OPTO 22

DATA SHEET

| Part Number	Description
SNAP-B4	High-speed Digital Brain, Pamux Protocol

Description

The SNAP-B4 is a high-performance digital brain used to connect and control up to 32 channels of digital I/O using Opto 22's SNAP "B Series" I/O mounting racks and the Pamux bus. The SNAP-B4, combined with Opto 22's AC28 interface card and a host PC, provides the world's fastest digital I/O.

The SNAP-B4 communicates over a 50-pin flat ribbon cable (Pamux bus) and can be located up to 500 feet away from the host processor. The Pamux bus has 64 possible addresses. Each group of eight I/O points occupy one address, therefore the Pamux bus can control up to 512 digital and analog I/O points. Each SNAP-B4 brain controls 32 digital I/O points and occupies four consecutive addresses on the Pamux bus.

For additional technical information about Pamux, please refer to Opto 22 form number 726.
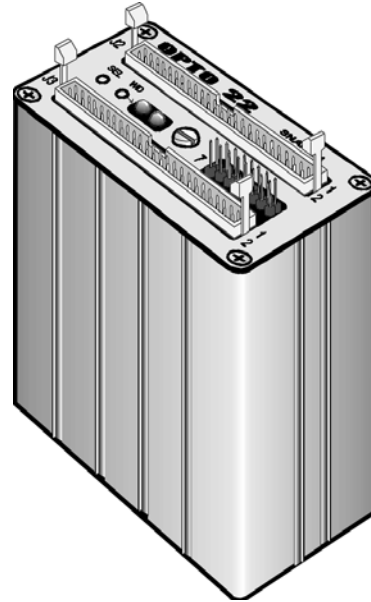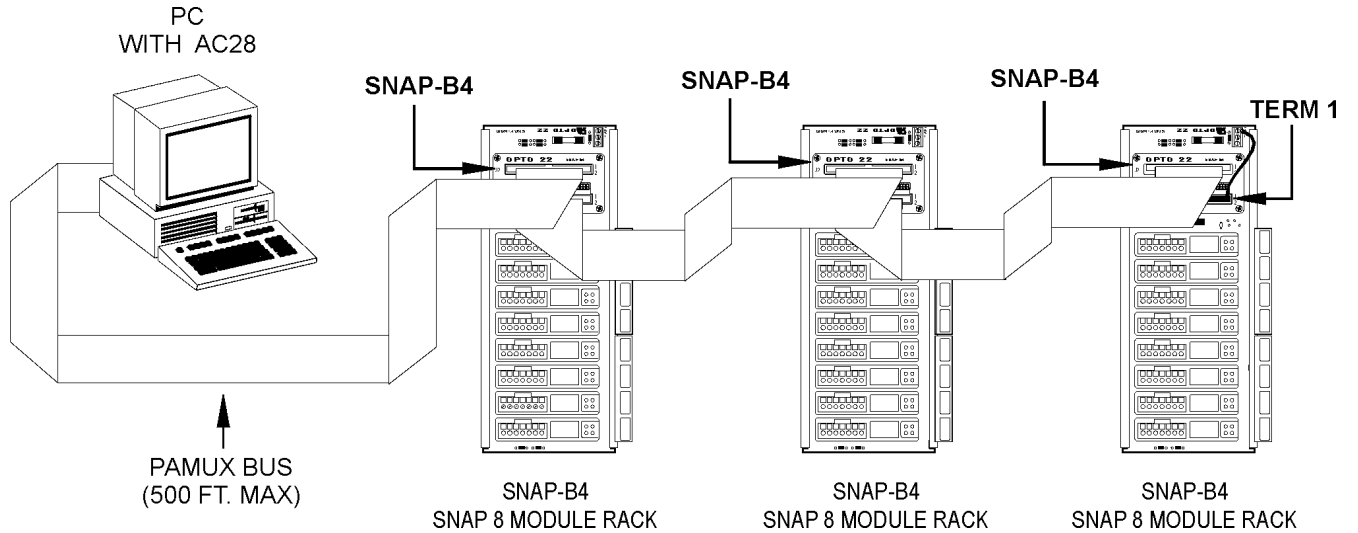
SNAP-B4 Digital Brain

