Quick Start Guide

Safety information

Please read this entire document before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

To ensure that the protection provided by this equipment is not impaired, do not use or install this equipment in any manner other than that specified in this document.

Important Note: *The manufacturer is not responsible for any damages due to misapplication or misuse of this product including,without limitation, direct, incidental and consequential damages, and disclaims such damages to the full extent permitted under applicable law. The user is solely responsible to identify critical application risks and install appropriate mechanisms to protect processes during a possible equipment malfunction.*

Use of hazard information

DANGER
Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION
Indicates a potentially hazardous situation that may result in minor or moderate injury.

Important Note: *Information that requires special emphasis.*

Note: *Information that supplements points in the main text.*

Precautionary labels
Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol, if noted on the instrument, will be included with a danger or caution statement in the manual.

	This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.
	Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user. ***Note:*** *For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment, producer-supplied electrical accessories, and all auxiliary items for proper disposal.*

Introduction

This quick-start booklet contains condensed instructions to assist the user in starting and operating the instrument. These condensed instructions pertain to basic conductivity measurement operation and wiring the transmitter in a two-wire hookup. Refer to the PRO-C3

manual for information about measure resistivity or TDS, wire in a three or four-wire hookup, or use a specific instrument feature.

Mount the transmitter

Refer to the PRO-C3 manual for instructions on mounting the transmitter.

Connect the sensor/Configure the temperature element type

DANGER
Explosion Hazard. Do not connect or disconnect electrical components or circuits to the equipment unless power has been removed or the area is known to be non-hazardous.

WARNING
Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.

1. Connect the enhanced performance contacting conductivity sensor, matching wire colors to terminals as indicated in Table 1.

Table 1 Sensor connections

Wire color	Terminal
Red	Terminal 1
No connection (not used)	Terminal 2
Inner shield	Terminal 3
White	Terminal 4
Blue	Terminal 5
No connection (not used)	Terminal 6
Black	Terminal 7
Outer shield[1]	Earth ground

[1] *For systems not requiring CE compliance and lacking an earth ground, connect the outer shield to Terminal 3 on TB2.*

2. The transmitter is factory-set for automatic temperature compensation using the PT 1000 ohm temperature element built into conductivity sensors. If fixed manual temperature compensation is required, change the temperature element type to manual and enter a temperature. For details, refer to the PRO-C3 manual, section Select Temp Element Type.

Connect the DC power

In a two-wire hookup, at least 14 VDC is required for operation. A load device can be connected in the current loop as shown in Figure 1.

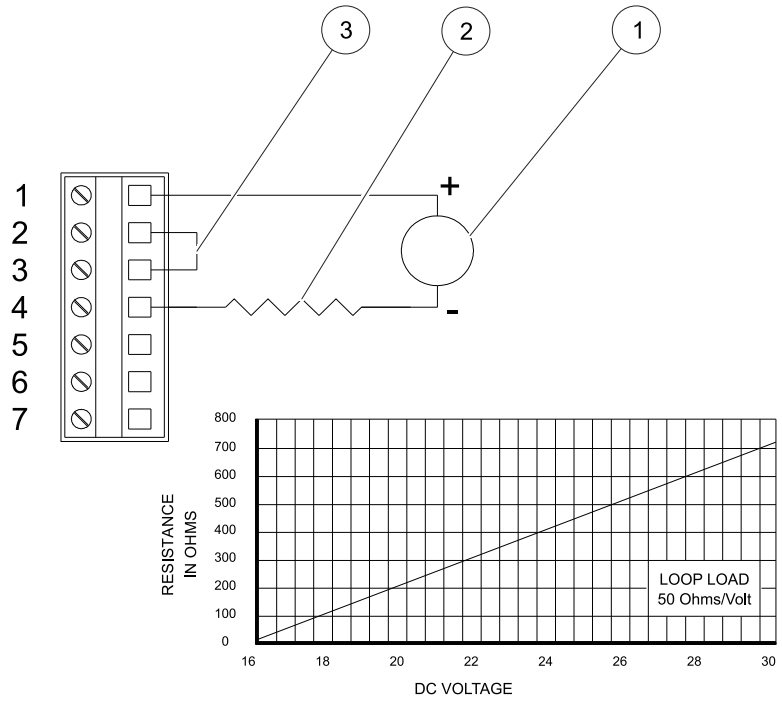


Figure 1 Load device connected in the current loop

1	Loop power 14–30 VDC class 2, 4–20 mA	**3**	Jumper required
2	Loop resistance (see nomograph)		

Depending on how the transmitter is mounted, route the DC power/analog output wiring into the transmitter as follows:

- **Wall/Pipe-mounted transmitter:** Route the cable through the right side cable entry knockout hole in the back cover.
- **Panel-mounted transmitter:** Route the cable behind the panel to the exposed TB1 terminal strip.
- **Integral Sensor-mounted transmitter:** Route the cable through the right side cable entry knockout hole in the back cover. (Do not open left side cable entry knockout hole in the cover.)

Note: *Use high quality, shielded instrumentation cable.*

For more information about wiring the transmitter in a three or four-wire hookup arrangement or monitor mode hookup, refer to the PRO-C3 manual.

