Wiring Diagrams

Original Instructions

Allen-Bradley by ROCKWELL AUTOMATION

Micro800 Non-isolated RTD Plug-in Module

Catalog Number 2080-RTD2

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Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Updated template	Throughout
Updated Environment and Enclosure	2
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Rockwell Automation

Environment and Enclosure

ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in EN/IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR 11. Without appropriate precautions, there may be difficulties with electromagnetic compatibility in residential and other environments due to conducted and radiated disturbance.

This equipment is supplied as open-type equipment for indoor use. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain more information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for more installation requirements.
- NEMA Standard 250 and EN/IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

Prevent Electrostatic Discharge

ATTENTION: This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

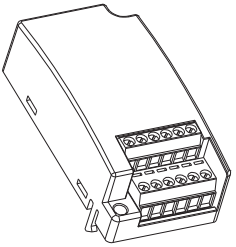
North American Hazardous Location Approval

The following module is North American Hazardous Location approved: 2080-RTD2

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: **EXPLOSION HAZARD** • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of any component may impair suitability for Class I Division 2.	**AVERTISSEMENT** **RISQUE D'EXPLOSION** • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de tout composant peut rendre cet équipement inadapté à une utilisation en environnement de Classe I Division 2.

Parts List

Your package contains one Micro800™ non-isolated RTD plug-in module, two module fastening screws, and these pinout guide wiring instructions.



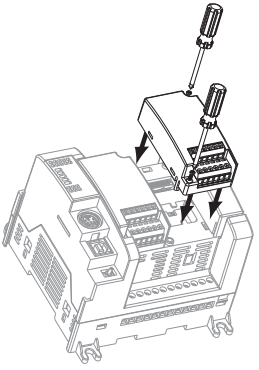
ATTENTION:

- Be careful when stripping wires. Wire fragments that fall into the controller could cause damage. Once wiring is complete, make sure the controller is free of all metal fragments before removing the protective debris strip.
- Do not wire more than 2 conductors on any single terminal.
- If you insert or remove the plug-in module while power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.
- Use only shielded twisted core cables to connect sensor to module.
- Cable shield should be connected to chassis ground only at controller end.
- Do not insert or remove the plug-in module while power is applied, otherwise, permanent damage to equipment may occur.

You can choose to wire the plug-in before inserting it onto the controller, or wire it once the module is secured in place.

Insert Module into Controller

Follow the instructions to insert and secure the plug-in module to the controller.



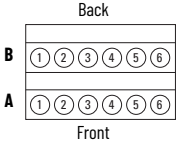
WARNING: If you insert or remove the module while the controller power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.
WARNING: When used in a Class I Division 2, hazardous location, this equipment must be mounted in a suitable enclosure with proper wiring method that complies with the governing electrical codes.
WARNING: If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

1. Position the plug-in module with the terminal block facing the front of the controller as shown.
2. Snap the module into the module bay.
3. Using a screwdriver, tighten the 10...12 mm (0.39...0.47 in.) M3 self-tapping screw to torque specifications.

Wire the Module

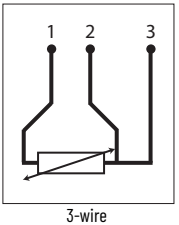
Follow the pinout diagram to wire your plug-in module.

12-pin Female Terminal Block

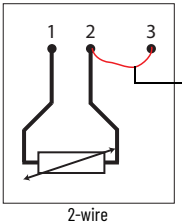


(View into terminal block)

Pin A1	CH0+	Pin B1	CH1+
Pin A2	CH0-	Pin B2	CH1-
Pin A3	CH0L (Sense)	Pin B3	CH1L (Sense)
Pin A4	No connection	Pin B4	No connection
Pin A5	No connection	Pin B5	No connection
Pin A6	No connection	Pin B6	No connection



3-wire



2-wire

50 mm (2.17 in.), 0.5 mm^2 (22 AWG) external wire

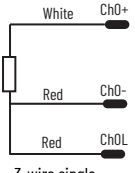
Wire the Sensors

The RTD sensing element is always connected between two wires of different colors. Wires of the same color are shorted and form the compensation leads.

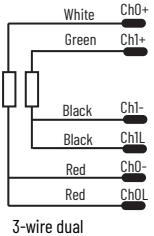
Measuring resistance between these wires confirms the position of RTD resistor element and compensation leads. Compensation leads always show 0 ohms.

