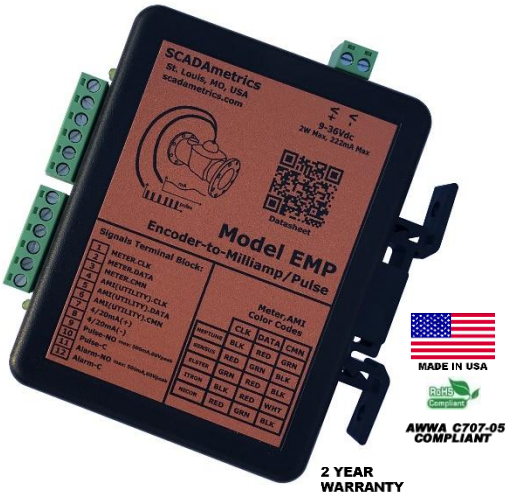
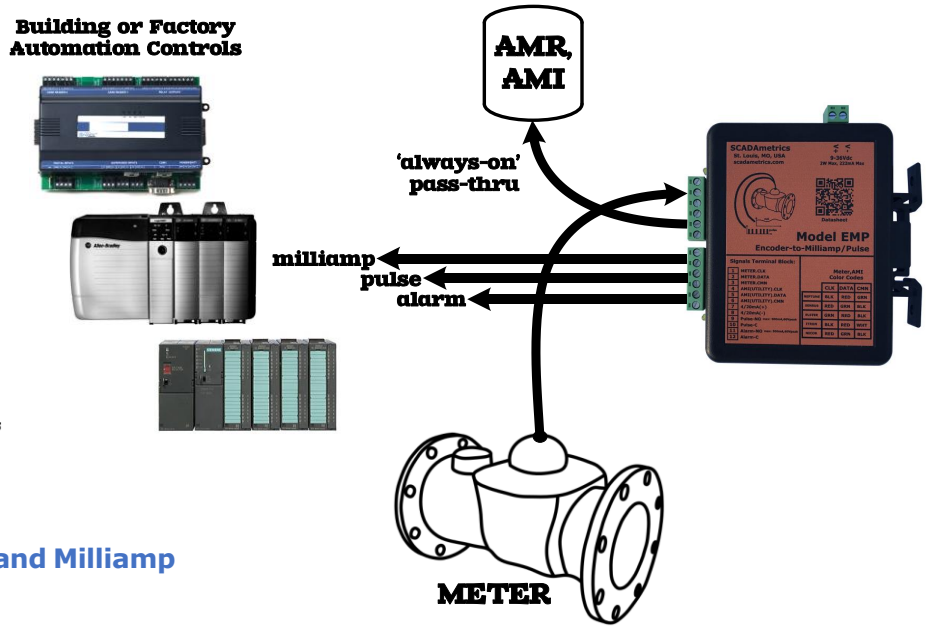
SCADAMETRICS®

The Signalizer™

Model EMP – Patent Pending





The Industry's Most Versatile Flow and Milliamp Signal Source for Water Meters!

SCADAmetrics® is pleased to introduce the newest member of its DINstrumentation™ series – **The Signalizer™!**

This new electronic signal generator for water meters provides a 4-20 milliamp (flow) output and a dry contact pulse (per volume) output! – while still maintaining the meter's ability to be co-connected to an AMI/AMR endpoint!

Meter Owners have traditionally been required to make a weighted buying decision: encoder-type meter?... or milliamp/pulse-type meter? **The Signalizer** allows you to easily have both with the same meter!

The Signalizer utilizes the popular encoder signal from the water meter to generate both a 4-20mA rate-of-flow signal[1] and a dry-contact pulse-per-volume signal. …And because **The Signalizer** is outfitted with an integral pass-thru port, it can co-exist with an AMI/AMR system[2]. Even if power is removed, the pass-thru port is always functional – ensuring continuous connectivity to the AMR/AMI system!

The Signalizer is compatible with every late-model, encoder-type water meter in North America – including those from **Neptune, Sensus**, **Metron-Farnier**, **Mueller**, **Kamstrup**, **Badger**, **Master Meter**, **RG3**, **Zenner**, **Elster-AMCO**, **McCrometer**, and many others!

