

# CONTROL SIGNAL

A publication of Gilson Engineering Sales, Inc.

Volume 14 Issue 2

April 2009

## Banner iVu Low Cost Image Sensor

The new Banner **iVu** series Image Sensor combines the simplicity of a photoelectric sensor and the intelligence of a vision sensor, delivering powerful and affordable inspection capabilities to solve a wide variety of complex applications, without the need of a PC or software package for start-up, programming or operation.

The **iVu** sensor is three advanced sensors in one compact and rugged package. The sensor is used to monitor parts for type, size, orientation, and shape in three broad categories:

1. A match sensor that compares a part to a reference to determine if there is a match (pattern, shape, or orientation i.e. date/lot code id, regular/



*iVu used to inspect food packaging*

- irregular shapes, labels, logos)
2. An area sensor that detects whether a particular feature is present (confirm each part or package includes the specified number of features (count) and size i.e. blister packs, drilled holes.)
3. An area sensor with tools that adjust for motion (used to ensure features are present, accommodat-

*(Continued on page 2)*

## Hot New Products

### Siemens Vortex Flow Meter for Gas, Liquid and Steam

Siemens has introduced the FX300 Vortex flow meter series. It includes a pressure and temperature sensor in one unit. Using the vortex principal to measure the flow of steam, gases or liquids, the vortex flow meters are technologically superior compared to traditional flow meters.

Easy to mount and integrate, this metering solution is the ideal choice for a wide range of industries such as chemical, HVAC, power, food & beverage, oil & gas and pharmaceuticals.

The FX300 flow meters measure process flow by detecting the frequency at which alternating vortices are



shed from a bluff body which is hit by the medium. The vortices create a dif-

*(Continued on page 2)*

## Multi-channel isolator from Moore Industries

Featuring a very narrow installation footprint, mini MOORE Signal Isolators, Converters, Boosters and Splitters combine multiple analog signal channels in a rugged, easy-to-install signal conditioner.



The mini MOORE multi-channel family includes the model MIX 2-wire (loop) and the model MIT 4-wire (line/mains) powered models. The complete family delivers cost-effective solutions for signal interface applications.

The MIT/MIX provides isolation to stop unwanted ground loops. It

*(Continued on page 3)*

## Inside This Issue

**Licensed Wireless I/O P.3**

**Liquid Flow Meter Selection Guide. P4**

## Employee Profile

**L**inda Crago came on board with Gilson Engineering September 1991. She is the inside sales support person for Jeff Russo, covering orders, quotes, customer and principal assistance, past due invoices and anything else that may arise in the day to day operations of an eager office environment. Prior to joining Gilson she worked for Digital Equipment in a number of areas. The most rewarding part of the job for her is creating satisfied customers.



She lives in Winfield, WV with her husband Lee. Her hobbies outside of work are drag racing, and building and working on race cars.

*(Banner iVu, continued from page 1)*  
ing positional and rotational change introduced by motion)



*Injection molding verification*

With functions for easy configuring and operating, users can have the sensor up and running in minutes without training use of a PC. Using the touch screen and intuitive interface, inspection parameters are easily configured and quickly deployed. Three easy steps are all that's required:

1. Install and connect the sensor.
2. Select the sensor type.
3. Acquire a good image and set the inspection parameters from the integrated touch screen.



*Blister pack inspection*

Typical applications include Date/Lot code inspection, injection molding verification, label alignment inspection, stamped hole inspection (size and correct number), food packaging inspection, blister pack inspection.

*(Vortex meter, continued from page 1)*  
ferential force across a sensor wing, flexing it at a frequency proportional to a flow rate that is measured by the meter. The movement of the oscillating wing is transmitted to the FX300 electronics by a dual piezoelectric crystal sensor mounted in the wing. The result is a precise and efficient metering solution that provides a competitive edge.

The FX300 has integral temperature and pressure sensors, all in a single 2-wire transmitter with HART. Via HART, one can extract flow total, temperature, and density data.

The FX300 can provide volumetric and mass flow of steam, gases, conductive and non-conductive gases. \*Fully welded sensor design without internal gaskets making the FX300 the safest vortex flow meter available.

FX300 Vortex flow meters are specially designed for applications that require reliable flow measuring independent of pressure, temperature. Since the meter measures temperature and static pressure, it is ideal for measuring flow of superheated steam.

