UE One Series
with WirelessHART adapter

TECHNICAL NOTE

This technical note is to assist in setting up the One Series 1XTX00 or 1XTXSW with an Emerson THUM WirelessHART adapter. Other adapters can follow similar guidance.

Parts List

United Electric One Series model 1XTXSW
200 ohm, 1/4W+ resistor
15-30V supply (usually 24V)
Explosion proof conduit, ¾" NPT type, long enough to escape the hazardous location
¾" to ½" NPT adapter, to adapt the One Series to the THUM
90 degree elbow such that the THUM is mounted vertically
Emerson 775XD11E5 OR 775XD11E6, MUST have relevant explosion proof cert and ½" NPT connection. IS is not supported by the 1XTXSW.
10k pull up/down resistor (may be included in PLC)
Two twisted wire pairs: One for the 4-20 mA loop (required), one for the switched output (optional).

Circuit Description

The basic circuit tested by UE is shown in Figure 1. The circuit may change depending on the customer's specific need.

- The wires run back to the PLC through one conduit
- The 1XTXSW enclosure is used as a junction box
- The THUM is secured to the One Series via a direct conduit connection (See figure 2)
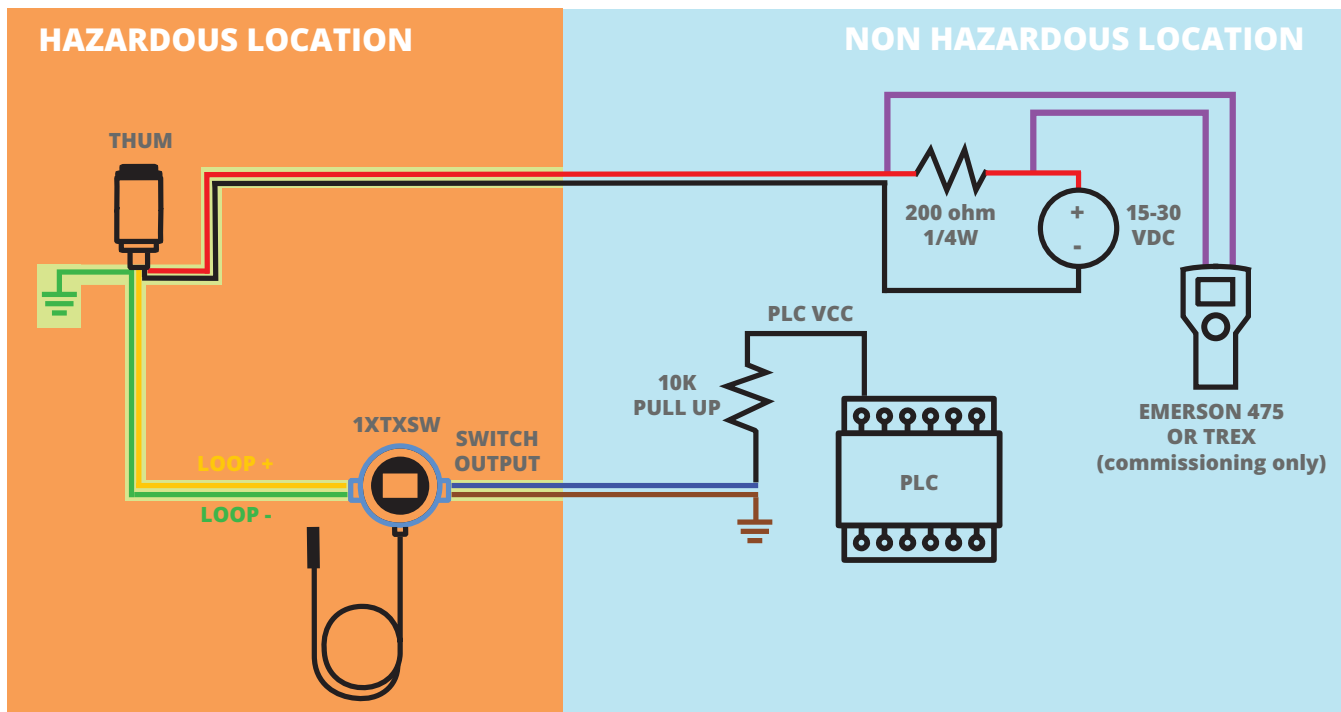- Both the 1XTXSW and the THUM can be programmed prior to installation in the HAZLOC area.

Figure 1: Schematic diagram for circuit tested at UE

Layout

Figure 2 shows how UE recommends wires are routed to and from the 1XTXSW.