[1]**Encoder Resolution** – a high-fidelity 4-20mA signal requires high-resolution encoder resolution (7-9 digits). Therefore, for optimal performance, we recommend that you pre-program your water meter's encoder register for maximum resolution.

[2]**Permitting** – If the meter is owned by the water utility, we recommend that you first contact its engineering department for permission!

Key Features –

- 4-20mA Flow-Proportional Output (3KV Isolation).
- Dry-Contact, Volume-Proportional Output (3.75KV Isolation).
- Dry-Contact Alarm Output (3.75KV Isolation).
- Built-In Pass-Thru Port for Co-Connection to an AMI/AMR System – Works Even If Power Down!

- Compatible with All Late-Model, North American Encoder-Type Water Meters (Neptune 6,8,9-digit, Sensus 4,5,6,7,8,9-digit, Elster K-Frame Protocols).
- Works with All Popular Registration Units (Gallons, Cubic Feet, Cubic Meters, Acre Feet).

- No Computer Required! – Setup via DIP Switches Only!
- Removable Terminal Blocks, Simplified Wiring Procedures.
- Mounts on standard 35mm industrial DIN-rail.
- 24VDC-Powered (1.5KV Isolation). Low 1.2W Power Consumption.
- Enclosure and Circuit Board: UL 94-VO recognized materials.

Are you interested in how SCADAmetrics meter technology can help you more closely monitor the flow through your water meters? Give us a call! We'll be glad to discuss the details!

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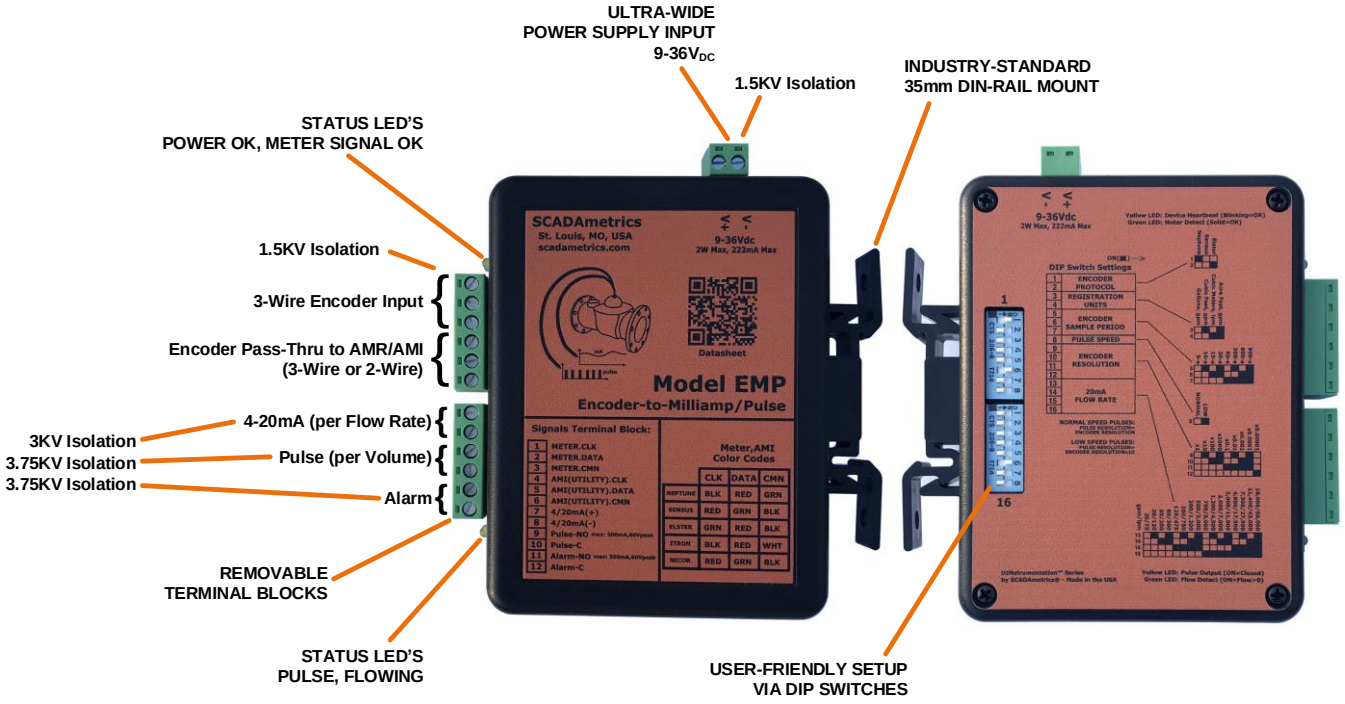


