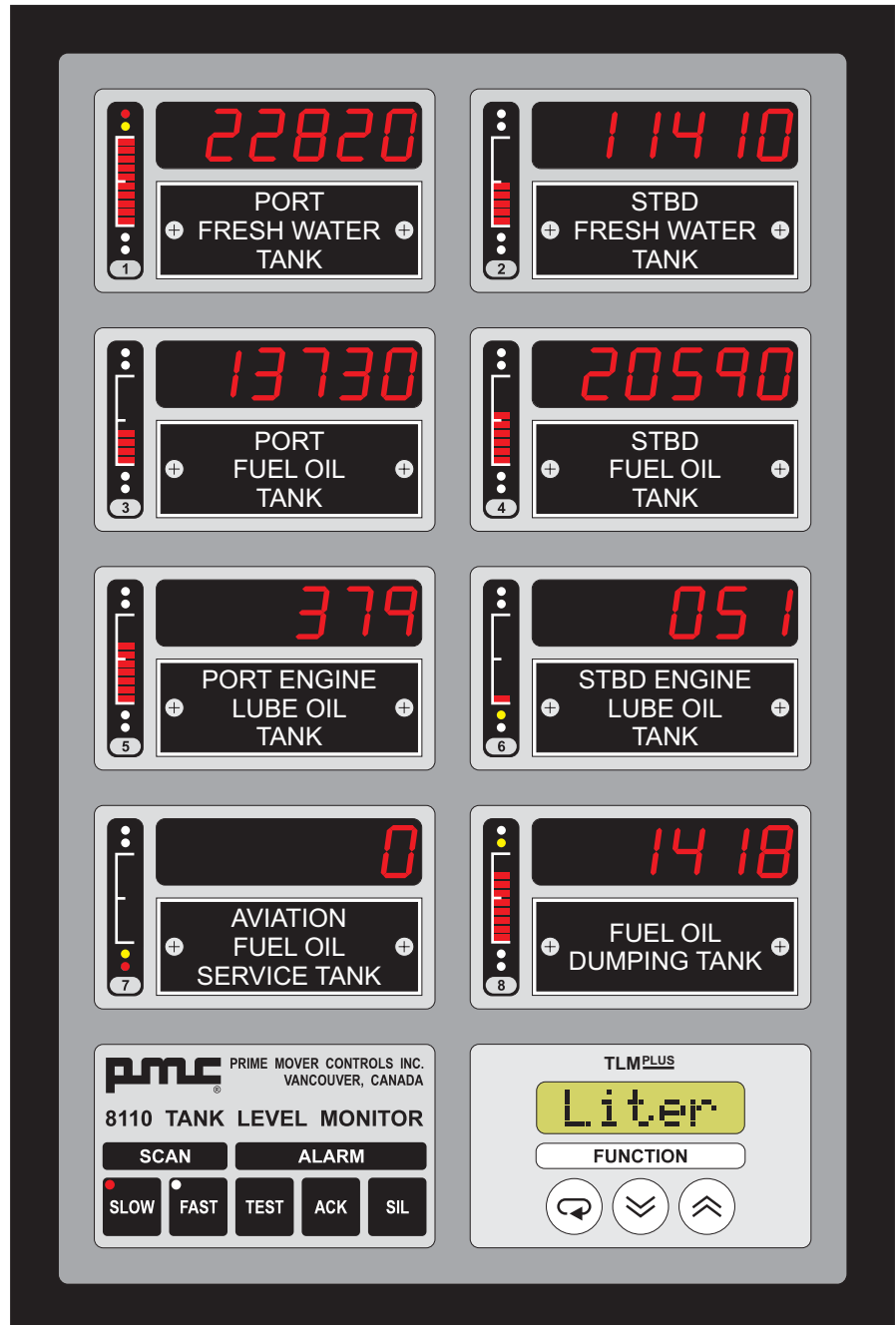# TANK LEVEL MONITOR

# Type 8110

## FEATURES

- Monitors volume or level of eight tanks simultaneously

- Large six digit LED displays for tank level status

- Bar graph displays percent of volume

- Backlit LCD shows unit of measure: liters, cubic meters, US & Imperial gallons, feet, meters, etc.

