



Serving the Pacific Northwest

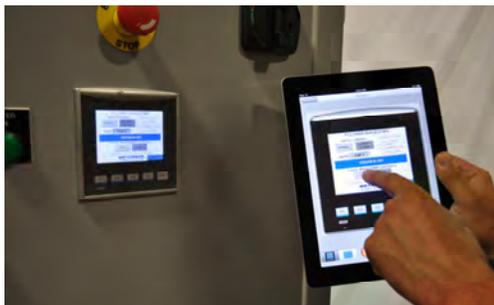
PumpTech Pipeline

Providing Knowledgeable Solutions

iRover - PumpTech's Mobile Human Machine Interface

Usually the Human Machine Interface (HMI) for pump system control is at the control panel or maybe the control center for your SCADA system. Now there is another place - - Anywhere!

iRover mobile HMI allows you to use your iPad to connect to the PLC used in PumpTech's control systems or any Unitronics, Vision 350, color touch panel PLC. The picture below shows how the iPad displays the V350's



touch panel. We call this capability "Onsite Mobility".

Onsite Mobility allows operators to move freely about their plant or station while monitoring or controlling the application. With Onsite Mobility they can actually watch the various parts of a process while maintaining full control of the PLC. Never again will they have to stand outside in the rain to access their PLC and, when the sun does shine, it will not affect the visibility of their iPad like it does with outside, panel mounted screens.

iRover also offers Dynamic Document
iRover continues on [Page 3](#)

PolyMan - High Velocity / Low Shear Polymer Mixing

Scott Bush, PumpTech Canby, OR MeterMan's PolyMan system provides excellent polymer blending in a multi-stage mixing system. The PolyMan system uses high velocity energy to mix the most difficult polymers without damaging them. PolyMan make down systems handle all types of polymers, including the highest viscosity and toughest



Mannich polymers. With a wide range of standard systems up to 3600 GPH, in both manual and fully automated models, MeterMan has the PolyMan polymer make down system to fit your needs.

PolyMan skids are available in two distinct designs - PolyMan Sr. and PolyMan Jr. Both offer a wide range of standard and optional features and provide the best polymer performance during blending and activation. They are extremely reliable and have the

PolyMan continues on [Page 6](#)



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Camp Gilead - Packaged Solutions for Small Water Systems

Camp Gilead, a church affiliated youth camp, near Carnation, WA had an old, spring fed water system that delivered very low pressure to nine different locations and did not meet several Washington Dept. of Health requirements. DR Strong Consulting Engineers was hired to design an upgrade for the entire system. The original proposal called for a new, 100,000 gallon storage tank, a new chlorination system / building and a walk-in pump house.



After a discussion with Rick Olson of DR Strong, Jack Boyd (PumpTech Bellevue) suggested a Hydronix Gull Wing enclosure with packaged piping, pumps and controls. Jack also proposed a MeterMan, packaged chlorination system housed in separate enclosure.

The Hydronix Booster system seen below was installed within a concrete retaining wall adjacent to the new storage tank. It includes three Grundfos vertical multistage pumps controlled via variable



frequency drives. In addition to pump control, the custom control panel includes controls for the storage tank, the upstream chlorinator and automatic switching during "tank bypass" operation.



The new MeterMan chlorination system (below) utilizes a Grundfos digital dosing pump that provides precise injection into the spring water prior to its entry into the storage tank. Both stations were provided with insulation, heating, ventilation, convenience outlets and lighting. All PumpTech packaged stations meet UL508 and ULQCZJ requirements.



The packaged system approach reduced the project cost considerably while providing a completely new water system that features the latest technology. The new system has been on line since August 2011 and the old system is being completely dismantled as mandated by the Washington Dept. of Health. The Camp Gilead water system upgrade is a shining example of how small water systems can benefit from the cost effective solutions provided by PumpTech Packaged Systems.

For more information contact Jack Boyd at:

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Canby Manufacturing

Much to everyone's delight our Hydronix and MeterMan divisions have remained very busy building packaged systems. The large wet well on the right is a Hydronix 421 submersible pump system with an independent valve vault (the vertical tank behind the wet well). It is 12 feet in diameter and is the largest that can shipped on the highway without special permitting. The one seen in the background is also a 421 system but it has an integral valve vault that is a part of the wet well. There are two additional 421's at the other end of the shop which are not visible in this photo.

Thanks, Canby - T'was a busy summer!



