TELEDYNE ISCO
Everywhere**you**look™

Configurable

Intelligent

Compliant

Signature®
Flow Meter

Keep Smart Monitoring Simple

The Signature from Teledyne Isco is not just another open channel flow meter — it is a highly flexible monitoring platform, adapting right along with your current need and any future changes in your monitoring requirements. Simply add or swap flow and water quality measurement technologies as needed.

Applications

Industrial Pretreatment Compliance

Permit Enforcement

Wastewater Treatment Plant Discharge Monitoring

Outfall Monitoring

Shallow Flow Measurement in Small and Large Channels

gal
113 gpm
167 in
Humidity: 24 %
idity: 4 %

ISCO

Benefits of the Signature Flow Meter

• Simple, yet comprehensive discharge monitoring solution

• Cost effective and easy installation with simple programming and interchangeable sensors

• Low cost of system integration with multiple input, output and communications options

• Easily expandable for future changing needs

• Provides a common data recording, reporting and communication platform for multiple parameters

• Easy data retrieval options

• Built in preventive maintenance alerts and detail diagnostics

2

Signature Flow Meter

0004
Total Flow:
1644545 gal
Flow Rate-A: 113 gpm
330 Level: 3.167 in
300 Reference Humidity: 24 %
300 Case Humidity: 4 %

