EX100/200-SERIES
INSERTION ELECTROMAGNETIC FLOW SENSOR

Seametrics
Precision Flow Measurement
An ONICON Brand

APPLICATIONS

3" - 48" pipe (up to 72" optional)

Clean or "dirty" liquids

Conductive liquids

Municipal

Industrial

Irrigation

Features

- No moving parts
- Durable
- Adjustable depth
- Hot-tap available
- Brass or stainless steel
- Immersibility available
- Reverse flow output available

Contact Your Supplier

The **EX100/200-Series** are adjustable depth insertion magmeters that fit 3" to 48" pipe (up to 72" optional). The complete lack of moving parts of the EX100/200-Series is the source of its reliability. Brass and stainless steel models withstand a variety of temperature, pressure, and chemical conditions. The EX-Series has no rotor to stop turning in dirty water and there are no bearings to wear out. Like all magmeters, when used in chemical injection applications, these meters should be installed upstream of the chemical line (or far enough downstream to allow complete mixing of fluids before the meter). Adapters mate with standard 1-1/2" (11x/21x) or 2" (15x/25x) FNPT threaded fittings such as saddles and weldolets which may be purchased either locally or from Seametrics.

A rapidly reversing magnetic field is produced in the lower housing. As the fluid moves through this field, a voltage is generated that is measured and translated into a frequency signal proportional to flow rate. This square wave signal can be sent directly to a PLC or other control or can be converted using any of the Seametrics family of indicators and converters. A modular system of electronics can be installed directly on the flow sensor or mounted remotely. The FT430 (externally powered with pulse) and the FT440 (loop powered), both provide digital rate and total displays, as well as a programmable pulse; the FT440 also provides a 4-20 mA analog output.

The "hot-tap" models (EX15x/25x) can be installed or serviced without shutting down the line by means of a 2" full-port isolation valve that comes with a nipple for installation on the pipe fitting; a bronze ball valve is standard, with a 316 stainless steel valve option if needed. In most circumstances, no special tool is required.

Reverse flow output and immersibility are optional.

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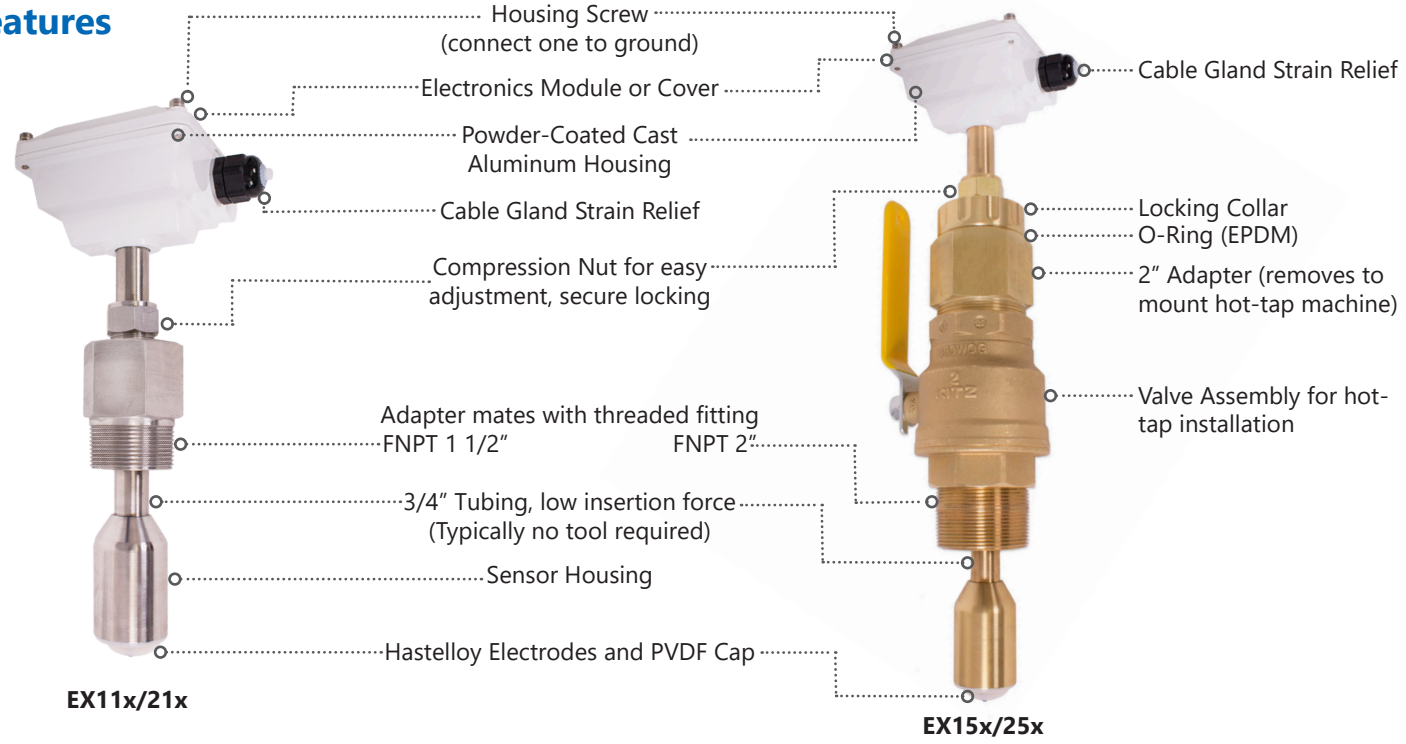
Features