Other applications for the FX300 are:

- Steam and saturated steam measurement
- Steam boiler monitoring
- Control of compressor output
- Consumption measurement in compressed air systems
- Measurement of industrial gases
- Burner consumption measurement
- SIP and CIP processes in the food & beverage and pharmaceutical industries

## General News, Schedule of Events

Please welcome David Dean to the Gilson Team. David will be starting May 18th and working in Pittsburgh as an application Engineer and in training to be an outside sales engineer. David will be graduating May 2nd from Florida University with a Mechanical Engineering degree. David will be working hard to advance to outside sales where he will return to his home state, and work out of southern Florida.

## Elpro Technologies Introduces Licensed Radio I/O

**E**lpro Technologies, the premier supplier of wireless technologies for I/O, Gateways, and various modems, is pleased to announce the availability of the new FCC licensed radio units, the 105U series. Well known for the 900 MHz Spread Spectrum (902-928MHz) I/O units with the 905U series, the 105U Series mimics the same I/O count with a version that includes a licensed radio purchased in one of seven frequency ranges covering 380 to 512 MHz, capable of up to 5 watts. The 105U retains the I/O expansion capabilities with the 105S and 115S modules, as well as the capability utilizing 105U-G FCC licensed gateways available in a variety of interfaces identical to 905U-G 900MHz family.



Third party licensing services are available. For a charge, these organizations can advise what wattages/ frequencies are available from the FCC for the zip code where the system shall be installed. Services can extend all the way to handling and submitting the license to the FCC. The licenses can run several hundred dollars for a 10 year period with additional charges based upon the number of radios in a given system.

The 105U series have their I/O mapped and gateways configured in the same manner as the 900MHz units with the same software available at no charge shipped on CD with each unit, or downloaded at [www.elprotech.com](http://www.elprotech.com). The units may be purchased in any one of 7 frequency ranges based upon the availability of a frequency. Both the frequency and the wattage (.5 thru 5 watts) can be spelled out when ordering and set at the factory prior to shipment.

## Vibrating Point Level Switch for Liquids

**S**iemens has developed a new product for point level measurement in liquid applications. Similar to Siemens LVS200 for solids, the LVL100 and LVL200 are vibrating liquid point level switches for high and low level detection of liquids. No calibration or set up are required with these switches. Any non-coating, liquid storage or process tank would benefit from this reliable on/off point level even when there are changing conditions in the fluid such as conductivity, dielectric, vapors, or bubbles. Pump protection is another common application for this new product.

Both switches have an insertion length of about 1.5 inches and can be mounted horizontally or vertically. This makes them ideal in applications with minimal mounting space, including pipe lines down to 1 inch. These switches are not affected by external vibrations and feature a specially threaded piezo drive that increases reliability and performance in high temperature applications.

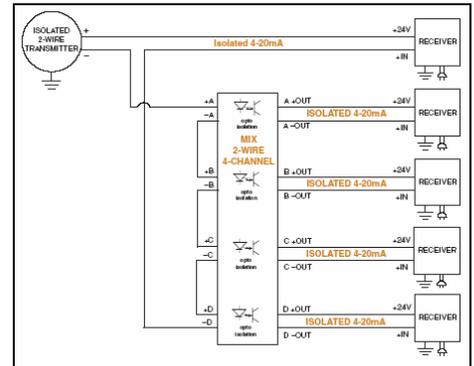


The LVL100 is a compact switch designed for customers needing a transistor output. It is able to be used in applications with medium temperatures up to 300 degrees F.

The LVL200 is available with FM (XP) Class I Division 1 Groups A-D, Class II and III Division 1 Groups E-G approvals. It has a variety of process connections and comes standard with a DPDT relay. The LVL200 can be used in applications with temperatures up to 480 degrees F.

*(mini Moore, continued from page 1)*

can also protect equipment by eliminating common electrical paths. They can convert or split signals so that one primary measurement can be sent to two, or up to four separate systems. They also allow you to boost the signal so that more instruments can be added to the loop.



*Signal splitter: Single 4-20 ma input, up to four 4-20 ma outputs*

They have switch-selectable current/voltage inputs. The 2-channel mini MOORE models provide DIP switches for selecting input types of 4-20mA, 0-5V, 1-5V or 0-10V for each channel.

The MIT/MIX solves "Bucking" Power Supply problems by stopping a conflict caused by a 4-wire transmitter and a DCS both trying to power the same process loop. The 4-wire MIT model automatically accepts any power input range between 20-375Vdc and 90-264Vac.

