

Veeder-Root TLS2 Console Gilbarco EMC2 Console

Setup and Operation Manual

Notice

Veeder-Root makes no warranty of any kind with regard to this publication, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Veeder-Root shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this publication.

Veeder-Root reserves the right to change system options or features, or the information contained in this publication.

This publication contains proprietary information which is protected by copyright. All rights reserved. No part of this publication may be photocopied, reproduced, or translated to another language without the prior written consent of Veeder-Root.

Contact TLS Systems Technical Support for additional troubleshooting information at 800-323-1799.

DAMAGE CLAIMS / LOST EQUIPMENT

Thoroughly examine all components and units as soon as they are received. If any cartons are damaged or missing, write a complete and detailed description of the damage or shortage on the face of the freight bill. The carrier's agent must verify the inspection and sign the description. Refuse only the damaged product, not the entire shipment.

Veeder-Root must be notified of any damages and/or shortages within 30 days of receipt of the shipment, as stated in our Terms and Conditions.

VEEDER-ROOT'S PREFERRED CARRIER

1. Contact Veeder-Root Customer Service at 800-873-3313 with the specific part numbers and quantities that were missing or received damaged.
2. Fax signed Bill of Lading (BOL) to Veeder-Root Customer Service at 800-234-5350.
3. Veeder-Root will file the claim with the carrier and replace the damaged/missing product at no charge to the customer. Customer Service will work with production facility to have the replacement product shipped as soon as possible.

CUSTOMER'S PREFERRED CARRIER

1. It is the customer's responsibility to file a claim with their carrier.
2. Customer may submit a replacement purchase order. Customer is responsible for all charges and freight associated with replacement order. Customer Service will work with production facility to have the replacement product shipped as soon as possible.
3. If "lost" equipment is delivered at a later date and is not needed, Veeder-Root will allow a Return to Stock without a restocking fee.
4. Veeder-Root will NOT be responsible for any compensation when a customer chooses their own carrier.

RETURN SHIPPING

For the parts return procedure, please follow the appropriate instructions in the "General Returned Goods Policy" pages in the "Policies and Literature" section of the Veeder-Root **North American Environmental Products** price list. Veeder-Root will not accept any return product without a Return Goods Authorization (RGA) number clearly printed on the outside of the package.

Introduction

| | |
|---|---|
| Contractor Certification Requirements | 1 |
| Related Manuals | 1 |
| Safety Symbols | 1 |
| Safety Warnings | 2 |
| Regulatory Compliance and Approvals | 2 |
| Console | 3 |
| Monitoring Functions | 3 |
| Output Relay | 3 |
| Communications Functions | 3 |
| Alarm Message Quick Reference Index | 4 |

System Setup Screens

| | |
|---|----|
| System Status (Home) Screen | 5 |
| Main Menu Screen | 6 |
| [266] System Setup - Enter Password Screen | 7 |
| System Setup Screen | 8 |
| [201-203, 240] System Language and Units Setup Screen | 9 |
| [204 - 207] Station Header Setup Screen | 10 |
| Alpha Keypad Screen | 11 |
| Numeric Keypad Screen | 12 |
| [208-211] System Security Setup Screen | 13 |
| [263-265] System Setup Security - Setup Password Screen | 14 |
| [212-214] System Time/Date Setup Screen | 15 |
| Current Date Entry Screen | 16 |
| Current Time Entry Screen | 17 |
| [500-503] System Setup Close Times Screen | 18 |
| [215-218] Shift Times Setup Screen | 19 |
| [219-223] Daylight Savings Time Setup Screen | 20 |
| [224-226, 321] Auto-Dialout Setup Screen | 21 |
| [227-230] Autodial Alarm Setup Screen 1 | 22 |
| [231-234] Autodial Alarm Setup Screen 2 | 23 |
| [235-237, 320] Autodial Alarm Setup Screen 3 | 24 |
| [550-551] Autodial Alarm Setup Screen 4 | 25 |
| [238-239] Comm Port 1 and 2 Serial Setup Screen 1 | 26 |
| [241] Comm Port 1 Printer Setup Screen | 27 |
| [244-246] Comm Port 1 Modem Setup Screen 1 | 28 |
| [249-252] Comm Port Setup Screen 2 | 29 |
| [247-248] Advanced Communications Setup Screen | 30 |
| Data Entry Screen | 31 |
| Parallel Port Setup Screen | 32 |
| [256] Alarm Relay Setup Screen | 33 |
| [254, 257-258] Temperature Setup Screen | 34 |
| [259-262] EuroProtocol and Stick Offset Setup Screen | 35 |
| About TLS2 Screen | 36 |

Tank Setup Screens

| | |
|--|----|
| [267] Tank Setup - Enter Password Screen | 37 |
| Tank Setup Screen | 38 |
| [119-121] Tank Setup Screen 1 | 39 |
| [122-124] Tank Setup Screen 2 | 40 |
| [125-128] Tank Setup Screen 3 | 41 |
| [101-104] Tank Limits Setup Screen 1 | 44 |

| | |
|---|----|
| [105-108] Tank Limits Setup Screen 2 | 45 |
| 109-111, 552] Tank Limits Setup Screen 3 | 46 |
| [553] Tank Alarm Limits Setup Screen 4 | 47 |
| [112-114] Tank Leak Test Setup Screen 1 | 48 |
| [115] Same All Tanks Screen | 49 |
| [116-118] Tank Leak Test Setup Screen 2 | 50 |
| Manually Closing a Shift | |
| Manual Shift Close Screen | 51 |
| Manually Starting/Stopping Tank Leak Tests | |
| Manual Test Start/Stop Screen | 52 |
| Reports | |
| System Reports | 53 |
| Inventory Report (US Units and Non-Density Probe) | 55 |
| Example Report Printout - Inventory Report with TC volume | 55 |
| Example Report Printout - Timed Shift Inventory Report with TC volume | 55 |
| Example Report Printout - Snapshot Shift Inventory Report | 56 |
| Inventory Report Notes | 56 |
| Example Report Printout - Inventory Log Report | 56 |
| Inventory Log Report Notes | 56 |
| Inventory Report (Metric Units and Density Probe) | 57 |
| Example Report Printout - Inventory Report with Density Probe | 57 |
| Delivery Report (US Units and Non-Density Probe) | 58 |
| Example Printout - Delivery Report with Non-density Probe | 58 |
| Delivery Report (Metric Units and Density Probe) | 59 |
| Example Printout - Delivery Report with Density Probe | 59 |
| Active Alarm Status Screen | 60 |
| Alarm Reports | 60 |
| Important Alarm Notes | 61 |
| Information on Alarm States | 61 |
| Active Alarm | 61 |
| Acknowledging an Active Alarm | 61 |
| Returning to Normal State | 61 |
| In-Tank Alarm Information | 62 |
| Max Product Alarm | 62 |
| Overfill Alarm | 62 |
| Low Product Alarm | 62 |
| High Water Alarm | 62 |
| Probe Out Alarm | 62 |
| Invalid Fuel Height | 62 |
| Probe Low Temperature Warning | 62 |
| Delivery Needed Alarm | 62 |
| Leak Test Alarm | 62 |
| Diagnostic Screens | |
| Function Test Menu Screen | 63 |
| LCD Touch Test Screen | 64 |
| Probe Diagnostic Screen | 64 |
| Example Report Printout - Probe Diagnostic Report | 65 |
| Availability of Probe Data | 65 |
| Label Code Index | 66 |

Warranty Conditions and Limitations of Liability

| | |
|---|----|
| Limitations Of Liability | 70 |
| Inspection | 70 |
| Limitation of Remedy and Warranty | 70 |
| Limitation of Damages | 70 |
| Limitation of Actions | 70 |
| Collateral Promises | 70 |
| Interpretation | 70 |

Tables

| | |
|---|----|
| Table 1: Alarm Message Table | 4 |
| Table 2: U.S. and Metric Thermal Coefficients | 42 |
| Table 3: Calculating Tank Tilt | 43 |
| Table 4: System Reports | 53 |
| Table 5: Alarm Reports | 60 |
| Table 6: Tank Setup Label Codes | 66 |
| Table 7: System Setup Label Codes | 67 |

Introduction

This manual describes setup and operating procedures for the following Touch-Screen consoles:

- Veeder-Root TLS2
- Gilbarco EMC2

This manual assumes that the console is installed and has successfully completed the Cold Boot procedure. You should begin the setup procedure with the System Setup Screens and finish with the Tank Setup Screens.

After entering the System and Tank Setup parameters the console should be operational. Consult the Reports Section for instructions on viewing system and alarm reports. The Diagnostic Section contains some simple console test procedures and access to Probe Diagnostic data.

Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and setup the equipment discussed in this manual:

Installer Certification: Contractors holding valid Installer Certification are approved to perform wiring and conduit routing, equipment mounting, probe and sensor installation, tank and line preparation, and line leak detector installation.

TLS-350 Technician Certification: Contractors holding valid TLS-350 Technician Certifications are approved to perform installation checkout, startup, programming and operations training, troubleshooting and servicing for all Veeder-Root TLS-300 or TLS-350 Series Tank Monitoring Systems, including Line Leak Detection and associated accessories.

Warranty Registrations may only be submitted by selected Distributors.






Related Manuals

577013-756 TLS2/EMC2 Site Prep Manual





577013-767 Veeder-Root Serial Interface Manual for TLS2 Monitoring Systems

Safety Symbols

The following safety symbols are used in this manual to alert you to important safety hazards and precautions.

| | |
|--|--|
|  EXPLOSIVE Fuels and their vapors are extremely explosive if ignited. |  FLAMMABLE Fuels and their vapors are extremely flammable. |
|  ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists. |  READ ALL RELATED MANUALS Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does. |
|  WARNING Heed the adjacent instructions to avoid damage to equipment, property, environment or personal injury. | |

Safety Warnings

|  WARNING | |
|---|---|
|   | <p>This system operates near highly combustible fuel storage tanks.</p> <p>Fire or explosion resulting in serious injury or death could result if the equipment is improperly installed or modified or is used in any way other than its intended use. Serious contamination of the environment may also occur.</p> <p>Leaking tanks can create serious environmental and health hazards. Improper programming and operation may also result in equipment self-test failures and submersible pump shutdowns.</p> <p>ATTEMPTING TO SERVICE TANK MONITORS AND EQUIPMENT WITHOUT PROPER TRAINING CAN CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN PERSONAL INJURY OR DEATH.</p> |
|  | <p>To ensure proper installation, operation, and continued safe use of this product:</p> <ol style="list-style-type: none">1. Read and follow all instructions in this manual, including all safety warnings.2. Have equipment installed by a contractor trained in its proper installation and in compliance with all applicable codes including: the National Electrical Code; federal, state, and local codes; and other applicable safety codes.3. Ensure that this equipment is properly programmed.4. Operate this equipment in accordance with the instructions in this manual.5. Promptly investigate any alarm conditions.6. Do not modify or use service parts other than those provided by Veeder-Root. |

Regulatory Compliance and Approvals

Plan your leak detection program to comply with local, state, and federal regulations governing underground storage tanks. Save all inventory and leak test records provided by the system as part of a regulatory compliance program.

