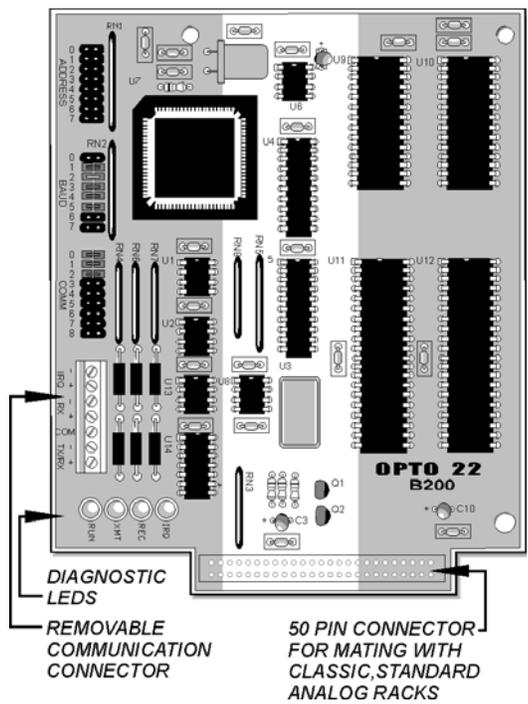
For systems I/O customers, the B200 is the gateway to Opto 22's FactoryFloor. FactoryFloor consists of these integrated components:

- OptoControl™, a graphical, flowchart-based development environment for real-time control solutions.
- OptoDisplay™, a graphical, multimedia operator interface package.
- OptoServer™, an OPC 1.0-compliant data server that connects the controller network with the PC-based FactoryFloor network.

Opto 22's OptoDriver Toolkit™ allows you to create custom solutions utilizing the B200. The OptoDriver toolkit includes 32-bit

Windows-compatible drivers, Windows 16-bit drivers, and Opto 22's classic DOS drivers. The kit also provides files, documentation, and real-world examples needed to write Microsoft Windows and DOS software applications that can access Opto 22 I/O hardware, using high-level languages such as Microsoft Visual C++™ or Microsoft Visual Basic®. The OptoDriver Toolkit provides programmers with a simple, direct connection to Opto 22's industry-standard Mistic, Optomux, or Pamux® I/O systems.

Part Number	Description
B200	16-Channel Analog Brain, Mistic Protocol



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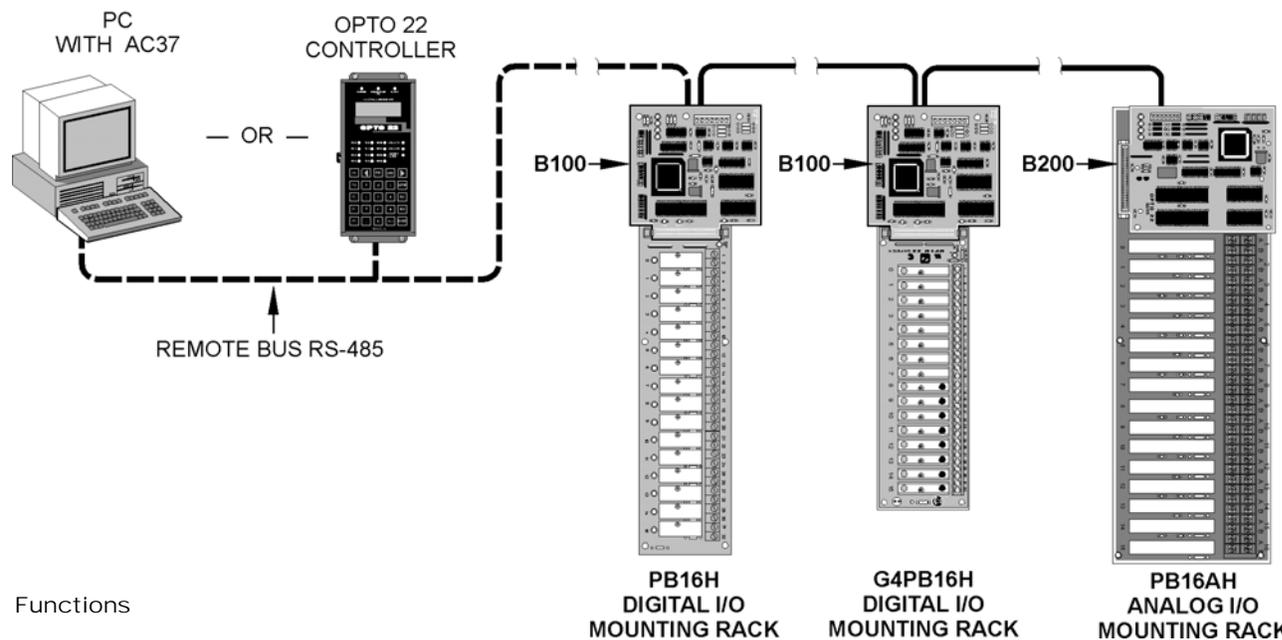
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Description (Continued)