The mini MOORE has a rugged metal construction that provides excellent RFI/EMI protection and is an effective barrier against the unpredictable, harmful effects of radio frequency and electromagnetic interference. The high-density 2- and 4-channel configurations substantially reduce panel space, installation and instrument costs. At only 25.4mm (1 inch) wide, the MIT/MIX delivers up to four low cost I/O at 0.25 inch (6.35mm) per channel.

The MIT/MIX provides superior performance and is just the latest in a great line of products provided by Moore Industries.

## Selecting the Proper Liquid Flow Meter

One of the most common applications in process control is the measurement of flow. When selecting a flow meter, there is a list of application questions that must be answered. An incorrectly chosen flow meter can be extremely expensive to replace, especially if the process is already up and running. Consider the following points when choosing a liquid flow meter.

### Meter Size

Too often, flow meters are sized to match the existing pipe size. One should determine the expected minimum and maximum flow rates, and select a flow meter that will cover this range.

### Physical Properties of Liquid

There is no one flow meter technology that will work for all applications. The flow sensor must be able to withstand the pressure, temperature, corrosiveness, vibration, thermal shock (is the flow sensor steam cleaned). Other fluid properties to consider are viscosity, conductivity, and percent solids.

### Pressure Drop

Many flow meters will create a pressure drop. This is of extreme importance in gravity fed systems, or when dealing with highly viscous liquids. Once you have determined the maximum pressure drop allowed by a flow meter, calculate the pressure drop that the flow sensor will create at worst case conditions (highest flow rate and viscosity). The flow meter manufacturer should be able to assist with pressure drop calculations.

### Straight Pipe Runs

Accuracy statements for most flow meters are assuming that the sensor is seeing a flow stream without turbulence, swirl, or vortices. Items such as valves, pumps, elbows, strainers, and thermowells can create irregularities in flow that will cause a greater inaccuracy in the flow measurement.

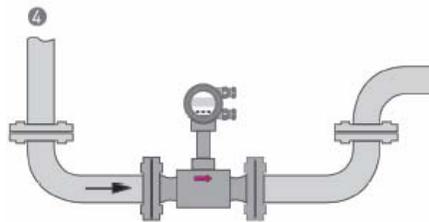
The flow meter manufacturer will be able to advise the necessary straight runs of pipe upstream and downstream of the flow sensor in order for the

flow meter to work properly. The straight runs are normally stated as a ratio of pipe length to pipe inside diameter.

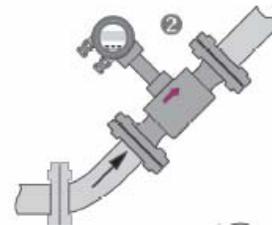
### Full Pipe

Most liquid flow technologies require that the pipe is full of liquid, with no vapor spaces. Mounting a flow sensor in a vertical pipe with flow moving upwards will assure a full pipe at the point of measurement.

You may consider installing a goose neck in a horizontal pipe to assure a full pipe. However, this may create clogging problems in some fluids with high solids, and low velocities.



*Good installation in low point of pipe*

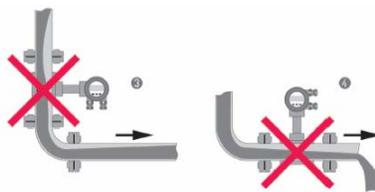


*Good installation, upward flow*

### Solids



*Bad installation, vapor may be trapped in high point of piping*



*Bad installation, non-full pipe*

Some flow meters, such as Doppler ultrasonic require entrained solids, or bubbles to function properly. Others, such as turbine flow meters

may be damaged by solids. The sensor's wetted components may also be affected by high solids and fast velocities. For example, the choice of a magmeter's liner may depend on the erosive nature of the fluids.

### Environmental Conditions

Like any other instrument, you should consider what type of environment the flow meter will be exposed to. Many flow meter LCD displays are only rated to 32 Deg F. In these cases, remote electronics may be advised. If a flow meter is to be mounted in a metering pit, is there a chance it will get flooded? If so, you should choose a flow meter that is rated for permanent submergence.

### Cost vs. Performance

Flow meter accuracy may range between 0.1% and greater than 3%, depending on the application. One should determine the required accuracy for a given application. A flow meter that gives 1.5% accuracy, and costs \$500 may be perfectly adequate.

Also, one should consider the cost of installation. Will the installation of the flow meter require rearrangement of existing piping, vibration isolation, filters, etc?

