

# MonitorPro Pump Station Supervisor

The MonitorPro will monitor, protect, control, display and log all functions in a water or sewage pumping station



- Electronic motor protection for 3 pumps
- Insulation resistance monitoring
- 3-phase supply and battery monitoring
- Full pump and station status display
- 65,000 event data logger
- Pump flow rate and volume
- Configurable inputs and outputs
- Expandable to 9 pumps
- On screen help
- Security features
- Built in RS232 radio modem
- SCADA ready

The MonitorPro provides flow monitoring, electronic motor protection, insulation resistance testing, data-logging, an RTU and a full 4-line display, all in one integrated package.

The MonitorPro, with the MT2PC and MT3PC, extends the life of the pump station assets and reduces municipal operations and maintenance costs. Unnecessary site visits can be dramatically reduced, as the MonitorPro not only monitors and protects the motor dynamically, but station data is remotely accessible to view the true status of the station, as well as controlling the operation of pumps and alarms.

Station history, including data-logging of 3-phase currents, volts, external I/O and pump operation can be downloaded to a laptop, providing easy fault diagnosis. Engineering data, including station and pump flow rates, (previously uneconomical to obtain) is now available for system planning or to detect inefficient pumps.

*Every aspect of the station and pump status is displayed on the screens - 3-phase volts and amps for each pump, flow monitoring, electronic motor protection, insulation resistance testing and data-logging.*

*All of the information is available through MultiTrode's OUTPOST - Pump Station Management System.*

Pump	Amps	Volts	HrsRun	LstMin	Starts
1ON	18.7	104.7	2350.7	2.4	2361
2OFF	0.0	110.7	3420.0	3.8	2250
Date :		11/23/2003		Time : 13:36.49	

Pump	AmpsA	AmpsB	AmpsC	InsRes
1ON	21.7	23.4	20.2	18.4
2OFF	0.0	0.0	0.0	19.7

Pump	HrsRun	LstMin	Sts/Hr	Starts	Faults
1ON	2350.7	2.4	2	2361	2
2OFF	3420.0	3.8	2	2250	8

Pump	TotVol(g)	LstVol(g)	GPM
1OFF	186175.44	3168	84.6
2OFF	161736.96	5016	73.9

Phases - A:	118.6	B:	112.5	C:	109.0
DC Supply Volts	12.8				
PC Analogue Input	35.5				

Last Overflow Time :	11/23/2003 18:22.19				
Last Overflow Duration (Min):	8.6				
Last Overflow Volume (G) :	0000000109.5				

## Electronic Motor Protection

The MonitorPro provides advanced condition monitoring of up to three pumps. Motors are protected against over-current locked rotor, under-current (running dry), phase fail, ground fault, under-voltage and over-voltage. Electronic thermal protection prevents degradation of windings from over-temperature.

*Electronic motor protection not only reduces motor failures but also nuisance trips and unnecessary call-outs.*

Pump	Amps	Volts	HrsRun	LstMin	Starts
P1	Locked Rotor Fault			Fit	Present
P2	0.0	112.5	3420.0	3.8	2250
Date	: 11/23/2003		Time : 13:36.49		

MOTOR PROTECTION : PUMP 1		1/7
CT Primary FLC(A)	:->050.0	
Locked Rotor Fault	:Enabled	
Level (Amps)	:0110.00	

## Motor Insulation

The MonitorPro automatically tests the insulation resistance of the motor windings with 500VDC every time the motor stops (operational temperature is the optimum time to measure for consistency). Re-varnishing or drying out motor windings is much more cost-effective than rewinding a burnt-out motor.

*Motor winding insulation testing will detect well in advance, any impending insulation or moisture seal deterioration.*

Pump	AmpsA	AmpsB	AmpsC	InsRes
1ON	21.7	23.4	20.2	18.4
2OFF	0.0	0.0	0.0	19.7
Value of last Insulation Resistance Test				

MOTOR PROTECTION: GENERAL		1/2
Motor Insuln Fault	: Enabled	
Level (Mohm)	:01.0	
Test Frequency	:->All Pumps Stopped	

## Supply Voltage & Motor Current Monitoring

The MonitorPro monitors and displays all 3-phase voltage values, as well as the DC backup voltage (if connected). Three-phase motor currents are continuously displayed and can be logged. This information is also available remotely through MultiTrodé "Outpost - Municipal SCADA" or the MTCDS software.

*This information is required to determine the overall status of the station.*

Phases - A:	118.6	B:	112.5	C:	109.0
DC Supply Volts					:12.8
PC Analogue Input					:35.5

Pump	AmpsA	AmpsB	AmpsC	InsRes
1ON	21.7	23.4	20.2	18.4
2OFF	0.0	0.0	0.0	19.7

## Data Logging

The MonitorPro typically stores up to three months of data history. All fault events and configuration changes are logged, dated and time-stamped. Data can be filtered and viewed on the MonitorPro screen or downloaded to the MultiTrodé diagnostic software for trending, graphs and reporting. For example, station volume pumped and rainfall can be trended together to catalog infiltration. This is very useful in finding intermittent problems that are very difficult to locate.

