CONTROL SIGNAL

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Omnisite Web Based SCADA

The OmniSite Crystal Ball is a stand alone single channel set point controller and web based alarm notification system that provides the capability to monitor and control remotely located equipment of any type without dedicated telephone lines or proprietary radio systems. Your connected equipment and machinery is completely monitored over the Internet using just a web browser, so there is no software to buy. If an abnormal condition occurs, notifications are sent by e-mail, pager, text, or voice call to any location.

Some built in features of the OmniSite Crystal Ball include: Immediate alarm reporting, otherwise report equipment operational data every 15 minutes using the Elite Data package,

(Continued on page 2)

Hot New Products

Low cost Operator Interface Panels

Fuji Electric Monitouch is a leading manufacturer of graphical operator interface products ranging from 5.7" to 15". The panel displays feature Serial, USB, and Ethernet ports, as well as communications modules for other protocols such as Profibus-DP, Devicenet, and video. This allows for easy connectivity to external devices, such as:

- Most PLC models
- Temperature Controllers
- Frequency Drives
- Power Meters
- Motion Controllers
- Barcode Readers
- Video Cameras (NTSC, PAL)
- Analog VGA Connections
- Printers

V8 series programmable operator Interface panel

The panel displays include high resolution graphics. All units are V-SFT Windows based configurable and include full remote monitor control and data acquisition. Other features include:

- Trending capabilities up to 32 pens
- Macro script support for HMI control
- Conditional visibility

(Continued on page 6)

Puls Low Profile Power Supplies

Most switching power supplies are considered a commodity until a PULS power supply comes into the picture. PULS power supplies have THE smallest footprint in the industry being 55% smaller than most others conserving panel space.

Puls 20 Amp power supply (top) compared to competitive units

PULS offers Single and Three Phase Input Power (120 VAC, 220 VAC, 480 VAC ; 85-375 DC) with current out-

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Inside This Issue

To remove your name from our newsletter mailing list, please send email to:
sales@gilsoneng.com
Subject: Gilson newsletter

Employee Profile

Jeff Russo is our sales engineer in Charleston WV. He began his career after graduating from Carnegie Mellon University's electrical engineering program in 1988. After a two-year stint as the company applications engineer, he briefly worked in our Cleveland OH office before relocating to Charleston in May of 1991. Almost twenty two years later, he finds the position more interesting than ever. "The challenge of changing business conditions, new markets and new products keeps it fresh", he says. "I like to tell my friends that the job is half technical, half sales, and half research and planning– that's three halves, and that's what it takes to be successful, and I love doing it."

According to Jeff, the most rewarding aspect of the job is the sense of accomplishment. "If it is to be, it is up to me. Knowing that you've made the difference for a customer, for a manufacturer, or for a fellow employee is a great feeling."

When not working, Jeff enjoys exercise, coaching kid's soccer, home improvement, and travel. He is currently the national president of the Sigma Tau Gamma Men's Fraternity. His wife of thirteen years, Victoria, was a former regional sales manager for Moore Industries. They have two children, Louis Oscar, nine, and Angela, six.

(Omnisite, continued from p. 1)

true SCADA replacement at fraction of cost/complexity, perfect solution for monitoring critical or remote applications, advanced internet based monitor, analyzer and controller.

The OmniSite Crystal Ball provides for a flexible, easy to install and configure, powerful controller/ monitor. The OmniSite Crystal Ball data may be also fully integrated into existing SCADA databases using OmniSite's SCADA-Bridge™ software package. Utilizing a single, integrated controller eliminates the need for multiple PLCs, relays and other controls. A complete packaged unit can be installed in under two hours, without the need for highly specialized technicians/ engineers. The Crystal Ball includes OmniSite's "plug and play" GuardDog web interface software, which eliminates the costly need of cumbersome software programming.

OmniSite relies on a combination of cellular telephone and web based technology. The Crystal Ball is installed at your remote equipment and sends a wireless signal to the local cellular tower. That signal is then bounced to OmniSite's web interface, where you can log-on, any day, anytime from any computer or smart phone to see how your remote equipment is operating. A "call out" list is set up online so that when an alarm is triggered, identified technicians/ operators are contacted immediately. Because OmniSite engineers recognize today's fast-paced world, that notification comes by way of text message, page, email or call to your land line or cell phone.

