



ALSONIC-DSP

Ultrasonic Flowmeter

Model Alsonic-DSP



GENERAL

SMARTMEASUREMENT's **ALSONIC DSP** series is a fixed-mount, transit-time ultrasonic flowmeter with clamp-on transducers for non-invasive liquid measurement. This device uses patented "fine time measurement technology", making use of ultrasonic beams that can measure at pico-seconds time intervals. This rapid array of measurements enables accurate, drift-free flow rate data in liquids that contain a second phase of entrained solids or gas bubbles. The use of DSP technology enables "Cross Correlation" of ideal signals to cancel extraneous noise signals, and create a three dimensional cross section of the velocity distribution profile of the medium flowing through the pipe. DSP technology also enables the use of "FFT (Fast Fourier Transforms)" in order to generate the two signals at the same frequency; thereby increasing the signal to noise ratio for accurate, drift-free flow measurement in liquids.



FEATURES

- Color Graphic LCD display 128x64 for flow rate, total flow & signal shape
- 32Mbytes more than 1,000,000 points data
- Velocities from 0.03 ~ 66 feet/sec ($\pm 0.01 \sim \pm 20$ m/s)
- Any liquids containing $\leq 30\%$ bubbles, solids, including waste water & slurries
- NIST traceable calibration certificate
- High accuracy; $\pm 1.0\%$ of reading with single path; $\pm 0.5\%$ of reading with dual path
- Oscilloscope function for diagnostics
- AR (Anti-Round) Mode (patent pending)
- Fine Time Measurement Technology (Patented)
- Data logger function; includes date, totalizer, diagnostics
- Response time less than 1 second.



Oscilloscope Function

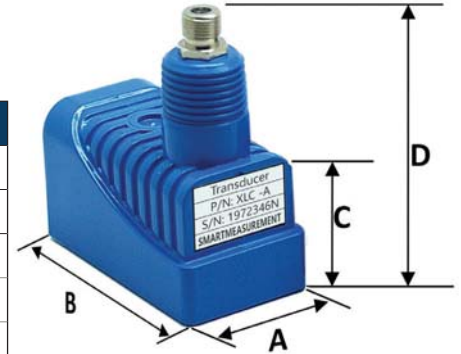
SPECIFICATIONS

- | | |
|--|---|
| <ul style="list-style-type: none"> • Measuring Principle: Transit time ultrasonic • Pipe Size: <ul style="list-style-type: none"> A Type : 1/2" ~ 1" (6 mm ~ 30 mm) B Type : 1/2" ~ 3" (15 mm ~ 80 mm) C Type : 2" ~ 10" (50 mm ~ 250 mm) D Type : 8" ~ 20" (200 mm ~ 500 mm) E Type : 20" ~ 118" (500 mm ~ 3000 mm) F Type : 78" ~ 236" (2000 mm ~ 6000 mm) • Pipe Material: Cast Iron, Stainless Steel, Ductile Iron, Copper, PVC, Aluminum, Asbestos, Fiberglass • Liner Material: Tar Epoxy, Rubber, Mortar, Polypropylene, Polystryal, Polystyrene, Polyester, Ebonite, Polyethylene, Teflon • Display: Color Graphic LCD 128x64 with backlight <ul style="list-style-type: none"> Flowrate: 4 1/2 digit Totalizer: 10-digit, Positive, Negative & Net values Engineering Units: m3, Liter, US Gallon, Imperial Gallon, Million Gallon, Cubic Feet, US Barrels, Imperial Barrels, Oil Barrel. Time Units: Second, Minute, Hour, Day Other: Oscilloscope function for diagnostics | <ul style="list-style-type: none"> • Accuracy: $\pm 1\%$ of reading with single path
$\pm 0.5\%$ of reading with dual path • Repeatability: $\pm 0.2\%$ of reading • Keypad & Display: Touch screen with Color Graphic LCD • Response Time: Less than 1 second • Flow Velocity: 0.03 ~ 66 feet/sec ($\pm 0.01 \sim \pm 20$ m/s) • Resolution: 0.003 feet/sec (0.001 m/s) • Ambient Temperature: -4 ~ +140 °F (-20 ~ +60 °C) • Max. Cable Length: Wall mounting, up to 650' (200 M) • Power Consumption: Less than 20W • Data Storage: Operation parameters and totalization Data are stored by EEPROM for more than 10 years • Output: Two 4-20 mA ,USB for up and download • Signal Damping: 1 ~ 999 seconds • Data Logger: 32Mbytes more than 1,000,000 points • Required Straight Run: Single path -10D upstream 5D downstream
Dual path -5D upstream 3D downstream • Alarm: Two relays for total, hi/low • Communication: RS-232/485 MODBUS • Protection - Transmitter: NEMA 4 (IP65), NEMA 4X(IP67) Ex proof • Transducer: IP68(Submersible) |
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TRANSDUCER SPECIFICATION