- Up to six alarms per tank including: two high level, two low level, high flow rate and transducer fault

- Adjustable slow and fast scan rates

- Vessel draft can be monitored

- Easy programming with front LCD or external computer

- Manual entry or automated calibration of tank shape tables

- Analog outputs for remote displays

- Relay outputs for remote alarms or pump controls

- Easy connection to PMC repeaters and alarm products via the RS-485 communication port

- Uses standard 4 to 20 mA transducers

- IP65 splash proof, flush mount

- Marine approvals



| Display | Tank |
|---|---|
| 22820 | PORT FRESH WATER TANK (1) |
| 11410 | STBD FRESH WATER TANK (2) |
| 13730 | PORT FUEL OIL TANK (3) |
| 20590 | STBD FUEL OIL TANK (4) |
| 379 | PORT ENGINE LUBE OIL TANK (5) |
| 051 | STBD ENGINE LUBE OIL TANK (6) |
| 0 | AVIATION FUEL OIL SERVICE TANK (7) |
| 1418 | FUEL OIL DUMPING TANK (8) |

PRIME MOVER CONTROLS INC.
VANCOUVER, CANADA

8110 TANK LEVEL MONITOR

SCAN: SLOW FAST
ALARM: TEST ACK SIL

TLM PLUS
Liter
FUNCTION

# PRIME MOVER CONTROLS INC.

## EIGHT TANK LEVEL DISPLAYS

**205.90**

**STBD FUEL OIL TANK**

8

### Alarm Indication:
- Two high level alarms
- Two low level alarms
- High flow rate and/or leak alarm
- Transducer fault alarm
- LED indicators and internal audible alarm for each alarm condition
- Adjustable time delay for each level alarm point
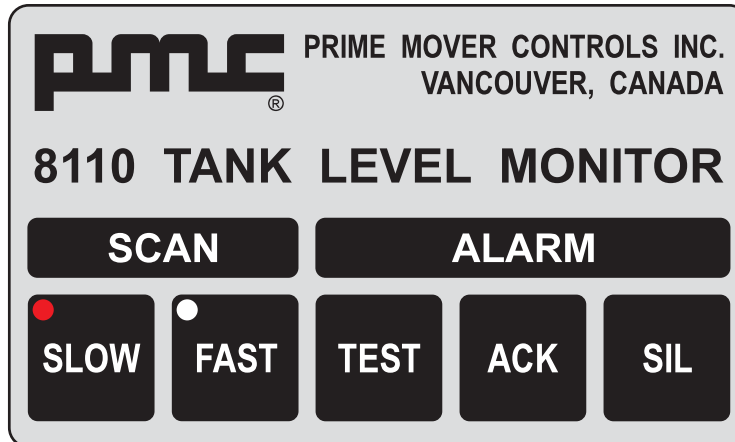- Relay contacts for remote displays, audible alarms, or pump control

### Level Indication:
- Six digit display for tank level measurement
- Ten segment bar graph for tank volume
- Output to slave 8110 for remote display
- Outputs for remote analog meters
- Engraved ID nameplate for each tank

## OPERATION INTERFACE

**PRIME MOVER CONTROLS INC. VANCOUVER, CANADA**

**8110 TANK LEVEL MONITOR**

| SCAN | ALARM |
|------|-------|

| SLOW | FAST | TEST | ACK | SIL |
|------|------|------|-----|-----|

### Scan Rate Interface:
- Touch keys for slow and fast scan rate selection
- LED indicators show selected scan rate
- Slow scan smooths the effects of sloshing liquids
- Fast scan gives instant level indication when transferring liquids or filling tanks

