Isco Product Data

Isco 2110 Ultrasonic Flow Module

The 2110 Ultrasonic Module provides accurate non-contact liquid level measurement, using built-in software to calculate flow in weirs, flumes and streams. When used in conjunction with Isco's Flowlink® software, that information can be managed and used in a wide variety of ways.

With the 2110, an ultrasonic sensor mounted above the flow stream transmits sound waves, which are reflected by the liquid surface. The elapsed time between transmitted and returned signals determines the liquid level.

The device then calculates flow rate, using the liquid level reading and a built-in conversion for the specified primary device or natural stream boundaries.

It can also be used for redundant level measurement to complement Isco's 2150 Area Velocity Flow Module.

Applications

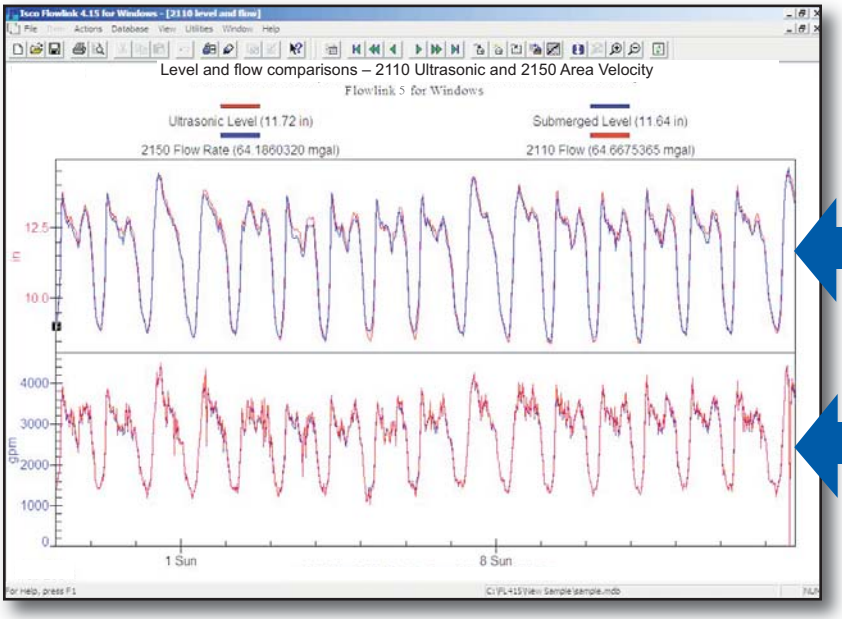
- CSO, SSO, I&I, cMOM, SSEs, Sewer flow monitoring.
- Open-channel flow measurement with or without primary devices.
- Redundant level measurement in combination with Isco 2150 Area Velocity Flow Modules, or other AV systems.
- Non-contact flow measurement in streams containing harsh chemicals, grease, or suspended solids.

Standard Features

- Digital communication between sensor and flow module makes it immune to RF interference.
- Sensor deflector plate resists condensation.
- Minimal deadband in level measurement.
- Its modular, stackable design snaps together with other 2100 modules to quickly create application-optimized configurations.
- Direct connect, modem, or wireless communication options let you choose the best data retrieval method for any job.
- Bracket, suspension, or insertion mounting of ultrasonic sensor makes setup quick and flexible.
- AC power compatibility for fixed sites.

