

Connect an Endress+Hauser ProMag W 400 to an AMI/AMR System Using the SCADAmetrics Encodalizer™



The Endress+Hauser Promag W 400 (pictured left) is a popular magnetic flow meter that is suitable for a broad range of water and wastewater flow metering applications. It is manufactured in a range of sizes so as to support flow metering within 1- thru 120-inch diameter pipes.

The Promag features traditional 4-20 milliamp and pulse SCADA signals, as well as the EtherNet/IP network protocol. Like most mains-powered process magnetic flow meters, the Promag W 400 does not offer native AMI/AMR-compatibility.

However, today, the latest firmware release for the SCADAmetrics Model MBE Encodalizer now adds Neptune and Sensus encoder protocols to this important flow meter, 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 Promag W 400 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. No special setup of the meter should be required beyond normal initialization procedures. When ordering a ProMag W 400, please note that the meter must be outfitted with the Modbus/RTU (RS.485) option, in addition to any other application-specific I/O options. 24V_{DC} Mains Power option is also recommended, but not required.



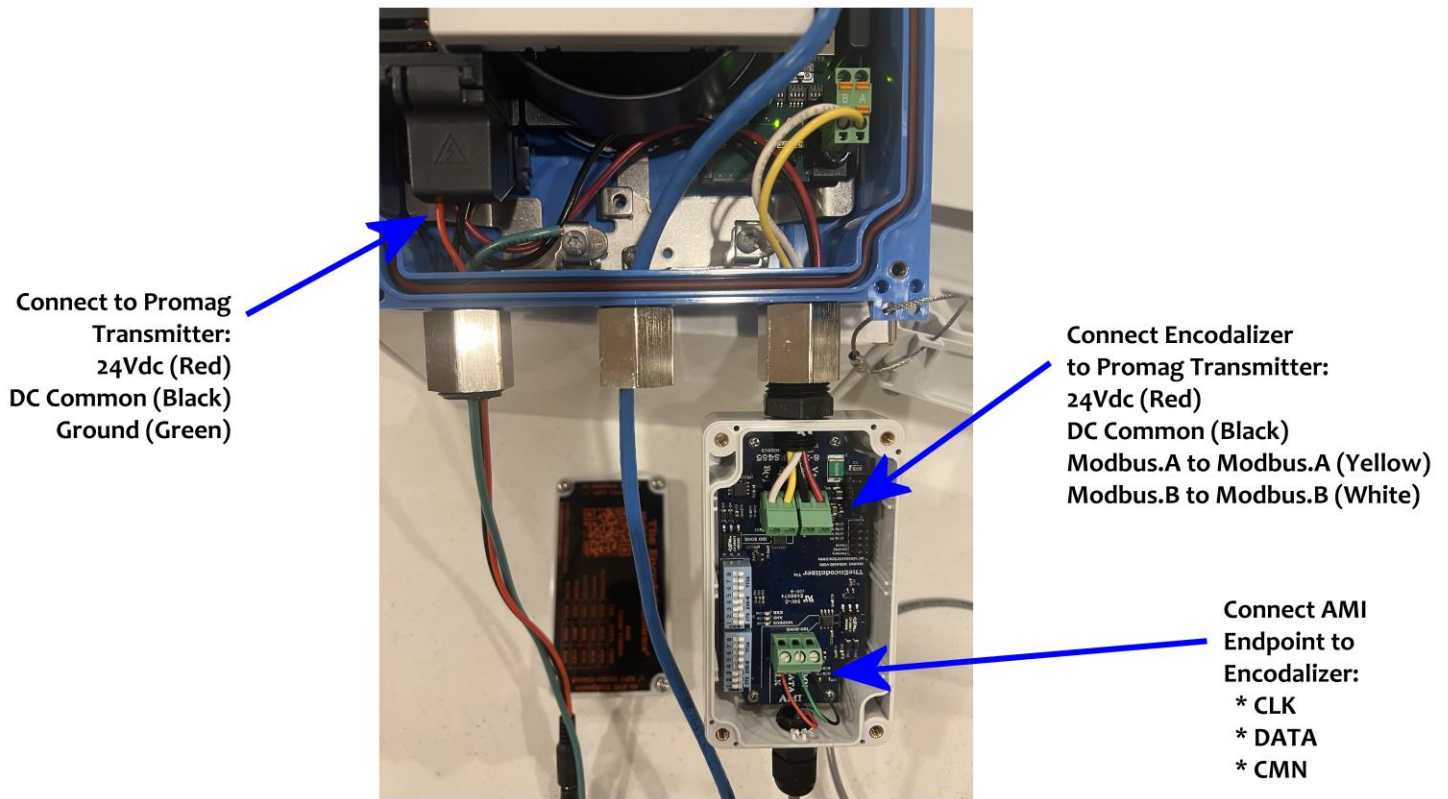
Jim 'Slim' Mimplitz, SCADAmetrics

SCADAmetrics / Endress+Hauser Demo:



Endress+Hauser 1" Promag W 400
 SCADAmetrics Model MBE Encodalizer™
 SCADAmetrics Model TMD TheMeterDisplay™ - For Troubleshooting

Promag / Encodalizer Integration:



Acknowledgements:

Firmware development and validation was performed using an **Endress+Hauser ProMag W 400**.

This flow instrument was generously provided on loan to SCADAmetrics, courtesy of **Mike Vollmar**, Endress+Hauser Product Business Manager – Flow | West Area (Pearland, TX).

Encodalizer DIP Switch Settings:

1. Set DIP Switches 1-6 Per Meter Type “Promag W 400 Totalizer 1”
(DIP Switches 1,2,3=ON. DIP Switches 4,5,6=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 Promag Always Follow the Promag Units of Totalizer 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!!)**

Promag and Encodalizer Wiring:

1. Connect Ground to Promag grounding lug. Connect Power (Preferably 24V_{DC}) to Promag W 400. The Promag bootup process completes in approximately 25 seconds.
2. If SCADA Connection is Required, Then Connect SCADA System to Promag:
EtherNet/IP, Modbus/TCP, 4-20mA, or Pulse
3. Connect Encodalizer Modbus Terminals to Promag Modbus 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.

Promag W 400 Setup:

1. Set Totalizer Units In Two (2) Menu Locations: GAL, KGAL, FT³, or M³, or L
 - Main Menu > Setup > System Units
 - Main Menu > Setup > Advanced Setup > Totalizer 1
2. Set Totalizer Display Decimal Point Location: X. (Zero Digits After Decimal Point)
 - Main menu > Setup > Advanced setup > Display
3. Do NOT Modify Promag Modbus/RTU Default Settings.
(Device ID: 247, Baud: 19200, Stop Bits: 1, Parity: Even, Byte Order: 1-0-3-2)
4. Ensure That Promag Totalizer 1 Is Set To: NET FLOW TOTAL (Factory Default)
 - Expert > Application > Totalizer 1 > Operation mode

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

