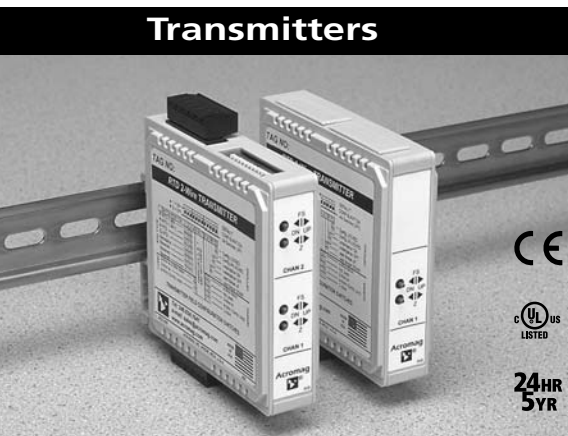




Transmitters



24HR
5YR

650T Units Multi-Channel, Two-Wire Transmitters

RTD / Resistance Input

Models

657T: Single RTD input channel

658T: Dual RTD input channels

Input Ranges

RTD: 100 ohm Pt, 120 ohm Ni, 10 ohm Cu

Resistance: 0 to 500 ohms

Output Range

4 to 20mA DC

Power Requirement

12 to 50V DC (loop-powered)

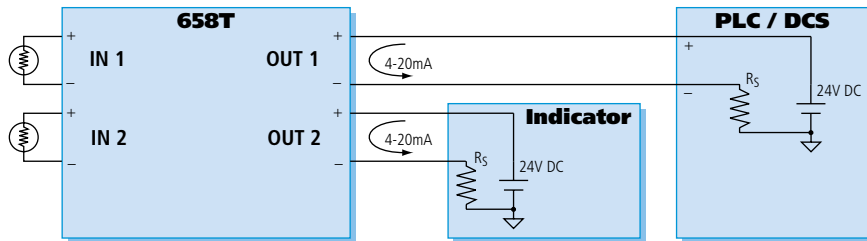
Two-wire transmitter

Approvals

CE marked. UL, cUL listed

Class I; Division 2; Groups A, B, C, D.

Single/Dual Channel Loop-Powered Transmitter



Description

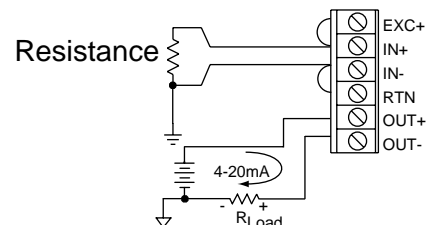
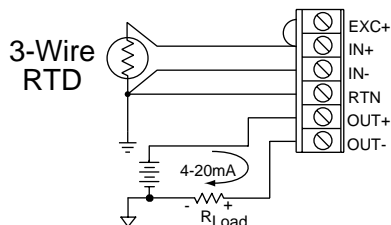
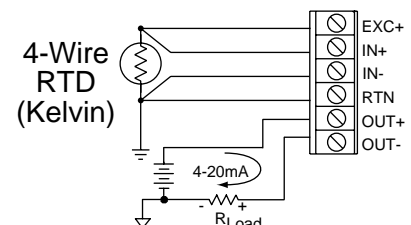
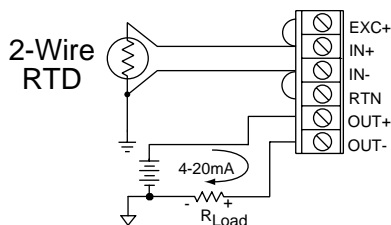
These units accept universal RTD or resistance input signals and output proportional DC current signals. The output can also be linearized to the input sensor signal. Single-channel 657T and dual-channel 658T units are ideal for panel shops and end-users who require a high-density signal conditioner that can accommodate a broad range of temperature measurement applications.

Configuration is fast and easy. First, you select the input type with a simple DIP switch. Then, you set your zero/full-scale output values using a toggle switch on the front panel to increase or decrease the signal until you read the desired output value on your voltmeter. The toggles make it easy to calibrate a normal (proportional) or reverse-acting (inverse) response in seconds. After completing the calibration, just press the mode/set toggle and your configuration settings are safely saved to nonvolatile memory.

Special Features

- Selectable RTD input types offer flexibility to fit many applications.
- DIP switch-configuration and self-ranging technologies speed installation without pots, jumpers, or software.
- Toggle-switch calibration simplifies field adjustments for faster and easier maintenance.
- Configuration lockout safety feature prevents tampering and accidental changes.
- Reverse-acting output capability enables inverse proportional control signals.
- Dual channel model saves space and reduces equipment costs.
- High-resolution Σ - Δ A/D converters deliver superior accuracy for reliable measurements.
- Lead break detection supports upscale or downscale failsafe mode.