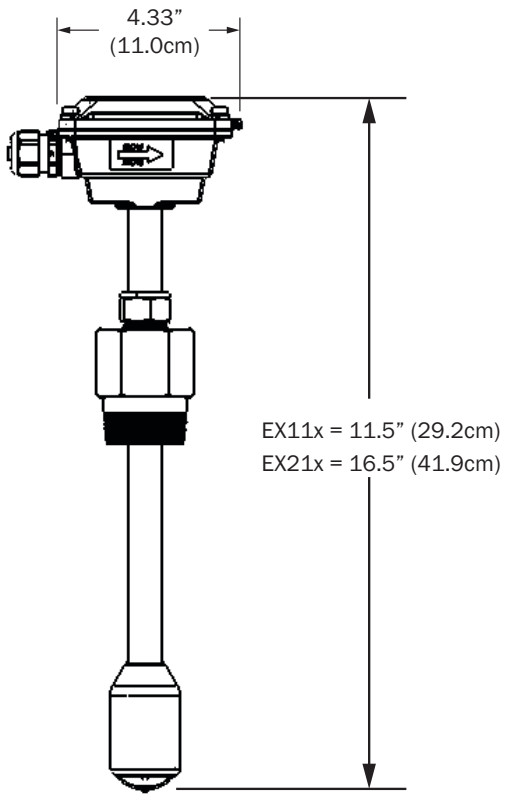


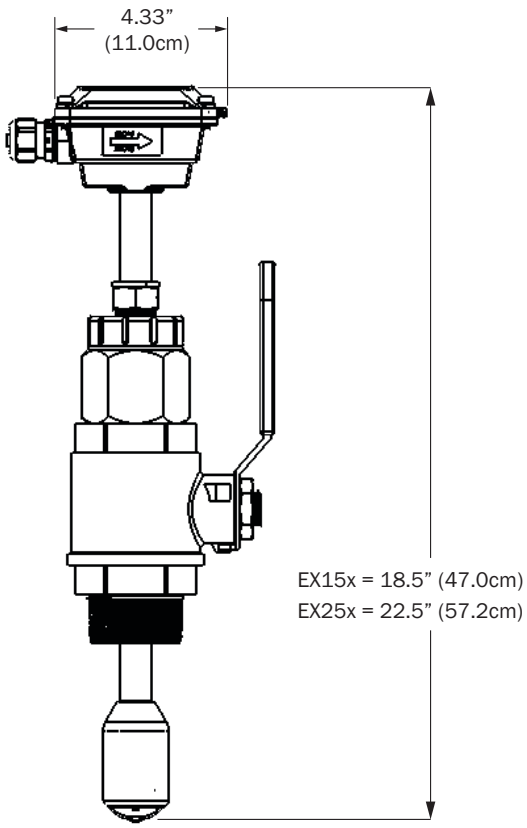
Specifications*

Pipe Size		3" to 48" (up to 72" optional)
Power		**Full Power:** 12 - 24 Vdc, 250mA **Low Power:** 12 - 24 Vdc, 40mA average with 250mA peaks
Materials	**Housing**	Powder-coated cast aluminum
	Tubing/Fitting/Sensor Housing	Brass or 316 Stainless Steel
	Electrodes	Hastelloy
	Electrode Cap	PVDF
	O-Ring *(15x/25x only)*	EPDM
	Valve Assembly *(15x/25x only)*	Bronze (stainless optional) with bronze ball valve
Fitting Size Required		**11x/21x:** 1.5" FNPT **15x/25x:** 2" FNPT
Maximum Pressure		200 psi (14 bar)
Temperature	**Ambient**	0˚ to 160˚ F (-17˚ to 72˚ C)
	Fluid	32˚ to 200˚ F (0˚ to 93˚ C)
Minimum Conductivity		20 microSiemens/cm
Flow Velocity		0.28 - 20 ft/sec (0.08 - 6.09 m/sec)
Accuracy		± 1% of full scale
Output		Square wave pulse, opto-isolated, 500 Hz @ 20 ft/sec 6 mA max, 30Vdc forward flow standard; reverse flow optional
Empty Pipe Detection		Software, defaults to zero flow
Cable		Standard 18' (6m), #22 shielded twisted pair, 4-conn. Max. cable run at 24 Vdc = 1000' (300m); at 12 Vdc = 500' (150m). For other circumstances, contact the factory.
Environmental		See meter mounted electronic specification for rating.

