



Allen-Bradley

SLC 500 RTD/Resistance Input Module

1746-NR4

User Manual

**Rockwell
Automation**

The status of each LED indicator, during each of the operational states (for example, powerup, module operation and error), is depicted in the following table.

LED Indicator Status

LED Indicator	Cycle Power	Module Operation (No Error)	Module Error	Channel Error
Ch 0 Status	Off ⁽¹⁾	On/Off ⁽²⁾	Off	Blinks
Ch 1 Status	Off ⁽¹⁾	On/Off ⁽²⁾	Off	Blinks
Ch 2 Status	Off ⁽¹⁾	On/Off ⁽²⁾	Off	Blinks
Ch 3 Status	Off ⁽¹⁾	On/Off ⁽²⁾	Off	Blinks
Mod. Status	Off ⁽¹⁾	On	Off	On

⁽¹⁾ Module is disabled while you cycle module power.

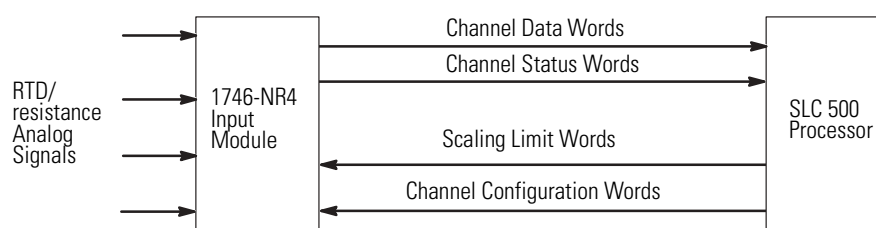
⁽²⁾ Channel status LED indicator is ON if the respective channel is enabled and OFF if the channel is disabled.

Module to Processor Communication

The RTD module communicates with the SLC processor through the backplane of the chassis. The RTD module transfers data to and receives data from the processor by means of an image table. The image table consists of eight input words and eight output words. Data transmitted from the module to the processor is called the input image (for example, Channel Data Words and Channel Status Words). Conversely, data transmitted from the processor to the module is called the output image (for example, Channel Configuration Words and Scaling Limit Words).

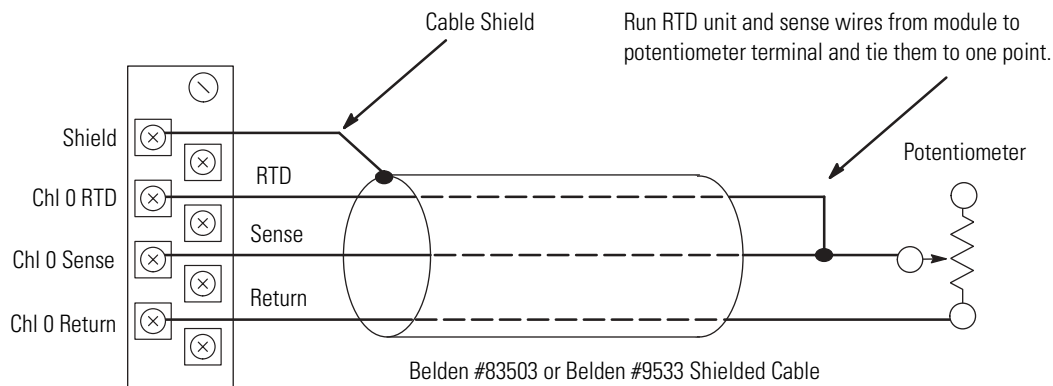
Details about the input and output images are found in Module Addressing on page 52 and 53.

Communication Flow

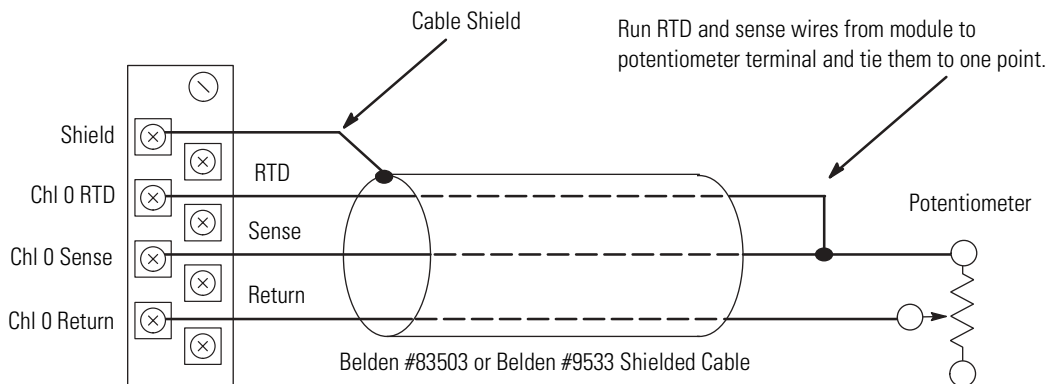


Three-wire Potentiometer Connections to Terminal Block

For details on wiring an RTD to the module, see chapter 3.



Potentiometer wiper arm can be connected to either the RTD or return terminal depending on whether you want increasing or decreasing resistance.