Input Connections





Performance

General Input

Analog to Digital Converter (ADC)
16-bit $\Sigma\text{-}\Delta$ A/D converter.

Noise Rejection

Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 100dB @ 60Hz.

Input Overvoltage Protection

Bipolar Transient Voltage Suppressors (TVS).

Input Impedance

400K ohm at 10mV span;
input current, $\pm 25\text{nA}$, typical ($\pm 30\text{nA}$, max.).

RTD Input

RTD Input Ranges

100 Ω Pt, 120 Ω Ni, or 10 Ω Cu; user-configured.

RTD	$^{\circ}\text{C}$ Range ($^{\circ}\text{F}$ Range)	Accuracy
Pt ¹	-200 to 850 $^{\circ}\text{C}$ (-328 to 1562 $^{\circ}\text{F}$)	$\pm 0.25^{\circ}\text{C}$
Pt ²	-200 to 850 $^{\circ}\text{C}$ (-328 to 1562 $^{\circ}\text{F}$)	$\pm 0.25^{\circ}\text{C}$
Ni	-80 to 320 $^{\circ}\text{C}$ (-112 to 608 $^{\circ}\text{F}$)	$\pm 0.25^{\circ}\text{C}$
Cu	-200 to 260 $^{\circ}\text{C}$ (-328 to 500 $^{\circ}\text{F}$)	$\pm 1.00^{\circ}\text{C}$

Alpha: Pt¹ ($\alpha = 1.3850$), Pt² ($\alpha = 1.3911$),
Ni ($\alpha = 1.6720$), Cu ($\alpha = 1.4272$).

2, 3, or 4-wire configurations supported. Module provides sensor excitation, linearization, lead-wire compensation, and sensor break detection.

RTD Excitation Current

0.5mA DC typical, all types.

RTD Lead-Wire Compensation

25 ohms per lead.

RTD Break Detection

Configurable for either upscale or downscale.

Resistance Input

Resistance Input Range

0 to 500 ohms.

Resistance Accuracy

± 0.05 ohms.

Output

Output Range

Range: 4 to 20mA DC, 3.8 to 22mA range typical.

Output Compliance

$R_{LOAD} = (V_{SUPPLY} - 12V) / 0.02A$

Output Response Control

Proportional/inverse selectable.

Ambient Temperature Effect

Better than $\pm 0.006\%$ of input span per $^{\circ}\text{C}$ or $\pm 100\text{ppm}/^{\circ}\text{C}$, whichever is greater.

Output Response Time (for input step change)

700ms typical to 98% of final output value.

Environmental

Ambient Temperature

Operating: -25 to 75 $^{\circ}\text{C}$ (-13 to 167 $^{\circ}\text{F}$).
Storage: -40 to 85 $^{\circ}\text{C}$ (-40 to 185 $^{\circ}\text{F}$).

Relative Humidity

5 to 95%, noncondensing.

Power Requirement

12 to 50V DC @ 25mA for each output channel.

Isolation

Not isolated.

Radiated Field Immunity (RFI)

Complies with EN61000-4-3 Level 3 and EN50082-1.

Electromagnetic Field Immunity (EMI)

Less than $\pm 0.25\%$ of output span effect.

Electrical Fast Transient (EFT)

Complies with EN61000-4-4 Level 3 and EN50082-1.

Electrostatic Discharge (ESD)

Complies with EN61000-4-2 Level 3 and EN50082-1.

Radiated Emissions

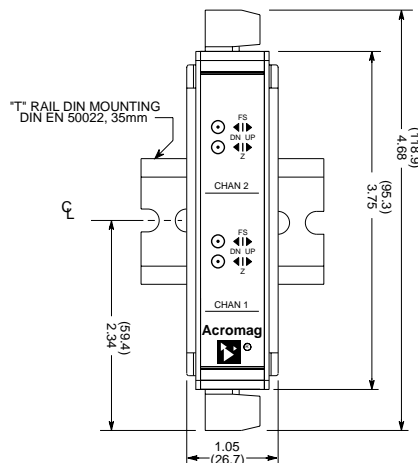
Meets or exceeds EN50081-1 for Class B equipment.

Approvals

CE marked.
UL listed (UL508 and UL1604).
cUL listed (C22.2, 142-M1987 and 213-M1987).
Hazardous Loc.: Class I; Division 2; Groups A, B, C, D.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.



NOTE: ALL DIMENSION ARE IN INCHES (MILLIMETERS)

Physical

Enclosure

Case: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2 NEMA Type 1 enclosure.

Connectors (Removable Terminal Blocks)

Wire Range: AWG #12-24.

Printed Circuit Boards

Military grade FR-4 epoxy glass circuit board.

Dimensions

1.05W x 4.68H x 4.35D inches.
26.7W x 118.9H x 110.5D millimeters.