The system, when equipped with Magnetostrictive 0.2 gallon-per-hour (gph) (0.76 lph) (Mag 2) probes, is classified as an Automatic Tank Gauge System and has been third-party tested by Midwest Research Institute. This system can detect a 0.2 gph leak exceeding a 95% probability of detection [P(D)] and less than a 5% probability of false alarm [P(FA)]. It meets federal U.S. E.P.A. performance standards (0.2 gph at [P(D)] of 95% and [P(FA)] of 5%) and the federal performance standard of measuring water in the bottom of a tank to the nearest 1/8 inch (3.2 mm).

The system, when equipped with Magnetostrictive 0.1 gph (0.38 lph) (Mag 1) probes, meets Volumetric Tank Tightness Testing Method standards and has been third-party tested by Midwest Research Institute. This system can detect a 0.1 gph leak exceeding a 95% probability of detection [P(D)] and less than a 1% probability of false alarm [P(FA)]. This system meet U.S. E.P.A. federal performance standards (0.1 gph at [P(D)] of 95% and [P(FA)] of 5%).

Console

The TLS2 Console features a front panel touch screen display, a dual-purpose Alarm/Normal LED, and an audible beeper for alarm and warning notification. Serial and parallel printer ports are available for connection to a remote printer. The TLS2 Console can monitor up to six magnetostrictive probes.

Monitoring Functions

Depending on installed equipment, the console can provide:

- Inventory status for up to six tanks
- In-tank leak detection.

Output Relay

An output relay is provided that can trigger external alarm devices when an alarm condition is sensed by the system.

Communications Functions

Several communications options are available for the TLS2 Console:

- RS-232
- RS-422
- RS-485 2-wire or 4-wire
- External modem support
- Serial or parallel remote printer interface

Alarm Message Quick Reference Index

Table 1: Alarm Message Table

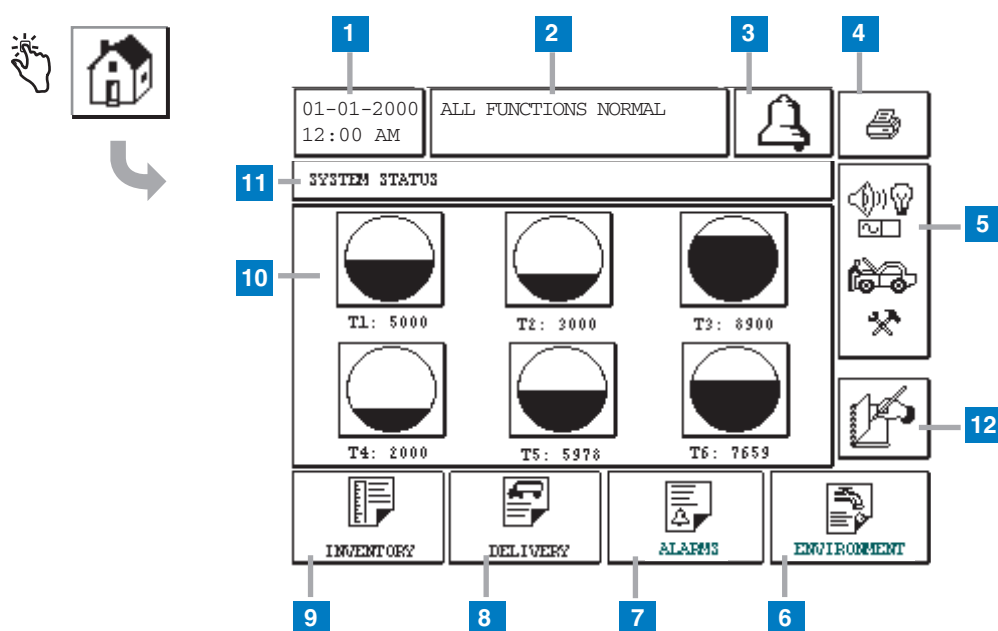
| Alarm | Type | Cause | Action |
|---------------------|------|--|--|
| Annual Test Fail | Tank | In-tank annual leak test failed | Rerun in-tank leak test. If second test fails, call for service. |
| Autodial Fail | Comm | System failed to connect to a remote receiver after programmed number of tries. | Check remote receiver. |
| Delivery Needed | Tank | Product level dropped below preset limit. | Call for delivery. |
| Gross Test Fail | Tank | In-tank leak test failed. | Rerun in-tank leak test. If second test fails, call for service. |
| High Water | Tank | Water detected in tank exceeds pre-set limit. | Remove water from the tank. |
| Invalid Fuel Height | Tank | Fuel level dropped to a point below the minimum detectable level or only one float is present. | Call for delivery. |
| Low Product | Tank | Tank level dropped below preset limit. | Call for delivery. |
| Low Temperature | Tank | Probe temperature dropped below -4°F (-20°C). For Low Temperature probes, below -40°F (-40°C). | Probe returns to normal operation after probe temperature rises above 0°F (-17.7°C). For Low Temperature probes, above -36°F (-38°C) |
| Max Product | Tank | Product level rose above preset limit. | Stop delivery. |
| Overfill | Tank | Potential overflow of tank may occur. | Stop delivery. Check for spillage. |
| Periodic Test Fail | Tank | In-tank leak test failed. | Rerun in-tank leak test. If second test fails, call for service. |
| Probe Out | Tank | Hardware failure - probe or interconnecting wiring to console. | Call for service. |

System Setup Screens

This section describes all of the TLS2 System Setup Screens along with setup choices and explanations that you will need for data entry. Because the TLS2 Setup Displays have only English labels, Screen Label codes have been placed in brackets beneath every English label to let you quickly find a translation of the label and the page number(s) of the Screen in which the label is used. Tank Setup Screens are covered in a separate section.

Entering data, confirming selections, etc. is done through one of several Data Entry Screens which display when you touch any button to the right of a data entry window. These screens are described where they are first discussed in this section.

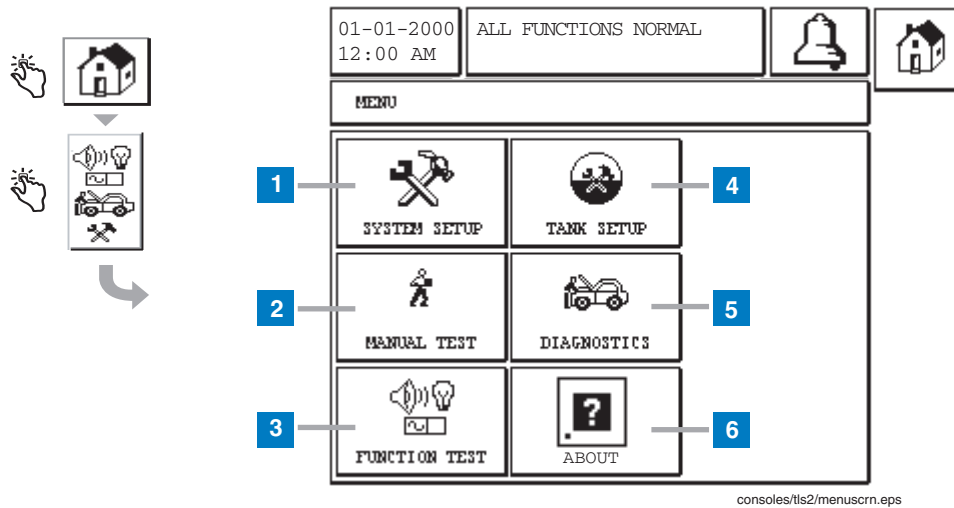
System Status (Home) Screen



Legend for numbered boxes

- 1 Date/time window - displays current date and time
- 2 Message window - displays All Functions Normal or active alarms.
- 3 Alarm button - touch to acknowledge alarm and silence alarm beeper. Note: touching this button does not clear the alarm - the problem that caused the alarm must be repaired.
- 4 Print button - For menu screens, touch this button and all items available through the menu are printed to a connected printer. For non-menu screens only, a print dialog box appears when the print button is touched. The user also has the option to cancel the print.
- 5 Main Menu button - touch to display the Main Menu Screen (page 6) for access to system/tank setup and manual tank testing.
- 6 Environmental Report button - touch to display tank leak test results (page 53).
- 7 Alarm Report button - touch to display the Active Alarm Status (and History) Screen (page 60).
- 8 Delivery Report button - touch to display the Delivery Report Screen (page 53).
- 9 Inventory Report button - touch to display the Inventory Report Screen (page 55).
- 10 Tank buttons - touch any tank button to display the current inventory report for that tank.
- 11 Screen title window.
- 12 Manual Shift Close button - touch to manually close the shift. (visible only if Snapshot is selected in Shift Time (System Setup) as the Shift Close Method.

Main Menu Screen

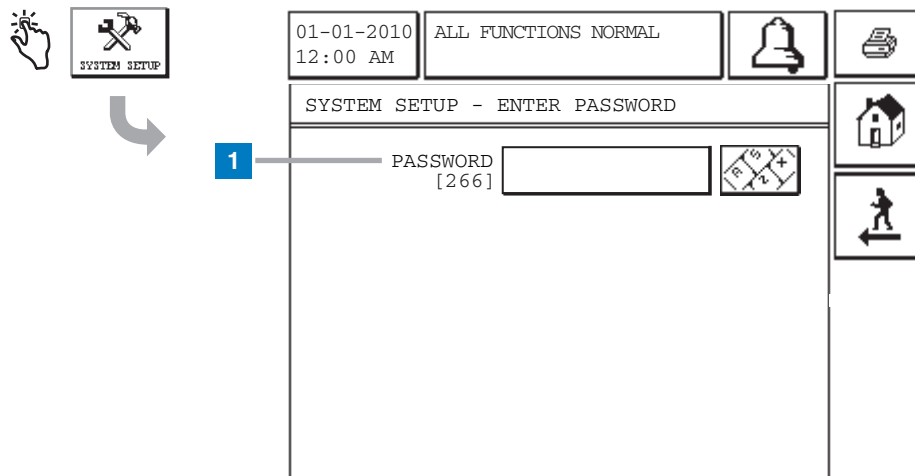


Legend for numbered boxes

- 1 System Setup button - touch to display the System Setup Screen (page 8). If a System Security Setup - Setup Password has been entered, the System Setup - Enter Password screen will display (page 8).
- 2 Tank Setup button - touch to display the Tank Setup Menu Screen (page 38).
- 3 Diagnostics button - touch to display the Probe Diagnostic Screen (page 64).
- 4 About button - touch to display the About Screen (page 36) for information about the TLS2 Console's software and installed features.
- 5 Function Test button - touch to display the Function Test Menu Screen (page 63).
- 6 Manual Test button - touch to display the Manual Tank Test Start/Stop Screen (page 52).

