MICROSONICS®

DFX Series
Doppler Ultrasonic Flowmeter

DFX Series Doppler Ultrasonic Flowmeter

Features

The DFX flowmeter works on Doppler ultrasonic principle, and implements clamp-on or insertion sensor installation. It has DFXW & DFXP types with the following features:

- Non-invasive, clamp-on sensors for most pipes from 25 to 3000mm
- Minimal material costs: clamp-on sensor eliminates the need of in-line flanges, pipe fittings, strainers, or filters
- Minimal installation time: the DFX may be installed and fully operational with minutes. For most homogenous pipe materials, there is no need to break into pipelines
- Reduced down time: installation may be performed on full pipes and active systems, there is no need to shut the process down for installation or maintenance
- Suitable for complicated fluid measurement, such as multiphase flow containing suspended solids or gas bubbles
- Suitable for complicated pipes: polymethyl methacrylate pipe, rubber pipe or the pipe with cement liner or rubber liner
- Fluid conductivity & PH value do not affect the measurement accuracy
- Effectively protect flowmeter from the frequency inverter interference
- User friendly operating interface, easy to use and setup
- Security password protection, access code enable
- Chinese / English bilingual switching

Operating Principle

The DFX flowmeter employs frequency shift (Doppler Effect) of an ultrasonic sound when it is reflected by suspended solids or gas bubbles (discontinuities) within the flowing liquid. It utilizes two piezoelectric crystals sensors. Ultrasonic sound is transmitted from one sensor and received by another one. The difference between reflected frequencies and transmitted frequencies is directly proportional to the speed of sonic discontinuities. Flow is then converted to various user-defined measuring units.

It is a non-directional flowmeter, having the same accuracy and repeatability for both positive and negative flows.

Product Specification

Transmitter	Display	● LCD: display flowrate, total flow and velocity, etc ● 5 line X 10 Chinese characters or 5 line X 20 English letters
	Signal output	Current output: 4-20mA, loading:0~600Ω
		Relay output: user configured, high or low limit alarm
		Data communication interface: RS-232C or RS-485
	Data logger & Resume	● Can store 65072 data points ● Data resume 1. Windows-based graphical interface, easily download data from flowmeter to computer system 2. Display flowrate/time curves for data analysis
		With year/month/day based total flow logger: ● Logging data over past 5 years, past 12 months and past 31 days, or ● Logging data in this year, this month and today
Sensor	Installation	Clamp-on
		Insertion (fit for ≧DN150 pipe sizes)
	Cable length	Standard length: 6m, can extend up to 299m
	Ex-proof	Exib ⅡBT4
Temperature	Transmitter	-20~+50℃
	Sensor	Standard temp type: -40~+82℃, high-temp type:-40~+150℃
Pipe	Material	● Carbon steel, stainless steel, cast iron, copper, PVC, aluminum, FRP, cement, plastic, etc. ● Liner is allowable
	Straight run	Sensor location: upstream straight≥10D, downstream straight ≥5D, distance from pump ≥30D (Note: D is pipe diameter)
Diameter	Pipe ID = 25~3000mm	
Velocity	0.3 ~8.0m/s, 0.5 ~8.0m/s	
Accuracy	±1% (optional), ±2%	
Repeatability	±0.5% FS	
Power	AC power supply, 85~265VAC, 50/60Hz ±10%	
Enclosure	IP65	
Case	ABS, 240*185*120 mm	
Weight	1.88Kg	

Typical Application

A variety of liquid applications can be accommodated: raw sewage, river water, plant effluent, mining slurries, sludge, etc. Because the clamp-on sensors are non-contacting and have no moving parts, the flow meter is not affected by system pressure, fouling or wear. Standard temperature sensors are rated to 82 °C. Optional high temperature sensors are rated to operate to 150 °C.

Municipal sewage	Industrial sewage	Circulating water	Liquid medicine
Coal seam water	Crude oil	Paper stock	Juice
Syrup	Lubricant oil	Primary slurry	Milk
Acid alkaline liquid	Ming slurry	Drilling mud	Dredging

Ordering Information

DFXW	–	☐	☐	☐	☐	☐	☐
		Measurement accuracy	**Sensor installation**	**Cable length**	**Sensor temperature**	**Velocity range**	**Outside diameter**
		10 1.0%	C Clamp-on	06 6m	01 -40～82℃	01 0.3～8.0m/s	104mm
		20 2.0%	I Insertion	15 15m	02 -40～150℃	02 0.5～8.0m/s	
				30 30m			
				Max 299m			

***Typical code information: DFXW**-10-C-06-01-01-104(mm)*

Sensor Installation

Clamp-on sensors should be mounted on the pipe 180° apart and facing each other, with the cables on the downstream side of the sensors. If the pipe is horizontal, the preferred mounting orientation is 3 and 9 o'clock, with 12 o'clock being the top of the pipe. Orientation on vertical pipes does not matter.

