

GTM – GRAPHICAL TANK MONITOR OPERATOR'S MANUAL



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INTRODUCTION

The GTM – Graphical Tank Monitor is a ready to use system for tank monitoring, complete with level and temperature indication. Also included are two level alarms per tank, allowing the GTM to prevent overflow, or to actuate other devices at predetermined levels.

SENSOR INPUTS

The GTM accepts any two-wire, level sensor with a 4-20 mA output. Linear (vertical) tanks require only two point scaling, which can be performed either by keying in the current signal, or through the use of its built-in learn mode. For nonlinear applications, such as horizontal tank measurement, up to 100 scaling points can be entered via the free Crimson software package. The GTM also accepts two, or three-wire, 100 Ohm platinum RTDs to monitor tank temperature. The trending feature allows an operator to look at a history of the temperature, similar to that of a chart-recorder.

STANDARD PROGRAMMING

All standard programming is done via the bright 10.4" touchscreen. Critical parameters are protected by a programmable password, while often-changed values are accessible via an easy to use menu.

OPTIONAL FEATURES

The unit comes standard with Ethernet and RS485 ports, which allow unlimited connection possibilities to PCs, PLCs, and SCADA systems. As an option, Red Lion can configure the communications protocols, addresses, and memory map prior to shipment. The built-in web server allows users to view and control the GTM from any networked PC via standard web browser.

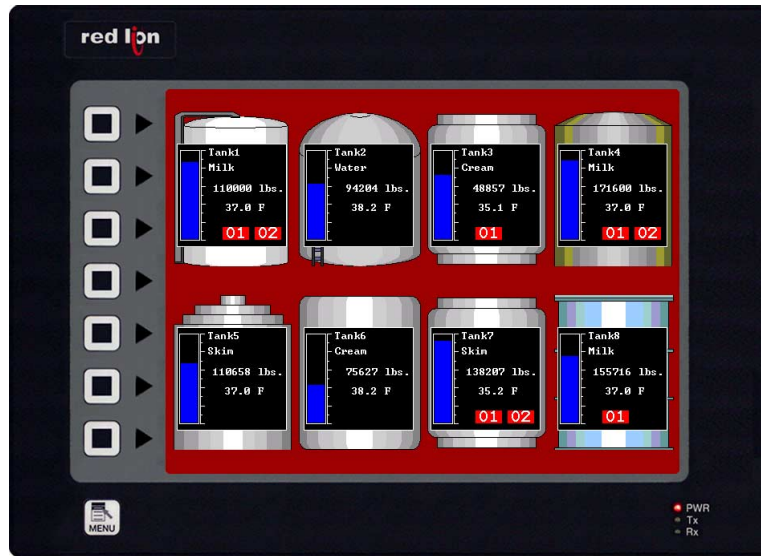
ENCLOSURE

Enclosed in a stainless steel Hoffman Concept[®] cabinet designed specifically for the food and beverage industry, the GMT is suitable for use in demanding applications such as those found in the dairy and beverage markets.

OPERATION

Navigation and programming is done via the bright 10.4" touchscreen.

MAIN SCREEN



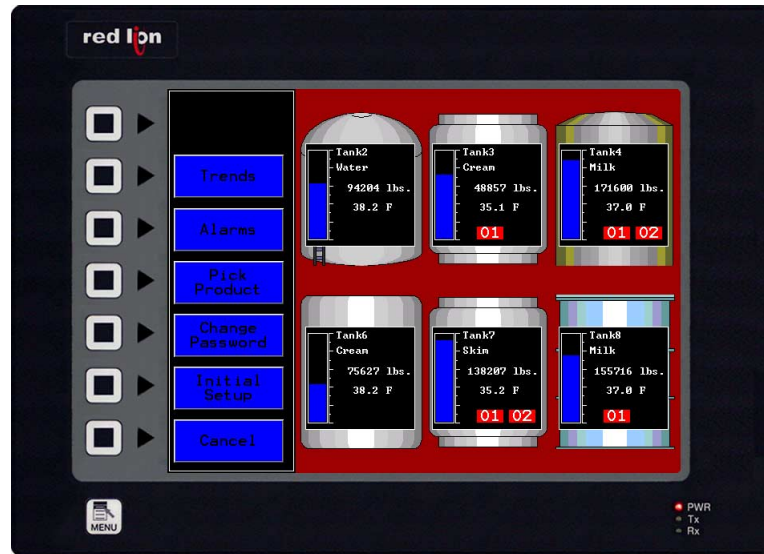
The main screen of the GTM displays all relevant information at a glance. This includes the following...

