SCADAMETRICS®
APPLICATION NOTE

Application Note UTM20.1
Version 001
30 January 2026

Connect a Spirax/Sarco UTM-20 Ultrasonic Flow Meter to an AMI/AMR System Using the SCADAmetrics MBE Encodalizer™

(Also Applies to the Dynasonics TFX-5000 Ultrasonic Flow Meter)

The UTM20 Ultrasonic Flow Meter (pictured left) by **Spirax/Sarco (Blytheville, NC)** is a metering instrument that is based upon an ultrasonic sound and sensor measurement pair that is clamped to the external surface of a closed pipe. It is suitable for use in both water and wastewater applications.

The UTM20 is available with SCADA connectivity, which includes a pulse (totalizing) output, a 4-20mA (flow) output, and Modbus/RTU (RS.485) industrial protocol.

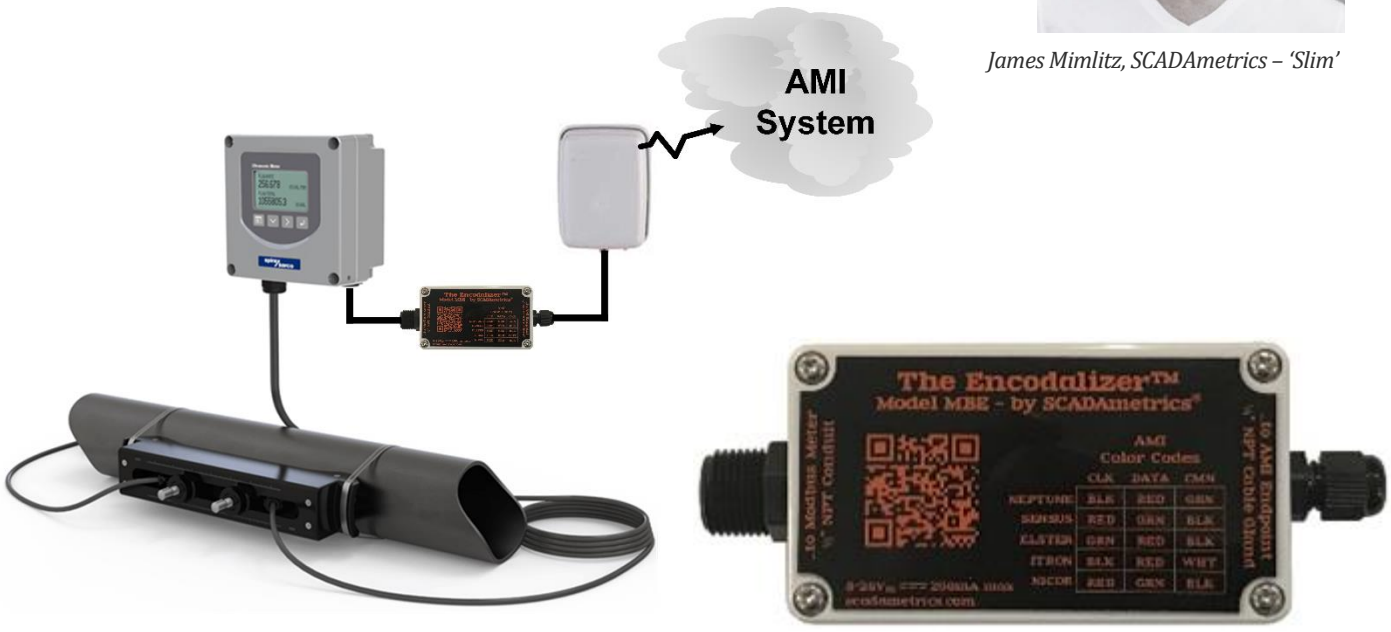
Today, the latest release of the **SCADAmetrics Model MBE Modbus Encodalizer** now adds UI.1203 (Sensus) protocol and Neptune protocol to this important flow meter, so that it may now be easily integrated into modern potable water AMI/AMR systems.

