

GEMS Continuous Transmitters Provide Direct Level Measurement of Water, Oils, Process Blends, Fuels and Chemicals

- ▶ Lengths to 15 feet; Customized to 30 feet and More
- ▶ Alloys or Engineered Plastic Wetted Parts
- ▶ Analog Output

Completely electronic, GEMS Liquid Level Transmitters provide sophisticated, remote tank gauging. A wide variety of material combinations provides compatibility for most liquid media. The 36000 and 66000 Series transmitters, designed for large tanks, offer indicating lengths to 180 inches, while the 800 Series features smaller overall proportions, with indicating lengths to 144 inches.

GEMS doesn't limit you with the standard designs cataloged here. Our experienced engineering staff, with extensive research and development capabilities, will customize liquid level indicators to meet your specific requirements.

Modifications can include a variety of mountings, exotic materials and float configurations to accommodate various tank temperatures and pressures, as well as liquids with a broad range of specific gravities. Over the years, GEMS engineering expertise has led to solutions for the most demanding instrumentation needs.

XM or XT Prefix . . . What's the Difference?

Most compact 800 Series, or larger 36000 and 66000 Series Transmitters, are available in analog output (XM) or signal conditioned output (XT). GEMS XT-Series Transmitters, equipped with built-in signal conditioning, provide regulated 0-5 VDC, 0-12 VDC or 4-20 mA output. These signal conditioned transmitters can be directly interfaced with GEMS digital bargraph receivers shown in this catalog or user's instrumentation such as process controllers, recorders or microprocessors. No intermediate receiver is needed.

GEMS signal conditioned transmitters can operate on an unregulated DC input voltage, since regulation is provided by discriminator circuitry in the signal conditioning. Tap switch operation and external configurations are the same in both the XM- and XT-Series.

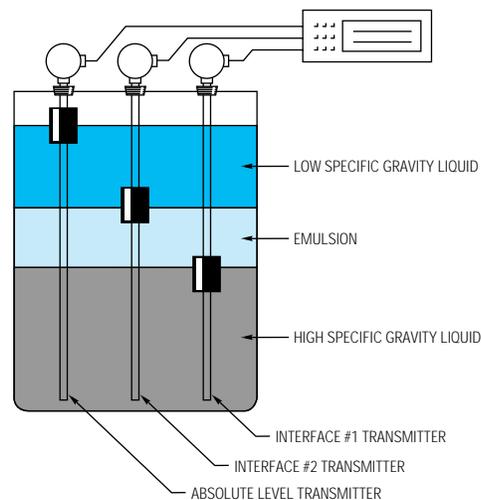


GEMS Transmitters Can Monitor Unseen Liquid Interfaces and Emulsions

By design or otherwise, dissimilar liquids often reside in the tank — one floating atop another. Most tank gauging methods are limited in these cases, and can only indicate the level of the uppermost surface. But, with GEMS Transmitters, you can easily monitor the interface between liquids. . . including the emulsions and slurries that sometimes form between them.

By adjusting the specific gravity of the magnetic float, GEMS can adapt the transmitter to monitor the interface of a broad range of media. This principle applies to oil and water, slurries, acids, bilge and other dissimilar liquids.

In conjunction with low level alarms, or automatic controllers, GEMS Transmitters will help assure that only the "correct" liquid is taken from a tank, or introduced into a process system.



Multiple GEMS Transmitters can accurately monitor proportions of dissimilar liquids and emulsions within a single tank.

GEMS Receivers



3-Digit Level Cube



Digital Bargraph Receiver for Panel Mounting



Digital Bargraph Receiver in Enclosure

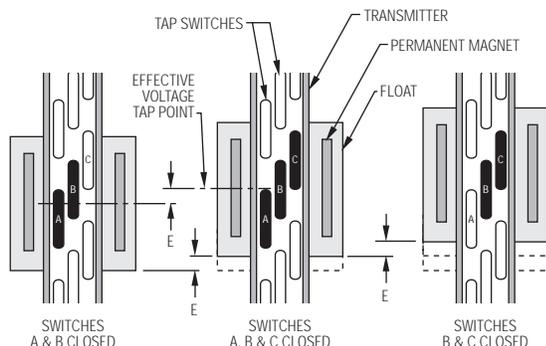
Any of these receivers shown, detailed in Section J, can be used with any XM- or XT-Series Transmitter in this section. Combined with GEMS Receivers these transmitters form a complete liquid level monitoring system. GEMS offers a broad range of receivers to suit a multitude of applications. Used as a separate component within a process control system, GEMS Transmitters can interface with programmable controllers and other industrial microprocessors.

