

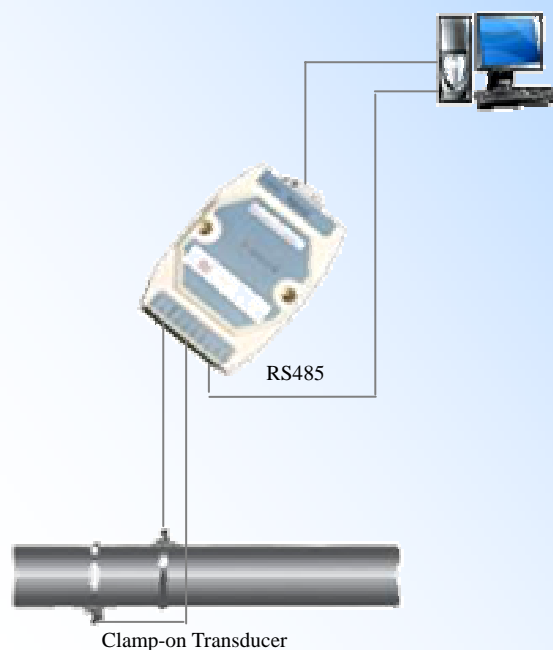
*Small Package, High Performance, OEM Available*

# LOW COST ULTRASONIC FLOWMETER

- Advanced Transit-time Technology for Accurate Flow Measurement

## **Features and Benefits:**

- Very low cost
- High accuracy, better than  $\pm 1\%$
- Non-intrusive. No pipe disturbance. No moving parts. No pressure drop. Very minimum maintenance
- Easy and economical installation. No pipe cutting, no hole drilling
- Wide measurement range, 0.03~105ft/s (0.01~32m/s)
- Wide pipe size range, 1"~240" (DN25mm~DN6,000mm)
- Suitable for all commonly used pipe materials
- Highly efficient ultrasonic transmission and highly sensitive ultrasonic receiving
- Positive, negative and net totalizers
- Optional LCD display / keyboard module
- RS-485 / RS-232 interface for networking. Support MODBUS and Extended Water Meter protocols
- One 4-20mA input
- One 4-20mA output
- Two OCT digital outputs for frequency counters or valve relays
- Small size, 43 x 72 x 118mm<sup>3</sup>
- 12VDC~24VDC power supply. Low power consumption, less than 1.2W



STUF-200MB low cost ultrasonic flowmeter is the latest innovation from Shenitech. It employs cutting-edge technologies on ultrasonic transit-time measurement, digital signal processing and surface mounting electronics. It provides abundant capabilities for accurate liquid flow measurement from outside of a pipe. The proprietary signal quality tracking and self-adapting techniques allow the system to optimally adapt to different pipe materials automatically.

The STUF-200MB flowmeter can be equipped with an optional LCD display / key board module. The users can either use the RS-485 interface or the display / keyboard interface to program the flowmeter.

The transducer installation is also simple and no special skills or tools are required.

Due to the non-intrusive nature of the clamp-on technology, there is no pressure drop, no moving parts, no leaks, no risk of contamination, no risk of corrosion, no pressure dependency.

STUF-200MB is designed for large quantity, low cost applications. Its unique features, particularly *very low cost, very high performance and very small size*, make it the ideal choice for industrial automation, processing control, water source management, flow meter networking and OEM applications.