- Tank Name
- Tank Contents
- Lbs. of Product Contained
- Temperature of Contents
- Bar-graph – Graphically displays the level of the contents.
- Alarm Status – Annunciators indicate the status of each tank alarm.

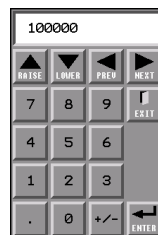
NAVIGATION

PAGES AND MENUS

Pressing the menu key from any page provides a pop-up navigation menu. You may touch the graphical button, or the physical button located next to the touchscreen, to navigate.



DATA ENTRY FIELDS



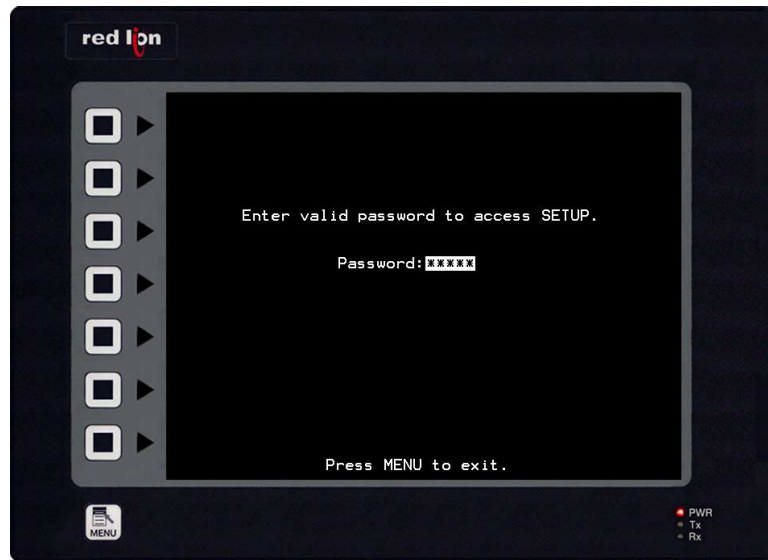
To adjust a numeric field, such as an alarm value, simply touch the field. A numeric keypad will appear, which will allow you to edit the field. Pressing enter will commit the number to memory, and close the keypad.



To adjust an alphanumeric field, such as a tank name, simply touch the field, and a keyboard will appear. The keyboard works in a similar fashion to that of a typewriter keyboard, in that SHIFT invokes uppercase for a single character, and LOCK causes the uppercase characters to remain on until you press LOCK for a second time. Pressing SYMBOL, as well as SHIFT+SYMBOL, accesses extra characters such as numeric, punctuation, and symbols.

In some rare cases, such as the Select Product menu, pressing a field causes a specific list of choices to appear. In this case, press the appropriate field to commit it to memory.

INITIAL SETUP

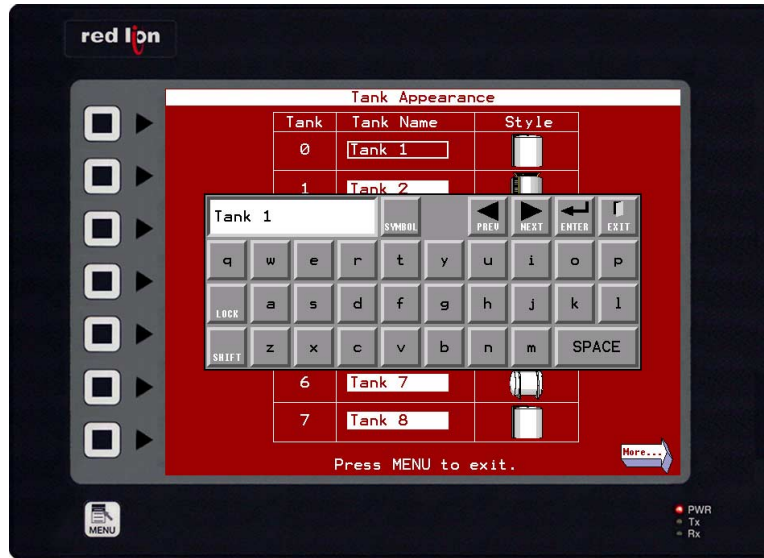


PASSWORD PROTECTION

Initial setup should be performed immediately after installation to ensure accurate monitoring. The proper password must be entered to access the setup menus, which prevents unauthorized or accidental changes. The default password is “0”. It is strongly recommended that the password be changed to something other than the default during installation. (See Change Password.)