In order to achieve an accurate and reliable flow reading, the pipe must be filled with fluid. Flow in partially filled pipes and immediately downstream of elbows, valves and pumps is unstable and will lead to unstable readings and nonlinearity.

Select a sensor mounting location with adequate straight runs of pipe, both upstream and downstream to achieve stable readings. Generally upstream pipe diameter needs 10D and downstream pipe diameter needs 5D (Note: D is the pipe diameter).

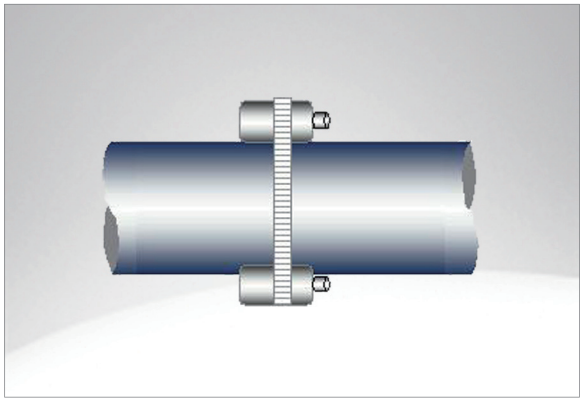


Figure 1A Clamp-on sensor installations
(Fit for most pipes with good-sound transmission)

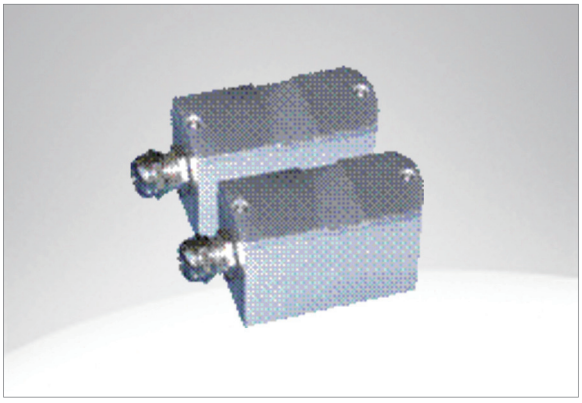


Figure 1B Clamp-on sensor

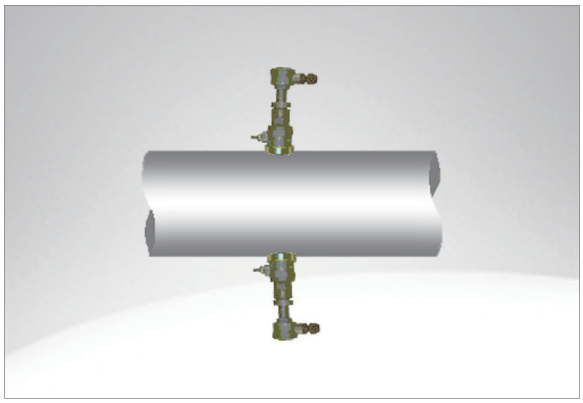


Figure 2A Insertion sensor installations
(Welded, fit for metal pipes with poor-sound transmission)