Shipping Weight

1 pound (0.45 Kg) packed.

Ordering Information

Models

657T-0600 (add "-C" for factory calibration)
Single channel RTD 2-wire transmitter

658T-0600 (add "-C" for factory calibration)
Dual channel RTD 2-wire transmitter

Accessories (see Page 108)

PS5R-D24

Power supply (24V DC, 2.1A).
See Power Supplies on page 183.

TBK-B01

Optional terminal block kit, barrier strip style, 2 pcs.

TBK-S01

Optional terminal block kit, spring clamp style, 2 pcs.

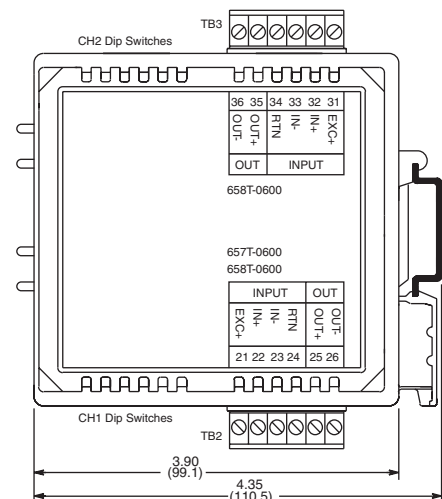
DIN RAIL 3.0

DIN RAIL 16.7

DIN rail strip, Type T, 3 inches (75mm) or 16.7 inches (425mm)

20RM-16-DIN

19" rack-mount kit with DIN rail.
Holds sixteen 650T transmitters.





Accessories

Terminal Blocks

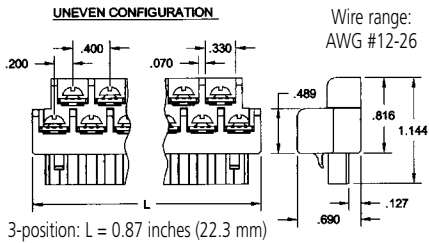
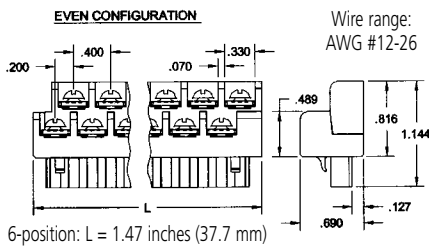


Barrier strip (left) and spring clamp (right).

Ordering Information

See individual I/O modules for compatibility.

Barrier Strip Terminal Blocks

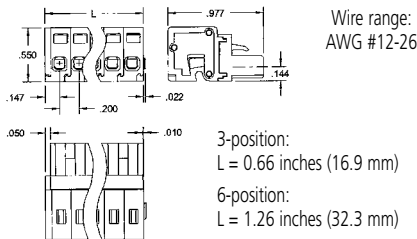


TBK-B01
Terminal block kit,
two 6-position pieces

TBK-B03
Terminal block kit,
one 3-position and
three 6-position pieces

TBK-B02
Terminal block kit,
four 6-position pieces

Spring Clamp Terminal Blocks



TBK-S01
Terminal block kit,
two 6-position pieces

TBK-S03
Terminal block kit,
one 3-position and
three 6-position pieces

TBK-S02
Terminal block kit,
four 6-position pieces

Mounting Hardware

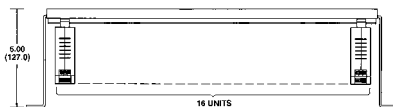
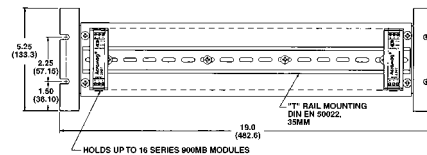


DIN-Rail Mounting

For your convenience, Acromag offers several mounting accessories to simplify your system installation. Our 19" rack-mount kit provides a clean solution for mounting your I/O modules and a power supply. Or you can buy precut DIN rail strips for mounting on any flat surface.

Ordering Information

- 20RM-16-DIN 19" rack-mount kit with DIN rail.
- DIN RAIL 3.0
- DIN RAIL 16.7
- DIN rail strip, Type T, 3 inches (75mm) or 16.7 inches (425mm)



Power Supplies



50W Supply

Input Power Requirement
85 to 264V AC or 105 to 370V DC

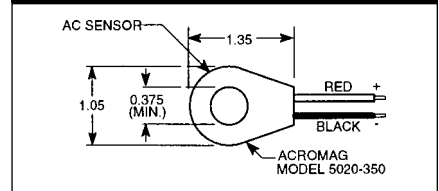
Output
24V DC, 2.1A (50W)

Ordering Information

PSSR-D24
Universal 50W power supply

See Power Supplies on page 183 for other models and more information.

AC Current Sensor



Ordering Information

5020-350
AC current sensor