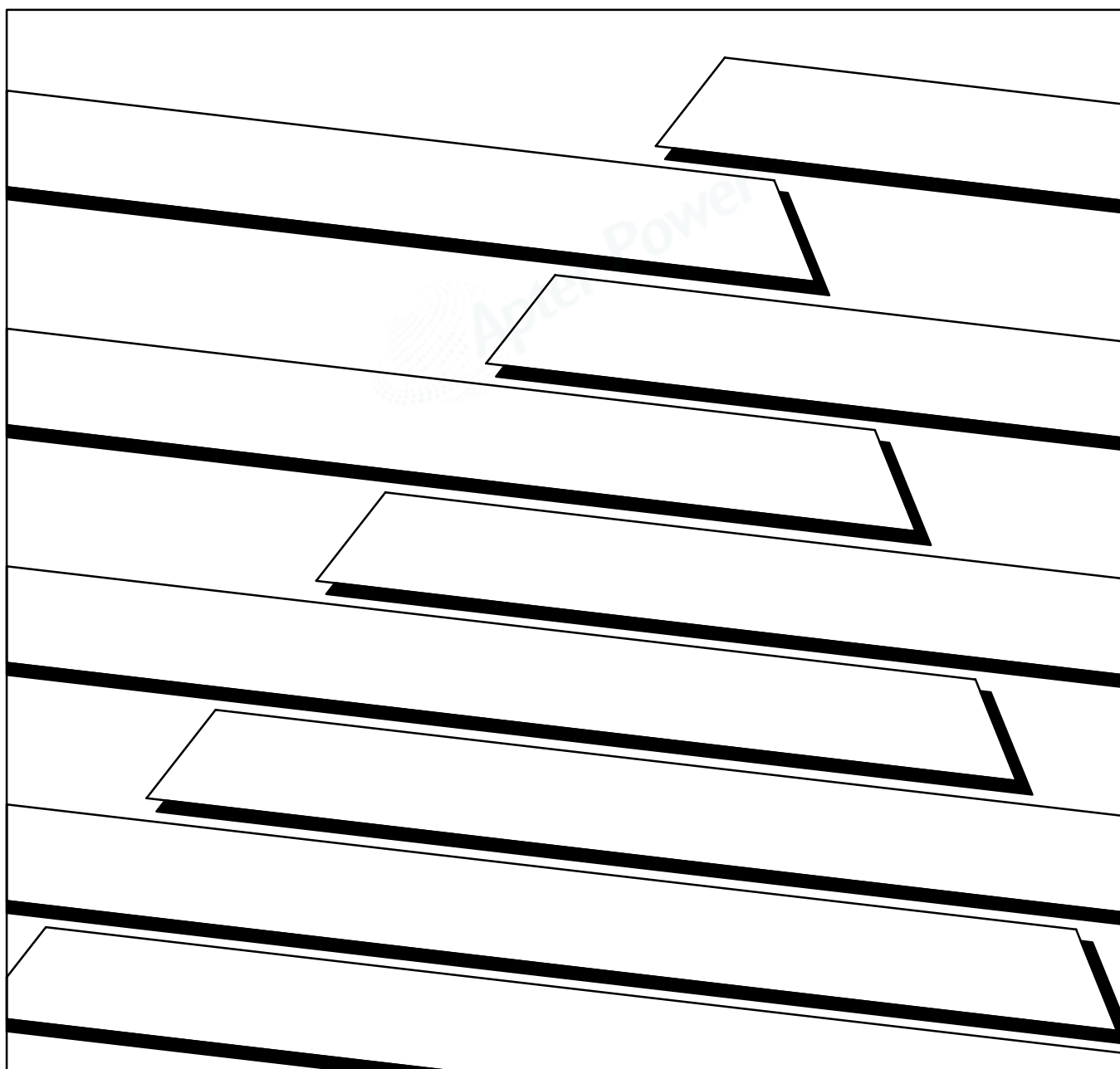




ALLEN-BRADLEY

RTD Input Module Cat. No. 1771-IR Series B

User Manual



Chapter 2

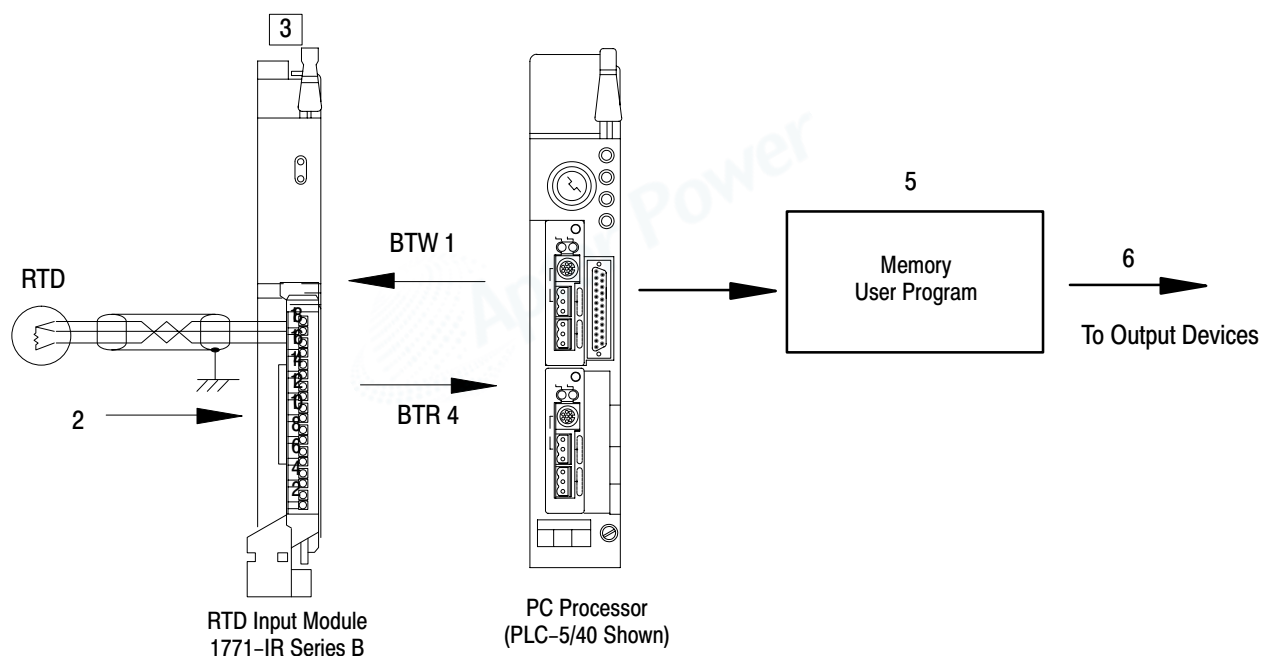
Overview of the RTD Input Module

How Analog Modules Communicate with Programmable Controllers

The processor transfers data to and from the module using block transfer write (BTW) and block transfer read (BTR) instructions in your ladder diagram program. These instructions let the processor obtain input values and status from the module, and let you establish the module's mode of operation (figure 2.1).

1. The processor transfers your configuration data and calibration values to the module using a block transfer write instruction.
2. External devices generate analog signals that are transmitted to the module.

Figure 2.1
Communication Between Processor and Module



12933-I

3. The module converts analog signals into binary or BCD format, and stores these values until the processor requests their transfer.
4. When instructed by your ladder program, the processor performs a read block transfer of the values and stores them in a data table.
5. The processor and module determine that the transfer was made without error, and that input values are within specified range.
6. Your ladder program can use and/or move the data (if valid) before it is written over by the transfer of new data in a subsequent transfer.

Appendix

A

Specifications

Module Capacity	Six RTD input channels
Module Location	1771 I/O Chassis
Sensor Type	100 ohm platinum ($\alpha = 0.00385$) or 10 ohm copper ($\alpha = 0.00386$) Other types may be used with report in ohms only
Units of measure	Temperature in $^{\circ}\text{C}$ Temperature in $^{\circ}\text{F}$ RTD resistance in ohms (10milliohms or 30milliohms resolution)