The purpose of this Application Note is to provide technical assistance to the UTM20 User who wishes to connect his meter to an AMI system.

The operational convenience of the MBE Encodalizer is based upon the principle that the User sets the Sensor Type (Make & Model) via Encodalizer DIP switches, connects the Encodalizer to the meter via Modbus/RTU (2-Wire RS.485), and the Encodalizer interacts with the target Sensor using the Sensor's factory default Modbus/RTU settings.

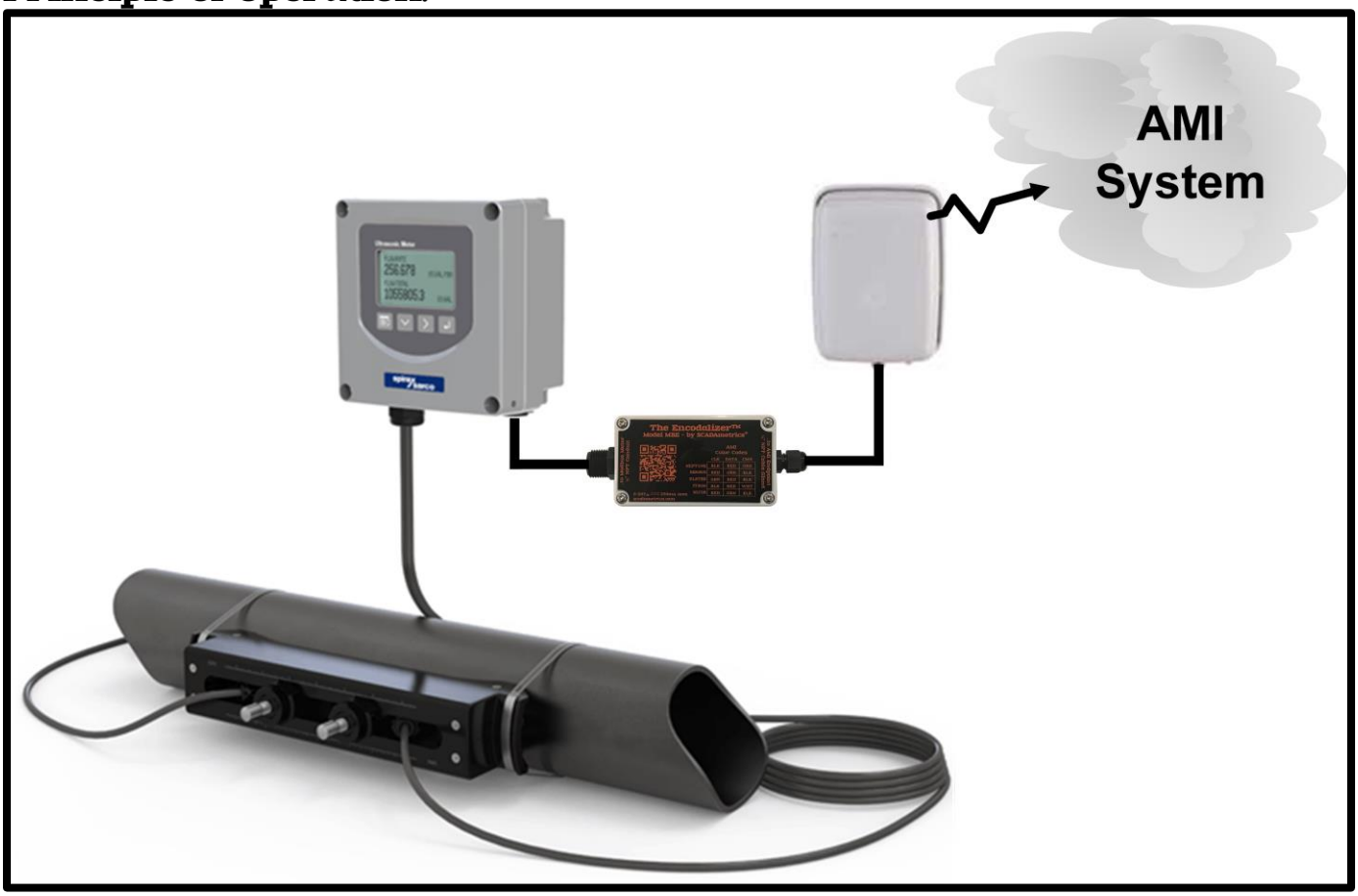
Therefore, no special setup of the UTM20 is required. All Spirax/Sarco factory defaults are used, including Modbus Device ID (1), baud (9600), data bits (8), parity (none), stop bits (1), and word ordering ("Big-Endian").