**Specifications subject to change • Please consult our website for current data (www.seametrics.com).*

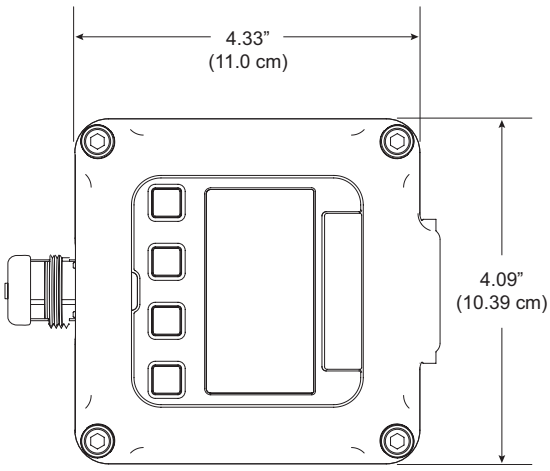
Dimensions





Flow Range

Flow Range (GPM)		
Nominal Pipe Size	**Minimum Flow**	**Maximum Flow**
3	6	440
4	11	783
6	25	1,762
8	44	3,133
10	69	4,895
12	99	7,050
14	134	9,596
16	175	12,533
18	222	15,863
20	274	19,584
24	395	28,200
30	617	44,064
36	888	63,452
48	1,580	112,804



How to Order

	Description	Size	Sensor Material	Options (110/210)	Options (150/250)
Sensor Only	Externally powered (12 - 24Vdc) sensor only.	3" – 10" pipe = EX110 10" – 48" pipe = EX210 Hot Tap 3" – 10" pipe = EX150 10" – 48" pipe = EX250	Brass = B 316 Stainless = S	Brass Adapter Fitting 2" NPT = -02 SS Adapter Fitting 2" NPT = -02 Reverse Flow Output = -15 Brass Adapter 1 ½" BSP = -23 SS Adapter 1 ½" BSP = -24 Old Style Adapter 1 ½" NPT = -35 *Immersible = -40 Low Power = -50 12" Extension (200 Series Only) = -72	316 SS Valve Assembly = -08 No Valve Assembly = -09 316 SS Valve Assembly = -08 Reverse Flow Output = -15 *Immersible = -40 Low Power = -50 12" Extension (200 Series Only) = -72

	Description	Size	Sensor Material	Options (113/213)	Options (153/253)
FT430 Mounted on Sensor	Externally powered sensor (12 - 24Vdc) with FT430 rate and total indicator (with pulse outputs) mounted on the sensor.	3" – 10" pipe = EX113 10" – 48" pipe = EX213 Hot Tap 3" – 10" pipe = EX153 10" – 48" pipe = EX253	Brass = B 316 Stainless = S	Brass Adapter Fitting 2" NPT = -02 SS Adapter Fitting 2" NPT = -02 Reverse Flow Output = -15 Brass Adapter 1 ½" BSP = -23 SS Adapter 1 ½" BSP = -24 Tamper Evident Kit = -32 Old Style Adapter 1 ½" NPT = -35 Low Power = -50 Non-resettable Total = -64 12" Extension (200 Series Only) = -72 Hinged Display Cover = -126	316 SS Valve Assembly = -08 No Valve Assembly = -09 Reverse Flow Output = -15 Tamper Evident Kit = -32 Non-resettable Total = -64 12" Extension (200 Series Only) = -72 Dual Relay Output = -98 Hinged Display Cover = -126

	Description	Size	Sensor Material	Options (116/216)	Options (156/256)
DL76 Mounted on Sensor	Externally powered sensor (12 - 24Vdc) with self powered DL76 data logger mounted on the sensor.	3" – 10" pipe = EX116 10" – 48" pipe = EX216 Hot Tap 3" – 10" pipe = EX156 10" – 48" pipe = EX256	Brass = B 316 Stainless = S	Brass Adapter Fitting 2" NPT = -02 SS Adapter Fitting 2" NPT = -02 Reverse Flow Output = -15 Brass Adapter 1 ½" BSP = -23 SS Adapter 1 ½" BSP = -24 Tamper Evident Kit = -32 Old Style Adapter 1 ½" NPT = -35 Low Power = -50 12" Extension (200 Series Only) = -72	316 SS Valve Assembly = -08 No Valve Assembly = -09 Reverse Flow Output = -15 Tamper Evident Kit = -32 Low Power = -50 12" Extension (200 Series Only) = -72