Omnisite GuardDog Iphone App is available as free download

GuardDog software allows users to manage their systems over the internet

OmniSite is a cellular monitoring solutions company that provides cellular monitoring and control of equipment. The OmniSite system was specifically designed to be the easiest to install, setup and use monitor on the market. OmniSite cellular monitors are used on industrial and municipal applications across the country, allowing operators to view and analyze data from any computer at anytime and anywhere. Contact your sales Engineer to arrange a demonstration at your plant.

General News, Schedule of Events

Pittsburgh

Mike Gorman has started as an Applications Engineer for all Gilson offices.

March 9. ISA Pittsburgh Section Education and Product Symposium
Regional Learning Center, Cranberry PA

Charleston

March 23. Charleston ISA Show
March 24-25. Charleston Industrial Expo

Orlando

May 16-18 Florida Water Resource Conference (www.fwrc.org)
Renaissance Orlando Hotel at Sea World. Orlando, FL. Booth 818

www.gilsoneng.com

Basic Overview of Wireless HART

"Lower my installation costs."
"Lower my cost of ownership."
"Give me more meaningful information from the field."
"Help me be proactive versus reactive when scheduling maintenance."
"Give me more efficient use of my limited resources."
"And above all, make it safer and more reliable."

In our world, these are timeless pursuits, and worthy goals. Since its first release to the public in 1986, HART protocol has become widely accepted, initially as a tool for instrument configuration, and later as a tool for obtaining more complete information from field devices, such as secondary and tertiary process variables, and true valve position feedback. Now, the Hart Communication Foundation (HCF) has released HART specification 7.1, which combines modern wireless technology with the existing HART platform to produce a network solution for users in pursuit of the goals above. In this first article, we'll examine the basics of Wireless HART (WHART): the pieces of the system, how they work together, how well they perform, and some of the approximate costs involved.

First, a little bit of review. Recall that HART instruments have registers that contain a wealth of information about the process loop, but unless the installation has the infrastructure to get that data (e.g., a Moore Industries HIM Hart Interface Monitor or a HART multiplexer) this information is wasted. Furthermore, even though HART allows for daisy-chaining up to 16 instruments on a single pair of wires, it is rarely implemented that way; there would be a single point-of-failure for all those instruments, and the polling speed would be too slow for most processes. WHART addresses both of these issues:

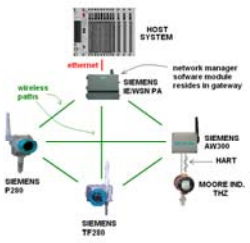


Figure 1: WHART Basic Mesh Network

1. A network of 30 transmitters provides updates to the host system *at an average of once per second*, with options for topology and reporting schemes that can speed this up for selected time-critical loops.

2. WHART supports a self-healing mesh network layout; which means that specific field failures are discovered by the network, and the signals are automatically re-routed.

The key thing about WHART is that, like its HART predecessor, it's a public protocol. Any manufacturer, with enough resources, can produce WHART transmitters, adapters, and gateways. That doesn't guarantee you can plug and play at random (there will still be issues like version mismatch) but the intent is to allow the user to select best-of-class hardware for a particular application, without being tied down to a particular vendor.

OK, enough of the preamble. Let's look at the pieces of the system. Figure 1 shows a sample layout. We have a generic control system that needs to receive and send information to a bunch of devices in the field. We have a new **SIEMENS P280** WHART pressure transmitter and a new **SIEMENS TF280** WHART temperature transmitter. We also have an older TT that we want to use, say, a Moore Industries THZ. Rather than buy a new TT, we wire it to an interface – the **SIEMENS AW300** - that pulls the HART information from the TDZ and puts it up on the WHART network. The interface between the field network and the control system is the **SIEMENS IE/WSN PA Link** gateway. There's also a software module in every WHART network called the Network Manager. Usually, it resides in the gateway, but it does not have to. The Network Manager does just that – it "forms" the network, allows new devices to join, sets the communications schedule and establishes redundant paths for all devices, and monitors the network for faults.

Note the multiple paths between the transmitters and the gateway. If, say, a temporary obstruction were to prevent the PT from communicating directly with the gateway, the Network Manager would detect this, and reroute the data along another path. Each field device in the mesh network is a router.