[266] System Setup - Enter Password Screen

If the System Security Setup - Setup Password (page 14) is enabled, you will be required to enter that password before accessing the System Setup Screen (page 8). If the Setup Password is disabled, the System Setup - Enter Password screen will not display.



Legend for numbered boxes

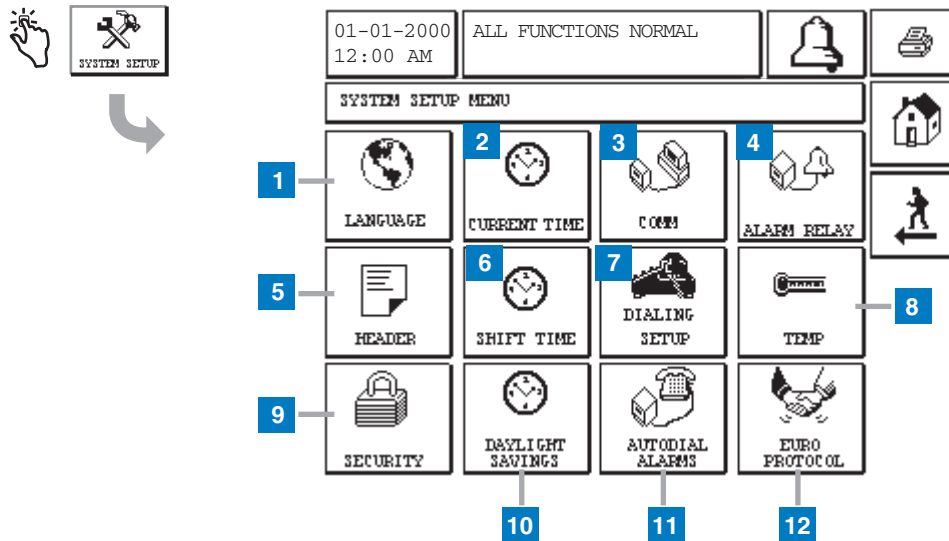
- 1 Password [266] - To access the System Setup Screen (page 8), you must enter the 6 to 16 character alphanumeric System Security Setup - Setup Password.

As you enter the password, asterisks (*) will display in place of the entered characters.

If the entered password is correct, the System Setup Screen will display.

If the entered password is incorrect, you will be asked to re-enter the password.


System Setup Screen



Legend for numbered boxes

- | | |
|---|---|
| <p>1 Language button - touch to display the System Language and Units Setup Screen (page 9)</p> <p>2 Current Time button - touch to display the System Time/Date Setup Screen (page 15).</p> <p>3 Comm button - touch to display the Comm Setup Screen (page 26).</p> <p>4 Alarm Relay button - touch to display the Alarm Relay Setup Screen (page 33).</p> <p>5 Header button - touch to display the Station Header Setup Screen (page 10).</p> <p>6 Shift Time button - touch to select the Setup Shift Times Screen (page 19) or Manual Shift Close.</p> <p>7 Dialing Setup button - touch to display the Auto Dialout Setup Screen (page 21).</p> | <p>8 Temp button - touch to display the Temperature Setup Screen (page 34).</p> <p>9 Security button - touch to display the System Security Setup Screen (page 13).</p> <p>10 Daylight Savings button - touch to display the Daylight Savings Setup Screen (page 20).</p> <p>11 Autodial Alarms button - touch to display the Autodial Alarms Setup Screen (page 22).</p> <p>12 EuroProtocol button - touch to display the EuroProtocol and Stick Offset Setup Screen (page 35). This screen also lets you select a leak test report format.</p> |
|---|---|

[201-203, 240] System Language and Units Setup Screen












| | | | | |
|---------------------------------|---------------------------|---------|--|--|
| 01-01-2000 12:00 AM | ALL FUNCTIONS NORMAL | | | |
| SYSTEM SETUP LANGUAGE AND UNITS | | | | |
| 1 | SYSTEM LANGUAGE [201] | ENGLISH | | |
| 2 | UNITS [202] | US | | |
| 3 | SERIAL LANGUAGE [203] | ENGLISH | | |
| 4 | ISO 3166 COUNTRY [240] | | | |

Legend for numbered boxes

- 1 System Language [201] - Choose from English (default), Chinese (Mandarin), Finnish, French, German, Italian, Polish, Portuguese, Russian, Spanish and Swedish.
- 2 Units [202] - Choose Metric (default) or U.S.
- 3 Serial Language [203] - Choose from English (default), Finnish, French, German, Italian, Polish, Portuguese, Russian, Spanish and Swedish.
- 4 ISO Country Code [240] - This feature is an international option. Enter the three alpha-character country code. Default is blank.

[204 - 207] Station Header Setup Screen

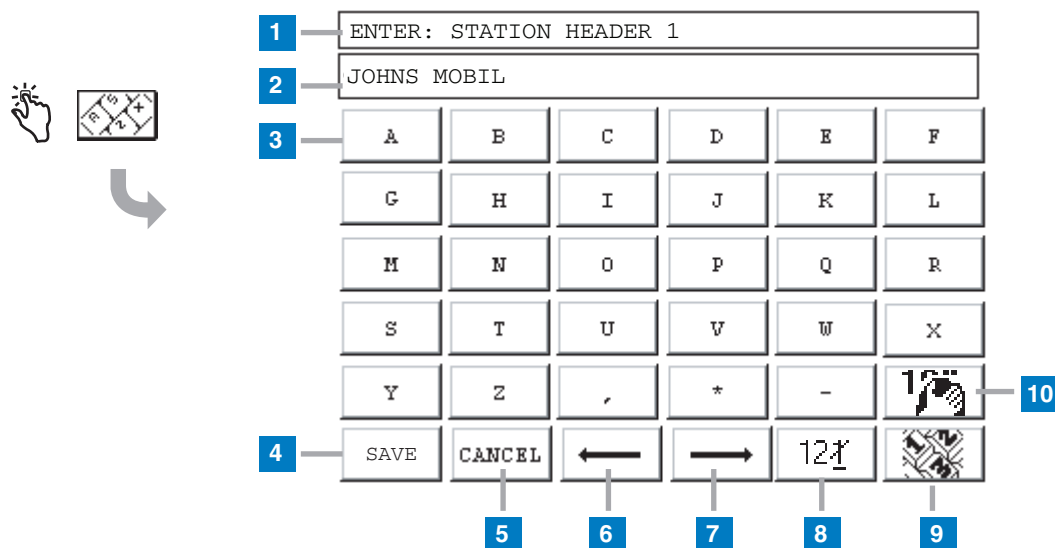


| | | | | | |
|-----------------------------|-------------------|----------------------|--|---|---|
| 01-01-2000 12:00 AM | | ALL FUNCTIONS NORMAL | |  |  |
| SYSTEM SETUP STATION HEADER | | | | | |
| 1 | HEADER 1 [204] | 12345678901234567890 |  |  |  |
| 2 | HEADER 2 [205] | 12345678901234567890 |  | | |
| 3 | HEADER 3 [206] | 12345678901234567890 |  | | |
| 4 | HEADER 4 [207] | 12345678901234567890 |  | | |

Legend for numbered boxes

- 1 Header Line 1 [204] - Enter first line of Report header. The entry can be alphanumeric and up to 20 characters. Only numbers and the Roman alphabet are supported.
- 2 Header Line 2 [205] - Enter second line of Report header. The entry can be alphanumeric and up to 20 characters. Only numbers and the Roman alphabet are supported.
- 3 Header Line 3 [206] - Enter third line of Report header. The entry can be alphanumeric and up to 20 characters.Only numbers and the Roman alphabet are supported.
- 4 Header Line 4 [207] - Enter fourth line of Report header. The entry can be alphanumeric and up to 20 characters. Only numbers and the Roman alphabet are supported.

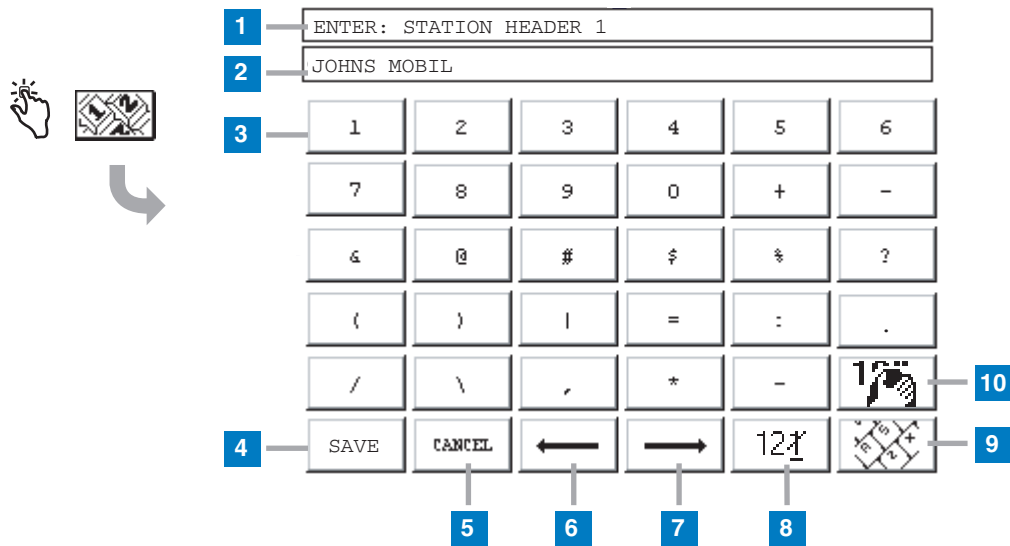
Alpha Keypad Screen



Legend for numbered boxes

- | | |
|---|---|
| <p>1 Displays Title of data to be entered.</p> <p>2 Data Entered Window displays data entered.</p> <p>3 Alpha keypad buttons - touch a character button to place that character in the data entered window (2).</p> <p>4 Save button - touch to accept entered data and close Screen.</p> <p>5 Cancel button - touch to cancel any entry and close Screen.</p> | <p>6 Cursor left button - touch to move the cursor one position left in the Data Entered Window (2).</p> <p>7 Cursor right button - touch to move the cursor one position right in the Data Entered Window (2).</p> <p>8 Backspace delete button - touch to delete character in cursor.</p> <p>9 Number keypad button - touch to display the Numeric Keypad Screen.</p> <p>10 Clear button - touch to clear contents of Data Entered Window (2).</p> |
|---|---|