James Mimlitz, SCADAmetrics – 'Slim'



Model MBE Modbus Encodalizer™
By SCADAmetrics

Principle of Operation:



Encodalizer DIP Switch Settings:

1. Set DIP Switches 1-6 Per Desired Data Type:

    - **"UTM20 Forward Total":**
      (DIP Switches **1,4,5=ON**. DIP Switches 2,3,6=OFF)

    - **"UTM20 Reverse Total":**
      (DIP Switches **2,4,5=ON**. DIP Switches 1,3,6=OFF)

    - **"UTM20 Net Total (Forward – Reverse)":**
      (DIP Switches **1,2,4,5=ON**. DIP Switches 3,6=OFF)

2. Set DIP Switches 7,8 = OFF,OFF.

3. Set DIP Switches 9,10 = OFF,OFF.

4. Set DIP Switches 11,12 per the Desired Number of Encoded Digits. For example, if 8 encoded digits are desired, then set 11,12 = OFF,**ON**.

5. Set DIP Switches 13,14,15,16 according to the desired totalizer multiplier.

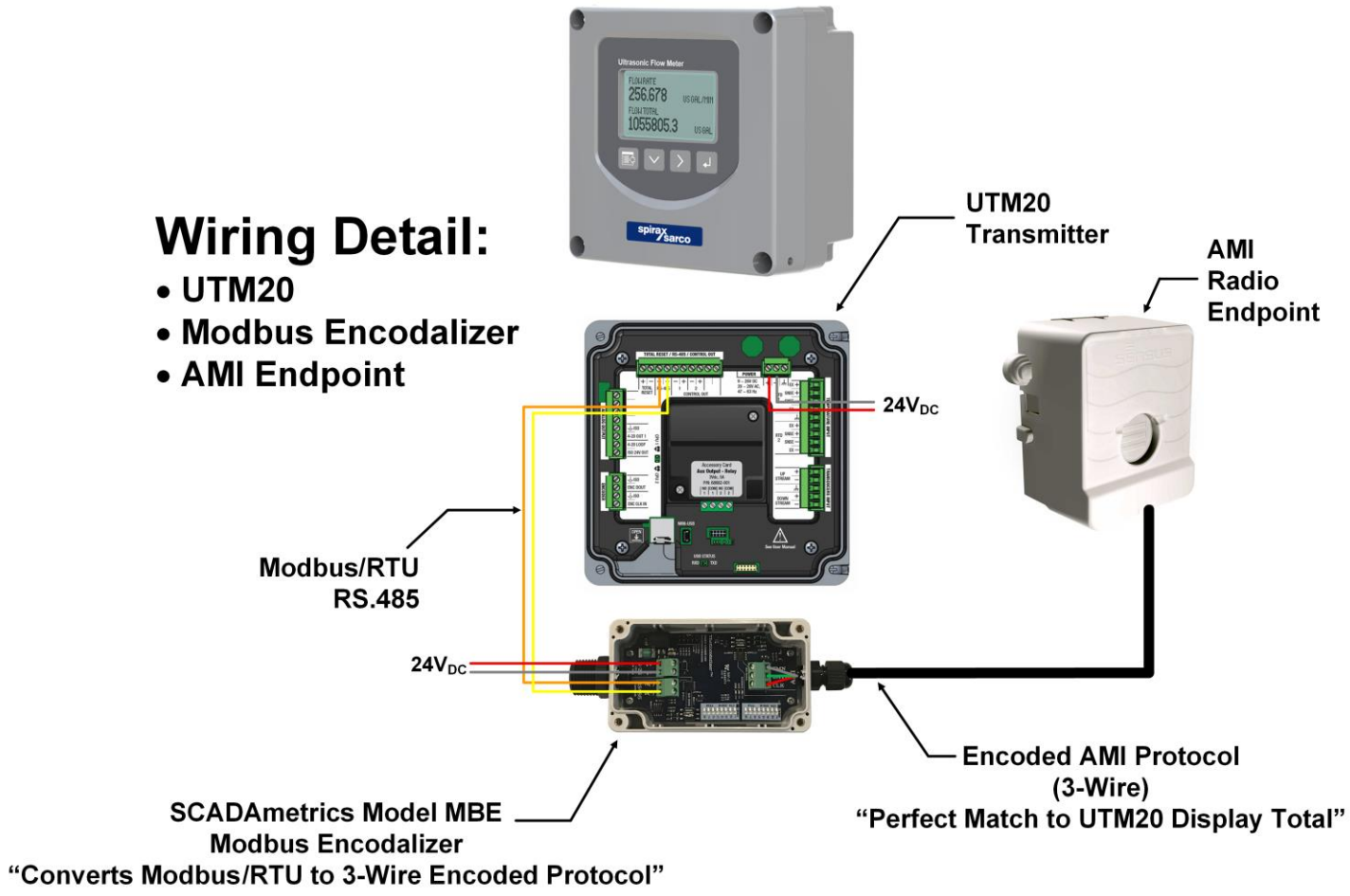
   Example 1: The UTM20 Screen Displays 925,402.44
   Desired AMI Reading: 00925402
   Set Multiplier DIP Switches to x1
   (13,14,15,16 = OFF,OFF,OFF,OFF)

   Example 2: The UTM20 Screen Displays 925,402.44
   Desired AMI Reading: 00092540
   Set Multiplier DIP Switches to x10
