

Connect a Siemens Mag 6000 to an AMI/AMR System Using the SCADAmetrics Encodalizer™



The Siemens FM Mag 6000 (pictured left) is a popular magnetic flow meter transmitter that is suitable for a broad range of water and wastewater flow metering applications. It is usually paired with a FM Mag 5100w or FM Mag 3100 flow sensor tube, which are available in diameter sizes ½–78 inches.

The Mag6000 features traditional 4-20 milliamp and pulse SCADA signals, as well as fieldbus protocols. Like most process magnetic flow meters, the Mag6000 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 Mag6000 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 Mag6000, 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.



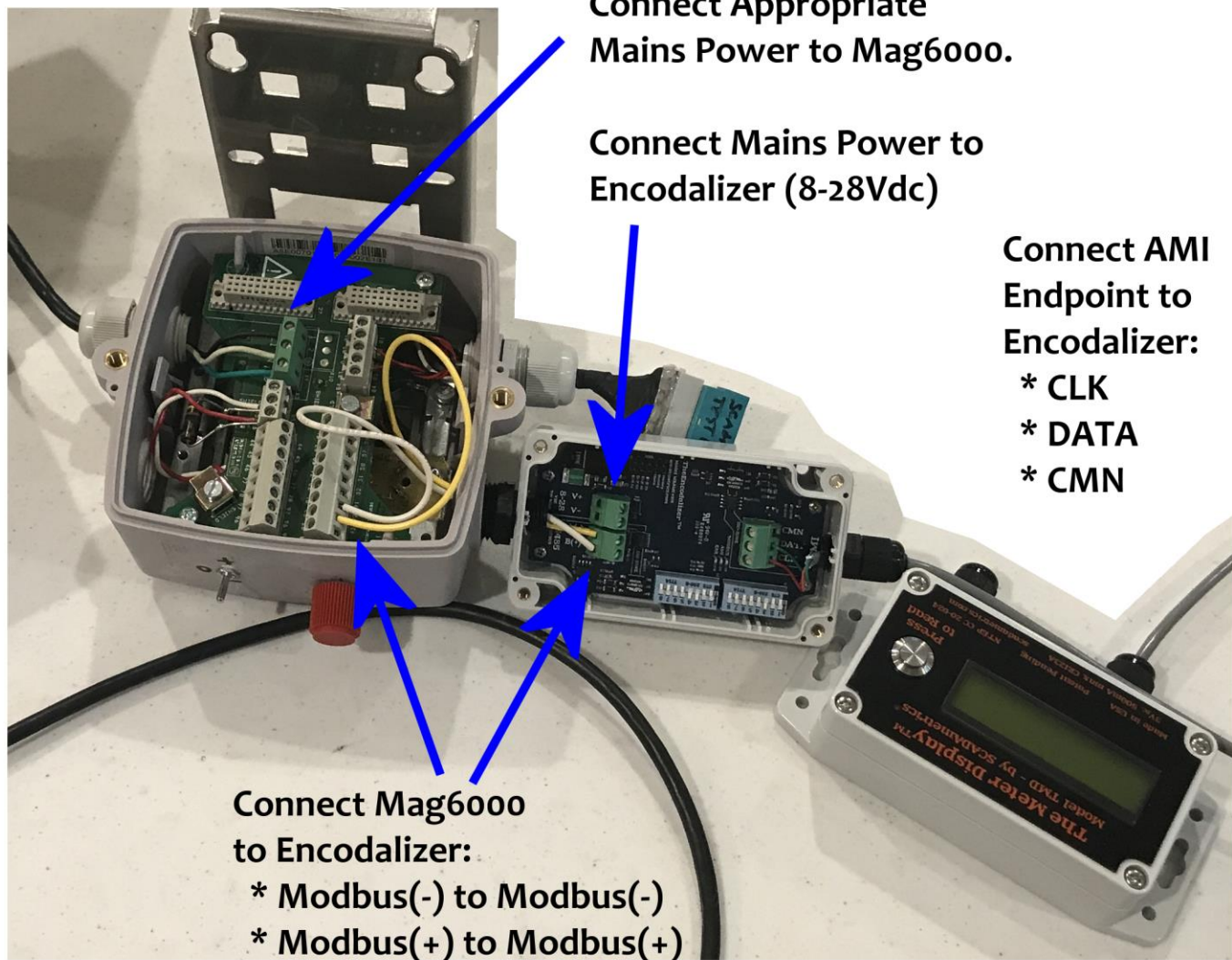
Jim 'Slim' Mimplitz, SCADAmetrics

SCADAmetrics / Siemens Mag6000 Demo:



Siemens Mag6000 Transmitter with Modbus/RTU Option Card
SCADAmetrics Model MBE Encodalizer™

Mag6000 / Encodalizer Integration:



Acknowledgements:

Firmware development and validation was performed using a **Siemens FM Mag 6000**.

This flow instrument was generously provided on loan to SCADAmetrics, courtesy of **Norm Kramer**, Application Engineer | Siemens Industry (Spring House, PA).

Encodalizer DIP Switch Settings:

1. Set DIP Switches 1-6 Per Meter Type "Siemens Mag6000": Fwd, Rev, or Net (Fwd-Rev)
Example, Net DIP Switches 2,3=ON. DIP Switches 1,4,5,6=OFF
 2. Set DIP Switch 8 Per Desired AMI Protocol: Sensus or Neptune: OFF=Sensus, ON=Neptune.
 3. Set DIP Switches 9 and 10 per Desired AMI Units (Gal, FT³, M³...). It is Recommended That Mag6000 Display Units Also Be Set to Match the AMI Units to Avoid Confusion.
 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!!)**

Mag6000 and Encodalizer Wiring:

1. Connect Ground to Mag6000 grounding lug. Connect Power (Preferably 24V_{DC}) to Mag6000. The Mag6000 bootup process completes in approximately 5 seconds.
2. If SCADA Connection is Required, Then Connect SCADA System to Mag6000: 4-20mA or Pulse
3. Connect Encodalizer Modbus Terminals to Mag6000 Modbus Terminals:
 - Mag6000.Term.93(-) to Encodalizer.Term.A(-)
 - Mag6000.Term.92(+) to Encodalizer.Term.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.

Mag6000 Setup:

1. Set Display Totalizer Units to Match AMI Totalizer Units:
 - GAL, KGAL, MGAL, FT³, or M³, or L
 (Although This Step Is Not Required, It Is Highly Recommended to Avoid Confusion.)
2. Do NOT Modify Mag6000 Modbus/RTU Default Settings.
(Device ID: 1, Baud: 19200, Stop Bits: 1, Parity: Even)

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

