ALSONIC-DSP

Ultrasonic Flowmeter

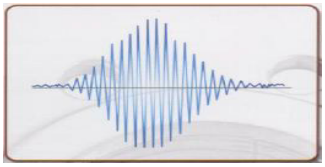
Model Alsonic-DSP

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
- 32 Mbytes memory more than 1,000,000 data points
- Velocities from 0.03 ~ 66 feet/sec (±0.01 ~ ± 20 m/s)
- Any liquids containing ≤30% bubbles, solids, including waste water & sluries
- NIST traceable calibration certificate
- High accuracy; ±1.0% of reading with single path; ±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

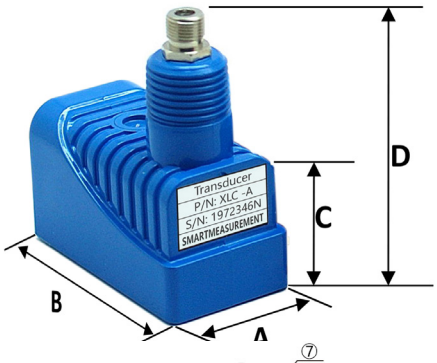
SPECIFICATIONS

- **Measuring Principle:** Transit time ultrasonic
- **Pipe Size:** A Type: ⅕" ~ 1" (6 mm ~30 mm)
  B Type : ¾" ~ 3" (20 mm ~ 80 mm)
  C Type : 2" ~ 12" (50 mm ~ 300 mm)
  D Type : 12" ~ 40" (300 mm ~ 900 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
  Flowrate: 4 ½ digit
  Totalizer: 10-digit, Positive, Negative & Net values
  Engineering Units: m^3, 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
- **Accuracy** ± 1% of reading with single path
  ± 0.5% of reading with dual path
- **Repeatability:** ± 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 (± 0.01 ~ ± 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:** 32 Mbytes; 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)

TRANSDUCER SPECIFICATION

■ Standard transducers
Fluid Temperature : -5 ~ 250 °F (-20 ~ +120 ℃)

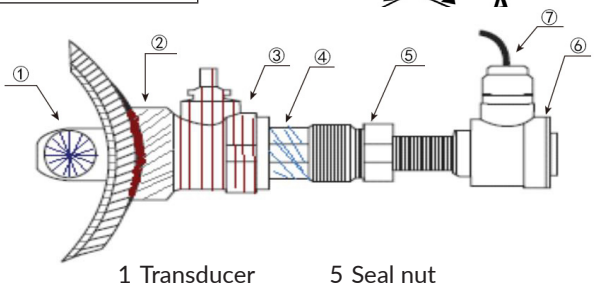
Model	A	B	C	D	Pipe Size (Nominal)
XLB	0.90" (23 mm)	1.65" (42 mm)	1.45" (37 mm)	2.48" (63 mm)	³/₄" ~ 3" (DN 20 ~ 80 mm)
XLC	1.38" (35 mm)	2.36" (60 mm)	1.77" (45 mm)	2.83" (72 mm)	2" ~ 12" (DN 50 ~ 300 mm)
XLD	1.38" (35 mm)	3.66" (93 mm)	1.97" (50 mm)	3.38" (86 mm)	12" ~ 35" (DN300~900mm)
XLE	2.00" (51 mm)	5.70" (145 mm)	3.00" (76 mm)	4.37" (111 mm)	20" ~ 118" (DN500~3000mm)
XLF	2.00" (51 mm)	5.70" (145 mm)	3.00" (76 mm)	4.37" (111 mm)	78" ~ 236" (DN2000~6000mm)



■ Insertion Transducers
Fluid Temperature : -40 ~ 250 °F (-40 ~ +120 ℃)

Model	XIS (Standard)	XIL (Large Size)
Pipe Size	2"~20" (DN50-500mm)	20"~240" (DN500-6000mm)

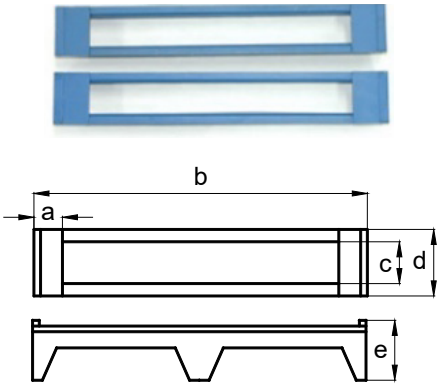
Dual path or dual channel (can measure two pipe simultaneously)
(user can select dual path or dual channel in programming)



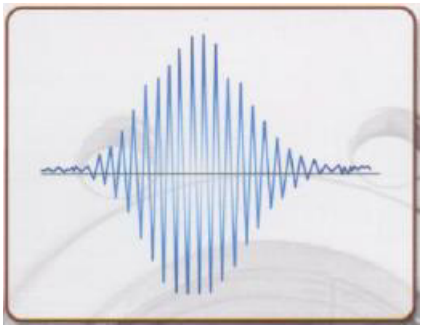
1 Transducer
2 Ball valve base
3 Ball valve
4 Male thread
5 Seal nut
6 Transducer head
7 Cable entry

