Allen-Bradley

MicroLogix 1200 Thermocouple/mV Input Module

Catalog Number 1762-IT4

Table of Contents

Module Overview

The thermocouple/mV modules receive and store digitally converted thermocouple and/or millivolt (mV) analog data from any combination of up to four thermocouple or millivolt analog sensors. Each input channel is individually configurable via software for a specific input device and provides open-circuit, over-range and under-range detection and indication. The module receives all of its +5V DC and +24V DC power from the 1762 expansion I/O bus. The module features a terminal block with a cold junction compensation (CJC) sensor.

Accepted Inputs	Range
Thermocouple Type J	-210…1200 °C (-346…2192 °F)
Thermocouple Type K	-270…1370 °C (-454…2498 °F)
Thermocouple Type T	-270…400 °C (-454…752 °F)
Thermocouple Type E	-270…1000 °C (-454…1832 °F)
Thermocouple Type R	0…1768 °C (32…3214 °F)
Thermocouple Type S	0…1768 °C (32…3214 °F)
Thermocouple Type B	300…1820 °C (572…3308 °F)
Thermocouple Type N	-210…1300 °C (-346…2372 °F)
Thermocouple Type C	0…2315 °C (32…4199 °F)
Millivolt inputs	-50…50 mV
	-100…100 mV

Description
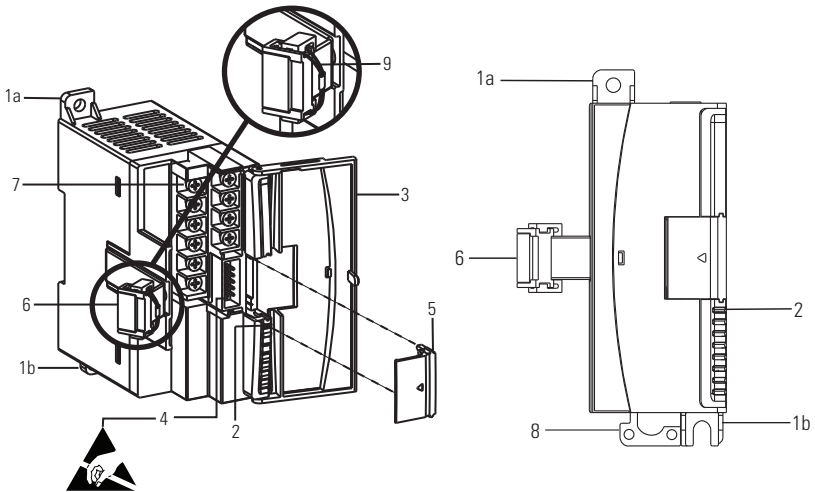
Item	Description	Item	Description
1a	upper panel mounting tab	5	bus connector cover
1b	lower panel mounting tab	6	flat ribbon cable with bus connector (female)
2	power diagnostic LED	7	terminal block
3	module door with terminal identification label	8	DIN rail latch
4	bus connector with male pins	9	pull loop

Module Installation

1762 I/O is suitable for use in an industrial environment when installed in accordance with these instructions. Specifically, this equipment is intended for use in clean, dry environments (Pollution degree 2[1]) and to circuits not exceeding Over Voltage Category II[2] (IEC 60664-1).[3]

Prevent Electrostatic Discharge

ATTENTION

Electrostatic discharge can damage integrated circuits or semiconductors if you touch bus connector pins. Follow these guidelines when you handle the module:

- Touch a grounded object to discharge static potential.
- Wear an approved wrist-strap grounding device.
- Do not touch the bus connector or connector pins.
- Do not touch circuit components inside the module.
- If available, use a static-safe work station.
- When not in use, keep the module in its static-shield box.

Remove Power

ATTENTION

Remove power before removing or installing this module. When you remove or install a module with power applied, an electrical arc may occur. An electrical arc can cause personal injury or property damage by:

- sending an erroneous signal to your system's field devices, causing unintended machine motion;
- causing an explosion in a hazardous environment;
- causing permanent damage to the module's circuitry.

Electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance.