Engineering Specifications –

Dimensions:	4.5" x 5.0" x 1.275"
Weight:	6.5 Ounces
Supply Voltage:	9-36V_{DC}
Supply Power:	1.25W
Power Supply Isolation:	1500V_{RMS}
Neptune Protocol Support:	Yes, 8,9-Digit "E-Coder Plus", and 6-Digit "Pro-Read" Protocols
Sensus Protocol Support:	Yes, Both Fixed and Variable Digit Sensus Protocols (4-9 digits)
Elster Protocol Support:	Yes, Auto-Fills Units and Decimal Shift, Based on Embedded Info within Elster K-Frame
Supported Units:	Gallon, Cubic Feet, Cubic Meters, Acre-Feet
Supported Scalors:	x1 , x10 , x100 , x1,000 --- x0.1 , x0.01 , x0.001 , x0.0001 , x0.00001
Encoder Sample Period (s):	5, 10, 15, 30, 60, 300, 600, 900 (User-Selectable)
Programming Method:	Integrated DIP Switches, 16-Poles
4-20mA Flow Range (gpm):	20,30,50,80,125,200,300,500,750,1200,2000,3000,4600,7300,11400,18000
4-20mA Flow Range (lpm):	75,120,200,300,475,750,1200,2000,3000,4500,7000,11000,17500,27500,43000,68000
4-20mA Resolution:	16-Bit DAC
4-20mA Isolation:	3000V_{RMS}
4-20mA Max Series Resistance:	500 Ω
4-20mA Signal Type:	Active. External Loop Supply *Not* Required?
Pulse Output Type:	Solid-State Dry-Contact, 1 Pulse-per-Encoder Resolution
Alarm Output Type:	Solid-State Dry-Contact, Closes if Meter or Signalizer Fault
Pulse Resolution:	Normal-Speed Mode: Pulse Resolution = Encoder Resolution
	Low-Speed Mode: Pulse Resolution = Encoder Resolution / 10
Closed-Contact Resistance:	0.4 ohm, typical
Closed-Contact Max Current:	500mA
Open-Contact Max Voltage:	60V
Pulse/Alarm Isolation:	3750V_{RMS}
Meter Cable Connection:	3-Position, Removable Screw-Down Terminal Block, 12-26 AWG
Pass-Thru Cable Connection:	3-Position, Removable Screw-Down Terminal Block, 12-26 AWG
Pass-Thru Port for AMR/AMI:	Yes, Supports both 3-Wire and 2-Wire AMR Devices
Temperature:	-40C to 85C (-40°F to 185°F)
Relative Humidity:	5% to 95%, Non-Condensing
Enclosure Rating:	Built to IP40 Specifications, Not Rated for Submersion /Outdoor Use
Manufacturing Location:	USA
Environmental:	ROHS-Compliant, Lead-Free
Meter Interface:	AWWA C707-05
Warranty:	2 Years (see www.scadametrics.com for details)

Engineering Dimensions (Inches) –

Meter Terminal Block Hookup –

Terminal	Function	Sensus Meter Color (Badger, Metron-Farnier, Master Meter, Kamstrup, Mueller, Zenner, RG3, Nicor Cable)	Neptune Color	Elster Color	Itron ERT Cable
1	Meter Clock	Red	Black	White|Green	Black
2	Meter Data	Green|White	Red	Red	Red
3	Meter Ground	Black	Green	Black	White|Shield
4	Utility AMI Clock	Red	Black	White|Green	Black
5	Utility AMI Data	Green|White	Red	Red	Red
6	Utility AMI Ground	Black	Green	Black	White|Shield

