



The Signalizer™

Model EMP - US Patent No. 11,041,738



Building or Factory Automation Controls



AWWA C707-05 COMPLIANT

2 YEAR WARRANTY

The Versatile 4-20 Milliamp and Pulse Signal Source for Honeywell evoQ4 Water Meters!

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

This new electronic signal generator for evoQ4 water meters provides a dry contact pulse (per volume) output and a 4/20mA (flow) output! – while still maintaining the meter's ability to be co-connected to an AMI/AMR endpoint!

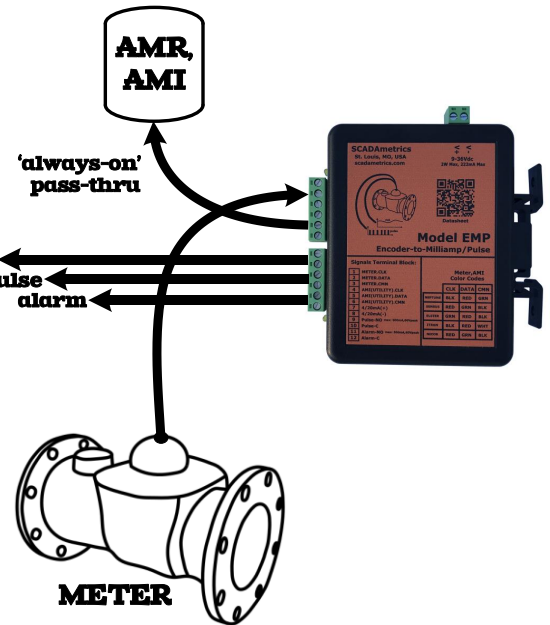
Meter Owners have traditionally been required to make a weighted buying decision: encoder-type meter?... or milliamp/pulse-type meter? **The Signalizer** allows you to easily have both with the same meter!

The Signalizer utilizes the popular encoder signal from the water meter to generate both a 4-20mA rate-of-flow signal¹ 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 system². 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 evoQ4 and other encoder-type Honeywell/Elster water meters.

¹**Encoder Resolution** – a high-fidelity 4-20mA signal requires high-resolution encoder resolution (8+ digits). Therefore, for optimal 4-20mA SIGNALIZER performance, we recommend evoQ4 meter be outfitted with either the Sensus Protocol VFRAME or SHIFTED VFRAME module, which transmit eight (8) totalizer digits.

