PanaFlow™ XMT1000

Panametrics liquid flow ultrasonic transmitter

The XMT1000 is a new, cost-effective ultrasonic flow transmitter that builds on Panametrics flow expertise and on years of reliable performance from its XMT868i predecessor. It offers state-of-the-art flow measurement capability in a rugged, locally-mounted or remote-mounted transmitter certified for use in hazardous areas. It brings a new level of performance with improved accuracy, configurable inputs and outputs, and multiple ultrasonic transducer path options.

Liquid flow measurements for a wide range of applications

- Hydrocarbon liquids
- Crude oil
- Lubricating oil
- Diesel fuel oil
- Solvents
- Liquefied natural gas (LNG)
- Water and wastewater
- Distilled water
- Hot/chilled water
- Chemicals
- Beverages

Non-intrusive, reliable, and accurate flow measurement

The PanaFlow XMT1000 comes from a long line of proven ultrasonic flow meters from Panametrics. It shares all the advantages of ultrasonic flow measurement, no moving parts to wear, no filters or strainers, no maintenance requirement, no pressure drop, and no drifting or required periodic calibration.

Its on-board digital signal processor (DSP) provides proprietary digital signal coding and correlation detection routines, automatic adjustment to changing fluid properties, and dynamically-configured operating software to simplify programming.

The XMT1000 offers:

- Improved accuracy of 0.3% of reading
- One, two or three-channel operation
- Four configurable inputs/outputs for analog or digital communication
- Suitability for a wide range of pipe sizes and materials
- SIL configuration available

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Improved programming capability

The XMT1000 introduces a magnetic six-button keypad to allow safe programming and diagnostics verification in your hazardous (classified) location. There is no need to open the case to use a PC to program, eliminating the cost and time associated with obtaining hot work permits, and there is no need for an additional handheld programmer. Just touch the glass of the XMT1000 with the magnetic wand to change any parameter setting.

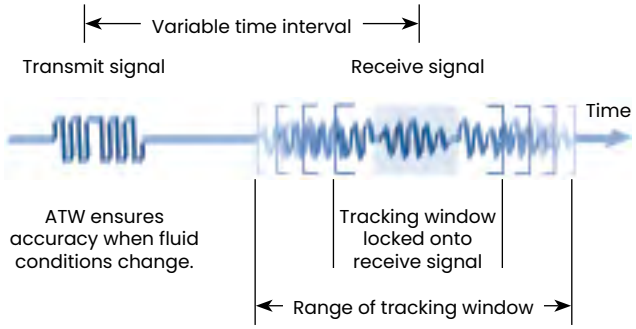
If you prefer your PC interface, the PanaFlow XMT1000 comes standard with MODBUS RS485 connectivity, providing full access to the meter's diagnostics and programming using PanaView Plus software. PanaView Plus also provides continuous logging capability of up to 10,000 points with 26 parameters logged per point.

Multi-channel, multi-path options reduce costs and improve performance

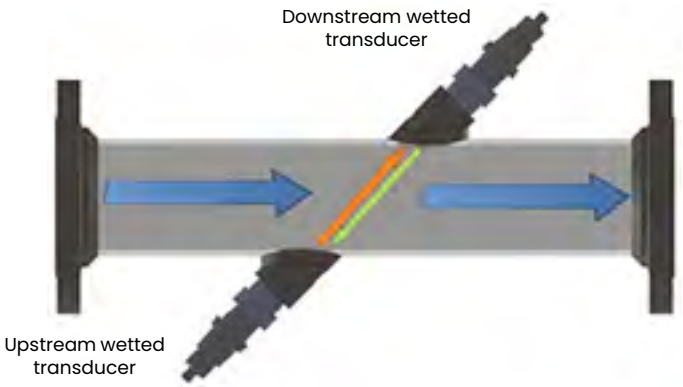
The XMT1000 may be configured as a one-channel, two-channel or three-channel meter for measurement flexibility. It also offers one, two or three ultrasonic transducer paths. A single path can provide cost effective flow measurement while multiple paths improve flow measurement accuracy and repeatability and add redundancy.

Automatically adjusts to changing fluid properties

Standard in all PanaFlow XMT1000 transmitters, our unique Automatic Tracking Window™ (ATW™) feature ensures accurate flow measurements even when fluid properties are unknown or changing. ATW dynamically sweeps the receiver window whenever the sound speed of the fluid changes. This powerful feature lets you measure flow when the fluid sound speed is unknown, or is changing.



