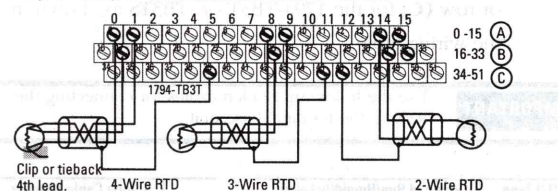
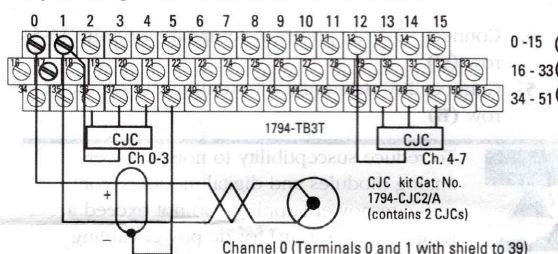


The diagram shows a 1794-TB3 terminal block with 16 terminals (0-15) arranged in three rows. The top row contains terminals 0-15, the middle row contains terminals 16-33, and the bottom row contains terminals 34-51. A legend on the right indicates that terminals 0-15 are labeled (A), 16-33 are labeled (B), and 34-51 are labeled (C). Below the terminal block, three wiring configurations are shown: 1. 4-Wire RTD: Terminals 0, 1, 2, and 3 are connected to a 4-wire RTD. A note indicates 'Clip or tieback 4th lead'. 2. 3-Wire RTD: Terminals 4, 5, 6, and 7 are connected to a 3-wire RTD. 3. 2-Wire RTD: Terminals 8, 9, 10, and 11 are connected to a 2-wire RTD.

Example of 2, 3 and 4-wire RTD Wiring to a 1794-TB3T Terminal Base Unit

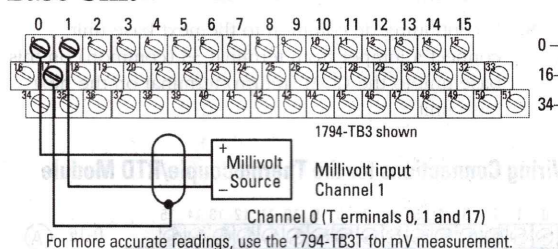


Example of Thermocouple Wiring to a 1794-TB3T Terminal Base Unit



The diagram shows a 16-channel CJC kit connected to a 1794-TB3T terminal block. The terminal block has two rows of terminals, labeled 0-15 and 16-31. The CJC kit consists of two CJC modules, each with two channels. The first CJC module is connected to terminals 0-3, and the second CJC module is connected to terminals 16-19. The CJC kit is labeled "CJC Ch 0-3" and "CJC Ch. 4-7". The CJC kit is also labeled "CJC kit Cat. No. 1794-CJC2/A (contains 2 CJs)". The CJC kit is connected to the terminal block via a cable. The CJC kit is also connected to a power source (battery) via a cable. The CJC kit is also connected to a ground plane via a cable. The CJC kit is also connected to a signal line (Channel 0) via a cable. The signal line is labeled "Channel 0 (Terminals 0 and 1 with shield to 39)".

Example of Millivolt Wiring to a 1794-TB3, -TB3S or -TB3T Terminal Base Unit



The following block transfer read and write word bit information is presented for experienced users only. Refer to the user manuals (publication 1794-UM004 for the RTD or 1794-UM007 for TC/mV) for these products for complete information on programming and configuring your modules.

Dec.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
Dec.	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word 0	Reserved																	
1	Channel 0 Input Data																	
2	Channel 1 Input Data																	
3	Channel 2 Input Data																	
4	Channel 3 Input Data																	
5	Channel 4 Input Data																	
6	Channel 5 Input Data																	
7	Channel 6 Input Data																	
8	Channel 7 Input Data																	
9	Overrange Alarm Bits (channel 0 = bit 8, etc.)								Underrange Alarm Bits (channel 0 = bit 0, etc.)									
(-I18)	0	0	0	0	0	0	Bad Cal	Cal Done	Cal Ring	0	Diag. Status Bits	Pwr Up	Bad Struct	CJC Over				
(-I19)	0	0	0	0	0	0	Bad Cal	Cal Done	Cal Ring	Ri Up	Critical Error Bits	Pwr Up	Res.	0				

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Supersedes publication 1794-IN021C-EN-P - April 2002 and 1794-IN022B-EN-P - April 2002

