

## STANDARD VOLTAGE INPUT MODULE

### Features

- >Single channel of optically-isolated voltage-to-digital conversion
- >"T" modules also include 4,000 Vrms channel-to-channel isolation, which eliminates any ground loop problems.
- >Modules plug into a Standard analog I/O rack and are secured by a captive screw.

### DESCRIPTION

Voltage input analog modules provide a single channel of optically-isolated voltage-to-digital conversion.

These modules offer wide nominal input and special over/under range capabilities.

Modules with a "T" in the part number also include 4,000 Vrms channel-to-channel isolation, which eliminates any ground loop problems.

Modules plug into a Standard analog I/O rack and are secured by a captive screw.



### Part Numbers

Part	Description
AD6	0 TO +5 VDC Input
AD6T	0 TO +5 VDC Input Isolated
AD6HS	0 TO +5 VDC Input-High Speed
AD7	0 TO +10 VDC Input
AD9T	0 TO 50 mV Input Isolated
AD11	-5 TO +5 VDC Input
AD12	-10 TO +10 VDC Input
AD12T	+10 TO -10 mV Input Isolated
AD13T	0 TO 100 mV Input Isolated

## SPECIFICATIONS

	AD6 AD6HS	AD6T	AD7	AD9T
Nominal Voltage Input	0 to 5 VDC	0 to 5 VDC	0 to 10 VDC	0 to 50 mVDC
Over/Under Range Capability	-0.125 to 11 VDC	-0.125 to 11 VDC	-0.250 to 11 VDC	-0.125 to 110 mVDC
Accuracy*	± 5 mV	± 5 mV	± 10 mV	± 100 µV
Power Requirements	16 mA at +15 (+/- 0.25) VDC 11 mA at -15 (+/- 0.25) VDC	35 mA at +15 (+/- 0.25) VDC 35 mA at -15 (+/- 0.25) VDC	16 mA at +15 (+/- 0.25) VDC 11 mA at -15 (+/- 0.25) VDC	35 mA at +15 (+/- 0.25) VDC 35 mA at -15 (+/- 0.25) VDC

\*May be improved by the use of the "Set Offset" or "Set Gain" commands in the OPTOMUX command set.

	AD11	AD12	AD12T	AD13T
Nominal Voltage Input	-5 to + 5 VDC	-10 to 10 VDC	-10 to 10 VDC	0 to 100 mV DC
Over/Under Range Capability	-5.25 to 11 VDC	-10.5 to 11 VDC	-10.5 to 11 VDC	-0.250 to 220 mV DC
Accuracy*	± 10 mV	± 20 mV	± 20 mV	± 100 µV
Power Requirements	15 mA at +15 (+/- 0.25) VDC 12 mA at -15 (+/- 0.25) VDC	15 mA at +15 (+/- 0.25) VDC 12 mA at -15 (+/- 0.25) VDC	35 mA at +15 (+/- 0.25) VDC 35 mA at -15 (+/- 0.25) VDC	35 mA at +15 (+/- 0.25) VDC 35 mA at -15 (+/- 0.25) VDC
Agency Approvals	CE; RoHS; UKCA	CE; RoHS; UKCA	CE; RoHS; UKCA	CE; RoHS; UKCA

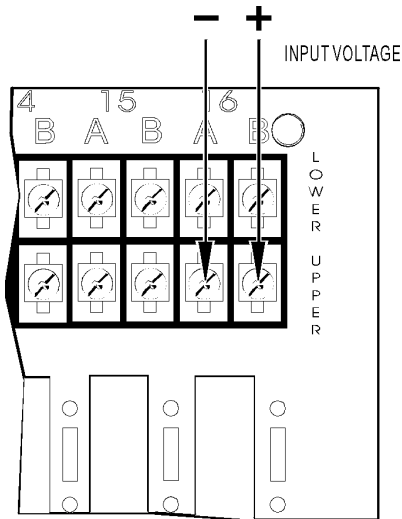
\*May be improved by the use of the "Set Offset" or "Set Gain" commands in the OPTOMUX command set.

Input Response Time*	5% of scale change in 8.5 ms 63% of scale change in 165 ms
Resolution	12-bits
Isolation	
Input-to-Output	4,000 V <sub>RMS</sub>
Input-to-Analog Supply ("T" Modules)	4,000 V <sub>RMS</sub>
Temperature	
Operating	0 to 70 °C
Storage	-25 to 85 °C

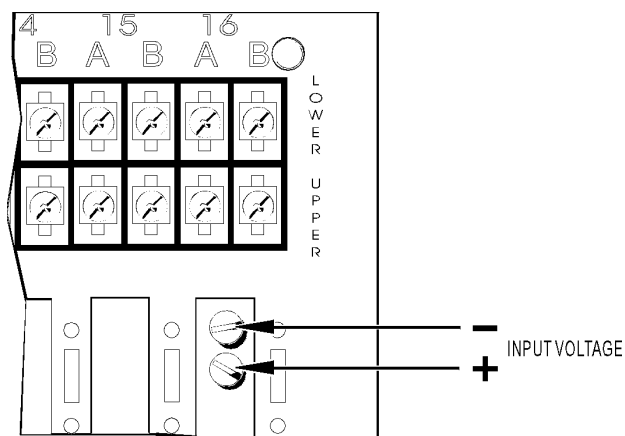
\*AD6HS input response 100% step change in less than 3 milliseconds.

## CONNECTIONS

### Wiring for AD6, AD6T, AD6HS, AD7, AD11, AD12, and AD12T



### Wiring for AD9T and AD13T



## PRODUCTS

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

### groov EPIC® System

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

#### groov EPIC I/O

*groov I/O* connects locally to sensors and equipment with up to 24 channels on each I/O module. 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 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.

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 or on a monitor connected via the HDMI or USB ports.

#### groov EPIC Software

Software included in the *groov EPIC* processor:

- PAC Control engine to run PAC Control and PAC Display
- CODESYS Runtime engine to run IEC61131-3 compliant programs built with CODESYS Development System
- Optional access to the Linux operating system through a secure shell (SSH) to download and run custom applications
- *groov View* for building your own device-independent HMI, viewable on the touchscreen, PCs, and mobile devices
- Node-RED for creating simple logic flows from pre-built nodes
- Ignition Edge® from Inductive Automation®, with OPC-UA drivers to Allen-Bradley®, Siemens®, and other control systems, and MQTT communications with Sparkplug for efficient IIoT data transfer

### groov RIO®

*groov RIO* revolutionizes remote I/O by offering a single, compact, PoE-powered industrial package with web-based configuration, commissioning, and flow logic software built in, plus support for multiple OT and IT protocols.

Standing alone, it meets the needs of small, variable I/O count applications, especially those that require data logging or data communications, commonly found in IIoT applications. *groov RIO* can also be used with a Modbus/TCP master or as remote I/O for a *groov EPIC* system.

### Older products

From solid state relays (our first products) to world-famous G4 and SNAP I/O, to SNAP PAC controllers, older Opto 22 products are still supported and still doing the job at thousands of installations worldwide. You can count on us to give you 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, comprehensive 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, troubleshooting tips, and [OptoForums](#). In addition, instructor-led, hands-on [Premium Factory Training](#) is available at our Temecula, California headquarters, and you can [register online](#).

## 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](http://www.opto22.com).