Operating Principle

The level sensing unit of GEMS Float Type Transmitters is vertically mounted in the tank and cable-connected (3 wire) to a remote receiver. A voltage divider extends the full indicating distance within the sealed transmitter stem, with magnetic reed switches tapped in at regular intervals (See Typical System Schematic). These switches are, in turn, connected to the indicating meter in the receiver. A regulated DC voltage from the receiver is applied across the voltage divider. As it moves with liquid level, the float magnetically closes a series of reed switches in sequence that varies the tapped-off portion of the divider voltage which is applied to the indicating meter.

Voltage Divider Design Ensures Consistent Accuracy and Reliability

GEMS voltage divider uses a staggered series of reed switches tapped in a "2-3-2 at-a-time" sequence (see diagram below). When two adjacent switches are closed, the effective electrical tap point is midway between the two. When the float closes the next switch, while holding the first two closed, the effective tap point is at the middle switch of the three, and distance "E" from the first tap point. Since voltage drops are read at the meter for each distance "E" of float travel, any inaccuracy would be limited to this distance plus meter and other circuit tolerances.



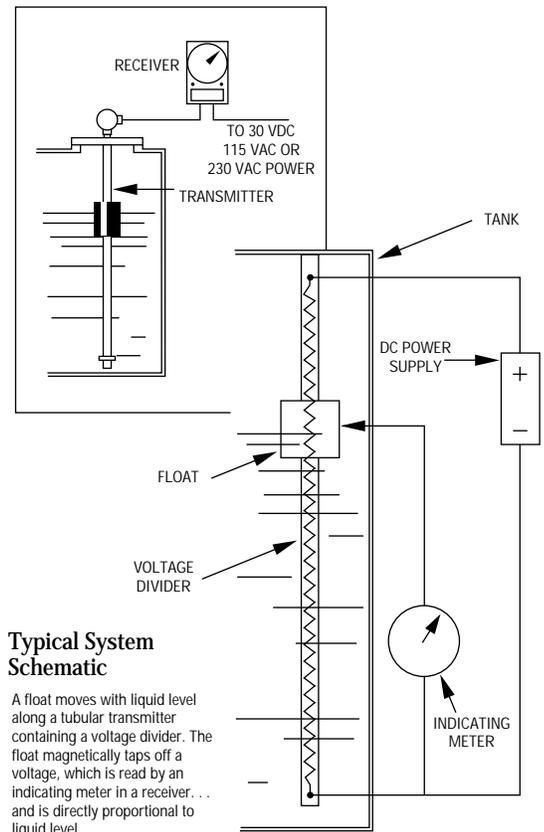
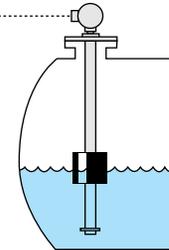
"E" = 1/4" or 1/2"; distance the float travels to tap off the next higher (or lower) voltage, depending on transmitter series. Therefore, the level indicated is within 1/4" or 1/2" of the true level over the total indicating distance, regardless of tank depth.

Electronic Transmitters/Receivers

As a Component: Signal conditioned, 2-wire: 4-20 mA, 0-5 and 0-12 VDC outputs for programmable controllers, microprocessors or receivers.



As a System: Supplied with analog or digital display receiver modules.



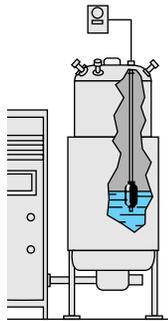
Typical System Schematic

A float moves with liquid level along a tubular transmitter containing a voltage divider. The float magnetically taps off a voltage, which is read by an indicating meter in a receiver. . . and is directly proportional to liquid level.