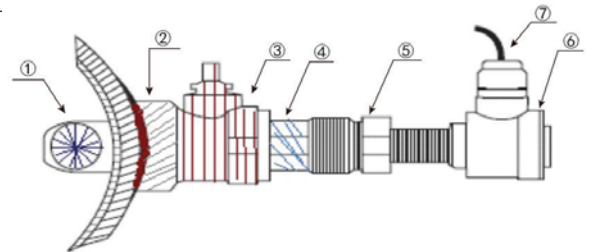
- Standard transducers
Fluid Temperature : -20 ~ +120 °C

Model	A	B	C	D	Pipe Size (Nominal)
XLA	0.90" (23 mm)	1.65" (42 mm)	1.45" (37 mm)	2.48" (63 mm)	1/5" ~ 1" (DN 6 ~ 30 mm)
XLB	1.38" (35 mm)	2.36" (60 mm)	1.77" (45 mm)	2.83" (72 mm)	1/2" ~ 3" (DN 15 ~ 80 mm)
XLC	1.38" (35 mm)	3.66" (93 mm)	1.97" (50 mm)	3.38" (86 mm)	2" ~ 10" (DN50~250mm)
XLD	2.00" (51 mm)	5.70" (145 mm)	3.00" (76 mm)	4.37" (111 mm)	8" ~ 20" (DN200~500mm)
XLE	TBA	TBA	TBA	TBA	20" ~ 118" (DN500~3000mm)
XLF	TBA	TBA	TBA	TBA	78" ~ 236" (DN2000~6000mm)



- Insertion Transducers
Fluid Temperature : -40 ~ +120 °C

Model	XIS (Standard)	XIL (Large Size)
Pipe Size	DN50-500mm	DN500-6000mm

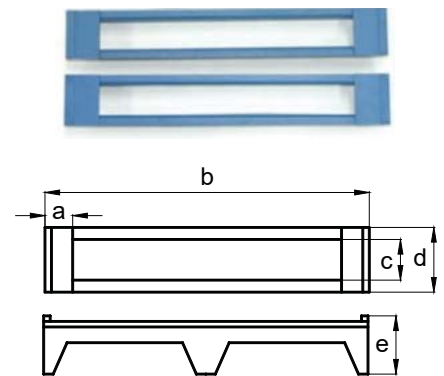


- 1 Transducer
- 2 Ball valve base
- 3 Ball valve
- 4 Male thread
- 5 Seal nut
- 6 Transducer head
- 7 Cable entry

