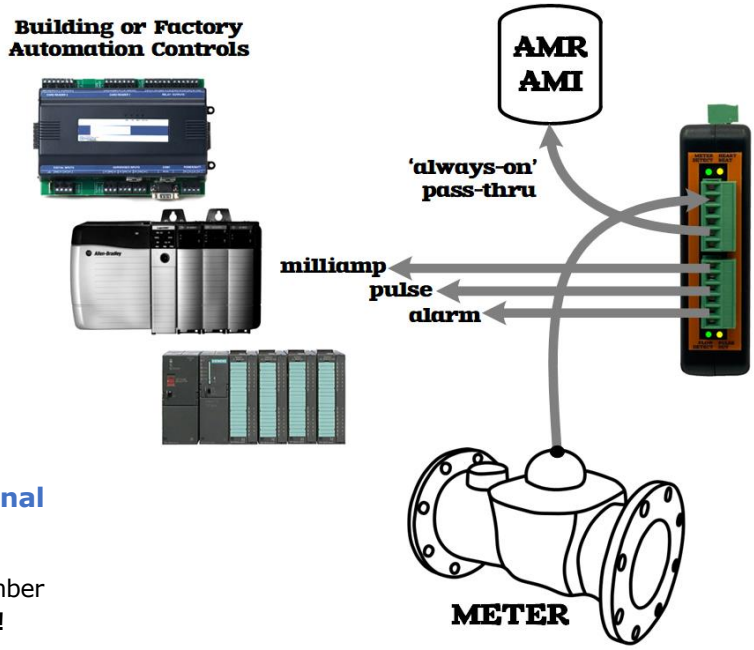
SCADAMETRICS®

The Signalizer™

Model EMP$_{V2}$ – US Patent No. 11,041,738

2 YEAR WARRANTY



The Versatile 4-20 Milliamp and Pulse Signal Source for Kamstrup 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 compatible with the FlowIQ 2200, 3200, and 4200 ultrasonic flow meters by **Kamstrup Water Metering LLC** (Cumming, GA), and many others!

[1]**Encoder Resolution** – a high-fidelity 4-20mA signal requires high-resolution encoder resolution (8-9 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 3-wire version Kamstrup water meter 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.
- Integral Common-Mode Rejection Choke

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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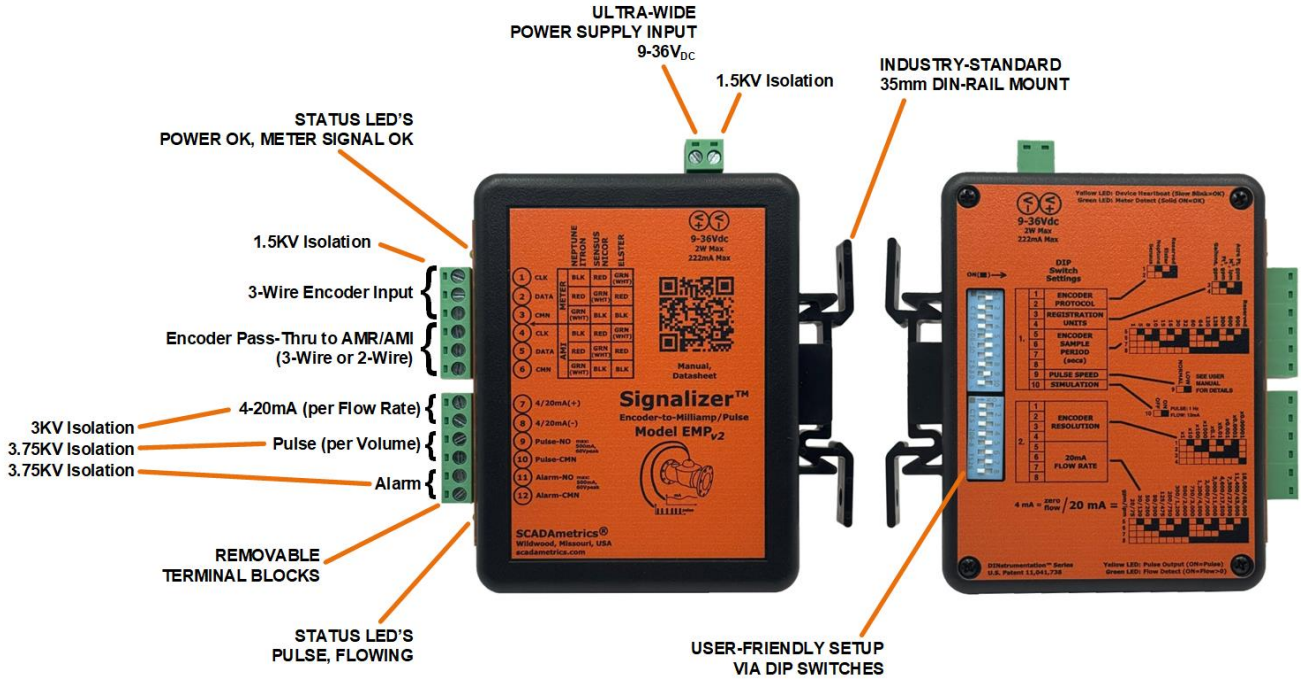