Figure 2B Insertion sensor

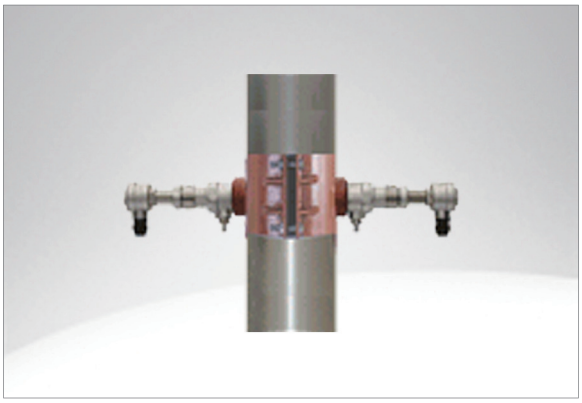
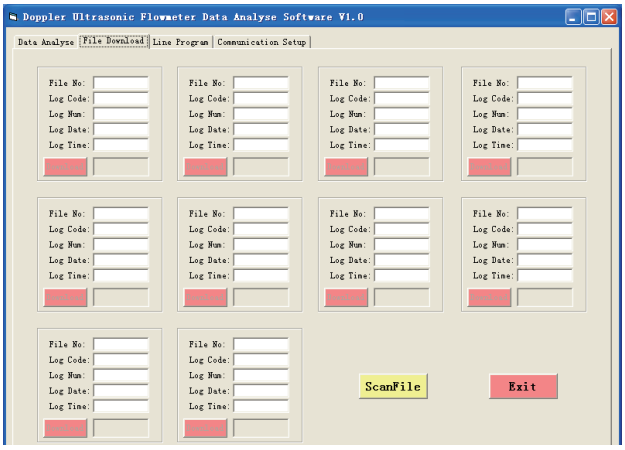
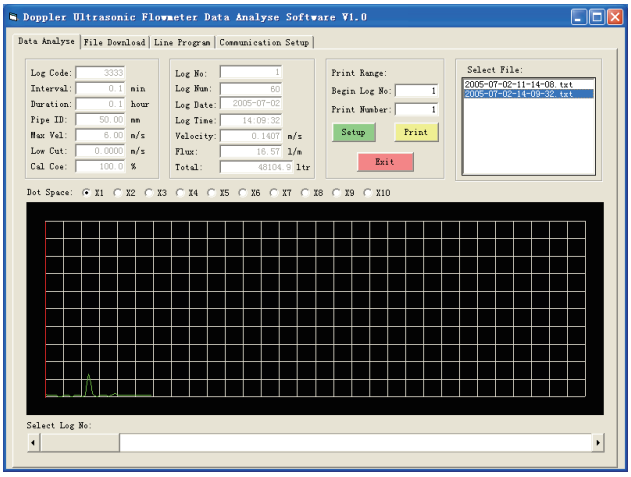


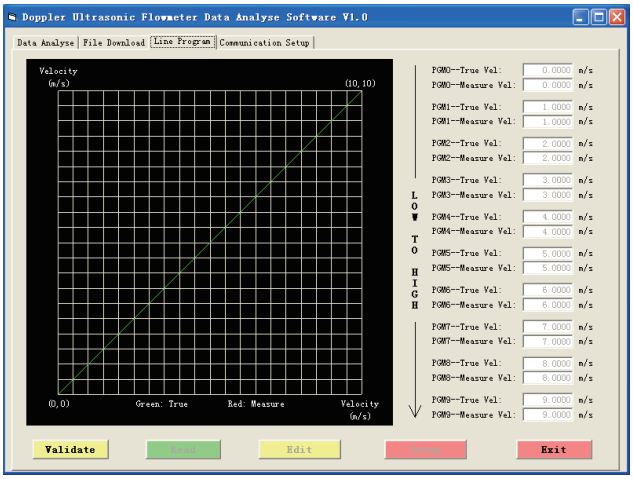
Figure 3 Insertion sensor installations through fastening metal straps
(Welded, fit for cement, cast iron & FRP pipes with hard- sound transmission)

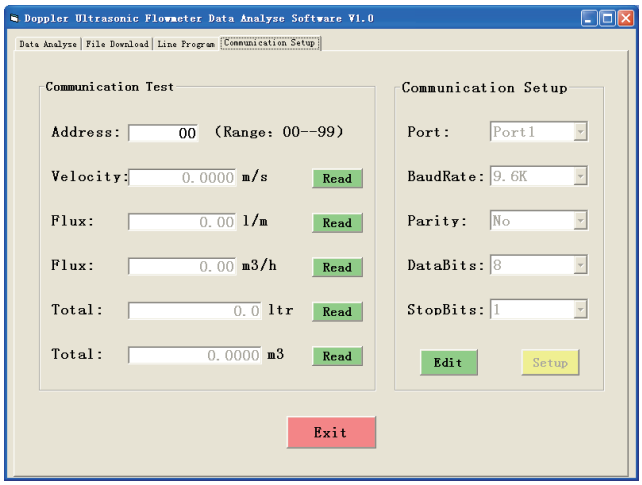
Data Analysis Software

The DFX flowmeter has been built-in data logger inside, which can record up to 65,072 points of data. The logging data can be transferred to your computer system through RS232 serial interface. The dedicated Data Analysis Software is based on the Microsoft Windows. By running it, you can start a comprehensive analysis for the flowmeter operation.









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