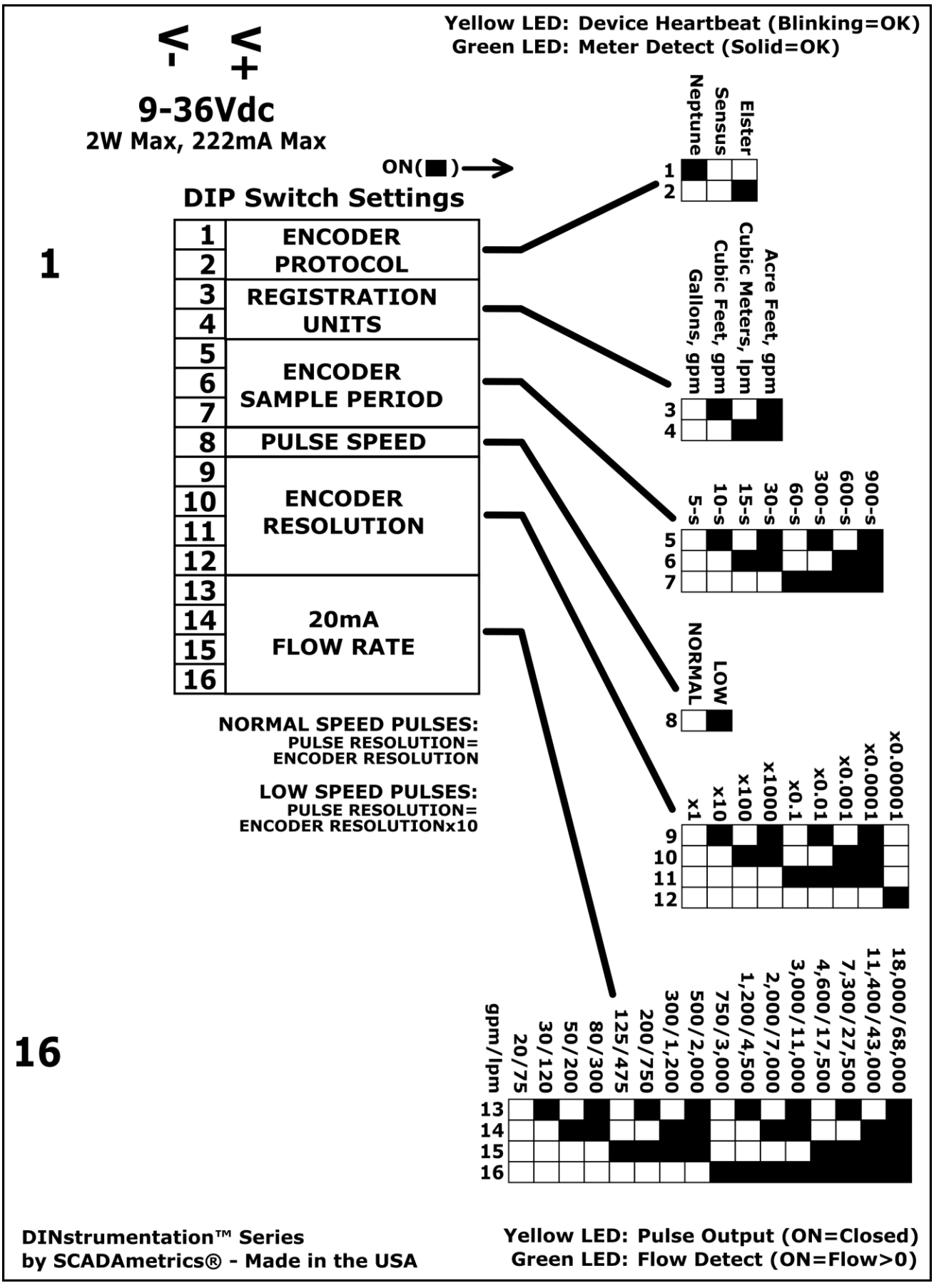
Wiring Notes:

1. With the exceptions of Neptune Technology Group and Elster-AMCO (aka Honeywell, ABB, Kent), most meter manufacturers follow the Sensus wire color-coding scheme.
2. Meter Terminal Block Hookup (Terminals 1,2,3): Apply the color-coding that pertains to the manufacturer of the Water Meter (or manufacturer of the Specialty Cable, such as Nicor or Itron).
3. Utility AMI/AMR Terminal Block Hookup (Terminals 4,5,6): Apply the color-coding that pertains to the manufacturer of the AMI/AMR Endpoint (or manufacturer of the Specialty Cable, such as Nicor or Itron).
4. Alternative color-coding: manufacturers occasionally substitute a WHITE wire for a GREEN wire.
5. If the recommended wiring has been attempted, and the display still reports "meter not detected", then re-try using each of the six possible wire color-coding combinations on terminals 1,2,3.