Engineering Specifications –

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}
EMI Suppression:	EN55032 Class B Chebyshev DC Power Filter, 3-Wire Common-Mode Rejection Choke for Encoder Signal
Neptune Protocol Support:	Yes, 8,9-Digit "MACH-10/ProCoder/E-CODER", and 6-Digit "ProRead" Protocols
UI.1203 Protocol Support:	Yes, Both Fixed and Variable Digit UI.1203 (Sensus) 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 Scalars:	x1 , x10 , x100 , x1,000 --- x0.1 , x0.01 , x0.001 , x0.0001 , x0.00001
Encoder Sample Period (s):	1, 5, 8, 10, 15, 16, 30, 32, 60, 64, 120, 128, 300, 600, 900, Reserved (User-Selectable)
Programming Method:	Integrated DIP Switches, 18-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 (All Encoders): Pulse Resolution = Encoder Resolution Low-Speed Mode (8-Digit Encoders): Pulse Resolution = Encoder Resolution / 10 Low-Speed Mode (9-Digit Encoders): Pulse Resolution = Encoder Resolution / 100
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	UI.1203 Meters (Kamstrup, Sensus, Badger, Metron-Farnier, Master Meter, Mueller, Zenner, RG3, Aclara, Nicor Cable)	Neptune & Itron ERT	Elster
1	Meter Clock	Red	Black	White|Green
2	Meter Data	Green|White	Red	Red
3	Meter Cmn	Black	Green | White	Black
4	Utility AMI Clock	Red	Black	White|Green
5	Utility AMI Data	Green|White	Red	Red
6	Utility AMI Cmn	Black	Green | White	Black