Wire the Sensors

2-wire sensor connection



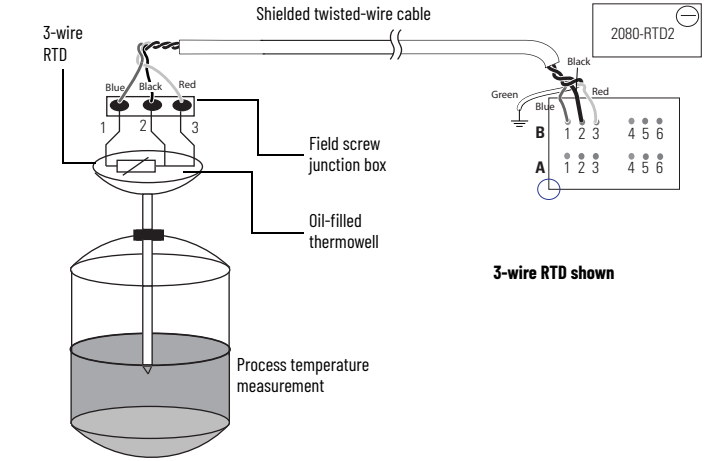
3-wire single sensor connection



3-wire dual sensor connection

This illustration provides for channel 0 only for 2-wire and 3-wire single sensor connections.

Wire the Module in the Field



The RTD sensing element should always be connected between terminals B1 (+) and B2 (-) for channel 1, and A1 (+) and A2 (-) for channel 0. The terminals B3 and A3 should always be shorted to B2 and A2 respectively to complete the constant current loop. Mismatch in wiring can cause erroneous, over, or under range readings.

Specifications

General and Environmental Specifications

Attribute	Value
Dimensions, HxWxD, approx	62 x 31.5 x 20 mm (2.44 x 1.24 x 0.79 in.)
Weight, approx	21 g (0.74 oz)
Mounting torque	0.2 N•m (1.48 lb•in)
Terminal screw torque	0.22...0.25 N•m (1.95...2.21 lb•in) Use a 2.5 mm (0.10 in.) screwdriver.
Wire size	<table><tr><th></th><th>Min</th><th>Max</th><th></th></tr><tr><td>Solid</td><td>0.14 mm^2 (26 AWG)</td><td>1.5 mm^2 (16 AWG)</td><td rowspan="2">rated @ 90 °C (194 °F) insulation max</td></tr><tr><td>Stranded</td><td>0.14 mm^2 (26 AWG)</td><td>1.0 mm^2 (18 AWG)</td></tr></table>
Input impedance	> 5 MΩ
Common mode rejection ratio	100 dB @ 50/60 Hz
Normal mode rejection ratio	70 dB @ 50/60 Hz
Resolution	14-bit
Accuracy	±1.0 °C @ 25 °C (±1.8 °F @ 77 °F)
Channels	2, nonisolated
RTD types supported	100 Ω Platinum 385, 200 Ω Platinum 385, 500 Ω Platinum 385, 1000 Platinum 385, 100 Ω Platinum 392, 200 Ω Platinum 392, 500 Ω Platinum 392, 1000 Ω Platinum 392, 10 Ω Copper 427, 120 Ω Nickel 672, 604 Ω Nickel-Iron 518
Open circuit detection time	8...1212 ms
Power consumption	3.3 V, 40 mA
Enclosure type rating	None (open-style)
North American temp code	T4
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20...+65 °C (-4...+149 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...+85 °C (-40...+185 °F)
Temperature, surrounding air, max	65 °C (149 °F)

Certifications

Certification (when product is marked)[1]	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. 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 2014/30/EU 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) European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical documentation
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 29 ramadan 1436
UKCA	2016 No. 1091 – Electromagnetic Compatibility Regulations 2012 No. 3032 – Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations

(1) See the Product Certification link at rok.auto/certifications for Declarations of Conformity, Certificates, and other certification details.

Additional Resources

For more information on the products that are described in this publication, use these resources. You can view or download publications at rok.auto/literature.

Resource	Description
Micro800 Plug-in Modules User Manual, publication 2080-UM004	Installation and wiring descriptions for the different Micro800 plug-in modules.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	More information on proper wiring and grounding techniques.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Notes:

Notes:

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

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