



# MORE THAN SENSORS, SOLUTIONS



OUR EXPERIENCE • YOUR SOLUTION

LEVEL | FLOW | PRESSURE | TEMPERATURE | SOLENOID VALVES | FLUIDIC SYSTEMS



## We've got the experience you need – and then some

Gems Sensors and Controls products have been field-tested by customers like you for over 60 years. We offer an extensive catalog of pressure, level and flow sensors, as well as miniature solenoid valves, available through our worldwide sales and distribution network. Our four, fully equipped ISO9001:2008 certified manufacturing sites, located in North America, Asia and Europe, ship more than 4 million sensors annually.

Gems Sensors has earned an international reputation for developing and manufacturing a wide variety of quality, dependable components. We use real-time customer and industry feedback to drive our manufacturing and quality initiatives. Once installed, our components run continuously in some of the world's harshest environments. There are Gems units in the field today that have been running for decades with no degradation in the original performance.

Gems Sensors work in a variety of Oil and Gas applications such as:

- Wellhead Automation
- Storage Tank Level Monitoring
- Chemical Injection
- Hydraulic and Lubricating Oil Reservoirs
- Fracturing Truck Monitoring
- Tote Level Monitoring
- Spark Protection in Diesel Fuel Distribution
- CNG/LNG Vehicle Stations.

# Engineered Solutions for Oil and Gas

## Engineer to engineer problem solving – it's common sense

The fastest way to solve any manufacturing problem is to let engineers speak directly with other engineers. While this may be rare in the industry, for us it's common sense. Gems' engineers collectively have more than 400 years of work experience among active staff. Our engineers are in the field and working with customers around the globe. Because the better we understand your challenge, the faster we can deliver a solution.

Gems Sensors is ever committed to accomplishing measurement goals on time and on budget. If you are looking for a custom engineered solution, the first step is always referencing the vast Gems legacy projects library. Chances are good that Gems has already successfully implemented designs of similar criteria. As a result, an off-the-shelf solution may be immediately available, saving time and costs.

## Rapid prototyping – because sometimes you need it now

Who can you count on when the deadline is now? Gems Sensors. Our design engineers work closely with manufacturing to shorten turnaround times for prototypes. In most cases, we can have a prototype on your desk weeks or even months sooner than our competition.

Whether we start with your drawings or our original designs, Gems' engineers can provide 2D or 3D modeling to resolve component issues or design flaws prior to prototype production.



## Flexible, global manufacturing – same high standards on three continents

Your design or ours, we will build, test and ship quality sensors to fit your specific timing and budget. Our facilities are designed to adjust to short-runs or high volume. At each facility, Gems utilizes Lean Manufacturing principles and processes to make significant improvements to safety, quality, delivery, and cost. Areas of focus include:

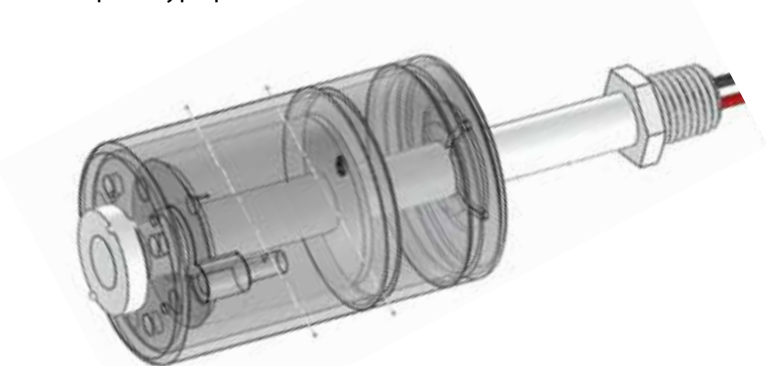
- Assembly
- Testing
- Labeling/Packaging
- Documentation
- Production Process Validation and Control.

## Durable in harsh environments – as tough as you are

The oil and gas industry operates complex drilling, pumping, piping and storage facilities in some of the most difficult environments on earth. Gems' sensors and controls are engineered to respond reliably and over the long haul in difficult environments. Our sensors are designed to meet minimal energy consumption requirements for remote sites.

Gems Sensors understands the critical value of our products to *your* solutions. Any component failure means expensive downtime for your customers. Our durability and consistent performance over time helps to keep your customers up running – and coming back to you for more equipment.

**Talk to Gems Sensors and find out what solutions we can engineer for you.**





# Success stories for tough oil, gas and petrochemical applications

## PLUNGER LIFT SYSTEMS

Superior performance in extreme conditions.