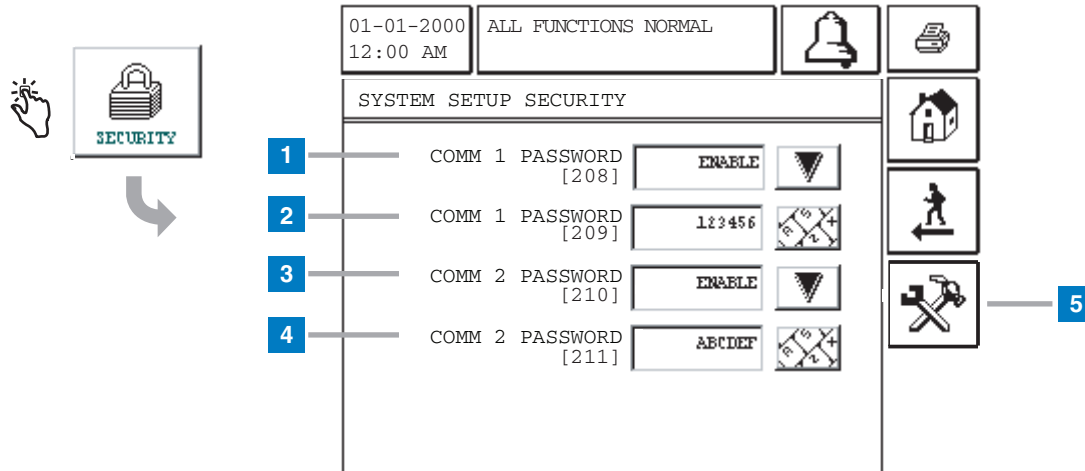
Numeric Keypad Screen



Legend for numbered boxes

- | | |
|---|---|
| <p>1 Displays title of data to be entered.</p> <p>2 Data Entered Window displays data entered.</p> <p>3 Numeric Keypad buttons - touch a character button to place that character in the Data Entered Window (2).</p> <p>4 Save button - touch to accept entered data entered and close Screen.</p> <p>5 Cancel button - touch to cancel any entry and close Screen.</p> <p>6 Cursor left button - touch to move the cursor one position left in the Data Entered Window (2).</p> | <p>7 Cursor right button - touch to move the cursor one position right in the Data Entered Window (2).</p> <p>8 Backspace delete button - touch to delete character above cursor.</p> <p>9 Alpha keypad button - touch to display the Alpha Keypad Screen.</p> <p>10 Clear button - touch to clear contents of Data Entered Window (2).</p> |
|---|---|

[208-211] System Security Setup Screen



Legend for numbered boxes

- 1 Comm 1 Password [208] - Select Enable or Disabled for Comm 1 port password (default is Disabled). If this port is setup for a printer, the security code requirement is ignored.
- 2 Comm 1 Password [209] - Enter a six-digit alphanumeric password for Comm 1 port (default is 000000).
- 3 Comm 2 Password [210] - Select Enable or Disabled for Comm 2 port password (default is Disabled).
- 4 Comm 2 Password [211] - Enter a six-digit alphanumeric password for Comm 2 port (default is 000000).
- 5 Touch to open the System Setup Security - Setup Password Screen (see page 14). Entering a Setup Password will require that you enter this password prior to accessing System Setup (page 7) and Tank Setup (page 37) screens .

[263-265] System Setup Security - Setup Password Screen

The diagram shows the 'SYSTEM SETUP SECURITY - SETUP PASSWORD' screen. At the top, there is a status bar with a date/time field (01-01-2010 12:00 AM), a status field (ALL FUNCTIONS NORMAL), and two icons (a bell and a printer). Below this is the title bar 'SYSTEM SETUP SECURITY - SETUP PASSWORD' with a home icon on the right. The main area contains three password input fields: 'OLD PASSWORD [263]', 'NEW PASSWORD [264]', and 'CONFIRM NEW [265]'. Each field has a password strength indicator icon to its right. Below these fields is a 'PASSWORD DISABLED' message. At the bottom are two buttons: 'OK' and 'CANCEL'. Numbered callouts point to specific elements: 1 points to the 'OLD PASSWORD' label, 2 points to the 'NEW PASSWORD' label, 3 points to the 'CONFIRM NEW' label, 4 points to the 'PASSWORD DISABLED' message, 5 points to the 'OK' button, and 6 points to the 'CANCEL' button. To the left of the screen, there is a hand icon and a wrench icon with a curved arrow pointing towards the screen.

Legend for numbered boxes

A current (old) password will display as all asterisks (*).
Also, as you enter a new password, each character will display as an asterisk.

Passwords are not case sensitive.

Once you OK the Setup Password, you will be required to enter this password before accessing System Setups (page 7) and Tank Setups (page 37).

- 1** Old Password [263] - If you want to change the current password, enter that 6 to 16 character alphanumeric password.
- 2** New Password [264] - Enter your new 6 to 16 character alphanumeric password.
- 3** Confirm New [265] - You must re-enter the new 6 to 16 character alphanumeric password.
- 4** PASSWORD DISABLED - This message displays when the system setup password is disabled.
- 5** OK button - touch the OK button to accept the new password and close the screen
- 6** Cancel button - touch the Cancel button to abort and close the screen.

[212-214] System Time/Date Setup Screen

10-04-01
13:54

ALL FUNCTIONS NORMAL

SYSTEM SETUP TIME/DATE

1 DATE [212] 10-04-01

2 TIME [213] 13-54

3 TM/DATE FORMAT [214] DD-MM-YY-HH-MM

Legend for numbered boxes

- 1 Date [212] - Enter current date.
- 2 Time [213] - Enter current time.
- 3 TM/Date Format [214] - Select one of 3 formats:
 DD-MM-YY-HH¹-MM (default)
 YY-MM-DD-HH¹-MM
 MM-DD-YY-HH²-MM-xM
 where:
 DD = 01 - 31,
 MM = 01 - 12,
 YY = last 2 digits of year, i.e., 01,
 HH¹ = 01 - 24
 HH² = 01 - 12,
 MM = 00 - 59, and
 xM = AM or PM (used only with 3rd format choice above).

Current Date Entry Screen

The diagram illustrates the 'Current Date Entry Screen'. At the top, a title bar reads 'ENTER: CURRENT DATE'. Below this, there are three entry windows: 'MONTH' (containing '10'), 'DAY' (containing '1'), and 'YEAR' (containing '2001'). Below these windows are two arrows, one pointing left and one pointing right. At the bottom of the screen is a numeric keypad with digits 1-9, 0, and a '12' button. Below the keypad are four buttons: 'SAVE', 'CANCEL', an empty button, and a button with a '12' and a hand icon. Numbered callouts are present: '1' points to the 'MONTH' window, '2' points to the 'DAY' window, and '3' points to the 'YEAR' window. To the left of the screen, there is a hand icon pointing to a '12' button, with a curved arrow pointing towards the screen.

Legend for numbered boxes

- 1 Month entry window - enter 01 - 12
- 2 Day entry window - enter 01 - 31
- 3 Year entry window - enter year, e.g. 2001.

The remaining buttons function as described on page 12.

Current Time Entry Screen

The diagram illustrates the 'Current Time Entry Screen' interface. It features a title bar 'ENTER: CURRENT TIME' and a central input area with three fields: 'HOURS' (displaying '12'), 'MINUTES' (displaying '00'), and 'AM/PM' (displaying 'AM'). Below these fields are left and right arrow buttons. To the left of the main input area is a clock icon and a hand icon, with a curved arrow pointing towards the screen. Below the main input area is a numeric keypad with buttons for digits 1-9, 0, and AM/PM. At the bottom are buttons for 'SAVE', 'CANCEL', a '12' button, and a hand icon. Numbered callouts point to specific elements: 1 points to the 'HOURS' field, 2 points to the 'MINUTES' field, 3 points to the 'AM/PM' field, 4 points to the 'PM' button on the keypad, and 5 points to the '12' button on the keypad.

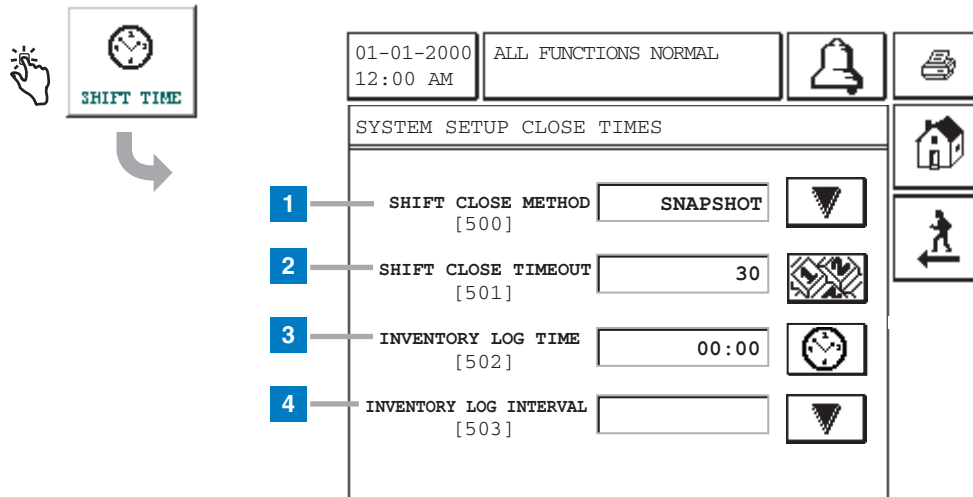
Legend for numbered boxes

- 1 Hours entry window - enter 00 - 23, or 01 - 12¹
- 2 Minutes entry window - enter 01 - 59
- 3 AM/PM entry window¹ - enter AM or PM
- 4 Touch PM if after noon¹.
- 5 Touch AM if before noon¹.

The remaining buttons function as described on page 12.

¹(select only if the MM-DD-YY-HH-MM-xM time/date format was selected in the System Time/Date Setup Screen (page 15).

[500-503] System Setup Close Times Screen



Legend for numbered boxes

This screen allows you to select Auto (Timed) or Manual (Snapshot) Shift Close times. The default setting is Timed (close by time).