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iRover continues



Management. This means that important documents such as schematics, O&M manuals, pump curves, photos, and any other items pertinent to your system will always be just a touch away. They are updatable and can be shared with multiple users.

The iRover mobile HMI is not only flexible but is also expandable and can operate up to 99 PLC's. It can be set up with a local WiFi router that provides Onsite Mobility or it can go remote with a 3G modem or internet connection. The choice is yours!

iRover was developed by Chris Suskie, VP of Operations at our manufacturing facility in Canby, OR. Chris was impressed with the Unitronics, touch screen PLC that we use in our Hydronix and MeterMan controls but saw the value of expanding its mobility at an affordable price. His solution, iRover, meets all of his goals. The picture on the left shows Chris performing tests early in the development cycle.



PumpTech partnered with the city of Scappoose, OR as the beta test site for iRover. In December of 2010 PumpTech installed a Hydronix 421 packaged lift station that was designed to provide continuous variable flow to a new filtering station. All that was required to upgrade the system was the installation of an Ethernet card in the

Unitronics PLC and a WiFi router to connect the controls to the iRover iPad. The photo below left shows the lift station after installation. The one on the right shows Carl Wickstrom, PumpTech's electronic tech, installing the Ethernet card in the PLC. Later, a second router was installed as a repeater to allow mobility throughout the entire treatment plant and office building.



iRover is available for all of PumpTech's Hydronix and MeterMan packaged systems. But, it is not limited to pumping systems. Any application that can be controlled by a V350 can be upgraded to link up with iRover. It offers complete flexibility to meet your mobility needs - - as little or as much as you need!

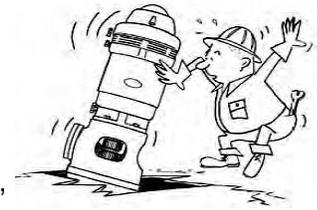
iRover is offered in two configurations - **iRover Lite** and **iRover Pro**. The Lite version provides remote PLC monitoring and Dynamic Data Management. The Pro version includes these features, plus on-site control or remote access and control. The chart below outlines the features of each. For more information on iRover contact your local PumpTech branch.

Features	PLC Monitoring	Dynamic Data Management	On Site Mobility Control	Remote Access (requires internet connection or 3G modem)	Always Connected (requires 3G iPad)
iRover Lite					
WiFi iPad					
Local WiFi	✓	✓			
Internet	✓	✓			
3G Modem	✓	✓			
iRover Pro					
WiFi iPad					
Local WiFi	✓	✓	✓		
Internet	✓	✓	✓	✓	
3G Modem	✓	✓	✓	✓	✓

Maintenance Tips

Trending Your Trends - Part 2

Ed Smith, PumpTech Moses Lake



Vibration Analysis - Considered the cornerstone of predictive maintenance, vibration amplitude and frequency can predict impending equipment failures. It can reveal mechanical imbalances, critical speeds and harmonics. Changes in vibration trended over time are more meaningful than a single “snapshot” of the vibration spectrum. Vibration trending should be part of any predictive maintenance program.

Motor Voltage & Current - Measuring the motor voltage and current on a regular basis can reveal deteriorating motor insulation, electrical system changes and possible mechanical wear. This is a valuable component of trending pump performance and system changes over time.

Temperature - Component temperature is another important part of equipment trending that will provide comparative data, over time, that can be used to determine possible mechanical and electrical failures. A simple, inexpensive infrared monitor can be used to collect this data. It is also important to measure and record ambient temperature whenever component temperature measurements are taken.

Pressure - Another valuable tool in recording system parameters is installed pressure gauges. When possible, suction and discharge gauges should be installed to provide pressure measurements that can be used to evaluate system changes and potential mechanical component wear. These pressure measurements can be compared to the manufacturers pump curve and original design points to determine if the pump performance has changed. When used in conjunction with other measurements, such as flow and current, they will help determine the appropriate course of action and repair if needed.

Flow - When available, a regular measurement of flow can be very useful in determining pump performance or possible system changes. Once again, when used with other comparative values this can help determine possible pump problems and repair. Generally, a pump should be repaired when its flow (or head) is reduced by more than 10% from the original design point.

All of these accumulated values, accrued over time on a weekly or even monthly basis, can help predict potential problems that can be addressed on a planned basis. It is important that these measurements be done in the same location for consistency, and ideally by the same person. A simple chart can be prepared and used for recording the data for comparison and evaluation. If certain values start to change gradually, then a planned response with corrective measures can be implemented and the necessary repairs or replacement can be made. The example below is a chart with data collected on a weekly basis. It shows a gradual decrease in pump performance and an increase in vibration readings and bearing temperature. Upon repair and reinstallation on 8/15, conditions returned to normal.