Software Features

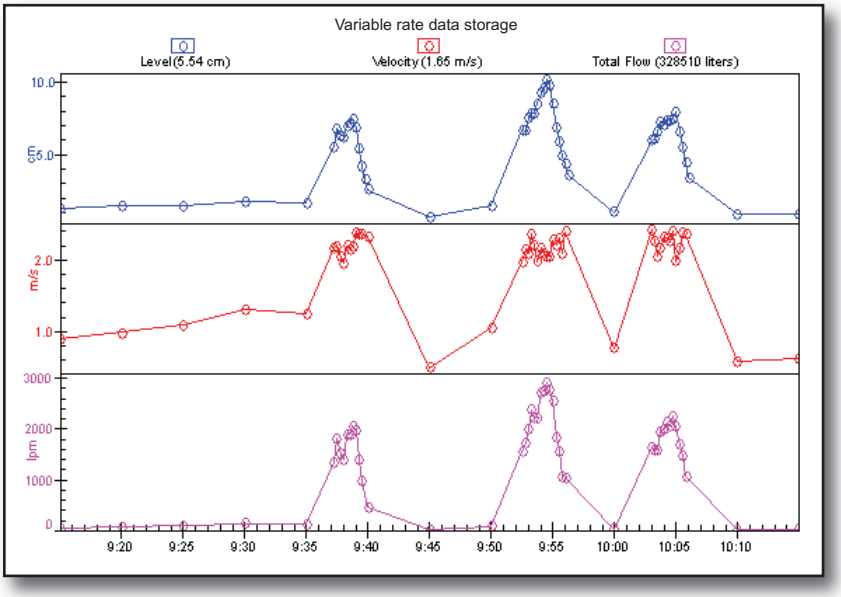
- Variable data storage rates can automatically be switched when conditions vary.
- 38.4k baud communication for speedy setup and data retrieval.
- Easily upgradeable. New operating software can be downloaded into non-volatile "flash" memory, without affecting your stored program or data.
- Rollover memory with variable rate data storage lets you change the data storage interval when programmed conditions occur.
- Secure data storage. All data are continuously stored in “flash” memory to protect against loss in case of power failure.
- Records and stores input voltage information to let you know when to change batteries.



Redundant level measurement

This panel shows how closely the 2110’s ultrasonic level reading (red) tracked with the level reading of an Isco 2150 area velocity sensor (blue), indicating that both instruments were providing accurate readings.

This panel shows the same degree of proximity with flow readings.



Variable rate data storage

The 2100 Series flow meter has the ability to automatically switch data storage rates based on varying conditions.

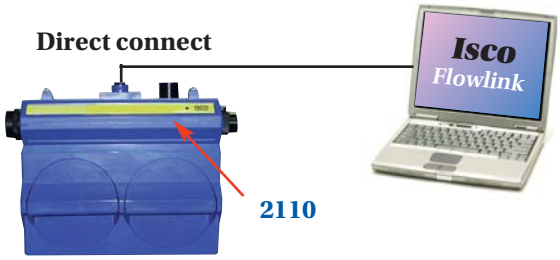
This feature assures maximum information about an event, such as an overflow, but saves power and memory space during normal conditions.

In the example at left, the 5-minute data storage rate automatically changed to 30 seconds once the level rose to 1.5 inches.

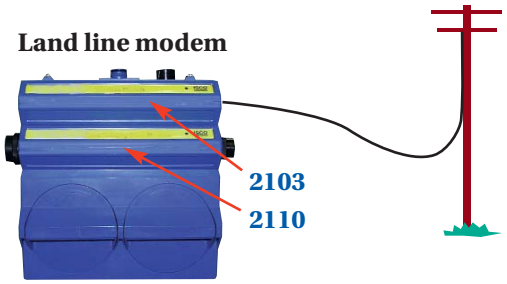
The important information recorded between 9:35 and 9:40, and so on, would have been missed without this unique feature.

