OPTO 22

DATA SHEET

Form 439-040728

Description

The thermocouple analog modules provide a single channel of optically isolated temperature-to-digital conversion. The modules offer wide nominal input and special over/under range capabilities. The 'T' module also includes 4000 Vrms transient channel-to-channel isolation which eliminates any ground loop problems. Modules plug into a Classic standard analog I/O rack and are secured by a captive screw.

Part Number	Description
AD5	J Thermocouple Input
AD5T	J Thermocouple Input, Isolated
AD8	K Thermocouple Input
AD8T	K Thermocouple Input, Isolated
AD17T	R or S Thermocouple Input, Isolated
AD18T	T Thermocouple Input , Isolated
AD19T	E Thermocouple Input, Isolated

Features

- Rugged Packaging
- 4000 Vrms Transient Isolation
- 12-bit Resolution
- Factory Calibrated, No User Adjustments
- Operating Temperature: 0° to 70° C
- "T" Models Offer Channel-to-Channel Isolation

* For 'T' models only.
** Accuracy figure requires use of gain and offset commands.

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Specifications

Module Specifications

	AD5	AD5T	AD8	AD8T
Thermocouple Type	J	J	K	K
Nominal Temperature Range ° C	0° to 700°	0° to 700°	-100° to 924°	-100° to 924°
Nominal Temperature Range ° F	32° to 1292°	32° to 1292°	-148° to 1695°	-148° to 1695°
Over/Under Range Capability ° C	-20° to 1200°	-20° to 1200°	-125° to 1250°	-125° to 1250°
Over/Under Range Capability ° F	- 4° to 2192°	- 4° to 2192°	-193° to 2282°	-193° to 2282°
Average Resolution	0.18° C (0 to 700° C) 0.36° C (700 to 1200° C)	0.18° C (0 to 700° C) 0.36° C (700 to 1200° C)	± 0.25° C (-100 to 924° C) ± 0.5° C (924 to 1250° C)	± 0.25° C (-100 to 924° C) ± 0.5° C (924 to 1250° C)
Accuracy*	± 3° C (0 to 700° C)	± 3° C (0 to 700° C)	± 3° C (-100 to 924° C)	± 3° C (-100 to 924° C)
Repeatability	± 1° C	± 1° C	± 1° C	± 1° C
Power Requirements	17 mA at +15 VDC 12 mA at -15 VDC	35 mA at +15 VDC 35 mA at -15 VDC	17 mA at +15 VDC 12 mA at -15 VDC	35 mA at +15 VDC 35 mA at -15 VDC

*Accuracy may be improved by the use of "Set Offset" and "Set Gain" commands in the OPTOMUX command set.

	AD17T	AD17T	AD18T	AD19T
Thermocouple Type	R	S	T	E
Nominal Temperature Range ° C	0° to 960°	0° to 1034°	-200° to 224°	-100° to 435°
Nominal Temperature Range ° F	32° to 1760°	32° to 1893°	-328° to 435°	-148° to 815°
Over/Under Range Capability ° C	-50° to 1768°	-50° to 1768°	-200° to 400°	-100° to 900°
Over/Under Range Capability ° F	-58° to 3214°	-58° to 3214°	-328° to 752°	-148° to 1652°
Average Resolution	0.23° C (200 to 960° C) 0.35° C (960 to 1768° C)	0.25° C (200 to 1034° C) 0.48° C (1034 to 1768° C)	0.1° C (-200 to 244° C) 0.14° C (244 to 400° C)	0.13° C (-100 to 435° C) 0.23° C (435 to 900° C)
Accuracy*	± 5° C (200 to 960° C) ± 3.5° C (960 to 1768° C)	± 5.2° C (200 to 1034° C) ± 4.2° C (1034 to 1768° C)	± 3° C (-100 to 224° C) ± 2° C (224 to 400° C)	± 3° C
Repeatability	± 2.5° C (200 to 960° C) ± 1.8° C (960 to 1768° C)	± 2.6° C (200 to 1034° C) ± 2.1° C (1034 to 1768° C)	± 1.0° C (-100 to 0° C) ± 0.6° C (0 to 224° C) ± 0.4° C (224 to 400° C)	± 0.8° C (-100 to 0° C) ± 0.6° C (0 to 435° C) ± 0.5° C (435 to 900° C)
Power Requirements	30 mA at +15 VDC 30 mA at -15 VDC	30 mA at +15 VDC 30 mA at -15 VDC	30 mA at +15 VDC 30 mA at -15 VDC	30 mA at +15 VDC 30 mA at -15 VDC

*Accuracy may be improved by the use of "Set Offset" and "Set Gain" commands in the OPTOMUX command set.

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General Specifications

Isolation: Input-to-Output Input-to-Analog Supply*	4000 Vrms (Transient) 4000 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:	0° to 70°C - 25° to 85°C
Resolution:	12 bits

Connection Diagram
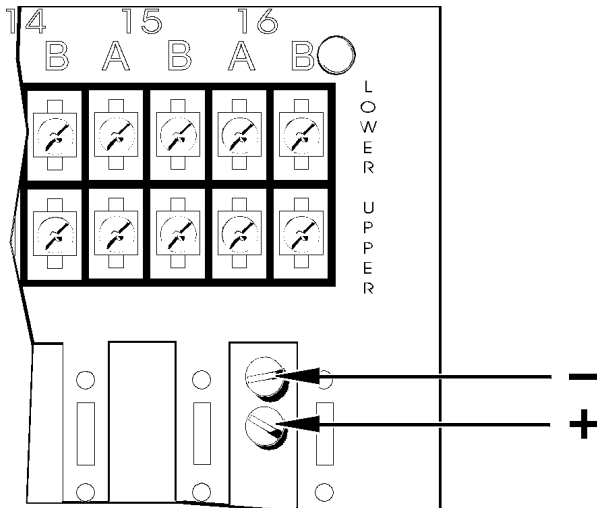
Model	T/C Type	Polarity/Color	
		+	-
AD5/AD5T	J	WHITE	RED
AD8/AD8T	K	YELLOW	RED
AD17T	R	BLACK	RED
AD18T	T	BLUE	RED
AD19T	E	PURPLE	RED
AD17T	S	BLACK	RED

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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 (HMI)
- 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.