PanaFlow XMT1000 flow transmitter uses transit-time flow measurement technique



The transit time flow measurement method utilizes two transducers to serve as both ultrasonic signal generators and receivers. When mounted on a pipe, they are in acoustic communication with each other. In operation, each transducer functions as a transmitter, generating a certain number of acoustic pulses, and then as a receiver for an identical number of pulses. The time interval between transmission and reception of the ultrasonic signals is measured in both directions. When the liquid in the pipe is not flowing, the transit-time downstream equals the transit-time upstream. When the liquid is flowing, the transit-time downstream is less than the transit-time upstream.

The difference between the downstream and upstream transit times is proportional to the velocity of the flowing liquid, and its sign indicates the direction of flow.

Wetted transducers

The XMT1000 can be used with a variety of wetted systems including the PanaFlow system. The PanaFlow system offers a fully integrated flow meter solution that includes the XMT1000 electronics, flow cell, and transducers, which simplifies installation.

The PanaFlow XMT1000 can be used with other PanaFlow systems or may be configured as a custom meter solution with wetted transducers to meet specific application needs.

XMT1000 specifications

Operation and performance

Fluid types

Acoustically conductive fluids, including most clean liquids, and many liquids with entrained solids or gas bubbles. Maximum void fraction depends on transducer, interrogation carrier frequency, path length and pipe configuration.

Transducer types

All liquid wetted and clamp-on transducers

Pipe sizes

Standard: 0.5in (15mm) to 84in (2100 mm)
Optional: >84in (2100 mm), consult factory

Data logging

Storage standard on meter, up to 10,000 flow data points with up to 26 parameters per data point

Measurement parameters

Volumetric flow, mass flow, flow velocity and totalized flow

Flow accuracy (velocity)

Up to ±0.3% of reading (achievable when supplied with a complete flow meter system and process calibration). Accuracy depends on pipe size, installation and number of measurement paths.

The accuracy statement assumes measurement of a single phase homogeneous liquid with a fully developed symmetrical flow profile passing through the meter. Applications with piping arrangements that create an asymmetrical flow profile may require extended piping straight runs and/or flow conditioning for the meter to perform to this specification.

Repeatability

±0.1% to 0.3% of reading

Range (bidirectional)

–40 to 40 ft/s (–12.2 to 12.2 m/s)

Meter turndown

400:1

Electronics

Enclosure

Powder coated aluminum (copper free) or stainless steel

Dimensions (standard)

- Weight: 10 lb (4.5 kg)
- Size (D x H x W): 8.40 in. x 6.42 in. x 5.87 in. (213.4 mm x 163.1 mm x 149.1 mm)

Channels

One, two or three-channel options

Display

128 x 64 mono-color LCD display, configurable for single or dual measurement parameters

Keypad

Built-in magnetic, six-button, lockable keypad

Standard outputs

- One 4 to 20 mA isolated output, 600 Ohm maximum load, NAMUR NE43
- One additional output, may be configured as either a pulse or frequency output

Optional input/output

- One 4 to 20 mA (SIL) isolated output, 600 Ohm maximum load, NAMUR NE43 (required for SIL installation)
- Two additional 4 to 20 mA isolated outputs, 600 Ohm maximum load, NAMUR NE43
- One or two 4 to 20 mA isolated inputs, 24-VDC loop power, NAMUR NE43
- One or two isolated, three-wire RTD (temperature) inputs, –148°F to 662°F (–100°C to 350°C), 100 Ohm or 1000 Ohm platinum
- One or two isolated, four-wire RTD (temperature) inputs, –148°F to 662°F (–100°C to 350°C), 100 Ohm or 1000 Ohm platinum

Digital interfaces

Standard: RS485/Modbus®

Optional: HART® 7.0 protocol, with 4 dynamic variables, includes one additional 4 to 20 mA analog output

Optional: Foundation Fieldbus® FISCO, LAS capable with 5 AI blocks and a PID block

Power supplies

Universal 100-240 VAC 50/60 Hz ±10% or 12 to 28 VDC

Note: For DC-powered meters, Class 2 rated supplies must be used for the line power

Power consumption

15W maximum, typically <7W
Inrush current: 25 A maximum @ 100 µs
15 A maximum @ 1 ms

Temperature range

Operating Temperature: -40°F to 149°F (-40°C to 65°C)*
*Maximum ambient temperature of 140°F (60°C) with foundation fieldbus option selected.