### Alarm Interface:
- Touch keys for Test, Acknowledge, and Silence
- Internal horn alarm
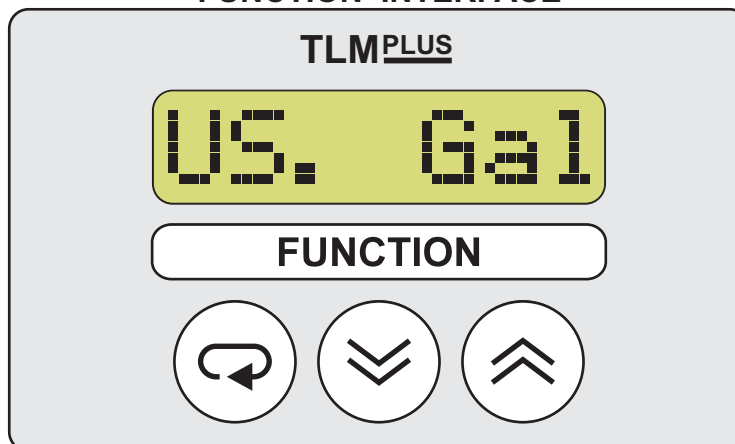- Compatible with the PMC family of alarm and remote repeater products

## FUNCTION INTERFACE

**TLM PLUS**

**US. Gal**

**FUNCTION**

**Shown Actual Size**

### Function Interface:
- Large LCD shows current unit of measure
- Touch keys for selecting unit of measure and changing parameters
- Setup parameters are entered by touch keys or transferred from a computer through the communication port

### Nonvolatile Memory:
- Retains parameters when power is off
- Password and external lockout prevents accidental or unauthorized changes
- All parameters are stored in a removable memory module for easy transfer to spare unit

### Units of Measure:
Units of Volume:
- Percent
- Liters
- cubic meters
- US gallons
- imperial gallons
- custom volume unit
- Units of Height:
- Meters
- Millimeters
- Feet
- inches
Units of Pressure:
- kPa
- psi

### Tank Shape Tables:
- Corrections for irregular shaped tanks are entered manually or created by using one of two automated calibration modes

## GENERAL DESCRIPTION

The PMC type 8110 Tank Level Monitor is designed specifically for marine systems, as well as a wide range of industrial applications. The 8110 is a combined tank level indicator, controller, and tank alarm annunciator capable of simultaneously monitoring eight tanks. The compact, flush mounted anodized aluminum enclosure along with the Lexan front provides IP65 splash proof protection. Using micro controller technology and operating from standard 24 $V_{DC}$ ship's batteries or commercial power supplies provides the 8110 with versatility and reliability.

Standard 4 to 20 mA pressure and ultrasonic transducers are used to measure the level of liquid in each tank. Low cost transducers, such as a basic 0 to 5 psi without zero or span adjustments, may be used because the 8110 internally adjusts for transducer range and tank shape.

To meet marine requirements the 8110 is equipped with a slow and fast scan update rate. Slow scan is used to smooth the displays from the effects of liquids moving erratically in the tanks due to vessel motion. Fast scan is used to give rapid level indication when transferring liquids or filling tanks. An additional feature for marine applications is the 8110's ability to monitor a vessel's draft.

Ease of use is a major feature of this versatile tank monitoring system. Six touch keys are used to operate the 8110. They are used to control the tank level scan rate, respond to alarm conditions and select which unit of measure is to be displayed. Each of the eight tanks have a large six digit display, a bar graph for volume, and four indicators for alarm points. A large eight character LCD shows at a glance the selected unit of measure for all the tanks.

The 8110 operates as a tank alarm annunciator panel with six alarm points available for each tank. These points are high level, very high level, low level, very low level, high flow rate for leak detection and transducer fault. A programmable time delay is provided for each alarm point to minimize the effects of sloshing liquids. Each alarm point can be programmed to operate the internal horn and any one of the four built-in relays. The isolated relay contacts are connected to terminals for easy wiring to remote indicators, audible alarms or remote control devices. Touch keys are provided to silence, acknowledge and test the alarm points.

