

MPCFN

Flow meter

Velocity area for open channels, tunnels or full/partially full pipes with ultrasonic sensors

LECTRONIC

COUSTI

EIGHING

ANTI-TILTING

VALVES

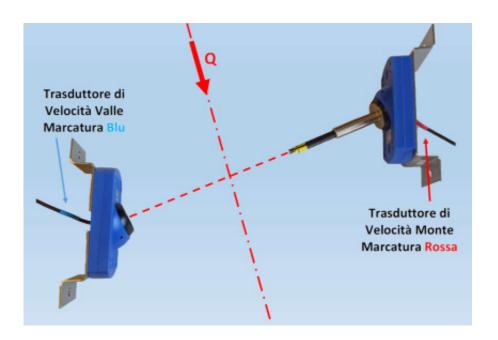
TEMPERATURE

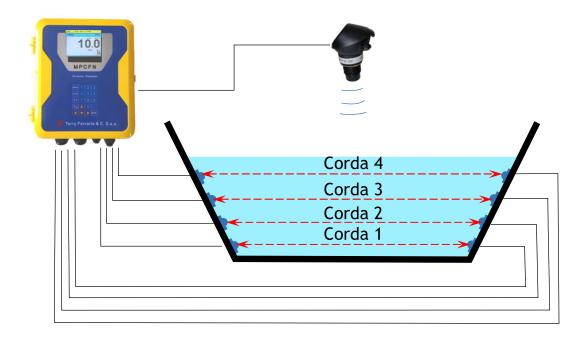
FLOW/ RATE



The MPCFN system is an area-flow meter that is used in combination with an optional level transmitter to measure flow in open channels. The MPCFN consists of an advanced digital signal processing (DSP) computer and up to eight speed transducers. The flow meter uses the transit time difference of ultrasonic sound pulses to measure the flow velocity in the open channel. Ultrasonic pulses are transmitted from upstream to downstream, and vice versa, through the channel at an angle α between the direction of flow and the path of the sound wave. The difference between the transit times of the sonic waves is directly proportional to the speed of the liquid.

The MPCFN can be used in rectangular, circular, trapezoidal or other shaped channels. Since the transducers generate almost no restriction, virtually no pressure drop is generated. The meter's computer-based DSP with Cross Correlation and Fast Fourier Transform (FFT) technology allows the system to operate in the most demanding applications, including those involving liquids with high concentrations of suspended solids and air or components that generate a lot of noise. The MPCFN is also able to provide two independent measurements with a total maximum limit of 4 chord planes (example: 2 sizes each with 2 chord levels).





TRANSDUCERS

LTI-M Insertion transducer

Mat.: AISI 304 (transducer body, ball valve)
Mat.: Carbon steel (weld sleeve)



TRSBC Transducer

Mat.: Polyurethane



LTR-L Transducer

Mat.: Nylon



LO Pipe Insert

Mat.: Polyethylene, AISI304



LTO-M Transducer with adjustable angle

Mat.: Nylon



LTO-L Transducer with adjustable angle

Mat.: Nylon

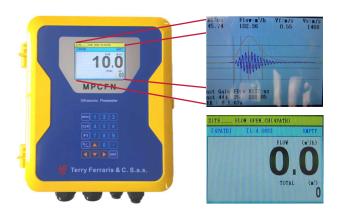




The transit time technique uses a pair of transducers for each acoustic chord, and each transducer sends and receives encoded ultrasonic signals through the fluid. When the fluid flows, the transit time signal in the downstream direction is less than that in the upstream direction: the speed at which the liquid moves is given by the difference between these two times of flight.

The MPCFN flow meter measures the time-of-flight difference and uses the programmed parameters of the channel/pipeline to determine direction and flow rate.

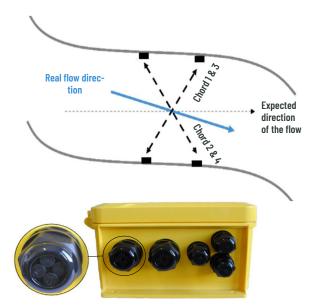
The mounting position of speed transducers in a channel, or within a pipe,



is a function of the straight sections upstream and downstream of the measuring point. Normally upstream straight sections are 5 to 10 widths while downstream stretches are 3 to 5 widths.