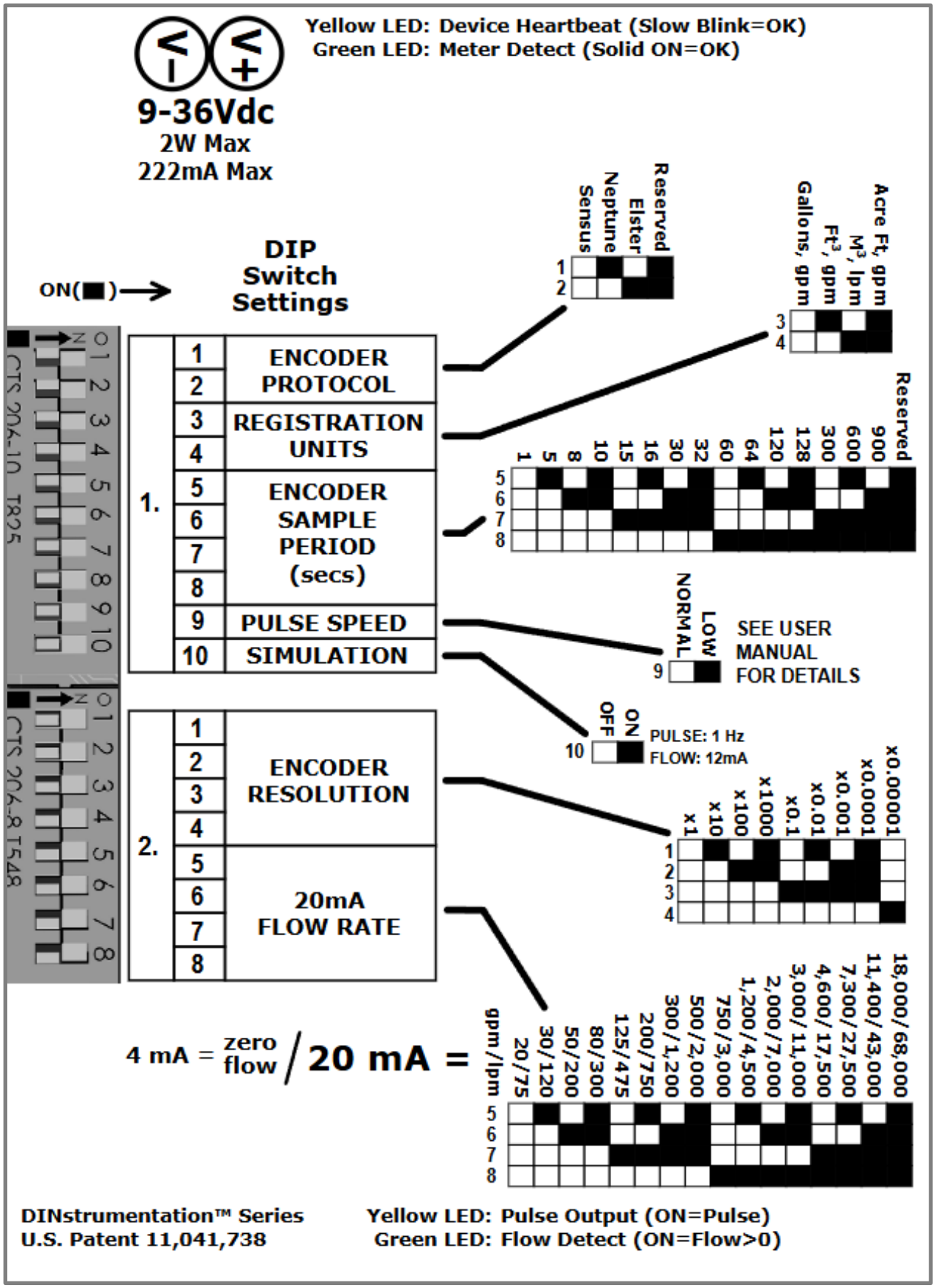
Wiring Notes:

1. With the exceptions of Neptune Technology Group and Elster-AMCO (aka Honeywell, ABB, Kent), most meter manufacturers follow the UI.1203 (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 –

KAMSTRUP WIRING

Fig.1

FLOW-IQ CABLING

Fig.2

In order for the Kamstrup FlowIQ meter to be compatible with the EMP Signalizer, the FlowIQ should be outfitted with the proper Kamstrup cable type, as illustrated per Fig.2 (left).

Meter Diameter (in)	9-Wheels
5/8" - 1"	0.01 USG 0.001 FT3 0.01 L
1.5" - 4"	0.1 USG 0.01 FT3 0.1 L
6" - 12"	1 USG 0.1 FT3 1 L

FLOW-IQ PROGRAMMING

Fig.3

In order to provide full SCADA functionality, the encoded output should be programmed for "9 digits", and with resolution per Fig.3 (left).

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

- During bootup, if the meter is detected, the upper green 'Meter OK' LED will blink ON for each detected encoded digit (from 4 to 9 blinks).

- After bootup, the upper green 'Meter OK' LED should light up SOLID GREEN, signifying that the meter has been successfully detected. A fast green blink means "Meter Not 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.