Features

- PAMUX Bus
- Configurable Watchdog Timer
- Digital Only
- Very High Speed
    - 500 I/O Points
    - 500 Microseconds
- Cable Lengths up to 500 Feet

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SNAP
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System Architecture

PC
WITH AC28

SNAP-B4   SNAP-B4   SNAP-B4

TERM 1

PAMUX BUS
(500 FT. MAX)

SNAP-B4
SNAP 8 MODULE RACK

SNAP-B4
SNAP 8 MODULE RACK

SNAP-B4
SNAP 8 MODULE RACK

Specifications
General

Power Requirements	5.0 VDC ± 0.1 VDC @ 1.0A max. (If Term1 installed add 0.5A)
Operating Temperature	0° C to 70° C, 95% humidity, non-condensing
Communications Interface	Pamux Bus; two 50-pin connectors
Range: (Multidrop mode)	Up to 500 feet
LED Indicators	SEL (address selected), WD (watchdog timeout)
Jumpers	0 - 3 Address 4 - 5 Watchdog Timer Function 6 Reset Level 7 Effect of Reset on Channel 0 Watchdog

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Specifications

B4 Jumpering

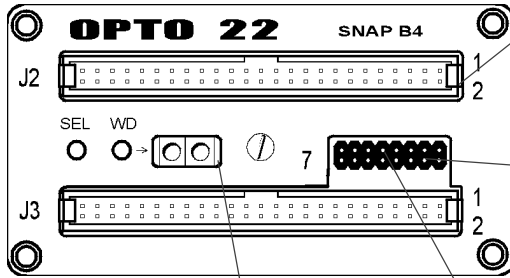Please refer to the tables on this page for SNAP-B4 jumper functions.

Notes:
1. The B4 can only be jumpered for addresses that are either zero or a multiple of four.
2. The B4's watchdog timeout value is a function of hardware and is not user-configurable. An on-board RC circuit sets the watchdog between 1.0 and 2.25 seconds.

Address Jumpers

	3 2 1 0		3 2 1 0
0	☐☐☐☐	32	■☐☐☐
4	☐☐☐■	36	■☐☐■
8	☐☐■☐	40	■☐■☐
12	☐☐■■	44	■☐■■
16	☐■☐☐	48	■■☐☐
20	☐■☐■	52	■■☐■
24	☐■■☐	56	■■■☐
28	☐■■■	60	■■■■

■ = JUMPER INSTALLED

☐ = NO JUMPER

OPTO 22 SNAP B4

J2

SEL WD

7

J3

Watchdog Timer Jumpers

Jumper 4	Jumper 5	Watchdog	Action
In	In	Active	No Action
Out	In	Active	Activate Channel 0
In	Out	Active	Deactivate all Channels
Out	Out	Active	Activate 0, all others Deactivate

Jumper 6	Jumper 7	Action
Out	X	Logic Low Reset
In	X	Logic High Reset

LED Descriptions

LED	Description
WD	Watchdog timer has expired
ADR	Address lines on Pamux bus match jumper address

Jumper 7	Action
Out	Reset has no effect on Channel 0 watchdog operation
Installed	Reset Active before Watchdog Timeout: All outputs off until Reset off, then normal watchdog function
Installed	Watchdog Timeout then Reset Active: Normal Watchdog function; subsequent Reset has no effect

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Specifications

B4 I/O Mapping

I/O on the SNAP-B4 is divided into four addresses of digital I/O, each with eight channels as follows:

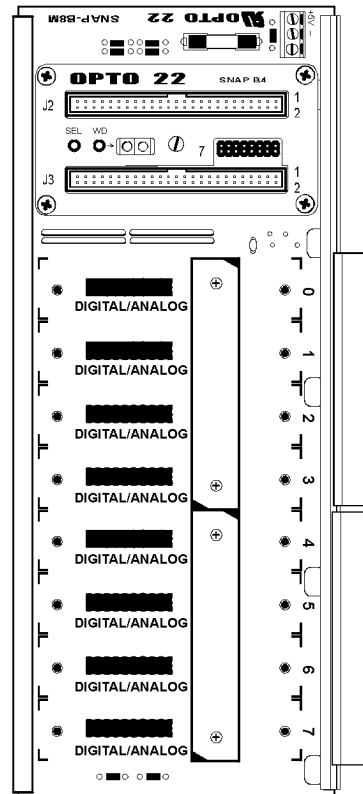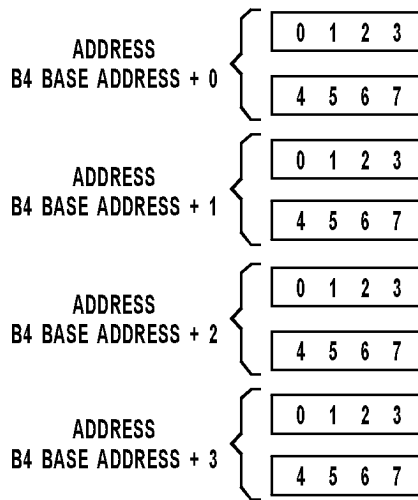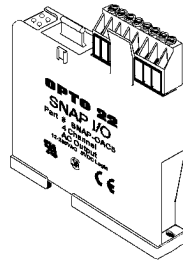**First two module positions (0-1):** The 8 digital channels of B4 Base Address + 0.
Second two module positions (2-3): The 8 digital channels of B4 Base Address + 1.
Third two module positions (4-5): The 8 digital channels of B4 Base Address + 2.
Fourth two module positions (6-7): The 8 digital channels of B4 Base Address + 3.

If a SNAP-B4 brain is configured at address 12, the digital addresses used by that SNAP-B4 would be 12, 13,14, and 15.

Note:
Base address set by jumpers on brain board

ADDRESS
B4 BASE ADDRESS + 0

| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |

ADDRESS
B4 BASE ADDRESS + 1

| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |

ADDRESS
B4 BASE ADDRESS + 2

| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |

ADDRESS
B4 BASE ADDRESS + 3

| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |

SNAP I/O Rack

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Dimensional Drawing

B4 Brain

TERM 1
CABLE

.062" (1.57mm)
3.00" (76.2mm)
.109" (2.77mm)
3.30" (83.82mm)
3.52" (89.41mm)

4.90" (124.46mm)
1.75" (44.35mm)
1.82" (46.18mm)

TOP WIRE ENTRY
NOTE: CONSIDER NECESSARY DIMENSIONS

PLUGGABLE
FIELD
CONNECTOR

TERM 1

SNAP-B4

SNAP I/O
MODULE

SNAP
I/O RACK
BOARD

MODULE WITH RACK
MODULE
3.55*** (90.17mm)
4.310**** (109.47mm)
RACK
.75*** (19.05mm)

SNAP-B4
3.17" (80.54mm)

SNAP-B4 WITH TERM & RACK
5.65**** (143.51mm)

FOR DIN CLIP ADD ADDITIONAL
.06" TO OVERALL HEIGHT

SNAP RACK DIN RAIL ADAPTER

CUSTOMER SUPPLIED
35mm DIN RAIL
NOTE: BE SURE TO CONSIDER
DIN RAIL DIMENSIONS.
(DIN RAIL MUST BE MOUNTED
HORIZONTALLY TO USE SNAP I/O
WITHOUT MODULE HOLD-DOWN SCREWS)

SNAP RACK
BASE EXTRUSION

TOLERANCE LEGEND
* +/– .010"
** +/– .020"
*** +/– .030"
**** +/– .060"
NO * REFERENCE ONLY

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Assembly
Brain and Mounting Rack

To install SNAP-B4 onto B Series rack:

1. Turn off power to rack assembly.
2. If a plastic brain insulator is present on your mounting rack, remove as shown below
3. Align the brain connector with mating connector on rack.
4. Seat brain onto connector.
5. Use integral hold-down screw to secure in position. Do not overtighten.
6. If Term 1 is used install as shown. Note: Term 1 is only for the last physical connection to Pamux bus.

