Remote Displays

SITRANS RD100

Operating Instructions · 01/2011

SITRANS

SIEMENS

Safety Guidelines: Warning notices must be observed to ensure personal safety as well as that of others, and to protect the product and the connected equipment. These warning notices are accompanied by a clarification of the level of caution to be observed.

Qualified Personnel: This device/system may only be set up and operated in conjunction with this manual. Qualified personnel are only authorized to install and operate this equipment in accordance with established safety practices and standards.

Unit Repair and Excluded Liability:

- The user is responsible for all changes and repairs made to the device by the user or the user's agent.
- All new components are to be provided by Siemens Milltronics Process Instruments.
- Restrict repair to faulty components only.
- Do not reuse faulty components.

Warning: Cardboard shipping package provides limited humidity and moisture protection. This product can only function properly and safely if it is correctly transported, stored, installed, set up, operated, and maintained.
This product is intended for use in industrial areas. Operation of this equipment in a residential area may cause interference to several frequency based communications.

Note: Always use product in accordance with specifications.

MILLTRONICS® is a registered trademark of Siemens Milltronics Process Instruments.

Contact SMPI Technical Publications at the following address:
Technical Publications
Siemens AG
Siemens Milltronics Process Instruments
1954 Technology Drive, P.O. Box 4225
Peterborough, Ontario, Canada, K9J 7B1
Email: **techpubs.smpi@siemens.com**

European Authorized Representative

Siemens AG
Industry Sector
76181 Karlsruhe
Deutschland

- For a selection of Siemens Milltronics level measurement manuals, go to:
  www. siemens.com/processautomation. Under Process Instrumentation, select *Level Measurement* and then go to the manual archive listed under the product family.
- For a selection of Siemens Milltronics weighing manuals, go to:
  www. siemens.com/processautomation. Under Weighing Technology, select *Continuous Weighing Systems* and then go to the manual archive listed under the product family.

SITRANS RD100 Loop Powered Meter

SITRANS RD100

SITRANS RD100 is a 2-wire loop powered, NEMA 4X enclosed remote digital display for process instrumentation.

This digital meter is easy to use with a display of 3.5 digits, 1" (2.54 cm) high. It accepts 4 to 20 mA input and operates from -40 to +80 °C (-40 to +176 °F).

SITRANS RD100 is CSA and FM Approved.

Safety Notes

Special attention must be paid to warnings and notes highlighted from the rest of the text by grey boxes.

> ! **WARNING: means that failure to observe the necessary precautions can result in death, serious injury, and/or considerable material damage.**

> **CAUTION: means that failure to observe the necessary precautions can result in considerable material damage.**

> **Note:** means important information about the product or that part of the operating manual.

The Manual

This manual provides specifications and instructions for the operation of SITRANS RD100 Remote Display. The manual is designed to help you get the most out of your Remote Display, and it provides information on the following:

- Meter specifications
- Wiring diagrams
- Installation requirements
- Setup instructions

If you have any questions, comments, or suggestions about the manual content, please email us at **techpubs.smpi@siemens.com**. For the complete library of Siemens Milltronics manuals, go to **www.siemens.com/processautomation**.

Specifications

Display

- 1.0 " (25.4 mm) high LCD, numeric display range from -1000 to 1999

Enclosure

- Impact-resistant glass-filled polycarbonate body
- Color: gray
- Impact-resistant clear polycarbonate cover: NEMA 4X, Type 4X, IP67

Mounting

- Standard:
  - wall mount
- Optional:
  - panel mounting kit (does not provide NEMA 4X seal to panel)
  - 2" pipe mounting kit

Entity Parameters

- V_{max} = 30 V, I_{max} = 175 mA, $C_i = 0$ μF, $L_i = 0$ μH, $P_i = 1.3$ W

Input

- 4 to 20 mA

Maximum Input Current

- 30 V DC

Maximum Voltage Drop

- 1 V at 20 mA

Connections

- Screw terminal block

Operating Temperature Range

- -40 to +85 °C (-40 to +185 °F)
- -40 to +40 °C (-40 to +104 °F) for Canadian installations