HELP

MENU

SHORTCUTS

A   B   C

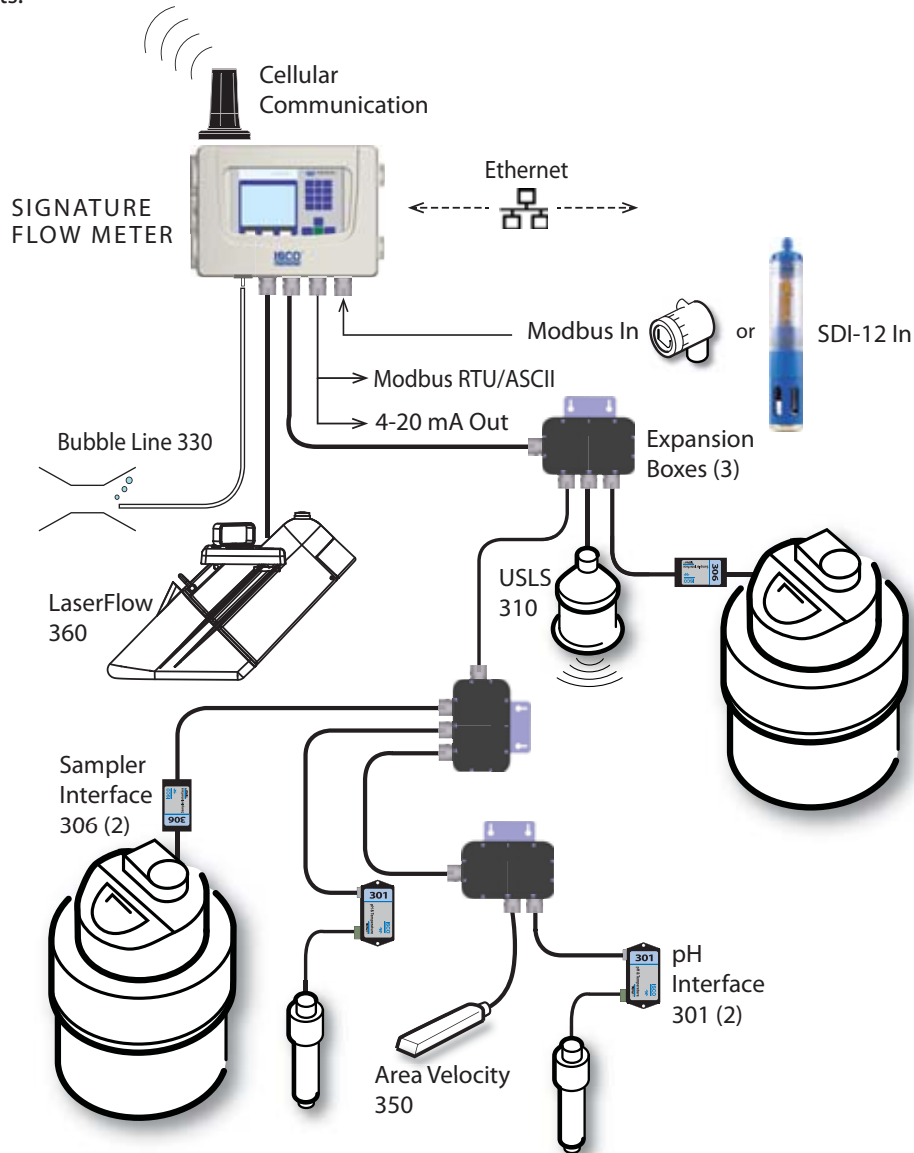TELEDYNE

1 2 3
4 5 6
7 8 9
0 ±
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Configurable

The Teledyne Isco Environmental Network —TIENet® — is key to the Signature flow meter's flexibility. The Signature supports multiple TIENet devices to monitor one or more channels with multiple, redundant, or alternate technologies, without hardware or firmware changes. This network's intelligent design minimizes cabling and conduit costs through the use of TIENet expansion boxes, common connectors, and efficient cable configurations.

In addition to TIENet devices, the Signature also accepts SDI-12 and Modbus ASCII/RTU inputs.

Simplified Plant Integration

Acting as a system hub, the Signature records and transmits data, generates reports, and takes intelligent action in response to multiple simultaneous inputs, communicating with SCADA systems using RS-485 Modbus ASCII or RTU, or optional 4-20 mA Analog. With a diverse array of possible inputs and an industry-standard output, the Signature is a one-stop access point for process monitoring and control.

Cellular Communication

SIGNATURE FLOW METER

Ethernet

Modbus In   or   SDI-12 In

Modbus RTU/ASCII

4-20 mA Out

Bubble Line 330

Expansion Boxes (3)

LaserFlow 360

USLS 310

Sampler Interface 306 (2)

Area Velocity 350

pH Interface 301 (2)

Flow Technologies

Designed with a variety of flow measurement options, the Signature has the flexibility to meet challenging site requirements head-on. Choose from four established flow measurement technologies.

The Signature flow meter can employ any combination of these technologies simultaneously, even at great distances.
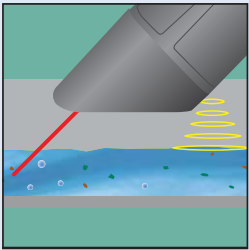
Non-contact LaserFlow™ Velocity Sensor

The LaserFlow sensor remotely measures flow in open channels with non-contact Laser Doppler Velocity technology and non-contact ultrasonic level technology. The sensor uses advanced technology to measure velocity with a laser beam at single or multiple points below the surface of the water. A non-contacting ultrasonic transmitter measures the liquid head height to determine the wetted area. Multiplying the wetted area by the average velocity yields the flow rate. Flow during surcharge conditions can be measured with an optional, integrally-mounted continuous-wave Doppler area velocity sensor.
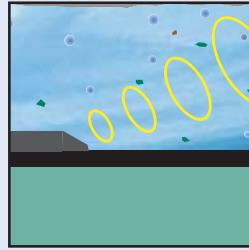
Continuous-wave Doppler

Teledyne Isco's TIENet™ 350 Area Velocity Sensor continuously transmits an ultrasonic signal into the flow stream. The signals are reflected off bubbles and particles, and then return to the sensor with a frequency shift (Doppler effect) which is proportional to velocity. A differential pressure transducer in the sensor measures liquid depth in order to determine the wetted area. Flow rate is then calculated by multiplying the wetted area of the flow stream by its average velocity.
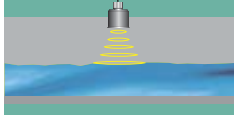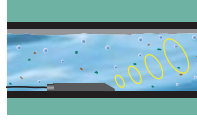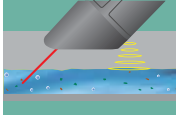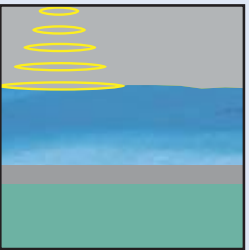
Non-contact Ultrasonic