Calibrate the transmitter

The transmitter must be calibrated so that measured values will correspond to actual process values. The “wet" calibration method can be used to calibrate the transmitter. As the measured conductivity is greatly affected by small changes in temperature, the manufacturer insists on using the Dry-Cal method for highest measuring accuracy of conductivity and temperature. Dry-Cal method eliminates the need for conductivity reference solutions and Dry-Cal is a normal part of configuring the sensor characteristics during initial startup. Dry-Cal method sets the transmitter measuring range to match the inherent range of the cell constant

of the sensor. For more information about the benefits of Dry-Cal calibration method, see the QSPRO-C3 manual.

Note: *Dry-Cal method eliminates the need for periodic re-calibration. The only requirement, depending on the application, may be to periodically clean the sensor. It is necessary to perform a new Dry-Cal calibration when the sensor is replaced.*

Each contacting conductivity sensor has a unique zero point and span. Consequently, when calibrating a sensor for the first time, always zero it according to step 1. Zeroing provides the best possible measuring accuracy.

Dry-Cal calibration, routinely attained while configuring the transmitter for sensor characteristics, requires the entry of the certified Cell K value of the sensor and temperature T factor of the sensor which is unique for every sensor.

1. Zero the sensor if it is being calibrated for the first time. If not, disregard this step and perform steps 2 through 17.

   If the "Zero: Confirm Failure?" screen appears at any time during zeroing, press **ENTER**. Press the **UP** or the **DOWN** arrow key to select between Cal: Exit or Cal: Repeat and do one of the following:

   Select “Zero? (Cal: Exit)" and press **ENTER**. After the "Zero: Confirm Active?" screen appears, press **ENTER** to return the analog output to its active state (Measure screen appears).

   Select “Zero? (Cal: Repeat)” and press **ENTER** to repeat zeroing.

   a. Ensure that the sensor is dry before zeroing.

   b. Press **MENU** to display the Main Menu screen. If the Calibrate screen is not displayed, press the **UP** or the **DOWN** arrow key to display it and press **ENTER**.

   c. Press **ENTER** again to display the Sensor 1 Point Sample screen.

   d. Press the **DOWN** arrow to display the Sensor Zero screen.

   e. Press **ENTER** to display the “Zero: In Dry Air?” screen.

   f. With the dry sensor held in air, press **ENTER** again to start automatic zeroing. (During zeroing, the analog output is automatically "held" at the last measured value.)

   g. After the "Zero: Confirm Cal Ok?" screen appears, press **ENTER** to end zeroing.

   h. After the "Zero: Confirm Active?" screen appears, press **ENTER** to return the analog output to its active state (Measure screen appears).

2. Press **MENU** to display the Main Menu Calibrate screen.
3. Press the **DOWN** arrow to display the Main Menu Configure screen.
4. Press **ENTER** to display the Configure Set Output screen.
5. Press the **DOWN** arrow to display the Configure Sensor screen.
6. Press **ENTER** to display the Sensor Select Measure screen.
7. Press the **DOWN** arrow to display the Sensor Cell Constant screen.
8. Press **ENTER** to display the Cell Constant Select Cell K screen.

9. Press **ENTER** again to display the Select Cell K? (0.0500) screen. Press the **UP** and the **DOWN** arrow keys to select the nominal cell category that corresponds to the certified Cell K value of the sensor shown on a label attached to the sensor cable or to the inside cover of its optional junction box. Then press **ENTER**.

10. After the Cell Constant Select Cell K screen appears, press the **DOWN** arrow to display the Cell Constant Set Cell K screen.

11. Press **ENTER** to display the Cell K value Set Cell K? (0.0500) screen. Adjust the displayed value to exactly match the certified Cell K value of the sensor. Press the **RIGHT** and **LEFT** arrow keys to select digit, and the **UP** and the **DOWN** arrow keys to adjust its value and press **ENTER**.

12. After the Cell Constant Set Cell K screen appears, press **ESC** to display the Sensor Cell Constant screen.

13. Press the **DOWN** arrow to display the Sensor Temp Element screen.

14. Press **ENTER** to display the “Temp Element Select Type” screen.

15. Press the **DOWN** arrow to display the “Temp Element Set T Factor” screen.

16. Press **ENTER** to display the T Factor “Set T Factor? (1000.0 Ohms)” screen. Adjust the displayed value to exactly match the certified T Factor of the Sensor. Press the **RIGHT** and **LEFT** arrow keys to select digit, and the **UP** and **DOWN** arrow keys to adjust its value and press **ENTER**.

17. After the Temp Element Set T Factor screen appears, press **MENU** and then **ESC** to display the Measure screen.

The transmitter is now ready to measure conductivity.

To change the display format of the Measure screen (for example, from 0–2000 µS/cm to 0.000–2.000 mS/cm), refer to the PRO-C3 manual, section "Select Display Format."

Note: *If the values the user intends to measure are above the fixed measuring range of the transmitter (not its selected display format), a different sensor that has the appropriate nominal cell constant has to be used. For more information about listing of sensor cell constants and their inherent measuring ranges, refer to the PRO-C3 manual.*

Complete the transmitter configuration

To further configure the transmitter to meet the application requirements, use the appropriate Configure screens to make selections and "key in" values. For more information about complete configuration, refer to the PRO-C3 manual.

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