## Specifications:

<b>Main Unit</b>	Repeatability	Better than 0.2%
	Accuracy	Better than $\pm 1\%$ for velocity above 0.6ft/s
	Response Time	0.5s
	Velocity	$\pm 0.03 \sim \pm 50$ ft/s ( $\pm 0.01 \sim \pm 15$ m/s), bi-directional.
	Display / Keyboard	Optional. LCD with backlight. 2x20 letters. Display instantaneous flow rate, accumulated flow rate (positive, negative and net rates), velocity, time, analog inputs, etc.
	Units	English (U.S.) or metric
	Signal Outputs	Current output: 4-20mA. Impedance 0-1k. Accuracy 0.1%
		OCT output: two channels. Can be programmed as pulse signal for accumulated flow rate (positive, negative and net rates); frequency signal for instantaneous flow rate; ON/OFF signal for relay drive or alarm drive; batch control
		Printer output: optional
	Signal Inputs	Current input: 4-20mA., 0.1% accuracy. Can be used for signals such as temperature, pressure, liquid level, etc.
	Recording	Automatically record the following information: <ul style="list-style-type: none"> <li>• The totalizer data of the last 64 days / 64 months;</li> <li>• The time and corresponding flow rate of the last 64 times of power on and off events. Allow manual or automatic flow loss compensation</li> <li>• The instrument working status of the last 128 days</li> </ul>
Communication Interface	RS-232 and RS-485 (note: can not be activated simultaneously)	
Enclosure	Plastic, rack mounting support	
<b>Liquids</b>	Liquid Types	Virtually all commonly used liquids (full pipe)
	Liquid Temp	32°F ~ 212°F (0°C ~ 100°C)
	Suspension concentration	<20,000ppm, or, < 2%, particle size smaller than 100um.
<b>Pipe</b>	Pipe Size	1" ~ 240" (DN25 ~ DN6,000mm )
	Pipe Material	All metals, most plastics, fiber glass, etc. Allow pipe liner.
	Straight Pipe Section	Longer than 15D, where D is pipe diameter. If a pump is near, the straight pipe section following the pump should be > 30D.
<b>Cable</b>	Shielded transducer cable. Standard length 15' (5m). Can be extended to 1640' (500m). Contact the manufacturer for longer cable requirement. Cable should not be laid in parallel with high-voltage power lines, neither should it be close to strong interference source such as power transformers.	
<b>Environment</b>	Temperature	Main unit: 0°F ~ 176°F (-30°C ~ 80°C)
		Transducer: -40°F ~ 212°F (-40°C ~ 100°C)
<b>Environment</b>	Humidity	Main unit: 85% RH
		Transducer: water-immersible, water depth less than 10' (3m)
<b>Power</b>	12VDC ~ 24VDC. Can be customized to 12VDC or 5VDC.	
<b>Weight</b>	110g	

## Applications:

STUF-200MB flowmeters are designed for large quantity, low cost applications. Benefited from our innovate network interface technique, the flowmeter is the ideal choice for industrial automation, processing monitoring, water source management, flow meter networking and OEM applications. It provides reliable measurement in both clean and opaque liquid flow. Examples of applicable liquids are:

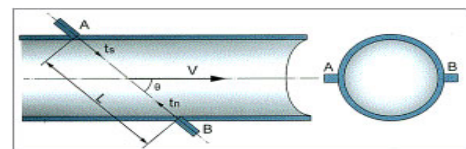
- Water, including hot water, chilled water, city water, sea water, etc.
- Sewage, waste treatment, etc.
- Oil, including crude oil, diesel oil, fuel oil, lubricating oil, etc.
- Chemicals, including alcohol, acids, etc.
- Solvents
- Beverage, food and pharmaceutical processors where non-contact is a must
- HVAC, energy measurement system, etc.

## Measurement Principle:

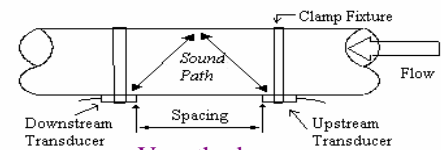
The STUF-200MB flowmeter is based on transit-time measurement principle, as shown in the following figure.

A typical transit-time flow measurement system utilizes two transducers (A and B) that function as both ultrasonic transmitter and receiver. The transducers are clamped on the outside of a closed pipe at a specific distance from each other. The flow meter operates by alternately transmitting and receiving a coded burst of sound energy between the two transducers and measuring the transit time that it takes for sound to travel between the two transducers. The difference in the transit time measured is directly and exactly related to the velocity of the liquid in the pipe.

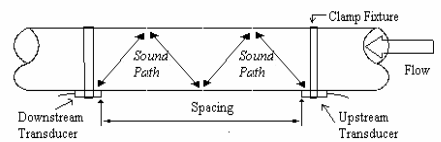
The transducers can be mounted in three methods, Z-method, V-method and W-method, depending on pipe size. Z-method is used for large pipe. The two transducers are installed on opposite sides of the pipe. V-method is used for medium size pipe. The two transducers are on the same side, the sound transverses the flow twice. W-method is usually used for small pipe. The sound transverses across the flow four times.