	Description	Size	Sensor Material	Options (119/219)	Options (159/259)
FT440 Mounted on Sensor [1]	Externally powered sensor (12 - 24Vdc) with FT440 rate and total indicator (with pulse and 4-20mA outputs) mounted on the sensor.	3" – 10" pipe = EX119 10" – 48" pipe = EX219 Hot Tap 3" – 10" pipe = EX159 10" – 48" pipe = EX259	Brass = B 316 Stainless = S	Brass Adapter Fitting 2" NPT = -02 SS Adapter Fitting 2" NPT = -02 Reverse Flow Output = -15 Brass Adapter 1 ½" BSP = -23 SS Adapter 1 ½" BSP = -24 Tamper Evident Kit = -32 Old Style Adapter 1 ½" NPT = -35 Low Power = -50 Non-resettable Total = -64 12" Extension (200 Series Only) = -72 Hinged Display Cover = -126	316 SS Valve Assembly = -08 No Valve Assembly = -09 Reverse Flow Output = -15 Tamper Evident Kit = -32 Non-resettable Total = -64 12" Extension (200 Series Only) = -72 Dual Relay Output = -98 Hinged Display Cover = -126

** Immersible to maximum of 3 ft (1m), up to 2 weeks*

[1] When ordering an EX with an FT440 mounted, the EX sensor cannot be loop powered.

FT430/440/450
RATE/TOTAL INDICATOR

Seametrics
Precision Flow Measurement
An ONICON Brand

Optional Protective Cover Closed

THE RIGHT INDICATOR FOR

Water Treatment

Water Utility

Industrial Chemical Handling

Features

- Simple Setup
- DC Powered (FT430)
- Loop Powered (FT440)
- Battery Powered (FT450)
- Remote or Flow Sensor Mounted Indicator
- Rugged Plastic Housing
- Non-volatile Memory

Contact Your Supplier

The **FT430/440/450** flow computers are microcontroller-based indicator/transmitters that interface with pulse output flow sensors to compute and display flow rate, flow total, and also generate output signals representing flow. The FT430 and FT450 have one scaled pulse output and one pulse pass through. The FT440 has two scaled pulse outputs. Galvanic isolation is provided for most pulse outputs.

The FT450 is battery powered while the FT430 may be powered by an external DC power source or an optional internal AC power supply*. The FT440 is a "two-wire" or "loop powered" device, meaning that it is powered by the 4-20 mA loop circuit itself. An optional internal AC power supply* is available for the FT440 with dual 24 and 12VDC outputs to power both the loop and sensors requiring more power than the loop can supply.

Pulse and 4-20mA analog outputs can be used to signal external devices, e.g. certain metering pumps and water treatment controls. Alternatively, one or more pulse outputs can be configured as alarm outputs. These flow computers can be password protected to prevent resetting the total or changing configuration settings.

The FT430/440/450 meters are available in wall and meter mount configurations. The FT430 and FT440 models can also be panel mounted. Some configurations can be converted from wall to meter or meter to wall after installation if needed. Consult factory for details.

Order the FT440 only if a 4-20mA output signal is a requirement and the FT450 if internal battery power is needed. Otherwise the FT430 offers the most flexibility.

**Internal power supply is available for the wall mount option only.*

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Specifications*

		FT430	FT440	FT450
Power		7-30Vdc, 4mA	9-30Vdc, 4mA (4-20 mA when loop-powered)	Lithium "C", 3.6Vdc, replaceable. Life is ~5 years depending on usage.
Display	**Rate**	5-digit autorange	5-digit autorange	5-digit autorange
	Total	8-digit	8-digit	8-digit
Units	**Rate Units**	Gallons/Second/Minute/Hour/Day, Liter/Second/Minute/Hour/Day, Cubic Feet/Second/Minute/Hour/Day, Cubic Meters/Second/Minute/Hour/Day, Mega Liters/Day, Million Gallons/Day, Fluid Oz/Second/Minute/Hour/Day, Barrels/Second/Minute/Hour/Day		
	Total Units	Gallon, Gallon x 1000, Liters, Mega Liter, Cubic Meter, Acre Feet, Cubic Feet, Cubic Feet x 1000, Million Gallon, Acre Inch, Fluid Ounce, Barrels		
Outputs	**Pulse Output 1**	Scaled pulse output, high alarm output or low alarm output. Optoisolated on FT430 and FT440.[1]		
	Pulse Output 2	Pulse pass through	Scaled pulse output, high alarm output or low alarm output.[1]	Pulse pass through
	Loop Power Output	N/A	4-20mA Loop	N/A
Set P Range		0.1 - 99999.9 units/pulse	0.1 - 99999.9 units/pulse	0.1 - 99999.9 units/pulse
Input		5V pulse or contact closure	5V pulse or contact closure	Micropower GMR Sensor (square wave)
Input Range		0.75[2] - 2000Hz	0.75[2] - 2000Hz	0.75[2] - 550Hz
K-Factor Range		.001 - 999999.999	.001 - 999999.999	.001 - 999999.999
Flow Alarm Output Range		0.1 - 99999.9	0.1 - 99999.9	0.1 - 99999.9
Operating Temperature		-5˚ to 55˚ C (23˚ to 131˚ F)	-5˚ to 55˚ C (23˚ to 131˚ F)	-5˚ to 55˚ C (23˚ to 131˚ F)
Non-Operating Temperature		-40˚ to 75˚ C (-40˚ to 158˚ F)	-40˚ to 75˚ C (-40˚ to 158˚ F)	-40˚ to 75˚ C (-40˚ to 158˚ F)
Environmental		NEMA 4X, IP67	NEMA 4X, IP67	NEMA 4X, IP67
Regulatory		CE Mark	CE Mark	CE Mark

** Specifications subject to change • Please consult our website for current data (www.seametrics.com).*
1 Scaled output pulses have a fixed width of 100ms. Maximum pulses per second is 6.5Hz
2 For pulse frequencies <1 Hz, increase setting in SET F menu to 3 or higher.

