

Product Datasheet - Technical Specifications



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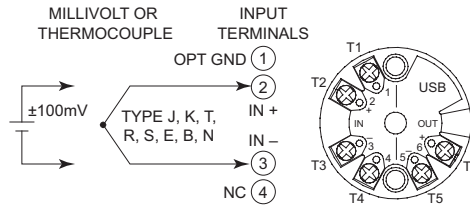


Transmitters: ST130 Series

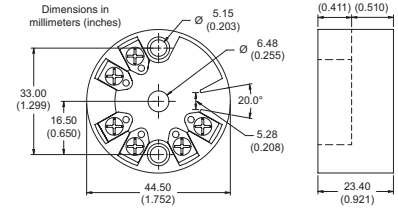
ST133 Isolated thermocouple/mV input head-mount transmitter



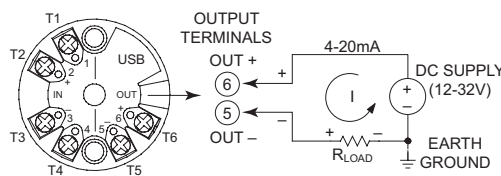
INPUT CONNECTIONS



DIMENSIONS



OUTPUT CONNECTIONS



Thermocouple (8 types) or ±100mV input ♦ 4-20mA output ♦ 1500V isolation ♦ Loop-powered

Description

The ST133 is a low-cost two-wire transmitter that isolates and converts a millivolt or thermocouple sensor input to a proportional 4-20mA control signal. Power is received from the output loop current. The transmitter performs signal linearization, cold-junction compensation, and lead-break detection functions.

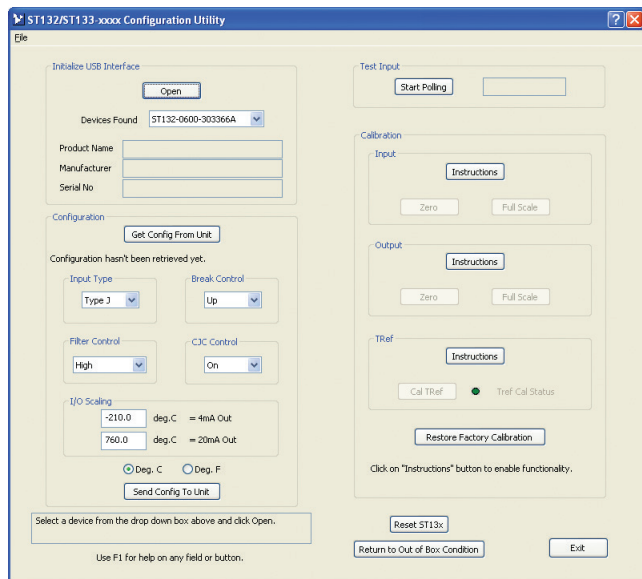
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

Setup and calibration are fast and easy with a convenient USB connection to your PC and Acromag's Windows configuration software.

Advanced signal processing capabilities, variable range input, and convenient USB programming make this instrument a very versatile temperature measurement device. These transmitters can withstand harsh industrial environments and operate reliably across a wide temperature range with very low drift. They feature RFI, EMI, ESD, EFT, and surge protection plus low radiated emissions.

Key Features & Benefits

- Easy setup and digital calibration via USB with Windows configuration software
- Flexible thermocouple or millivolt input ranges (TC Type J, K, T, R, S, E, B, N or ±100mV)
- 1500V input isolation
- 24-bit A/D microcontroller
- High accuracy, linearity, stability, and reliability
- Low temperature drift (<75ppm/°C)
- User selectable filtering (none, low, med. high)
- Fast response time (as low as 90ms)
- Supports reverse-acting (inverse) output
- Selectable upscale or downscale operation for sensor errors and lead-break detection
- Non-polarized output/power connection
- Mounts in DIN Form B sensor heads
- Shock (50g) and vibration (5g) resistant
- Optional DIN rail adapter
- Wide ambient operation (-40 to 80°C)
- Hardened for harsh environments
- CE compliant. UL/cUL Class 1 Div 2 Zone 2 approvals. ATEX Certified.



ST130 Series Transmitter Configuration Software is downloadable (FREE) from www.acromag.com.

ST133 software allows you to configure transmitters offline, save the file, and download settings into units later, at your convenience.



Transmitters: ST130 Series

ST133 Isolated thermocouple input head-mount transmitter with USB-configuration

Performance Specifications

IMPORTANT: To prevent damage or errors from grounded PCs and surges, Acromag strongly recommends use of the USB-ISOLATOR when configuring an ST130 transmitter.