With the Teledyne Isco TIENet™ 310 Ultrasonic Level Sensor mounted above the flow stream, transmitted sound pulses are reflected off the liquid surface. The elapsed time between transmitted and returned signals determines liquid level. Flow rate is then calculated using one of the meter's built-in flow conversions, or a user-defined level-to-flow relationship.
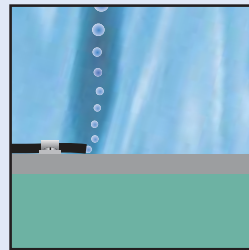
Bubbler Module

Teledyne Isco's TIENet™ 330 Bubbler Module technology is ideal in flow streams affected by harsh weather, debris, or corrosive chemicals. Since the depth of flow is determined by measuring the pressure needed to force bubbles out of the line, you are able to calculate flow rate using one of the meter's built-in flow conversions, or a user-defined level-to-flow relationship.

Signature Flow Measurement Technology Guide

Suitability for Different Applications	310 Ultrasonic Sensor	330 Bubbler	350 Area Velocity	LaserFlow
Weirs and flumes	Excellent [1]	Excellent	Excellent	Good [5]
Channels less than 6 in. (150 mm)	Good [2]	Excellent	Good	Good [2]
Small round pipes, 6 to 8 in. (150 to 200mm)	Good [2]	Excellent	Good	Excellent
Medium round pipes, 10 to 15 in. (250 to 375 mm)	Good [2]	Excellent	Excellent	Excellent
Large round pipes, 15 to 96 in. (375 to 2500 mm)	Excellent [2]	Excellent	Excellent	Excellent
Irrigation channels and small streams	Excellent [2]	Excellent	Good	Excellent
Rivers and large streams	Excellent [2]	Excellent	Good	Excellent
Chemical Compatibility of Sensor				
Organic Solvents	Compatible	Compatible	Not recommended	Compatible
Organic Acids	Compatible	Compatible	Not recommended	Compatible
Alcohols	Compatible	Compatible	Not recommended	Compatible
Esters	Compatible	Compatible	Not recommended	Compatible
Inorganic acids	Compatible	Compatible	Compatible	Compatible
Inorganic bases	Compatible	Compatible	Compatible	Compatible
Inorganic salts	Compatible	Compatible	Compatible	Compatible
Performance Under Adverse Conditions				
Strong wind	Not recommended	Excellent	Excellent	Not recommended
Air temperature fluctuations	Good [3]	Very good [3]	Excellent	Good [3]
Steam above liquid	Not recommended [4]	Excellent	Excellent	Not recommended [4]
Foam on liquid	Not recommended [4]	Excellent	Excellent	Not recommended [4]
Flow stream turbulence	Not recommended [4]	Excellent	Excellent	Not recommended [4]
Floating debris	Not recommended [4]	Excellent	Excellent	Not recommended [4]
Floating oil or grease	Not recommended [4]	Excellent	Excellent	Not recommended [4]
Suspended solids	Excellent	Good	Very good	Excellent
Suspended grease	Excellent	Good	Very good	Excellent
Silting	Excellent	Good	Very good	Excellent
Liquid temperature fluctuations	Very good	Excellent	Good [4]	Very good
Submerged flow	Not recommended	Not recommended	Excellent	Excellent
Full pipe flow	Not recommended	Not recommended	Excellent	Excellent
Surcharged flow	Not recommended	Not recommended	Excellent	Excellent
Reverse flow	Not recommended	Not recommended	Excellent	Excellent
Maintenance Requirements Caused by Adverse Conditions				
Silting	None	Occasional	Occasional	None
Suspended solids	None	Occasional	Occasional	None
High grease concentration	None	Occasional	Occasional	None