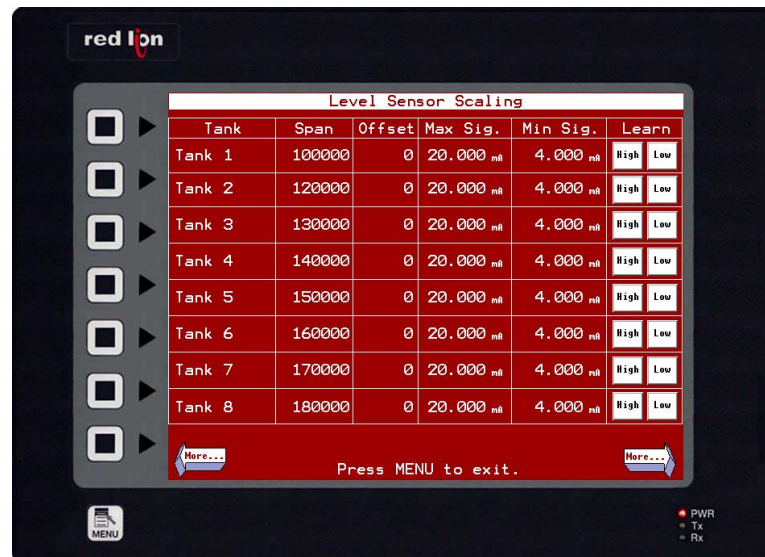
Once the proper password is entered, you may use the “<- More ->” buttons at the bottom of the screen to navigate through the various setup screens.

TANK APPEARANCE



The first page of the Initial Setup menu allows you to enter a meaningful name for each of the tanks, as well as choose a tank graphic for each. To change the tank name, simply double-tap the desired field, and an alphanumeric keypad will appear. To change a tank's graphic representation, touch the tank next to the name.

LEVEL SENSOR SCALING



Each level input must be scaled to accurately measure the contents of the tank. The Span is the value that will be displayed when the Maximum Signal is reached, and the Offset is the value that will be displayed when the Minimum Signal is reached.

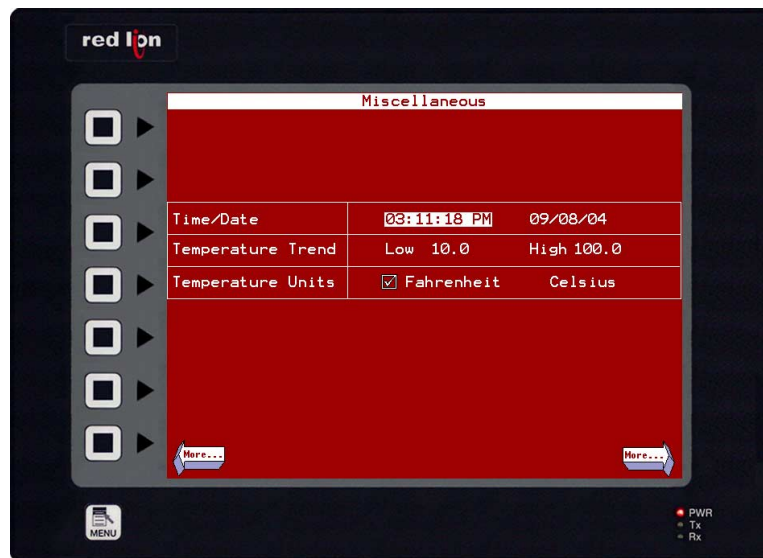
EXAMPLE 1

Suppose you have a pressure sensor that will transmit a 4-20 mA signal based on the level of a vessel that can hold 100,000 lbs. of water when filled to capacity. You would simply enter a Span of 100,000, and an Offset of 0, with Maximum and Minimum Signal values of 20.000 and 4.000 respectively.