B100/B200 System Architecture



Functions

Analog
PID Loop Control
High/Low Limit Monitoring
Thermocouple Linearization
Digital Filtering
Ramping/Waveform Generation
Programmable Offset and Gain
Engineering Unit Scaling
Square Root Extraction

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Specifications **[OBSOLETE]**

MISTIC Command Set - Analog Functions

Analog Setup/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
SET CHANNEL CONFIGURATION
SET ENGINEERING UNIT SCALING PARAMETERS
SET I/O CONFIGURATION - GROUP
SET TOTALIZATION SAMPLE WEIGHT
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

Analog Event/Reaction Commands

CLEAR EVENT/REACTION TABLE
CLEAR EVENT TABLE ENTRY
CLEAR INTERRUPT
ENABLE/DISABLE EVENT ENTRY - GROUP
ENABLE/DISABLE EVENT TABLE ENTRY
READ AND CLEAR EVENT LATCHES
READ EVENT DATA HOLDING BUFFER
READ EVENT ENTRY ENABLE/DISABLE STATUS
READ EVENT LATCHES
READ AND OPTIONALLY CLEAR EVENT LATCH
READ EVENT TABLE ENTRY
SET EVENT INTERRUPT STATUS
SET EVENT ON COMM LINK WATCHDOG TIME-OUT
SET EVENT ON I/O \geq SETPOINT
SET EVENT ON I/O \leq SETPOINT
SET EVENT REACTION COMMAND

Analog PID Loop Commands

INITIALIZE PID LOOP
READ ALL PID LOOP PARAMETERS
READ PID LOOP PARAMETER
SET PID LOOP CONTROL OPTIONS
SET PID LOOP DERIVATIVE RATE
SET PID LOOP GAIN
SET PID LOOP INTEGRAL RESET RATE
SET PID LOOP MIN-MAX OUTPUT LIMITS
SET PID LOOP MIN-MAX SETPOINT LIMITS
SET PID LOOP PROCESS VARIABLE
SET PID LOOP SETPOINT

1. For detailed information about Mistic Command Set, refer to Mistic Protocol User's Guide (Form #270) or Misticware™ User's Guide (Form #522).
2. For detailed information about Optomux Command Set, refer to Optomux Protocol Guide (Form #1572).

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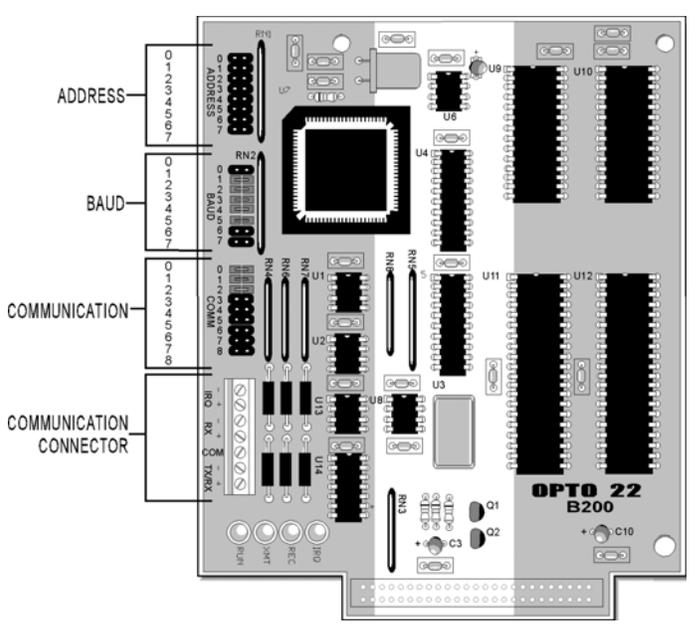
Specifications **[OBSOLETE]**