1. Use with caution on small flumes
2. There must be adequate space above for mounting sensor
3. Large air temperature fluctuations will affect accuracy
4. Conditions that limit access to the water level may adversely affect measurement
5. Non free flow conditions may require programming adjustments
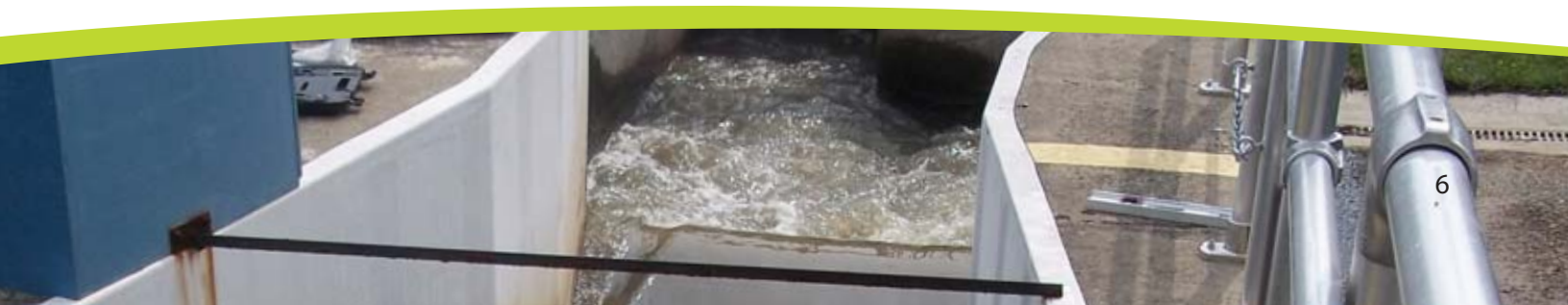
Inputs

Flow monitoring combines with a variety of inputs to produce an in-depth representation of the measurement site. All input data can be recorded and used for reporting, output or control.

Flow Technologies

- Ultrasonic
- Bubbler
- Continuous wave Doppler
- Laser and Doppler

pH

The TIENet 301 pH/temperature sensing device provides acidity/alkalinity measurements to the Signature.
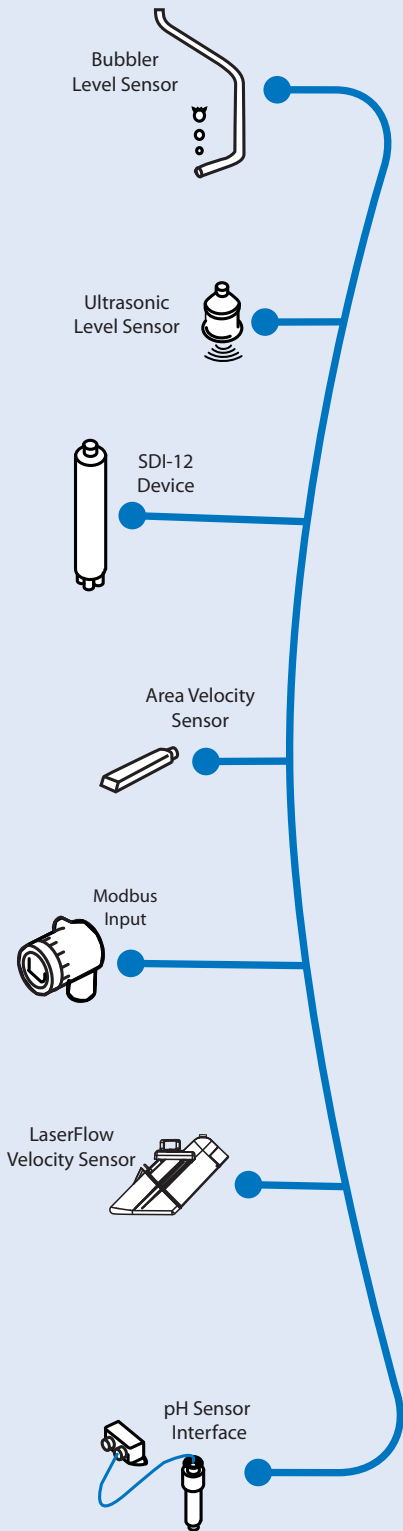
SDI-12

Two SDI-12 inputs accept data ranging from single-parameter sensors to multi-parameter sondes and other SDI-12 output devices.

Modbus Input

The Signature accepts up to two writable modbus registers to request updated readings from other measurement devices, totaling up to 40 parameters.

TIENet ™ Devices

- TIENet input and output device utilize a common, proprietary interface protocol.
- Low system integration cost with multiple measurement technologies, Input/Outputs, protocols and communication options.
- Configurable and upgradable without hardware or firmware changes in Signature Flow Meter.
- Quick set-up with an identifiable, unique address for each device.
- Easy trouble shooting with built in device diagnostics.

