Transmitters: ST130 Series
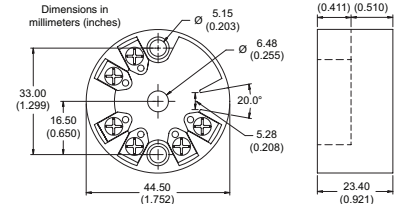
ST131 RTD input head-mount transmitter
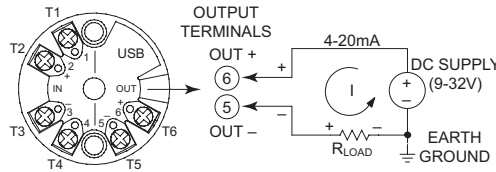
Ex c UL us LISTED CE 24 HOUR STOCK ITEM 2 YEAR WARRANTY RoHS Compliant

USB Configured

INPUT CONNECTIONS

PT RTD OR RESISTANCE
4-WIRE   3-WIRE   2-WIRE

INPUT TERMINALS

IN +
IN –

ADD JUMPER (2-WIRE ONLY)

T1 T2 T3 T4 T5 T6 USB IN OUT

OUTPUT CONNECTIONS

T1 T2 T3 T4 T5 T6 USB IN OUT

OUTPUT TERMINALS
OUT +
OUT –

4-20mA
DC SUPPLY (9-32V)
EARTH GROUND
R_{LOAD}

DIMENSIONS

Dimensions in millimeters (inches)

33.00 (1.299)
16.50 (0.650)
44.50 (1.752)
Ø 5.15 (0.203)
Ø 6.48 (0.255)
20.0°
5.28 (0.208)
10.44 (0.411) 12.96 (0.510)
23.40 (0.921)
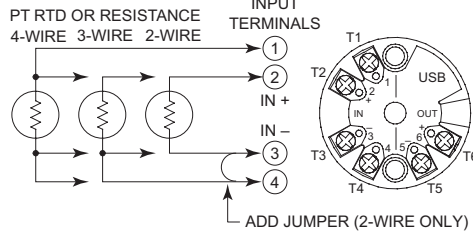
## 100 ohm Pt RTD or 0-900 ohm input ◆ 4-20mA output ◆ Loop-powered, 9-32V DC

Description

The ST131 is a low-cost two-wire transmitter that converts a 100 ohm Platinum RTD sensor input to a proportional 4-20mA signal. Power is received from the output loop current. The transmitter provides sensor excitation and includes linearization, lead-wire compensation, and lead-break detection functions. 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 transmitter for RTD and resistance elements. These transmitters are designed to 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 RTD or linear resistance input ranges
- Supports any 100 ohm Pt RTD (375-393 alpha)
- High accuracy and linearity
- Advanced analog signal conditioning ASIC eliminates digitization errors
- Low temperature drift
- Fast response time (< 500µS)
- Programmable over/under-range limits
- Selectable upscale or downscale operation for sensor errors and lead-break detection
- NAMUR NE43 compliant fault response
- Reverse polarity protected with non-polarized output
- Mounts in DIN Form B sensor heads
- 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.
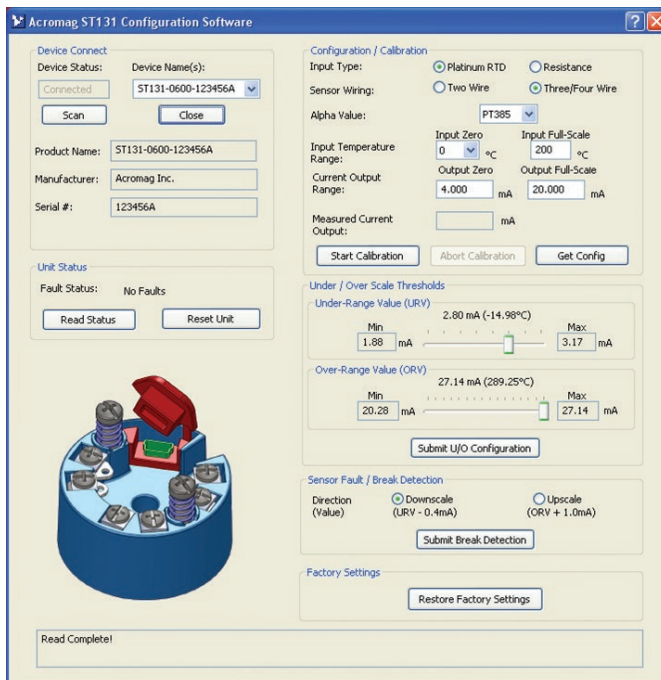
ST130 Series Transmitter Configuration Software is downloadable (FREE) from www.acromag.com.