*This information is valuable in assessing station performance, predicting impending problems, and for future planning.*

-----Date Stamp 11/23/2003-----		
23:43:50	MonPro	Configuration Change
23:06:40	Pump 1	Stopped
23:01:23	Pump 1	Started

23:01:23	AL Current Ph1 Pump1	51.5
23:01:23	AL Ph1 Pump1	110.4
23:01:23	AL Ph2 Pump1	106.2
23:01:23	AL Ph3 Pump1	111.8

HISTORY :	
Jump To	- Date : 112303
	- Time : 192600

## Fault Enunciation

The MonitorPro will display a complete description of each fault, whether detected by the MonitorPro or pump controller.

*Generally, with other systems, a single fault light is the only enunciation, which does not assist with determining the real problem.*

-----Date Stamp 11/24/2003-----			
01:43:50	Pump 1	Thermal	Fit Cleared
02:06:40	Pump 1	Thermal	Fit Cleared
06:01:23	Pump 1	Under-Current	Unacked-Man

Pump	TotVol(g)	LstVol(g)	GPM
1OFF	186175.44	3168	213.5
2OFF	161736.96	5016	179.2

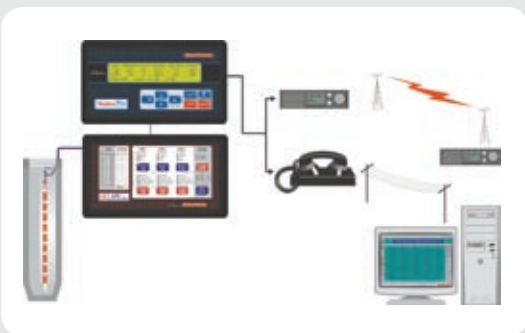
Total Station Flow (Gal)	:	1347912.4
Last Inflow Rate (GPM)	:	10.6
Last Outflow Rate (GPM)	:	110.7

Total Number of Overflows	:	12
Total Overflow Time	:	00d 01h 12m 21s
Total Overflow Volume (G)	:	000000001945

DOT1 - Generator	:	OFF
DOT2 - Bypass Valve Open	:	ON
DOT3 - Security Light	:	OFF

DIN4 - Security	:	OFF
DIN5 - KWH Units	:	56217
DIN6 - Rain (points)	:	146

SET LEVELS HELP Pump Level: Press SELECT1 for the LEAD pump or SELECT2 Through to the last pump for LAG 1-x Alarm Levels: Press ALARM RESET



## Flow and Pump Rate Measurement

Pumps that are inefficient can waste thousands of dollars in electricity. Low flow rate can also be an indication of blocked valves, worn impellers and impending mechanical problems.

In the past, these problems remained undetected until pumps were pulled out for servicing, or until total malfunction occurred. With the MonitorPro, these problems can be quickly detected.

The MonitorPro calculates the individual pump flow rates. This data is logged at the MonitorPro and can be downloaded to a laptop PC for further evaluation. (This data is also available automatically in MultiTrode Outpost's standard reports.)

*Determining accurate flow rates for pumps can result in significant energy savings, prevent failures and overcome unnecessary reactive maintenance, as well as provide valuable engineering data.*



## Configurable Inputs & Outputs

The MonitorPro is fitted with configurable Inputs (6 digital and 2 analog) and Outputs (3 digital and 1 analog). These can be individually configured as n/o or n/c, and can each be customized with a text description such as "valve closed to suit your application".

Each digital input can be set as pulsed accumulators for rain gauges, power meters, etc. In addition, digital inputs and outputs can be set as "and/or/if", adding control functionality.