Bubbler Level Sensor

Ultrasonic Level Sensor

SDI-12 Device

Area Velocity Sensor

Modbus Input

LaserFlow Velocity Sensor

pH Sensor Interface

Outputs and Communication

The Signature can export selected data in the industry format of choice to associated equipment for remote data acquisition and/or process control. The Signature's ability to communicate over great distances using a number of protocols makes it a powerful tool for smart triggering, alarming, reporting, and data infrastructure.

Modbus Output

Simplified Plant Integration - The Signature communicates with SCADA systems using RS-485 Modbus ASCII/RTU output.

4-20 mA Current Loop

Optional dual Analog Output cards support up to six independent 4-20 mA current loops for external control. Additional outputs are possible with an Expansion Box.

Sampler Interface

The TIENet 306 Sampler Interface connects the Signature to an automatic wastewater sampler. The Signature can then enable the sampler based on user-specified conditions, (threshold, logic and equation) pace the sampling routine based on flow, and receive sample and bottle information from the Teledyne Isco sampler.

USB Connectivity

USB connectivity allows easy retrieval of report files via the front panel USB port with a flash drive, or a direct Windows® PC connection. Report files may be viewed as a text file or imported into Teledyne Isco's Flowlink® software. USB connectivity can also be used to save or load program settings and up-date firmware.
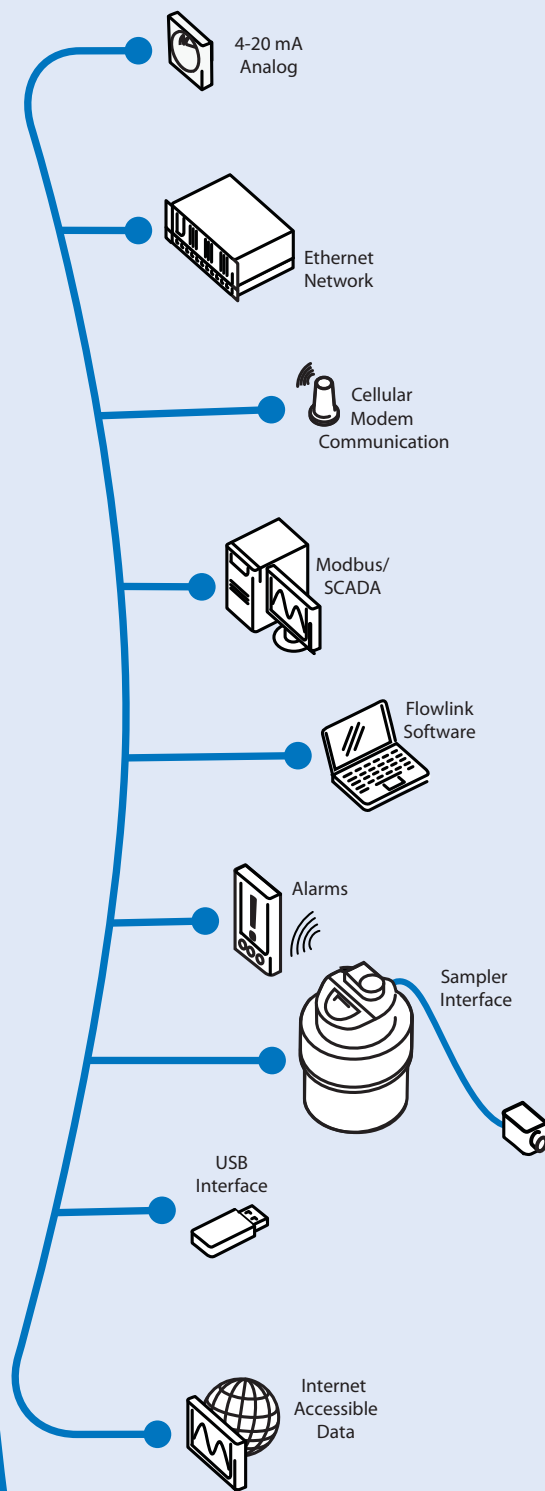
Ethernet

An Ethernet card provides remote retrieval of data and summary reports, remote programming, and alarming via SMS text messaging or email.