(1) Pollution Degree 2 is an environment where, normally, only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation shall be expected.

(2) Over Voltage Category II is the load level section of the electrical distribution system. At this level transient voltages are controlled and do not exceed the impulse voltage capability of the product's insulation.

(3) Pollution Degree 2 and Over Voltage Category II are International Electrotechnical Commission (IEC) designations.

System Assembly

The expansion I/O module is attached to the controller or another I/O module by means of a ribbon cable after mounting as shown below.
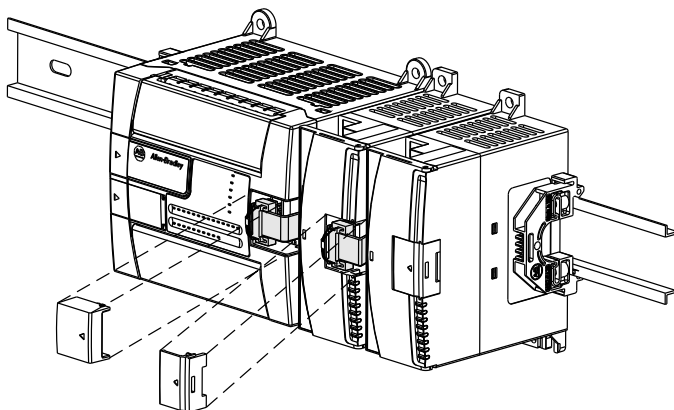
TIP	Use the pull loop on the connector to disconnect modules. Do not pull on the ribbon cable.

| WARNING	EXPLOSION HAZARD
⚠	• In Class I, Division 2 applications, the bus connector must be fully seated and the bus connector cover must be snapped in place.
	• In Class I, Division 2 applications, all modules must be mounted in direct contact with each other as shown on page 7. If DIN rail mounting is used, an end stop must be installed ahead of the controller and after the last 1762 I/O module.

Mounting

ATTENTION	Do not remove protective debris strip until after the module and all other equipment near the module is mounted and wiring is complete. Once wiring is complete and the module is free of debris, carefully remove protective debris strip. Failure to remove strip before operating can cause overheating.

Minimum Spacing

Maintain spacing from enclosure walls, wireways, adjacent equipment, etc. Allow 50.8 mm (2 in.) of space on all sides for adequate ventilation, as shown:
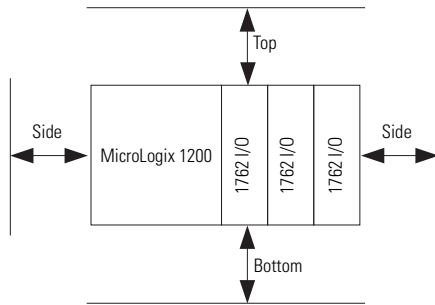
| TIP	1762 expansion I/O may be mounted horizontally only.

ATTENTION	During panel or DIN rail mounting of all devices, be sure that all debris (metal chips, wire strands, etc.) is kept from falling into the module. Debris that falls into the module could cause damage when power is applied to the module.

DIN Rail Mounting

The module can be mounted using the following DIN rails: 35 x 7.5 mm
(EN 50 022 - 35 x 7.5) or 35 x 15 mm (EN 50 022 - 35 x 15).

Before mounting the module on a DIN rail, close the DIN rail latch. Press the DIN rail
mounting area of the module against the DIN rail. The latch will momentarily open and lock
into place.

Use DIN rail end anchors (Allen-Bradley part number 1492-EA35 or 1492-EAH35) for
environments with vibration or shock concerns.
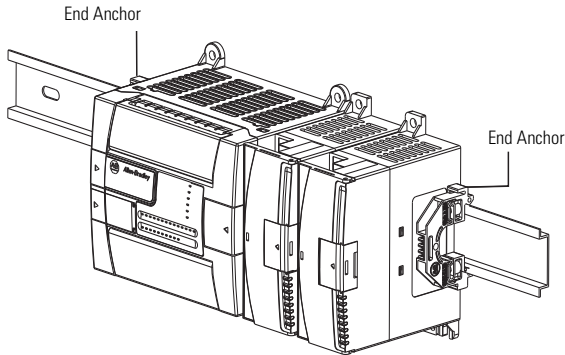
| **TIP** | For environments with extreme vibration and shock concerns, use the panel mounting method described below, instead of DIN rail mounting. |

Panel Mounting

Use the dimensional template shown below to mount the module. The preferred mounting
method is to use two M4 or #8 panhead screws per module. M3.5 or #6 panhead screws may also
be used, but a washer may be needed to ensure a good ground contact. Mounting screws are
required on every module.

