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ABB MEASUREMENT & ANALYTICS | LEVEL MEASUREMENT

# LevelMaster series

A whole new level of accuracy



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## Measurement made easy

**Preventing spills and detecting leaks. Managing inventories. Ensuring accurate custody transfer. ABB Totalflow has the industry-leading technology to help you stay on top of it all—accurate, rugged and efficient liquid-level measurement systems that can help take your business to the next level.**

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# LevelMaster

## Level sensor product

Sarbanes-Oxley (SOX) regulations and other local and state requirements are driving companies to seek the most accurate and reliable measurement technology available. Your search can begin and end with the LevelMaster Digital Level Sensor.

The LevelMaster combines the industry's most innovative hardware and software to address the unique custody-measurement and operational needs of tank-level management. The LevelMaster provides not only an accurate level gauge but also an accurate measurement of the oil and water interface, for trustworthy oil sales.

Unlike other level-sensing technologies, LevelMaster provides precise levels without having to continuously adjust for changes in the unpredictable properties of storage-tank liquids. LevelMaster floats can measure oil, water and emulsion levels up to 25 feet (7.6m) deep, with a standard relative accuracy of 0.1 inch (2.5 mm) or optional high-precision relative accuracy of 0.05 inch (1.25 mm). Floats can be installed to measure only the topsurface level (single float) or both surface and interface levels (dual floats). In addition to measuring the liquid level, an RTD measures the liquid temperature at the load line.



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# The great idea meets the great outdoors

Measuring the LevelMaster's importance.

The LevelMaster provides high-precision level measurement for any tank up to 25 feet (7.6 m) tall. A LevelMaster of any length is an exceptional tool that can be relied on to:

#### **Ensure accurate sales**

For custody transfer applications, the measurement reliability, life cycle and no-drift accuracy of LevelMaster sensors are unsurpassed by competing technologies. When used with powerful XSeries technology, the LevelMaster is approved by the Bureau of Land Management for measuring gross volumes of oil in custody-transfer transactions.

#### **Prevent spills**

The LevelMaster can prevent environmental damage caused by spills. Combined with a Totalflow XSeries RTU, the LevelMaster automatically alerts all necessary parties in the event of an unexpected rise in the tank level or spill.

#### **Increase safety**

The LevelMaster not only provides accurate levels, it can also save lives. With the help of XSeries RTUs and software, the LevelMaster can provide accurate level data to offsite personnel, eliminating the need to perform manual measurement on hazardous sites. The LevelMaster is CSA-certified for use in Division 1, Group D Hazardous Environments.

#### **Reduce operating expense**

By utilizing a combination of XSeries RTUs and associated applications support, the LevelMaster reduces the need to drive to storage sites to monitor gas and liquids. Its simple, one-time installation and calibration enable the operator to "set it and forget it."

#### **Minimize training time**

The LevelMaster is designed to work with all Totalflow flow computers and RTUs, and offers the same trending tool as other Totalflow applications, so training time is minimal for those already familiar with this intuitive, user-friendly technology.





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# Technology doing what it should: simplifying your life

## Data-collection capabilities

As part of a system including Totalflow XSeries hardware and software and/or the LMC7100 LevelMaster Communication Package, the LevelMaster offers highly adaptable, data-collection capabilities. Data from the level sensors can be accessed either locally (near the tank) or remotely via wired or wireless networking.

### **In-field interfaces/software options**

- Push-to-read display near the tank (Totalflow XSeries device or LMC7100)
- MasterLink software on PC connected directly to the LevelMaster sensor
- PCCU software on PC connected to Totalflow XSeries device or LMC7100

### **Remote interfaces/software options**

- WinCCU software on a PC connected to an XSeries device or LMC7100
- TF.NET software on a PC in a web browser for multiple-client access to level data
- SCADA Advantage™ software on a PC provides multiple-client access to dashboard views, for comprehensive tank management
- Automated Voice Alarm System (VAS), which calls specified meter technicians, producers, and other relevant personnel in the event of an alarm condition detected on any Totalflow flow computer or remote controller

### **Communications options**

- RS-485 port with open ASCII protocol
- Licensed and spread spectrum radio
- Microwave and leased lines
- Cellular and cellular digital packet data
- LAN/WAN and satellite



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# Technology you can depend on, rain or shine

## **LevelMaster Communication Package**

The LMC7100 LevelMaster Communication Package is a low-cost system that significantly increases communication flexibility and decreases installation expenses, specifically the time-consuming practice of trenching through tank dikes to bury conduit and wire. The self-powered (solar energy and battery) LMC7100 enables communication between multiple LevelMaster sensors and a host system using spread-spectrum and low-power radio system. It is designed to be installed in a Class 1, Division 2 area on top of or at the base of a tank or tank battery.

Two LMC7100 models are available. One is a basic unit that utilizes a radio and barrier board for communication. The advanced unit uses a radio and PTR-195 electronics board and is based on Totalflow XSeries technology. This unit offers local push-to-read display plus custom control, trending and alarm capabilities.



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# Out here, there is simply no room for error

## Automation capabilities

For stand-alone operation, powerful and highly adaptable level measurement applications can be configured in PCCU and deployed on Totalflow XSeries flow computers and LMC7100 devices.