EXAMPLE 2

Taking the above example a bit further, if the sensor was mounted a foot or so above the bottom of the tank, and it was determined that 700 lbs. of water was under the sensor and therefore unmeasured, you would enter 99,300 as the Span, and 700 as the Offset. The Signal values would still be 20.000 and 4.000 mA.

Instead of entering the Maximum and Minimum Signal values manually, you may also choose to allow the system to learn the actual signal. To do this, simply press the Learn High or Learn Low button when the appropriate signal level is applied.

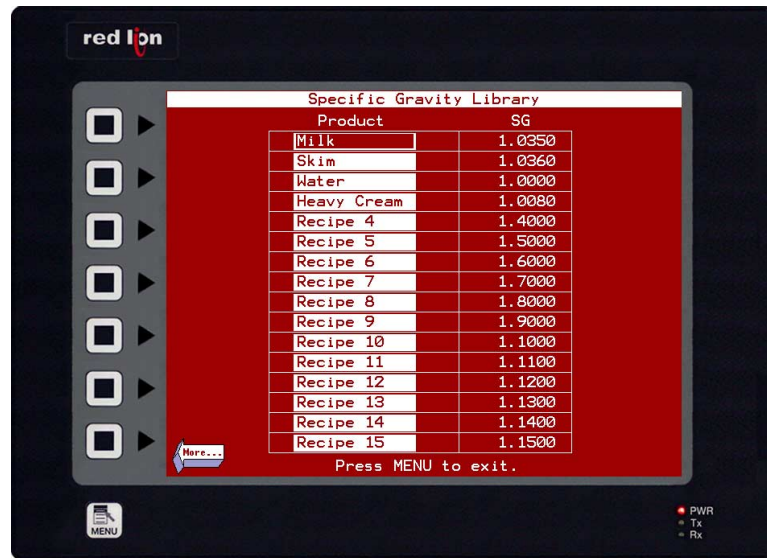
MISCELLANEOUS

The Miscellaneous page allows the adjustment of several parameters that are loosely related. The time and date may be adjusted, which is important for the historical trending and data logging features.

The Temperature Trend Low and High values determine the minimum and maximum scale of the historical trend viewer.

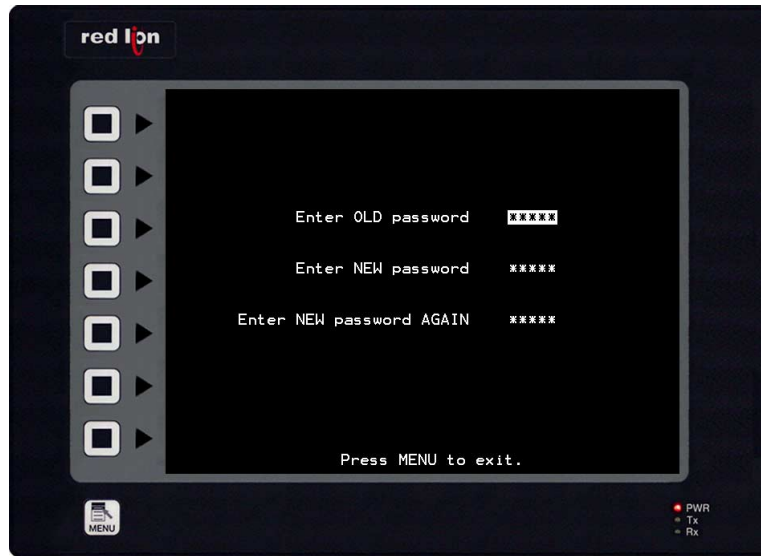
The Temperature Units field allows the panel to display and record temperatures in either Fahrenheit or Celsius.

SPECIFIC GRAVITY LIBRARY



The Specific Gravity Library provides the means to store up to 16 different liquids, as well as their specific gravity. This allows the operator to assign various liquids to different tanks by name, instead of by specific gravity. (See Selecting a Product.)