For more than 2 modules: (number of modules - 1) x 40.4 mm (1.59 in.)
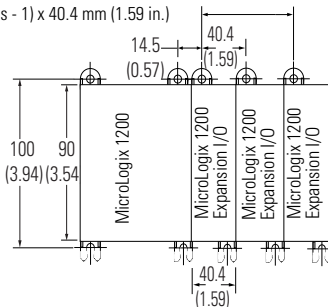
NOTE:
Hole spacing tolerance:
±0.4 mm (0.016 in.).

Field Wiring Connections

Grounding the Module

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel. Additional grounding connections from the module's mounting tabs or DIN rail, are not required unless the mounting surface cannot be grounded. Refer to Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-4.1, for additional information.

System Wiring Guidelines

ATTENTION

! The possibility exists that grounded or exposed thermocouples can become shorted to a potential greater than that of the thermocouple itself. Due to possible shock hazard, care should be taken when wiring these types of thermocouples.

Consider the following when wiring your system:

- Do not tamper with or remove the CJC sensor on the terminal block. Removal of the sensor will reduce accuracy and set the open circuit bit for the CJC sensor.

- For thermocouple inputs, always use shielded, twisted-pair thermocouple extension lead wires specified by the thermocouple manufacturer for the themocouple type you are using. Using an incorrect thermocouple extension wire type or not following correct polarity convention will cause invalid readings.

- Keep cable shield connection to ground as short as possible.

- To limit noise, keep thermocouple and millivolt signal wires as far away as possible from power and load lines as well as other sources of electrical noise, such as motors, transformers, contactors, and AC devices.

- If the field wiring must cross AC or power cables, ensure that they cross at right angles.

- For millivolt inputs, always use Belden™ 8761 (shielded, twisted-pair) or equivalent wire to ensure proper operation and high immunity to electrical noise.

- If multiple power supplies are used with millivolt analog inputs, the power supply commons must be connected.

- Ground the shield drain wire at one end only. The typical location is the same point as the sensor ground reference.

    – For grounded thermocouples or millivolt sensors, this is at the sensor end.
    – For insulated/ungrounded thermocouples, this is at the module end. Contact your sensor manufacturer for additional details.

- If it is necessary to connect the shield drain at the module end, connect it to earth ground using a panel or DIN rail mounting screw.

- Routing the field wiring in a grounded conduit can further reduce electrical noise.

Terminal Block Layout
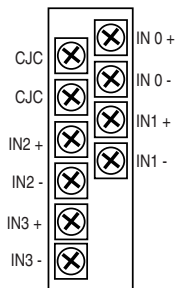
Labeling the Terminals

A write-on label is provided with the module. Mark the identification of each terminal with permanent ink, and slide the label back into the door.
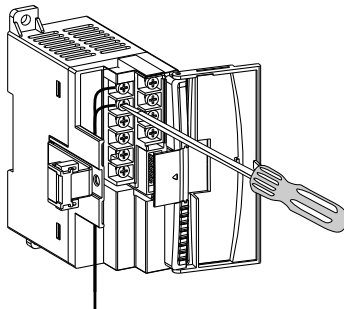
Wiring the Finger-Safe Terminal Block

ATTENTION

⚠️

Be careful when stripping wires. Wire fragments that fall into a module could cause damage when power is applied. Once wiring is complete, ensure the module is free of all metal fragments.

When wiring the terminal block, keep the finger-safe cover in place.