The 8110 is able to communicate with other PMC alarm products throughout the vessel. When connected over a simple two-wire bus, alarm information may be displayed over transmission distances of 4000 feet using reliable communication standards.

Up to four analog meters may be connected to the 8110 for remote tank level display. Also, a slave 8110 may be connected to the communication line to provide a complete duplicate display at a remote location.
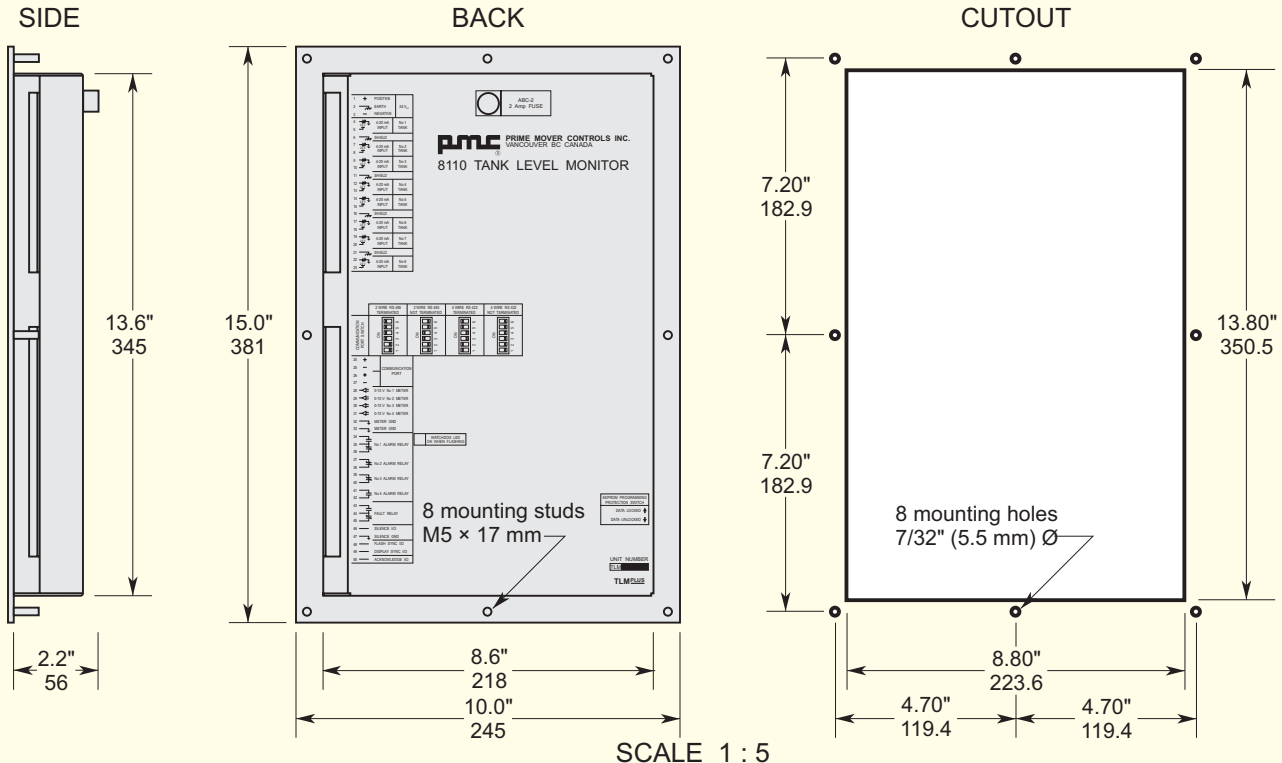
Corrections for irregular shaped tanks are done using tank shape tables. These tables can be manually entered or created by using one of the 8110's two automated calibration methods, as follows:

1.  Manual calibration from tank tables: Tank height vs. tank volume data is entered directly into the 8110 from tank tables supplied when the tanks are designed or constructed.

