

Application Note 016  
Version 003  
29 November 2019

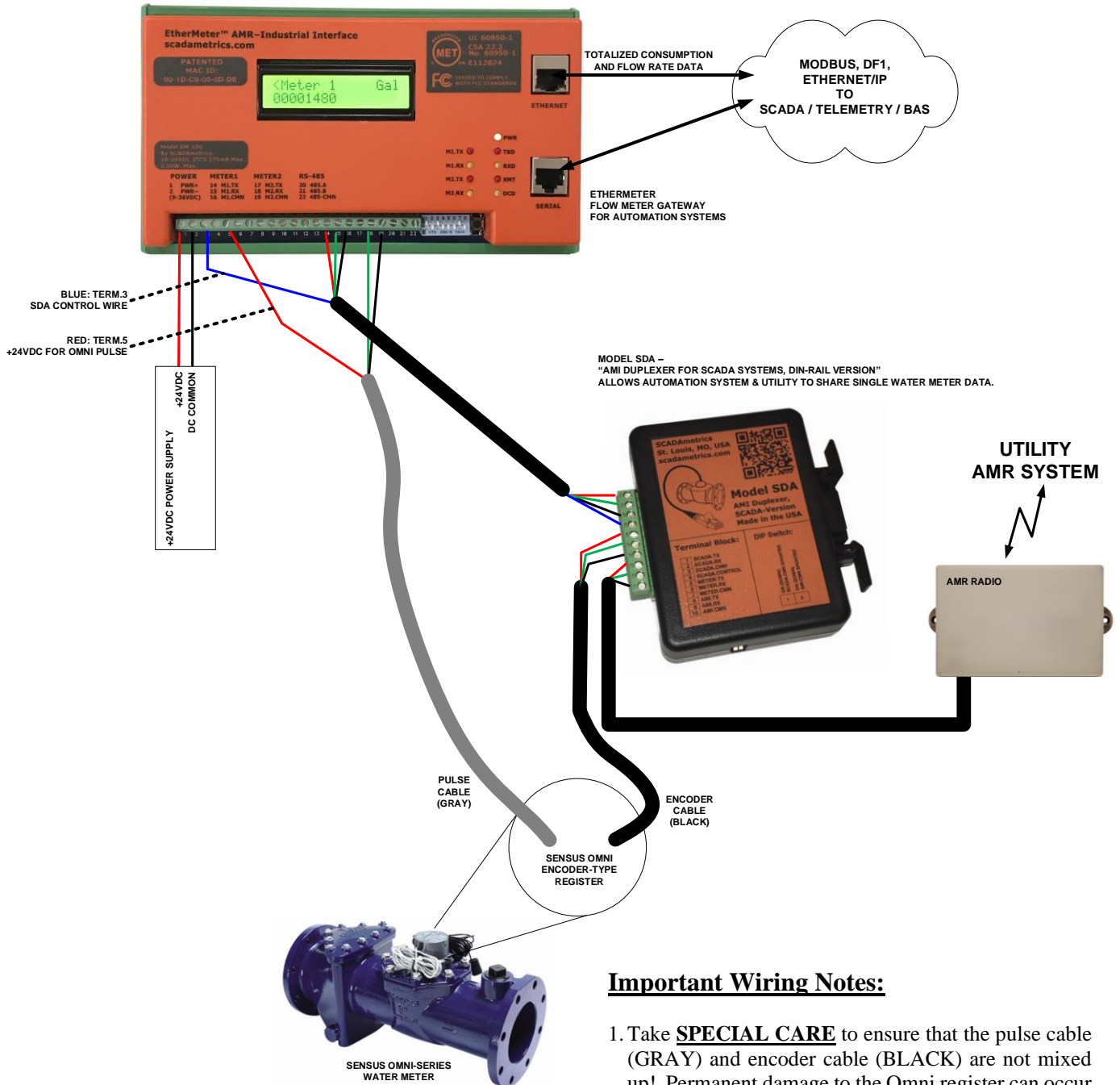
## **Connecting The Sensus Omni-T2/C2/F2 Register Signals (Encoder and/or Pulse) To The EtherMeter®.**

This document describes the wiring procedures and EtherMeter settings required when connecting to a Sensus Omni Meter (Series T2, C2, or F2) to the EtherMeter. Both Encoder and Pulse signals will be addressed.