1. Route the wire under the terminal pressure plate. You can use the stripped end of the wire or a spade lug. The terminals will accept a 6.35 mm (0.25 in.) spade lug.

2. Tighten the terminal screw making sure the pressure plate secures the wire. Recommended torque when tightening terminal screws is 0.904 Nm (8 lb-in.).

3. After wiring is complete, remove the debris shield.

TIP

If you need to remove the finger-safe cover, insert a screw driver into one of the square wiring holes and gently pry the cover off. If you wire the terminal block with the finger-safe cover removed, you will not be able to put it back on the terminal block because the wires will be in the way.

Wire Size and Terminal Screw Torque

Each terminal accepts up to two wires with the following restrictions:

| Wire Type		Wire Size	Terminal Screw Torque
Solid	Cu-90 °C (194 °F)	14…22 AWG	0.904 Nm (8 lb-in.)
Stranded	Cu-90 °C (194 °F)	16…22 AWG	0.904 Nm (8 lb-in.)

Wiring Input Devices to the 1762-IT4

ATTENTION

⚠️

Be careful when stripping wires. Wire fragments that fall into a module could cause damage at power up. Once wiring is complete, ensure the module is free of all metal fragments.

After the thermocouple module is properly installed, follow the wiring procedure below, using the shielded thermocouple extension cable recommended for the type of thermocouple you are using, or Belden 8761 for non-thermocouple applications.
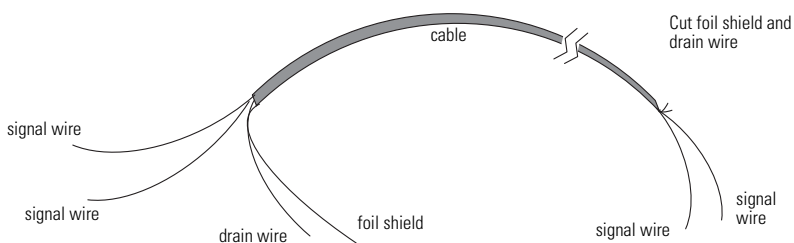
To wire your sensor to the module, follow these steps:

1. At each end of the cable, strip some casing to expose the individual wires.

2. Trim the signal wires to 2-in. lengths. Strip about 3/16 in. (5 mm) of insulation away to expose the end of the wire.

3. At one end of the cable, twist the drain wire and foil shield together, bend them away from the cable, and apply shrink wrap. Then earth ground at the preferred location based on the type of sensor you are using.

4. At the other end of the cable, cut the drain wire and foil shield back to the cable and apply shrink wrap.

5. Connect the signal wires to the module terminal block and input.

6. Repeat steps 1…5 for each channel on the module.

Terminal Block with CJC Sensor and Thermocouple Junctions
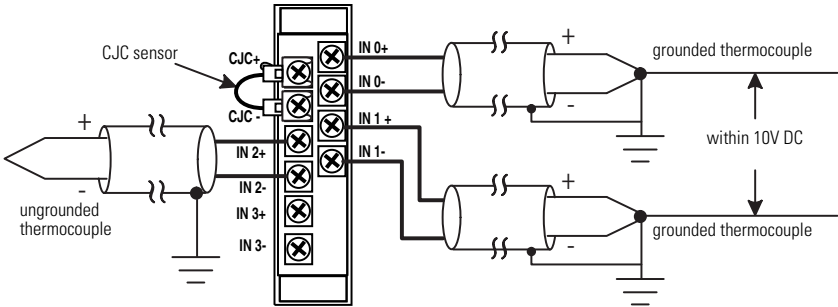
TIP	When using an ungrounded thermocouple, the shield must be connected to ground at the module end.

IMPORTANT	When using grounded and/or exposed thermocouples that are touching electrically conductive material, the ground potential between any two channels cannot exceed ±10V DC, or temperature readings will be inaccurate and the module may be damaged.

Cold Junction Compensation (CJC)

To obtain accurate readings from each of the channels, the temperature at the terminal junction between the thermocouple wire and the input channel must be compensated for. A cold junction compensating thermistor has been integrated in the terminal block, as shown on page 12.