2.  Automated calibration by filling the tank at a constant flow rate: Activate the internal timer when filling begins and stop it when the tank is completely filled. Then enter the volume of liquid added and the 8110 will create and store the tank shape table.

3.  Automated calibration by filling the tank in predetermined amounts: Fill the tank in small steps and enter the amount of liquid added after each step. This can be done by using a fuel flow indicator at a filling station or 50 gallon drums. After the tank has been completely filled, the 8110 will create and store the tank shape table.

The 8110 is programmed by three touch keys and a LCD, or optionally by transferring a text file from a computer through the 8110's communication port. A wide selection of programmable parameters are available, such as tank characteristics, specific gravity for each liquid type, and alarm points. A password and a memory protection switch are incorporated to prevent accidental or unauthorized changes to the setup parameters. Battery back-up is unnecessary as the tank setup parameters are held in non-volatile memory and retained for an indefinite period of time even if the 8110 is not powered.

A wide variety of accessories are available from PMC to meet your tank level system requirements.

# DIMENSIONS AND CUTOUT FOR 8110 TANK LEVEL MONITOR

SIDE    BACK    CUTOUT



**SIDE dimensions:**
13.6" / 345
15.0" / 381
2.2" / 56

**BACK:**
PRIME MOVER CONTROLS INC.
VANCOUVER BC CANADA
8110 TANK LEVEL MONITOR
ABC-2 2 Amp FUSE
8 mounting studs M5 × 17 mm
8.6" / 218
10.0" / 245

**CUTOUT:**
7.20" / 182.9
7.20" / 182.9
13.80" / 350.5
8 mounting holes 7/32" (5.5 mm) Ø
8.80" / 223.6
4.70" / 119.4
4.70" / 119.4

SCALE 1 : 5

Mounting hardware is included with each panel and consists of 8 nuts and washers.

## SPECIFICATIONS:
### Supply:
- nominal 24 $V_{DC}$, range 17 to 36 $V_{DC}$
- 1 A nominal, 1.5 A peak
- reverse and over voltage protection to 120 $V_{AC}$
- input power fuse, 2 A type ABC-2

### Environmental:
- operating temperature 0 to +70°C
- storage temperature -40 to +85°C
- vibration: frequency range 2 to 100 Hz
  Peak to peak amplitude 2 mm below 13.2 Hz
  Acceleration amplitude 0.7 $g$ above 13.2 Hz
- CE compliant for EMC (IEC/EN60945)

### Physical:
- IP65 splash proof front
- flush panel mounting
- Dimensions 381 mm H × 245 mm W × 59 mm D
  (15" H × 10" W × 2.3" D)
- weight 4.5 lbs (2 kg)
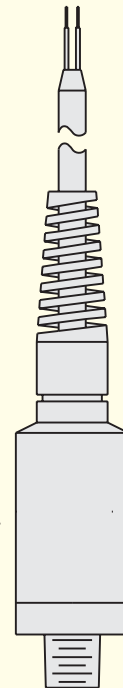- plug in terminals for 14 to 20 AWG wires

### Inputs/Outputs:
- eight two-wire 4 to 20 mA transducers
- RS-422 / RS-485 communication port
- five relay contacts, 1 A @ 24 $V_{DC}$

- four meter drivers, 0 to 10 $V_{DC}$
  @ 5 mA, ±1% FSD
- external / common horn silence line

### SYSTEM ACCESSORIES AVAILABLE FROM PMC:
- pressure transducers
- ultrasonic level transducers
- intrinsic safety barriers
- remote analog meters (illuminated)
- remote alarm repeater panels
- control relays
- bells, horns and beacons
- enclosures
- fittings and isolation valves
- factory preprogramming
- project specific connection diagrams drawn with AutoCAD
- installation, calibration and testing of complete system by PMC technician
- the Type 8110-8900 Comm8110 Tank Level Monitor Setup Software is available separately to automate the setup of the 8110 using a computer.

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