General

Operating Specifications

Power Requirements	5.0 VDC \pm 0.1 VDC @ 600 mA max. (supplied through header connector pins 1 and 49).
Operating Temperature	0° to 70°C, 95% humidity, non-condensing
CPU	16-bit Intel 80C196 I/O processor
Communications Interface	RS-485 twisted pair with shield, 2-wire or 4-wire (if using interrupts)
Data Rates	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, and 115200 baud
Range: Multidrop	Unlimited. (Up to 3,000 feet or 32 stations maximum between repeaters)
PID Update Rate	100 ms (for 1 to 8 PID loops)
LED Indicators	RUN (Power On), RCV (Receive), XMT (Transmit), and (IRQ) Interrupt
Options: Jumper Selectable	Address, communication, baud rate, CRC/Checksum, Binary/ASCII

Connectors and Jumpers



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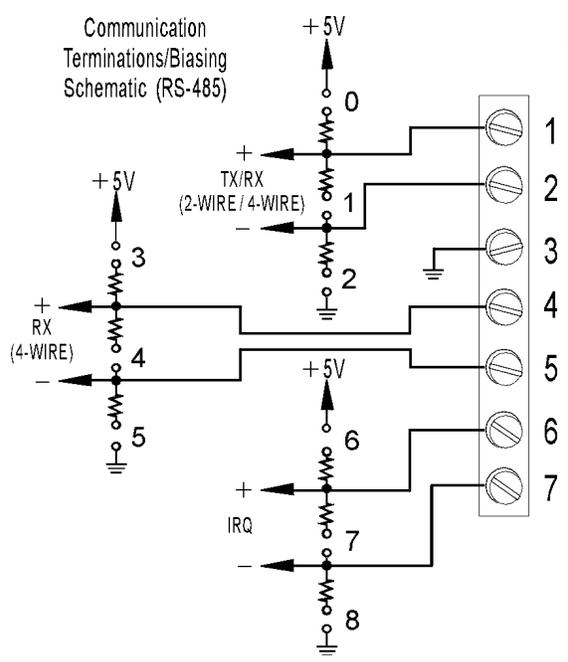
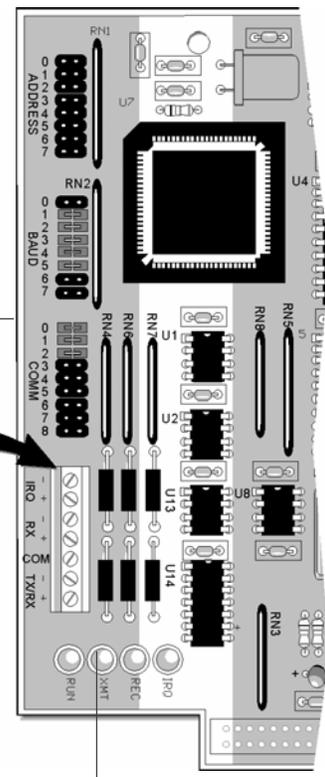
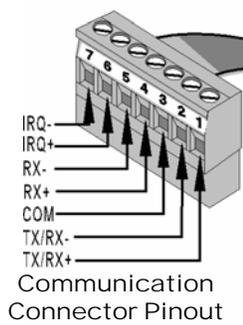
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Specifications **[OBSOLETE]** LED Descriptions Communication Jumpers/Wiring

Communication Jumper Descriptions

Jumper	Description
0	Pull-up for TX/RX+
1	Terminator for TX/RX lines
2	Pull-down for TX/RX-
3	Pull-up for RX+
4	Terminator for RX lines
5	Pull-down for RX-
6	Pull-up for IRQ+
7	Terminator for IRQ lines
8	Pull-down for IRQ-



LED Description Table

LED	Description
IRQ	Processor interrupt request currently active.
RCV	Processor is currently receiving data on communication line.
XMT	Processor is currently transmitting data on communication line.
RUN	Power on Processor