### Accuracy

Flow meter accuracies are normally stated as percent of full scale (span), or percent of reading. It is important to recognize the difference. Lets look at the following example.

Calibrated Span: 0-100 gpm  
Current flow reading: 10 gpm

If the accuracy is +/- 2% of reading, the flow reading would be 10 gpm, +/- 0.2 gpm.

If the flow meter accuracy statement is +/- 2% of span, the flow reading would be 10 gpm, +/- 2.0 gpm. As you can see, there is quite a difference in accuracy, especially at lower flows.

Gilson Engineering represents several manufacturers of liquid flow meters. The table on page 5 lists these meters, along with their associated properties.

## Liquid Flow Meter Selection Guide

	Siemens Magmeter	Siemens Coriolis	Siemens Clamp-on Transit time	Siemens Clamp-on Doppler	Siemens Vortex	Seametrics Turbine/paddle	Seametrics Magmeter	Differential Pressure
Accuracy	0.25% of rate	0.1% of rate	0.5% rate	0.5% rate	0.75%	1% full scale	1% of rate	0.5%-3.0%
Size	1/12" to 78"	1/16" to 6"	0.25" to 48"	0.25" to 48"	1/2" to 12"	0.5" to 48"	0.25" to 48"	Any
Turndown	33:1	100:1	36:1	36:1	Application dependent	100:1	100:1	3:1 to 10:1
Temperature limits	356 Deg F	355 Deg F	446 Deg F	446 Deg F	464 Deg F	250 Deg F	212 Deg F	DP Dependent
Pressure limits	1,500 PSIG	1,450 PSIG	Pipe dependent	Pipe dependent	1470 PSIG	500 PSIG	200 PSIG	DP dependent
Straight run requirements (diameters)	3-10 up 2-5 down	None	10 up 5 down	10 up 5 down	10 up 5 down	10 up 5 down	10 up 5 down	Primary element dependent
High solids	Yes	Yes	No	Yes	No	No	No	No
Hydrocarbons	No	Yes	Yes	Yes	Yes	No	No	Yes
Advantages	No moving parts or obstructions	Mass and density outputs	Non-intrusive	Non-intrusive	Non-conductive fluid	Low cost, easy maintenance	No moving parts	Applicable to many types of fluid
Disadvantages	Must be conductive fluid	High press. Drop with viscous fluids	No high solids	Entrained solids or bubbles required	Low viscosity fluid	Moving parts	Must be conductive fluid	Expensive, low turndown,
Niche Applications	Slurries, Acids, wastewater	High accuracy, non-conductive fluids	Pipeline, water & wastewater	Wastewater, slurries	Hydrocarbons, Steam	Potable water	Potable Water, Well fields	Steam

### Clamp-On Flow Meter Rental Program

The Siemens rental program offers liquid, gas, and energy flow meters for rental on a weekly basis to fit even the smallest budget. This program is ideal for proving applications and situations requiring fast, short term, immediate response to your flow monitoring needs. In most cases, portable equipment can be shipped rapidly after receipt of order.

#### Sample Applications

- Existing flow meter verification
- Temporary Flow Measurement
- Pump performance
- Leakage detection
- Balancing

- Energy efficiency and optimization
- Gas distribution modeling



#### Transit-Time and Doppler Technology

All of our flow meters come with transit-time and doppler technology capability which allows for flow measurement, whether the liquid is clean or dirty.

#### Datalogging Capability

All flow meters have a built-in datalogger to log all of your required variables. The datalogger is easily downloadable onto your PC/Mac.

#### Certificate of Calibration

All of our equipment comes with an NIST traceable certificate of intrinsic calibration.

## Gilson Engineering Website Enhancements

**O**ur website has had a major overhaul. It now has an easy interface with bookmarks for category of interest. The new interface allows you to page thru the electronic catalog, similar to a paper catalog with tabs. Instead of tabs there are bookmarks on the left side column. Hit the + sign to drill down to the specific product of interest. Once on the product of interest, one can download the brochure, instruction manual or quick start guide in PDF format. There are 3 different catalogs available,

Process Catalog (products handled in Western PA, WV and Ohio) , Florida Catalog and the HVAC catalog.

Please pass on any suggestions or missing links or pages to [cjg@gilsoneng.com](mailto:cjg@gilsoneng.com).

This is the most comprehensive Instrumentation catalog on the web. 98% of all products that are bought from Gilson Engineering, will have product information along with the instruction manuals all located on one site for easy download. Look for future enhancements to make the site even more useful to each of you.



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