

Allen-Bradley 1756 Series Service Manual

1756-IRT8I

1. Description

Manufactured by Allen-Bradley/Rockwell Automation, the 1756-IRT8I is a high-resolution analog I/O module. Specifically, it is an 8-point isolated combined temperature and millivolts-sensing input module. The 1756-IRT8I module is a member of the ControlLogix system, and it requires a 36-pin RTB, or a detachable terminal block housing. This can be either the 1756-TBS6H or the 1756-TBCH. The Allen-Bradley 1756-IRT8I has 8 isolated channels for use in any combination of RTD or Thermocouple modes. Th

2. Specifications

Specification	Value
Manufacturer	Rockwell Automation
Brand	Allen-Bradley
Part	Number/Catalog No. 1756-IRT8I
Series	ControlLogix
Module	Type Analog RTD / Thermocouple / millivolt Module
Inputs	8 Isolated Channels
No.	of Inputs Eight (8) Point Isolated RTD / Thermocouple / millivolt
Current	Draw (5.1 Volts) 200 milliamps
Compatible	RTD Type 100, 200, 500, 1000 ? Platinum, alpha=385 100, 200, 500, 1000 ? Platinum, alpha=3916 120 ? Nickel, alpha=672 100, 120, 200, 500 ? Nickel, alpha=618 10 ? Copper, alpha=427
Current	Draw (24 Volts) 150 milliamps
Compatible	Thermocouple Types B, C, D, E, J, K, N, R, S, T, TXK/XK (L)
Power	Dissipation (Maximum) 4.6 Watts
Resolution	24 bits 0...510 ? : 0.06 mV/count 0...1020 ? : 0.12 mV/count 0...2040 ? : 0.25 mV/count 0...4080 ? : 0.50 mV/count -101...101 mV: 0.01 ?V/count
Thermal	Dissipation 15.7 BTU per hour
Input	Range 1...500 ? 2...1000 ? 4...2000 ? 8...4000 ? -100...100 mV
Isolation	Voltage 250 Volts Continuous
Module	Scan Time 1 ms
Backplane	Current at 24 Volts 2 milliamps
Data	Format IEEE 32-bit

3. Product Information

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Manufactured by Allen-Bradley/Rockwell Automation, the 1756-IRT8I is a high-resolution analog I/O module. Specifically, it is an 8-point isolated combined temperature and millivolts-sensing input module. The 1756-IRT8I module is a member of the ControlLogix system, and it requires a 36-pin RTB, or a detachable terminal block housing. This can be either the 1756-TBS6H or the 1756-TBCH. The Allen-Bradley 1756-IRT8I has 8 isolated channels for use in any combination of RTD or Thermocouple modes. The Allen-Bradley 1756-IRT8I ControlLogix RTD Thermocouple Input Module is equipped with 2 CJC sensors for thermocouple use, but they can be ordered separately. The accuracy of local CJC sensor is +/- 0.3 degrees Celsius, and this is the same as remote CJC sensor accuracy. The 1756-IRT8I module's channel sampling rate is determined only by the RPI value since the 1756-IRT8I does not offer RTS parameter. Similarly, channels configured for the thermocouple inputs does lead resistance self-calibration if the module power is cycled.

Some of the properties of the 1756-IRT8I module are the notch filter, multiple module input ranges, digital filter, rate alarm, under-range/over-range detection, 10-ohm copper offset, process alarms, sensor offset, sensor types, wire off detection, synchronized sampling, temperature units, thermocouple wire length compensation, and the cold junction compensation. The 1756-IRT8I ControlLogix RTD Thermocouple Input Module features improved analog I/O modules, three 8-channel isolated designs as well as 12 and 16-channel non-isolated designs all with the enhanced functionality of the analog I/O. This module provides faster performance, is more accurate, and presents better resolution and cost savings than other analog I/O modules because there is less space needed in its chassis for extra modules and power supplies. The 1756-IRT8I is a ControlLogix analog input module. It has Eight (8) individually isolated channels compatible for Resistance Temperature Detector (RTD) and Thermocouple sensors. Compatible RTDs are 100, 200, 500, 1000 Ω Platinum, alpha=385; 100, 200, 500, 1000 Ω Platinum, alpha=3916; 120 Ω Nickel, alpha=672; 100, 120, 200, 500 Ω Nickel, alpha=618; and 10 Ω Copper. Compatible Technical specifications for 1756-IRT8I

Manufacturer Rockwell Automation

Brand Allen-Bradley

Part Number/Catalog No. 1756-IRT8I

Series ControlLogix

Module Type Analog RTD / Thermocouple / millivolt Module

Inputs 8 Isolated Channels

No. of Inputs Eight (8) Point Isolated RTD / Thermocouple / millivolt

Current Draw (5.1 Volts) 200 milliamps

Compatible RTD Type 100, 200, 500, 1000 Ω Platinum, alpha=385 100, 200, 500, 1000 Ω Platinum, alpha=3916 120 Ω Nickel, alpha=672 100, 120, 200, 500 Ω Nickel, alpha=618 10 Ω Copper, alpha=427

Current Draw (24 Volts) 150 milliamps

Compatible Thermocouple Types B, C, D, E, J, K, N, R, S, T, TXK/XK (L)