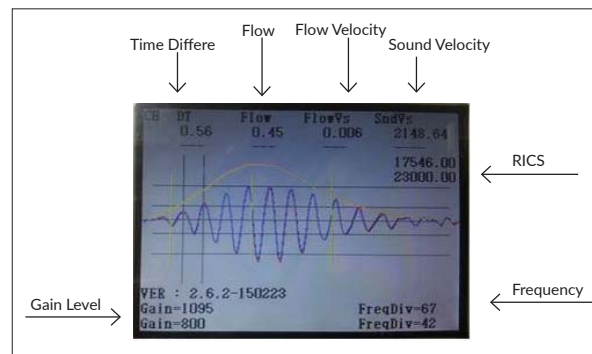
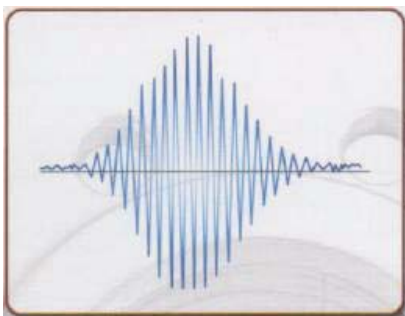
Dual path or dual channel (can measure two pipe simultaneously)
(user can select dual path or dual channel in programming)

Mounting Track Size

Model	a	b	c	d
M-XLB	1.18" (30 mm)	11.00" (280 mm)	0.90" (23 mm)	0.90" (23 mm)
M-XLC	1.57" (40 mm)	14.96" (380 mm)	1.38" (35 mm)	1.69" (43 mm)
M-XLD	1.57" (40 mm)	27.55" (700 mm)	1.38" (35 mm)	1.69" (43 mm)
M-XLE	1.57" (40 mm)	14.96" (380 mm)	2.00" (51 mm)	2.75" (70 mm)

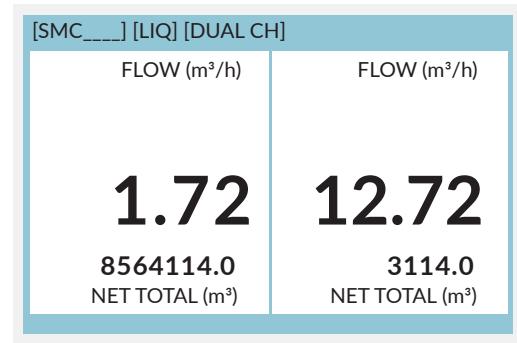
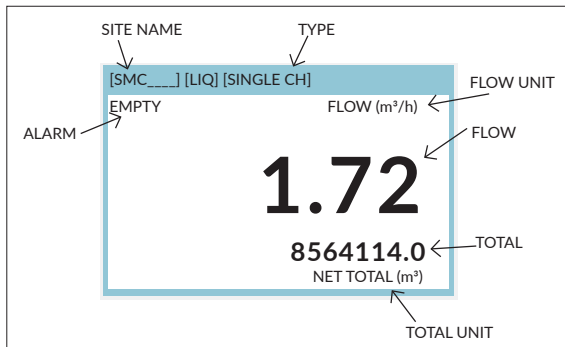


Oscilloscope Function (Diagnostic)



ALSONIC DSP TRANSMITTER

- Two channels: two different pipes, one pipe for average or less straight runs
- Straight run: single path - 10D upstream, 5D downstream; dual path - 5D upstream, 3D downstream
- Display: Touch screen Keypad with Color Graphic LCD Display
4.5digit - Flow 12 digits Total
Flowrate, Velocity, Total (POS, NEG, NET), Input Data (AI)



- Oscilloscope function: Delta T, Frequency, Signal Shape
- 32Mbytes memory (more than 1,000,000 points Datalogging)
- Two 4-20mA outputs and relay for totalizer
- Two 4-20mA Inputs for pressure, temperature or level
- RS-232C / RS-485 Modbus, USB port for data download
- Patented Anti-Round Technology
- Key Lock Function
- IP65 Enclsoure, NEMA 4



■ ALSONIC DSP 100L

- Power supply: 100~240VAc
- Keyboard: keyboard or remote controller
- Dimensions: 282*199*122 mm
- Wall mount install holes: $\Phi 8$, 150*260 mm
- Weight: 7.25 lbs (3.3 Kg)