Dec.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Oct.	17	16	15	14	13	12	11	10	7	6	5	4	3	2	1	0
IT8 Word 0	8-Bit Calibration Mask								Cal Clk	Cal H/ Lo	Filter Cutoff			FD	MDT	
IR8 Word 0	8-Bit Calibration Mask								Cal Clk	Cal H/ Lo	Filter Cutoff			Enh	MDT	
Word 1	Thermocouple or RTD Type Ch 3				Thermocouple or RTD Type Ch 2				Thermocouple or RTD Type Ch 1				Thermocouple or RTD Type Ch 0			
Word 2	Thermocouple or RTD Type Ch 7				Thermocouple or RTD Type Ch 6				Thermocouple or RTD Type Ch 5				Thermocouple or RTD Type Ch 4			
Word 3	Reserved															

Where: FDF = Fixed digital filter (TC only)
 Enh = Enhanced mode (RTD only)
 MDT = Module Data Type

Bit	01	00	
	0	0	°C
	0	1	°F
	1	0	Bipolar counts scaled between -32767 to +32767
	1	1	Unipolar counts scaled between 0 and 65535
0101 thru 1111 not used			

RTD Type					
Bit	03	02	01	00	Channel 0 (Write word 1)
Bit	07	06	05	04	Channel 1 (Write word 1)
Bit	11	10	09	08	Channel 2 (Write word 1)
Bit	15	14	13	12	Channel 3 (Write word 1)
Bit	03	02	01	00	Channel 4 (Write word 2)
Bit	07	06	05	04	Channel 5 (Write word 2)
Bit	11	10	09	08	Channel 6 (Write word 2)
Bit	15	14	13	12	Channel 7 (Write word 2)
	0	0	0	0	Resistance (default = mV)
	0	0	0	1	No sensor connected - do not scan
	0	0	1	0	100 Ω Pt $\alpha = 0.00385$ Euro (-200 to +870°C)
	0	0	1	1	100 Ω Pt $\alpha = 0.003916$ U.S. (-200 to +630°C)
	0	1	0	0	200 Ω Pt $\alpha = 0.00385$ Euro (-200 to +630°C)
	0	1	0	1	500 Ω Pt $\alpha = 0.00385$ Euro (-200 to +630°C)
	0	1	1	0	Reserved
	0	1	1	1	10 Ω Copper (-200 to +260°C)
	1	0	0	0	120 Ω Nickel (-60 to +250°C)
	1	0	0	1	100 Ω Nickel (-60 to +250°C)
	1	0	1	0	200 Ω Nickel (-60 to +250°C)
	1	0	1	1	500 Ω Nickel (-60 to +250°C)
	1	1	0	0	Reserved

Thermocouple Type					Range
Bit	03	02	01	00	Channel 0 (Write word 1)
Bit	07	06	05	04	Channel 1 (Write word 1)
Bit	11	10	09	08	Channel 2 (Write word 1)
Bit	15	14	13	12	Channel 3 (Write word 1)
Bit	03	02	01	00	Channel 4 (Write word 2)
Bit	07	06	05	04	Channel 5 (Write word 2)
Bit	11	10	09	08	Channel 6 (Write word 2)
Bit	15	14	13	12	Channel 7 (Write word 2)
	0	0	0	0	mV (default)
	0	0	0	1	B -300 to 1800°C (-572 to 3272°F)
	0	0	1	0	E -270 to 1000°C (-454 to 1832°F)
	0	0	1	1	J -210 to 1200°C (-346 to 2192°F)
	0	1	0	0	K -270 to 1372°C (-454 to 2502°F)
	0	1	0	1	R -50 to 1768°C (-58 to 3214°F)
	0	1	1	0	S -50 to 1768°C (-58 to 3214°F)
	0	1	1	1	T -270 to 400°C (-454 to 752°F)
	1	0	0	0	C 0 to 2315°C (32 to 4199°F)
	1	0	0	1	N -270 to 1300°C (-450 to 2372°F)
	1	0	1	0	TXK/XK(L) -200 to 800°C (-328 to 1472°F)
	1	0	1	1	Reserved
	1	1	0	0	Module reports cold junction sensor temperature for channels 00-03
	1	1	0	1	Module reports cold junction sensor temperature for channels 04-07
	1	1	1	0	Reserved
	1	1	1	1	No input device connected - do not scan