Cellular

An internal CDMA or GSM cellular modem enables long distance, remote programming, data retrieval, and alarms. Data can be automatically sent to server at set time intervals.

SCADA

The Signature provides a Modbus output for exporting site data to an external control system.

4-20 mA Analog

Ethernet Network

Cellular Modem Communication

Modbus/ SCADA

Flowlink Software

Alarms

Sampler Interface

USB Interface

Internet Accessible Data

Intelligent

The Signature responds intelligently to multiple concurrent inputs, with preprogrammed actions.

Actions

• Trigger and pace an automatic water sampler based on site conditions, with the optional TIENet 306 Sampler Interface.

• Log or push data at more frequent intervals during critical events to capture higher-resolution data, returning to the primary rate during normal operating conditions.

• Switch from one flow measurement technology to another based on site conditions.

• Send alarm notifications via SMS text messaging or email.

• Humidity alarms for preventive maintenance.

Compliant

The Signature secures the integrity of your site data through verifiable reports with data authentication for regulatory agencies.

Reports

Digital reports are accessible through the many communication options, eliminating the expense of hard copy report storage and paper roll/ribbon servicing. Report types include:

• Summary – Includes the daily minimum, maximum, and average for selected data types.

• Diagnostic – Tracks all diagnostic tests and results to ensure data quality. This can be useful in analyzing site or application issues.

• Program – Contains the current configuration and tracks any changes.

• History – Contains all user and meter events such as data transfers, program changes, and level adjustments. This information can be used to confirm equipment operation and detect tampering.

Summary Report

Diagnostic Report

History Report
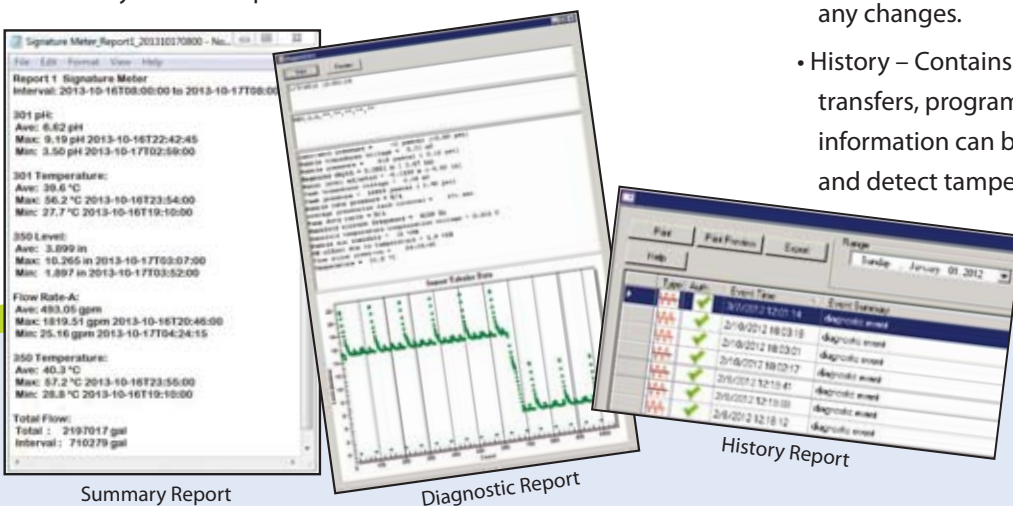
Original and Authentic—Verified!

Use the free Report Verification tool installed alongside Flowlink on your computer to verify data integrity. All downloaded Signature data is accompanied by a singular key calculated with a hash-based message authentication code (HMAC). Even the slightest change to your data will result in a drastically different key.
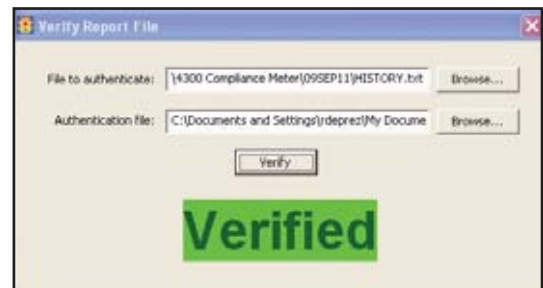
USB Connectivity

With a USB flash drive attached, you can quickly download 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.

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