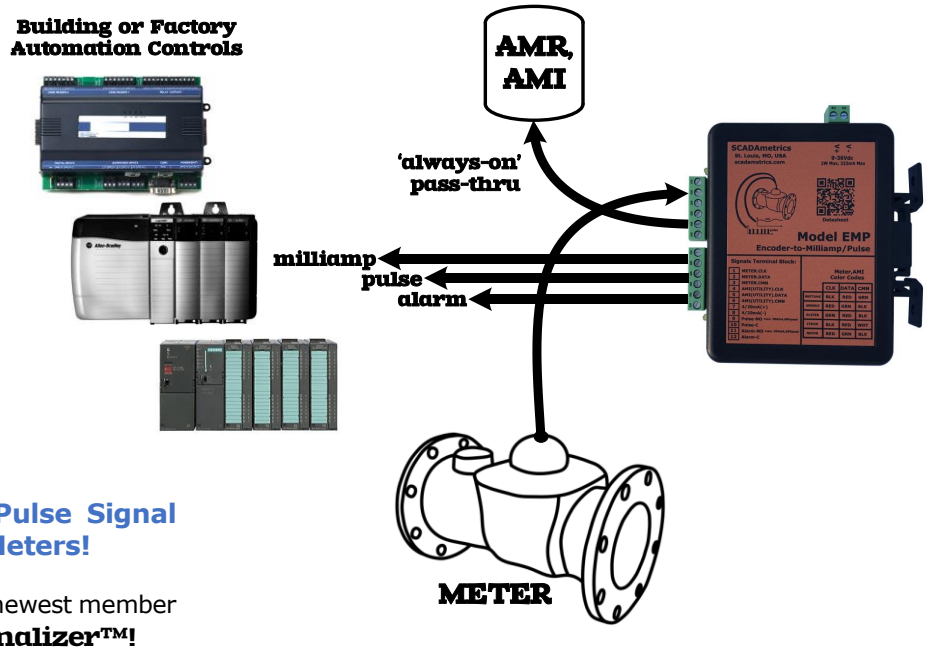
SCADAMETRICS®

The Signalizer™

Model EMP – US Patent No. 11,041,738



The Versatile 4-20 Milliamp and Pulse Signal Source for Hersey/Mueller 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 <u>both</u> 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 the MVR Turbine, HbMag, Positive Displacement, and SSM meters by Mueller Systems (Cleveland, NC).

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 3-wire version Mueller registers.
- 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.
- Simulation-Mode Feature: Emits 12mA and 1 Hz Pulse.

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!

[1]**Encoder Resolution** – a high-fidelity 4-20mA signal requires high-resolution encoder resolution (8+ digits), which is only available on select Mueller water meter registers. In those cases, we recommend the register be pre-programmed to transmit at least eight (8) totalizer digits or more.