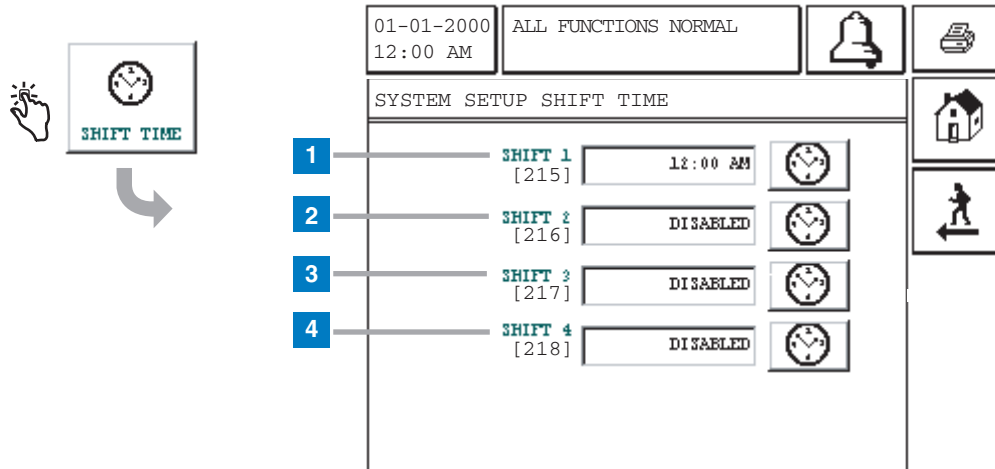
- 1 Shift Close Method [500] - touch the Select button to the right of the window and select Timed (Auto) or Snapshot (Manual) shift close method. Default is Timed.
- 2 Shift Close Timeout [501] - Enabled only if the Snapshot shift close method is chosen. Touch the number button to the right of the window and enter the Timeout.
When the timeout period starting from the last closed tank shift expires, any unopened tank shifts will automatically be closed.
For example, Shift Close Timeout is set to 30. You select manual shift close on tank 3. 30 minutes later the shift is closed for the remaining tanks, the shift number increments and a shift report is created. If the system is setup to autodial on Shift Close Event, the autodial assigned receiver will be sent the notification.
Allowable Timeout selections: 30 to 60 minutes.
Default is 30 minutes.
- 3 Inventory Log Time [502] - Touch the clock button to select the start time in a 24-hour period you want to record the first inventory that will be placed in the Inventory Log.
Default is 00:00 (midnight).

- 4 Inventory Log Interval [503] - Inventory Log records will be recorded by the system automatically at the intervals you select in this field. Touch the down arrow button to the right of the window and select the interval.

Allowable intervals: 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 8 hours, 12 hours, 24 hours, 5 minutes, 10 minutes, 15 minutes, 20 minutes or 30 minutes.
Default is 1 hour.

For example, you select an Inventory Log Time (item 3) of 00:00 (midnight) and you select a 30 minute Inventory log interval (item 4), then the system will record inventory snapshots at 00:00 (midnight), 12:30 am, 1:00 am, 1:30 am, etc.. The maximum number or records in the Inventory Log is 72. The Inventory Log is a rolling (first in, first out) log of 72 maximum records.

[215-218] Shift Times Setup Screen



Legend for numbered boxes

Shift Times Setup Screen is only visible if Timed is selected as the Shift Close Method in the System Setup Close Times screen (page 18). At each shift start time selected below, the system automatically saves a complete inventory report in memory. The default setting is disabled for all shifts.

NOTE: At least one shift start time must be entered to activate the "Last Shift Inventory" feature.

- 1 Shift 1 [215] - touch the time button to the right of the window and enter the Shift 1 start time and AM or PM.
- 2 Shift 2 [216] - touch the time button to the right of the window and enter the Shift 2 start time and AM or PM.
- 3 Shift 3 [217] - touch the time button to the right of the window and enter the Shift 3 start time and AM or PM.

- 4 Shift 4 [218] - touch the time button to the right of the window and enter the Shift 4 start time and AM or PM.

[219-223] Daylight Savings Time Setup Screen

The diagram shows the 'SYSTEM SETUP DAYLIGHT SAVINGS' screen. At the top, there are fields for '01-01-2000 12:00 AM', 'ALL FUNCTIONS NORMAL', a bell icon, and a printer icon. Below these are icons for a house and a person walking. The main section is titled 'SYSTEM SETUP DAYLIGHT SAVINGS' and contains five rows of settings, each with a numbered callout:

- 1** DAYLIGHT SAVINGS [219]: A toggle switch currently set to 'ENABLE' with a downward arrow icon.
- 2** START DATE [220]: A date field showing 'MAR WEEK 2 SUN' with a calendar icon.
- 3** START TIME [221]: A time field showing '2:00 AM' with a clock icon.
- 4** END DATE [222]: A date field showing 'NOV WEEK 1 SUN' with a calendar icon.
- 5** END TIME [223]: A time field showing '2:00 AM' with a clock icon.

To the left of the screen, a separate box labeled 'DAYLIGHT SAVINGS' with a clock icon and an arrow points towards the main screen.

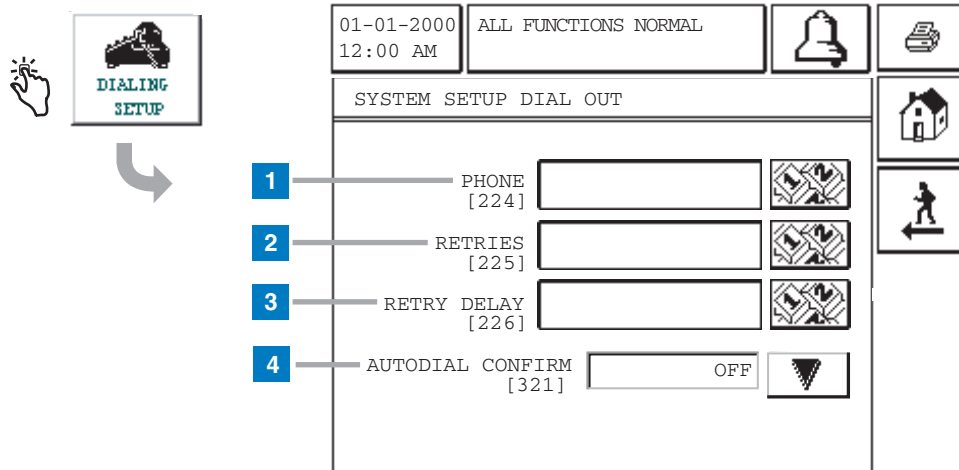
Legend for numbered boxes

This feature allows you to enter Daylight Savings Start and End Dates/Times. Once enabled, the system will automatically adjust for daylight savings time at the dates and times you enter.

- 1** Daylight Savings [219] - touch the Arrow button to the right of the window and select Enable or Disable (default is Disable).
- 2** Start Date [220] - touch the Date button to the right of the window and enter the start date (default is APR WEEK 1 SUN).
- 3** Start Time [221] - touch the Time button to the right of the window and enter the start time [and AM or PM] (default is 02:00 AM).

- 4** End Date [222] - touch the Date button to the right of the window and enter the end date (default is OCT WEEK 6 SUN).
- 5** End Time [223] - touch the Time button to the right of the window and enter the end time [and AM or PM] (default is 02:00 AM).

[224-226, 321] Auto-Dialout Setup Screen



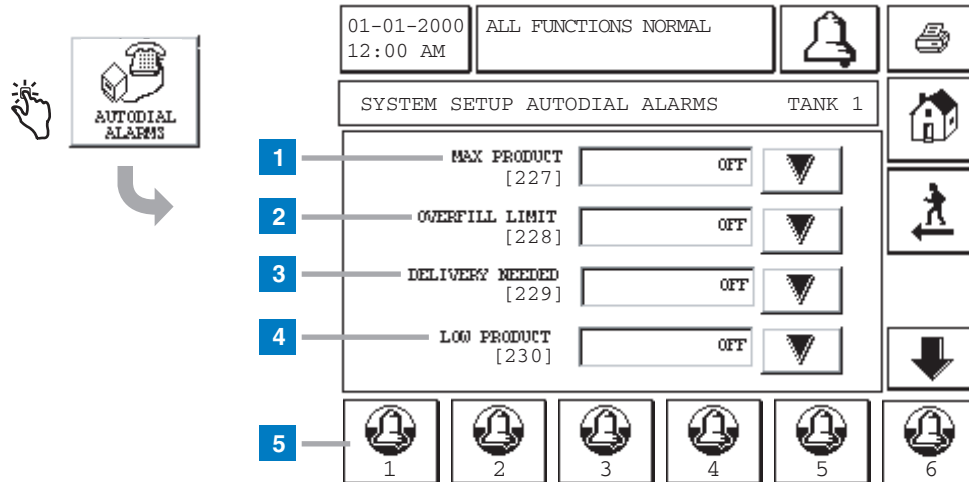
Legend for numbered boxes

This feature requires that Modem be selected as the Comm Type.

- 1** Phone [224] - touch the Numeric button to the right of the window and enter one phone number to which you want the system to dial.
- 2** Retries [225] - touch the Numeric button to the right of the window and enter the number of times (1-99) you want the system to redial the phone number if there is a busy signal, no answer, or an incomplete connection (default is 3 retries).
- 3** Retry Delay [226] - touch the Numeric button to the right of the window and enter the number of minutes (1-99) you want the computer to delay before redialing the phone number if there is a busy signal, no answer, or an incomplete connection (default is 3 minutes).

- 4** Autodial Confirm [321] - touch the Down Arrow button to select On or Off.

[227-230] Autodial Alarm Setup Screen 1



Legend for numbered boxes

This feature lets you program the system to dial out on the following alarm conditions.

Note: Autodial alarms continue on next two pages.

- 1 Max Product [227] - touch the Down Arrow button to select On (dial out) or Off (do not dial out).
- 2 Overfill Limit [228] - touch the Down Arrow button to select On or Off.
- 3 Delivery Needed [229] - touch the Down Arrow button to select On or Off.
- 4 Low Product [230] - touch the Down Arrow button to select On or Off.
- 5 Touch the Autodial Alarm button for the tank you wish to setup and select the desired alarms in Autodial Alarms screens 1-3. You must repeat this process for each tank.

