Isco Product Data

Signature® Flow Meter

The Signature flow meter is designed for open channel flow monitoring applications. It supports flow measurement technologies including bubbler, non-contact laser area velocity, submerged Doppler ultrasonic area velocity, and ultrasonic. The meter can calculate flow using standard open channel level-to-flow and area velocity conversions, as well as user-defined equations, level to area data points, or level to flow data points, depending on the application need. The Signature flow meter has unique features to verify data integrity. It logs key events such as changes in calibration and power outages to validate data accuracy. Data can be easily reviewed to detect any type of data alteration.With multiple smart interface options and multi-parameter logging (such as pH), the Signature flow meter provides a common platform for control action, reporting, and communication.

Available Measurement Technologies

- Bubbler and Ultrasonic
- Non-Contact Laser Velocity
- Continuous Wave Area Velocity

Applications

- Industrial Pretreatment Compliance
- Shallow flow measurement in large and small pipes
- Permit Enforcement
- Wastewater Treatment Plants
- Stormwater Monitoring
- Outfall

General Features

- Multiple parameter data logging
- Program and Summary Reports
- Data Integrity Verification
- Triggering, sampler enabling
- Compatibility with Flowlink® software
- Load calculation
- Add, subtract average multiple inputs

IP66/NEMA 4X panel offers protection against entry of dust or water during meter programming

I/O Features

- Multiple simultaneous flow technologies
- pH and temperature input
- SDI-12 input
- RS-485 Modbus input
- Rain gauge input
- Analog input (Optional TIENet® 307 card)
- RS-485 Modbus output
- Analog outputs (Optional TIENet® 308 card)
- Contact output (Optional TIENet® 304 card)

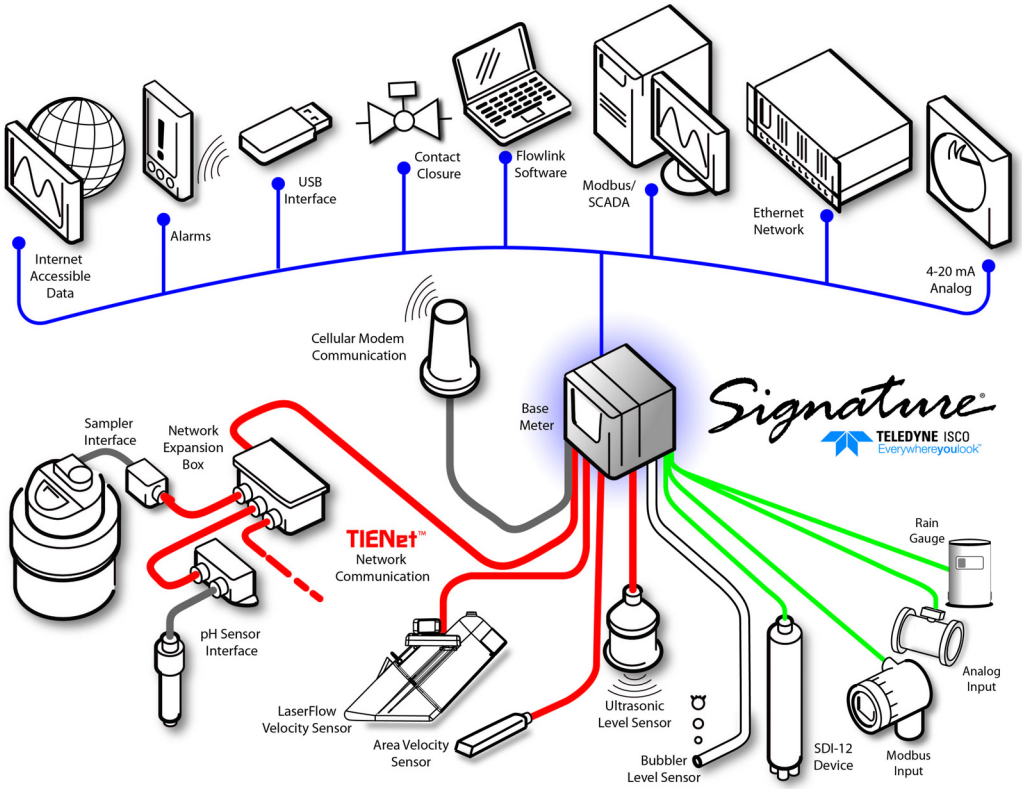
Communication/Interface Features

- Ethernet modem
- Cellular modem options
- USB interface

Signature permanently installed on location

Signature Portable with stand and locking handle for temporary installations

Signature Flow Meter Connectivity and Interface Options



Smart TIENet® Devices

- TIENet input and output devices utilize a common, proprietary interface protocol
- Low system integration cost with multiple measurement technologies, I/O protocols, and communication options
- Configurable and upgradable without hardware or firmware changes in Signature flow meter
- Quick setup with an identifiable, unique address for each device
- Easy troubleshooting with built-in device diagnostics

Data Integrity

Data Integrity is ensured by logging event data types that can be verified, thereby producing confidence with verifiable data:

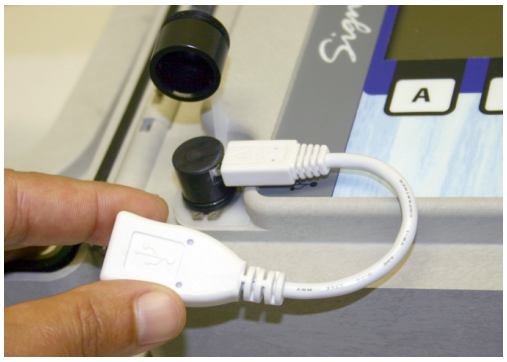
- Summary Report: Documents summaries of data measurements (e.g. Daily Min/Max/Avg) to meet regulatory and compliance requirements
- Diagnostic Report: Tracks the results with built-in diagnostic runs to provide confidence in data quality and spot application issues
- Program Report: Tracks changes to the Signature flow meter's configuration to ensure proper setup for specific applications
- History Report: Tracks user and meter events (e.g. level adjustments, data push, and program changes)
- Verify Report File: Detects any attempted data alterations

Flowlink® Data Analysis

Teledyne Isco Flowlink® software is a powerful tool for analyzing flow and water quality data. It provides site setup and data retrieval/analysis, as well as advanced reporting and graphing. Flowlink software also gives you the ability to generate site data graphing and reports.

USB Connectivity

With a USB flash drive attached, you can quickly download Data, Diagnostic, Program, History, and Summary reports, update firmware in the Signature flow meter and connected TIENet® devices, and download data files for use with Flowlink software. In addition, the USB port provides direct serial connection with a computer running Flowlink software.



Remote Communication

Remote communication options allow meter configuration and data/report retrieval from remote locations. They also enable the transfer of data to a dedicated server running Flowlink Pro software.

- Communication options include Ethernet and cellular phone (CDMA and GSM). Internal modems are factory-installed and configured, allowing remote programming and high-speed data transmission from the Signature flow meter.
- Also available is automatic alarm messaging which can be sent to multiple designated contact lists as SMS text or e-mail messages. The alerts are based upon user-specified conditions.

Specifications

Signature® Flow Meter	
Size (HxWxD)	8.88 x 12.22 x 8.22 in. (with mounting bracket) 16.74 x 13.58 x 10.48 in (with stand)
Materials	PPO Polyphenylene Oxide
Enclosure (self-certified)	NEMA 4X/IP66
Power Required	100 to 240 VAC 50/60 Hz 12V DC, Lead Acid Battery 12V DC (current consumption varies depending upon configuration)
Cable Entry	Standard: ¾" NPT conduit Optional: ¾" NPT cord grips
Flow Measurement Technologies	Ultrasonic (TIENet 310) Bubbler (TIENet 330) Area Velocity (TIENet 350, 360)
Inputs	Two SDI-12 Two MODBUS ASCII/RTU pH Measurement (TIENet 301) Analog In (TIENet 307) Rain In
Setup	Front Panel Keypad Flowlink Software - with serial USB, remote cellular, or Ethernet
Flow Conversions	Area Velocity, Weir, Flume, British Flume, Metering Insert, Manning Formula, Equation, Level to Flow Data Points, Level to Area Data Points
Data Storage	Non-volatile flash; retains stored data during program updates. Capacity: 8M Interval: 15 or 30 seconds; 1, 2, 5, 15, or 30 minutes; or 1, 2, 4, 12, or 24 hours Capacity: 180 days with 5 parameters logged at 1 minute intervals, reports once per day
Data Retrieval	USB drive Flowlink Software - with serial USB, remote cellular, or Ethernet
Outputs	MODBUS ASCII/RTU Analog (TIENet 308) Contact Output (TIENet 304) SMS Alarm
Sampler Interface	TIENet 306

TIENet® 301 pH/Temperature Device	
Weight (w/o probe)	w/ 10 m cable: 3.5 lb w/ 23 m cable: 7.5 lb
Ambient Operating Temperature	-20 to 50°C (-4 to 122°F)
pH Measurement Range	0 - 14 pH units
Temperature Compensation	Performed by the 301 device
pH Accuracy	±0.1 pH units (new probe, freshly calibrated w/in range)
Probe Dimensions	1.12"Æ X 6" long, 3/4 NPT; Cable 25ft

TIENet® 301 pH/Temperature Device	
Probe Body Material	316SST
pH Electrode Junction	Double porous
Temperature Measurement Range	0 to 80 °C (32 to 176 °F)

TIENet® Model 304 Contact Output	
Type	NO or NC, Galvanically isolated
Output rating	30 volts, 1 Ampere
Operating Temperature	-20 to 70°Celsius (-4 to 158 °F)

TIENet® Model 307 Analog Input	
Power source in active mode	17-29 volts
Isolation	Galvanically isolated
Input Impedance	400 ohm
Operating Temperature	-20 to 70 °Celsius (-4 to 158 °F)

