The SMC 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
- 4.0 Mbytes data logger up to 200,000 data fields
- Velocities from 0.03 ~ 40 feet/sec (0.01 ~ ± 12 m/s)
- Any liquids 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
- AR (Anti-Round) Mode (patent pending)
- Fine Time Measurement Technology (Patented)
- Data logger function; includes date, totalizer, diagnostics
- Response time less than 1 second.

### SPECIFICATIONS

- **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, Aluminum, Asbestos Fiberglass
- **Liner Material**
  - Tar Epoxy, Rubber, Mortar, Polypropylene, Polyethylene, Teflon
- **Display**
  - Color Graphic LCD 128x64 with backlight
- **Flowrate**: 4 ½ 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
- **Accuracy**
  - ± 1% of reading with single path
  - ± 0.5% of reading with dual path
- **Repeatability**
  - ± 0.2% of reading
- **Keypad**: 16 Key with tactile action
- **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)
- **Mounting**: wall mounting
- **Max. Cable Length**: 650’ (200 M)
- **Power Consumption**: Less than 20W
- **Power Supply**: 90 ~ 260VAC 50/60 Hz
- **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 relays for total, hi/low
- **Communication**: RS-232
- **Dimensions**: See page 3
- **Weight**: 7.25 lbs. (3.3 Kg)
- **Protection -Converter**: NEMA 4 (IP65)
- **Sensor**: IP68 (Submersible)
**Transducer Specification**

- **Standard-Transducers**
  Fluid Temperature: -20 ~ +120 °C

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Pipe Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>XLB</td>
<td>23 mm</td>
<td>42 mm</td>
<td>37 mm</td>
<td>63 mm</td>
<td>DN 15 ~ 100 mm</td>
</tr>
<tr>
<td>XLC</td>
<td>35 mm</td>
<td>60 mm</td>
<td>45 mm</td>
<td>72 mm</td>
<td>DN 50 ~ 300 mm</td>
</tr>
<tr>
<td>XLD</td>
<td>35 mm</td>
<td>93 mm</td>
<td>50 mm</td>
<td>86 mm</td>
<td>DN200~1000mm</td>
</tr>
<tr>
<td>XLE</td>
<td>51 mm</td>
<td>145 mm</td>
<td>76 mm</td>
<td>111 mm</td>
<td>DN500~6000mm</td>
</tr>
</tbody>
</table>

**Single Path**

**Duel Path**

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

**Mounting Track Size**

<table>
<thead>
<tr>
<th>Model</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTB</td>
<td>30 mm</td>
<td>280 mm</td>
<td>23 mm</td>
<td>23 mm</td>
</tr>
<tr>
<td>MTC</td>
<td>40 mm</td>
<td>380 mm</td>
<td>35 mm</td>
<td>43 mm</td>
</tr>
<tr>
<td>MTD</td>
<td>40 mm</td>
<td>700 mm</td>
<td>35 mm</td>
<td>43 mm</td>
</tr>
<tr>
<td>MTE</td>
<td>40 mm</td>
<td>380 mm</td>
<td>51 mm</td>
<td>70 mm</td>
</tr>
</tbody>
</table>

**Oscilloscope Function (Diagnostic)**
**DIMENSIONS**

- Alsonic-DSP NEMA 4

* Consult factory for dimensions of optional Explosion-Proof enclosure

---

**WALL MOUNTING WIRING**

![Wall Mounting Wiring Diagram](image-url)
Please contact your SMC application engineer
You also need to provide the following information:

<table>
<thead>
<tr>
<th>Type of Fluid</th>
<th>Please provide the name of your fluid, including operating density and viscosity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Size</td>
<td>Please indicate nominal pipe diameter and sensor connection type (insertion, clamp, etc..)</td>
</tr>
<tr>
<td>Process Pressure and Temperature</td>
<td>We will calibrate your flowmeter as close to your operating conditions as possible</td>
</tr>
<tr>
<td>Type of Electronics</td>
<td>Please specify output and installation type (compact, wall mount, panel mount, etc...)</td>
</tr>
<tr>
<td>Pipe name and material</td>
<td>Please provide pipe diameter, material, wall thickness, lining type, lining thickness</td>
</tr>
<tr>
<td>Pipe Condition</td>
<td>Straight pipe condition (10D upstream, 5D downstream of sensor location required)</td>
</tr>
</tbody>
</table>

**Model Selection Guide**

**Alsonic-DSP**

Example 1: Alsonic-DSP-100N-XLB-C10
Example 2: Alsonic-DSP-100DN-2(XLB)-2(C10)

<table>
<thead>
<tr>
<th>Alsonic-DSP-</th>
<th>**</th>
<th>**</th>
<th>**</th>
<th>**</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100L-up to 2-path/4 channel, with keypad, NEMA 4X</td>
<td>100L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100LM-up to 4-path/8 channel, with keypad, NEMA 4X</td>
<td>100LM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10L - up to 2-path/4 channel, compact type</td>
<td>10L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10LX - up to 2-path, compact type w/ EX-Proof box</td>
<td>10LX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½” – 4” (DN 15 – 100 mm) and mounting track</td>
<td>XLB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” – 12” (DN 50 – 300mm) and mounting track</td>
<td>XLC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8” – 40” (DN 200-1000mm) and mounting track</td>
<td>XLD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20” – 240’ (DN500~6000mm) and mounting track</td>
<td>XLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* cable length is 10 meter standard, and max. cable distance 200 M

*(V Method)

* Alsonic-DSP normal installation is reflect (V) method, not direct (Z) mode
* when using single path with reflect mode, accuracy is double that of direct mode and the same as dual path
* when using dual path with reflect mode, accuracy is the same as four path