Specifications	1794-IR8	1794-IR8																																	
Number of Inputs	8 channels																																		
Module Location	Cat. No. 1794-TB2, -TB3, -TB3S, -TB3T and -TB3TS Terminal Base Units																																		
Nominal Input Ranges	-76.5 to +76.5mV	1 to 433 ohms																																	
Supported Thermocouple Types (1794-IR8 only)	<table border="1"> <thead> <tr> <th>Type</th><th>Range °C</th><th>Range °F</th></tr> </thead> <tbody> <tr> <td>B</td><td>300 to 1800°C</td><td>(572 to 3272°F)</td></tr> <tr> <td>C</td><td>0 to 2315°C</td><td>(32 to 4199°F)</td></tr> <tr> <td>E</td><td>-270 to 1000°C</td><td>(-454 to 1832°F)</td></tr> <tr> <td>J</td><td>-210 to 1200°C</td><td>(-348 to 2192°F)</td></tr> <tr> <td>K</td><td>-270 to 1372°C</td><td>(-454 to 2500°F)</td></tr> <tr> <td>TXK/XX(L)</td><td>-200 to 800°C</td><td>(-328 to 1472°F)</td></tr> <tr> <td>N</td><td>-270 to 1300°C</td><td>(-454 to 2372°F)</td></tr> <tr> <td>R</td><td>-50 to 1768°C</td><td>(-58 to 3214°F)</td></tr> <tr> <td>S</td><td>-50 to 1768°C</td><td>(-58 to 3214°F)</td></tr> <tr> <td>T</td><td>-270 to 400°C</td><td>(-454 to 752°F)</td></tr> </tbody> </table>	Type	Range °C	Range °F	B	300 to 1800°C	(572 to 3272°F)	C	0 to 2315°C	(32 to 4199°F)	E	-270 to 1000°C	(-454 to 1832°F)	J	-210 to 1200°C	(-348 to 2192°F)	K	-270 to 1372°C	(-454 to 2500°F)	TXK/XX(L)	-200 to 800°C	(-328 to 1472°F)	N	-270 to 1300°C	(-454 to 2372°F)	R	-50 to 1768°C	(-58 to 3214°F)	S	-50 to 1768°C	(-58 to 3214°F)	T	-270 to 400°C	(-454 to 752°F)	
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Supported RTDs (1794-IR8 only)	Resistance 100Ω Pt α = 0.00385 Euro (-200 to +870°C) 100Ω Pt α = 0.003916 U.S. (-200 to +830°C) 200Ω Pt α = 0.00385 Euro (-200 to +400°C) 500Ω Pt α = 0.00385 Euro (-200 to +630°C) 100Ω Nickel α = 0.00618 (-60 to +250°C) 120Ω Nickel α = 0.00672 (-60 to +250°C) 200Ω Nickel α = 0.00618 (-60 to +250°C) 500Ω Nickel α = 0.00618 (-60 to +250°C) 10Ω Copper α = 0.00427 (-200 to +260°C)																																		
RTD Excitation Current		718.36μA																																	
Resolution	16 bits (2.384μV typical)	16 bits across 435 ohms																																	
Accuracy	Refer to "Calculating the Accuracy" section in Appendix A of the user manual (1794-UM007)	Without calibration, at low humidity: Normal mode: 0.05% full scale (max) Enh. mode: 0.01% full scale (typical)																																	
Common Mode Rejection	-115db @ 60Hz; -100db @ 50Hz	-120db @ 60Hz; -100db @ 50Hz with A/D filter cutoff @ 10Hz																																	
Common Mode Input Range	+10V maximum	0V between channels (common return)																																	
Isolation Voltage	Tested at 850V dc for 1s from inputs and user power to logic side																																		
Data Format	16-bit 2's complement or offset binary (unipolar)																																		

Normal Mode Noise Rejection	-60db @ 60Hz	-60db @ 60Hz for A/D filter cutoff @ 10Hz
Input Offset Drift w/Temperature	±6mV/°C maximum	1.5 milliohm/°C maximum
Gain Drift w/Temp.	10ppm/°C maximum	Normal mode: 20ppm/°C max. Enhanced mode: 10ppm/°C max.
Channel Bandwidth	0-2.62Hz (-3db)	
Settling time to 100% of final value	Available at system throughput rate	
System Throughput	325ms (1 channel scanned), programmable to 28ms 2.6s (8 channels scanned), programmable to 224ms	Normal mode - 325ms (1 channel scanned), programmable to 28ms 2.6s (8 channels scanned), programmable to 224ms Enhanced mode - programmable from 56 to 650ms/channel - 650ms (1 channel scanned), 2.925s (8 channels scanned)
Open TC/RTD Circuit Detection	Out of range reading (upscale)	
Open TC/RTD Time	Available at system throughput rate	
Overvoltage Capability	35V dc, 25V ac continuous at 25°C	
Overall Drift with Temperature	50ppm/°C of span (maximum)	
Cold Junction Compensation	Range: 0 to 70°C A-B catalog number 1794-CJC2	
Channel to channel isolation	±10V	0V
Indicators	1 red/green power status indicator	
Flexbus Current	20mA	
Power Dissipation	3.0W maximum @ 31.2V dc	
Thermal Dissipation	Maximum 10.2 BTU/hr @ 31.2V dc	
Keystwitch Position	3	