Acromag ST131 Configuration Software

Device Connect
Device Status: Connected
Device Name(s): ST131-0600-123456A
Scan   Close
Product Name: ST131-0600-123456A
Manufacturer: Acromag Inc.
Serial #: 123456A

Unit Status
Fault Status: No Faults
Read Status   Reset Unit

Configuration / Calibration
Input Type: ● Platinum RTD ○ Resistance
Sensor Wiring: ○ Two Wire ● Three/Four Wire
Alpha Value: PT385
Input Temperature Range: Input Zero 0 °C   Input Full-Scale 200 °C
Current Output Range: Output Zero 4.000 mA   Output Full-Scale 20.000 mA
Measured Current Output: mA
Start Calibration   Abort Calibration   Get Config

Under / Over Scale Thresholds
Under-Range Value (URV)   2.80 mA (-14.98°C)
Min 1.88 mA   Max 3.17 mA
Over-Range Value (ORV)   27.14 mA (289.25°C)
Min 20.28 mA   Max 27.14 mA
Submit U/O Configuration

Sensor Fault / Break Detection
Direction (Value): ● Downscale (URV - 0.4mA)   ○ Upscale (ORV + 1.0mA)
Submit Break Detection

Factory Settings
Restore Factory Settings

Read Complete!

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ST131 RTD input head-mount transmitter

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

Input Configuration
Two-, three- or four-wire sensor input connections.

Input Ranges
100 ohm Platinum RTD, alpha = 375-393,
385 (default), -50 to 900°C (-58 to 1652°F).

0 to 900 ohms linear resistance.

Programs in °C or ohmic integers only.

Zero Adjust
RTD 3/4 wire: -50, -17.78, or 0°C (-58, 0, 32°F).
RTD 2 wire: 0°C (32°F) fixed.
RES: 0 or 100 ohms.

Full-Scale Adjust
RTD: up to 900°C (1652°F), 50°C (58°F) span minimum.
Resistance: up to 900 ohms, 8 ohm span minimum.

Excitation Current
0.5mA, nominal.

Lead-Wire Compensation
25 ohms per lead.

Lead Break (Sensor Burnout) Detection
Configurable for either upscale or downscale.

■ Output

Output Range
4 to 20mA DC.
Under-scale limit adjustable for 2.1 to 3.6mA, nominal.
Over-scale limit adjustable for 21 to 30mA, nominal.

Output Fault Limits (Sensor Fault)
0.4mA below selected under-scale threshold and
1.0mA above over-scale threshold, typical.

Output Compliance
$R_{LOAD} = (V_{SUPPLY} - 9V) / 0.02A$.
R_{LOAD} = 0 to 750 ohms @ 24V DC.

Output Accuracy
Better than ±0.1% of span, typical for spans less than 500°C. Includes the effects of repeatability, terminal point conformity, and linearization, but does not include sensor error.

Ambient Temperature Effect
Better than ±0.010% per °C of input span or ±80ppm/°C, typical. Includes the combined effects of zero and span drift over temperature.

Output Response Time
500µS, typical with 250 ohm load.

■ 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
9-32V DC SELV (Safety Extra Low Voltage), 28mA max.

Isolation
Not isolated.

Shock and Vibration Immunity
Vibration: 5g, per IEC 60068-2-64.
Shock: 50g, per IEC 60068-2-27.

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

Radiated Field Immunity (RFI)
BS EN 61000-6-2, IEC 61000-4-3.

Conducted RF Immunity (CRFI)
BS EN 61000-6-2, IEC 61000-4-6.

Electrostatic Discharge (ESD)
BS EN 61000-6-2, IEC 61000-4-2.

Electrical Fast Transient (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.
⟨Ex⟩ 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.

DIN-Rail Mounting
Using optional ST130-DIN adapter, unit can mount to 35x15mm, T-type or G-type DIN rails.

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

Printed Circuit Board
Military grade fire-retardant epoxy glass per IPC-4101/98 with humi-seal conformal coating.

I/O Connectors
Barrier strip type, captive screw terminals.
Wire range: AWG #14-28 solid or stranded.

Dimensions
Diameter = 44.5mm (1.752 inches),
Height = 23.4mm (0.921 inches).
Conforms to DIN 43 729 Form B size requirements.

Shipping Weight
0.5 pounds (0.22 Kg) packed.

Ordering Information

Models

ST131-0600
Transmitter, 100 ohm Pt RTD input, CE Compliant.
Default calibration: Pt385 RTD, 3-wire, 0-200°C input, 4-20mA output, upscale fault detect.

ST131-0610
Same as ST131-0600 plus UL/cUL Class 1 Div 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
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. One (1) kit recommended per customer.

Accessories

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

ST130-DIN
DIN-rail adapter.

ST130-MTG
Replacement mounting kit (screws and relief springs) for installing ST130 transmitter in a DIN Form B connection head.

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

ISO9001
AS9100
MADE IN USA

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