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

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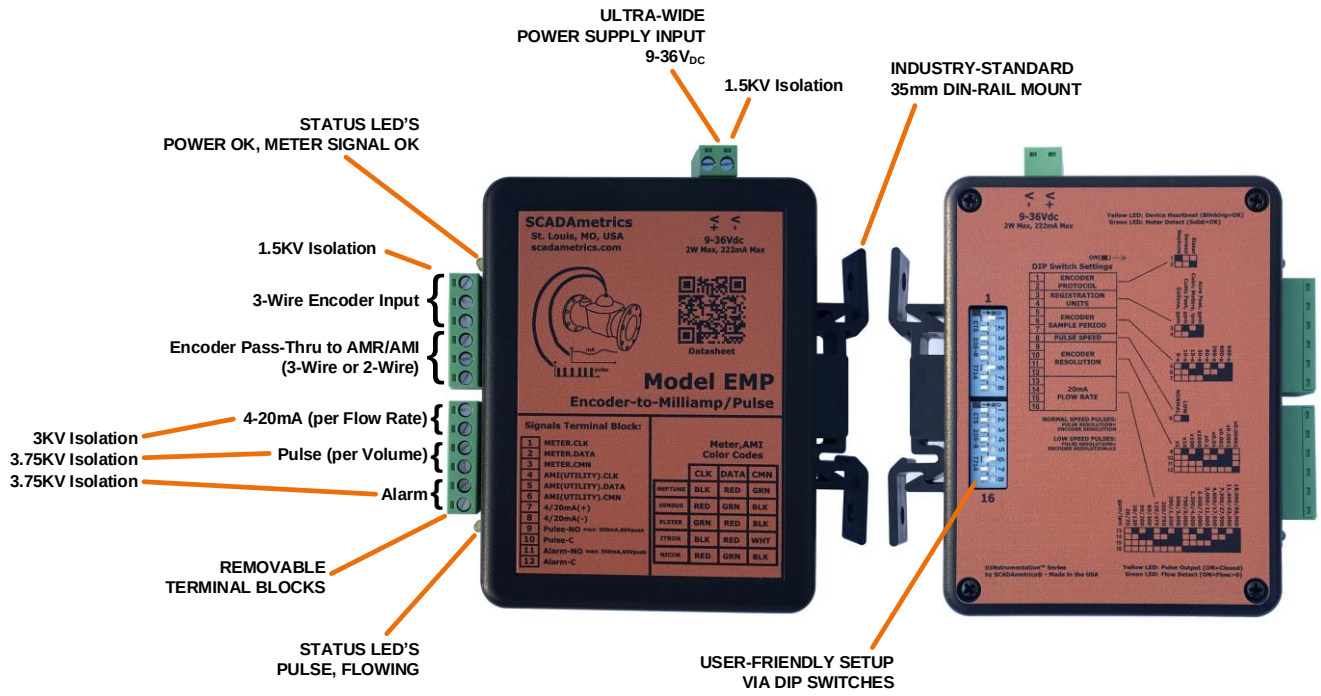
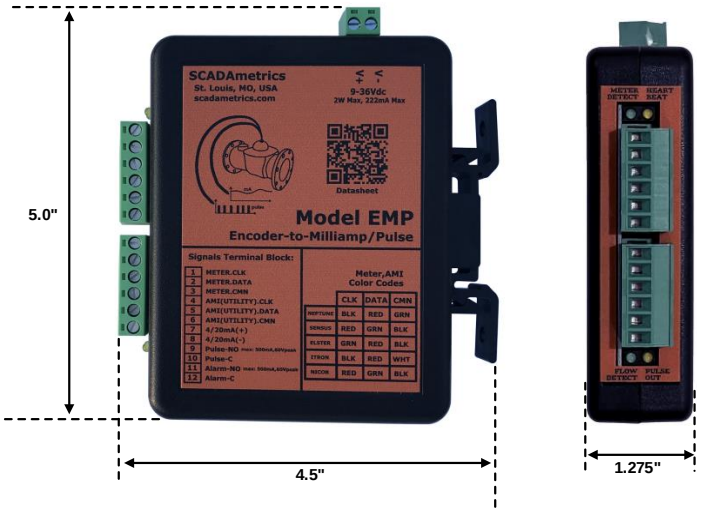


Engineering Specifications –

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 "MACH-10/ProCoder/E-CODER", and 6-Digit "ProRead" Protocols
Sensus/Mueller Protocol Support:	Yes, Both Fixed and Variable Digit Sensus/Mueller Protocols (4-9 digits)
Elster Protocol Support:	Yes, Auto-Fills Units and Decimal Shift, Based on Embedded Info within Elster K-Frame
AMI Pass-Thru Port Support:	Universal – Works with All Major-Brand AMI/AMR Endpoints: Neptune, Sensus, Aclara, Badger, Metron-Farnier, Itron, Master Meter, Hersey/Mueller, RG3, Zenner, Honeywell, Kamstrup, SCADAmetrics, Touchpads (All), Remote Displays (All)
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. Therefore, <u>do not</u> add an external loop supply, or else damage to the unit will result!
Pulse Output Type:	Solid-State Dry-Contact, 1 Pulse-per-Encoder Resolution
Contact Closure Duration:	50% Duty Cycle or 1000ms – whichever is less
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 –