Features

***Includes password protection for tamper prevention when needed*

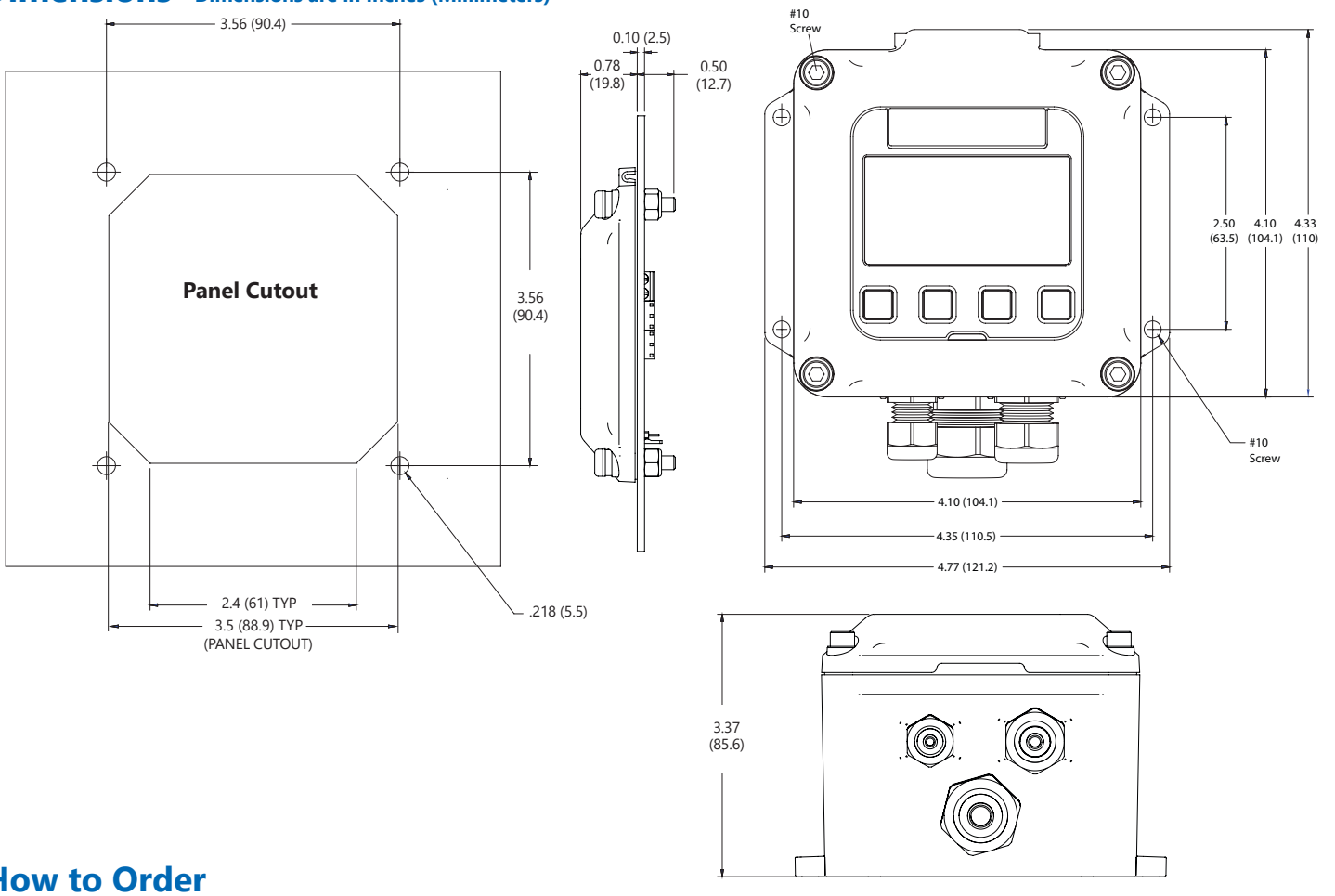
Pulse Output Function Table

PULSE OUTPUT 1 (SCALED)	FT430	FT440	FT450
TYPE	Current sinking	Current sinking	Current sinking
MAX. VOLTAGE	36 Vdc	36 Vdc	36 Vdc
MAX. CURRENT	100 mA	100 mA	100 mA
MAX. FREQUENCY	6.5 Hz	6.5 Hz	6.5 Hz
PULSE WIDTH	100 ms	100 ms	100 ms
ISOLATION	300 V	300 V	NOTE 1
CONFIGURABLE AS ALARM	YES (High or Low)	YES (High or Low)	YES (High or Low)
PULSE OUTPUT 2 (SCALED)	FT430	FT440 (Note 2)	FT450
TYPE	Not Available	Current sinking	Not Available
MAX. VOLTAGE		36 Vdc	
MAX. CURRENT		100 mA	
MAX. FREQUENCY		6.5 Hz	
PULSE WIDTH		100 ms	
ISOLATION		300 V	
CONFIGURABLE AS ALARM		YES (High or Low)	
PULSE OUTPUT 2 (PASS-THROUGH)	FT430	FT440	FT450
TYPE	Current sinking	Not Available	Current sinking
MAX. VOLTAGE	36 Vdc		36 Vdc
MAX. CURRENT	10 mA		100 mA
MAX. FREQUENCY	2000 Hz NOTE 2		550 Hz
PULSE WIDTH	SAME AS SENSOR INPUT		SAME AS SENSOR INPUT
ISOLATION	300 V		NOTE 1
CONFIGURABLE AS ALARM	NO		NO

NOTE 1: 150 V effective isolation when using Seametrics micropower sensors. • NOTE 2: With 2000 ohm or lower pull-up resistance.

FT430/440/450
RATE/TOTAL INDICATOR

Dimensions
Dimensions are in Inches (Millimeters)



How to Order

MODEL
DC-powered indicator = **FT430**

Loop-powered indicator/transmitter = **FT440**

Battery-powered indicator = **FT450**

MOUNTING
Wall mount = **-W**

Panel mount = **-P**

(FT430/FT440 only)

Meter mount = **See appropriate meter specification to order meter mounted units.**

OPTIONS
Tamper-evident = **-32**

Non-resettable total = **-64**

Dual Relay Output (FT430/440 only) = **-98**

Display Cover = **-126**

Built-in 120/240 Vac/12/24 Vdc dual power supply (FT430W/FT440W only) = **-139**

Built-in 120/240 Vac/12 Vdc single power supply (FT430W for use with mechanical or magmeters, FT440W for use with mechanical meters) = **-140**

ACCESSORIES

Display Cover = **102021**
Dual power supply, plug-in, 115 Vac, 12/24 Vdc = **PC42**
LMI pump power cable = **100013**
LMI pulse out cable = **100039**
Power converter, plug-in, 115 Vac, 24 Vdc = **PC3**
FT430 Module = **103591-01**
FT440 Module = **103591-02**