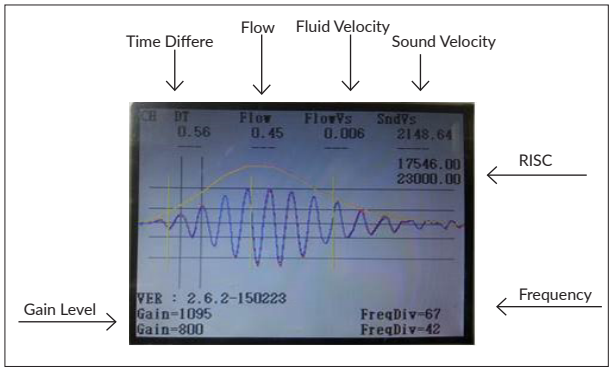
■ Mounting Track Size

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)



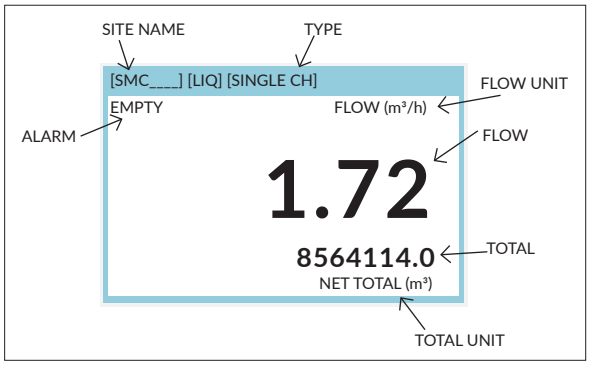
■ Oscilloscope Function (Diagnostic)

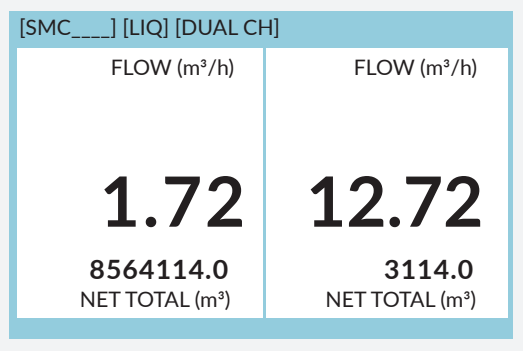




ALSONIC DSP TRANSMITTER

- Two channels: two different pipes, or dual path for single pipe; higher accuracy & more solids
- Straight run: single path - 10D upstream, 5D downstream; dual path - 5D upstream, 3D downstream
- Display: Touch screen keypad with color graphic LCD Display
  4½ digit Flow, 12 digits Total
  Flowrate, Velocity, Total (POS, NEG, NET), Input Data (AI)





- Oscilloscope function: Delta T, Frequency, Signal Shape
- 32 Mbytes memory (more than 1,000,000 data points)
- 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 enclosure, NEMA 4

■ ALSONIC DSP 100L

- Power supply: 100~240V_{AC}
- Keyboard: keyboard or remote controller
- Dimensions: 282*199*122 mm
- Wall mount install holes: Φ8, 150*260 mm
- Weight: 7.25 lbs (3.3 Kg)

■ ALSONIC DSP 10L

- Power supply: 12~24 V_{DC} with 100~240V_{AC} adapter
- Keyboard: No keyboard, IR remote controller
- Options: EX proof box available
- Dimensions: 197*133*86 mm
- Wall mount install holes: Φ8, 88*182 mm
- Weight: 4.4 lbs (2 Kg)

■ ALSONIC DSP 10LX

- Power supply: 12~24 V_{DC} with 100~240V_{AC} adapter
- Keyboard: No keyboard, remote controller
- Approval: Ex d IIB T6, EX box
- Dimensions: 350*260*165 mm
- Wall mount install holes: Φ12.5, 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: DUAL PATH ALSONIC-DSP-100L- 2(XLB)- 2(C10)

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, (DN20~80) ¾"~3", up to 248°F (120°C), Intrinsically Safe. 0.02 to 12 m/s		XLB		Transducers
Clamp-On, (DN50~300), 2~12", up to 248°F (120°C), Intrinsically Safe. 0.02 to 12 m/s		XLC		
Clamp-On, (DN300~900), 12"~ 36", up to 248°F (120°C), Intrinsically Safe. 0.02 to 12 m/s		XLD		
Clamp-On, (DN500~3000), 20"~120", up to 248°F (120°C), Intrinsically Safe. 0.02 to 12 m/s		XLE		
Clamp-On, (DN2000~6000), 80"~240", up to 248°F (120°C), Intrinsically Safe. 0.02 to 12 m/s		XLF		
Inline, ½" flow tube, 200 mm length, SS # 316, 0.5~10 LPM		XIL1		
Inline, ½" flow tube, 400 mm length, SS # 316, 0.25~5 LPM		XIL2		
Inline, ¾" flow tube, 200 mm length, SS # 316, 1.0~20 LPM		XIL3		
Inline, ¾" flow tube, 400 mm length, SS # 316, 0.5~10 LPM		XIL4		
Insertion (DN50~500) 2"~20", up to -40~248°F (-40~120°C)		XIS		
Insertion DN500~6000, 20"~240", up to -40~248°F (-40~120°C)		XIL		
None cable			NC	Signal Cable
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				MTE	
Portable easy mounting track for XLC, XLD				ETP	
Portable magnetic mounting track for XLC, XLD, XLE				MTP	
Remote control for 10L				RC	