**Challenge:** Effective plunger control in remote locations requires miniature latching valves to consistently drive the opening and closing of pneumatic well shutoff valves. In extreme cold conditions, some latching valves 'stick' in open or closed positions, either unnecessarily shutting off production or allowing water contamination.

**Solution:** Gems' third-generation latching valves are designed to significantly improve performance in cold conditions, with proprietary magnetic plunger characteristics. Gems' vertically integrated manufacturing process allows customers to make a wide range of design modifications to adapt our valve to your precise conditions and needs.



## 'MUD' TANKS

Specialized, self-cleaning floats keep an eye on mud.

**Challenge:** Drilling mud is a highly viscous liquid that coats everything on contact and is very effective in maintaining hydrostatic pressure and temperature during drilling. If mud is allowed to dry on sensor shafts, accurate levels cannot be detected, as dried mud has a concrete-like consistency. This sensor-driven problem can force a time-consuming and expensive service call.

**Solution:** Gems designed a specialized, self-cleaning sensor that maintains consistent, accurate tracking as mud level rise and fall. Gems' mud sensors are manufactured with stainless steel, enhancing their durability. Accurate sensing and a rugged sensor keep the well running, and keep unscheduled downtime to a minimum.



## CHEMICAL INJECTION SYSTEMS

Real-time, remote tracking lets you stay in control.

**Challenge:** More than 70% of producing wells worldwide require some kind of chemical injection. Replenishing these chemicals is often via a 20th Century solution based on timing calculations. If the calculation is off, unnecessary replenishments can occur, or worse, chemical tanks can run dry and not fill their function in production.

**Solution:** Gems' continuous level transmitter technology combined with wireless telemetry provides remote, real-time access to inventory levels. The low power requirements of Gems' sensors allow them to be run from a variety of power sources, including solar panels.



## CNG/LNG STATIONS

Smarter, smaller systems to help control costs in rapid-growth sectors.

**Challenge:** CNG/LNG compressors, storage vessels and dispensers are at the heart of natural gas refueling systems for point of use and fleet service vehicles. Because CNG/LNG costs less to use and produces dramatically less CO<sub>2</sub> than traditional fuels, new refueling stations are being installed alongside of traditional gas/petrol stations at a rapidly growing pace. As stations expand, costs must be safely kept under control to stay competitive.

**Solution:** Gems' pressure transducers are built with reliable, sputtered thin film technology. The compact size makes it ideal for tight spaces so manufacturers can reduce the product footprint and corresponding costs. And our low-energy, continuous-transmittal technology adds a new level of safety as CNG/LNG refueling stations become accessible to a broader audience.

Gems' ability to support sensing needs for pressure, level, flow and valves makes us the 'go to' supplier for this expanding sector.



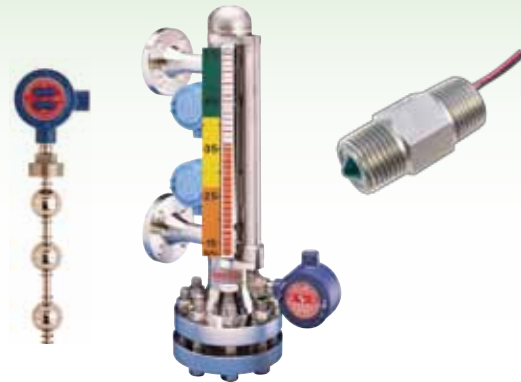
# PUT GEMS EXPERIENCE TO WORK FOR YOU

Your single stop for pressure, level, flow sensing and valves.



## Pressure Switches and Transducers

- Over 1 million units sold annually
- Unbeatable price performance ratio in a small package size
- Multiple technology platforms to meet hazardous environments



## Level Sensors and Transmitters

- Level sensing experts since 1955
- Widest range of material compatibility in the industry
- Highly scalable to meet the toughest applications requirements



## Flow Switches and Meter

- Large portfolio designed specifically for versatility and performance
- Reliable sensing of conductive and non-conductive fluids, as well as gases
- Gems flow switches feature high-quality, corrosion-resistant materials



## Valves and Manifolds

- Automatic fluid flow control of liquid or gases
- Bubble tight plunger for reliable operation over millions of cycles without failure
- Custom coils allow valves to exactly meet your wattage requirement
- Engineering capabilities to integrate multiple sensing technologies into modularize systems



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