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

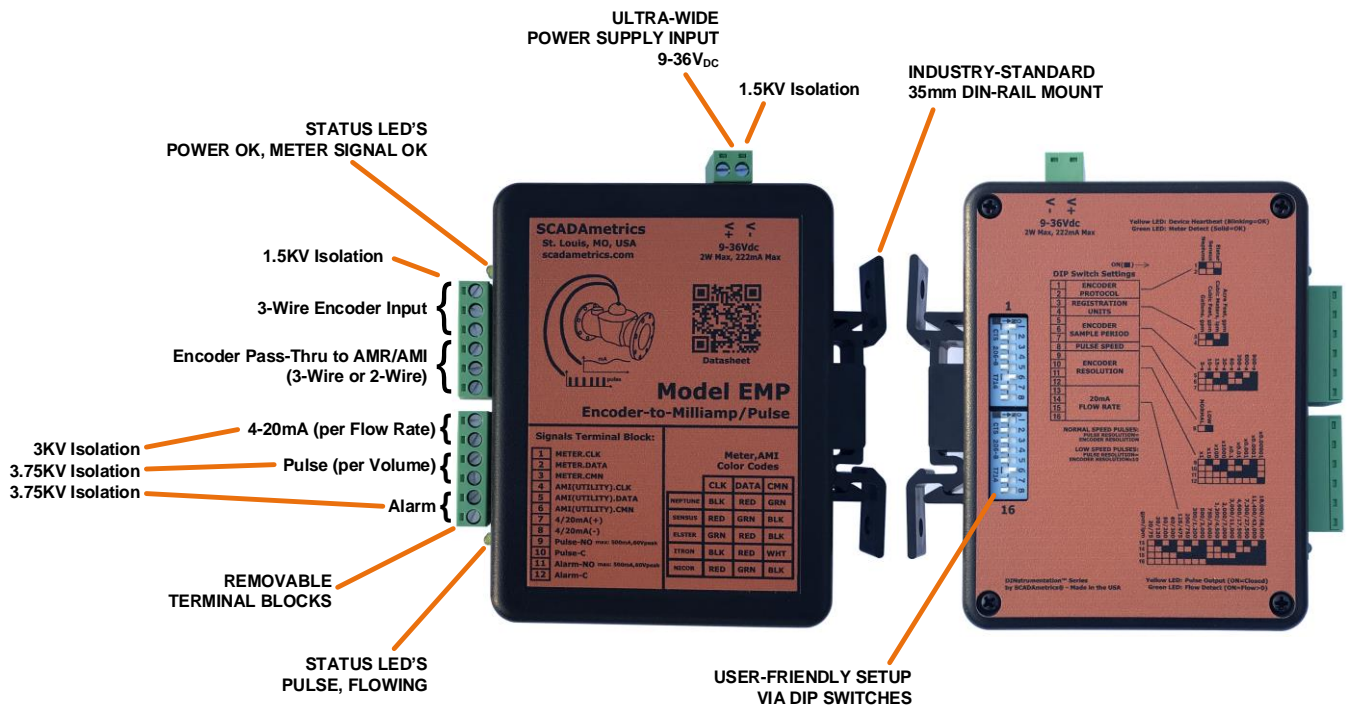


Key Features -

- 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 3-wire version Sensus 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.

Caveat! – A high-resolution 4/20mA signal can only be produced by the Signalizer if the the evoQ4 is field-retrofitted with an 8-Digit VFRAME encoder (Sensus protocol) communication module. Otherwise, the 4/20mA resolution will be coarse. Please contact your Honeywell/Elster and/or SCADAMETRICS sales representative for details.

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!



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 "MACH10/PROCORDER/ECORDER", and 6-Digit "PROREAD" 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

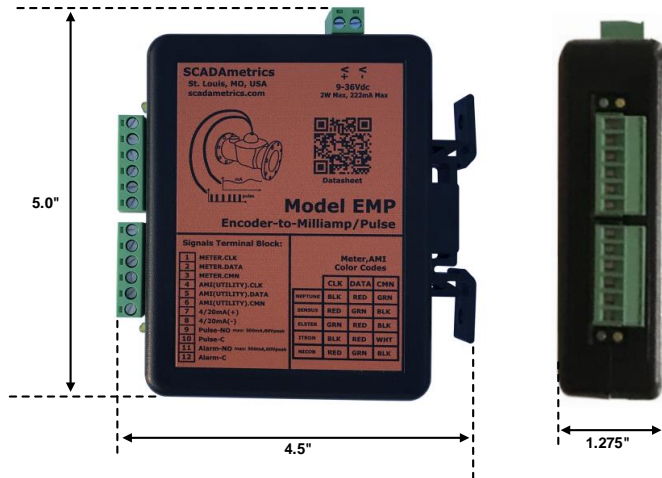
4-20mA Flow Range (gpm): 20,30,50,80,125,200,300,500,750,1200,2000,3000,4600,7300,11400,18000
 4-20mA Flow Range (lpm): 75,120,200,300,475,750,1200,2000,3000,4500,7000,11000,17500,27500,43000,68000
 4-20mA Resolution: 16-Bit DAC
 4-20mA Isolation: 3000V_{RMS}
 4-20mA Max Series Resistance: 500 Ω
 4-20mA Signal Type: Active. Therefore, do not 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
 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 | evoQ4 Meter with Standard Cable | evoQ4 Meter with Nicor Cable | evoQ4 Meter with Itron ERT Cable |
|-------|--------------|---------------------------------|------------------------------|----------------------------------|
| 1 | Meter Clock | White Green | Red | Black |
| 2 | Meter Data | Red | Green | Red |
| 3 | Meter Ground | Black | Black | White Shield |

AMR/AMI Terminal Block Hookup -

| Term. | Function | Elster (evoQ4) Color | Neptune Color | Sensus (Metron-Farnier, Badger, Master Meter, Kamstrup, Mueller, Zenner, RG3, Nicor Cable) | Itron ERT Cable |
|-------|--------------------|----------------------|---------------|--|-----------------|
| 4 | Utility AMI Clock | White Green | Black | Red | Black |
| 5 | Utility AMI Data | Red | Red | Green White | 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) -