   (13,14,15,16 = **ON**,OFF,OFF,OFF)

   Example 3: The UTM20 Screen Displays 925,402.44
   Desired AMI Reading: 09254024
   Set Multiplier DIP Switches to x0.1
   (13,14,15,16 = OFF,OFF,**ON**,OFF)

UTM20 and Encodalizer Wiring:

1. Connect Ultrasonic Sensors to UTM20 Transmitter, per Spirax/Sarco Instructions.
2. Connect Ground to UTM20 grounding terminal.
3. Connect Mains Power ($24V_{DC}$ or $12V_{DC}$) to UTM20.
4. The UTM20 bootup process completes after a few seconds.
5. Connect Encodalizer Modbus Terminals to UTM20 Modbus/RTU Terminals: A(-) to A(-), B(+) to B(+)
6. Connect DC Power to MBE Encodalizer ($24V_{DC}$ or $12V_{DC}$).
7. The Encodalizer LED should NOT blink RED. Red Blinks Denote a Configuration and/or Read Error.



Testing:

If you experience any problems, use of a SCADAmetrics model TMD TheMeterDisplay™ is highly recommended. When the TMD is operated in DEBUG mode (dip switch #10 = ON), the raw Sensus Protocol ASCII data can be observed on the LCD display.

Connections:

TMD.Terminal.1 to → Encodalizer.Terminal.CLK
TMD.Terminal.2 to → Encodalizer.Terminal.DATA
TMD.Terminal.3 to → Encodalizer.Terminal.CMN