Temperature Range	Platinum: -200 to $+870^{\circ}\text{C}$ (-328 to 1598°F) Copper: -200 to $+260^{\circ}\text{C}$ (-328 to $+500^{\circ}\text{F}$)
Resistance Range	1.00 to 600.00 ohms
Resolution	Platinum: 0.1°C (0.1°F) Copper: 0.3°C (0.5°F)
Sensor Excitation	1mA constant current source supplied by module
Input Isolation Dielectric Test	1000V peak channel to channel, channel to backplane, for 1 second
Common Mode Rejection	120db @ 60Hz up to 1000V peak
Common Mode Impedance	Greater than 10 megohms
Normal Mode Rejection	60db @ 60Hz
Input Overvoltage Protection	120V rms continuous
Open RTD Response Time	Open excitation (terminal A) to overrange: $<0.5\text{sec}$ Open common (terminal C) to underrange: $<0.5\text{sec}$ Open sense (terminal B): drift high
Scan Time (all 6 channels)	50ms
Environmental Conditions	
Operating Temperature	0 to 60°C (32 to 140°F)
Rate of Change	Ambient changes greater than $1.0^{\circ}\text{C}/\text{minute}$ may temporarily degrade performance during periods of change.
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Backplane Power Consumption	4.25W maximum, 0.85A at 5V
Keying	Between 10 and 12 Between 28 and 30
Field Wiring Arm	Cat. No. 1771-WF

Appendix A Specifications

Table A.A
1771-IR Series B Error Summary Based on Temperatures above -200°C

RTD Type	Range	Error @ Calibration Temperature (25°C) (over range)	Drift °C/°C or °F/°F
Copper	-200 to +260°C (-328 to +500°F)	±0.344°C/±0.564°F	±0.1306
Platinum	-200 to +870°C (-328 to 1598°F)	±0.100°C/±0.152°F	±0.0717

Table A.B
1771-IR Series B Resistance Error Summary

RTD Type	Resistance Error @ 25°C (over range)	Resistance Drift Ohm/°C
Copper	±0.074 ohm	±0.0213
Platinum	±0.075 ohm	±0.0213