- The THUM mounts to the 1XTXSW via an elbow. that comes out of port 1of the 1XTXSW
- The manufacturer recommends that the THUM remains upright.
- All the wires from the THUM run through the elbow conduit into port 1 of the 1XTXSW.
- The yellow and white wires will attach to the 1XTXSW 4-20mA port

- The red/black wires will pass through the 1XTXSW.
- The green wire will attach to the ground lug in the 1XTXSW.
- The 1XTXSW will connect to the PLC via port 2.
- This conduit will contain both the red/black loop supply wires from the THUM as well as the switched output of the 1XTXSW.
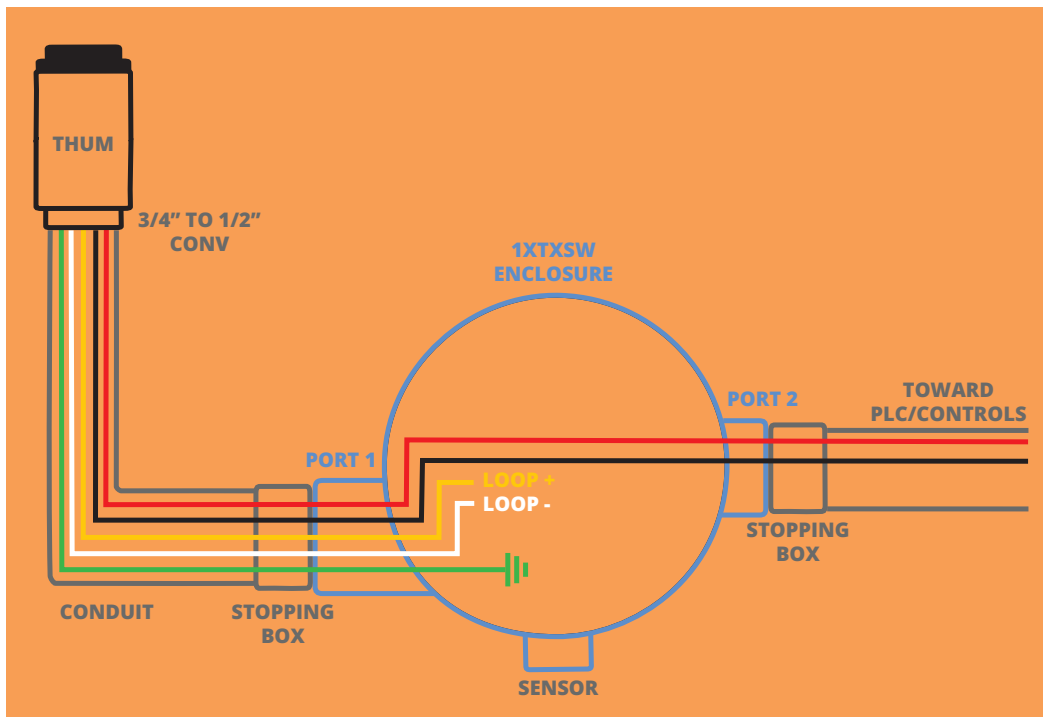

Figure 2: Physical schematic of 1XTXSW with conduits. The PLC/resistor and power supply are not shown in this picture; however they are necessary.

Construction Steps

❶ Ensure that power is disconnected from the system

❷ Enter the Haz-Loc and connect the 1XTXSW to the pipe. Then construct the port 1 conduit, which bends upwards and attaches to the THUM. Keep in mind that the 1XTXSW port is ¾" NPT and the THUM will be ½" NPT (a metric version is also available).

❸ Attach the THUM and run all the wires into the 1XTXSW

❹ Open the 1XTXSW enclosure and pull out the display module to expose the wiring. This procedure is shown in part 2 of the 1XTXSW installation manual (See QR code). Connect the 4-20 loop, as shown in figure 2. Also connect the green grounding wire to the ground lug in the 1XTXSW. Leave the 1XTXSW open for now.

1XTXSW installation manual

❺ Construct the conduit from port 2 of the 1XTXSW, this is also a 3/4" NPT threading. This should run out of the hazardous location. Run the necessary wiring through this. This should include the red/black power wires, as well as one or two switched ports. You may also run wiring for the IAW feature in the 1XTXSW.

❻ Attach the necessary connections from port 2 inside the 1XTXSW. Note that the power cables from port 2 need to be spliced to those of the THUM. Butt splicing is allowed inside of the explosion proof enclosure.

❼ Close the 1XTXSW as described in its installation manual. The Conduit system is now safe for power.