Configure Your I/O

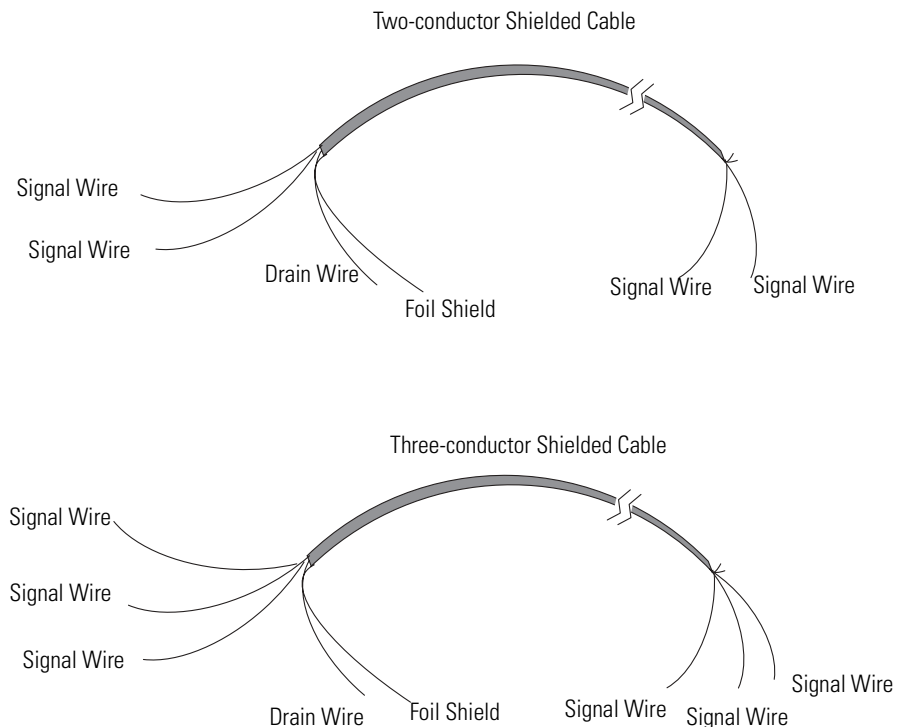
Configure your system I/O configuration for the particular slot where the RTD module resides (slot 1 in this example). Select the 1746-NR4 module from the list of modules, or if it is not listed in your software version, select Other and enter the RTD module ID code (3513) at the prompt on the I/O configuration display.

For more information refer to chapter 4, Preliminary Operating Considerations.

Follow these steps to wire your 1746-NR4 module.

1. At each end of the cable, strip some casing to expose the individual wires.
2. Trim the signal wires to 5.08 cm (2 in.) lengths. Strip about 4.76 mm (3/16 in.) 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 shield terminal.
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 and cable shield to the NR4 terminal block and the input.
6. Repeat steps 1 through 5 for each channel on the NR4 module.

Cable Examples



The Data Formats for RTD Temperature Ranges for 0.5 and 2.0 mA Excitation Current table shows the temperature ranges of several 1746-NR4 RTDs. The table applies to both 0.5 and 2.0 mA excitation currents. The temperature ranges of the remaining RTD units vary with excitation current, for example, 1000 Ω Platinum 385 (table Data Format for 1000 Ω Platinum RTD (385)), 1000 Ω Platinum 3916 (table Data Format for 1000 Ω Platinum RTD (3916)) and 10 Ω Copper 426 (table Data Format for 10 Ω Copper 426 RTD).

Data Formats for RTD Temperature Ranges for 0.5 and 2.0 mA Excitation Current

RTD Input Type	Data Format					
	Engineering Units x 1		Engineering Units x 10		Scaled-for-PID	Proportional Counts (Defaults)
	0.1 °C	0.1 °F	1.0 °C	1.0 °F		
100 Ω Platinum (385)	-2000...8500	-3280...15,620	-200...850	-328...1562	0 ... 16,383	-32,768 ... 32,767
200 Ω Platinum (385)	-2000...8500	-3280...15,620	-200...850	-328...1562	0 ... 16,383	-32,768 ... 32,767
500 Ω Platinum (385)	-2000...8500	-3280...15,620	-200...850	-328...1562	0 ... 16,383	-32,768 ... 32,767
100 Ω Platinum (3916)	-2000...6300	-3280...11,660	-200...630	-328...1166	0 ... 16,383	-32,768 ... 32,767
200 Ω Platinum (3916)	-2000...6300	-3280...11,660	-200...630	-328...1166	0 ... 16,383	-32,768 ... 32,767
500 Ω Platinum (3916)	-2000...6300	-3280...11,660	-200...630	-328...1166	0 ... 16,383	-32,768 ... 32,767
120 Ω Nickel (672)	-800...2600	-1120...5000	-80...260	-112...500	0 ... 16,383	-32,768 ... 32,767
120 Ω Nickel (618)	-1000...2600	-1480...5000	-100...260	-148...500	0 ... 16,383	-32,768 ... 32,767
604 Ω Nickel Iron (518)	-1000...2000	-1480...3920	-100...200	-148...392	0 ... 16,383	-32,768 ... 32,767

Data Format for 1000 Ω Platinum RTD (385)

Excitation Current	Data Format					
	Engineering Units x 1		Engineering Units x 10		Scaled-for-PID	Proportional Counts (Defaults)
	0.1 °C	0.1 °F	1.0 °C	1.0 °F		
0.5 mA	-2000...8500	-3280...15620	-200...850	-328...1562	0...16,383	-32,768...32,767
2.0 mA	-2000...2400	-3280...4640	-200...240	-328...464	0...16,383	-32,768...32,767

Data Format for 1000 Ω Platinum RTD (3916)

Excitation Current	Data Format					
	Engineering Units x 1		Engineering Units x 10		Scaled-for-PID	Proportional Counts (Defaults)
	0.1 °C	0.1 °F	1.0 °C	1.0 °F		
0.5 mA	-2000...6300	-3280...11,660	-200...630	-328...1166	0 ... 16,383	-32,768...32,767
2.0 mA	-2000...2300	-3280...44,600	-200...230	-328...446	0 ... 16,383	-32,768...32,767