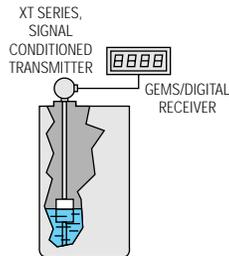
Typical Applications

Consider GEMS' versatile transmitters for all your continuous liquid level monitoring needs — water, diesel, lube oils and fuels, as well as various chemical and petrochemical liquids. Here are just a few areas where GEMS' transmitters are used:

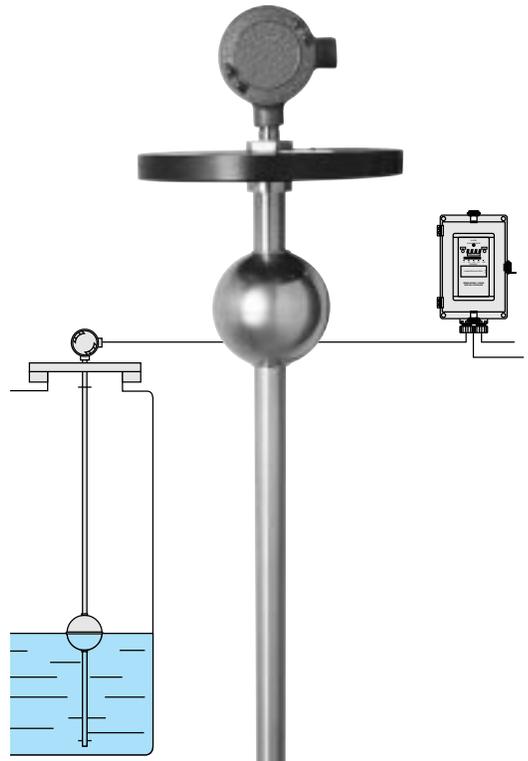
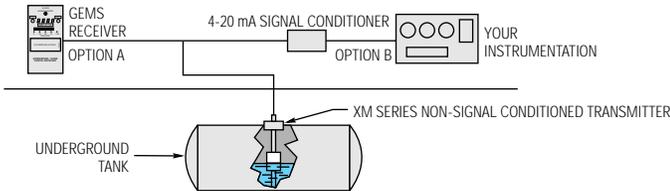
- Utilities • Beverage Industry • Medical • Pharmaceuticals • Food Processing • Wineries • Printing



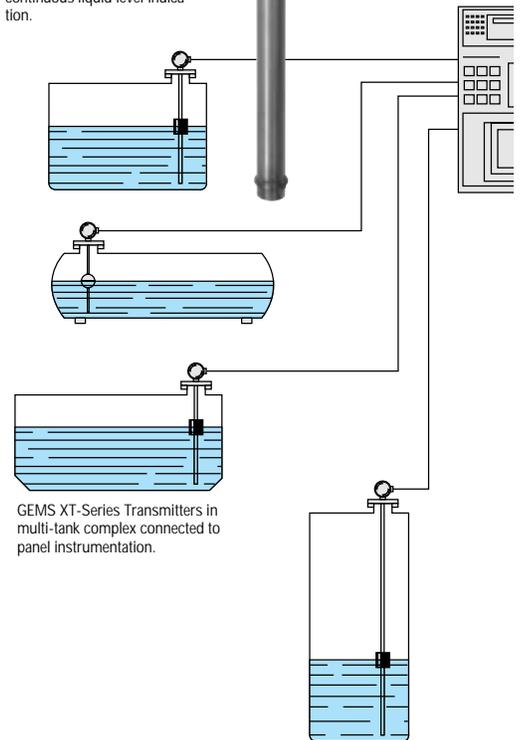
GEMS Transmitters monitor water, diesel or lube oils, chemicals and petrochemicals in industries such as pharmaceuticals, breweries, municipalities, automotive, textiles, pulp and paper and others.