External dc Power Supply Voltage Range	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 19.2 to 31.2V dc for ambient temperatures $\leq 40^{\circ}\text{C}$ 24V dc maximum for ambient temperatures = 55°C See derating curve 150mA @ 24V dc	
Supply Current	150mA @ 24V dc	
Dimensions (with module installed)	31.8H x 3.7W x 2.1D inches 45.7H x 94W x 53.3D mm	
Environmental Conditions		
Operating Temperature	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): 0 to 55°C (32 to 131°F)	
Storage Temperature	IEC 60068-2-1 (Test Ab, Un-packaged Non-operating Cold), IEC 60068-2-2 (Test Bb, Un-packaged Non-operating Dry Heat), IEC 60068-2-14 (Test Na, Un-packaged Non-operating Thermal Shock): -40 to 85°C (-40 to 185°F)	
Relative Humidity	IEC 60068-2-30 (Test Db, Un-packaged Non-operating Damp Heat): 5 to 95% non-condensing	
Vibration	IEC60068-2-6 (Test Fc, Operating): 5g @ 10-500Hz	
Shock	IEC60068-2-27 (Test Ea, Unpackaged shock): Operating 30g Non-operating 50g	
Emissions	CISPR 11: Group 1, Class A (with appropriate enclosure)	
ESD Immunity	IEC 61000-4-2: 4kV contact discharges 8kV air discharges	
Radiated RF Immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80%AM from 30MHz to 1000MHz	
EUT/B Immunity	IEC 61000-4-4: $\pm 2\text{kV}$ at 5kHz on signal ports	
Surge Transient Immunity	IEC 61000-4-5: $\pm 2\text{kV}$ line-earth(CM) on shielded ports	
Conducted RF Immunity	IEC 61000-4-6: 10Vrms with 1kHz sine-wave 80%AM from 150kHz to 30MHz	
Enclosure Type Rating	None (open-style)	
Signal Conductors Thermocouple	Thermocouple - Use appropriate shielded thermocouple wire ¹	2-wire - Belden 9501 3-wire, less than 100ft with normal humidity - Belden 9533
Millivolt Category ²	Belden 8761 2	3-wire greater than 100ft or normal humidity (> 55°C for > 8 hrs) - Belden 83503
Power Conductors Wire Size	12AWG (4mm ²) stranded copper wire rated at 75°C or higher 3/64 inch (1.2mm) insulation maximum	
Category ²	2	
Certifications (when product is marked) ³	UL	UL Listed Industrial Control Equipment
	c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada (1794-IT8)
	c-UL-us	UL listed for Class I, Division 2, Groups A, B, C and D Hazardous locations, certified for US and Canada (1794-IT8)
	CSA	CSA certified Process Control Equipment
	CSA	CSA certified for Class I, Division 2, Groups A, B, C and D Hazardous locations
	EEEx	European Union 94/9/EEC ATEX Directive, compliant with: EN 50021; Potentially Explosive Atmospheres, Protection "n" (Zone 2)
	CE ³	European Union 89/336/EEC EMC Directive, compliant with: EN 61000-6-4; Industrial Emissions EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity
	C-Tick ³	Australian Radiocommunications Act compliant with AS/NZS CISPR 11, Industrial Emissions

- 1 Refer to thermocouple manufacturer for proper thermocouple extension.
- 2 You use this category information for planning conductor routing as described in Allen-Bradley publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines.
- 3 For the latest up-to-date information, see the Product Certification link at www.ab.com for Declarations of Conformity, Certificates and other certification details. For notification of any additional release notes, refer to www.ab.com/manuals/.

Graph showing the safe operating area for the device. The Y-axis is 'User Applied 24V dc Supply' and the X-axis is 'Ambient Temperature'.

The safe operating area is defined by the shaded region, which is bounded by the Y-axis (0°C), the X-axis (55°C), and the line connecting (40°C, 31.2V) and (55°C, 24.0V).

Key points on the graph:

- Y-axis: 19.2, 24.0, 31.2
- X-axis: 0°C, 25°C, 40°C, 50°C, 55°C
- Safe operating area: Shaded gray region.

The area within the curve represents the safe operating range for the module under various conditions of user supplied 24V dc supply voltages and ambient temperatures.