These applications can measure inputs, compute control logic, and drive output channels to automate the management of liquids at a tank battery. SCADAverage™ can gather data from multiple tank batteries and automate business processes for optimal production and disposal of liquids.

### **Tank Battery Automation**

The LevelMaster greatly enhances the automation of oil and gas producers' tank batteries. Designed to allow two floats on the same sensor assembly, the LevelMaster can measure the levels of two fluids of different densities in the same tank. The standard RTD measures the temperature of the fluid at the load line, and can be customized for any location on the sensor. With this data, numerous functions that used to require manual labor can be performed automatically, including:

#### **Saltwater separation and disposal**

Pumps to move the skim oil and water from the holding tanks are controlled by a LevelMaster and Totalflow RTU. The water disposal pump is automatically turned on or off based on the water level.

#### **Hauler scheduling**

The LevelMaster can eliminate the need to manually check tanks and schedule haulers of tank battery oil and water. Totalflow software such as TF.NET allows haulers to view near-real-time level data on a secure website and schedule pickup.

#### **Alarm and run-ticket generation**

By monitoring the rate of change on the LevelMaster's two floats, Totalflow RTUs can detect when liquid is transferring in or out of the tank and then automatically trigger electronic run-tickets and exception-based alarms.

#### **Redundant crosscheck of transfer status**

When valve position switches are monitored, the LevelMaster can automatically crosscheck the status of the transfer.





# Never have you felt so in control so far away

## **Liquid Custody-transfer Automation**

Oil-transfer tickets can be automatically generated or audited by combining a LevelMaster with a BS&W monitor and densitometer. This highly efficient sales method benefits from a proprietary algorithm in the Totalflow RTU that filters out normal production “waves” and automatically senses an actual drop in level.

The main benefits of automated custody-transfer transactions include:

### **Regulatory compliance**

The LevelMaster helps companies comply with SOX and other local ordinances related to custody transfer as well as environmental issues such as spill-prevention.

### **Reduced manpower**

LevelMaster eliminates the need to have personnel physically present at the site to witness sales and gauge tanks.

### **Improved accuracy**

LevelMaster is at least two to five times more accurate in obtaining the level than required by API Chapter 18, Section 1. LevelMaster samples the fluid temperature at least 30 to 45 times, as opposed to the standard three samples normally required.

### **Continuous monitoring**

With LevelMaster serving as around-the-clock “pumper’s eyes,” oil theft and oil loss can be monitored and documented, with time-stamped occurrences noted.

### **Greater safety**

Keeping gauges and pumpers off the tanks reduces climbing accidents and avoids exposure to H<sub>2</sub>S, benzene and other poisons, carcinogens and harmful chemicals.

### **Less operating expense**

LevelMaster automation eliminates monthly calibrations that require expensive equipment and manpower to witness.

### **Easier communication**

Remote access of data is available through many types of remote communication channels, including radio, land and cell lines, and satellite.



# LevelMaster series: A whole new level of accuracy

## High level switch assembly

Communication can be interrupted by a number of factors beyond our control: natural occurrences such as lightning strikes or fire, or mechanical breakdown such as battery failure. For these situations, we developed the High Level Switch Assembly.

If communication between the LevelMaster and the RTU is interrupted, or if the Totalflow flow computer or RTU loses power, the High Level Switch Assembly serves as a redundant safety shutdown control mechanism. Designed as a single metal float separate from the flow computer or RTU, the High Level Switch Assembly can be set to “normally open” or “normally closed” to suit the application. It is available in lengths of up to 36 inches (914 mm) with an adjustable range of 24 inches (610 mm).

The High Level Switch Assembly also can serve as a stand-alone switch that provides fail-safe shutdown of oil or saltwater tanks with 2-inch (51 mm) ports.

## Other industry applications and benefits

### Regulatory compliance

The LevelMaster helps companies comply with SOX and other local ordinances related to custody transfer as well as environmental issues such as spill-prevention.

### Liquid transport

The LevelMaster is an ideal solution for measuring liquid levels in mobile containers such as those transported by 18-wheelers and rail cars.

## Water utilities

The LevelMaster can be used to monitor remote culinary water tanks and provide leak detection. As opposed to pressure transducers that only provide an estimate over time, the LevelMaster is designed to detect an extremely small water-level difference.

## Groundwater

The LevelMaster can provide accurate level measurement of any type of groundwater.

## Chemical

The LevelMaster provides safety in the most caustic chemical environments. In these applications, many other sensors would fail within days. The LevelMaster has a special outer casing that allows it to be used in almost any chemical process, including chrome plating, plastics, biological, photo processing, and tanning.

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# ABB level products

## Reassuringly right

There is not an engineer, sales representative, customer service professional or technician on the ABB Totalflow team who doesn't believe in doing the job right every time. It's more than a matter of pride—it's a matter of responsibility. When we tell a customer that our products will deliver the most accurate information in the most efficient manner possible, a lot is at stake. The customer's profitability, for one. And our reputation. Part of our reputation is making sure the customer is satisfied no matter what. So, if a standard product is not enough, our project engineers will create the right solution for your business. Discover how much easier life can be when you go with the 'flow—ABB Totalflow.





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