How can WHART systems provide value? Consider one application for equipment maintenance and condition monitoring – sometimes referred to as "asset management". Best practice calls for separation of control and monitoring functions; in other words, a failure or malfunction of the monitoring system must never compromise the control. Also, some monitoring applications are only temporary, so savings in wiring costs are a big deal. And if we're trying to monitor a condition that is tracked by, say, a valve positoner's HART diagnostic data bits, we'll need some way of getting that particular value out of the transmitter and into a host system. Wireless HART is a solution for these concern. With HART version 6, diagnostics information was increased. Devices can send messages like "Device Needs Maintenance". With version 7, status changes can be reported whenever changes occur, without waiting for a poll fro the host system. These features are available in not only Wireless HART devices but also conventional wired devices, like the **SIEMENS DSIII** pressure transmitter, and **PS2** digital valve positioner. In both the wired and wireless worlds, the information is there, and can bring value to the user through the WHART network.[1]

In future articles, we'll provide a detailed look as to the radios used in WHART systems, discuss control applications, and give insights on other relevant issues.

When does 150 lb Flange Mean 150 PSI?

What is the pressure rating of a class 150# flange? What is the pressure rating of a class 250# flange? The answer to any pressure rating question is: It depends on the temperature pressure and material of the flange!

Flanges that are made to standards called out by ASME/ANSI or AWWA are typically made from forged materials and have machined surfaces. They are typically in "Pressure Classes" such as 150#, 300#, 600#, 900# & 1500#. These "Pressure Classes" have both pressure and temperature ratings for specific materials. The flange faces are made to standardized dimensions and are typically "flat face" or "raised face", although other styles may be permitted. Flange designs are available as "welding neck" "slip-on" "lap joint" "socket weld" "threaded" and also "blind flange".

The flange rating refers to the ANSI/ASME standard that sets the allowable pressure a flange can be designed for. The allowable pressure varies for each rating (fig 1).

There are more factors affecting the pressure rating than its stated class. There are differences in material, sealing methods and operating temperature. For instance, a 150# flange made of carbon steel starts at -20 to 150°F with a max pressure rating of 285 psig and falls off to 95 psig at 750°F. The temperature chart goes higher than 750°F, but this is the limit where you have to be concerned about the steel losing some of its properties over time. If the flanges were made from 304 stainless then the pressure would go from 275 psig at 100°F to 20 psig at 1000°F.

NOTE: the pressures and temperatures I have quoted may not be 100 percent accurate. You should always refer to an up-to-date copy of the standards like the one found at **gilsoneng.com**

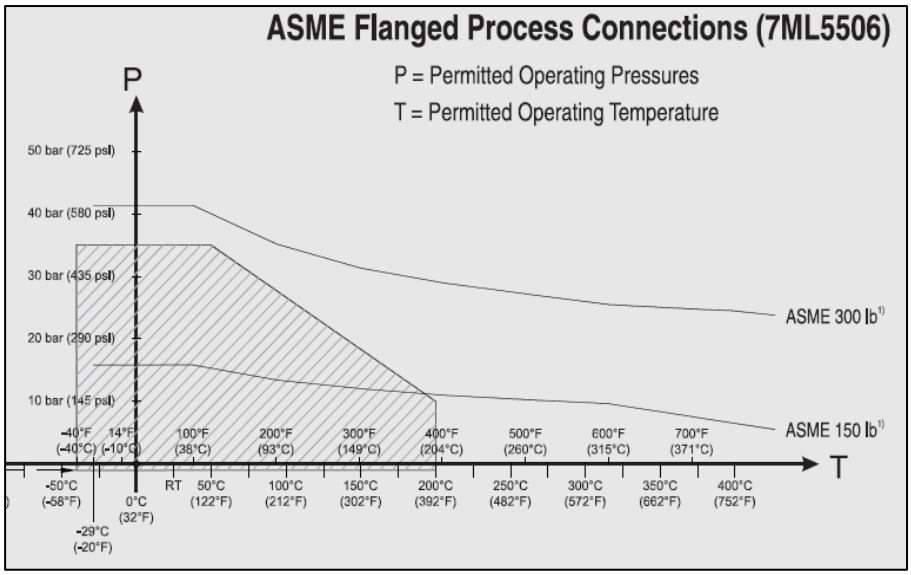


Fig. 2, De-rating table for flange on level transmitter

As you may know many of the instruments and valves we use today come with flanged connections. Most manufacturers of these products provide a way to check your choice in flanges or process connections by use of a "De-Rating" table. These tables show us the process pressure and correlating process temperature and what the flange (or NPT connection) can withstand under these conditions. Again, always check the manufactures de-rating tables to assure that it is suitable for your process temperature and pressure. Fig. 2 is an example of a de-rating table that indicates the rating of the flange as well as the rating of the instrument:

As you can see there are many factors affecting the pressure rating of a flange than its stated class. There are differences in materials, sealing methods and differences in operating temperatures. The fact that a flange is rated to class 150# does not limit the performance of that flange to 150psi. Then again, the class 150# may not meet the requirements of your process! Always check those charts!

CLASS	150 lb.	300 lb.	400 lb.	600 lb.	900 lb.	1500 lb.	2500 lb.
HYDROSTATIC TEST PRESSURE, PSIG	450	1125	1500	2225	3350	5575	9275
TEMPERATURE, F	MAXIMUM ALLOWABLE NON-SHOCK PRESSURE PSIG						
-20 to 100	285	740	990	1480	2220	3705	6170
200	260	675	900	1350	2025	3375	5625
300	230	655	875	1315	1970	3280	5470
400	200	635	845	1270	1900	3170	5280
500	170	600	800	1200	1795	2995	4990
600	140	550	730	1095	1640	2735	4560
650	125	535	715	1075	1610	2685	4475
700	110	535	710	1065	1600	2665	4440
750	95	505	670	1010	1510	2520	4200
800	80	410	550	825	1235	2060	3430
850	65	270	355	535	805	1340	2230
900	50	170	230	345	515	860	1430
950	35	105	140	205	310	515	860
1000	20	50	70	105	155	260	430

Fig. 1, Pressure-Temperature ratings for steel flanges

Open Channel Flow Measurement Basics

Most municipal wastewater plants, and many industrial facilities use open channel flow meters to monitor their effluent, and sometimes influent. Care must be taken in order to get good readings. You may notice I did not use the term 'accurate reading'. Before we get in the details of open channel flow measurement, lets look at a statement from a major flume manufacturer discussing the accuracy of flumes:

'*A good flume installation may possibly to be out as much as 5% to 10 % from reality.*'

Flumes and weirs are a convenient way to get flow measurement in gravity fed systems, but they will not give the accuracies as expected in other types of flow meters.

There are 2 components to an open channel flow measurement system. The Primary Device may be a weir or flume. The function of the primary device is to Back up the flow in the channel. Every primary device has a known relationship between the level of the fluid (upstream of the device) and the flow rate. This allows users to measure level, then compute flow.

The secondary device measures the level of the fluid behind the primary device, and gives a linearized reading for flow rate and/or total. Secondary devices can be ultrasonic, radar, pressure, capacitance, bubbler, or float.

Here is a list of common causes of inaccuracy in open channel flow measurement:

Primary device installation

A flume needs to be installed in a straight run with minimal slope. Too large of a slope will create velocities too severe for accurate measurement. The flume will need to be level

Sensor placement

The level sensor must be installed the proper distance behind the primary device.

Calibration

It can be difficult to take a visual measurement of the actual level in the flume during calibration of the flow meter. A permanently installed staff gauge installed at the point of measurement will assist in the calibration of the flow meter. Trying to measure the water level in the flume with a yard stick or tape is very difficult. An error in level measurement of just 0.25" can result in flow measurement error of over 10%.

If taking a level measurement with a yardstick or tape measure, make sure to take the level measurement at the proper location. Measuring the level at the 'V' of a V-notch weir will give an erroneous reading. The proper location is 3-4 times the maximum head height behind the weir plate.

On a Palmer Bowlus flume, inserting the yardstick to the bottom of the flume will give a false high measurement. The zero flow level is not the same as flume bottom where the sensor is located (see fig 1).

