

FLOWMETER CONSOLE MODEL 7510P PIPE/OPEN CHANNEL METER AND LEAK DETECTION SYSTEM

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System Description

The Accusonic Model 7510P flowmeter console is designed for accurate, reliable flow measurement in pipes and penstocks.

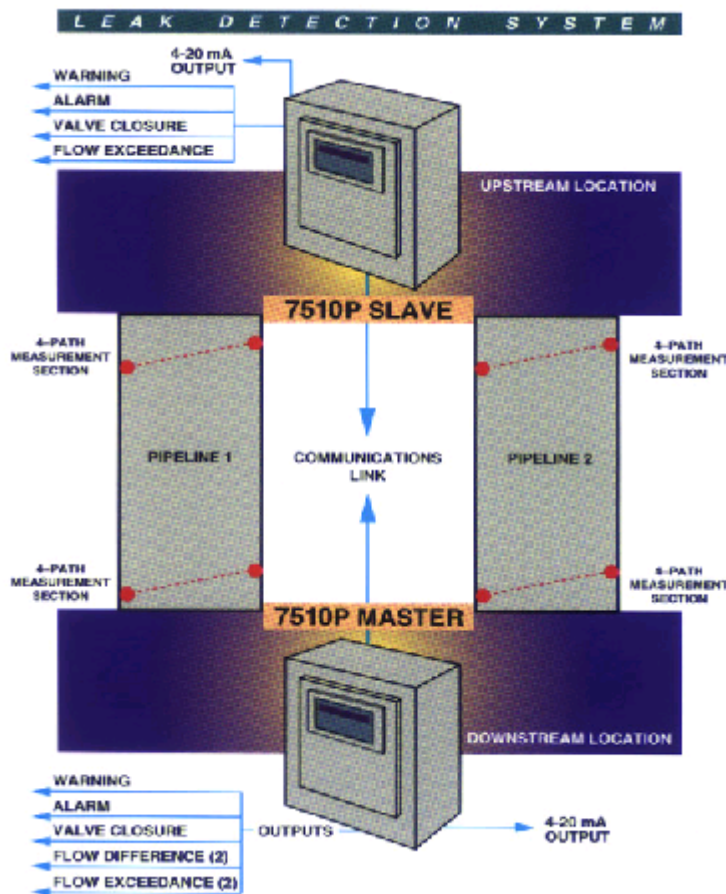
When used as a 4 parallel or 8 crossed-path flowmeter on pressurized pipes, the 7510 measures flow to within $\pm 0.5\%$ of actual flowrate when installed according to Accusonic specifications.

Flow in pipes of 1 to 40 ft. (0.3 to 12m) in diameter can be measured economically with the system.

Transducers can be selected for a variety of applications, including:

- Exposed steel pipes
- Concrete pipes
- Buried or encased pipes
- Pipes with external access only
- Pipes that cannot be dewatered for installation

The Accusonic Model 7510P "Penstock Protection" System is designed for the detection of leaks in penstocks. In its standard configuration, the system consists of two multi-path ultrasonic flowmeters, one at each end of the penstock. One is designated the "Master", usually at the lower end, and the other ("Slave"), at the upper end. A serial digital communication link using modems and a two-wire cable or fiber-



optic link connects the two flowmeters.

The communications link is used to synchronize the flow measurements at the two ends of the penstock, send data from the Slave to the Master and enable operational control of the system in the Master unit.

The system may be configured to provide independent determination of flow, analog outputs and alarm relays for two separate and dissimilar penstocks.

At the Master flowmeter, the flows in the pipe sections at the two ends of the penstock are compared and alarm relays are set if either flowrate or the difference between the Master and Slave flows exceeds specified thresholds for longer than specified times.

Nine relays are provided to indicate:

- Minor Master section fault
- Master section failure
- Slave section failure
- Master flow in excess of first threshold
- Master flow in excess of second threshold
- Flow difference in excess of first threshold
- Flow difference in excess of second threshold
- A minor leak
- Command to close the butterfly valve.

At the Slave flowmeter, 5 relays are provided for each penstock to indicate:

- Minor slave section fault
- Slave section failure
- Slave flow in excess of first threshold
- Slave flow in excess of second threshold
- Command to close the butterfly valve.

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Penstock Installation

Automatic Path Substitution

In the unlikely event of path failure, an automatic substitution routine using the remaining good paths is used.

Data Display/Parameter Entry

Detailed displays of flow, velocities and diagnostic data are provided on a separate hand-held terminal which is connected to a dedicated RS232 port. The site parameters are inserted into the flowmeter's non-volatile memory from the terminal, following menu prompts. The parameters of the Slave may be interrogated and/or modified from the terminal at the Master.

Alternatively, a PC may be used in place of the hand-held terminal. Special software may be installed on the PC to provide a full screen display of the flowmeter's variables, including graphics showing trends from recent data, data to aid commissioning and acoustic signal wave form.

System Specifications

Power requirement

90-250 VAC 47-63 Hz
12 to 32 VDC
90 to 300 VDC

Enclosure

NEMA 4X, IP65

Enclosure Dimensions

20" h x 20" w x 9" d
(508 x 508 x 228 mm)
64 lb. (29 kg)

Master Unit:

(2) 4-20 mA isolated 800 Ω
max impedance
(9) Relays 10 A 110 VAC/0.5 A
110 VDC
RS-232 (to hand-held terminal or PC)

Slave Unit:

2 line x 20 character LCD
Hand-held terminal

Display Options:

2 line x 20 character LCD
Hand-held terminal

Standard RS-232 Output to RTU or Portable PC:

- Travel times
- Path velocities
- Volume
- Flowrate (bidirectional)
- Diagnostics: signal gains
signal / noise ration
path status
system status
error type / location

Number of Acoustic Paths

1 to 8

Number of Pipes

1 or 2

The total number of acoustic paths in all the pipes cannot exceed 8 for each master or slave unit.

Environmental Requirements

Storage:

-20° to 160° F (-30° to 70° C)
0% to 95% Relative Humidity

Operation:

15° to 140° F (-10° to 60° C)
0% to 95% Relative Humidity

*Operational range increased with heater
-15° to 140° F (-25° to 60° C)

Power Consumption

35 Watts Nominal
200 Watts Heater

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