ALSONIC-DSP

Ultrasonic Flowmeter
Model Alsonic-DSPPL

⬈ GENERAL

The SMC Alsonic DSPPL series is a portable 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 measurement 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
- ❑ 4.0 Mbytes data logger up to 200,000 data fields
- ❑ Velocities from 0.03 ~ 40 feet/sec (0.01 ~ ± 12 m/s)
- ❑ Measures flow rates for any liquid containing ≤ 30% suspended solids, including waste water
- ❑ NIST traceable calibration certificate
- ❑ High accuracy; ±1.0% of reading with single path
  - ±0.5% of reading with dual path
- ❑ Oscilloscope function for diagnostics
- ❑ Durable carrying case allows for portable use of the instrument
- ❑ Fine Time Measurement Technology (Patented)
- ❑ Data logger function; includes date, totalizer, diagnostics
- ❑ Response time less than 1 second.

⬈ SPECIFICATION

● Measuring Principle	:	Transit time differential
● Pipe Size	:	B Type : ½" ~ 4' (15 mm ~ 100 mm)
	:	C Type : 2" ~ 12" (50 mm ~ 300 mm)
	:	D Type : 12" ~ 40" (200 mm ~ 1000 mm)
	:	E Type : 20" ~ 240" (500 mm ~ 6000 mm)
● Pipe Material	:	Cast Iron, Stainless Steel, Ductile Iron, Copper, PVC, PVDF, 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	:	16-key touch pad
● Response Time	:	Less than 1 second
● Flow Velocity	:	0.03 ~ ±40 feet/sec (0.01 ~ ± 12 m/s)
● Resolution	:	0.003 feet/sec (0.001 m/s)
● Ambient Temperature	:	-4 ~ 140° F (-20 ~ 60° C)
● Fluid Temperature	:	-40 ~ 250° F (-40 ~ 120° C)
● Max. Cable Length	:	650' (200 M)
● Power Consumption	:	Less than 20W
● Power Supply	:	Battery operated; 90 ~ 260V_{AC} 50/60 Hz recharger included
● Data Storage	:	Operation parameters and totalization data are stored by EEPROM for more than 10 years
● Output	:	two analog 4-20 mA
● Data Logger	:	4.0 Mbytes, up to 200,000 bits of data
● Alarm	:	two alarm outputs configurable for total, hi/low flow rate
● Communication	:	RS-232
● Dimensions	:	See page 2
● Weight	:	7.25 lbs. (3.3 Kg)
● Protection -Converter		NEMA 4 (IP65)
Sensor	:	IP68 (Submersible)

Smartmeasurement™

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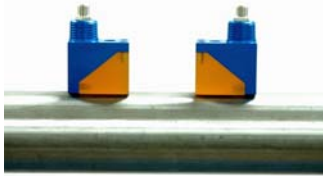# ↗TRANSDUCER SPECIFICATIONS

● **Standard transducers**

Fluid Temperature : -4 ~ 250 °F (-20 ~ 120 °C)