In summary, the collection of available data at regular intervals can help identify equipment performance and mechanical deficiencies that can be addressed by maintenance on a planned basis. Performance trending can identify worn out and inefficient pumps. Once identified and rebuilt, energy savings as high as 20% can be realized - not to mention the savings from maintenance being planned and scheduled rather than reacting on an emergency basis.

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DATE	TIME	TEMP	MTR TEMP	BRG TEMP	GPM	SUC PSI	DIS PSI	AMPS & VOLTS			VIBRATION READINGS				NOTES
								A	B	C	1	2	3	4	
7/15	9:45	72	205	116	1003	36	125	86/465	88/461	87/463	1.9	1.8	2.8	2.7	
7/20	10:12	74	205	118	996	35	124	86/466	86/463	88/461	2	1.9	2.9	2.7	
7/25	10:44	78	210	120	960	35	125	86/463	85/461	87/462	2	2	2.9	2.9	
7/30	10:50	80	212	122	910	34	124	84/462	83/461	85/462	2.4	2.1	2.8	3	
8/5	11:53	79	211	136	865	34	124	83/461	82/463	84/465	2.6	2.4	3.4	3.7	
8/12	9:56	80	212	165	820	34	123	81/462	80/465	81/465	3.5	3.1	3.7	4.5	
8/15	9:12	82	215	132	1010	35	127	89/462	87/463	86/466	1.7	1.8	2.2	2.5	Repaired Pump
8/16	8:45	80	213	130	1015	36	128	88/465	86/461	88/465	1.8	1.6	2.1	2.6	
8/20	9:10	78	211	112	1002	35	126	87/466	88/460	87/462	1.7	1.8	2.2	2.5	
8/25	10:11	76	210	112	1003	34	125	87/466	87/463	86/465	1.8	1.9	2.2	2.5	

Pump Ed 101– Pump Testing in the Field

Joe Evans, Ph.D Education & Training

The best efficiency point (BEP) is the point on the H/Q curve where the cost of pumping is at its lowest. It is also the best operating point (BOP) for a centrifugal pump as the unbalanced hydraulic forces acting upon the impeller are at their lowest. In order to reduce the power required for pumping and eliminate premature failures due to off BEBOP operation, pumps must be tested on a regular basis.

Several years ago I developed an Excel based, field test procedure that standardizes testing and provides data that allows direct comparison of the test data to that of the manufacturer’s performance curve. There are three different procedures that allow testing of end suction & double suction pumps, submersible pumps and vertical turbine pumps. It automatically accounts for velocity head and also provides important motor calculations. If you test several different flow points, it

will also plot a performance curve.

The example below shows the entered data and calculated results for a submersible wastewater pump. If a flow meter is not available, a simple drawdown analysis will accurately calculate the flow. In this example we tested two different flow points twice. The gray cells are entered data and the yellow cells are the calculated results. The equations on the right are the ones used to calculate the hydraulic and electrical data. A notes page and complete instructions for each test procedure are included.

The Field Test spreadsheet can be downloaded from the “Resources” page at PumpTechnw.com or the “Pump Sizing, Selection & Testing Tools” page at PumpEd101.com. There is also a Draw Down test calculator for wet wells that do not have flow meters.

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Submersible Wastewater Pump Field Test Procedure (Discharge Gauge Measurement)

Manufacturer / Model # / etc	Hydromatic S4L - 1750 RPM - 11.88" Trim			
Job Name				
Date:	8/13/2010	Witness	Doug Fir	
Motor Serial Number	123456	Liquid SG & Temp	1.0	?F
Pump Serial Number	654321	Q Measurement	Drawdown - 1 ft	
Time of Day	9:00 AM			
Ambient Temperature	?F	?F	?F	?F
Motor Temperature	?F	?F	?F	?F
Vibration (in/sec peak to peak)				

Pump

Flow Rate (GPM)	1200	1200	1000	1000
Discharge Gauge to Waterline (ft)	10.0	10.0	10.0	10.0
Discharge Gauge Head (ft)	91.0	88.0	105.0	102.0
Pipe Friction Pump to Gauge (ft)	3.4	3.4	2.8	2.8
Discharge Pipe ID (in)	6.0	6.0	6.0	6.0
Discharge Velocity (fps)	13.6	13.6	11.3	11.3
Velocity Head (Hv in ft)	2.9	2.9	2.0	2.0
TDH (ft)	107.3	104.3	119.8	116.8