*Enables custom control logic to be implemented.*

## On-Screen Help

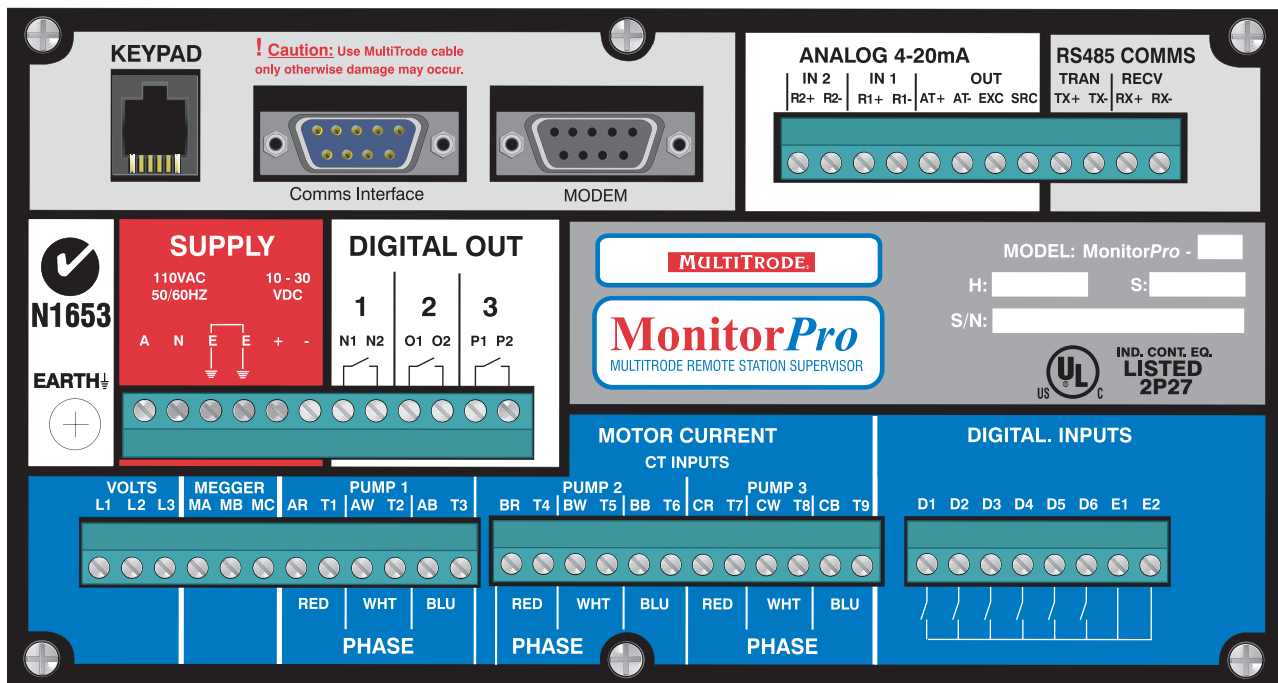
With the added benefit of built-in "On Screen Help", the MonitorPro has step-by-step interactive programming instructions. These instructions provide additional interactive guidance, thereby increasing operator efficiency.

*Interactive on screen help for all screens, including controllers.*

## SCADA Ready – Simply Add a Radio

The MonitorPro, when connected to a controller, has over 300 Points of information and control, which are seamlessly connected via a standard radio or phone line to the Outpost management system. Outpost is also pre-configured so that a new station can be added, complete with trending and reports and auto phone dialler, within minutes.

*This breakthrough means that expensive integration is not required.*



## Specifications

### Inputs:

Digital Inputs	6
Analog	2 x 4-20mA @ 75 Ohms
Monitoring	3 x phase voltage inputs 3 x 3 Phase-current transformer inputs (shunts not included)

### Relay Outputs:

No of relay outputs	3
Relay contact rating	250VAC 5A Resistive, 2A Inductive
Relay contact life	10 <sup>5</sup> Operations
Terminal size mm	2 x 13 AWG / 2.5mm <sup>2</sup>

### Other Inputs:

Keypad remote	
Analog	4-20mA RL < 500 Ohms
Motor insulation:	Tests up to 3 motors @ 500vdc
Other outputs	Keypad (can be remotely mounted using 2m cable provided) Analog 4-20mA, (locally powered via 13.8vdc supply) - Optional external supply maximum 15vdc - Max. allowable loop resistance 500 Ohms

### Communications:

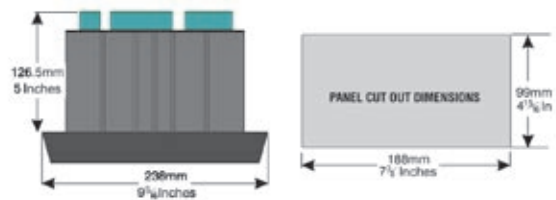
Local area network	Digital RS485
Wide area network	RS 232 via modem FSK
Radio modem	1200 Baud Bell 202

### Display:

LCD	4 lines x 40 Character Display Adjustable contrast from the front panel
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### Physical Product:

Dimensions	5 <sup>5</sup> / <sub>16</sub> h x 9 <sup>5</sup> / <sub>16</sub> w x 3 <sup>7</sup> / <sub>8</sub> d (Inches) 137h x 237w x 162d (mm)
Mounting	Panel mounted or internal keypad may be remotely mounted
Enclosure	Extruded aluminium



### Power Supply:

Supply Voltage AC	110VAC, 240VAC Nominal 50/60Hz
Power Consumption	18VA max
Supply Voltage DC	10-30VDC, 6W max

### Environmental Range:

Fahrenheit	+14 <sup>0</sup> to +140 <sup>0</sup> F
Centigrade	- 10 <sup>0</sup> to +60 <sup>0</sup> C
Humidity	90% non condensing

### Available Models & Ordering Information:

MonitorPro-2	240VAC & 10-30VDC
MonitorPro-3	110VAC & 10-30VDC

All MultiTrode products carry a full two year warranty



**MULTITRODE**

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