■ USB Interface

USB Connector

USB Mini-B type socket, 5-pin.

USB Data Rate

12Mbps. USB v1.1 and 2.0 compatible.

USB Transient Protection

Transient voltage suppression on power and data lines.

USB Cable Length

5.0 meters maximum.

Driver

Not required. Uses built-in Human Interface Device (HID) USB drivers of the Windows operating system.

■ Input

Default Configuration/Calibration

Input: TC J, -210 to 760°C, upscale fault, high filter.

Output: 4 to 20mA.

Input Ranges and Accuracy

Input	Range	Accuracy
TC J	-210 to 760°C (-346 to 1400°F)	±0.5°C
TC K	-200 to 1372°C (-328 to 2502°F)	±0.5°C
TC T	-260 to 400°C (-436 to 752°F)	±0.5°C
TC R	-50 to 1768°C (-58 to 3214°F)	±1.0°C
TC S	-50 to 1768°C (-58 to 3214°F)	±1.0°C
TC E	-200 to 1000°C (-328 to 1832°F)	±0.5°C
TC B	260 to 1820°C (500 to 3308°F)	±1.0°C
TC N	-230 to 1300°C (-382 to 2372°F)	±1.0°C
mV	-100 to 100mV	±0.1mV

Error includes the effects of repeatability, terminal point conformity, and linearization at 25°C operating ambient temperature.

Thermocouple Reference

(Cold Junction Compensation)

±0.1°C typical, ±0.3°C maximum at 25°C.

Ambient Temperature Effect

Better than ±75ppm/°C (±0.0075%/°C).

Zero Scaling Adjust

0 to 95% of range, typical.

Full Scale Adjust

5 to 100% of full scale range, typical.

Lead Break (Sensor Burnout) Detection

Configurable for either upscale (24mA) or downscale (3.3mA) operation.

Thermocouple Input Bias Current

±250nA typical (TC break).

Input Over-Voltage Protection

Bipolar Transient Voltage Suppressors (TVS), 5.6V clamp level typical.

Resolution

Millivolt input: 0.0025% (1 part in 40,000)
Thermocouple input: 0.1°C.

Input Filter

Normal mode filtering, plus selectable digital filtering settings (none, low, medium, high) optimized and fixed per input range within the A/D converter.

Noise Rejection (Normal Mode)

75dB @ 60Hz, typical with 100 ohm input unbalance.

■ Output

Output Range

4 to 20mA DC.

Output Compliance

$R_{LOAD} = (V_{SUPPLY} - 12V) / 0.024A$.

$R_{LOAD} = 0$ to 500 ohms @ 24V DC.

Output Response Time (for step input change)

Time to reach 98% of final output value (typical)	
No filtering	90 to 125ms
Low filter	240 to 420ms
Medium filter	550 to 1020ms
High filter	900 to 1500ms

■ Environmental

Operating temperature

-40 to 80°C (-40° to 176°F).

Storage temperature

-40 to 85°C (-40 to 185°F).

Relative humidity

5 to 95% non-condensing.

Power Requirement

12-32V DC SELV (Safety Extra Low Voltage), 24mA max.

Isolation

1500V AC peak. 250V AC (354V DC) continuous isolation between input and output circuits.

Shock and Vibration Immunity

Vibration: 5g, per IEC 60068-2-64.

Shock: 50g, per IEC 60068-2-27.

Electromagnetic Compatibility (EMC) Compliance

Radiated Emissions: BS EN 61000-6-4, CISPR 16.

RFI: BS EN 61000-6-2, IEC 61000-4-3.

Conducted RFI: BS EN 61000-6-2, IEC 61000-4-6.

ESD: BS EN 61000-6-2, IEC 61000-4-2.

EFT: BS EN 61000-6-2, IEC 61000-4-4.

Surge Immunity: BS EN 61000-6-2, IEC 61000-4-5.

Approvals

CE compliant. UL/cUL listings. ATEX Certified.

Designed for Class I; Division 2; Groups ABCD; Zone 2.

Ⓜ II 3 G Ex nA IIC T4 Gc -40°C ≤ Ta ≤ +80°C

■ Physical

General

General purpose enclosure with potted circuit designed for mounting in DIN Form B connection heads.

Case Material

Self-extinguishing polycarbonate ABS plastic, UL94 V-0 rated base material. USB dust cap material is Santoprene, 251-70W232.

I/O Connectors

Barrier strip type, captive screw terminals.

Wire range: AWG #14-28 solid or stranded.