FT450 Module = **103591-03**
FT430/440 Dual Relay Option w/wire adapter = **100557**

ADAPTER KITS

	Part #	Electronics module	Lower wall housing	Lower meter housing
Convert wall to meter mount (MK10)	102632	Blue	Blue	Blue
Convert wall to meter mount (MK15)	103594	White	White	White
Convert meter to wall mount (MK20)	102633	Blue	Blue	Blue
Convert meter to wall mount (MK25)	103396	White	White	White
Adapter kit to mount white electronics to blue housing	103391	White	Blue	Blue
Adapter kit to mount white electronics to blue housing/ Tamper evident	103392	White	Blue	Blue

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LT-65650318r2.1 20180726
7/26/2018

DL76
DATA LOGGER

Seametrics
Precision Flow Measurement
An ONICON Brand

APPLICATIONS

- Water usage monitoring, reporting and management
- Custody transfer regulation
- Peak demand monitoring

FEATURES

- Easy to set-up, easy to use
- Weeks/months/years of data storage
- User-selected sampling interval
- Data retrieval with laptop computer
- Single data retrieval device serves multiple data loggers

The DL76 is a battery-powered data logger that can be used with any Seametrics flowmeter. It stores pulses for up to 3 years, depending on the user-selected frequency of reading. Indicator lights on the unit flash to indicate when it is functioning and when the battery is low.

The DL76 can be factory-mounted on the meter or remotely mounted. Housings are rugged cast aluminum, gasketed for environmental protection.

When a DL76 logger is placed into operation, it is easily set up using a laptop computer. Data is also retrieved from the DL76 by means of a laptop and can be analyzed on the laptop or easily loaded on a desktop computer for analysis.

*FlowInspector version 2 software (ordered separately) is required for the downloading, storing, viewing, graphing, charting and printing of data in several formats. FlowInspector requires a PC with Windows 98, NT, 2000, XP, Vista or Windows 7; CD-Rom drive; 800 x 600 screen resolution; serial port or USB/serial adapter; and a Seametrics DC3 data cable. FlowInspector can be used with an unlimited number of dataloggers.

*Older versions of FlowInspector are not compatible with the DL76.

