



PULSAR

Process Measurement



FlowCERT

The most accurate open channel flow measurement system available

FlowCERT

The most accurate Open Channel Flow monitoring system in the world



Pulsar's new FlowCERT system gives you everything you need for the very highest accuracy non-contacting ultrasonic measurement of open channel flows. Designed for flumes and weirs, FlowCERT gives temperature-independent, reliable measurement and high capacity logging facilities.

FlowCERT controller includes five alarm/control relays plus 4-20mA output, datalogging, digital input with the ability to accept a velocity sensor input if required (see over). Programming the unit is a simple, menu-driven process and, as standard, calculations for a wide range of flumes and weirs. FlowCERT performs a fully implemented calculation to BS3680, and 32-point linearisation is also included.



FlowCERT can be programmed from the front control panel or can be controlled and monitored via Pulsar's Ultra Log software, which also allows viewing of echo traces, downloading of logging data etc. A memory capacity of 256Kb with flexible time integration periods allows custom calibration for each application.

Features

Five control/alarm relays
Choice of transducers
I. S. transducer (Eex ia) option
Wall mounted

Alarm functions
High/Low level
In band/out of band
Rate of level rise/fall
High/Low temperature
Loss of Echo

Data logs (all date/time stamped)
Flow rate (variable time intervals)
Total flow (and daily totals etc)
Average flow rate
Temperature (max/min)
Echo confidence
and more...

Flow totalisation and outputs
Relay closure assignable to totalised flow for remote totaliser
Relay closure assignable for flow volume or time for a flow sampler
Ten days logged flow at 24 hour intervals recorded by date and accessible via the key pad.

Penstock control

Open channel flow elements
Simple exponential (venturi, trapezoidal weir etc

Selected primary element to BS 3680:
Flumes: rectangular, u-throated
Thin-plate weirs (standard v-notch)
Thin-plate weirs (rectangular & v-notch 90° and 60°
Other types (Palmer-Bowlus, Parshall, H-flume etc)

Universal flow calculation (32 setpoints)
Penstock control using step time
Option: Speedy velocity sensor for area x velocity (Q=VA calculation) in channels or pipes

FlowCERT sensor options

- DUET (for high accuracy measurement of flumes & weirs)
- dBMACH3 or dB6 Transducers (for flumes and weirs)
- dBMACH3 or dB6 PLUS Speedy (for applications with no primary element)

Speedy velocity sensor

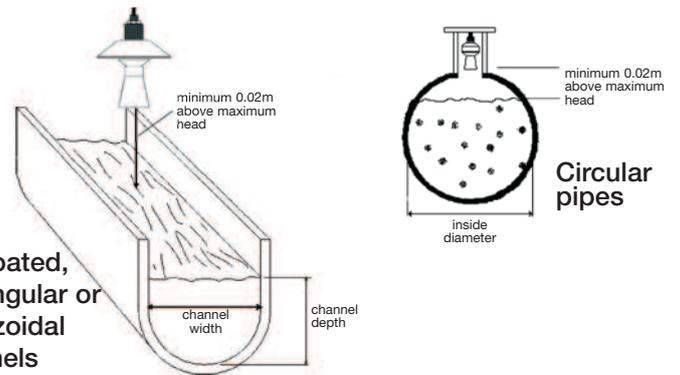
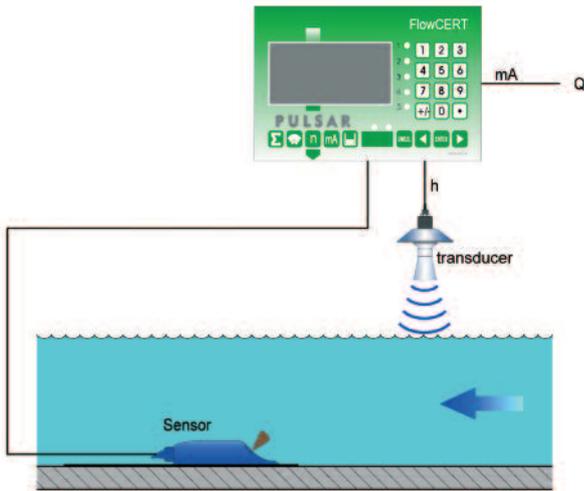
The latest version of Pulsar's popular "Speedy" velocity sensor, for use where no Primary Measurement Device exists, performs all its calculations internally, removing the need for a separate interface/converter unit. Communication with the FlowCERT unit is via RS485, and Speedy can be mounted up to 250m from the FlowCERT controller and is available as a "wedge" sensor or as a pipe mounted sensor.