Storage Temperature: -67°F to 167°F (-55°C to 75°C)

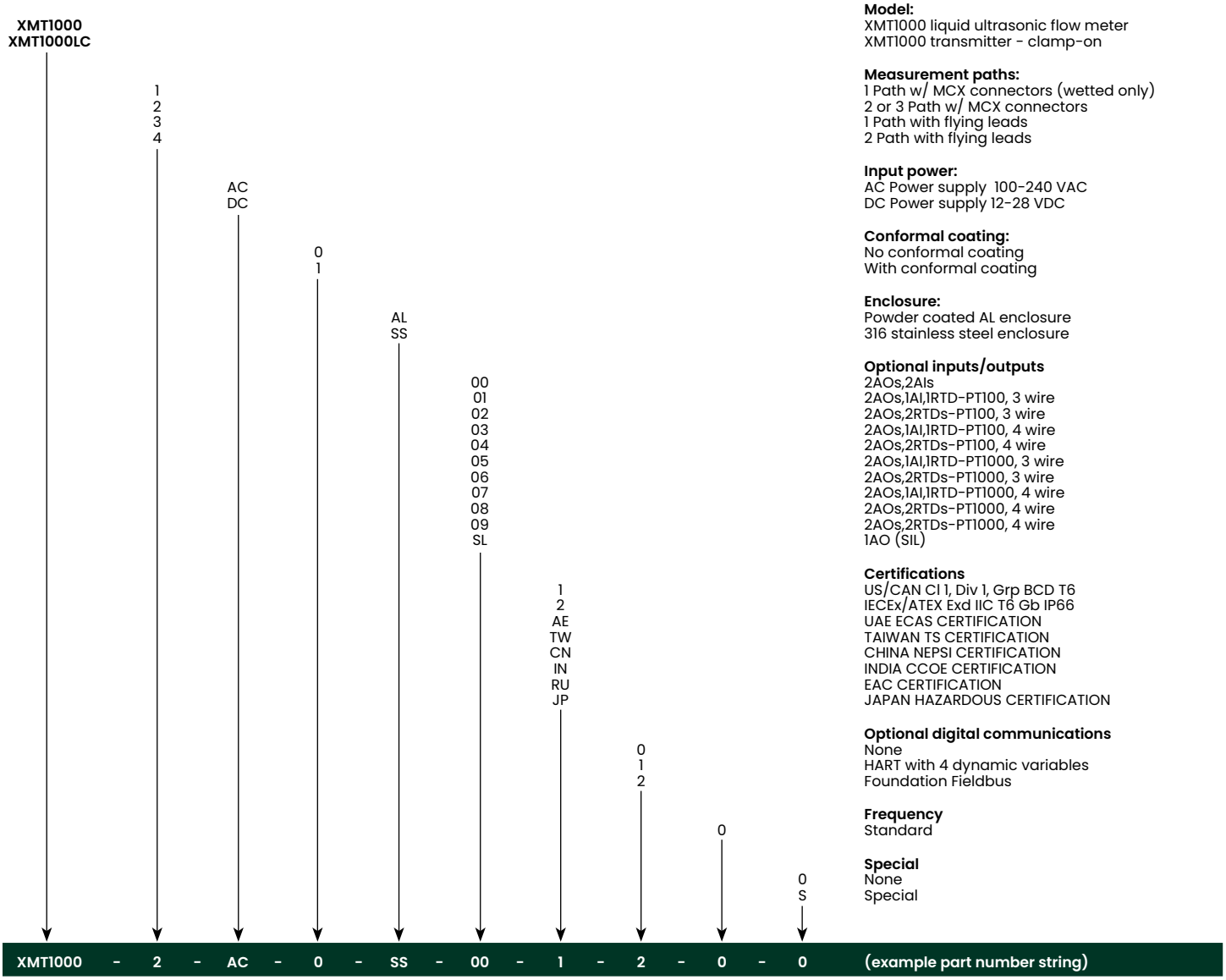
Optional PC software

PanaView Plus software for added functionality

Certifications

- **US/CAN:** Class I, Division 1, Groups B, C, D; Class I, Zone 1, Ex d IIC T6;
- **ATEX/IECEx:** Ex d IIC T6 FISCO outputs (pending) Ta = -40°C to +60°C, Type 4X
- ECAS certification
- Taiwan certification
- China certification
- India certification
- Japan certification

PanaFlow XMT1000 part number



Panametrics, a Baker Hughes Business, provides solutions in the toughest applications and environments for moisture, oxygen, liquid and gas flow measurement. Experts in flare management, Panametrics technology also reduces flare emissions and optimizes performance.

With a reach that extends across the globe, Panametrics' critical measurement solutions and flare emissions management are enabling customers to drive efficiency and achieve carbon reduction targets across critical industries including: Oil & Gas; Energy; Healthcare; Water and Wastewater; Chemical Processing; Food & Beverage and many others.

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