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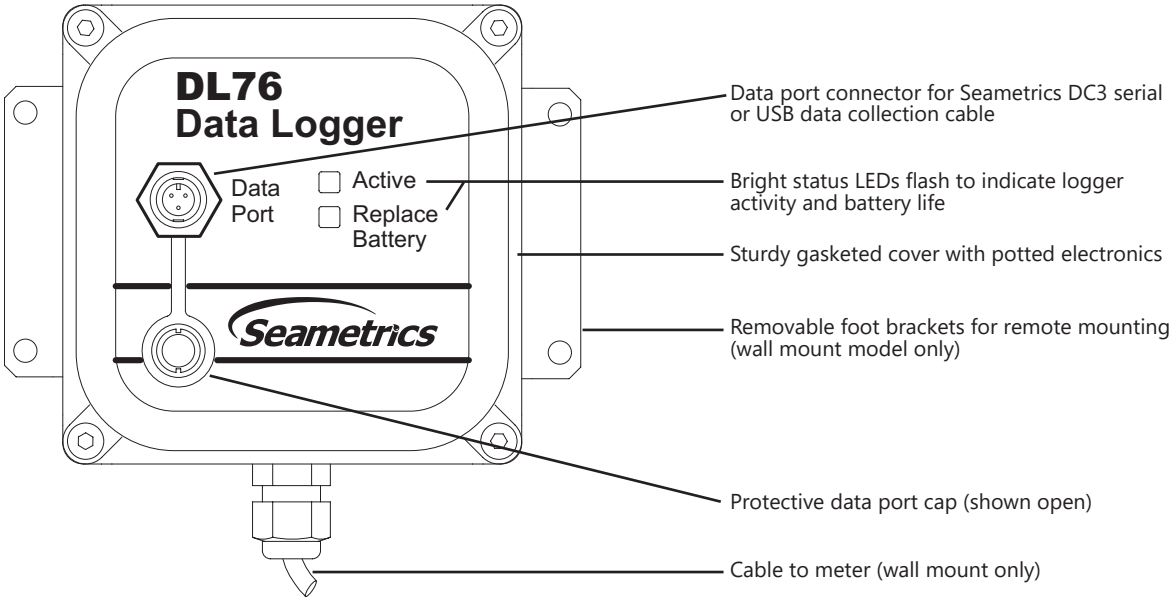
FEATURES



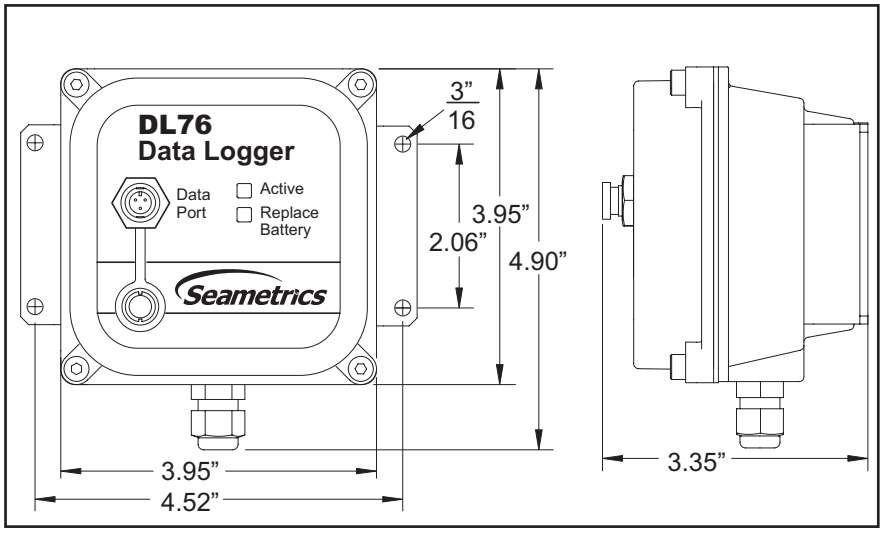
SPECIFICATIONS*

Power		Size C 3.6 Vdc lithium battery (included)		
Battery Life		Estimated life is 3-5 years depending on usage.		
Temperature		0˚ to 130˚ F (-18˚ to 54˚C)		
Rate Units	Volume	mL, liter, gallon, Imperial gallon, cubic foot, cubic meter, million gallon		
	Time	Seconds, minutes, hours, days		
Total Units		Liter, gallon, Imperial gallon, cubic foot, cubic meter, million gallon, acre-foot, acre-inch, megaliter, thousand-gallon		
Data Storage Capacity Example: If logging interval is every 480 seconds (8 min.) = 7.5 datapoints/hour = 180 datapoints/day. Therefore: for 365 days capacity is 65,700 datapoints/year.		Capacity	at	Sampling Interval
		11 days	at	15 seconds
		22 days	at	30 seconds
		44 days	at	60 seconds
		6 months	at	240 seconds
		1 year	at	480 seconds
		3 years	at	1450 seconds
Maximum Input Frequency		500 Hz		
Indicators		Low battery; Power		
Memory Wraparound		Selectable options (Stop or Overwrite) on 512KB Internal Memory		
Clock Accuracy		10 minutes/month (.02%)		
Environmental		NEMA 4X, IP66		

