



ALSONIC-DSP

Ultrasonic Flowmeter

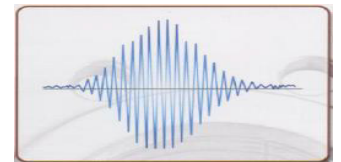
Model Alsonic-DSP

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 memory more than 1,000,000 data points
- 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

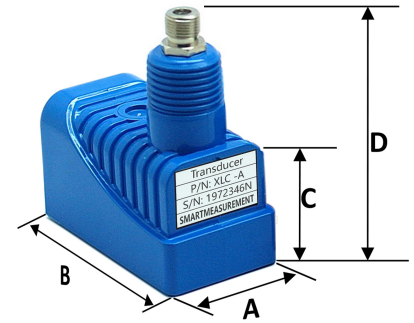
SPECIFICATIONS

| | | | |
|------------------------|--|-----------------------------|--|
| • Measuring Principle: | Transit time ultrasonic | • Repeatability: | $\pm 0.5\%$ of reading with dual path |
| • Pipe Size: | B Type : $\frac{3}{4}$ " ~ 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) | • Keypad & Display: | Touch screen with Color Graphic LCD |
| • Pipe Material: | Cast Iron, Stainless Steel, Ductile Iron Copper, PVC, Aluminum, Asbestos Fiberglass | • Response Time: | Less than 1 second |
| • Liner Material: | Tar Epoxy, Rubber, Mortar, Polypropylene Polystyrene, Polystyrene, Polyester, Ebonite Polyethylene, Teflon® | • Flow Velocity: | 0.03 ~ 66 feet/sec ($\pm 0.01 \sim \pm 20$ m/s) |
| • Display: | Color Graphic LCD 128x64 with backlight | • Resolution: | 0.003 feet/sec (0.001 m/s) |
| Flowrate: | 4 $\frac{1}{2}$ digit | • Ambient Temperature: | -4 ~ +140 °F (-20 ~ +60 °C) |
| Totalizer: | 10-digit, Positive, Negative & Net values | • Max. Cable Length: | Wall mounting, up to 650' (200 M) |
| Engineering Units: | m ³ , Liter, US Gallon, Imperial Gallon, Million Gallon, Cubic Feet, US Barrels, Imperial Barrels, Oil Barrel. | • Power Consumption: | Less than 20W |
| Time Units: | Second, Minute, Hour, Day | • Data Storage: | Operation parameters and totalization Data are stored by EEPROM for more than 10 years |
| Other: | Oscilloscope function for diagnostics | • Output: | Two 4-20 mA, USB for up and download |
| • Accuracy: | $\pm 1\%$ of reading with single path | • 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) |

TRANSDUCER SPECIFICATION

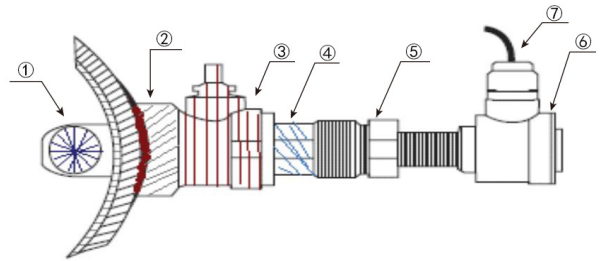
- Standard transducers
Fluid Temperature : -5 ~ 250 °F (-20 ~ +120 °C)

| 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 °C)

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

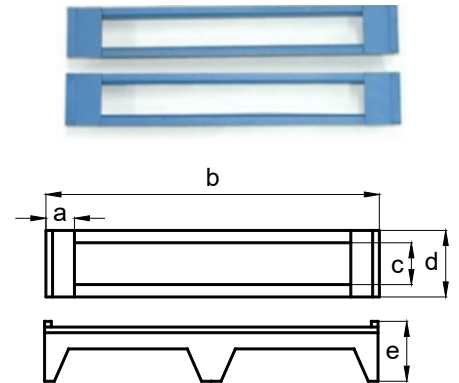


- 1 Transducer
- 2 Ball valve base
- 3 Ball valve
- 4 Male thread
- 5 Seal nut
- 6 Transducer head
- 7 Cable entry

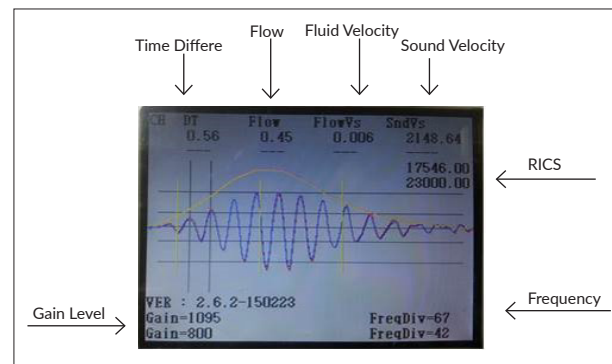
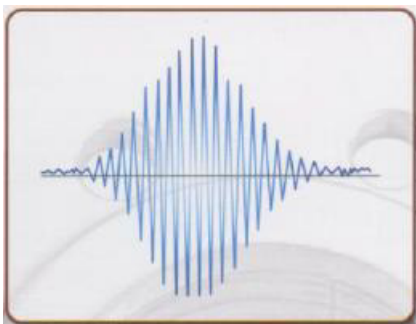
Dual path or dual channel (can measure two pipe simultaneously)
(user can select dual path or dual channel in programming)

- 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) |

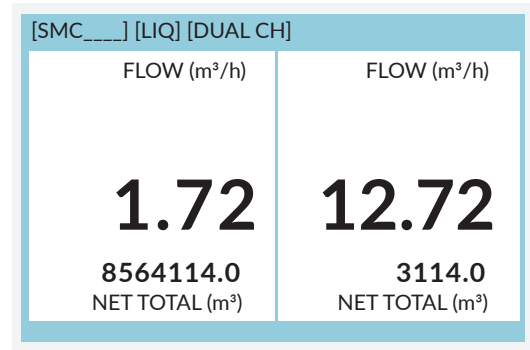
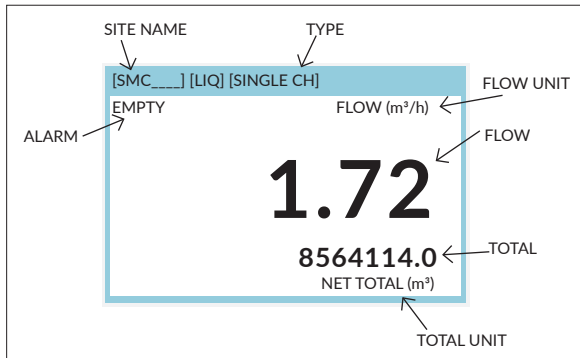


- Oscilloscope Function (Diagnostic)



ALSONIC DSP TRANSMITTER

- Two channels: two different pipes, one pipe for average or fewer 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
4½ digit 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 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, 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 | |

