



Smart Transmitters



151T/155H Units Universal Input (TC, RTD, mV, ohms)

Models

151T: PC-configured transmitter

155H: HART®-configured transmitter

ATW-TLD: Optional plug-in LCD display with two-line text and bar graph readout

Input Ranges

Universal input with PC or HART configuration

- RTD (2, 3, and 4-wire),
100 ohm Pt DIN (alpha = 0.00385),
100 ohm Pt SAMA, (alpha = 0.003923)
10 ohm Cu, 100 ohm Ni, 120 ohm Ni
- Thermocouple: B, C, E, J, K, L, N, R, S, T, U
- Millivolt (-15 to 115mV)
- 4 to 20mA DC (with optional 5 ohm resistor)
- Resistance (0 to 500 ohms)

Output Ranges

- 4 to 20mA (both models)
- HART protocol (155H model only)

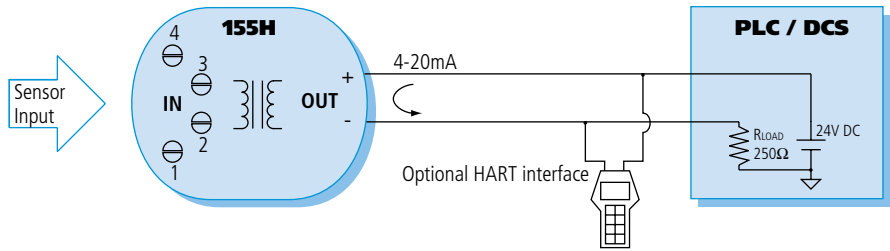
Power Requirement

- Loop-powered (2-wire), 12 to 42V DC

Approvals

- CE marked. CSA:
Class I Division 2 Groups A, B, C, D.

PC or HART®-configured Two-Wire Transmitter



Description

These programmable transmitters convert temperature and other sensor inputs to a proportional process current signal. A HART protocol output is optional.

Acromag's 1500 series transmitters bring the best elements of analog and smart digital technologies together to offer unsurpassed value for temperature measurement applications. They deliver superior accuracy, unrivaled versatility, and are extremely easy to use. Save time. Cut costs. And improve performance.

Two models are available. The 151T model is a standard PC-configurable two-wire transmitter. The 155H is a two-wire transmitter with a HART interface for communication and configuration.

Options include a plug-in LCD display and an explosion-proof enclosure. The two-line display provides a 4½ digit readout in °C or °F, a bar graph, and a text line for tag information. Push-buttons on the display unit allow you to configure the transmitter in the field. The enclosure is ideal for field mounting in hazardous locations. A window maintains visibility for the LCD display.



Special Features

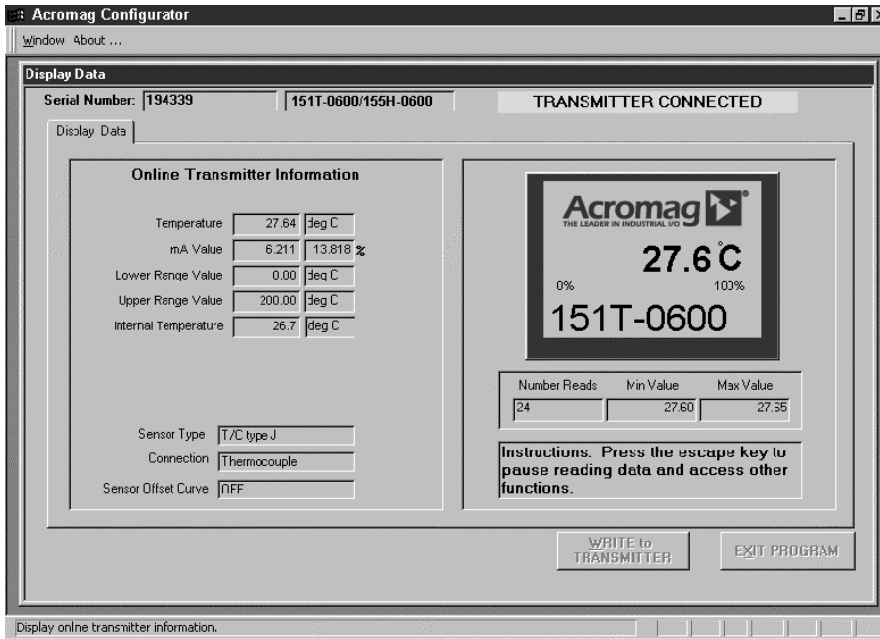
- Microprocessor reduces setup time, improves performance, and performs self-diagnostics.
- Multivariable transmitter accepts a variety of input sensor types to meet most applications and help minimize inventory requirements.
- Multifunction LCD readout displays temperature in °C or °F, a bar graph, the tag name, and diagnostic data.
- Flexible configuration supports setup via a PC with Acromag's software interface package, a standard handheld 275 HART communicator (155H only), or by using pushbuttons on the optional LCD display.
- 22-breakpoint linearizer table helps the user define custom output transfer functions.
- Sensor break detection and reporting functions allow users to specify a failsafe output and post a message on the optional LCD display.
- Automatic cold-junction compensation ensures high accuracy over a wide temperature range.
- Isolation between input/output circuits allows the use of grounded or ungrounded sensors.
- Output ranges can be set in engineering units anywhere within the input sensor range. No minimum/maximum span limitation.