Z-method






V-method

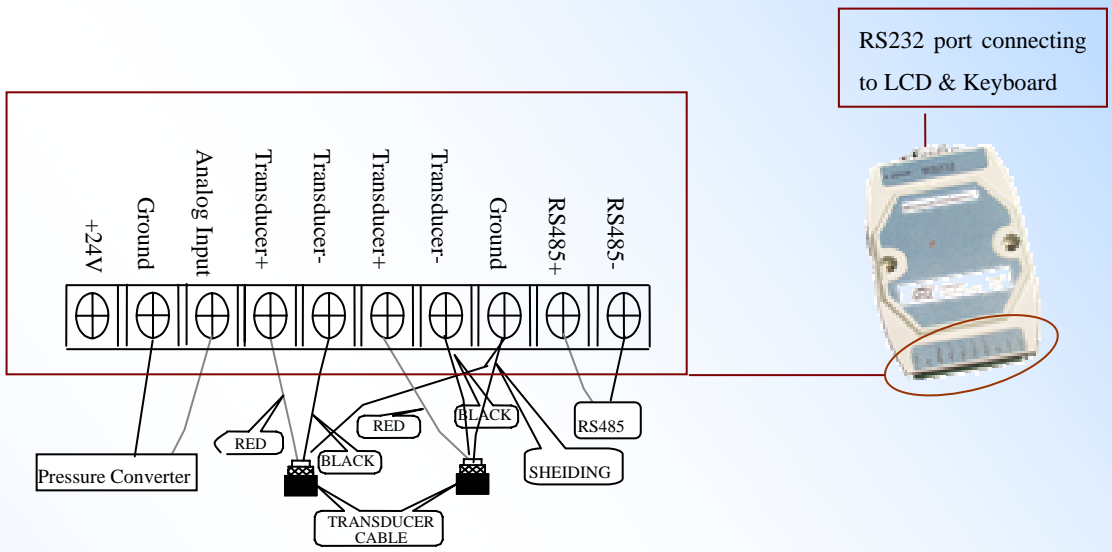


W-method

## Transducer Options:

	<p>Type S1: Small size transducer (magnetic) for pipe size 1" – 4" (DN25 – DN100mm)</p>
	<p>Type M1: Medium size transducer (magnetic) for pipe size 2" – 28" (DN50 – DN700mm)</p>
	<p>Type L1: Large size transducer (magnetic) for pipe size 11" – 240" (DN300 – DN6,000mm)</p>

# Wiring Diagram:



# Model Selection:

**S T U F - 2 0 0 M** - □ - □ - □ - □ - □ - □

- Transducer:**  
 B1 – S1 type clamp-on (pipe size 1” - 4”)  
 B2 – M1 type clamp-on (pipe size 2” - 28”)  
 B3 – L1 type clamp-on (11” - 240”)
- Pipe Size:**  
 DNxxx (metric) or INxxx (English)
- Transducer Cable Length:**  
 Cable length in meters or ft.
- Power Supply:**  
 DC: 24V (default); 12V;5V.
- 4-20mA Analog Output:**  
 AO – With 4-20mA module; NAO – No 4-20mA output
- Other Options:**  
 KD - With Keyboard / Display module;  
 P – With Printer  
 M – With Memory module



Example: Model# STUF-200MB2-DN100-10-24V-AO stands for standard model with RS485/RS232 communication interface, M1 type clamp-on transducer, pipe size DN100mm, transducer cable length 10m, 24VDC power supply, with 4-20mA analog output module.



**SHENITECH, LLC**  
 100-H Tower Office Park, Woburn, MA 01801, USA.  
 Tel. +1 781-932-0900, +1 888-738-0188 (Toll-free)  
 Fax +1 978 418 9170  
 Email: [sales@shenitech.com](mailto:sales@shenitech.com)  
 Website: [www.shenitech.com](http://www.shenitech.com)