

Connect an AMETEK USonic-R to an AMI/AMR System Using the SCADAmetrics MBE Encodalizer™



The AMETEK USonic-R (pictured left) is a popular transmitter for open-channel flow meters; and it is suitable for a broad range of water and wastewater flow metering applications.

The USonic-R features traditional 4-20 milliamp and pulse SCADA signals, as well as modern Modbus/RTU communication protocols. Like most process flow meter transmitters, the USonic-R does not offer native AMI/AMR-compatibility.

However, today, the latest release of the SCADAmetrics Model MBE Encodalizer now adds Sensus and Neptune protocols to this important flow meter transmitter, so that it may now be easily integrated into today's modern AMI/AMR systems.

The purpose of this Application Note is to provide technical assistance to the AMETEK USonic-R User who wishes to connect his meter to an AMI/AMR system.

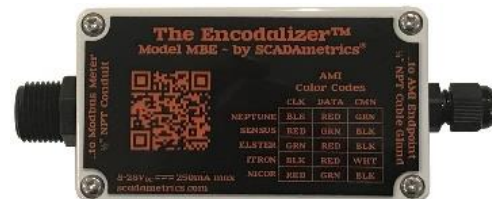
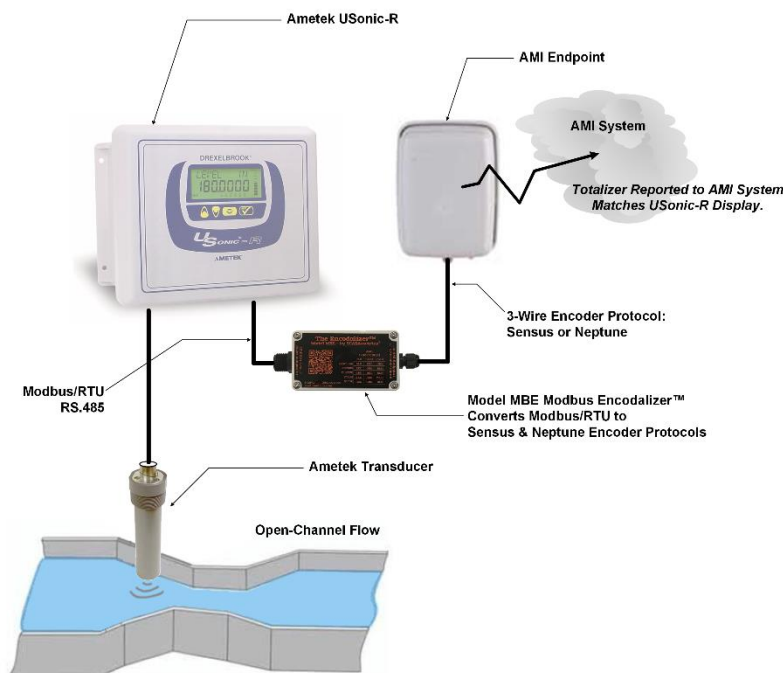
The operational convenience of the MBE Encodalizer is based upon the principle that the User sets the Meter Type (Make & Model) via Encodalizer DIP switches, connects the Encodalizer to the meter via Modbus/RTU (2-Wire RS.485), and the Encodalizer interacts with the target flow meter using the meter's factory default Modbus/RTU settings. Except for activation of the USonic-R's RS.485 serial port, no special setup of the meter should be required beyond normal initialization procedures.



James 'Slim' Mimplitz, SCADAmetrics

Principle of Operation:

Connecting an Open-Channel Wastewater Flow Meter to an AMI System



Model MBE Modbus Encodalizer™

Encodalizer DIP Switch Settings:

1. Set DIP Switches 1-6 Per Meter Type:
 - “AMETEK USonic-R Channel 1 – Totalizer”
(DIP Switches 1,2,4=ON. DIP Switches 3,5,6=OFF)
...or...
 - “AMETEK USonic-R Channel 1 – Resettable Totalizer”
(DIP Switches 3,4=ON. DIP Switches 1,2,5,6=OFF)
2. Set DIP Switch 8 Per Desired AMI Protocol: Sensus or Neptune: OFF=Sensus, ON=Neptune.
3. DIP Switches 9 and 10 Have No Effect Upon the AMI Units (Gal, FT³, M³...), and Therefore May Be Ignored. AMI Units for The USonic-R Always Follow the USonic-R Units of Channel 1.
4. Set DIP Switches 11,12 Per Number of Desired AMI Digits: 6, 7, 8, or 9.
If AMI Protocol is Set to Neptune, Then Setting Number of AMI Digits to 6 Will Force 6-Digit Neptune Protocol. Otherwise, Neptune Protocol Returns 8 or 6 Digits – Depending Upon Interrogation Device Protocol.
5. Set DIP Switches 13,14,15,16 Per Desired Totalizer Multiplier (x1, x10, x100, etc...).
(FOR SIMPLICITY – SEE DIP SWITCH TABLES AT THE END OF THIS DOCUMENT!!)