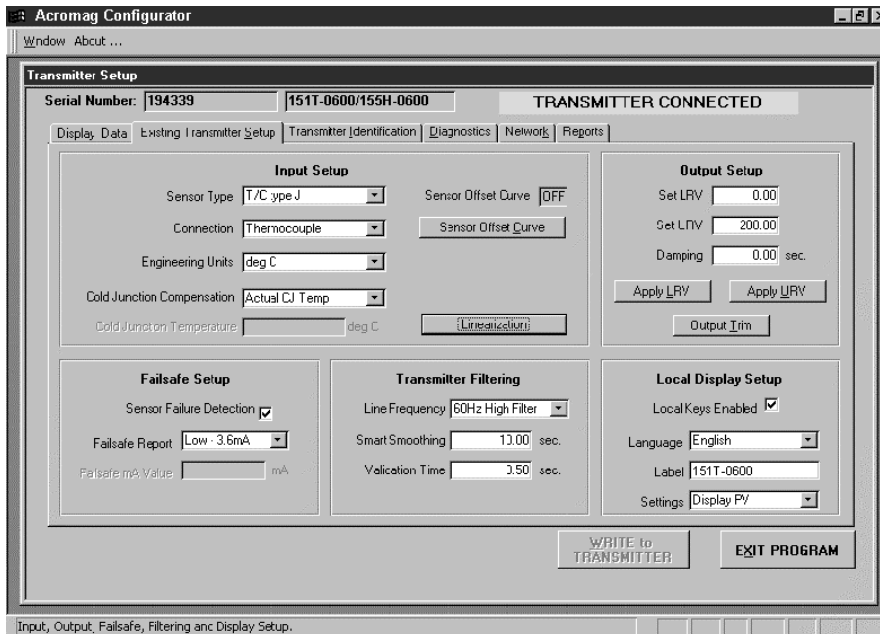
Explosion-proof and NEMA 4X stainless steel industrial enclosures are available.