CHANGE PASSWORD

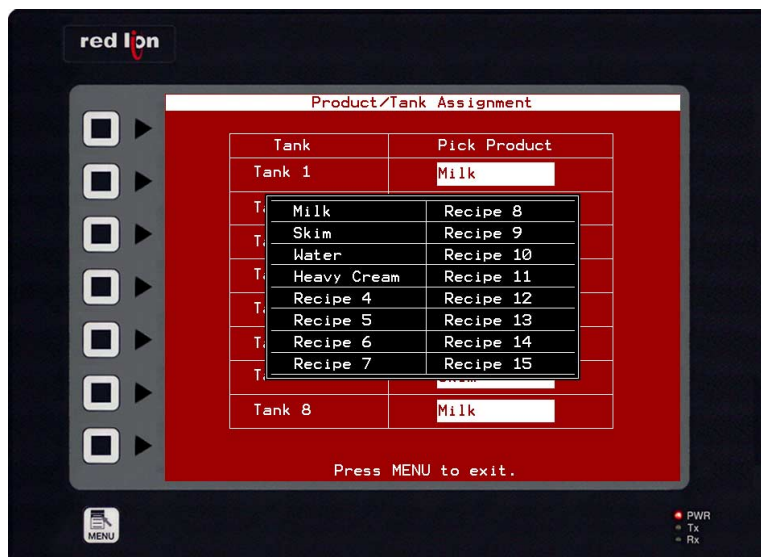


The Change Password page allows you to enter a new password to prevent access to the setup menus. After entering the current password (default password is “0”), you may enter a new one. You must enter the new password twice to ensure you know what you typed! Immediately after entering the new password for a second time, the display returns to the main page.

Pressing the Menu key at any time during the above sequence aborts the change, and the old password is retained.

SELECTING A PRODUCT (PICK PRODUCT)

As contents of a given tank are likely to change, the Pick Product page is accessible directly from the main menu.



PRODUCT SELECTION

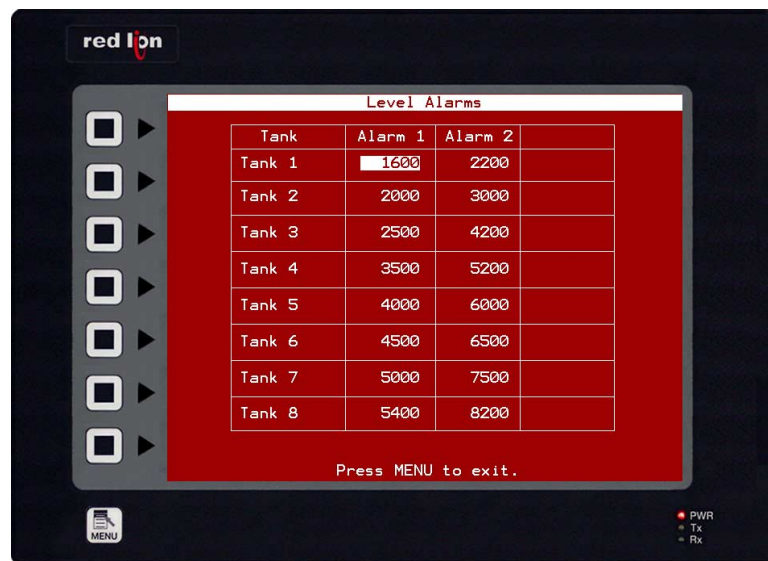
This menu allows you to select the product contained in each vessel. Simply touch the product field next to the appropriate tank, and a menu containing up to sixteen product types will be displayed. Touch the desired product to assign it to the tank.

Press the Menu key to return to the main display.

ALARMS

The GTM provides two high-acting relay outputs per tank. These may be used to energize auxiliary equipment, or two warn of overflow conditions.

SETPOINTS



The alarms menu shows the values, in lbs., at which the alarms will energize. To change a value, simply press it, and a numeric keypad will pop up. Type in the new alarm value, and press Enter.

TRENDS

The Trends pages display the temperature of the vessels, as well as a historical trend. Use the “More...” buttons at the bottom to select tanks 1-4, or tanks 5-8.

ADJUSTING THE VIEW

The < and > keys at the bottom of the trend window may be used to look at historical data. If historical data is being viewed, the top of the trend window will indicate it such, otherwise it will indicate “Live Data”.

The IN and OUT buttons allow you to change the amount of time being viewed at once.



CUSTOM SETTINGS

The GTM may be modified to add communications to PCs, PLCs, or SCADA systems. The built-in web server may also be enabled, and given an IP address, so that users can monitor and/or control the GTM from any networked PC, via web browser.

