

## QUANTUM 2

The Quantum 2 provides alarms & 'time to spill' warnings of critical areas & resets tripped pumps automatically



### Superior Pumping Station Control

Pulsar Measurement's Quantum 2 is a fully-featured pump controller, using Pulsar's non-contacting, ultrasonic technology including DATEM digital echo discrimination to provide solid performance and sophisticated level management. The unit includes 10 relays (digital outputs) and 7 digital inputs and has optional RS485 communications allowing for Modbus RTU, and optional Profibus DP V0 and V1; enabling the status of the unit to be monitored and the controller to be programmed remotely.

Digital inputs allow the unit to respond to 'no-flow' conditions and the Quantum 2 is able to automatically reset pumps in case of failure, saving unproductive maintenance trips to the site and freeing up staff time for more important work.

The Tariff Guard routines, which are common to all intelligent controllers, ensure that energy costs are minimized through periods of maximum electricity tariff, while the Quantum's unique 'time to spill alarm' protects critical pumping stations from uncontrolled overflow.

#### **The Tariff Guard**

All intelligent pump controllers by Pulsar Measurement operate in a highly intelligent and predictive manner: with the objective to have a 'full' or 'empty' well as the tariff charges.

### THE RIGHT METER FOR

- Pump Station Monitoring
- 'Time to Spill' Alarms
- Well Monitoring
- Pump Efficiency Monitoring
- Automated Pump Reset
- Predictive Maintenance

The liquid level and the inflow rate are continually measured and assessed in the well. Both these variables are then related to the time the next tariff charge occurs. If the next tariff charge is for a higher cost rate, the well will be filled first to enable pump down immediately prior to moving onto the higher tariff charge. This then provides maximum storage capacity in the well during the higher tariff period, once in the lower tariff cost period the level is pumped down as normal using the minimum number of pumps.



A typical wet well application where Quantum 2 is used for Pump Control.

The level and inflow condition of the well is continuously monitored to optimize the liquid level and intelligently control the purpose of the pumps according to the impending tariff charge. By doing this, high tariff charge pumping may be reduced significantly, or avoided entirely, to provide real cost savings on pump energy charges, especially during higher energy cost periods.

Ten set points for tariff variations may be installed, these can be assigned per day, week, or other reoccurring periods to be site-specific.

It is important to note that the normal pump on and off points are maintained in storm conditions, eliminating the possibility of spills.

Actual energy savings achieved will depend on the capacity of the wet well, the frequency of the tariff charges, the size of the pumps, and the relative tariff charges applied. However, cost savings are usually significant.

### **'Time to Spill' & Alarm Programming**

The Quantum 2 can be programmed to provide an alarm based on the time remaining before the pumping station or well spills over. This is vital for utility companies, who face the risk of prosecution if a station pollutes the local environment.

The likelihood of a spill depends both on the rate of change of the level and the operating efficiency of the pumps, which can be affected by a catastrophic failure, blockages, or general wear and tear. If a pump has failed, the rate of change may not be important, because the level may creep up slowly to reach a dangerous level. Knowing how much time remains before a critically high level or an overspill level is crucial. The Quantum 2 takes into account the inflow and outflow rates and calculates the time remaining before a spill, warning via Modbus RTU register, or any other protocol or relay closure for the site operators to take remedial action.

### **DATEM Analysis**

The unit features Pulsar Measurement's unique non-contacting, ultrasonic technology including DATEM digital echo discrimination to provide rock-solid performance and sophisticated level management.

### **Digital Outputs & Communications**

Quantum 2 includes ten relays (digital outputs) and seven digital inputs. Digital inputs are used to detect the status of the pump trip circuit. If a pump has tripped, digital outputs can be assigned to provide a reset to the trip circuit (after a programmable time delay). The unit counts the number of consecutive trips and the number of trips in a rolling 24-hour period. If any of these counts reach a predetermined maximum, the pump is considered to be faulty and the auto-reset process is ceased. A digital output can be assigned to indicate that a pump is faulty and site attendance is required.

The Quantum range of controllers has optional RS485 digital communications (Modbus RTU and optional Profibus DP V0 and DP V1) allowing the status to be monitored and the unit to be programmed remotely.



A typical wet well application.

## Technical Specifications

### PHYSICAL: MOUNTING OPTION SPECIFIC

<b>Mounting Option:</b>	<b>Fascia Mount:</b>
<b>Controller Body Dimensions:</b>	200 mm x 112 mm (7.9 in x 4.4 in) front, 165 mm x 105 mm (6.5 in x 4.1 in) cut-out
<b>Weight:</b>	Nominal 1.3 kg (2.9 lb)
<b>Enclosure Material/Description:</b>	Stainless steel and polycarbonate, flame resistant to UL94 V0
<b>Transducer Cable Extensions:</b>	Twin Screened
<b>Maximum Separation:</b>	1,000 m (3,280 ft)

### ENVIRONMENTAL

<b>IP Rating:</b>	IP64
<b>Max. &amp; Min. Temperature (Electronics):</b>	-20 °C to +55 °C (-4 °F to +131 °F)
<b>Flammable Atmosphere Approval:</b>	For installation in non-flammable area only. Most compatible transducers suitable for flammable atmospheres. See sensor / transducer datasheet or brochure.
<b>CE Approval:</b>	EMC approval to BS EN 50081-1: 1992 for emissions and BS EN50082:1995 for immunity and to BS EN61010-1:1993 for low voltage directive.
<b>UL Approval:</b>	UL Listed. UL Listed to Canadian safety standards. Certificate Number: E257330
<b>Power Supply:</b>	115 V AC +5%/ -10% 50/60 Hz, 220 V AC +5%/ -10%, 18-36 V DC 50/60 Hz