Motor - 3 Phase

Voltage - Phase a to b	463	463	463	463
Voltage - Phase b to c	459	459	459	459
Voltage - Phase c to a	460	460	460	460
Amperage - Phase a	62	61	58	57
Amperage - Phase b	62	61	57	57
Amperage - Phase c	63	62	57	57
Motor Efficiency (0.XX)	80.0%	80.0%	80.0%	80.0%
Motor or Measured PF (0.XX)	83.0%	83.0%	83.0%	83.0%
KW Meter Reading (KW)				
Average Voltage	460.7	460.7	460.7	460.7
Average Amperage	62.3	61.3	57.3	57.0
Motor BHP @ Test Point	44.3	43.6	40.7	40.5
Hydraulic HP @ 100% Eff	32.5	31.6	30.3	29.5
Pump Efficiency @ Test Point	73.4%	72.5%	74.3%	72.9%

Printing - Set to landscape @ 75% of full size



Entered Data

Calculated Results

Calculations:

TDH = Hd + GW + F + Hv

- Where Hd = discharge gauge pressure (ft)
- GW = vertical distance between the gauge and wet well level
- F = friction in the discharge piping from pump to gauge
- Hv = velocity head at the discharge gauge

Velocity (V) = (Q * 0.4085) / ID²

- Where Q = flow rate (gpm)
- ID = pipe inner diameter
- 0.4085 = conversion constant

Velocity Head (Hv) = V² / 2g

- Where V = flow velocity
- g = gravitational constant

BHP @ Test Point = (1.732 * Va * Aa * E * PF) / 746 or (KW * E * PF) / 0.746 (see instructions)

- Where Va = average voltage
- Aa = average amperage
- E = motor efficiency
- PF = power factor
- 1.732 Y/Δ constant
- 746 = watts / hp
- KW = KW meter reading

Hydraulic (Water) HP = (Q * H * SG) / 3960

- Where Q = flow rate (gpm)
- H = TDH
- SG = specific gravity
- 3960 = conversion constant

Pump Efficiency = Hydraulic HP / BHP

PolyMan Continues

lowest maintenance cost in the industry. Both come with a satisfaction and performance guarantee.

PolyMan Sr.

A typical PolyMan Sr. system is shown in the picture below. Flows, dimensions and electrical data are shown in the table at the bottom of the page.

Standard features include:

- Auto Polymer Ratio Control
- Touch Screen Control Panel
- Wireless i-Pad® Control (PumpTech iRover™)
- Multiple Alarm Outputs
Low Water
Low Polymer
Low Level
- Stainless Connections
- Stainless Steel Blending Chamber
- Probe or Loop Powered Level Transmitters
- Rugged Stainless Steel Frame



PolyMan Jr.

The PolyMan Jr. (below) is a compact, manually controlled, version of its big brother.

Standard features include:

- Polymer Ratio Control
- NEMA 4X Control Panel
- 4 - 20mA Analog Flow Output
- Multiple Alarm Outputs
Low Water
Low Polymer
Low Level
- Local Digital Flow Display
- Stainless Steel Blending Chamber
- Stainless Gauge
- Probe or Loop Level Transmitter Compatible



Contact Scott Bush at: sbush@pumptechnw.com

PolyMan Systems Design Flow and Dimensional Data

Series	Model	Flow GPH	Polymer GPH	*Pump	**Control	***Voltage	L	W	H	HP
PolyMan Jr.	PMJ-05	300	6	D	B	1, 2, 3, 4, 5	36"	15"	28"	1
	PMJ-08	480	10	D	B	1, 2, 3, 4, 5	36"	15"	28"	1
	PMJ-12	720	15	D	B	2, 3, 4	36"	15"	28"	2
PolyMan Sr.	PMS-10	600	12	D, G, P	A, B	1, 2, 3, 4, 5	42"	28"	68"	1
	PMS-20	1200	24	D, G, P	A, B	2, 3, 4, 5	42"	28"	68"	3
	PMS-30	1800	36	D, G, P	A, B	2, 3, 4, 5	42"	28"	68"	5
	PMS-60	3600	72	D, G, P	A, B	2, 3, 4, 5	42"	32"	68"	10
***Standard AC Voltages	1 = 120/60hz, 2 = 208-240/1ph/60hz, 3 = 240/3ph/60hz, 4 = 480/60hz, 5 = 575/3ph/60hz									
*Polymer Pump Type	D = Diaphragm Pump, G = Gear Pump, P = Progressive Cavity Pump									
**Polymer Solution Control	A = Automated with Mass Flow Meter, B = Base Control									
Sample Model Number	PMS20-1200-6-D1-1									

Please Note: The above Design and Dimensional data can change without notice. Larger or custom systems are available, please contact PumpTech regarding specific information for a MeterMan PolyMan system specific to your application.