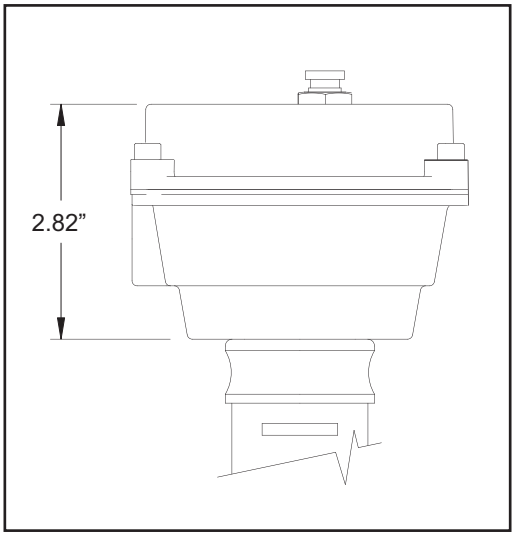
**Specifications subject to change • Please consult our website for current data (www.Seametrics.com).*

DIMENSIONS

DL76W (WALL MOUNT)



DL76M (METER MOUNT)

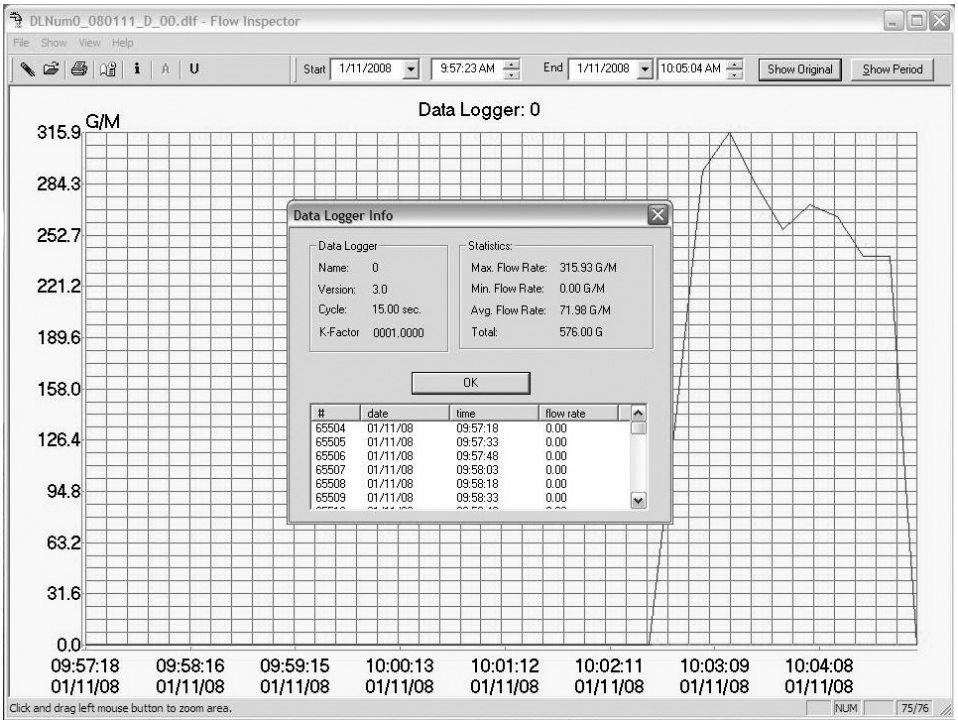


FlowInspector™ SOFTWARE

FlowInspector version 2 software (ordered separately) is required for setup and operation of the DL76, including data retrieval (with a laptop computer), storage, and analysis. (NOTE: Older versions of FlowInspector are not compatible with the DL76.)

FlowInspector Capabilities:

- Manage multiple loggers
- Record up to 3 years of data (depending on sampling interval)
- View current rate and total
- Download files to laptop
- Download files stored on the laptop
- Display flow information as a graph
- Display average and maximum/ minimum flow rate for any selected time period
- Zoom in to graph any time period
- Show daily flow totals in table format
- Append multiple files
- Print graphs and tables
- Export data to an Excel spreadsheet (.csv) or simple text (.txt) file



HOW TO ORDER

MODEL	MOUNTING	SOFTWARE
Data Logger = **DL76**	Wall mount = **W***	FI-SW Version 2*
	Meter mount = **See appropriate meter specification to order meter mounted units.**	
DL76		

*If ordering a wall mounted DL76 with a mechanical meter, select the micropower -04 option.

ACCESSORIES

Data Logger Serial Cable for Laptop = **DC3**

Data Logger USB Cable for Laptop = **DC3-USB**

NOTE: If the DC3 Serial Cable is used with a laptop configured with a USB port, a serial-to-USB converter cable is required.
NOTE: FlowInspector software is provided at no charge but must be ordered as a seperate line item.

*FlowInspector software is also available for download at: www.seametrics.com/downloads

CONTACT YOUR SUPPLIER