Term.	Function	Mueller Meter with Standard Cable	Mueller Meter with Nicor Cable	Mueller Meter with Itron ERT Cable
1	Meter Clock	Red	Red	Black
2	Meter Data	Green | White	Green	Red
3	Meter Ground	Black	Black	White|Shield

AMR/AMI Terminal Block Hookup –

Term.	Function	Mueller (Metron-Farnier, Badger, Master Meter, Kamstrup, Sensus, Zenner, RG3, Nicor Cable)	Neptune Color	Elster Color	Itron ERT Cable
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

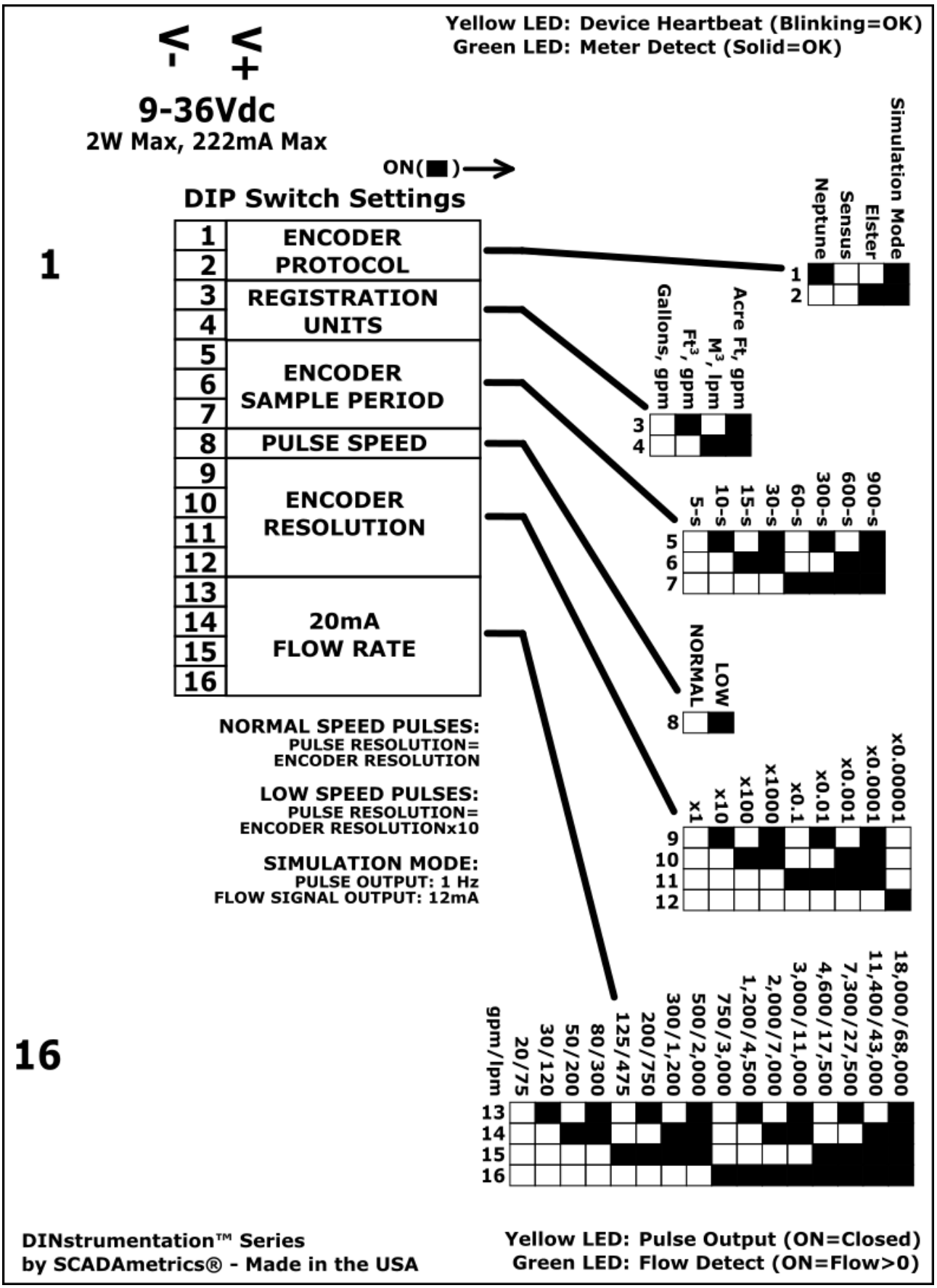
Wiring Notes:

1. 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).
2. 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).