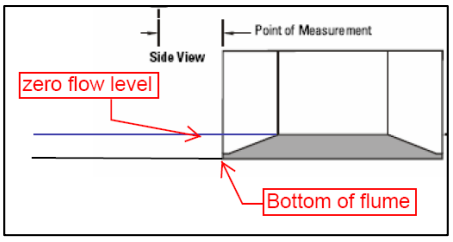


Fig 1. Zero-flow level is not bottom of Palmer Bowlus flume

Buildup at flume

Dirt and sludge can buildup in flume and weir installations to a point where significant errors can occur. Clogging at flume throat or weir plate will also cause the water level to backup, and cause false high flow readings. These errors will always cause a false high flow reading, so it can pay to periodically inspect the flume bottom.

(Puls power, Continued from p. 1)

puts up to 40 Amps. The flexible switched-mode functionality the units offer automatically adjusts itself to different supply voltages, which significantly reduces the stock of different inventory styles needed. Their units are short-circuit and overload protected.

PULS patented retaining system assures a simple tool-free mounting to DIN rails of varying thickness. PULS units also utilize vibration resistant snap-on connectors which allow users front accessibility as well as rapid installation. All of PULS units feature a ventilation grill for superior cooling.

PULS units are 95% efficient and green. Efficiency eliminates excess heat in the enclosure as well as the panel, improving both life and performance of the power supply. Every 10 degrees C additional in temp decreases life of capacitor by half.

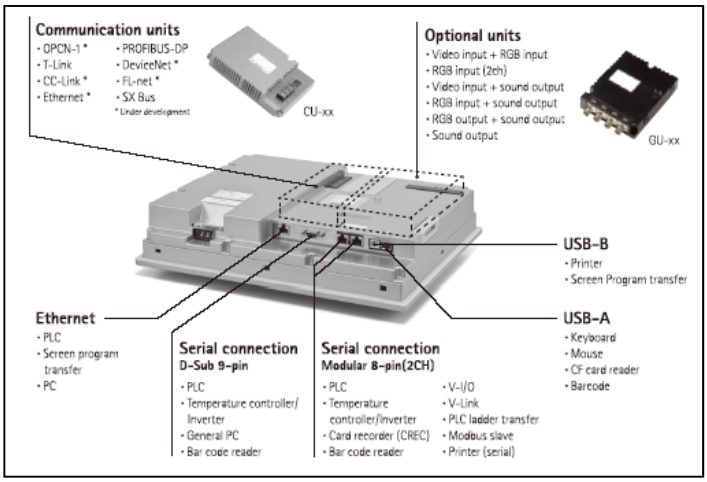
PULS is an ISO 9000 certified organization. PULS formerly was the manufacturer for the SOLA line of power supplies.

Primary Device	Advantage	Disadvantage
Parshall Flume	- self cleaning - good resolution - low head loss	- relatively expensive - small throat flumes can trap debris
Palmer Bowlus Flume	- easy installation - self cleaning - minimal head loss	- poor turndown - not easily installed in flat-bottom channels
Trapezoidal Flume	- high turndown - can pass large debris - can measure extremely low flows	- limited sizes. 6200 gpm max flow - ultrasonics and radar have trouble measuring low flow
Leopold Lagco Flume	- similar to Palmer Bowlus flume	- obsolete flume, but many existing installations
V-notch weir	- good turndown - high resolution	- susceptible to clogging at notch
Rectangular weir	- simple installation	- high head loss - may trap debris

(Monitouch, continued from p. 1)

- Animation
- FTP support
- Log viewer
- Security and password system
- Emulator and simulator
- Printer compatibility (pictbridge)

Models are available in Monochrome, STN or TFT. Screen resolutions are XGA (1024x768), SVGA (800x600) VGA (640x480) and QVGA (320x240). Automatic application resizing is available with multiple size HMI's at the same resolution which can eliminate hours of resizing.



Connectivity to peripheral equipment via the multiple communications ports

GILSON ENGINEERING SALES, INC.LOCATIONS:

PITTSBURGH, PA
535 Rochester Road
Pittsburgh, PA 15237-1747
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FAX 412-366-1728

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2697 Sawbury Boulevard
Columbus, OH 43235-4582
800-860-4499
FAX 614-889-6038

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Cleveland Height OH 44106
440-543-0300
FAX 440-543-1230

LOUISVILLE, KY
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FAX 502-415-7528

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FAX 304-342-0085

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26953 Mingo Drive
Perrysburg, OH 43551-1071
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Or 800-860-4499
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