KAMSTRUP WATER METERS –
PERSONALITY SETTINGS FOR KAMTRUP WATER METERS.

Recommended DIP Switches 1.1 thru 2.4 for FlowIQ 2200, 3200, 4200:

Size	Gallon	Cubic Feet	Cubic Meters
5/8” 3/4" 1”	Pre-Program FlowIQ: 9 Encoded Digits Resolution = 0.01 Gal DipSw.1.1= DipSw.1.2= DipSw.1.3= DipSw.1.4= DipSw.1.5=ON DipSw.1.6=ON DipSw.1.7=ON DipSw.1.8= DipSw.1.9=ON DipSw1.10= DipSw.2.1=ON DipSw.2.2= DipSw.2.3=ON DipSw.2.4= Normal Speed Pulse: 1 Pulse / 0.01 Gal Recommended: Low Speed Pulse: 1 Pulse / 1 Gal	Pre-Program FlowIQ: 9 Encoded Digits Resolution = 0.001 FT^3 DipSw.1.1= DipSw.1.2= DipSw.1.3=ON DipSw.1.4= DipSw.1.5=ON DipSw.1.6=ON DipSw.1.7=ON DipSw.1.8= DipSw.1.9=ON DipSw1.10= DipSw.2.1= DipSw.2.2=ON DipSw.2.3=ON DipSw.2.4= Normal Speed Pulse: 1 Pulse / 0.001 FT^3 Recommended: Low Speed Pulse: 1 Pulse / 0.1 FT^3	Pre-Program FlowIQ: 9 Encoded Digits Resolution = 0.0001 M^3 DipSw.1.1= DipSw.1.2= DipSw.1.3= DipSw.1.4=ON DipSw.1.5=ON DipSw.1.6=ON DipSw.1.7=ON DipSw.1.8= DipSw.1.9=ON DipSw1.10= DipSw.2.1=ON DipSw.2.2=ON DipSw.2.3=ON DipSw.2.4= Normal Speed Pulse: 1 Pulse / 0.0001 M^3 Recommended: Low Speed Pulse: 1 Pulse / 0.01 M^3
1.5” 2” 3” 4”	Pre-Program FlowIQ: 9 Encoded Digits Resolution = 0.1 Gal DipSw.1.1= DipSw.1.2= DipSw.1.3= DipSw.1.4= DipSw.1.5=ON DipSw.1.6=ON DipSw.1.7=ON DipSw.1.8= DipSw.1.9=ON DipSw1.10= DipSw.2.1= DipSw.2.2= DipSw.2.3=ON DipSw.2.4= Normal Speed Pulse: 1 Pulse / 0.1 Gal Recommended: Low Speed Pulse: 1 Pulse / 10 Gal	Pre-Program FlowIQ: 9 Encoded Digits Resolution = 0.01 FT^3 DipSw.1.1= DipSw.1.2= DipSw.1.3=ON DipSw.1.4= DipSw.1.5=ON DipSw.1.6=ON DipSw.1.7=ON DipSw.1.8= DipSw.1.9=ON DipSw1.10= DipSw.1.2=ON DipSw.2.2= DipSw.2.3=ON DipSw.2.4= Normal Speed Pulse: 1 Pulse / 0.01 FT^3 Recommended: Low Speed Pulse: 1 Pulse / 1 FT^3	Pre-Program FlowIQ: 9 Encoded Digits Resolution = 0.001 M^3 DipSw.1.1= DipSw.1.2= DipSw.1.3= DipSw.1.4=ON DipSw.1.5=ON DipSw.1.6=ON DipSw.1.7=ON DipSw.1.8= DipSw.1.9=ON DipSw1.10= DipSw.2.1= DipSw.2.2=ON DipSw.2.3=ON DipSw.2.4= Normal Speed Pulse: 1 Pulse / 0.001 M^3 Recommended: Low Speed Pulse: 1 Pulse / 0.1 M^3
6”-12”	Pre-Program FlowIQ: 9 Encoded Digits Resolution = 1 Gal DipSw.1.1= DipSw.1.2= DipSw.1.3= DipSw.1.4= DipSw.1.5=ON DipSw.1.6=ON DipSw.1.7=ON DipSw.1.8= DipSw.1.9=ON DipSw1.10= DipSw.2.1= DipSw.2.2= DipSw.2.3= DipSw.2.4= Normal Speed Pulse: 1 Pulse / 1 Gal Recommended: Low Speed Pulse: 1 Pulse / 100 Gal	Pre-Program FlowIQ: 9 Encoded Digits Resolution = 0.1 FT^3 DipSw.1.1= DipSw.1.2= DipSw.1.3=ON DipSw.1.4= DipSw.1.5=ON DipSw.1.6=ON DipSw.1.7=ON DipSw.1.8= DipSw.1.9=ON DipSw1.10= DipSw.2.1= DipSw.2.2= DipSw.2.3=ON DipSw.2.4= Normal Speed Pulse: 1 Pulse / 0.1 FT^3 Recommended: Low Speed Pulse: 1 Pulse / 10 FT^3	Pre-Program FlowIQ: 9 Encoded Digits Resolution = 0.01 M^3 DipSw.1.1= DipSw.1.2= DipSw.1.3= DipSw.1.4=ON DipSw.1.5=ON DipSw.1.6=ON DipSw.1.7=ON DipSw.1.8= DipSw.1.9=ON DipSw1.10= DipSw.2.1=ON DipSw.2.2= DipSw.2.3=ON DipSw.2.4= Normal Speed Pulse: 1 Pulse / 0.01 M^3 Recommended: Low Speed Pulse: 1 Pulse / 1 M^3