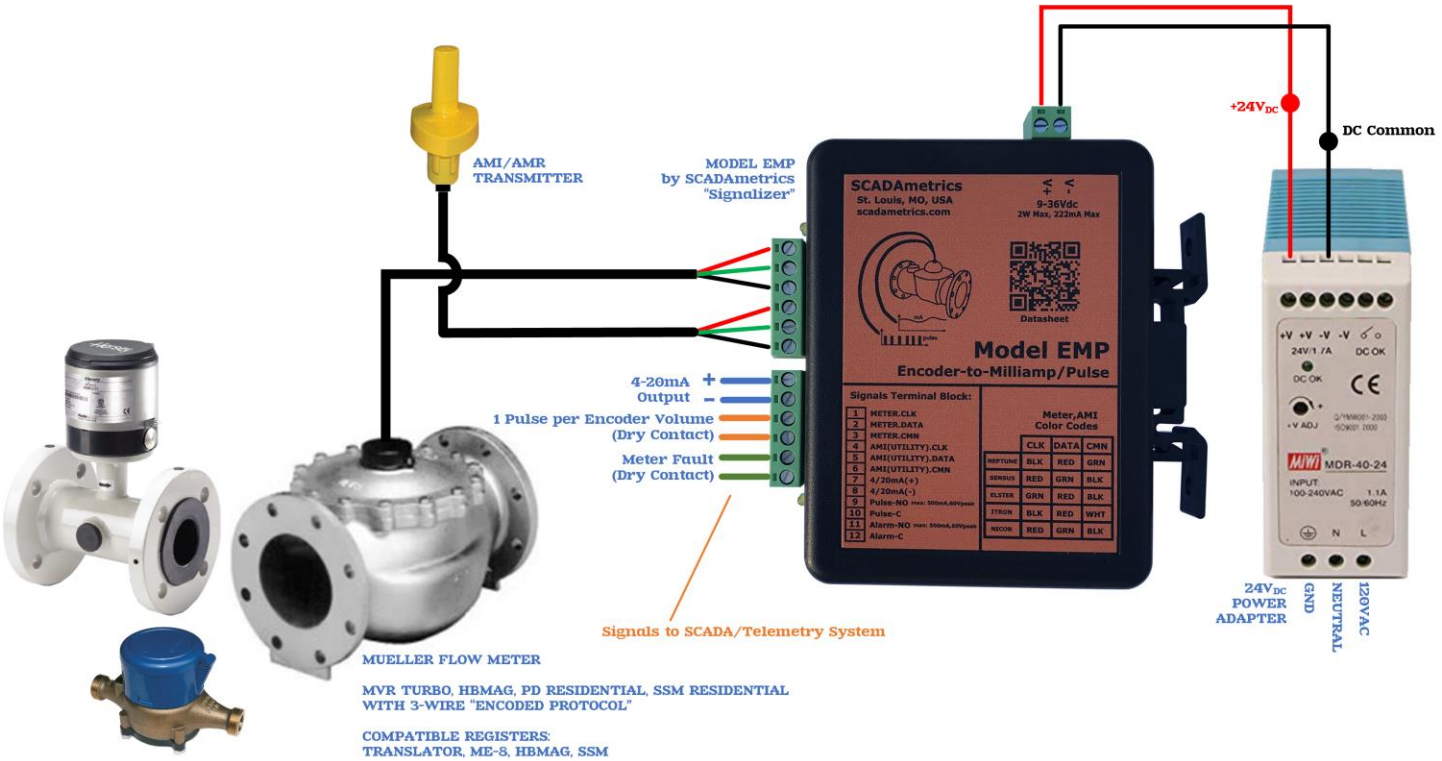
Signal Terminal Block Hookup –

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 –



WIRING FOR:
MUELLER MVR, HBMAG, PD RESIDENTIAL, & SSM WATER METERS

Fig.1

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. The user must not add an additional loop power supply, or else damage to the unit will result.**

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.**

   Mueller water meters communicate using Sensus protocol. Therefore, set DIP Switches 1,2 = OFF,OFF

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.