The wiring is different for Versions 257 (latest) and 256 (legacy) hardware configurations. This document addresses both configurations.

# Wiring A Sensus Omni Meter Register to A Version 257 EtherMeter:

CONNECTING AN ETHERMETER TO A SENSUS OMNI METER  
 USING BOTH ENCODER AND PULSE SIGNALS.  
 UTILITY METER-SHARING IMPLEMENTED USING THE SDA DUPLEXER.

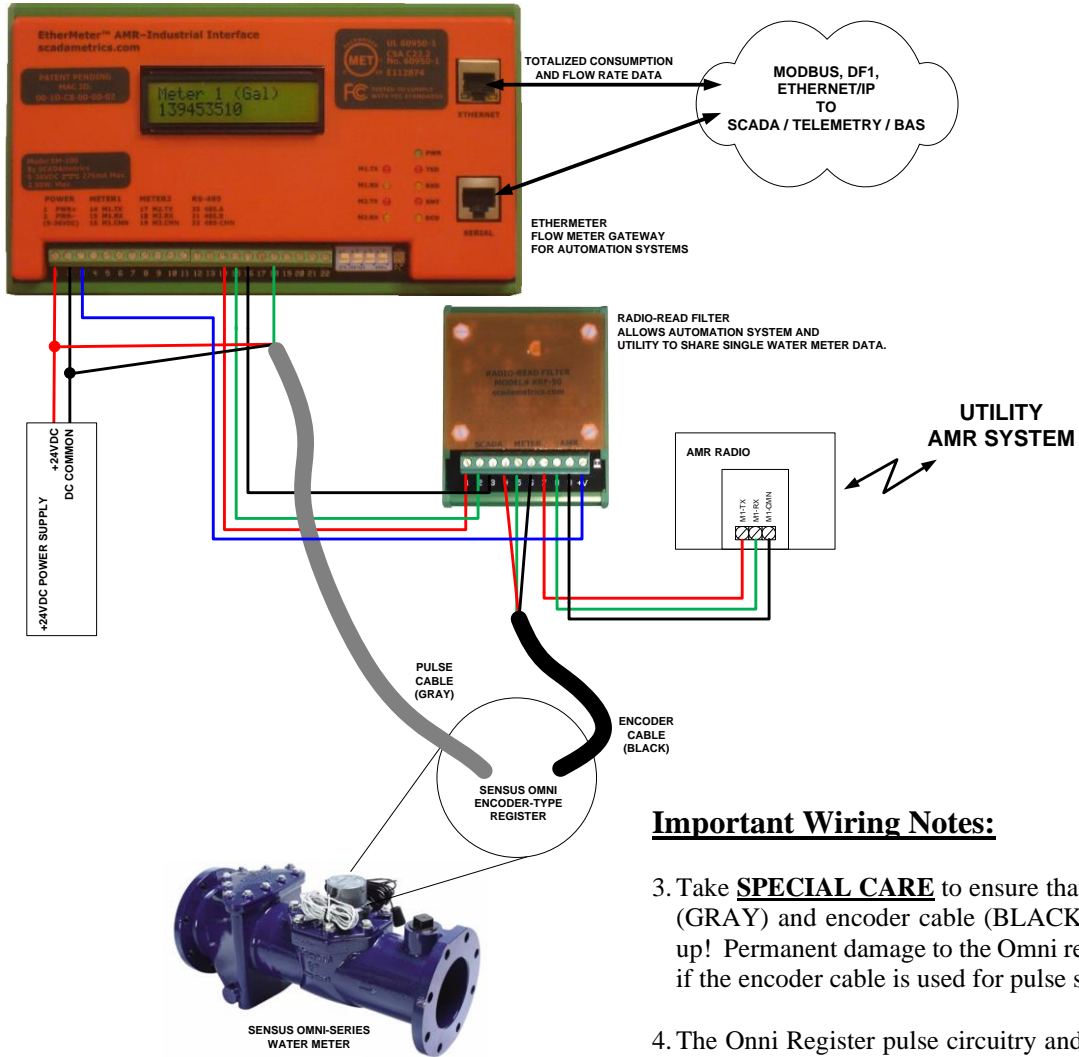


## Important Wiring Notes:

1. Take **SPECIAL CARE** to ensure that the pulse cable (GRAY) and encoder cable (BLACK) are not mixed up! Permanent damage to the Omni register can occur if the encoder cable is used for pulse signaling!
2. The Omni Register pulse circuitry **MUST** be powered from **EtherMeter.Terminal.5** (convenience isolated 24VDC).