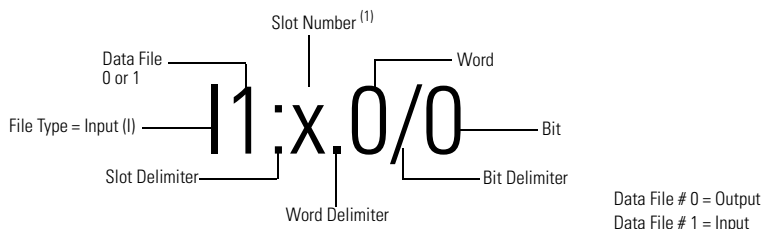|	
ATTENTION	Do not remove or loosen the cold junction compensating thermistor assembly on the terminal block. The thermistor assembly is critical to ensure accurate thermocouple input readings at each channel. If the CJC sensor is removed, the open-circuit detection bit (OC4) and the general status bit (S4) are set. The module will continue to operate, but with reduced accuracy.

I/O Memory Mapping

Addressing

The addressing scheme for 1762 Expansion I/O is shown below.

Slot Number [1]

Data File 0 or 1

Word

File Type = Input (I)

I1:x.0/0

Bit

Slot Delimiter

Bit Delimiter

Word Delimiter

Data File # 0 = Output
Data File # 1 = Input

(1)   I/O located on the controller (embedded I/O) is slot 0. I/O added to the controller (expansion I/O) begins with slot 1.

Input Data File

For each module, slot x, words 0...3 contain the analog values of the inputs. The input data file is shown below.

Word/ Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	SGN	Analog Input Data Channel 0														
1	SGN	Analog Input Data Channel 1														
2	SGN	Analog Input Data Channel 2														
3	SGN	Analog Input Data Channel 3														
4	Reserved			OC4	OC3	OC2	OC1	OC0	Reserved			S4	S3	S2	S1	S0
5	U0	O0	U1	O1	U2	O2	U3	O3	U4	O4	Reserved					

The bits are defined as follows:

- Sx = General status bits for channels 0…3 (S0 …S3) and the CJC sensor (S4). This bit is set (1) when an error (over-range, under-range, open-circuit, or input data not valid) exists for that channel. An input data not valid condition is determined by the user program. Refer to the MicroLogix 1200 I/O Thermocouple/mV Input Module User Manual, publication number 1762-UM002 for additional details.

- OCx = Open-circuit indication for channels 0…3 (OC0…OC3) and the CJC sensor (OC4).

- Ox = Over-range flag bits for channels 0…3 (O0… O3) and the CJC sensor (O4). These bits can be used in the control program for error detection.

- Ux = Under-range flag bits for channels 0…3 (U0…U3) and the CJC sensor (U4). These bits can be used in the control program for error detection.

Configuration Data File

The configuration data file consists of 5 words. Words 0…3 of the configuration file allow you to change the parameters of each channel independently. For example, word 0 corresponds to channel 0. The functional arrangement of the bits for a single channel are shown in the table on page 15. Word 4 is the Module Configuration Word and is explained on page 16.

To Select		Make these bit settings															
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Filter Frequency	10 Hz														1	1	0
	60 Hz														0	0	0
	50 Hz														0	0	1
	250Hz														0	1	1
	500 Hz														1	0	0
	1 kHz														1	0	1
Open Circuit	Upscale										0	0					
	Downscale										0	1					
	Hold Last State										1	0					
	Zero										1	1					
Temperature Units	Degrees C									0							
	Degrees F									1							
Input Type	Thermocouple J					0	0	0	0								
	Thermocouple K					0	0	0	1								
	Thermocouple T					0	0	1	0								
	Thermocouple E					0	0	1	1								
	Thermocouple R					0	1	0	0								
	Thermocouple S					0	1	0	1								
	Thermocouple B					0	1	1	0								
	Thermocouple N					0	1	1	1								
	Thermocouple C					1	0	0	0								
	-50…50 mV					1	0	0	1								
	-100…100 mV					1	0	1	0								
Data Format	Raw/Proportional		0	0	0												
	Engineering Units		0	0	1												
	Engineering UnitsX10		1	0	0												
	Scaled-for-PID		0	1	0												
	Percent Range		0	1	1												
Enable Channel	Disable	0															
	Enable	1															

Columns 4 and 3 are marked Not Used[1].