Communication Options

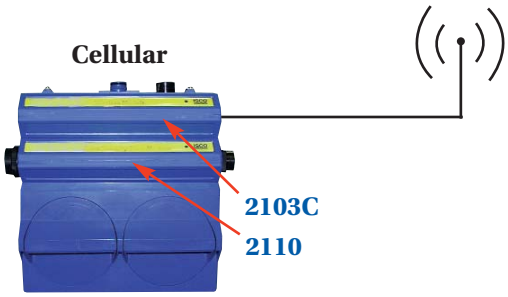
Direct connect



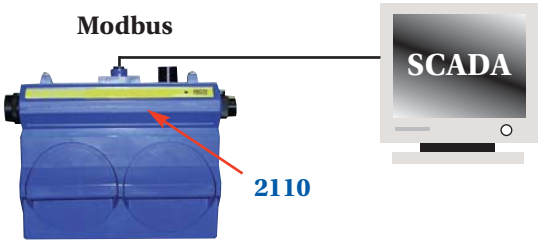
Land line modem



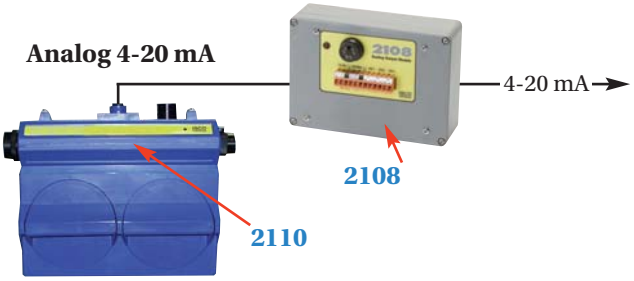
Cellular



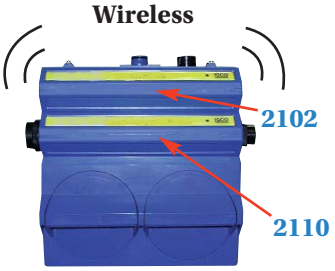
Modbus



Analog 4-20 mA



Wireless



(signal received by)
Remote 2102

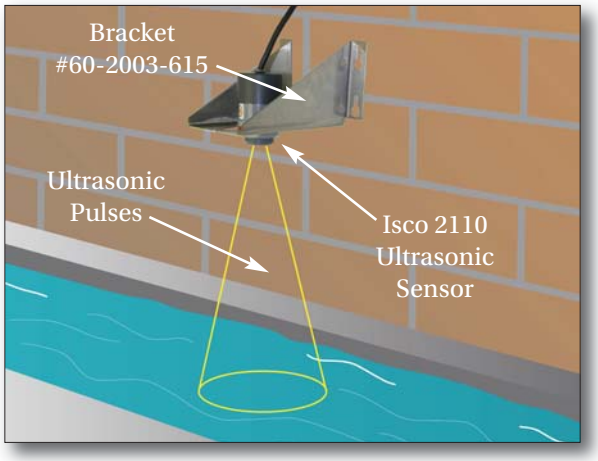
Sensor Mounting Options

Contact the factory for special applications.

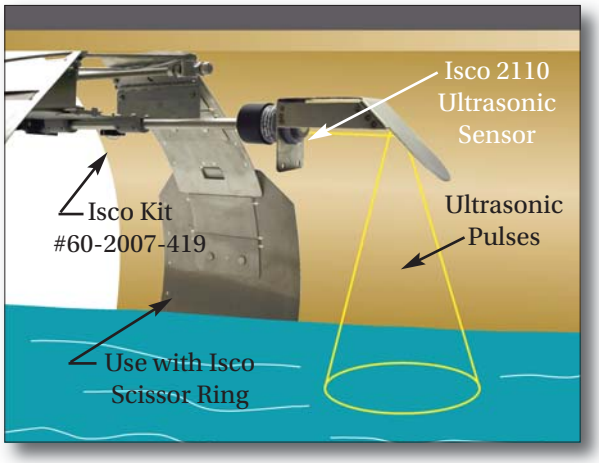
Suspension Mount

The sensor can simply be suspended above the water surface, using our weighted Suspension Mechanism (#60-2004-610).