Model 151T PC Configuration



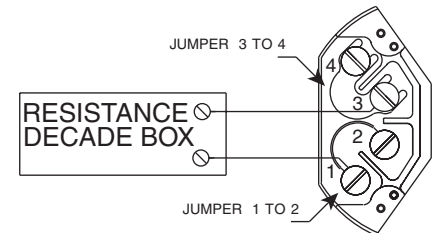
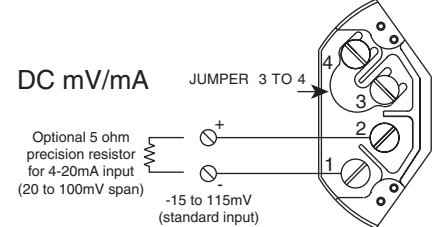
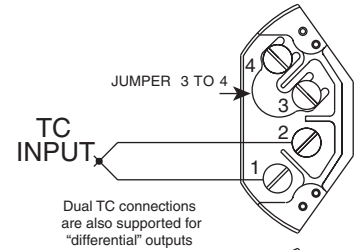
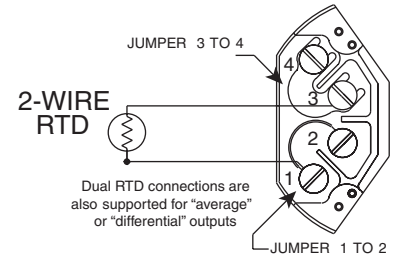
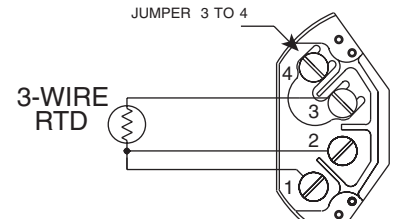
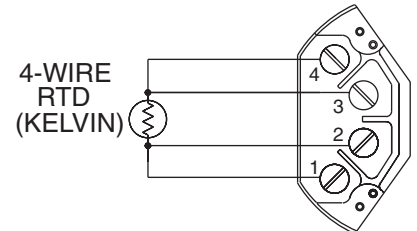
The Display Data screen shows the current status of the transmitter and simulates the readout on the optional LCD display.



Configuring Acromag's 151T and 155H transmitters is easy. The software interface package provides simple pull-down selection menus and fill-in-the-blank fields.