(1) An attempt to write any non-valid (spare) bit configuration into any selection field results in a module configuration error.

TIP Program defaults are indicated by zero (0) values. For example, type J thermocouple is the default (no user intervention) thermocouple type.

Module Configuration Word

Word 4 of the configuration data file contains the Enable/Disable Cyclic Calibration bit as shown in the table below.

To Select		Make these bit settings															
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Cyclic Calibration	Enabled[1]																0
	Disabled																1

(1)   When enabled, an autocalibration cycle is performed on all enabled channels every 5 minutes.

Specifications

General Specifications

Specification	Value
Dimensions, (H x W x D)	90 x 40 x 87 mm (height including mounting tabs is 110 mm) 3.54 x 1.58 x 3.43 in. (height including mounting tabs is 4.33 in.)
Approximate Shipping Weight (with carton)	220 g (0.53 lbs.)
Temperature, nonoperating	-40…85 °C (-40…185°F)
Temperature, operating	0…55 °C (-32…131 °F)
Humidity, operating	5…95% non-condensing
Altitude, operating	2000 m (6561 ft)
Vibration, operating	10…500 Hz, 5 g, 0.030 in. max. peak-to-peak
Shock, operating	30 g
Vendor ID code	1
Product type code	10
Product code	64
Hazardous environment class	Class I, Division 2, Hazardous Location, Groups A, B, C, D ISA/ANSI 12.12.01 (C-UL under CSA C22.2 No. 213)
Noise immunity	NEMA standard ICS 2-230
Radiated and conducted emissions	EN50081-2 Class A
ESD immunity (EN61000-4-2)	4 kV contact, 8 kV air, 4 kV indirect
Radiated immunity (EN61000-4-3)	10 V/m, 80…1000 MHz, 80% amplitude modulation, +900 MHz keyed carrier
Fast transient burst (EN61000-4-4)	2 kV, 5 kHz
Surge immunity (EN61000-4-5)	1 kV galvanic gun
Conducted immunity (EN61000-4-6)	10V, 0.15 …80 MHz[1]

(1)   Conducted Immunity frequency range may be 150 kHz…30 MHz if the Radiated Immunity frequency range is 30…1000 MHz.

Input Specifications

Specification	1762-IT4
Number of Inputs	4 input channels plus a CJC sensor
Resolution	15 bits plus sign
Bus Current Draw, max	40 mA @ 5V DC 50 mA @ 24V DC
Heat Dissipation	1.5 Total Watts (The Watts per point, plus the minimum Watts, with all points energized.)
Converter Type	Delta Sigma
Input Filtering	Programmable notch filter with 10, 50, 60, 250, 500 and 1k Hz frequencies.
Channel Update Time	Input filter and configuration dependent. See "Channel Update Time" on page 19
Rated Working Voltage[1]	30V AC/30V DC
Common Mode Voltage Range[2]	±10V DC maximum per channel
Common Mode Rejection	115 dB (minimum) @ 50 Hz (with 10 Hz or 50 Hz filter) 115 dB (minimum) @ 60 Hz (with 10 Hz or 60 Hz filter)
Normal Mode Rejection Ratio	85 dB (minimum) @ 50 Hz (with 10 Hz or 50 Hz filter) 85 dB (minimum) @ 60 Hz (with 10 Hz or 60 Hz filter)
Cable Impedance, max	25 Ω
Input Impedance	>10 MΩ
Open-circuit Detection Time (max.)	7 ms…1.515 seconds[4]
Calibration	The module performs autocalibration upon power-up and whenever a channel is enabled. You can also program the module to calibrate every five minutes using the Enable/Disable Cyclic Calibration bit.
Repeatability[3]	See "Repeatability" on page 19
Maximum Overload at Input Terminals	±35V DC continuous[5]
Module Error over Full Temperature Range (0…55°C [+32…131°F])	See "Input Accuracy" on page 18
CJC Accuracy	±1.3 °C (±2.34 °F)
Power Supply Distance Rating	6 (The module may not be more than 6 modules away from the system power supply.)
Input Group to Bus Isolation	720V DC for 1 minute (qualification) 30V AC/30V DC working voltage (IEC Class 2 reinforced insulation)
Input Channel Configuration	via configuration software screen or the user program (by writing a unique bit pattern into the module's configuration file).
Module OK LED	On: module has power, has passed internal diagnostics, and is communicating over the bus. Off: Any of the above is not true.
Channel Diagnostics	Over- or under-range and open-circuit by bit reporting