Power Dissipation (Maximum) 4.6 Watts

Resolution 24 bits 0...510 Ω : 0.06 m Ω /count 0...1020 Ω : 0.12 m Ω /count 0...2040 Ω : 0.25 m Ω /count 0...4080 Ω : 0.50 m Ω /count -101...101 mV: 0.01 μ V/count

Thermal Dissipation 15.7 BTU per hour

Input Range 1...500 Ω 2...1000 Ω 4...2000 Ω 8...4000 Ω -100...100 mV

Isolation Voltage 250 Volts Continuous

Module Scan Time 1 ms

Backplane Current at 24 Volts 2 milliamps

Data Format IEEE 32-bit floating point

Backplane Current (5Volts) 250 mA

UPC 10885630245420

Backplane Current (24 Volts) 150 mA

Power Dissipation (Max) 4.6 W

UNSPSC 32151705

Removable Terminal Blocks 1756-TBNH, 1756-TBS6H Description

The Allen-Bradley 1756-IRT8I module is a high-resolution analog I/O module. In particular, it is an Eight (8) point isolated temperature sensing module compatible with RTD, Thermocouple and millivolt signals. The module is part of the ControlLogix system and requires the 36-pin RTB or Removable Terminal Block (RTB). Compatible RTB are 1756-TBCH or the 1756-TBS6H. It has 2 CJC sensors for thermocouple use. The CJC sensor accuracy is +/- 0.3 degrees Celsius, The channel sampling rate of the module is only determined by the RPI value because the 1756-IRT8I does not offer the RTS parameter. Also, channels configured for thermocouple inputs perform a lead resistance self-calibration when the module power is cycled. Features of the 1756-IRT8I module include multiple module input ranges, a notch filter, under-range/over-range detection, a digital filter, process alarms, a rate alarm, a sensor offset, a 10-ohm copper offset, wire-off detection, temperature units, sensor types, thermocouple wire length compensation, synchronized sampling, and cold junction compensation. The 1756-IRT8I has multiple input ranges available, namely 1 to 500 Ohms, 2 to 1000 Ohms, 4 to 2000 Ohms, 8 to 4000 Ohms, and -100 to 100 millivolts. It supports 24-bit resolution with ranges of 0 to 510 Ohms with 0.06 milliohms per count, 0 to 1020 Ohms with 0.12 milliohms per count, 0 to 2040 Ohms with 0.25 milliohms per count, 0 to 4080 Ohms with 0.50 milliohms per count, and -101 to 101 millivolts with 0.01 microvolts per count. RTD sensors that are supported include 100, 200, 500, 1000 Ohm platinum, alpha=385, 100, 200, 500, 1000 Ohms platinum, alpha=3916, 120 Ohms nickel, alpha 672, 100, 120, 200, 500 Ohm nickel, alpha=618, and 10 Ohm copper, alpha=427. The RTD excitation current of the module is 600 microamps. The thermocouple types for this module are B, C, D, E, J, K, N, R, S, T, and TXK/XK (L). Its thermocouple linearization is ITS-90. The module has open circuit detection times of 2 seconds for a thermocouple input and 3-wire RTD input and of 5 seconds for a 4-wire RTD input. It should be noted that there is no open circuit detection when wires are simultaneously disconnected from the INx/RTD C and INx/RTD D terminals on the same channel (with x representing the channel number). Noise rejections are available for the module. At normal mode, it is 75 dB at 60 Hertz. During common mode, it is 125 dB at 60 Hertz 1000 Ohms differential, 120 dB at 50 Hertz 1000 Ohms differential, and 160 dB at 600 Volts 100 Ohms differential.

The Allen-Bradley 1756-IRT8I is a ControlLogix analog input module with Eight (8) channels configurable for Resistance Temperature Detector (RTD), Thermocouple and millivolt input. This module features high resolution analog to digital conversion via Sigma-Delta method. The converted data is saved to IEEE 32-bit floating point. The converted data are ideally accessed by Human Machine Interface (HMI), Supervisory Control and Data Acquisition (SCADA) and Distributed Control Systems (DCS). Other than computer-based systems, the signal data may be used for calculations, and Process Variables (PV) for controllers such as Proportional + Integral + Derivative (PID).

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This module is capable of Open Circuit Detection with detection time of 2 Seconds for Thermocouple input and 3-Wire RTD and 5 Seconds for 4-Wire RTD.

Supported input range of this module are 1 - 500 Ω , 2 - 1000 Ω , 4 - 2000 Ω , 8 - 4000 Ω and -100 to 100 mV. The modules overall resolution is 24 Bits. With actual resolution of 0...510 Ω : 0.06 m Ω /count 0...1020 Ω : 0.12 m Ω /count 0...2040 Ω : 0.25 m Ω /count 0...4080 Ω : 0.50 m Ω /count -101...101 mV: 0.01 μ V/count.

Supported Thermocouple types include Thermocouple Type B, C, D, E, J, K, N, R, S, T, TXK/XK (L) with linearization of ITS-90. Compatible RTD sensors include 100 Ω PT 385, 20 Ω PT 385, 500 Ω PT 385, 1000 Ω PT 385, 100 Ω PT 3916, 20 Ω PT 3916, 500 Ω PT 3916, 1000 Ω PT 3916, 10 Ω CU 427, 120 Ω NI 672, 100 Ω NI 618, 120 Ω NI 618, 200 Ω NI 618 and 200 Ω NI 618.

Compatible millivolt signals should be within the range of -100 to 100 mV.

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