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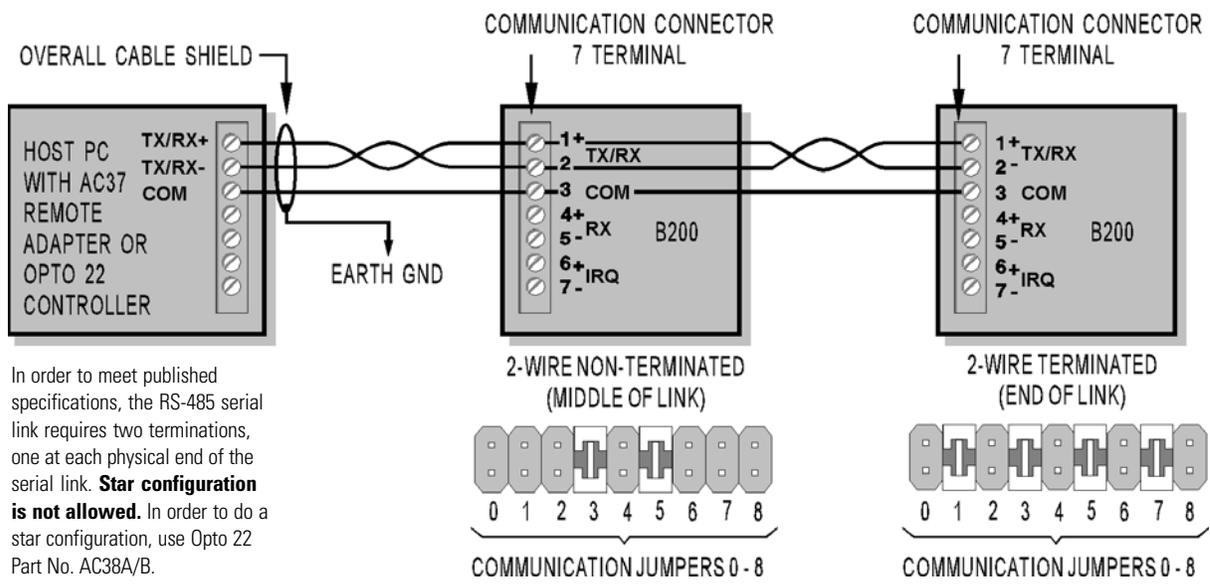
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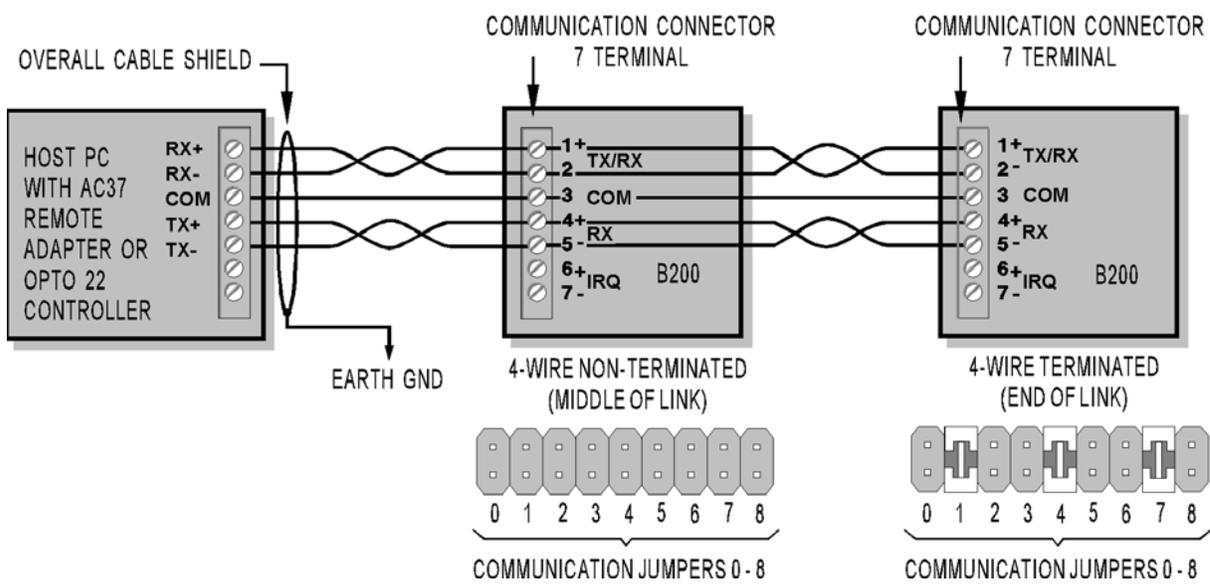
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Specifications **[OBSOLETE]** Communication Jumpers/Wiring (Continued)