### PERFORMANCE

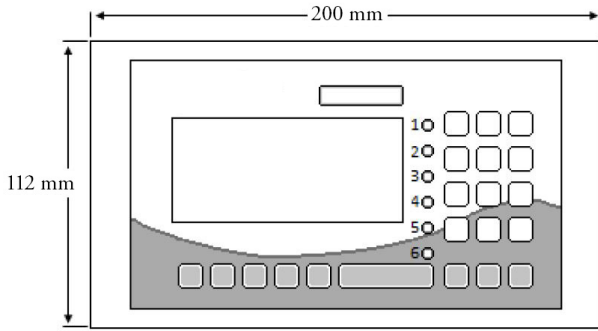
<b>Accuracy:</b>	+0.25% of the measured range or 6 mm (0.2 in), whichever is greater
<b>Resolution:</b>	dBMA3 0.3 mm (0.01 in), dB3 0.5 mm (0.02 in), dB6 and dB10 1 mm (0.04 in), dB15 1.5 mm (0.06 in), dB25 2.5 mm (0.1 in), dB40 5 mm (0.2 in)
<b>Range:</b>	Depending upon transducer, from 0 mm to 40 m (0 in to 131.2 ft)
<b>Echo Processing:</b>	Patented DATEM (Digital Adaptive Tracking of Echo Movement)
<b>Digital Communications:</b>	RS485 Modbus RTU or Profibus DP V0 or V1

### OUTPUTS / INPUTS

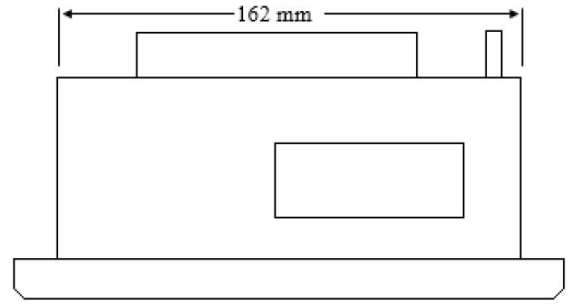
<b>Volt-free Contacts:</b>	10 in total. Relays 1-5 form C (SPDT) 5 A, 220 V AC. Relays 6-10 form C (SPDT) 3 A, 220 V AC
<b>Digital Inputs:</b>	7 NO or NC with 24 V DC internal supply, available max. 20mA
<b>Analog Output (Adjustable):</b>	2 off Isolated output of 4-20mA or 0-20mA into 500 Ω (user programmable and adjustable) 0.1% resolution
<b>Analog Input:</b>	Isolated input for loop-powered device. 4-20mA source. NB: Active input on request
<b>Serial Output:</b>	RS232 via RJ11 port
<b>Display:</b>	6 digits plus 12 character text, plus bar graph with direction indicators, remote communicator identifier, and program / run / test mode indicators

### PROGRAMMING

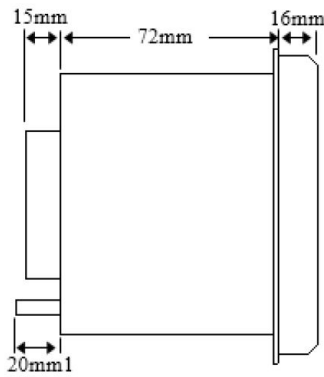
<b>Onboard Programming:</b>	Standard with integral keypad
<b>PC Programming:</b>	Via RS232 (RJ11 port)
<b>Programming Security:</b>	Via passcode (user selectable and adjustable)
<b>Programmed Data Integrity:</b>	Via non-volatile RAM, plus backup



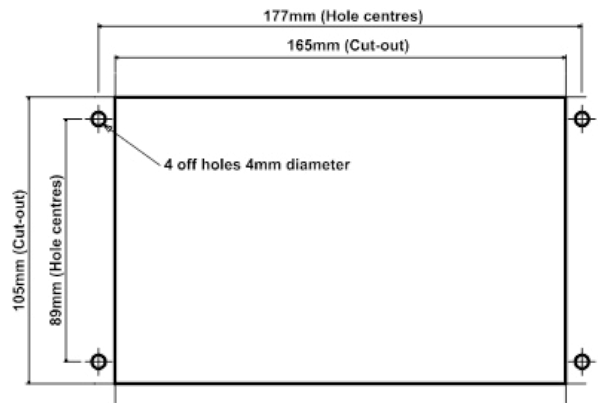
Quantum 2 Front Drawing



Quantum 2 Top Drawing



Quantum 2 Side Drawing



Cut-Out Dimensions

## Delivering the Measure of Possibility.

Pulsar Measurement offers worldwide professional support for all of our products and our network of distributors all offer full support and training. Our facilities in Malvern, UK and Largo, USA are home to technical support teams who are always available to answer your call or attend your site when required. Our global presence, with direct offices in the UK, USA, Canada and Malaysia allow us to create close relationships with our customers and provide service, support, training and information throughout the lifetime of your product.

For more information, please visit our website:

[www.pulsarmeasurement.com](http://www.pulsarmeasurement.com)



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