Calibration

- Two-step; non-interacting low and high

Calibration Range

- 4 mA input: display of -1000 to +1000 counts
- 20 mA input: display of 4 mA count value +20 to 2000 counts, to a max. display of 1999 counts

Accuracy

- ±0.1% of span ±1 count

Conversion Rate

- 2.5 conversions per second

Approvals

- Intrinsically Safe:
    - FM/CSA Class I, II, III, Division 1, Groups A to G T4
    - FM/CSA Class I, Zone 0, Group IIC
- Non-incendive:
    - FM/CSA Class I, Division 2, Groups A to D
    - FM/CSA Class II and III, Division 2, Groups F and G

See "RD100 Remote Display - Approval Connections Control Drawing" shipped with the unit and located on the Instruction Manual CD, for complete Intrinsically Safe installation instructions.

Mounting

Wall Mounting

wall mounting holes beneath cover screws

FRONT VIEW

SIDE VIEW
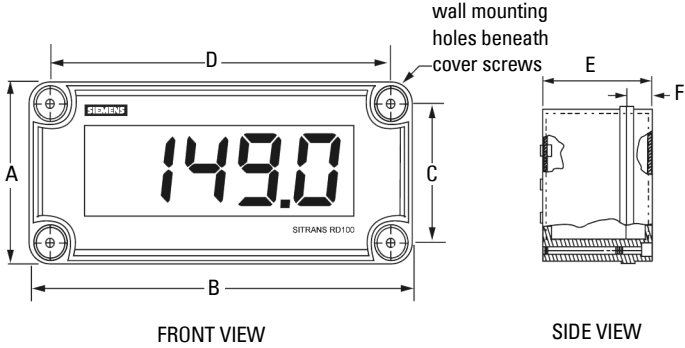
Dimensions

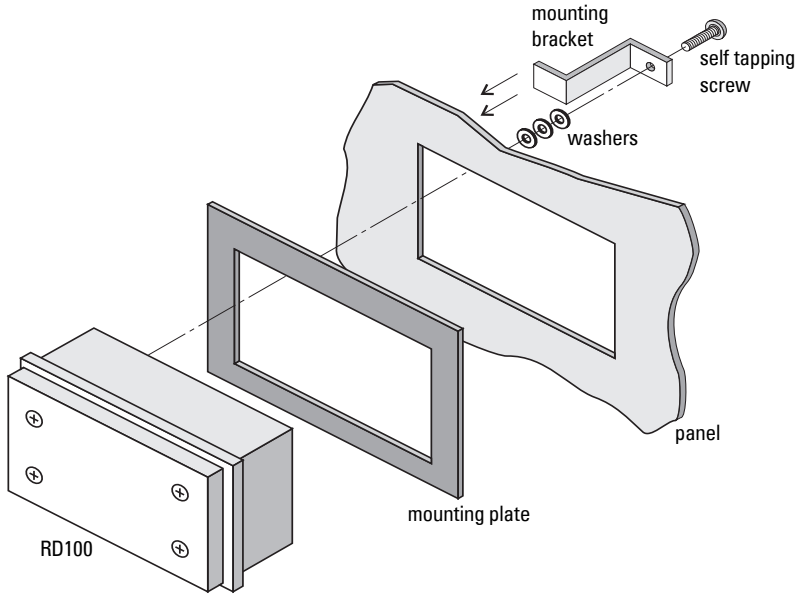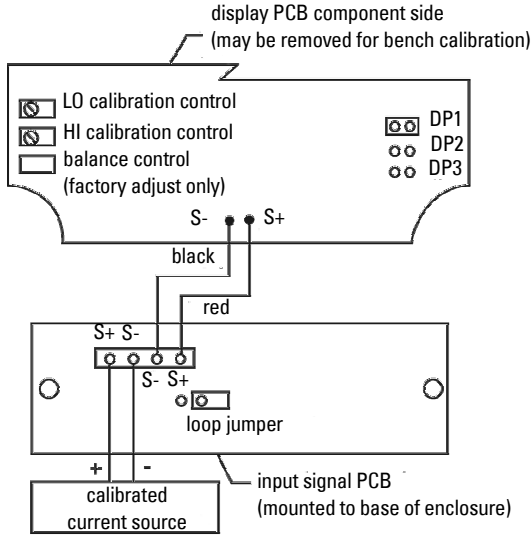|		
A: 80 mm (3.15")	C: 60 mm (2.36")	E: 65 mm (2.56")
B: 140 mm (5.51")	D: 120 mm (4.72")	F: 20 mm (0.79")
Wall mounting holes: Ø 4 mm (0.16")		Weight: 340 g (12 oz)