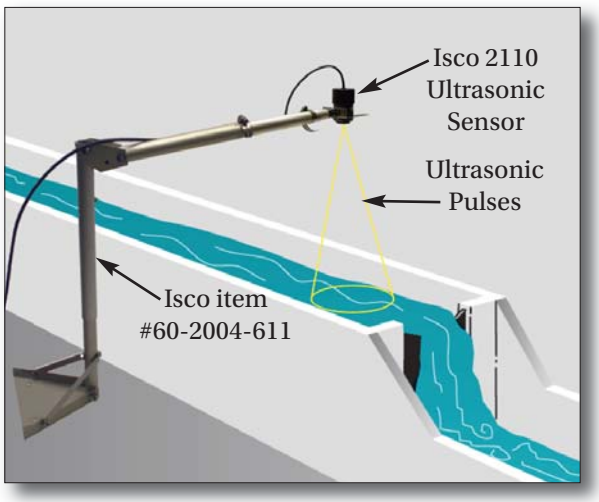
Wall-mounted



In-pipe



Floor Stand



Specifications

2110 Ultrasonic Module

Size *(H x W x D)*	2.9 x 11.3 x 7.5 in (7.4 x 28.7 x 19.1 cm)
Weight	2.4 lbs (1.08 kg)
Material	High-impact molded polystyrene, stainless steel
Enclosure *(self-certified)*	NEMA 4X, 6P, IP68
Power Required	7 to 15V DC, typical operating current 60 mA at 12V DC, 0.3 mA standby
Typical Battery Life *(Alkaline)*[1]	15 months (Level, temperature, and flow rate at 15-minute intervals. Input voltage and total flow at 24 hour storage interval)
Program Memory	Non-volatile, programmable flash; can be updated using PC without opening enclosure; retains user program after updating
Number of Modules Connected Together	(Up to 4, field interchangeable)
Separation Distance	3300 ft (1000 m) maximum, between modules
Wiring Between Remote Modules	Twisted pair for communication, pair for power, gauge dependent on distance
Level-to-Flow Rate Conversions	
Weirs	V-notch, rectangular, Cipolletti, Isco Flow Metering Inserts, Thel-Mar
Flumes	Parshall, Palmer-Bowlus, Leopold-Lagco, trapezoidal, H, HS, HL
Manning Formula	Round, U-shaped, rectangular, trapezoidal
Data Points	Up to 50 level-flow rate points
Equation	2-term polynomial
Total Flow Calculations	1 independent, net positive or net negative, based on flow rate conversion
Data Storage Memory (Non-volatile flash; retains stored data during program updates)	
Capacity	395,000 bytes (up to 79,000 readings, equal to over 270 days of level readings at 15 minute intervals, plus total flow and input voltage readings at 24 hour intervals)
Data Types	Level, flow rate, total flow, temperature, input voltage
Storage Mode	Rollover with variable rate data storage based on level, flow rate, total flow, or input voltage
Storage Interval	15 or 30 seconds; 1, 2, 5, 15, or 30 minutes; or 1, 2, 4, 12, or 24 hours
Bytes Per Reading	5
Setup and Data Retrieval	Serial connection to IBM PC or compatible computer with Isco Flowlink Software (version 5.1 or newer recommended)
Baud Rate	38,400
Operating temperature	0° to 140°F (-18° to 60°C)
Storage temperature	-40° to 140°F (-40° to 60°C)

Ultrasonic Sensor

Enclosure	NEMA 4X, 6P, IP68
Size (length x diameter)	3.08 x 1.9 in (7.8 x 4.8 cm)
Cable (length x diameter)	32.8 ft x 0.3 in (10 m x 0.8 cm)
Weight (including cables)	2.0 lbs (0.9 kg)
Level Measurement (@ 20 - 25°C, 30 - 70% RH, stable, non-stratified air)	
Frequency	150 kHz, 95 kHz
Cone Angle	8°
Range [2]	150 kHz - 4 to 72 in (0.1 to 1.8 m) 95 kHz - 12 to 144 in (0.3 to 3.6 m)
Accuracy	The greater of ± 0.013 ft (3.69 mm) or ± 0.0084 ft (2.56 mm) per foot (0.305 m) from the calibration point.
Typical Temperature Error	± the sum of 0.0042 ft + 0.00012 ft / °F from 68°F

2191 Battery Module

Size *(H x W x D)*	6.0 x 9.6 x 7.6 in (15.2 x 24.4 x 19.3 cm)
Weight *(without batteries)*	3.2 lbs (1.4 kg)
Material	High-impact molded polystyrene
Enclosure *(self-certified)*	NEMA 4X, 6P, IP68
Batteries	6V alkaline lantern or lead-acid lantern, quantity 2
Capacity	25 Ahrs

[1] *Using Energizer 529 alkaline batteries, discharged to a no load voltage of 4.2V DC per battery or 8.4V DC combined from the 2191 Battery Module.*

[2] *Zero deadband when installed with horizontal mounting bracket.*

Ordering Information

Description	Part Number
Isco 2110 Ultrasonic Flow Module with 2 m ultrasonic sensor and 2191 Battery Module	68-2000-073
Isco 2110 Ultrasonic Flow Module with 4 m ultrasonic sensor and 2191 Battery Module	68-2000-075
Isco 2110 Ultrasonic Flow Module with 2 m ultrasonic sensor	68-2000-072
Isco 2110 Ultrasonic Flow Module with 4 m ultrasonic sensor	68-2000-074
Sensor Suspension Mechanism	60-2004-610
Wall-mount Bracket for mounting on vertical surfaces	60-2003-615
Floor Stand for mounting on horizontal surfaces	60-2004-611
Sensor Mounting Kit for in-pipe mounting*	60-2007-419
Calibration Target for sensor calibration without	

** Requires appropriate diameter Isco mounting ring assembly.*

Contact the factory or your Isco representative for additional specifications.

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