PumpTech PumpChat

From the President's Desk

It's Fall, so it must be time for WEFTEC!

With the changing of the leaves and the crisp morning air, most of us in the pump / process business start to think about the annual Water Environment Federation Technical Education Conference (WEFTEC). This year we are fortunate to have it held on the West coast at the Los Angeles Convention center the week of October 16th. The last time it was held in Los Angeles was in 2003 and we are all interested in seeing how the area around the convention center has improved.

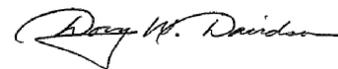
The most exciting part of WEFTEC for PumpTech is that we will have a booth (5728) this year and will be displaying a number of our products at the show. Our booth will highlight our MeterMan Division's Polymer make down systems which are trade named "PolyMan SrTM" and "PolyMan JrTM" as well as our new iRoverTM mobile, Human Machine Interface (HMI). We will also feature our extremely flexible HydronixTM Gull Wing pump station enclosure. PumpTech uses this design in our packaged pump stations that utilize self priming pumps, vacuum primed pumps, chopper pumps and water booster pumps. It can also be configured as an above grade valve vault and control panel enclosure. All of the items we will be displaying are uniquely PumpTech and were conceived, engineered and manufactured by PumpTech's Meterman and Hydronix divisions.

Most people think of pump and process companies as being fairly conservative and not too cutting edge. At PumpTech we are continuously challenging the norm and encourage our staff to look for ways to improve the working environment of our customers. Chris Suskie is just such an individual. After years of squinting at small, hard to read displays on the face of control panels and having to either bend down or look up or find something to shade the sunlight from the screen, he thought, "Isn't there a better way?". Earlier this year, PumpTech issued Apple[®] iPads[®] to Chris and a number of our staff for the purpose of improving our ability to connect and communicate. Not long after, Chris dared to ask why couldn't we provide a complete interface to the PLC through the iPad[®] and give the customer a truly mobile HMI? Why not create an interface that can be easily read and is portable so operators are not tied to the control panel

for operational changes and monitoring? That was the beginning, and after interfacing with Mark Miller in our IT department and a lot of hard work, Chris developed our iRoverTM application for the iPad[®] that does exactly what he envisioned. iRoverTM also provides a complete document management system that allows instant access to IOM's, panel schematics and all other technical information. A more detailed description of the iRoverTM application starts on page 1 of the newsletter. If you are attending WEFTEC please stop by booth 5728 to see a demonstration of this exciting technology. You might even win a free iPad[®]! If you are not attending, please let your PumpTech sales representative know of your interest and we will be happy to set up a demo at your place of business.

Similarly Scott Bush, who heads up our MeterManTM division, has been involved in polymer make down systems for years and had always noted deficiencies in the equipment packages manufactured by others. He designed the "PolyManTM" series of make down systems which provide all of the improvements that he noted were lacking in other systems. The key to the PolyManTM is that it uses standard, off the shelf components for simplicity. This allows it to be competitively priced while still offering features such as a stainless steel, multistage, high velocity mixing chamber that provides the best mixing without damaging the most difficult polymers. The PolyMan Sr. provides Automatic Polymer Ratio Control through its PLC and can be equipped with our new iRoverTM technology for true mobility. You will find a complete description of the PolyMan series on pages 1 and 6 of this newsletter.

Fall often brings cloudy skies and wet weather to the Pacific Northwest and often dampens the spirit. However, with the outlook of WEFTEC and the launch of our new product offerings, PumpTech's spirits are high and we look forward to the opportunity to show how our products can improve your working environment.



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PumpTech Pipeline - Fall 2011

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PumpTech Pipeline

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Upcoming PumpTech Participating Events

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10/19 WETRC Training, Green River CC

12/7 PNCWA, Port Townsend

1/15-18 NWFP EXPO, Portland