Optional Panel Mounting Kit

Notes
- The optional panel mounting kit does not provide a NEMA 4X seal to panel.
- Mounting brackets require 20 mm (0.8") clearance on either the top or the side of the meter for installation.

- Allowable panel thickness: 1.5 mm - 3.2 mm (0.060" - 0.125")
- Mounting plate dimensions: 163.3 mm x 102.9 mm x 3.2 mm (6.43" x 4.05" x 0.125")
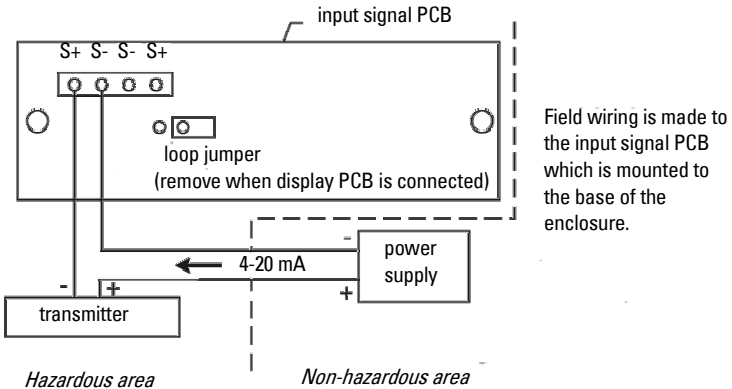- Panel cutout required: 138.4 mm x 77.5 mm (5.45" x 3.05")

Instructions

1. Insert the RD100 through the mounting plate.
2. Mount the complete assembly on the panel.
3. Secure with 4 brackets and 4 screws (supplied) at the corners of the meter. Use washers as needed to allow for panel thickness.
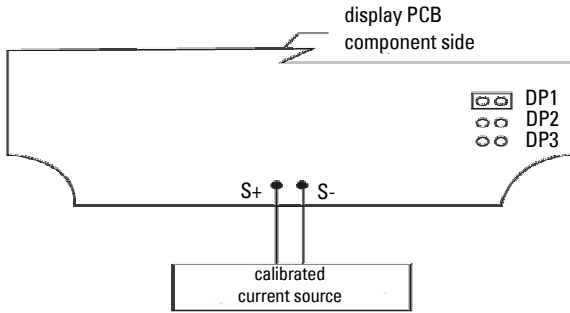
Connections

Calibrator connected to input signal PCB

display PCB component side
(may be removed for bench calibration)

LO calibration control
HI calibration control
balance control
(factory adjust only)

DP1
DP2
DP3

S-   S+

black

red

S+ S-

S- S+

loop jumper

+   -

calibrated
current source

input signal PCB
(mounted to base of enclosure)

Control loop connected to input signal PCB

input signal PCB

S+ S- S- S+

loop jumper
(remove when display PCB is connected)

Field wiring is made to
the input signal PCB
which is mounted to
the base of the
enclosure.