❽ Construct the rest of the circuit outside of the hazardous location as seen in Figure 1. The PLC/control connections may differ for different applications but the power supply should remain the same. Do not attach power without the 200ohm resistor.

9 Apply power (usually 24V) to the system. The rail voltage should be between 15 and 30VDC.

10 For commissioning of both devices, you can use either an Emerson 475 or the newer AMS TREX model.

Scan the QR code to download and install the upgrade utility for either the 475 model or the Trex.

NOTE: If using the easy upgrade utility for the 475 model, you will need to request a password to download the software. Also note that you may need to run it in windows 7 compatibility mode, from the C drive. With some versions of the easy upgrade utility, it may be necessary to roll the system clock back to 2015 in order to run the utility.

11 With the upgrade software installed on your local machine, you'll have to update the communicator with the device specific device descriptor (DD) files. These can be installed either with the SD card behind the battery pack, or via Bluetooth or IR on some models

With the SD card in your PC, or the Bluetooth connection open, open the upgrade utility. Select the appropriate connection type and click "connect" . Once the system is connected, click the "more" options button under the upgrade system card menu. Open the DD tab and select the HART packages for both the 1XTXSW listed under "United Electric" and the THUM package listed under "Rosemount". Once the appropriate packages are selected, click the >>> button to move them onto the communicator.

After these successfully upload, your device should be able to communicate with both the 1XTXSW and the THUM.

12 Charge up the communicator, and ensure that SD card is replaced if it was removed.

13 With the communicator plugged into the HART configuration, place the leads across the 200 ohm resistor.

14 Open the HART application on the communicator and scan for devices. The first device you see should be the 1XTXSW which should appear in a few seconds. Next you will see the THUM device. This will take much longer to appear. Since its polling address is 63, it will take over a minute to appear on the list, so be patient.

15 Select the 1XTXSW to configure it as desired. Under the "device variables" page you can read the current value of the PV. Under the "diagnostics" menu you can view and reset any error codes that may exist on the device. Under the "device setup" menu you can set up the switch set points as well as calibrate/zero the PV.

16 Once the 1XTXSW is set up as desired, return to the HART home screen and scan for devices again. You may need to wait another minute for the THUM device to be seen. Once you see it, select it from the menu.

Go to the "Configure" menu then select the "guided setup" option. Select the "Join device to network" option which should have you set up the network ID and join key of your gateway. The "configure update rate" should be used to set the desired burst period of the device.

After this has been set up, go to the "Discovery Mode" menu. Wait for the THUM to discover the 1XTXSW. It should read "1 wired device has been found..." this indicates that the 1XTXSW is visible to the THUM, otherwise there's likely a wiring issue. Leave the discovery mode in first found mode, there should only ever be 1 other device in this loop.

NOTE: Under the advanced setup tab, you can setup different burst messages with custom periods. This can relay other device information as well.

17 Unplug the configurator, it shouldn't be necessary anymore, unless you wish to change the set points on or calibrate the 1XTXSW.

18 Connecting to the wirelessHART network may need a reboot of the system. Remove the DC supply for 10 seconds and replace it. Wait for the THUM to be visible on the gateway.

19 The setup should be complete.

Application Notes

1. THUM device must use the explosion proof protection method when installed in a hazardous location. Intrinsic safety is NOT supported by the 1XTXSW.

In the United States and Canada, the E5 and E6 models can be used respectively, to meet Class 1 Div 1 standards. Internationally, the N1 and N7 varieties can be used to meet Ex nA IIC T4 standards.

2. Follow all directions in the 1XTXSW I&M manual regarding installation. Especially note the following phrase from the 1st page of the I&M:

⚠ **FOR ZONE HAZARDOUS LOCATIONS, ALL CABLE ENTRY DEVICES SHALL BE CERTIFIED IN TYPE OF EXPLOSION PROTECTION FLAMEPROOF ENCLOSURE "D" WITH AN IP66 RATING, SUITABLE FOR THE CONDITIONS OF USE AND CORRECTLY INSTALLED. IF CABLES AND CABLE GLANDS ARE NOT USED, A STOPPING BOX SHALL BE PROVIDED WITHIN 2" OF THE ENCLOSURE. FLAMEPROOF JOINT AND GAP DETAILS ARE PROVIDED ON PAGE 2.**

This mandates the use of the 2 stopping boxes shown in the diagrams. Note that the 2" of tubing is the total maximum for tubing on both ports. Realistically this mandates that the stopping boxes be fitted directly to the 1XTXSW before any other tubing. This is shown in Figure 2.

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