MUELLER MVR & PD METERS w/ TRANSLATOR REGISTER –

Recommended DIP Switches 1-12:

Size	Gallon	Cubic Feet
5/8″ 3/4" 1″	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 10 Gal Low Speed Pulse: 1 Pulse / 100 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 1 FT^3 Low Speed Pulse: 1 Pulse / 10 FT^3
1.5″ 2″ 3″ 4″	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10=ON DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 100 Gal Low Speed Pulse: 1 Pulse / 1000 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 10 FT^3 Low Speed Pulse: 1 Pulse / 100 FT^3
6″ and Larger	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10=ON DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 1000 Gal Low Speed Pulse: 1 Pulse / 10000 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10=ON DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 100 FT^3 Low Speed Pulse: 1 Pulse / 1000 FT^3

TRANSLATOR

4-20mA Not Available

Translator registers feature relatively coarse, 6-digit totalizer resolution, as opposed to fine 8-digit totalizer resolution with the ME-8 and SSM registers, and therefore do NOT support the Signalizer's 4-20 milliamp output function.

Field-Upgradeable

A Translator Register may be easily field-upgraded to an ME-8 Register for certain Mueller/Hersey Meters. Please contact SCADAmetrics or your local Mueller representative.

MUELLER MVR & PD & ULTRASONIC METERS w/ ME-8 OR SSM REGISTER –

Recommended DIP Switches 1-12:

Size	Gallon	Cubic Feet
5/8″ 3/4" 1″	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11=ON DipSw.12= Normal Speed Pulse: 1 Pulse / 0.1 Gal Low Speed Pulse: 1 Pulse / 1 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11=ON DipSw.12= Normal Speed Pulse: 1 Pulse / 0.01 FT^3 Low Speed Pulse: 1 Pulse / 0.1 FT^3
1.5″ 2″ 3″ 4″	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 1 Gal Low Speed Pulse: 1 Pulse / 10 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11=ON DipSw.12= Normal Speed Pulse: 1 Pulse / 0.1 FT^3 Low Speed Pulse: 1 Pulse / 1 FT^3
6″ and Larger	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 10 Gal Low Speed Pulse: 1 Pulse / 100 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 1 FT^3 Low Speed Pulse: 1 Pulse / 10 FT^3

ME-8

SSM

4-20mA Caveats

ME-8 and SSM registers offer up to 8-digit totalizer resolution.

However, if the register is factory-programmed to transmit fewer than 8 totalizer digits, then the Signalizer's 4-20 milliamp output function may be delayed or rendered inoperable.

Field-Programmable

An ME-8 or SSM register may be field-programmed by the Mueller representative to transmit the full 8 totalizer digits, if it is not already so programmed. Please contact SCADAmetrics or your local Mueller representative.

MUELLER MVR (FUTURE) & PD METERS w/ SSR REGISTER –

Recommended DIP Switches 1-12:

Size	Gallon	Cubic Feet
5/8″ 3/4" 1″	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= DipSw.9=ON DipSw.10= DipSw.11=ON DipSw.12= Normal Speed Pulse: 1 Pulse / 0.01 Gal Low Speed Pulse: 1 Pulse / 0.1 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= DipSw.9= DipSw.10=ON DipSw.11=ON DipSw.12= Normal Speed Pulse: 1 Pulse / 0.001 FT^3 Low Speed Pulse: 1 Pulse / 0.01 FT^3
1.5″ 2″ 3″ 4″	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= DipSw.9= DipSw.10= DipSw.11=ON DipSw.12= Normal Speed Pulse: 1 Pulse / 0.1 Gal Low Speed Pulse: 1 Pulse / 1 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= DipSw.9=ON DipSw.10= DipSw.11=ON DipSw.12= Normal Speed Pulse: 1 Pulse / 0.01 FT^3 Low Speed Pulse: 1 Pulse / 0.1 FT^3
6″ and Larger	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= DipSw.9= DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 1 Gal Low Speed Pulse: 1 Pulse / 10 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= DipSw.9= DipSw.10= DipSw.11=ON DipSw.12= Normal Speed Pulse: 1 Pulse / 0.1 FT^3 Low Speed Pulse: 1 Pulse / 1 FT^3

SSR

4-20mA Caveats

SSR registers display 10-digit totalizer resolution, and offer up to a 9-digit totalizer resolution on the transmitter cable.