1500 Series Installation

Input Connections

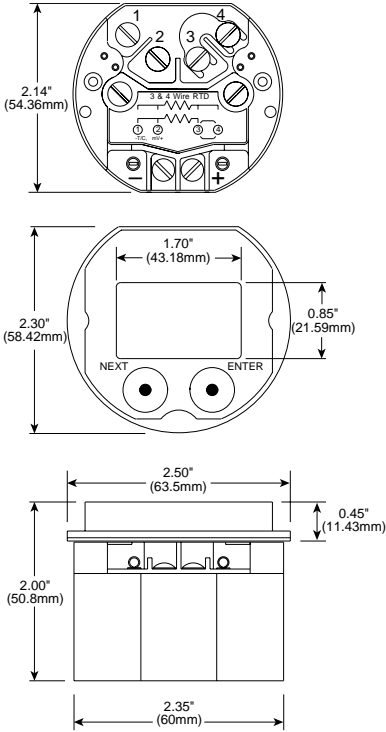


1500 Series

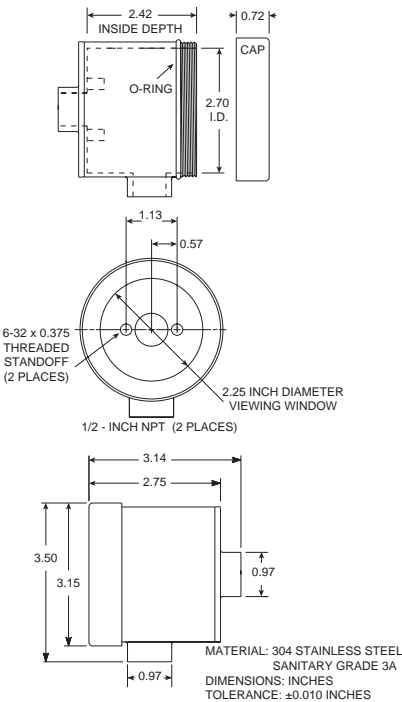


151T/155H Units Installation

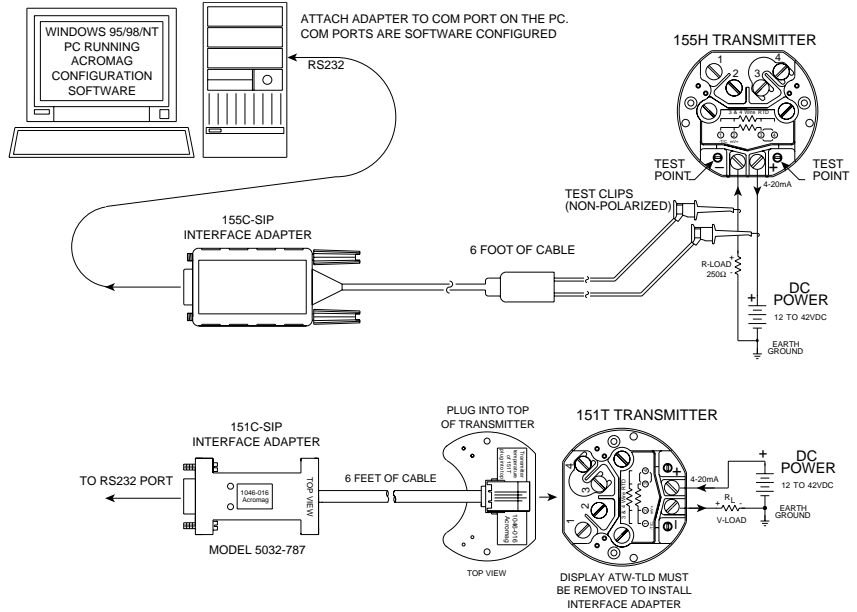
Dimensions



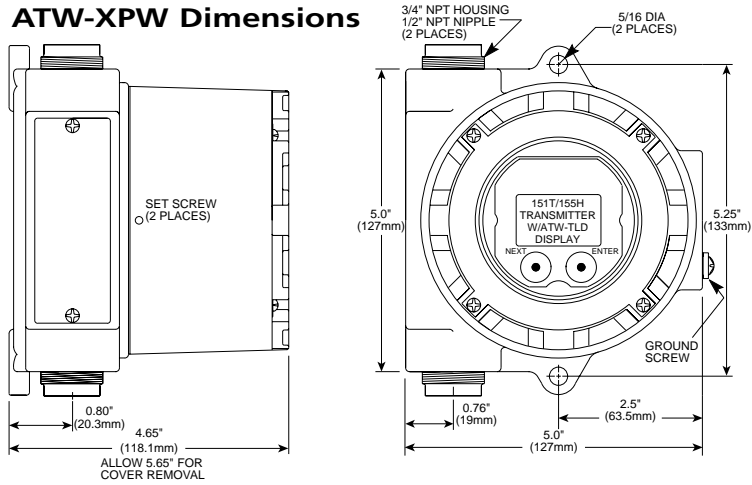
ATW-SSW Dimensions



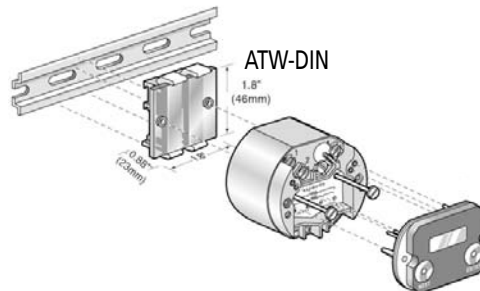
PC Configuration Connections



ATW-XPW Dimensions



DIN Rail Mounting





■ Performance

■ General Input

Digital Input Accuracy

±0.05% of equivalent millivolt or ohm reading, or the accuracy shown in range tables, whichever is greater.

Ambient Temperature Effect

Self-correcting over full operating temperature range for changes up to 20°C/hour. Error is less than half the reference accuracy plus 0.1°C per 28°C change.

Noise Rejection

Common Mode: Better than 120dB @ 60Hz.

Sensor Break Detection

Failsafe response configurable for upscale (23mA), downscale (3.6mA), or no circuit response.

Linearization

TC and RTD linearization to ±0.05°C. Custom software configuration table supports up to 22 breakpoints.

Input Conversion Rate

7 conversions per second (150mS), typical.

Cold Junction Measurement Accuracy

±0.5°C (±0.9°F).

Input Impedance

Thermocouple/millivolt input: 0.2M ohm.
RTD/resistance input: 1M ohm.

RTD Input Configuration

Supports two, three, and four-wire (Kelvin) RTDs.

RTD Excitation Current

0.3mA nominal.