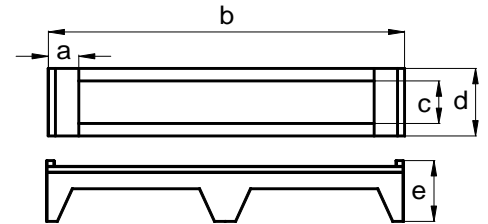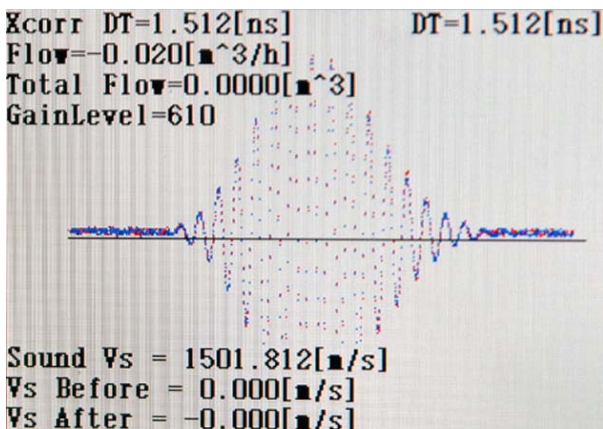| Model	A	B	C	D	Pipe Size (Nominal)
XLB	0.90" (23 mm)	1.65" (42 mm)	1.45" (37 mm)	2.48" (63 mm)	½" ~ 4" (DN 15 ~ 100 mm)
XLC	1.38" (35 mm)	2.36" (60 mm)	1.77" (45 mm)	2.83" (72 mm)	2" ~ 12" (DN 50 ~ 300 mm)
XLD	1.38" (35 mm)	3.66" (93 mm)	1.97" (50 mm)	3.38" (86 mm)	8" ~ 40" (DN200~1000mm)
XLE	2.00" (51 mm)	5.70" (145 mm)	3.00" (76 mm)	4.37" (111 mm)	20" ~ 240" (DN500~6000mm)

Single path

Dual Path
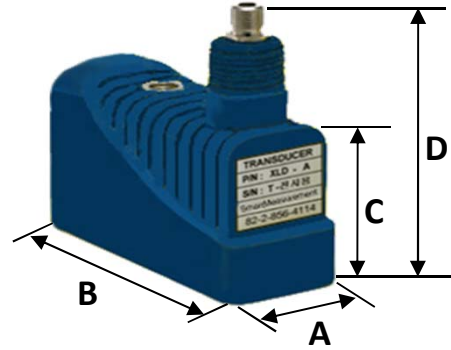
Dual path or dual channel - Users may measure two pipe simultaneously or use both paths to monitor
a single pipe for improved accuracy and improved performance in high-particle count applications.

● **Mounting Track Sizes**

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)**

```
Xcorr DT=1.512[ns]        DT=1.512[ns]
Flow=-0.020[m^3/h]
Total Flow=0.0000[m^3]
GainLevel=610




Sound Vs = 1501.812[m/s]
Vs Before = 0.000[m/s]
Vs After = -0.000[m/s]
```

DSPPL-ILLUSTRATION

Display Module

Transducers

Mounting Kit

Please contact your SMC application engineer

You also need to provide the following information:

Type of Fluid	We need the name of your fluid, including operating density and viscosity
Line Size	Pipe size and sensor connection type
Process Pressure and Temperature	We will calibrate your flowmeter as close to your operating conditions as possible.
Type of Electronics	Output and install type (compact, wall mount, panel mounted..)
Pipe name and material	Pipe diameter, material, wall thickness, lining type, lining thickness
Pipe Condition	Number of straight pipe runs present (10D upstream, 5D downstream required)

➚ Model Selection Guide

Alsonic-DSPPL

Example 1: Alsonic-DSPPL-100N-XLB-C10

Alsonic-DSPPL-	**	**	**	**			**Description**
100N-single pass/channel	100N						Flow Meter
DN 15 ~ 100 mm and mounting track		XLB					Transducers and mounting rack
DN 50 ~ 300mm and mounting track		XLC		`			
DN 200-1000mm and mounting track		XLD					
DN500~6000mm and mounting track		XLE					
* cable length is 10 meter standard, and max. cable distance 200 M		Cxx					Extra Cable
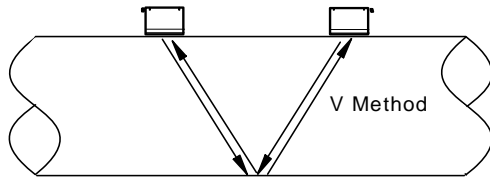
V Method

* Alsonic-DSPPL normal installation is reflect (V) method, not direct (Z) mode

* when use single path with reflect mode, accuracy is double than direct mode and same with dual path

* when use dual path with reflect mode, accuracy is same with four path