Signal Terminal Block Hookup –

Terminal	Function	Notes
7	4-20mA +	Settable Range via DIP Switches
8	4-20mA –	
9	Pulse +	Solid-State Dry Contact (N-O) 500mA Max, 60V Max
10	Pulse –	
11	Alarm +	Solid-State Dry Contact (N-O) 500mA Max, 60V Max
12	Alarm –	

DIP Switch Setup (Also Imprinted on Device Rear Cover) –



QUICK-START GUIDE –

Initial Setup:

1. **Attach the water meter's three (3) encoder wires to Signalizer terminals 1,2,3 (see above table for color-coding).**

2. **(If Applicable) Attach the AMR/AMI endpoint's three (3) encoder wires to Signalizer terminals 4,5,6 (see above table for color-coding).**

3. **(If Applicable) Connect the 4-20mA output signal to PLC/Controller: Terminals 7(+) and 8(-). Important Note! – The Signalizer™ provides loop power. Therefore, there is no need to add an additional loop power supply.**

4. **(If Applicable) Connect the pulse output signal to the PLC/Controller: Terminals 9 and 10. Important Note! – The pulse output is a solid-state, dry-contact type. 500mA max, 60V max. Circuit must be current-limited by external means.**

5. **(If Applicable) Connect the alarm output signal to the PLC/Controller: Important Note! – The alarm output is a solid-state, dry-contact type. 500mA max, 60V max. Circuit must be current-limited by external means.**

6. **Set the DIP Switches, per the Datasheet.**

7. **Connect DC voltage source to the Signalizer's V+/V- terminals. An isolated 24V_{DC} power supply is recommended.**

Apply Power, and Observe…

- The Upper Yellow 'Hearbeat' LED should light up YELLOW with an OCCASIONAL BLINK, signifying that the Signalizer is working.

- The Upper Green 'Meter OK' LED should light up SOLID GREEN, signifying that the meter has been successfully detected.

- The Lower Yellow LED will follow the Pulse Output (LED ON=Contact Closure).

- The Lower Green LED will light up SOLID GREEN during periods when Positive Flow is Detected.

NEPTUNE WATER METERS –
PERSONALITY SETTINGS FOR NEPTUNE WATER METERS.

Recommended Settings for E-Coder, Pro-Coder, and WaterFlux 3070 Registers:

Size	Gallon	Cubic Feet	Cubic Meters
5/8", 3/4", 1"	DipSw.1=ON DipSw.2= DipSw.3= DipSw.4= DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11=ON DipSw.12=	DipSw.1=ON DipSw.2= DipSw.3=ON DipSw.4= DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11=ON DipSw.12=	DipSw.1=ON DipSw.2= DipSw.3= DipSw.4=ON DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10=ON DipSw.11=ON DipSw.12=
1.5", 2", 3", 4"	DipSw.1=ON DipSw.2= DipSw.3= DipSw.4= DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11= DipSw.12=	DipSw.1=ON DipSw.2= DipSw.3=ON DipSw.4= DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11=ON DipSw.12=	DipSw.1=ON DipSw.2= DipSw.3= DipSw.4=ON DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11=ON DipSw.12= Special Case! – For 1.5" T-10 with E-Coder, DipSw.9= DipSw.10=ON DipSw.11=ON DipSw.12=
6"-12"	DipSw.1=ON DipSw.2= DipSw.3= DipSw.4= DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11= DipSw.12=	DipSw.1=ON DipSw.2= DipSw.3=ON DipSw.4= DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11= DipSw.12=	DipSw.1=ON DipSw.2= DipSw.3= DipSw.4=ON DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11=ON DipSw.12=
16"	DipSw.1=ON DipSw.2= DipSw.3= DipSw.4= DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10=ON DipSw.11= DipSw.12=	DipSw.1=ON DipSw.2= DipSw.3=ON DipSw.4= DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11= DipSw.12=	DipSw.1=ON DipSw.2= DipSw.3= DipSw.4=ON DipSw.5= DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11= DipSw.12=

NEPTUNE WATER METERS –
PERSONALITY SETTINGS FOR NEPTUNE WATER METERS (CONT).

