

## INTRODUCTION

The ABB Totalflow LevelMaster product currently provides level and temperature measurement in remote oil field environments. The LevelMaster level sensor has the capability of measuring up to two levels (oil and either emulsion or water) per tank.



The latest member of the ABB LevelMaster family, the LevelMaster Communication Package, has been developed to reduce installation cost and increase communication flexibility. No more trenching through tank dikes and burying conduit and wire. The LMC7100 is designed to be installed in a Class I, Division 2 area on top of or at the base of a tank or tank battery. The LMC7100 is self-powered and enables communication between multiple LevelMaster sensors and a host system using a spread spectrum or low power radio system.

The LMC is available in two versions:

- The basic unit utilizes a radio and barrier board for communication.
- The advanced unit uses a radio and PTR-195 electronics board featuring Totalflow's XSeries technology. The advanced unit offers local push to read display, plus custom control, trending and alarm capabilities.

Either LMC solves the worst installation and communication problems in one reliable low cost product.

## BENEFITS

- Reduced installation cost, no trench to dig, no

cable or conduit to bury

- Local display of temperature and levels available
- Self-powered using solar power and battery
- Supplies power and communication for up to four LevelMaster sensors
- Contains radio for remote communication to base station, flow computer or RTU
- Certified for installation in Class I, Division 2 area
- Can be mounted on, or at, the bottom of tank or tank battery
- Remote monitoring of level and temperature
- Communication via simple ASCII protocol
- Communication to Totalflow host software

## DESCRIPTION

The Basic LMC 7100 is designed to enable communication between LevelMaster sensors and higher-level devices. Within the ABB Totalflow family, the Basic LMC can report levels and temperature directly to flow computers and remote terminal units. The FCU or RTU can communicate with the LMC using a radio and communication port. The FCU or RTU can then perform tank volume calculations, trending and alarm functions. The LMC may also be directly poled by the Totalflow WinCCU software located at a remote base station.

This basic LMC is also capable of communication with other third party devices such as PLCs or Scada systems using the LevelMaster ROS ASCII protocol. When polled, the unit will report level(s) and temperature for the unit specified in the poll, along with any alarm code that may be present.

The basic LMC 7100 unit can be configured with a radio, solar panel and battery. The unit comes standard with an intrinsic safety barrier board and charger regulator board. Intrinsically safe power and communication for up to four LevelMaster units can be provided from one LMC. All wiring between the LMC and LevelMaster sensors is intrinsically safe and needs only to be protected from physical damage; conduit and seals are not required. The radio is connected to the barrier board via the RS-485 connection on the board.

The Advanced LMC 7100 contains a PTR-195 electronic board with 2 communication ports, one digital

input and one digital output. The digital input is typically used for the push to read button located on the unit. The digital output can be programmed to activate or turn off a pump or operate a valve based on the level of the tank. The Advanced LMC can be configured with a local display activated by a push button that displays levels and temperature for each tank connected to the LMC. The Advanced LMC can construct data logger files of tank information and from the files report levels and temperatures directly to the Totalflow host software products (WinCCU, TDS32) using Totalflow protocol. Cryout functions are available and can be programmed to alert operators on high or low tank level conditions. The advanced LMC can also communicate with other third party devices such as PLCs or Scada systems using various forms of Modbus.

The Advance LMC has XSeries RTU programming capability and can be configured to locally perform tank volume calculations, to trend levels and temperatures, perform alarm functions and provide a local display. The local display is connected to a push to read button to conserve power. The display will show the operator the levels, temperature and any alarms that may be present on all tanks connected to the LMC.

The Advanced LMC has the capability to communicate with and supply power to up to four LevelMaster level sensors. The unit comes standard with electronics board and intrinsically safe barrier board. The unit can be optionally configured with radio, solar panel, battery, push to read switch and visual display. The Advanced LMC also contains a PCCU connection to allow modification or loading of firmware and application software in the field using a Laptop Computer.

#### Input/Output Hardware

- 1 Digital Output
- 1 Digital Input
- 2 Communication Ports RS-232 or RS-485

#### Application Software available in Advanced LMC

- Real-time Data Logger (trending)
- Control of levels using:
  - ◊ Valve Control
  - ◊ Pump Control
- Tank strapping for volume calculation and display
- RAMS – Remote Alarm Monitoring System
- Alarm Logging

- Trending of levels and temperatures
- Press to read function
- Run Ticket software
- Leak and theft detection

*Note: All of the above functions are available in the XSeries flow computer and RTU when used with a Basic LMC.*

#### FEATURES

- Significant hardening against over current / transients
- Resetting fuses and transient protection on:
  - ◊ VBATT and SWVBATT outputs
  - ◊ Digital output
  - ◊ Battery charger input
- EMI/RFI suppression beads on all I/O ports
- Protection against reverse polarity wiring
- Low power design for solar power operation
- Aluminum enclosure, powder coated
- Flexible communications hardware RS-232/RS-485
- Rechargeable, lead acid batteries
- Solar panel charging for battery
- Dual level security code data protection
- Tank strapping for volume calculation
- Run Ticket calculation and generation
- Advanced embedded data logger (ex: trending of levels for theft and leak detection)
- Alarming on theft or leak detection
- Class I, Division 2 Groups C and D, CSA Hazardous Area Classification
- Real time clock that keeps running of lithium battery
- Programmable alarm filtering
- User programmable Modbus register maps
- User programmable math and logic sequences

LMC GENERAL SPECIFICATIONS	
Dimensions	Width - 12.756 in (324.00mm) Length - 17.23 in (437.64mm) Depth - 10.269 in (260.83mm)
Weight	8.60 lbs (3.9 kg) without Battery
Mounting	Wall, Pipe, or Rail
Operating Temperature	-40 to 185 F (-40 to 85 C)
Humidity	0 to 95% non-condensing
EMC Requirements	<p>EMMISSIONS</p> <p><i>European Regions</i> EN55022 Class A Emissions (Radiated and &amp; Conducted)</p> <p><i>North American Regions</i> CFR 47, Part 15, Subpart B Class A, FCC Emissions ICES-003 Issue 2, Rev. 1 Class A ITE Emissions</p> <p>IMMUNITY</p> <p><i>European Regions:</i> EN50082-1:98 Immunity EN61000-4-2.95, ESD, ± 8 kv Air, ± 4Kv Contact EN61000-4-3.95, RF Immunity, 10V/m EN61000-4-2.95, EFT, 1kV EN61000-5-5:95 Surge; 1kV line to line, 2kV line to earth EN61000-4-6.95, Conducted Susceptibility, 3Vrms EN61000-4-8.93, Power Frequency Magnetic Field 3 A/m EN61000-4-11.94 Voltage DIP and interrupt</p>

PTR 195 BOARD	
Power	Nominal 12 VDC Battery
Charger	Solar or 16 to 18 VDC
Memory	Data stored in 512K SRAM. (lithium battery backup) Applications programs stored in 512K Flash Flash loader stored in 512K PROM Registry and Configuration files stored in 32K E PROM
Comm Ports	1 - dedicated - PCCU (Local Configuration Port) 2 - RS-232 or RS-485 (via board insertion modules)
LCD Interface	Dedicated interface for 2 X 24 Liquid Crystal Display (LCD)
Keypad Interface	Dedicated interface for option ABB supplied keypad
I/O Scan Rate	One time per second
Digital Input	One input configurable as active or passive with optional software de-bounce
Digital Output	One output open channel FET transistor switch

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