Shipping Weight

0.5 pounds (0.22 Kg) packed.

Ordering Information

Models

ST133-1600

Transmitter, thermocouple/millivolt input, CE approval.

ST133-1610

Same as ST133-1600 plus UL/cUL Class 1 Division 2 Zone 2 approval and ATEX Certified.

If mounting screws are required, order one ST130-MTG with each unit.

Services

ST13x-Config/Cal

Factory custom configuration/calibration service.

Specify input type, input/output zero and full-scale values, filtering, and sensor fault settings on order.

Software

ST13C-SIP (recommend one kit per customer)

Software Interface Package. Includes configuration software (ST130-CONFIG), isolator (USB-ISOLATOR) and two USB cables (Part # 4001-112, 4001-113) for Acromag ST130 Series head-mount transmitters.

Accessories

Connection Head Enclosures

See Bulletin 8400-630 or www.acromag.com for info.

ST130-DIN

DIN-rail adapter (Type G or T).

USB-ISOLATOR

USB-to-USB isolator, includes USB cable (4001-112).





Transmitters: ST130 Series

Mounting Accessories Enclosures, adapters, mounting kits



4001-115K Aluminum Explosion-Proof, NEMA-4 rated



4001-116K Stainless Steel Explosion-Proof, NEMA-4X rated



4001-117K Aluminum General-Purpose, NEMA-4X rated



4001-119K Cast Iron General-Purpose, NEMA-4X rated

Simplifies mounting of ST130 Series transmitters ♦ Ideal for mounting in the field or in a control room

Description

For your convenience, Acromag offers a variety of head-mount enclosures and other mounting accessories to simplify your system installation.

Ordering Information

NOTE: For more information visit www.acromag.com.

Mounting Accessories

ST130-MTG

Replacement mounting Kit – Includes two (2) M4 mounting screws, (2) 6-32 mounting screws, and (2) two relief springs for mounting an ST130 transmitter in a DIN Form B connection head.

4001-115K

Explosion-Proof Aluminum Connection Head – FM/FMC, Class I, Division 1, Groups A, B, C, D, T6; Class II, III, Division 1, Groups E, F, G, T6; NEMA 4 rated. Includes M4 mounting screws and springs.

4001-116K

Explosion-Proof Stainless Steel Connection Head – FM/FMC, Class I, Division 1, Groups A, B, C, D, T6; Class II, Division 1, Groups E, F, G, T6; Class III, NEMA 4X rated. Includes M4 mtg screws and springs.

4001-117K

General-Purpose Aluminum Connection Head – NEMA 4X and IP68 rated. Includes M4 mounting screws and springs.

4001-119K

General-Purpose Cast Iron Connection Head – NEMA 4X rated. Includes M4 mtg screws and springs.

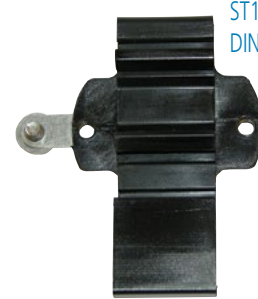
ST130-DIN

Series ST DIN Rail Adapter – Includes a DIN rail bracket with mounting screws that connects a ST130 transmitter to a 35mm T-type or G-type DIN rail. Includes M4 mounting screws and springs.



ST130-MTG Mounting Kit

Required to mount ST130 transmitter in connection head enclosure.

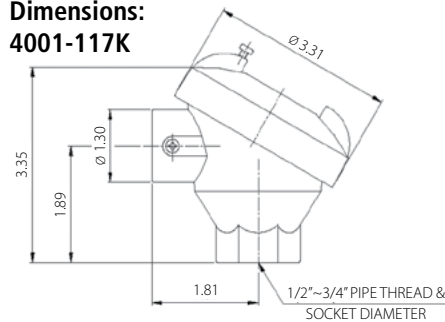


ST130-DIN DIN-rail Adapter

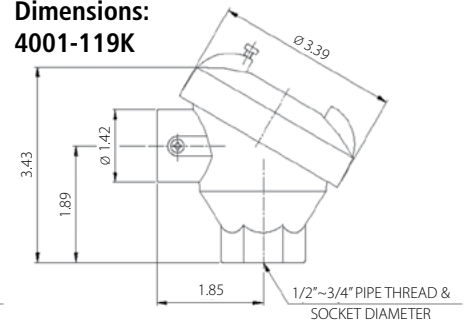


Includes ST130-MTG

Dimensions: 4001-117K



Dimensions: 4001-119K



Dimensions: 4001-115K and 4001-116K

