

SmartLine Level Transmitter in Refining

Solution Note

SmartLine® Level Transmitter's guided wave radar technology delivers accurate level measurement at each step of the hydrocarbon refining process – delivering value across the plant lifecycle.

The refining process starts at the delivery of the raw hydrocarbon fluid to the processing facility and continues through a number of steps which separate and optimize the final products of the plant.

Seamless flow and precise control of the process ensures optimized product quality and profit for the operation. Reliable level measurement is essential to optimize the ordering and delivery of raw stock and additional chemicals required for the process. Real-time level readings are used to optimize tank capacity, the control of the processes, and to ensure overfill protection.

Variability in stock sources and quality and the need for flexible, fast, and cost effective adjustments of the process call for level measuring instruments that accommodate varying types of liquids in the same tank while ensuring accurate and reliable level measurement. This is true for the stock flow and to the many storage and process tanks for the various chemicals used in the refining process. With different liquids in the tank the properties of the measured liquids change. Properties such as density, viscosity, flammability, storage temperature and pressure, dielectric constant, and others will vary with the product. This calls for a universal level measurement that is immune to product variations allowing fast and convenient adaptation to the process.



FEATURES & BENEFITS

- ATEX, CCoE, CSA, US, FM, IEC Ex, NEPSI, KOSHA, SAEx approvals, and more
- Exceptional level tracking algorithm for accurate and reliable measurement
- Modular design
- Configuration software and DTMs included as standard. Easy programming via HART or FOUNDATION Fieldbus
- Comprehensive set of process connections and flanges
- Two-wire design saves on wiring and lowers installation costs
- SIL 2/3 and WHG certification
- Level and interface measurement

Solution

Industry experience has shown that guided wave radar (GWR) provides an effective solution for liquid level measurement, including operations involving hydrocarbons. It is a top-down, direct measurement technology, as it measures the distance to the product surface.

Honeywell has the broad and deep experience and technology to address this need with its line of SmartLine SLG700 Level Transmitters. These transmitters are designed for exceptional ease of use, reduced maintenance and reduced inventory costs – delivering value across the plant lifecycle.

Fully electronic, continuous level measurement allows measurement of both level and interface (separation) at the same time. Internal calculations enable SmartLine Level Transmitter to report measured level, distance, percentage, volume and mass (based on internally stored strapping tables) for the target tank.

In addition, SmartLine Connection Advantage combined with Experion® control system provides transmitter messaging, maintenance mode indication, and tamper alerts to improve field time to repair and control room communication thereby helping to avoid unit trips and to improve employee productivity.

Applications

SmartLine Level Transmitters are an optimal solution for hydrocarbon refining applications. These robust devices help oil and gas companies reduce project costs and startup time, avoid unplanned downtime, improve product quality, reduce spare parts inventory, and shorten time to repair.

Some typical applications in the refining process are listed and described in table on the following page. A key advantage of Honeywell's GWR solution is the internal level tracking algorithm which ensures that fluctuations in pressure, temperature, and most vapor space conditions have no impact on measurement accuracy.

SmartLine Level Transmitter Features

Like all SmartLine instruments, SmartLine Level Transmitters are modular in design, making it easy to replace or upgrade hardware in the field even under power without affecting overall performance or impinging on approval body certifications.

The instrument comes with a patented level tracking method, including unique Auto-Amplitude Tracking functionality, which allows continuous and reliable level tracking even when the amplitude of level reflection changes due to variability in batches, turbulence or foaming. The level measurement additionally employs Dynamic Background functionality, which significantly cuts on maintenance effort that would otherwise be needed due to buildup in the tank.

With advanced display and local configuration capabilities the SmartLine Level Transmitter enables field operators to more efficiently perform tasks and solve problems. The advanced graphics display is capable of showing process data in graphical formats and communicating messages from the control room.

In addition to allowing configuration with any handheld device via new Device Type Managers (DTMs), users can configure the transmitters through externally accessible buttons even in an intrinsically safe environment. Whether on the bench or in the field, it is easy to configure, to change tag information or to switch languages without the need for a handheld device.

The local level display provides stem plot with measurement values for the flange location, interface level and ullage level. The complete echo curve is visible through user interfaces such as the Experion control system or via DTM with industry common configuration tools such as Honeywell's Field Device Manager (FDM).

SmartLine Level Transmitter employs a unique Application Validation Tool that is used to simplify purchasing. The online tool allows users to input technical data about their specific process tank and validate that the correct level transmitter application is delivered to the site ready to install. Using this tool plant personnel are able to engage Honeywell level experts through a joint, online collaborative engineering session.