[231-234] Autodial Alarm Setup Screen 2

01-01-2000 12:00 AM ALL FUNCTIONS NORMAL

SYSTEM SETUP AUTODIAL ALARMS TANK 1

| | | | |
|---|--------------------------|-----|---|
| 1 | HIGH WATER [231] | OFF | ▼ |
| 2 | GROSS TEST FAIL [232] | OFF | ▼ |
| 3 | PERIODIC TEST FAIL [233] | OFF | ▼ |
| 4 | ANNUAL TEST FAIL [234] | OFF | ▼ |

1 2 3 4 5 6

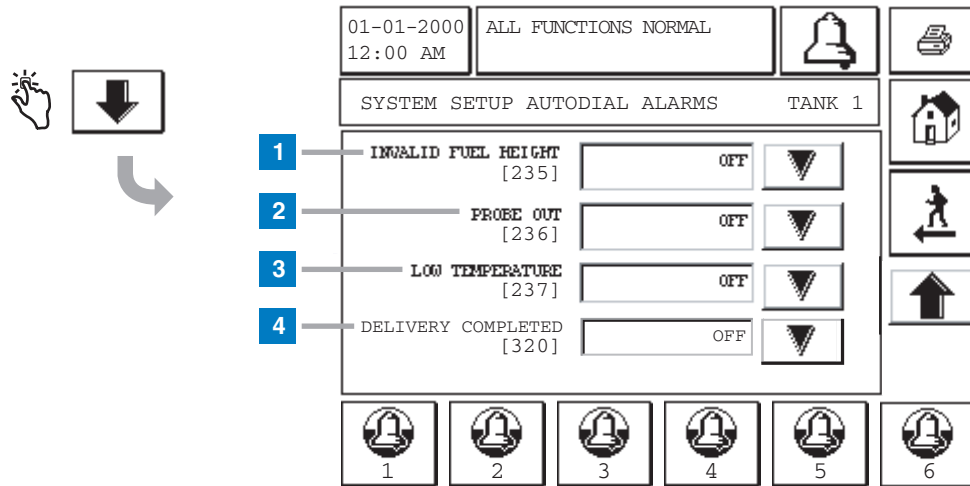
Legend for numbered boxes

This screen continues Autodial Alarms setup.

Note: Autodial alarms continue on next page.

- 1 High Water [231] - touch the Down Arrow button to select On (dial out) or Off (do not dial out).
- 2 Gross Test Fail [232] - touch the Down Arrow button to select On or Off.
- 3 Periodic Test Fail [233] - touch the Down Arrow button to select On or Off.
- 4 Annual Test Fail [234] - touch the Down Arrow button to select On or Off.

[235-237, 320] Autodial Alarm Setup Screen 3



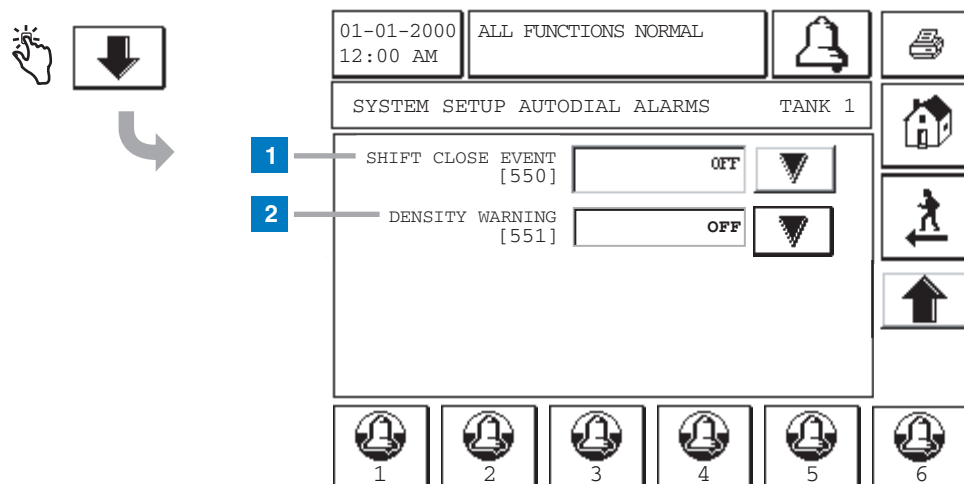
Legend for numbered boxes

This screen continues Autodial Alarms setup.

Note: Autodial alarms continue on next page.

- 1 Invalid Fuel Height [235] - touch the Down Arrow button to select On (dial out) or Off (do not dial out).
- 2 Probe Out [236] - touch the Down Arrow button to select On or Off.
- 3 Low Temperature [237] - touch the Down Arrow button to select On or Off.
- 4 Delivery Completed [320] - touch the Down Arrow button to select On or Off. Note, this event will only be used to dial out on the completion of a delivery. This event is not an alarm and will not display or go into alarm histories.

[550-551] Autodial Alarm Setup Screen 4

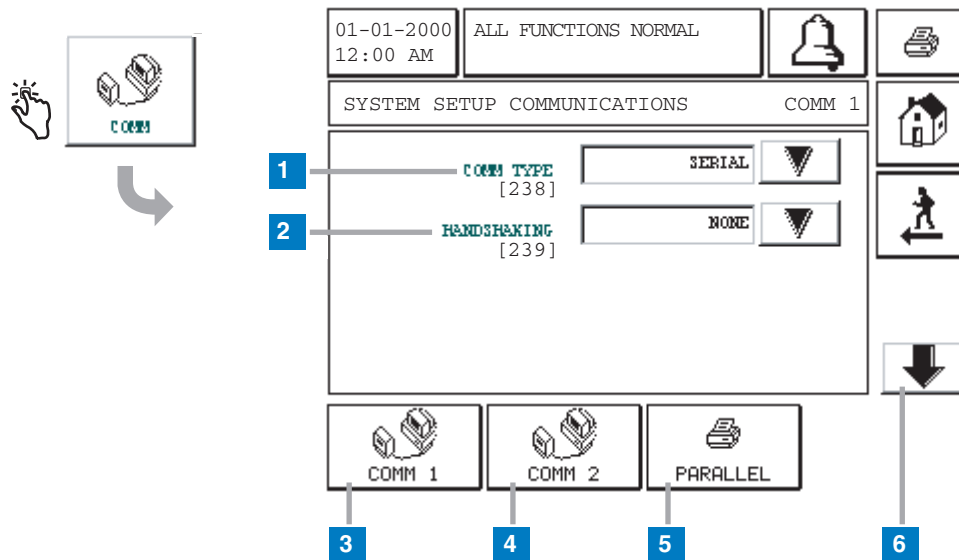


Legend for numbered boxes

This screen concludes Autodial Alarms Setup.

- 1 Shift Close Event [550] - touch the Down Arrow button to select On or Off.
- 2 Density Warning [551] - touch the Down Arrow button to select On or Off. When set to On, you will be able set up a tank density low limit and tank density high limit from the touch panel as well as from RS-232 commands. If the tank density is less than the tank density low limit or greater than the tank density high limit then a DENSITY WARNING will be posted for that tank

[238-239] Comm Port 1 and 2 Serial Setup Screen 1



Legend for numbered boxes

This screen is similar for Comm 1 and Comm 2 port setup.

- 1 Comm Type [238] - touch the Down Arrow button to the right of the window and select:
If Comm 1 -
Serial, Modem, Printer, or None (default)
If Comm 2 -
Serial or None (default)
- 2 Handshaking [239] - touch the Down Arrow button to the right of the window and select None, XON/XOFF, or Hardware (default). This parameter is identical for Comm 1 and Comm 2.
- 3 COMM 1 button - touch to display the Comm 1 Setup Screen (shown above).
- 4 COMM 2 button - touch to display the Comm 2 Setup Screen.
- 5 PARALLEL button - touch to display the Parallel Port Setup Screen (page 32).
- 6 Down button - touch to display Comm Port Setup Screen 2 (page 29).

[241] Comm Port 1 Printer Setup Screen

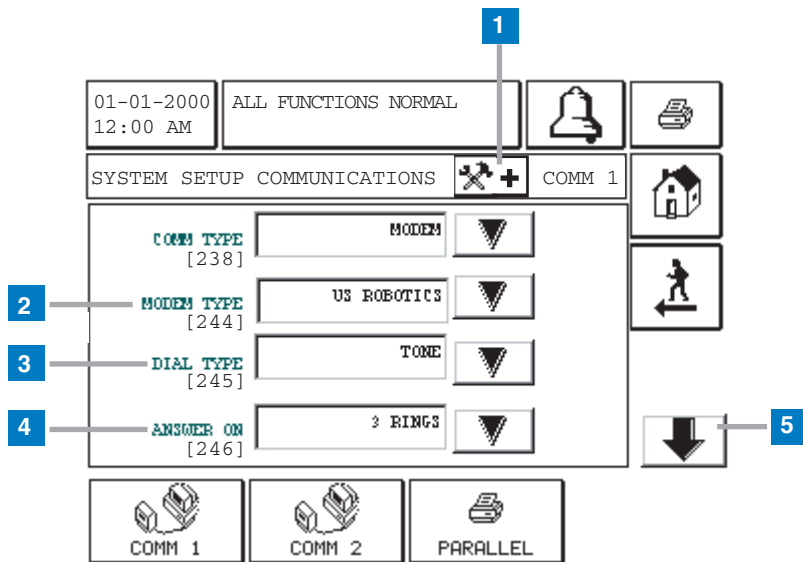
| | | | |
|-----------------------------|----------------------|----------|--|
| 01-01-2000 12:00 AM | ALL FUNCTIONS NORMAL | | |
| SYSTEM SETUP COMMUNICATIONS | | COMM 1 | |
| COMM TYPE [238] | PRINTER | | |
| PAGE EJECT [241] | NO | | |
| HANDSHAKING [239] | NONE | | |
| PRINTER LANG [253] | EPSON ESC/P | | |
| | | | |
| | | | |
| COMM 1 | COMM 2 | PARALLEL | |

Legend for numbered boxes

This screen displays if you selected Printer as the Comm Type in the Comm Port 1 Serial Setup Screen (page 26).

- 1** Page Eject [241] - touch the Down Arrow button to the right of the window and select Yes or No (default). If the page eject is set to Yes, a page feed command will be sent to the printer at the conclusion of the report, or when a report exceeds the length of the current page. A page length is defined as 50 lines for languages that have single height characters and 25 lines for languages that have double height characters.
- 2** Printer Lang [253] - touch to select one of three printer language options: Epson ESC/P (default), IBM Emulation, and DPU-414.
- 3** Down button - touch to display Comm Port Setup Screen 2 (page 29).