wedge sensor



pipe sensor



U-throated, rectangular or trapezoidal channels

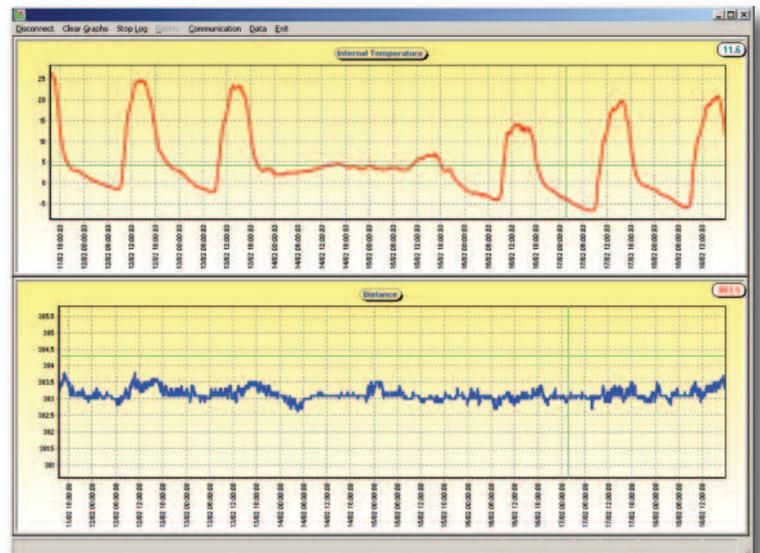


DUET*

FlowCERT has the option of Pulsar's unique twin-transducer DUET, Double Ultrasonic Echo Transducer, a radical new approach that provides an ultrasonic system accuracy performance which has previously been unobtainable. DUET compensates automatically for significant changes in air density and hence sonic velocity caused by solar radiation. Conventional 'temperature compensation' systems become inaccurate when installed in exposed locations. These systems are slow to react to changing conditions due to thermal lag and do not respond accurately to air density in conditions of bright sunlight.

Only DUET features Pulsar's unique approach to the problem. Both transducers fire together. By continuously monitoring the phase difference of the echoes as they are picked up by the lower transducer, and because the distance between the transducer faces is known and constant, the speed of sound is continuously updated and the accuracy of the measurement is superb.

This chart shows how a measurement of distance varies (lower trace) against changes in temperature over the period of a week. Despite temperatures ranging from over 25°C down to -7°C, the measurement remained extremely constant, within ±0.5mm on a range of 383.5mm.



Technical Information

FlowCERT Controller

Volt free contacts:	5 form C (SPDT) 5A, 240V ac
Outside dimensions:	240 x 184 x 118mm
Cable entry:	10 cable entries 5 x M20, 1 x M16 underside, 4 x 18mm at rear
Weight:	Nominal 1kg
Case material:	Polycarbonate, flame resistant to UL94-V2
IP rating:	IP65
Max and min temp. (electronics):	-20°C to +60°C
Flammable atmosphere approval:	Safe area: compatible with approved dB transducers (see transducer specification sheet)
CE Approval:	EMC approval to BS EN 50081-1:1992 for emissions and BS EN 50082-2:1995 for immunity, and to BS EN 61010-1:1993 for low voltage directive.
Echo processing:	Patented DATEM (Digital Adaptive Tracking of Echo Movement)
Analogue output:	Isolated output 4-20mA or 0-20mA into 500Ω (user programmable), 0.1% resolution
Digital output:	Full duplex RS232 via RJ11 port
Display:	6 digits plus 12 character text, plus bar graph with direction indicators, remote communicator identifier and program/run/test mode indicators
Programming:	Integral keypad PC Programming via RS232 (RJ11 port) or RS485
Programming security:	Via password (user selectable and adjustable)
Programmed data integrity:	Via non-volatile RAM, plus backup
Power supply:	115V ac +5% -10% 50/60Hz, 230V ac +5% -10%, 18-36V dc

Speedy Velocity Sensor

Measurement principle:	Doppler (flow velocity). Flow velocity sensor with v measurement using Doppler principle and temperature measurement to compensate temperature effects on speed of sound.
Measurement frequency:	1MHz
IP Rating:	IP68
Operating temperature:	-20°C - +50°C
Storage temperature:	-30°C - +70°C
Operating pressure:	Max 4bar
Cable length:	10/15/20/30/50/100 pre-cut, extendable to max 250m
Cable types:	LiC11Y 2x1.5 + 1x2x0.34
Cable diameter:	8.4mm ± 0.25mm
Constructions:	Wedge sensor for installation on channel bottom Pipe sensor for installation using nozzle and cutting ring screw joint in pipes
Contacting materials:	Wedge sensor: Polyurethane, stainless steel 1.4571, PVDF, PA Pipe sensor: stainless steel 1.4571, Polyurethane, FEP coated cable
Measurement range:	-6m/s - +6m/s
Zero point drift:	0 - absolutely stable zero point
Sonic lobe:	±5 degrees
Temp. measurement:	-20°C - +60°C ±0.5°C

DUET

Mode of Operation:	Twin transducers, fixed distance apart, firing together
Transducer types:	2 x Pulsar dBMACH3, kHz frequency, beam angle 10° (@ -3dB)
Range:	300mm - 2.5m (from face of lower transducer)
Hazardous area:	ATEX EEx m IIT6 for Zone 1 & 2. FM available
Transducer cable:	Three core screened, can be extended with 2 or 3 core screened
Maximum separation:	500m from transducer to control unit

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