(1)   Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential (for example, 30V DC input signal and 20V DC potential above ground).

(2)   For proper operation, both the plus and minus input terminals must be within ±10V DC of analog common.

(3)   Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.

(4)   Open-circuit detection time is equal to channel update time, which is based on filter frequency, number of channels enabled, and whether cyclic calibration in enabled.

(5)   Maximum current input is limited due to input impedance.

Input Accuracy

Input Type[1]	Accuracy for 10 Hz, 50 Hz and 60 Hz Filters[2] (max.)
	at 25 °C [77 °F]
Themocouples J (-210…1200 °C [-346…2192 °F])	±0.6 °C [± 1.1 °F]
Themocouple N (-200…1300 °C [-328…2372 °F])	±1 °C [± 1.8 °F]
Themocouple N (-210…-200 °C [-346…-328 °F])	±1.2 °C [±2.2 °F]
Themocouple T (-230…400 °C [-382…752 °F])	±1 °C [± 1.8 °F]
Themocouple T (-270…-230 °C [-454…-382 °F])	±5.4 °C [± 9.7 °F]
Themocouple K (-230…1370 °C [-382…2498 °F])	±1 °C [± 1.8 °F]
Themocouple K (-270…-230 °C [-454…-382 °F])	±7.5 °C [± 13.5 °F]
Themocouple E (-210…1000 °C [-346…1832 °F])	±0.5 °C [± 0.9 °F]
Themocouple E (-270…-210 °C [-454…-346 °F])	±4.2 °C [± 7.6 °F]
Themocouples S and R	±1.7 °C [± 3.1 °F]
Thermocouple C	±1.8 °C [±3.2 °F]
Thermocouple B	±3.0 °C [±5.4 °F]
±50 mV	±15 μV
±100 mV	±20 μV

(1)   The module uses the National Institute of Standards and Technology (NIST) ITS-90 standard for thermocouple linearization.

(2)   Accuracy is dependent upon the analog/digital converter output rate selection, data format, and input noise. Refer to the MicroLogix 1200 Thermocouple/mV Input Module User Manual, publication number 1762-UM002A for additional information.

Channel Update Time

Filter Frequency Selection	Channel Update Time
10 Hz	303 ms
50 Hz	63 ms
60 Hz	53 ms
250 Hz	15 ms
500 Hz	9 ms
1 kHz	7 ms

Repeatability

Input Type	Repeatability for 10 Hz Filter at 25°C [77°F]
Themocouple J	±0.1 °C [±0.18 °F]
Themocouple N (-110…1300 °C [-166…2372 °F])	±0.1 °C [±0.18 °F]
Themocouple N (-210…-110 °C [-346…-166 °F])	±0.25 °C [±0.45 °F]
Themocouple T (-170…400 °C [-274…752 °F])	±0 .1 °C [±0.18 °F]
Themocouple T (-270…-170 °C [-454…-274 °F])	±1.5 °C [±2.7 °F]
Themocouple K (-270…1370 °C [-454…2498 °F])	±0.1 °C [±0.18 °F]
Themocouple K (-270…-170 °C [-454…-274 °F])	±2.0 °C [±3.6 °F]
Themocouple E (-220…1000 °C [-364…1832 °F])	±0.1 °C [±0.18 °F]
Themocouple E (-270…-220 °C [-454…-364 °F])	±1.0 °C [±1.8 °F]
Themocouples S and R	±0.4 °C [±0.72 °F]
Themocouple C	±0.2 °C [±0.36 °F]
Themocouple B	±0.7 °C [±1.26 °F]
±50 mV	±6 µV
±100 mV	±6 µV

Certifications

Certification (when product is marked)[1]	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada.
	UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S and Canada. See UL File E334470.
CE	European Union 2004/108/EC EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
C-Tick	Autralian Rediocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) See product certification link at http://www.rockwellautomation.com/products/certification for Declaration of Conformity, Certificates, and other certification details.