-

4-20 mA

power
supply

-    +

+

transmitter

Hazardous area

Non-hazardous area

Calibrator connected to display PCB

The display PCB may be removed from the enclosure for bench calibration.
Loop jumper must be installed on input signal PCB to maintain loop. Refer to
Servicing display PCB outside the loop on page 9.

> ⚠ **WARNINGS:**
> - **To maintain hazardous area protection, the input signal must always be connected to the input signal PCB, and not directly to the display PCB.**
> - **Electrostatic hazard. Clean only with a moist cloth. Protect enclosure from exposure to chemical solvents and excessive ultraviolet (UV) light (such as sunlight).**

Setup

For calibration, a calibrated current source and a screwdriver are required.

Calibration connections

To access the input terminals, remove the enclosure cover and the display PCB.

1. Loosen the four screws on the enclosure cover and remove the cover.
2. Completely loosen the left screw that holds the display PCB to the enclosure and loosen the right screw about four turns so the display PCB remains attached to the enclosure.
3. Rotate the display PCB 90° to gain access to the input signal PCB.
4. Next, connect a calibrated current source as shown in *Calibrator connected to input signal PCB* on page 6.

Decimal point selection

The decimal point jumper array is located in the lower right corner of the display PCB next to the display. It is labeled DP1, DP2, DP3.

Place a jumper over both pins of DP1 for a display of 199.9, DP2 for 19.99, or DP3 for 1.999.

Calibration

LO and HI calibration controls are located to the left of the display (see *Calibrator connected to input signal PCB* on page 6).

1. Apply a signal equal to 4 mA and adjust the LO control to display the desired reading.
2. Apply a signal between 16 and 20 mA and adjust the HI control to display the desired reading.
3. Complete the calibration procedure by making any minor adjustments to the LO and HI controls.

Installation

To install the meter, remove the display PCB from its enclosure and connect a ½" conduit fitting to the hole provided. Refer to *Removing display PCB from the loop* on page 9 for

further details. Wall mounting holes are located in each corner of the enclosure (see *Mounting* on page 4).

Loop connections

Disconnect power to the loop and install the meter as illustrated in *Control loop connected to input signal PCB* on page 6 and *Removing display PCB from the loop* on page 9. Replace the enclosure cover.

Removing display PCB from the loop

The display PCB and input signal PCB are connected together with one black and one red wire. The wires are soldered to the display PCB and connected to a screw terminal connector on the input signal PCB.

1. Remove enclosure cover and the display PCB as described in steps 1 to 3 of *Calibration connections* on page 8.
2. Install loop jumper over both pins to bypass display PCB and allow the signal to flow through the loop jumper. The display turns off when jumper is installed.
3. Disconnect the black and red signal wires from the screw terminal connector.
4. Loosen completely the right-side screw and lift display PCB from enclosure.

> **CAUTION: Care should be taken to prevent static electricity from damaging the electronic circuitry.**

5. Restore enclosure cover to the base to prevent contamination of components.

Restoring display PCB to the loop

1. Loosen the four screws on the enclosure cover and remove the cover.
2. Secure display PCB to enclosure using right-side screw; do not tighten screw to allow rotation of display PCB while accessing input signal PCB.
3. Connect red wire to **S+** terminal and black wire to **S-** terminal, as shown in *Calibrator connected to input signal PCB* on page 6.
4. Remove loop jumper to allow the signal to flow through display PCB (save push-on jumper by placing over one pin only).
5. Tighten screws holding display PCB and install enclosure cover.

Servicing display PCB outside the loop

Two modes of input signal allow the user to remove the display PCB for service without interrupting the loop as indicated above and operate the display PCB at another location in a non-hazardous area. The loop remains connected to the input signal PCB while the display PCB is absent for service. The user may operate the display PCB at another location by connecting a signal to "**S+**" and "**S-**" wires on the display PCB. Refer to *Calibrator connected to display PCB* on page 7.

For more information

www.siemens.com/level

www.siemens.com/weighing

7 M L 1 9 9 8 5 J U 0 1
Printed in Canada