9-36Vdc
2W Max, 222mA Max

Yellow LED: Device Heartbeat (Blinking=OK)
Green LED: Meter Detect (Solid=OK)

Simulation Mode

| | | |
|---|---------|--|
| 1 | Elster | |
| 2 | Sensus | |
| | Neptune | |

ON(■) →

DIP Switch Settings

1

| | |
|----|-----------------------|
| 1 | ENCODER PROTOCOL |
| 2 | |
| 3 | REGISTRATION UNITS |
| 4 | |
| 5 | ENCODER SAMPLE PERIOD |
| 6 | |
| 7 | |
| 8 | PULSE SPEED |
| 9 | ENCODER RESOLUTION |
| 10 | |
| 11 | |
| 12 | |
| 13 | 20mA FLOW RATE |
| 14 | |
| 15 | |
| 16 | |

| | | |
|---|-----------------------|--|
| 1 | Acre Ft, gpm | |
| 2 | M ³ , lpm | |
| 3 | Ft ³ , gpm | |
| 4 | Gallons, gpm | |

| | | |
|---|-------|--|
| 5 | 900-s | |
| 6 | 600-s | |
| 7 | 300-s | |
| | 60-s | |
| | 30-s | |
| | 15-s | |
| | 10-s | |
| | 5-s | |

| | | |
|---|--------|--|
| 8 | NORMAL | |
| | LOW | |

| | | |
|----|----------|--|
| 9 | X0.00001 | |
| 10 | X0.0001 | |
| 11 | X0.001 | |
| 12 | X0.01 | |
| | X0.1 | |
| | X100 | |
| | X1000 | |
| | X10 | |
| | X1 | |