SmartLine SLG700 Level Transmitter

Typical Applications

| PROCESS / AREA | PURPOSE | APPLICATION | MEDIUM |
|---|--|---|---|
| Hydrocarbon storage, initial separation, chemical storage | Storage of incoming fluids | Level and interface measurement in storage tanks | Hydrocarbon stock, water, hydrocarbon products, chemicals (sulphuric acid, hydrochloric acid, sodium hydroxide, dispersants, flocculants, surfactants, glycols, diluents, inhibitors) |
| Chemical injection | Conditioning of the hydrocarbon feedstock | Level measurement in chemical injection skids | Hydrocarbon stock with additives (de-emulsifiers, foam and corrosion inhibitors, glycol, desalting chemicals) |
| Wellstream separation | Two or three phase separation to oil, water, gas | Level and interface measurement to control the separation process | Hydrocarbon stock with additives and water |
| Crude dehydration | Removal of remaining emulsified water | Level and interface measurement in knockout drums, heater treaters, chemelectric dehydrators | Hydrocarbon stock with additives |
| Desalting | Removal of salt (inorganic chlorides, suspended solids, trace metals) | Level and interface measurement in desalter units | Hydrocarbon stock, water, emulsion with contaminants |
| Crude degassing | Removal of dissolved gases, hydrogen sulphide, stabilization and sweetening of crude | Level measurement in reboiler and staged separators | Hydrocarbon stock with injected steam, hydrocarbon condensate |
| Vapour recovery | Recovery of hydrocarbon vapour | Level measurement in flash drums | Hydrocarbon condensate |
| Preflashing | Separation of vapours at the entrance to the main distillation column | Level measurement in the preflash drums | Preheated hydrocarbon stock |
| Distillation | Separation of hydrocarbon stock into fractions (streams) | Level measurement in distillation trays, distillation column bottom (bypass chamber), reflux drum, and reboiler | Hydrocarbon stock heated or condensed |
| Extraction | Processing of heavy fractions after distillation | Level and interface measurement in stripper and separator tanks | Heavy hydrocarbon stock with additives |
| Cracking / Stripping / Coking | Processing of heavy hydrocarbon fractions | Level measurement in regenerator, reactor, separator, blowdown and settling drum, and stripper | Heavy fractions in high temperatures, steam / condensate, catalyst |
| Alkylation | Creation of high octane blending stock | Level and interface measurement in the acid settling tanks, acid and water storage tanks, wash tanks | Hydrocarbon product, water, acids |
| Reforming | Upgrading of naphtha | Level and interface measurement in separator and wash tanks | Hydrocarbon product, water, additives |
| Blending | Mixing of the finished product | Level measurement for internal inventory control Level measurement in tanks for additives | Gasoline, alkylate, reformate, benzene, toluene, additives, detergents |
| Storage of finished products | Inventory control, overfill protection | Level measurement in interim and final storage tanks | Oils, gasoline, fuels, LPG |

SmartLine Transmitter Family

The SmartLine Pressure, Temperature, Level and Multivariable Transmitters deliver total value across the entire plant lifecycle, from construction to operations and maintenance.

Smart Performance: SmartLine accuracy, stability and response time result in tighter process control, improving product yield and quality.

Smart Design: SmartLine's innovative modular design reduces complexity by allowing quick in-field replacement of parts without taking transmitters out of process thereby reducing downtime, maintenance costs and spares inventory. SmartLine's universal terminals reduce costly wiring errors, troubleshooting and re-work by allowing loop wiring to be reversed. Rich advanced display and local configuration capabilities enable field operators to more efficiently perform tasks, solve problems and avoid errors without the need for a handheld device.

Smart User Experience: Smart messaging, maintenance and safety features as well as unique integration with Honeywell's Experion control system reduce design and operator errors and enable faster intervention to avoid process upsets..

SmartLine Support Services

This product comes with worldwide, premium Technical Assistance Center (TAC) support services which are part of the Total Care Field Instrumentation Services. The TAC services, along with the services provided by the local distributor, are designed to help customers improve and extend the usage of their field instrumentation, providing a safer, more reliable and more efficient operation.

Honeywell's Total Care Services bring 30 years of experience in terminals and the expertise of over 1,000 contracted customers around the world. Backed by the Honeywell Operating System, our support teams deliver greater in-depth domain and product expertise. We'll provide the right solution to critical issues—the first time—for a safer, more reliable and more efficient operation.

For More Information

To learn more about how Honeywell Level Transmitter technology can improve hydrocarbon product separation applications visit www.honeywellprocess.com/smartline or contact your Honeywell account manager, authorized distributor or system integrator.

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