[244-246] Comm Port 1 Modem Setup Screen 1

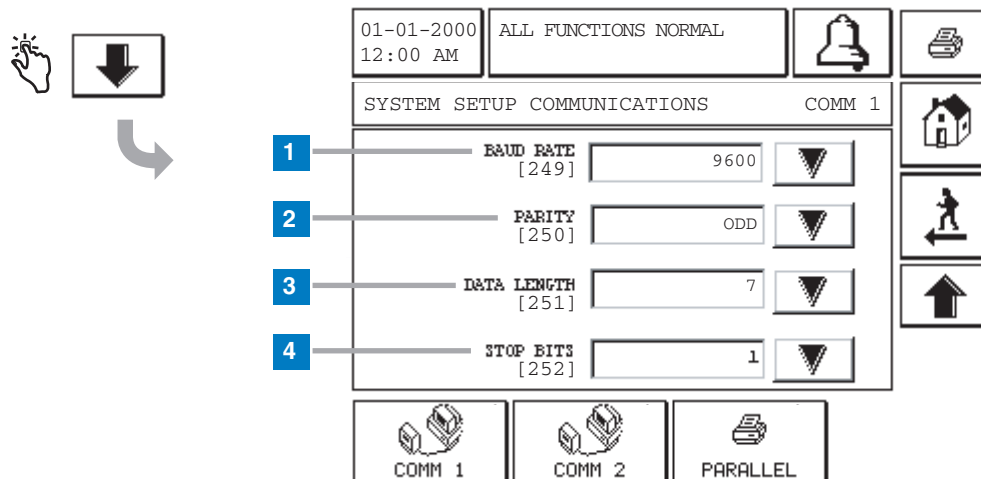


Legend for numbered boxes

This screen displays if you selected Modem as the Comm Type in the Comm Port 1 Serial Setup Screen (page 26).

- 1 Advanced Setup button - touch the Advanced Setup button and go to the Advanced Communications Setup Screen (page 30)
- 2 Modem Type [244] - touch the Down Arrow button to the right of the window and select your external modem type or serial TCPIP.
- 3 Dial Type [245] - touch the Down Arrow button to the right of the window and select dial type: Pulse or Tone (default).
- 4 Answer On [246] - touch the Down Arrow button to the right of the window and select number of rings to wait before answering: 0-9 (default 1).
- 5 Down button - touch to display Comm Port Setup Screen 2 (page 29).

[249-252] Comm Port Setup Screen 2

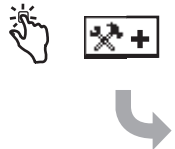


Legend for numbered boxes

This screen concludes the Comm Port setup.

- 1** Baud Rate [249]- touch the Down Arrow button to the right of the window and select a desired baud rate: 300, 600, 1200, 2400, 4800, or 9600 (default).
- 2** Parity [250] - touch the Down Arrow button to the right of the window and select a parity: None, Odd (default), or Even.
- 3** Data Length [251] - touch the Down Arrow button to the right of the window and select a data length: 7 (default) or 8.
- 4** Stop Bits [252] - touch the Down Arrow button to the right of the window and select the number of stop bits: 1 (default) or 2.

[247-248] Advanced Communications Setup Screen



01-01-2000
12:00 AM

ALL FUNCTIONS NORMAL

SYSTEM SETUP COMMUNICATIONS COMM 1

1 DIAL IN [247] AT&B1

2 DIAL OUT [248] AT&B1

Legend for numbered boxes



CAUTION!

Entering the wrong number strings in this screen may disable the modem.

- 1 Dial In [247] - touch the Numeric Keypad button and enter the auto-answer user configuration string (default is empty).
- 2 Dial Out [248] - touch the Down Arrow button to the right of the window and enter the autodial user configuration string (default is empty).

Data Entry Screen

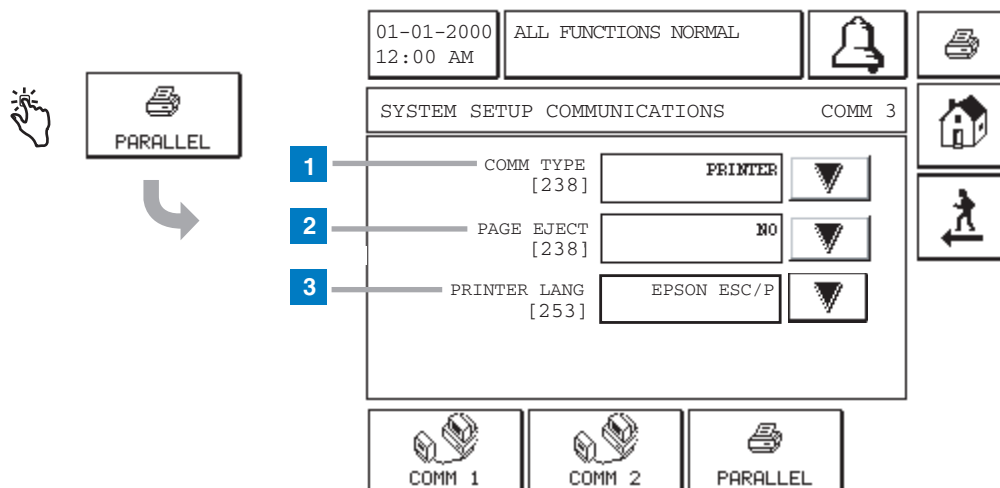
The diagram illustrates the 'Data Entry Screen' for selecting a baud rate. At the top, a title bar reads 'SELECT ENTRY'. Below this, a large rectangular area contains the text 'BAUD RATE' followed by '[249]' and a numeric input field displaying '9600'. To the right of the input field is a downward-pointing arrow button. A blue box with the number '1' is connected by a line to the arrow button. Below the main input area, there are two buttons: 'SAVE' on the left and 'CANCEL' on the right. A blue box with the number '2' is connected by a line to the 'SAVE' button, and a blue box with the number '3' is connected by a line to the 'CANCEL' button.

Legend for numbered boxes

The Data Entry screens are similar and display when you touch the arrow next to a setup parameter. In this example, Baud Rate offers multiple choices, so you touch the arrow button to choose one of the options.

- 1** Baud Rate [249]- touch the Down Arrow button to the right of the window and select a desired baud rate: 300, 600, 1200, 2400, 4800, or 9600 (default).
- 2** Save button - touch the Save button to accept the choice shown and close the screen
- 3** Cancel button - touch the Cancel button to abort and close the screen.

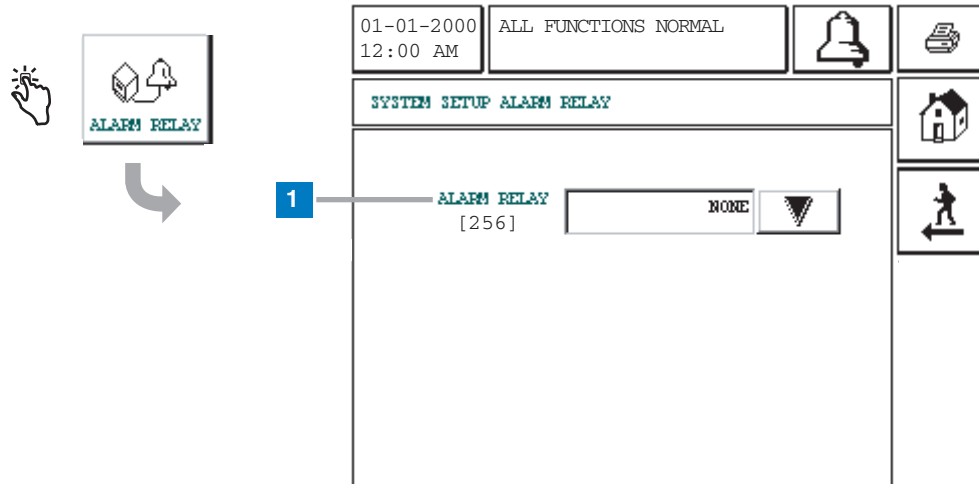
Parallel Port Setup Screen



Legend for numbered boxes

- 1 Comm Type [238] - touch the Down Arrow button to the right of the window and select Printer or None (default).
- 2 Page Eject [241] - touch the Down Arrow button to the right of the window and Yes or No (default). If the page eject is set to Yes, a page feed command will be sent to the printer at the conclusion of the report, or when a report exceeds the length of the current page. A page length is defined as 50 lines for languages that have single height characters and 25 lines for languages that have double height characters.
- 3 Printer Lang [253] - touch to select one of three printer language options: Epson ESC/P (default), IBM Emulation, and DPU-414.

[256] Alarm Relay Setup Screen

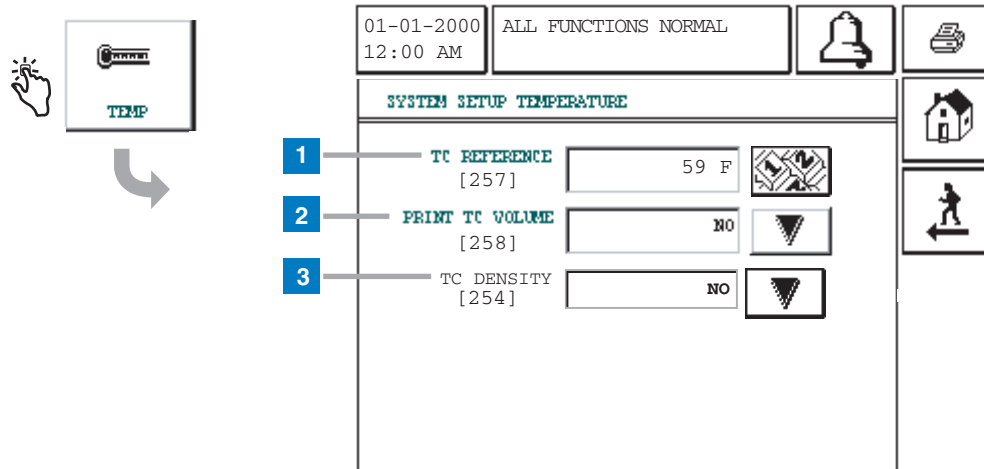


Legend for numbered boxes

This screen allows you to select the mode of activation for the remote beeper relay.

- 1 Alarm Relay [256] - touch the Down Arrow button to the right of the window and select: None (default), Overfill, or All Alarms.
 - If Overfill is selected, an overfill condition on any tank will activate the Alarm Relay.
 - If All Alarms is selected, any alarm going active will activate the Alarm Relay.
 - If None is selected, the relay will not be activated.
 - Touching the Alarm Acknowledgement button will deenergize the Alarm Relay.

