

## G4 ANALOG THERMOCOUPLE INPUT MODULES

### Features

- > Rugged packaging
- > 4000 Vrms Transient Isolation
- > True Differential (Floating) Inputs
- > • 12-bit Resolution
- > Factory-calibrated, no user adjustment necessary
- > Operating temperature 0° to 70° C



**G4AD8**

### DESCRIPTION

Thermocouple analog modules provide a single channel of transformer and optically- isolated temperature-to-digital conversion. The modules offer wide nominal input range and special over/under range capabilities. The modules also include complete electrical channel-to-channel isolation that eliminates troublesome ground loop problems. Modules plug into an Opto 22 Modular controller or an analog I/O brick and are secured by a captive screw. The field connections are made through four contacts to the terminal strip located on the brick base or Modular Controller I/O board.

*NOTE:* Any system using analog sensors and input modules should be calibrated annually for analog signals. To do so, use OptoControl commands "Calculate and Set Analog Offset" and "Calculate and Set Analog Gain."

### Part Numbers

Part	Description
G4AD5 [OBSOLETE]	[OBSOLETE] G4 Type J Thermocouple Analog Input
G4AD8	G4 Type K Thermocouple Analog Input
G4AD17 [OBSOLETE]	[OBSOLETE] G4 Type R Thermocouple Analog Input
G4AD18 [OBSOLETE]	[OBSOLETE] G4 Type T Thermocouple Analog Input
G4AD19 [OBSOLETE]	[OBSOLETE] G4 Type E Thermocouple Analog Input
G4AD23 [OBSOLETE]	[OBSOLETE] G4 Type S Thermocouple Analog Input
G4AD24 [OBSOLETE]	[OBSOLETE] G4 Type B Thermocouple Analog Input

## GENERAL SPECIFICATIONS

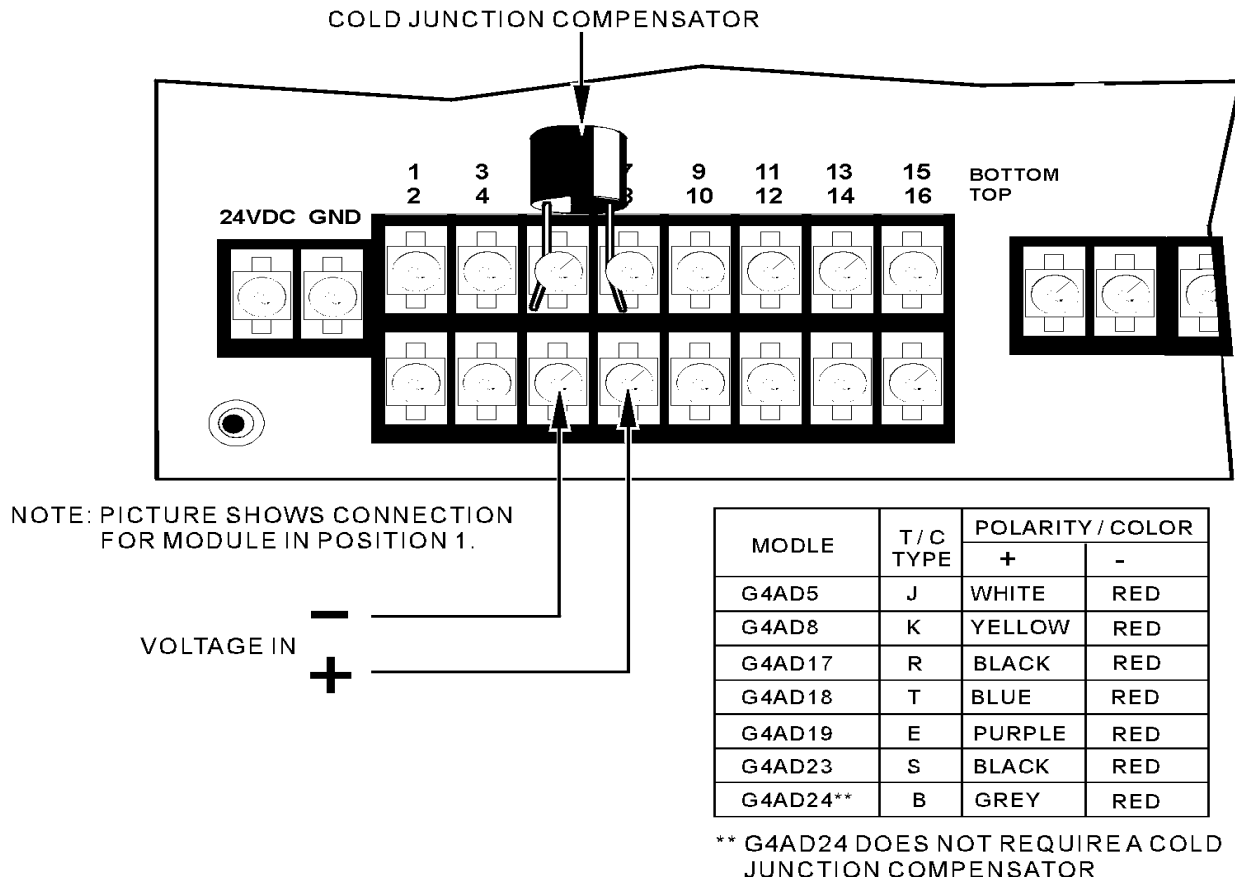
Isolation (Transient) Input-to-Output Input-to-analog Supply	4,000 Vrms 4,000 Vrms
Cold Junction Compensated	Yes
Open Thermocouple Detection	Yes
Input Response Time	-5% of scale change in 8.5 ms 63% of scale change in 165 ms
Ambient Temperature Operating Storage	0° to 70°C -25° to 85°C
Resolution	12 bits

## MODULE SPECIFICATIONS

	G4AD5 [OBSOLETE]	G4AD8	G4AD17 [OBSOLETE]	G4AD18 [OBSOLETE]	G4AD19 [OBSOLETE]	G4AD23 [OBSOLETE]	G4AD24 [OBSOLETE]
Thermocouple Type	J	K	R	T	E	S	B
Nominal Temperature Range °C	0° to 485°	-100° to 460°	0° to 960°	-200° to 224°	-100° to 435°	0° to 1,034°	42° to 1,491.85°
Nominal Temperature Range °F	32° to 905°	-148° to 860	32° to 1,760°	-328° to 435.2°	-148° to 815°	32° to 1,893.2°	107.888° to 2,717.33°
Accuracy*	± 1° C	± 1° C	± 2.5° C	± 0.9° C	± 0.9° C	± 2.5° C	± 5° C
Over/Under Range Capability °C	-32° to 1,200°	-150° to 1,372°	-50° to 1,768°	-270° to 400°	-155° to 1,000°	-50° to 1,768°	42° to 1,820°
Over/Under Range Capability °F	25° to 2,192°	-238° to 2,501°	-58° to 3,214°	454° to 752°	-247° to 1,832°	58° to 3,214°	107.9° to 3,308°
Over/Under Range Accuracy	± 2° C	± 2° C	± 5° C	± 1.8° C	± 1.8° C	± 2.5° C	± 5° C
Agency Approvals	UL, CE; UKCA	UL, RoHS, CE; UKCA	UL, CE; UKCA	UL, CE; UKCA	UL, CE; UKCA	UL, CE; UKCA	UL, CE; UKCA

\* Accuracy figure requires use of gain and offset commands.

## CONNECTIONS



## 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

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).