■ Input Ranges & Accuracy

Input Type	Input Range	Minimum Span	Accuracy
TC Type B	260 to 1820°C (109 to 3272°F)	100°C (212°F)	±0.8°C (±1.5°F)
TC Type C	0 to 2320°C (32 to 4208°F)	100°C (212°F)	±0.8°C (±1.5°F)
TC Type E	-270 to 1000°C (-454 to 1832°F)	20°C (68°F)	±0.3°C (±0.5°F)
TC Type J	-210 to 1200°C (-346 to 2192°F)	20°C (68°F)	±0.3°C (±0.5°F)
TC Type K	-270 to 1372°C (-454 to 2502°F)	20°C (68°F)	±0.3°C (±0.5°F)
TC Type L	-200 to 900°C (-328 to 1652°F)	20°C (68°F)	±0.3°C (±0.5°F)
TC Type N	270 to 1300°C (518 to 2372°F)	20°C (68°F)	±0.3°C (±0.5°F)
TC Type R	50 to 1768°C (122 to 3214°F)	25°C (77°F)	±0.8°C (±1.5°F)
TC Type S	-50 to 1768°C (-58 to 3214°F)	25°C (77°F)	±0.8°C (±1.5°F)
TC Type T	-270 to 400°C (-454 to 752°F)	20°C (68°F)	±0.3°C (±0.5°F)
TC Type U	-200 to 600°C (-328 to 1112°F)	100°C (212°F)	±0.8°C (±1.5°F)
Millivolt	-15 to 115mV DC	3mV	±0.1mV
DC current (4-20mA)	20 to 100mV DC	Requires 5032-850 precision resistor	
Platinum RTD, 100 ohm, alpha = 385, 392	-200 to 850°C (-328 to 1562°F)	10°C (50°F)	±0.14°C (±0.25°F)
Nickel RTD, 120 ohm	-80 to 320°C (-112 to 608°F)	10°C (50°F)	±0.14°C (±0.25°F)
Nickel RTD, 100 ohm	-60 to 250°C (-76 to 482°F)	10°C (50°F)	±0.14°C (±0.25°F)
Copper RTD, 10 ohm	-70 to 150°C (-94 to 302°F)	100°C (212°F)	±0.14°C (±0.25°F)
Resistance	0 to 500 ohm	n/a	±0.06 ohm

■ Output

Output Range

4 to 20mA DC.

Output Accuracy

±0.05% of span.

Output Load Compliance

$R_{LOAD} = (V_{SUPPLY} - 12V) / 23mA$.
500 ohm @ 24V DC supply.

Output Response Time (for input step change)

250mS typical to 98% of final output value.

Output Action

Normal or reverse acting.

Damping

Adjustable from 0 to 32 seconds.

■ Environmental

Ambient Temperature Range (Operating)

Electronics: -40 to 85°C (-40 to 185°F).

Display: -20 to 70°C (-4 to 158°F).

Relative Humidity

5 to 100% non-condensing.

Power Requirements

12 to 42V DC @ 25mA.

Isolation

250V AC (354V DC) continuous isolation between input and output circuits.

Approvals

CE marked.

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

EMI/RFI Susceptibility

Less than ±0.5% of reading at 10V/m, 20KHz-1GHz.

Electrical Fast Transient (EFT)

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

Surge Withstanding Capability (SWC)

Complies with EN61000-4-5 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.

■ Physical

Enclosure

Sealed Lexan® plastic with waterproof potting.

Connectors

Wire Range: AWG #10-24.

Printed Circuit Boards

Military grade FR-4 epoxy glass circuit board.

Shipping Weight

1 pound (0.45 Kg) packed.

■ Ordering Information

Models

151T-0600-C

PC-configured transmitter (no HART protocol).
Default calibration TC Type J thermocouple,
input: 40 to 200°F, output: 4 to 20mA unless
customer specified

155H-0600-C

HART-configured transmitter, calibration same as
above

151C-SIP

Software interface package for 151T-0600. Includes
user manual, CD-ROM, PC serial port adapter, cable.

155H-SIP

Software interface package for 155H-0600. Includes
user manual, CD-ROM, PC serial port adapter, cable.

ATW-TLD

Plug-in LCD display (compatible with 151T and 155H)

Accessories

5032-850: Precision 5 ohm (4 to 20mA sensing)
resistor, 0.1%, 0.75W.

5034-225: USB-to-RS232 adapter

ATW-XPW: Explosion-proof housing

ATW-SSW: NEMA4X stainless steel non-corrosive
housing

ATW-DIN: DIN-rail mounting adapter

8500-613: Configuration User's Manual for use with
hand-held 275 HART communicator.

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