USonic-R and Encodalizer Wiring:

1. Connect Mains Power to USonic-R. Connect Ground to USonic-R grounding lug. The USonic-R bootup process completes after approximately 15-30 seconds.
2. If SCADA Connection is Required, Then Connect SCADA System to appropriate USonic-R discrete I/O terminals, such as 4-20mA, Dry-Contact, etc...
3. Connect Encodalizer Modbus Terminals to USonic-R Modbus/RTU Terminals: A(-) to A(-), B(+) to B(+)
4. Connect DC Power to Encodalizer (8-28V_{DC}).
5. The Encodalizer LED should NOT blink RED. Red Blinks Denote a Configuration and/or Read Error.

USonic-R Setup:

Menu Navigation:

1. Hold ENTER Button 5 seconds to access configuration menu.
2. Use UP & DOWN buttons to select menu items
3. Press ENTER button to change selected items
4. Hold ENTER button to go to previous menu or continue to hold to return to operate mode.
5. Press UP & DOWN buttons simultaneously to force target acquisition.



1. Set Totalizer Units in USonic-R Menu: GAL or M³ (USonic-R does not support FT³)
2. Set Totalizer Display Decimal Point Location: (n Digits After Decimal Point)
3. Set USonic-R **COMMUNICATIONS TYPE** (FCT 5.04.02) to **RS.485**. (Default is RS.232)
4. Do NOT Modify Any Other USonic-R Modbus/RTU Default Settings.
(Device ID: 1, Baud: 19200, Stop Bits: 1, Parity: Even, Word Order: Little-Endian)
5. Ensure That USonic-R Totalizer Channel 1 Is Set To TOTALIZE

Connecting AMI Endpoint:

Function	Sensus Meter Color (Badger, Metron-Farnier, Master Meter, Kamstrup, Mueller, Zenner, RG3, Nicor Cable)	Neptune Color	Itron ERT Cable
CLK	Red	Black	Black
DATA	Green White	Red	Red
CMN	Black	Green	White Shield

Testing:



If you experience any problems, use of a SCADAmetrics model TMD TheMeterDisplay™ is highly recommended. The TMD can be used to display the AMI totalizer reading and/or AMI Serial Number:

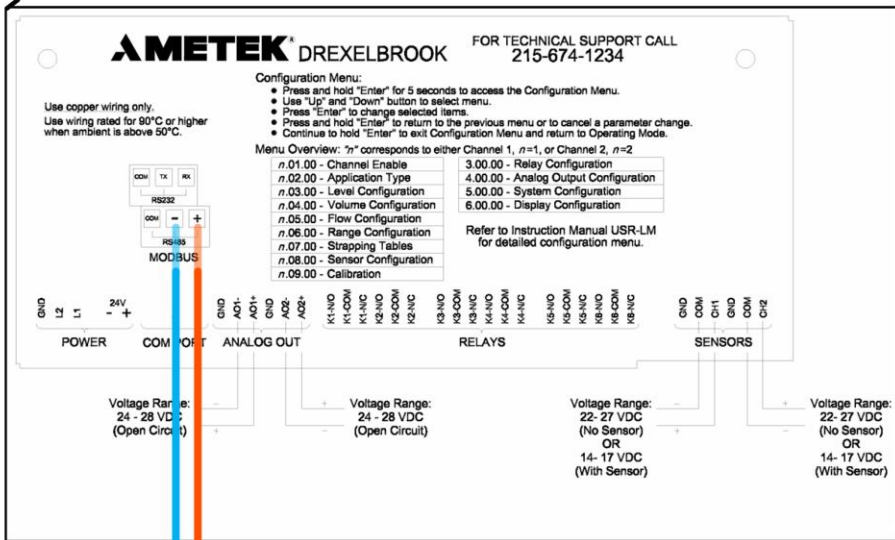
Connections:

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

USonic-R Connection to AMI System:



**AMETEK
USONIC-R**



SCADAMETRICS MODEL MBE MODBUS ENCODALIZER™