Standard 2-Wire Configuration



Alternate 4-Wire Configuration



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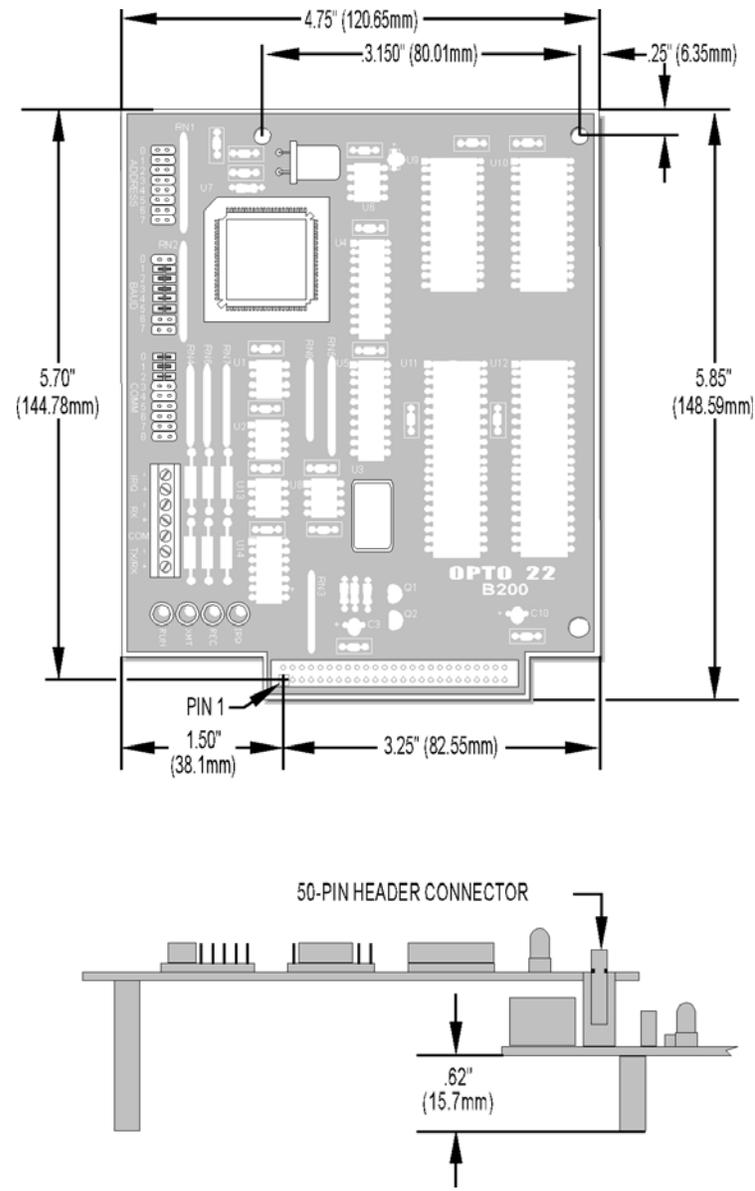
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Dimensional Drawing



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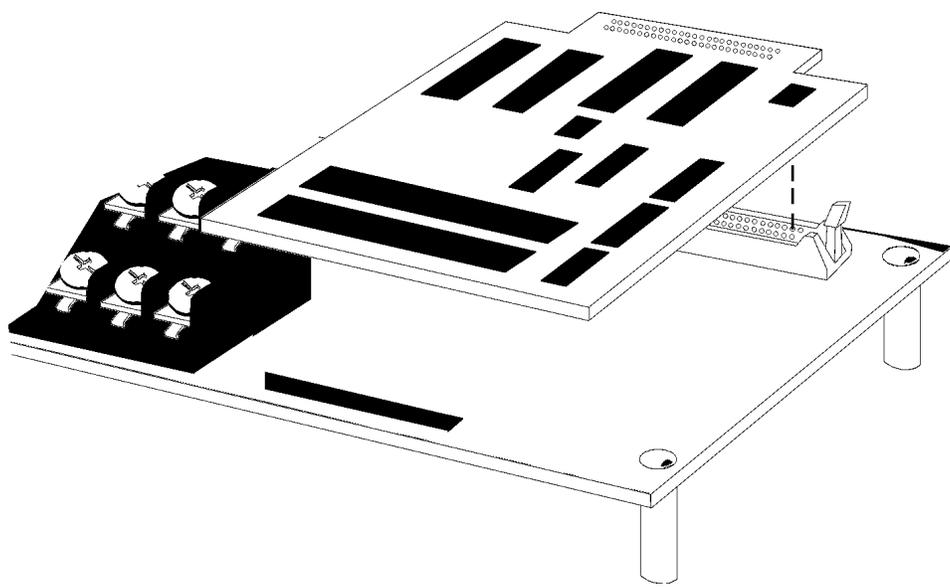
Assembly **[OBSOLETE]**

Mounting the B200

Installing a B200 onto a Mounting Rack

1. Align the brain board's header connector with the mounting rack's header connector.
2. Firmly press the header connectors together until the locking tabs clamp down on the brain board as shown in the diagram below.

Installing a B200 onto a Mounting Rack



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.