Width means the width of a channel or the diameter of a pipe.

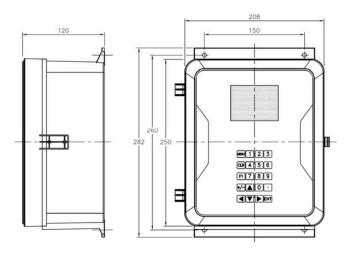
In the event that there are not enough straight sections, the acoustic chords can be crossed.

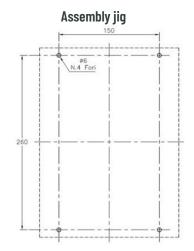


Technical specifications

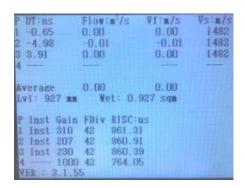
Measuring principle	In transit time with 4 acoustic chords - Cross Correlation - Fast Fourier Transform - Anti-Round, patented automatic tuning system for determining the best coupling frequency of transducers
MPCFN Electronics	IP65, suitable for wall mounting; Weight: 2.4Kg; N.2 PG21A cable glands for transducer cable entry (4+4); N.3 PG13.5 cable glands
Speed range	0 ÷ ±12m/s
Accuracy	±2%
Sensitivity	± 0.03m/sec
Solution	0.001m/sec
Keyboard	20 (4×5) membrane keys
Display	Backlit colour graphic LCD (128x64)
	- Display: instantaneous flow rate - totalization - signal shape
	- Oscilloscope function for diagnostics
Power supply	85 to 264Vac 20W or 24Vdc (22 to 26Vdc) 4W
Outputs	N.2 analogue 4 ÷ 20mA; N.2 relays; RS-232C / RS-485 Modbus
Input	N.2 analogue 4 ÷ 20mA (configurable)
Datalogger	32MB
Electronic Temperature	-20 ÷ +60°C
Transducers	IP68, 4 pairs maximum (8 transducers)
Assembly	suitable for channels, pipes, etc.
Model	LTO-M range 1÷3m; LTO-L range 3÷30m; LTR-M (low profile) range 1÷3m; LTR-L (low profile) range 3÷30m; TRSBC range 3÷33m LTI (insertion) range 0.05÷2m; L0 (insertion 4 chords for pipes) range 0.05÷1.2m
Transducers Temperature	0 ÷ +60°C (LT0-M/L, LTR-M/L, L0) -40 ÷ +120°C (LTI)
Cables length	10m standard (max. 200m)

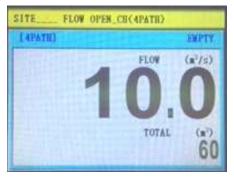
Enclosure and mounting template - Overall dimensions

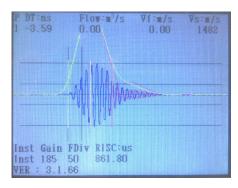




Graphical display for visualization, calibration and with oscilloscope function for diagnostics



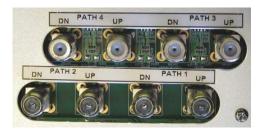


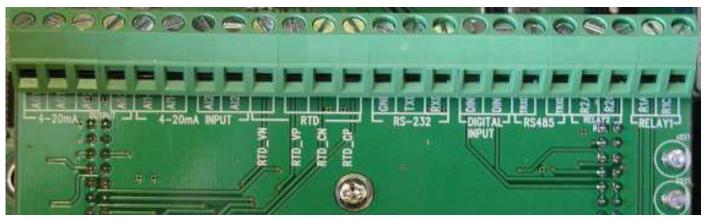


Wiring diagram

A maximum of 4 acoustic chords, 8 speed transducers can be connected to the MPCFN flow meter.

Upstream transducers must be connected to the ${\bf UP}$ connectors, and downstream transducers to the ${\bf DN}$ connectors.





Typical installations: mounting transducers by slides