Linearization tables for horizontal tanks may also be created.

All of the above may be done by the user via Crimson 1 and Crimson 2 software packages; however, a thorough understanding of the hardware and software is required to ensure that no mistakes are made. For a nominal fee, Red Lion can make the necessary changes, ensuring your system works “right out of the box”.

DOCUMENTATION

The following chart may be used to record features specific to a given GTM. Alternatively, if the GTM was ordered from Red Lion with custom settings, this same chart will have been shipped with the unit, and can be found inside the enclosure.

ENABLE WEB SERVER... (CIRCLE ONE EACH)

Remote Viewing? Yes / No Remote Control? Yes / No

NODE (ADDRESS) OF SYSTEM, OR IP ADDRESS?

Address: _____

MAP PLC/SCADA COMMUNICATIONS? (CIRCLE)

Modbus TCP/IP EtherNet/IP DH485

STARTING REGISTER ADDRESS (E.G. N7:01 OR 400001)

Address: _____

Registers will be consecutively numbered in the following sequence...

VARIABLE NAME	VARIABLE NAME	VARIABLE NAME
_____ TankName0	_____ Password	_____ RecipeNames0
_____ TankName1	_____ PasswordStored	_____ RecipeNames1
_____ TankName2	_____ PasswordNew	_____ RecipeNames2
_____ TankName3	_____ PasswordNewAgain	_____ RecipeNames3
_____ TankName4	_____ SpanTank0	_____ RecipeNames4
_____ TankName5	_____ SpanTank1	_____ RecipeNames5
_____ TankName6	_____ SpanTank2	_____ RecipeNames6
_____ TankName7	_____ SpanTank3	_____ RecipeNames7
_____ TankLevel0	_____ SpanTank4	_____ RecipeNames8
_____ TankLevel1	_____ SpanTank5	_____ RecipeNames9
_____ TankLevel2	_____ SpanTank6	_____ RecipeNames10
_____ TankLevel3	_____ SpanTank7	_____ RecipeNames11
_____ TankLevel4	_____ OffsetTank0	_____ RecipeNames12
_____ TankLevel5	_____ OffsetTank1	_____ RecipeNames13
_____ TankLevel6	_____ OffsetTank2	_____ RecipeNames14
_____ TankLevel7	_____ OffsetTank3	_____ RecipeNames15
_____ TankTemp0	_____ OffsetTank4	_____ RecipeSGs0
_____ TankTemp1	_____ OffsetTank5	_____ RecipeSGs1
_____ TankTemp2	_____ OffsetTank6	_____ RecipeSGs2
_____ TankTemp3	_____ OffsetTank7	_____ RecipeSGs3
_____ TankTemp4	_____ ScaleTempLo	_____ RecipeSGs4
_____ TankTemp5	_____ ScaleTempHi	_____ RecipeSGs5
_____ TankTemp6	_____ Out1Tank0	_____ RecipeSGs6
_____ TankTemp7	_____ Out2Tank0	_____ RecipeSGs7
_____ Alarm1Tank0	_____ Out1Tank1	_____ RecipeSGs8
_____ Alarm2Tank0	_____ Out2Tank1	_____ RecipeSGs9
_____ Alarm1Tank1	_____ Out1Tank2	_____ RecipeSGs10
_____ Alarm2Tank1	_____ Out2Tank2	_____ RecipeSGs11
_____ Alarm1Tank2	_____ Out1Tank3	_____ RecipeSGs12
_____ Alarm2Tank2	_____ Out2Tank3	_____ RecipeSGs13
_____ Alarm1Tank3	_____ Out1Tank4	_____ RecipeSGs14
_____ Alarm2Tank3	_____ Out2Tank4	_____ RecipeSGs15
_____ Alarm1Tank4	_____ Out1Tank5	
_____ Alarm2Tank4	_____ Out2Tank5	
_____ Alarm1Tank5	_____ Out1Tank6	
_____ Alarm2Tank5	_____ Out2Tank6	
_____ Alarm1Tank6	_____ Out1Tank7	
_____ Alarm2Tank6	_____ Out2Tank7	
_____ Alarm1Tank7		
_____ Alarm2Tank7		