TERM 1
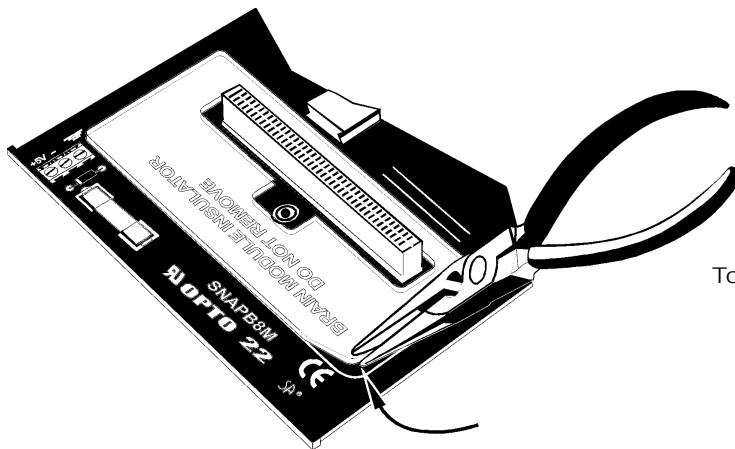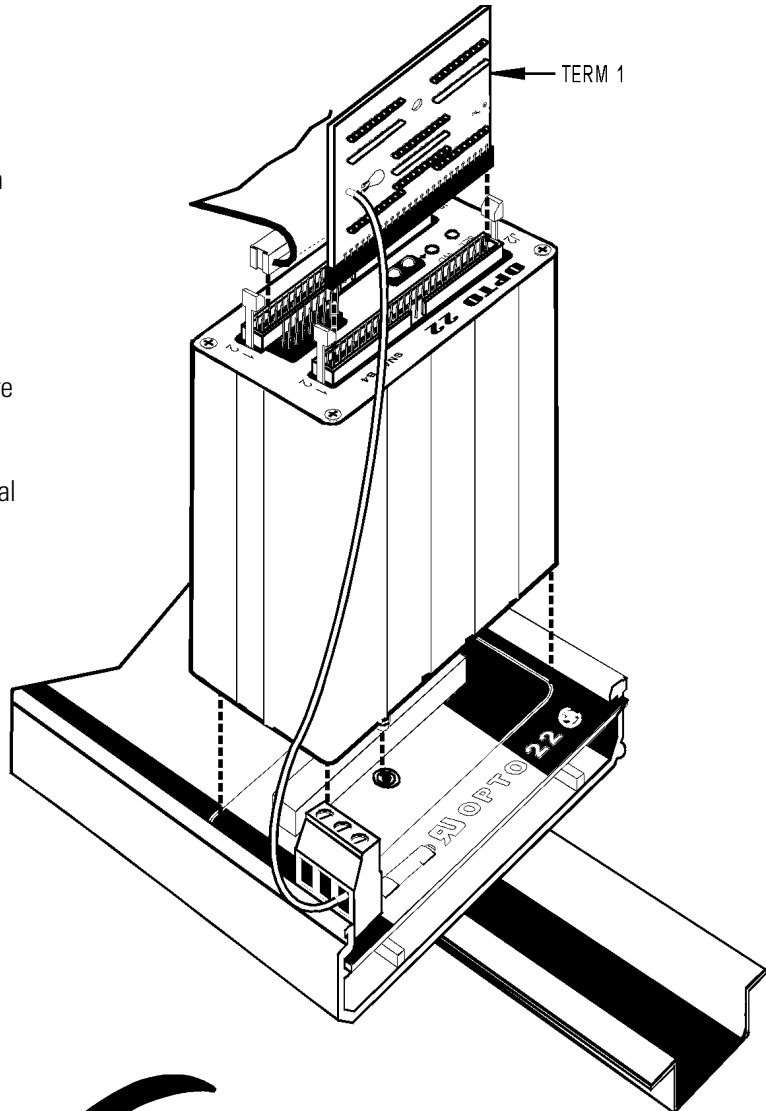
To remove SNAP-B4 from B Series rack:

1. Turn off power to rack assembly.
2. Loosen integral hold-down screw on SNAP-B4 processor.
3. Pull up on processor.

More about Opto 22

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 even write an IEC 61131-3 compliant control program to run on groov RIO, using CODESYS. 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

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