TIENet® Model 306 Sampler Interface	
Function	Flow pacing, enabling based on triggered event. Time and bottle information sent to Signature Flow Meter
Powered By	Signature Flow Meter
Operating Temperature	-20 to 50 °C (-4 to 122 °F)
Storage Temperature	-40 to 60 °C (-40 to 140 °F)
Pulse Width	50 ms
Pulse Output	5 volts
Sampler Connection	Standard: 6 pin connector for Isco 6712, Avalanche, Glacier, GLS, and 3700 samplers For other options, contact factory

TIENet® Model 308 Analog Output	
Output	4-20 mA
Isolation	Monolithic
Maximum Load	900 ohm
Outputs per card	Two

TIENet® Model 310 Ultrasonic Level Sensor	
Measurement Range	0.3 to 3.3 m (1 to 11 ft)
Accuracy at 72°F (22°C)	±0.006 m (0.02 ft) at ≤ 1 ft level change ±0.009 m (0.03 ft) > 1 ft level change
Temperature Coefficient (w/ in compensated range)	±0.0002 x Distance (m) x Temperature Deviation from 22 °C. ±0.00011 x Distance (ft) x Temperature Deviation from 72 °F.
Beam Angle	10° (5° from center line)
Frequency	50 kHz
Size	9.1 cm ∅ X 10.2 cm tall (3.63"x 4")
Cable Length	10 or 23m (32.8 or 75.5 ft)

TIENet® Model 310 Ultrasonic Level Sensor (cont.)	
Weight	1.8 kg (4 lbs)
Body Material	PVDF
Temperature Range	-30° to 60°C (-22° to 140°F) (Operating & Storage)
Certifications	Group 2, Category 1G (zone 0), T4 Class I, Div 1, Groups C & D, T4 (pending)

TIENet® 330 Bubbler Module	
Level Measurement Range:	0.003 to 3.05 m (0.01 to 10 ft)
Level Measurement Accuracy	±0.002 m @ 22 °C (0.007 ft @ 72 °F)
Operating and Storage Temperature	-18° to 60 °C (0 to 140 °F)
Temperature Compensation Range	0° to 60 °C (32° to 140 °F)
Temperature Coefficient (w/in compensated range)	±0.0003 x Level (m) x Temperature Deviation from 22 °C. ±0.00017 x Level (ft) x Temperature Deviation from 72 °F.

TIENet® Model 360 LaserFlow Velocity Sensor	
Sensor Dimensions	38.01 x 26.21 x 56.7 cm 14.96 x 10.3 x 22.32 in
Weight	8.7 kg (19.2 lbs)
Materials	Conductive Carbon Filled ABS, SST, Conductive Kynar, Anodized Aluminum, UV-Rated PVC
Temperature Range	Operating: 0 to 60 °C (32 to 140 °F) Storage -40 to 60 °C (-40 to 140 °F)
Cable Lengths	5, 10, or 15 m (16.4, 32.8, or 49.2 ft)
Enclosure	IP68
Certifications	CE EN61326; FDA CDRH 21CFR1040; IEC 60825-1
Power Required	Input voltage: 8 to 26 VDC 12 VDC Nominal
Flow Accuracy	±5% of Reading. (Typical, under normal flow conditions)
Velocity Measurement Range	-4.6 m/s to 4.6 m/s (-15 ft/s to 15 ft/s)
Direction	Bi-Directional[a]
Velocity Accuracy	±0.5% of reading ±0.03 m/s (0.1 ft/s)
Minimum Velocity	0.25 m/s (0.8 ft/s)
Level Measurement Range	0 to 3 m (0 to 10 ft) from measurement point

TIENet® Model 360 LaserFlow Velocity Sensor (cont.)	
Level Accuracy @ 22 °C (72 °F)	±0.006 m (0.02 ft) at ≤1 ft level change; ±0.012 m (0.04 ft) at >1 ft level change
Temperature Coefficient within compensated range	± 0.0002 x D (m) per degree C ± 0.00011 x D (ft) per degree F (Where D = Distance from transducer to liquid surface)
Beam Angle	10° (5° from center line)
Ultrasonic Signal	50KHz

TIENet® Model 350 Area Velocity Sensor	
Probe Dimensions	1.9 x 3.3 x 15.2 cm (0.75 x 1.3 x 6.0 in)
Materials	Sensor: Epoxy, chlorinated PC, SST. Cable: UV-Rated PVC
Temperature Range	0 to 70 °C (32 to 158 °F)
Velocity Measurement Range	-1.5 to 6.1m/s (-5 to 20 ft/s)
Velocity Measurement	Bi-Directional
Velocity Accuracy	±0.03 m/s (±0.1 ft/s) from -5 to 5 ft/s ±2% of reading from 5 to 20 ft/s, Uniform velocity profile
Minimum Depth	25 mm (0.08 ft)
Frequency	500 kHz
Level Measurement Range	0.01 to 3.05 m (0.033 to 10 ft)
Level Accuracy	± 0.10%FS[b]
Maximum Allowable Depth	10.5 m (34 ft)
Typical Long-Term Stability	±0.007 m/yr (±0.023 ft/yr)

a. Turbidity > 20 NTU; Distance from liquid surface to bottom of sensor < 48 inches

b. Maximum non-linearity, hysteresis, & temperature error from actual liquid level.

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