NORMAL SPEED PULSES:
PULSE RESOLUTION= ENCODER RESOLUTION

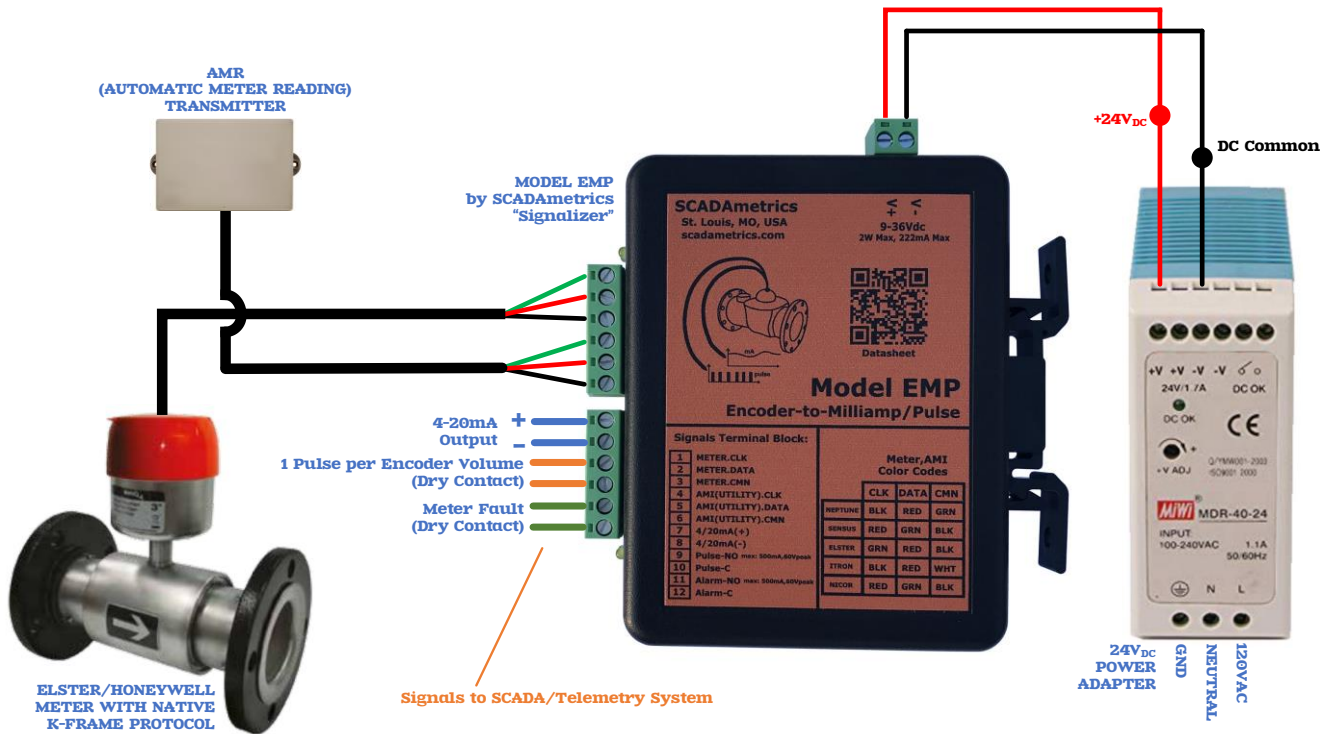
LOW SPEED PULSES:
PULSE RESOLUTION= ENCODER RESOLUTIONx10

SIMULATION MODE:
PULSE OUTPUT: 1 Hz
FLOW SIGNAL OUTPUT: 12mA

| | | |
|----|---------------|--|
| 13 | 18,000/68,000 | |
| 14 | 11,400/43,000 | |
| 15 | 7,300/27,500 | |
| 16 | 4,600/17,500 | |
| | 3,000/11,000 | |
| | 2,000/7,000 | |
| | 1,200/4,500 | |
| | 750/3,000 | |
| | 500/2,000 | |
| | 300/1,200 | |
| | 200/750 | |
| | 125/475 | |
| | 80/300 | |
| | 50/200 | |
| | 30/120 | |
| | 20/75 | |

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QUICK-START GUIDE -



**WIRING FOR:
HONEYWELL (ELSTER)
EVOQ4 WATER METERS**
Fig1

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.**
- 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 'Heartbeat' 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.

EVOQ4 WATER METERS with Elster Protocol (Standard) -

Recommended **DIP Switches 1-12 FOR 6-DIGIT ELSTER-PROTOCOL METERS:**

The Model EMP Signalizer is able to determine the Registration Units and the Encoder Resolution from information embedded within the Elster protocol, and therefore the DIP-Switch settings are simplified as follows:

| Size | Gallon, Cubic Feet, Cubic Meters | |
|-----------------|---|---|
| All Sizes evoQ4 | <p>DipSw.1= DipSw.2=ON DipSw.3= DipSw.4=</p> <p>For NYC-DEP-Owned Meters: DipSw.5= DipSw.6=ON DipSw.7=ON DipSw.8=</p> <p>For NYC Sub-Meters (*NOT* Owned by NYC-DEP): DipSw.5= DipSw.6= DipSw.7=ON DipSw.8=</p> <p>DipSw.9= DipSw.10= DipSw.11= DipSw.12=</p> <p>For FT³ Meters:</p> <p>Normal Speed Pulse: 1 Pulse / 100 FT³</p> <p>Low Speed Pulse: 1 Pulse / 1,000 FT³</p> <p>For Gal Meters:</p> <p>Normal Speed Pulse: 1 Pulse / 1,000 Gal</p> <p>Low Speed Pulse: 1 Pulse / 10,000 Gal</p> <p>For M³ Meters:</p> <p>Normal Speed Pulse: 1 Pulse / 1 M³</p> <p>Low Speed Pulse: 1 Pulse / 10 M³</p> | <p>For NYC DEP Meter Applications, The Signalizer Sample Period Is Set To 600 Seconds (DIP Switches 5,6,7) In Order to Reduce Battery Wear Within the Water Meter.</p> |

EVOQ4 WATER METERS with Sensus Protocol (Non-Standard) -

The Model EMP Signalizer, when connected to an evoQ4 meter retrofitted with a Sensus-Protocol 'VFRAME' or 'SHIFTED VFRAME' module, should be configured as if connected to a Sensus-compatible water meter, as follows:

Recommended DIP Switches 1-12 FOR 8-DIGIT 'VFRAME' METERS:

| Size | Gallon | Cubic Feet | Cubic Meters | |
|-----------------|--|--|---|---|
| All Sizes evoQ4 | DipSw.1= DipSw.2= DipSw.3= DipSw.4= | DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= | DipSw.1= DipSw.2= DipSw.3= DipSw.4=ON | For Sub-Meter Applications, The Signalizer Sample Period Is Set To 60 Seconds (DIP Switches 5,6,7) In Order to Provide Faster 4-20mA Updates to the BMS System. |
| | DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= | DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= | DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= | |
| | DipSw.9=ON DipSw.10= DipSw.11= DipSw.12= | DipSw.9= DipSw.10= DipSw.11= DipSw.12= | DipSw.9= DipSw.10= DipSw.11=ON DipSw.12= | |
| | Normal Speed Pulse: 1 Pulse / 10 Gal Low Speed Pulse: 1 Pulse / 100 Gal | Normal Speed Pulse: 1 Pulse / 1 FT ³ Low Speed Pulse: 1 Pulse / 10 FT ³ | Normal Speed Pulse: 1 Pulse / 0.1 M ³ Low Speed Pulse: 1 Pulse / 1 M ³ | |

Recommended DIP Switches 1-12 FOR 8-DIGIT 'SHIFTED VFRAME' METERS:

| Size | Gallon | Cubic Feet | Cubic Meters | |
|-----------------|--|---|--|---|
| All Sizes evoQ4 | DipSw.1= DipSw.2= DipSw.3= DipSw.4= | DipSw.1= DipSw.2= DipSw.3=ON DipSw.4= | DipSw.1= DipSw.2= DipSw.3= DipSw.4=ON | For Sub-Meter Applications, The Signalizer Sample Period Is Set To 60 Seconds (DIP Switches 5,6,7) In Order to Provide Faster 4-20mA Updates to the BMS System. |
| | DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= | DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= | DipSw.5= DipSw.6= DipSw.7=ON DipSw.8= | |
| | DipSw.9=ON DipSw.10= DipSw.11= DipSw.12= | DipSw.9= DipSw.10= DipSw.11=ON DipSw.12= | DipSw.9=ON DipSw.10= DipSw.11=ON DipSw.12= | |
| | Normal Speed Pulse: 1 Pulse / 1 Gal Low Speed Pulse: 1 Pulse / 10 Gal | Normal Speed Pulse: 1 Pulse / 0.1 FT ³ Low Speed Pulse: 1 Pulse / 1 FT ³ | Normal Speed Pulse: 1 Pulse / 0.01 M ³ Low Speed Pulse: 1 Pulse / 0.1 M ³ | |

EVOQ4 WATER METERS with Elster or Sensus Protocol -

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 | |
|------------------------------------|--|---|
| 5/8" evoQ4 20 gpm 75 lpm | DipSw.13= DipSw.14= DipSw.15= DipSw.16= | <p>NOTE! - The 4-20mA Signal Derived from an evoQ4 Meter's 6-Digit Encoder Signal Will Be Inherently Coarse, Due to the Coarseness of the Meter's 6-Digit Resolution.</p> <p>4-20mA Span Settings Are Based Solely on Meter Size and Maximum Expected Flow Rates.</p> |
| 3/4" evoQ4 30 gpm 120 lpm | DipSw.13=ON DipSw.14= DipSw.15= DipSw.16= | |
| 1" evoQ4 50 gpm 200 lpm | DipSw.13= DipSw.14=ON DipSw.15= DipSw.16= | |
| 1.5" EvoQ4 125 gpm 475 lpm | DipSw.13= DipSw.14= DipSw.15=ON DipSw.16= | |
| 2" EvoQ4 200 gpm 750 lpm | DipSw.13=ON DipSw.14= DipSw.15=ON DipSw.16= | |
| 3" EvoQ4 200 gpm 750 lpm | DipSw.13=ON DipSw.14= DipSw.15=ON DipSw.16= | |
| 4" EvoQ4 1200 gpm 4500 lpm | DipSw.13=ON DipSw.14= DipSw.15= DipSw.16=ON | |
| 6" EvoQ4 3000 gpm 11000 lpm | DipSw.13=ON DipSw.14=ON DipSw.15= DipSw.16=ON | |
| 8" EvoQ4 4600 gpm 17500 lpm | DipSw.13= DipSw.14= DipSw.15=ON DipSw.16=ON | |
| 10" EvoQ4 7300 gpm 27500 lpm | DipSw.13=ON DipSw.14= DipSw.15=ON DipSw.16=ON | |