North American Hazardous Location Approval

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.

The following WARNING statement applies to use in hazardous locations.

The following information applies when operating this equipment in hazardous locations:	Informations sur l'utilisation de cet équipement en environnements dangereux:
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.

WARNING

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EXPLOSION HAZARD

- Substitution of components may impair suitability for Class I, Division 2.
- Do not replace components or disconnect equipment unless power has been switched off.
- Do not connect or disconnect components unless power has been switched off.
- This product must be installed in an enclosure.
- In Class I, Division 2 applications, the bus connector must be fully seated and the bus connector cover must be snapped in place.
- In Class I, Division 2 applications, all modules must be mounted in direct contact with each other as shown on page 7. If DIN rail mounting is used, an end stop must be installed ahead of the controller and after the last 1762 I/O module.
- All wiring must comply with N.E.C. article 501-4(b).
- The interior of the enclosure must be accessible only by the use of a tool.
- For applicable equipment (relay modules, etc.), exposure to some chemicals may degrade the sealing properties of materials used in the following devices: Relays, Epoxy. It is recommended that the User periodically inspect these devices for any degradation of properties and replace the module if degradation is found.

AVERTISSEMENT

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RISQUE D'EXPLOSION

- La substitution de composants peut rendre cet équipement impropre à une utilisation en environnement de Classe 1, Division 2.
- Ne pas remplacer de composants ou déconnecter l'équipement sans s'être assuré que l'alimentation est coupée.
- Ne pas connecter ou déconnecter des composants sans s'être assuré que l'alimentation est coupée.
- Ce produit doit être installé dans une armoire.
- Pour les applications de Classe I, Division 2, le connecteur de bus doit être correctement installé et son couvercle enclenché.
- Pour les applications de Classe 1, Division 2, tous les modules doivent être installés en contact direct les uns avec les autres, comme indiqué page 6. Si on utilise le montage sur rail DIN, une butée doit être placée à l'avant de l'automate et après la dernière unité d'E/S 1762.

Additional Resources

Publication	Description
MicroLogix 1200 Programmable Controllers User Manual, publication 1762-UM001.	Information on installing, wiring, and operating a MicroLogix 1200 Programmable Controller.
MicroLogix 1200 Programmable Controllers Installation Instructions publication 1762-IN006.	Installation guide for the MicroLogix 1200 Programmable Controller.
MicroLogix 1200 Memory Module and/or Real Time Clock Installation Instructions, publication 1762-IN001.	Installation guide for the MicroLogix 1200 Memory Module and Real Time Clock.
1762-IA8 120V AC Input Module Installation Instructions, publication 1762-IN002.	Installation guide for the 1762-IA8 Discrete Input Module.
1762-OW8 Relay Output Module Installation Instructions, publication 1762-IN003.	Installation guide for the 1762-OW8 Discrete Output Module.
1762-IQ8 DC Input Module Installation Instructions, publication 1762-IN004.	Installation guide for the 1762-IQ8 Discrete Input Module.
1762-IF2OF2 Analog Input/Output Module Installation Instructions, publication 1762-IN005.	Installation guide for the 1762-IF2OF2 Analog Input/Output Module.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.	More information on proper wiring and grounding techniques.

If you would like a manual, you can:

- download a free electronic version from the internet: http://www.rockwellautomation.com/literature.

- purchase a printed manual by contacting your local Allen-Bradley distributor or Rockwell Automation representative.

Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support/, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/support/.

Installation Assistance

If you experience a problem within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature/.