■ ALSONIC DSP 10L

- Power supply: 12~24 Vdc with AC 100~240V adapter
- Keyboard: No keyboard, remote controller
- Options: EX proof box available
- Dimensions: 197*133*86 mm
- Wall mount install holes: $\Phi 8$, 90_{up}50_{down}*182 mm
- Weight: 4.4 lbs (2 Kg)

■ ALSONIC DSP 10LX

- Power supply: 12~24 Vdc with AC 100~240V adapter
- Keyboard: No keyboard, remote controller
- Approval: Ex d IIB T6, EX box
- Dimensions: 350*260*165 mm
- Wall mount install holes: $\Phi 12.5$, 270*260 mm
- Weight: 15.4 lbs (7 Kg)

Please contact your **SmartMeasurement** application engineer
 You also need to provide the following information:

TYPE OF FLUID	Please provide the name of your fluid, including operating density and viscosity
LINE SIZE	Please indicate nominal pipe diameter and sensor connection type (insertion, clamp, etc..)
PROCESS PRESSURE AND TEMPERATURE	We will calibrate your flowmeter as close to your operating conditions as possible
TYPE OF ELECTRONICS	Please specify output and installation type (compact, wall mount, panel mount, etc..)
PIPE NAME AND MATERIAL	Please provide pipe diameter, material, wall thickness, lining type, lining thickness
PIPE CONDITION	Straight pipe condition (10D upstream, 5D downstream of sensor location required)

ALSONIC-DSP

EXAMPLE 1: ALSONIC-DSP-10L-XLB-C10

EXAMPLE 2: ALSONIC-DSP-100L- 2(XLB)- 2(C10) - DUAL PATH

ALSONIC-DSP		**	**	**	DESCRIPTION
Compact type, up to 2 path/channel, IP65, DC power, 4-20mA, RS-232C/485	10L				Transmitter
Explosion proof, up to 2 path/channel, IP67, DC power, 4-20mA, RS-232C/485	10LX				
NEMA 4 with keyboard, up to 2 path/channel, IP65, AC power, Two 4-20mA, Two Relays, One RS-232C/485	100L				
Clamp-On, DN6~30, up to 120°C, Intrinsically Safe. 0.02 to 12 m/s		XLA			Transducers
Clamp-On, DN15~80, up to 120°C, Intrinsically Safe. 0.02 to 12 m/s		XLB			
Clamp-On, DN50~250, up to 120°C, Intrinsically Safe. 0.02 to 12 m/s		XLC			
Clamp-On, DN200~500, up to 120°C, Intrinsically Safe. 0.02 to 12 m/s		XLD			
Clamp-On, DN500~3000, up to 120°C, Intrinsically Safe. 0.02 to 12 m/s		XLE			
Clamp-On, DN2000~6000, up to 120°C, Intrinsically Safe. 0.02 to 12 m/s		XLF			
Inline, 1/2" flow tube, 200 mm length, 316SS, 0.5~10 LPM		XIL1			
Inline, 1/2" flow tube, 400 mm length, 316SS, 0.25~5 LPM		XIL2			
Inline, 3/4" flow tube, 200 mm length, 316SS, 1.0~20 LPM		XIL3			
Inline, 3/4" flow tube, 400 mm length, 316SS, 0.5~10 LPM		XIL4			
Insertion DN50~500, up to -40~120°C		XIS			
Insertion DN500~6000, up to -40~120°C		XIL			
None cable		NC			
10m cable (standard)		C10			
cable length is **(<=200m)		C**			
None option			NN		Options
Mounting track for transducer XLB			MTB		
Mounting track for transducer XLC			MTC		
Mounting track for transducer XLD			MTD		
Mounting track for transducer XLE/XLF/XLG			MTE		
Portalbe easy mounting track for XLC, XLD			ETP		
Portalbe magnetic mounting track for XLC, XLD, XLE			MTP		
Remote control for 10L			RC		