However, if the register is factory-programmed to transmit fewer than 9 totalizer digits, then the Signalizer's 4-20 milliamp output function may be delayed or rendered inoperable.

Field-Programmable

An SSR register may be field-programmed by the Mueller representative to transmit the full 9 totalizer digits, if it is not already so programmed. Please contact SCADAmetrics or your local Mueller representative.

MUELLER HBMAG METERS –

Recommended DIP Switches 1-12:

Size	Gallon	Cubic Feet
3"	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 10 Gal Low Speed Pulse: 1 Pulse / 100 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 1 FT^3 Low Speed Pulse: 1 Pulse / 10 FT^3
4"	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 10 Gal Low Speed Pulse: 1 Pulse / 100 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 1 FT^3 Low Speed Pulse: 1 Pulse / 10 FT^3
6" and Larger	DipSw.1= DipSw.2= DipSw.3= DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9= DipSw.10=ON DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 100 Gal Low Speed Pulse: 1 Pulse / 1000 Gal	DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= DipSw.5=ON DipSw.6=ON DipSw.7= DipSw.8= DipSw.9=ON DipSw.10= DipSw.11= DipSw.12= Normal Speed Pulse: 1 Pulse / 10 FT^3 Low Speed Pulse: 1 Pulse / 100 FT^3

4-20mA Caveats

The HBMAG register offers up to 8-digit totalizer resolution.

However, if the register is factory-programmed to transmit fewer than 8 totalizer digits, then the Signalizer's 4-20 milliamp output function may be delayed or rendered inoperable.

Field-Programmable

An HBMAG register may be field-programmed by the Mueller representative to transmit the full 8 totalizer digits, if it is not already so programmed. Please contact SCADAmetrics or your local Mueller representative.

MUELLER WATER METERS –

Recommended DIP Switches 13-16:

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

Size	Gallon , Cubic Feet , Cubic Meters	4-20mA Span Settings Are Based Solely on Meter Size and Maximum Expected Flow Rates.
5/8″ 20 gpm 75 lpm	DipSw.13= DipSw.14= DipSw.15= DipSw.16=	
3/4" 30 gpm 120 lpm	DipSw.13=ON DipSw.14= DipSw.15= DipSw.16=	
1″ 50 gpm 200 lpm	DipSw.13= DipSw.14=ON DipSw.15= DipSw.16=	
1.5″ 125 gpm 475 lpm	DipSw.13= DipSw.14= DipSw.15=ON DipSw.16=	
2″ 200 gpm 750 lpm	DipSw.13=ON DipSw.14= DipSw.15=ON DipSw.16=	
3″ 500 gpm 2000 lpm	DipSw.13=ON DipSw.14=ON DipSw.15=ON DipSw.16=	
4″ 1200 gpm 4500 lpm	DipSw.13=ON DipSw.14= DipSw.15= DipSw.16=ON	
6″ 3000 gpm 11000 lpm	DipSw.13=ON DipSw.14=ON DipSw.15= DipSw.16=ON	
8″ 4600 gpm 17500 lpm	DipSw.13= DipSw.14= DipSw.15=ON DipSw.16=ON	
10″ 7300 gpm 27500 lpm	DipSw.13=ON DipSw.14= DipSw.15=ON DipSw.16=ON	
12″ 11400 gpm 43000 lpm	DipSw.13= DipSw.14=ON DipSw.15=ON DipSw.16=ON	
16″ 18000 gpm 68000 lpm	DipSw.13=ON DipSw.14=ON DipSw.15=ON DipSw.16=ON	