An XM-Series Transmitter, illustrated below, connects directly to any GEMS Receiver (Option A). Add signal conditioning anywhere within the control loop to allow the transmitter to send signals into your digital-based instrumentation (Option B), such as process controllers, data recorders, etc.



GEMS XM-Series Transmitter with GEMS Digital Bargraph Receiver Station for complete continuous liquid level indication.



GEMS XT-Series Transmitters in multi-tank complex connected to panel instrumentation.

Commitment to Quality

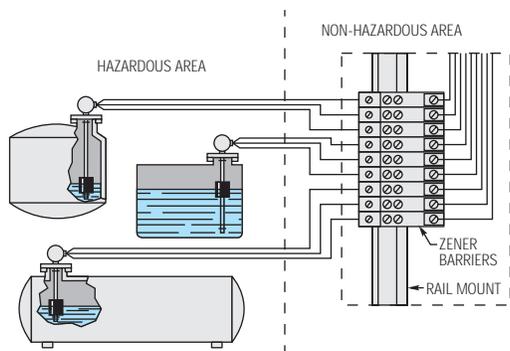
GEMS Liquid Level Transmitters and Systems are designed to meet the highest industry standards. Most common configurations are FM-approved, UL-Recognized and CSA Listed. Many of our float type transmitters are ABS-approved. (Contact GEMS product specialists for detailed information.)

Environmental and Personnel Safety

With increasing concerns for both personnel and environmental safety, it's good to know there is a company like GEMS with products that can help. GEMS Liquid Level Indicators not only improve the efficiency of your operations, but also assist you in meeting EPA and OSHA requirements.

Intrinsic Safety

GEMS transmitters are intrinsically safe for hazardous area operation when properly connected to a GEMS Zener Barrier, a solid-state, energy limiting device. Any need for explosion-proof housings or special wiring of any kind is eliminated. GEMS Zener Barriers are variously UL, FM, CSA and MSHA approved. See Section N.



Any non-voltage-producing sensor or switch is rendered intrinsically safe for hazardous locations when properly connected to the output of GEMS Zener Barriers. These are described in Section N.



Specifying and Ordering GEMS Liquid Level Transmitters

Our OrderIt! Forms make it quick and easy.

1. To specify this product, start by photocopying the appropriate OrderIt! PRODUCT CHECK LIST located at the back of this catalog; Pages Z-24 to Z-28.
2. Next, using the product information supplied in this section, check off the boxes and fill in the blanks of the OrderIt! Check List to specify your desired product configuration. Accurate answers to each question will assure correct fit and function of your custom built product. Note: Use a separate Check List for each unique configuration.
3. To obtain a priced quotation, Fax your completed OrderIt! Check List to Gems at 860-747-4244 or fax it to the Sales Office or Representative nearest you. All of our offices, along with their fax numbers, are conveniently located at the end of this catalog. Or, if you choose, mail it to us...We'll do the rest!
4. To order your CUSTOM product, contact one of our representatives, and use the OrderIt! method. Just photocopy the OrderIt! ORDER SHEET found at the back of this catalog. Accurately complete all of the purchasing information that we'll need to process your order and fax it along with your OrderIt! PRODUCT CHECK LISTS. When using the Fax or mail method, the ORDER SHEET must be accompanied by the PRODUCT CHECK LISTS to expedite your order. These forms will provide us with the shipping and billing information we need, along with any prices or delivery dates quoted.

OrderIt! Forms Missing?

If you no longer have an appropriate OrderIt! form, determine the following preliminary information:

- The transmitter Model Number with letter(s) prefix of interest to you
- Indicating length required
- Distance from mounting to top float stop
- Maximum operating temperature and pressure
- Liquid media
- Liquid specific gravity

Call your local GEMS sales office shown on the inside back cover of this catalog, or call the factory direct, and provide us with the above application information. We'll answer all of your questions and assist you in selecting a GEMS Liquid Level Transmitter to meet your specific requirements.



Don't hesitate to call a GEMS representative with questions, or for any clarification.

1-800-321-6070

(Outside of Continental U.S., 860-747-3000)