Flow IQ

DIP Switches 5,6,7,8:

The sample period (seconds) on the Signalizer should be set to 8, 16, 32 (default), 64, or 128.

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

Recommended DIP Switches 2.5 thru 2.8 for FLOWIQ 2200, FLOWIQ 3200, FLOWIQ 4200:

The following Flow Span settings are *suggested*, and may need to be adjusted, based on actual maximum flow conditions:

Size	Gallon , Cubic Feet , Cubic Meters
5/8" FlowIQ 20 gpm 75 lpm	DipSw.2.5= DipSw.2.6= DipSw.2.7= DipSw.2.8=
3/4" FlowIQ 30 gpm 120 lpm	DipSw.2.5=ON DipSw.2.6= DipSw.2.7= DipSw.2.8=
1" FlowIQ 50 gpm 200 lpm	DipSw.2.5= DipSw.2.6=ON DipSw.2.7= DipSw.2.8=
1.5" FlowIQ 125 gpm 475 lpm	DipSw.2.5= DipSw.2.6= DipSw.2.7=ON DipSw.2.8=
2" FlowIQ 200 gpm 750 lpm	DipSw.2.5=ON DipSw.2.6= DipSw.2.7=ON DipSw.2.8=
3" FlowIQ 500 gpm 2000 lpm	DipSw.2.5=ON DipSw.2.6=ON DipSw.2.7=ON DipSw.2.8=
4" FlowIQ 1200 gpm 4500 lpm	DipSw.2.5=ON DipSw.2.6= DipSw.2.7= DipSw.2.8=ON
6" FlowIQ 3000 gpm 11000 lpm	DipSw.2.5=ON DipSw.2.6=ON DipSw.2.7= DipSw.2.8=ON
8" FlowIQ 4600 gpm 17500 lpm	DipSw.2.5= DipSw.2.6= DipSw.2.7=ON DipSw.2.8=ON
10" FlowIQ 7300 gpm 27500 lpm	DipSw.2.5=ON DipSw.2.6= DipSw.2.7=ON DipSw.2.8=ON
12" FlowIQ 11400 gpm 43000 lpm	DipSw.2.5= DipSw.2.6=ON DipSw.2.7=ON DipSw.2.8=ON
16" FlowIQ 18000 gpm 68000 lpm	DipSw.2.5=ON DipSw.2.6=ON DipSw.2.7=ON DipSw.2.8=ON