Recommended Settings for E-Coder, Pro-Coder, and WaterFlux 3070 Registers:

The Following *Suggested* Flow Span Settings, and May Need To Be Adjusted Based on Anticipated Max Flow Conditions.

Size	Gallon , Cubic Feet , Cubic Meters
5/8" T10 20 gpm 75 lpm	DipSw.13= DipSw.14= DipSw.15= DipSw.16=
3/4" T10 30 gpm 120 lpm	DipSw.13=ON DipSw.14= DipSw.15= DipSw.16=
1" T10 50 gpm 200 lpm	DipSw.13= DipSw.14=ON DipSw.15= DipSw.16=
1.5" T10 125 gpm 475 lpm	DipSw.13= DipSw.14= DipSw.15=ON DipSw.16=
2" T10,1.5-2" HPT, 200 gpm 750 lpm	DipSw.13=ON DipSw.14= DipSw.15=ON DipSw.16=
3" HPT 500 gpm 2000 lpm	DipSw.13=ON DipSw.14=ON DipSw.15=ON DipSw.16=
4" HPT 1200 gpm 2000 lpm	DipSw.13=ON DipSw.14= DipSw.15= DipSw.16=ON
6" HPT 3000 gpm 11000 lpm	DipSw.13=ON DipSw.14=ON DipSw.15= DipSw.16=ON
8" HPT 4600 gpm 17500 lpm	DipSw.13= DipSw.14= DipSw.15=ON DipSw.16=ON
10" HPT 7300 gpm 27500 lpm	DipSw.13=ON DipSw.14= DipSw.15=ON DipSw.16=ON
12" HPT 11400 gpm 43000 lpm	DipSw.13= DipSw.14=ON DipSw.15=ON DipSw.16=ON
16" HPT 18000 gpm 68000 lpm	DipSw.13=ON DipSw.14=ON DipSw.15=ON DipSw.16=ON

SENSUS-COMPATIBLE WATER METERS –
PERSONALITY SETTINGS FOR SENSUS-COMPATIBLE WATER METERS. ALL ENCODER METERS, EXCEPT FOR NEPTUNE AND ELSTER, ARE SENSUS-COMPATIBLE.

Sensus-compatible water meters generally feature programmable resolution; so therefore, the user must field-adjust the decimal point shift:

1. **Set both dip switches 1 and 2 to the "down" position.**
2. **Note the Totalization Reading and Units on the water meter's register.**
3. **Use a SCADAmetrics TheMeterDisplay™ to determine the Water Meter's actual resolution…**

    a. **Connect the Water Meter's Red,Grn,Blk wires to TheMeterDisplay's terminals 1,2,3; and press the "Read" button.**
    b. **Adjust TheMeterDisplay's Decimal Point Shift (Rotary Switch), so that the displayed reading on TheMeterDisplay is a match to the reading on the water meter's register. Note the multiplier / decimal shift.**

4. **Set the DIP Switches of the TheSignalizer to match, accordingly.**
5. **Set the Units on TheSignalizer by setting dip switches 3,4.**

ELSTER-AMCO WATER METERS –
PERSONALITY SETTINGS FOR ELSTER-AMCO WATER METERS (aka HONEYWELL, ABB, KENT).

Elster-AMCO (aka Honeywell, ABB, Kent) water meters generally are programmed to communicate using Elster's "K-Frame" protocol, which embeds units and decimal point shift information within the digital message. TheSignalizer takes full advantage of this information and automatically configures its display settings based on that embedded information. Therefore, dip switches 3,4 and 9,10,11,12 may be left in their default positions (all down).

<u>Caveat:</u> Elster-AMCO (aka Honeywell, ABB, Kent) water meters can be purchased to include the "Sensus" protocol. If TheSignalizer fails to detect the meter, then retry setup while treating the meter as a "Sensus-compatible". In this case, that means you will need to follow Sensus wire color-coding, and follow the "Sensus-Compatible" setup of the dip switches.