# Wiring A Sensus Omni Meter Register to A Version 256 EtherMeter:

CONNECTING AN ETHERMETER TO A SENSUS OMNI METER  
 USING BOTH ENCODER AND PULSE SIGNALS.  
 UTILITY METER-SHARING IMPLEMENTED USING THE RRF-50 RADIO-READ FILTER.



## Important Wiring Notes:

3. Take **SPECIAL CARE** to ensure that the pulse cable (GRAY) and encoder cable (BLACK) are not mixed up! Permanent damage to the Omni register can occur if the encoder cable is used for pulse signaling!
4. The Omni Register pulse circuitry and the EtherMeter **MUST** be powered from the **SAME** DC Power Supply.



**Sensus Omni Register.** The Pulse Cable (L) has a GRAY jacket, and the Encoder Cable (R) has a BLACK jacket. The Encoder Cable is terminated with a touch-read pad, which should be cut/removed in order to expose the inner three conductors, which are color-coded RED, GREEN, BLACK.

**Question:** Under which circumstances would it be desirable to connect both encoder and pulse to signals to the EtherMeter?

**Answer:** The Meter is to be co-connected to both the Utility and an Automation System. Often, the Utility desires to configure the encoder output for coarse resolution (e.g. 1000's of gallons); and this coarse resolution makes it difficult or impossible to discern the realtime rate-of-flow. However, realtime rate-of-flow can be discerned from the pulse signal, which can be independently programmed for fine resolution. By utilizing both the encoder and pulse signals, the user can receive revenue-grade-accurate totalization (from the encoder signal) and realtime rate-of-flow (from the pulse signal).

**Question:** The pulse signal from the Sensus Omni Register features a programmable scaling. What scaling should be selected?

**Answer:** The Omni Register pulse output signal should be factory-pre-programmed for the finest pulse resolution available for the given meter size. Basically, with a faster pulse-rate – the EtherMeter can more quickly calculate the rate-of-flow.

### **EtherMeter Setup Commands:**

Using a serial setup cable (P/N EM-439), and referencing the EtherMeter User Manual, the EtherMeter should be configured for pulse input on the appropriate meter input channel. For example, a Sensus 4 Inch Omni-T2 Meter with encoder signal programmed for 1000's of gallons connected to EtherMeter Channel 1, and pulse signal programmed for 10's of gallons connected to EtherMeter Channel 2:

<b>SETUP COMMAND:</b>	<b>PURPOSE:</b>
<b>SET EXP1 3</b>	METER 1 READING IN 1000'S OF GALLONS
<b>SET SAMP1 60</b>	READ METER 1 EVERY 60 SECONDS
<b>SET PWR2 0</b>	SET METER CHANNEL #2 INPUT AS PULSE-TYPE
<b>SET DB2 1</b>	SET DEBOUNCE TO 1 MILLISECOND
<b>SET EXP2 1</b>	METER 2 READING IN 10'S OF GALLONS (DEPENDS ON METER SIZE)
<b>SET FCALC2 DTOTAL</b>	FLOW CALCULATION METHOD: FIXED DELTA-TOTAL
<b>SET SAMP2 20</b>	UPDATE FLOW-RATE CALCULATION EVERY 20 SECONDS
<b>SET TO2 20</b>	SET FLOW-RATE TO ZERO IF NO PULSES IN PAST 20 SECONDS
<b>SET CNT2 &lt;CURRENT READING&gt;</b>	SYNC ETHERMETER WITH REGISTER METER READING

In this configuration, Meter Total (encoder) is digitally available in MODBUS Register 40001-2 (Allen Bradley Register N7:0-1), and Meter Flow (pulse) is digitally available in MODBUS Register 40007-9 (Allen Bradley Register N7:6-7). The encoder-based flow (MODBUS Register 40005-6) and the pulse-based totalization (MODBUS Register 40003-4) may be ignored/discarded.