[254, 257-258] Temperature Setup Screen



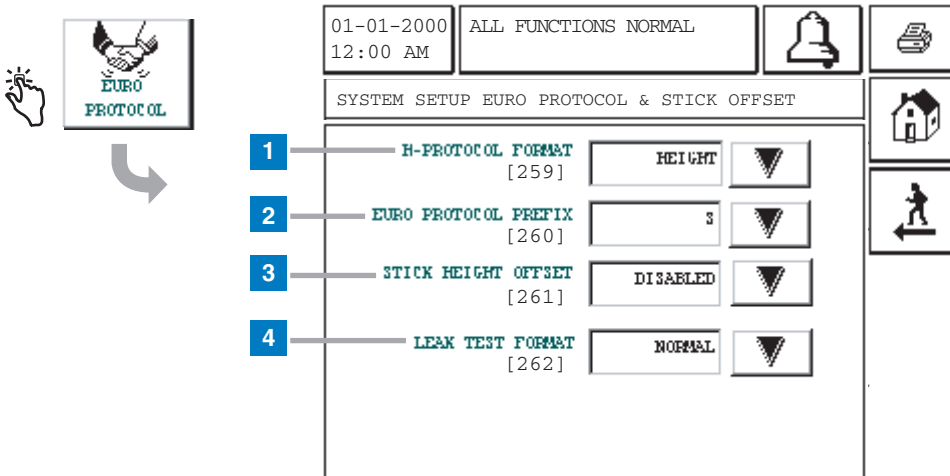
Legend for numbered boxes

This screen displays the Temperature Compensation Setup Screen.

- 1** TC Reference [257]- touch the Down Arrow button to the right of the window and enter a desired Temperature Compensation reference temperature. The allowable range is -49 to +120°F (-45 to +48.9°C). The default is 59°F (15°C).
- 2** Print TC Volume [258] - touch the Down Arrow button to the right of the window and select: Yes or No (default).
When set to NO, TC Volumes are not reported in displays, printouts, and serial reports.

- 3** TC Density [254] - touch the Down Arrow button to the right of the window and select: Yes or No (default). When set to Yes, all the inventory/delivery screens, printout and RS-232 commands will display density values as temperature compensated and this will be indicated by "TC".

[259-262] EuroProtocol and Stick Offset Setup Screen

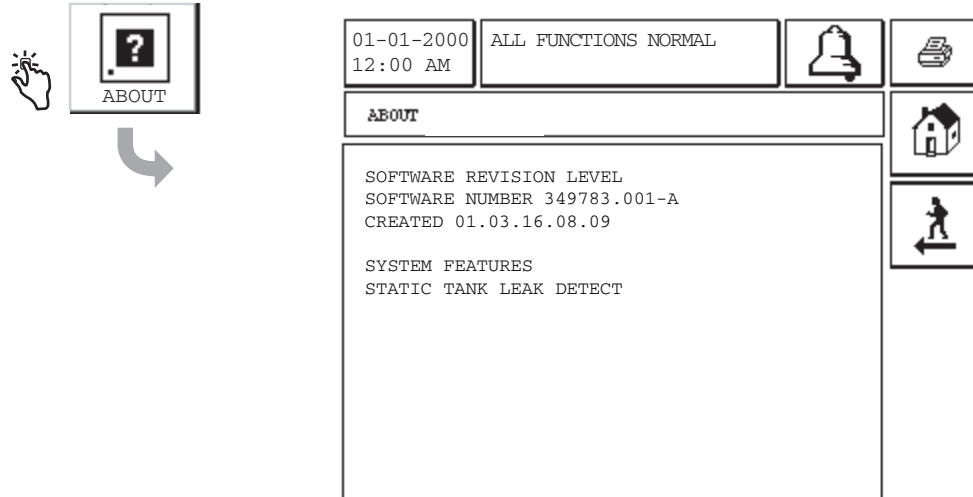


Legend for numbered boxes

This screen contains international format options and leak test format setup.

- 1** H-Protocol Format [259] - Touch the Down Arrow button to the right of the window and select: Height (default) or Volume for H-Protocol.
- 2** Euro Protocol Prefix [260] - Touch the Down Arrow button to the right of the window and select: S (default) or 'd'.
- 3** Stick Height Offset [261] - Touch the Down Arrow button to the right of the window and select: Enabled or Disabled (default).
- 4** Leak Test Format [262] - The leak test report format can be set to Enhanced to comply with the California Code of Regulations. The enhanced report will have height, water, temperature, percent volume, rate and threshold values in addition to the normal report format. Touch the Down Arrow button to the right of the window and select: Normal (default) or Enhanced.

About TLS2 Screen



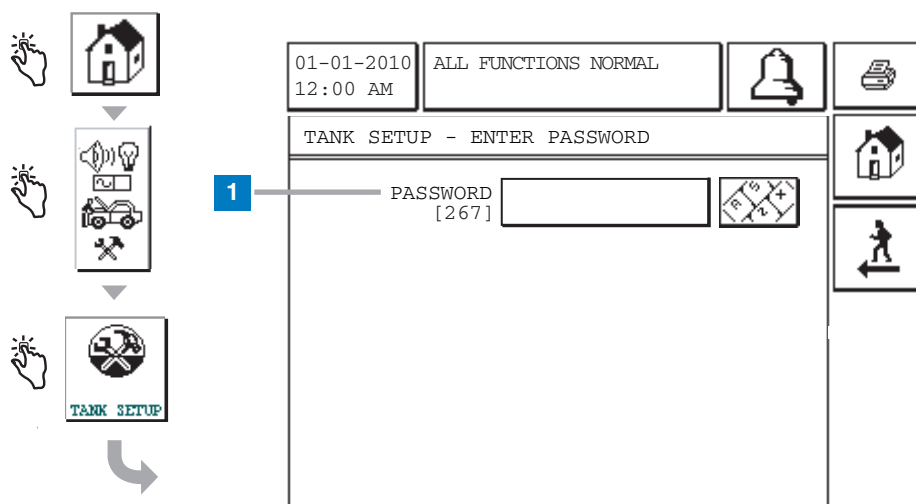
This screen lists information about the TLS2 Console's installed software and features:

- System Software Revision Level
- Software Part Number
- Software Creation Date
- System Features: Static Tank Leak Detect

Tank Setup Screens

[267] Tank Setup - Enter Password Screen

If the System Security Setup - Setup Password (page 14) is enabled, you will be required to enter that password before accessing the Tank Setup Screen (page 38). If the Setup Password is disabled, the Tank Setup - Enter Password Screen will not display.



Legend for numbered boxes

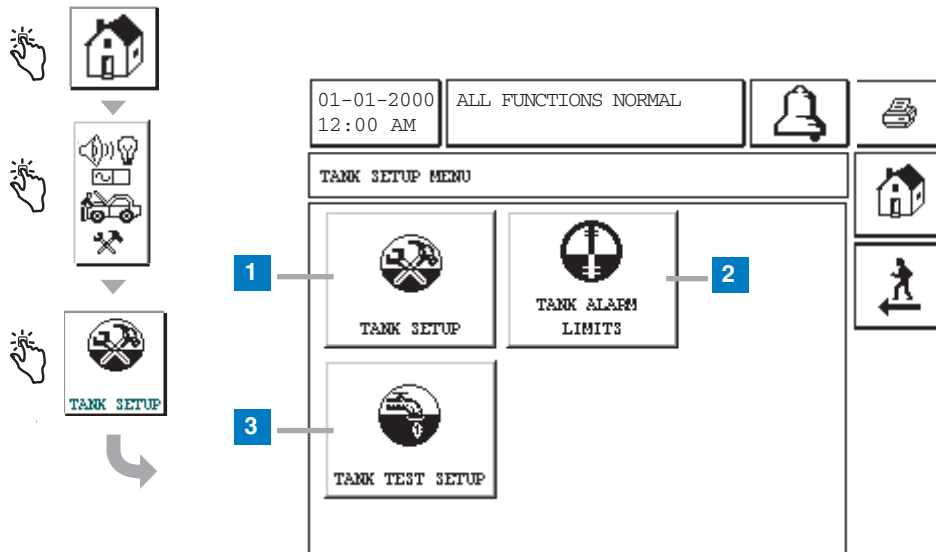
- 1 Password [267] - To access the Tank Setup Screen (page 38), you must enter the 6 to 16 character alphanumeric System Security Setup - Setup Password.

As you enter the password, asterisks (*) will display in place of the entered characters.

If the entered password is correct, the Tank Setup Screen will display.

If the entered password is incorrect, you will be asked to re-enter the password.

Tank Setup Screen



Legend for numbered boxes

This screen contains access to Tank Setup Screens.

- 1** Tank Setup button - touch to display the Tank Setup Screen (page 37).
- 2** Tank Alarm Limit button - Touch to display the Tank Alarm Limits Setup Screen (page 44).
- 3** Tank Test Setup button - Touch to display the Tank Test Setup Screen (page 48).

[119-121] Tank Setup Screen 1

01-01-2000 12:00 AM ALL FUNCTIONS NORMAL

TANK SETUP TANK 1

1 CONFIGURE [119] ENABLED

2 PROD LABEL [120] 12345678901234567890

3 MANIFOLD STATUS [121] 2

1 2 3 4 5 6

Legend for numbered boxes

This screen accesses Tank Setup parameters.

- 1 Configure [119] - Touch the Down Arrow button to the right of the window and select: Enabled or Disabled (default).
- 2 Prod Label [120] - Touch the Down Arrow button to the right of the window and enter up to a 20 character label. Only numerals from 0 - 9 and Roman alphabet characters can be entered.
- 3 Manifold Status [121] - Touch the Keypad button to the right of the window. Enter the number(s) of the tanks to which this tank is manifolded. You must enter a comma between tank numbers if more than one tank is entered.

Tank Setup parameters continue on next page.

[122-124] Tank Setup Screen 2

01-01-2000 12:00 AM ALL FUNCTIONS NORMAL

TANK SETUP TANK 1

1 DIAMETER [122] 87 IN

2 FULL VOLUME [123] 10000

3 TANK PROFILE [124] 4 POINT

4 CHRT

1 2 3 4 5 6

Legend for numbered boxes

This screen continues Tank Setup.

- 1 Diameter [122] - touch the Down Arrow button to the right of the window and enter the diameter of the tank.
- 2 Full Volume [123] - touch the Down Arrow button to the right of the window and enter the Full Volume of the tank.
- 3 Tank Profile [124] - touch the Down Arrow button to the right of the window and select a tank profile: Linear -for rectangular tanks or cylindrical tanks standing on end, 1 point - for flat-ended steel tanks (default), 4 points - for fiberglass tanks, or 20 points - for all tanks.
- 4 Tank Chart button - This button only appears if you have selected the 4-point or 20-point Tank Profile.
 - The system will calculate heights for each point (4 or 20) based on the selected profile and the tank's diameter, and display them beside windows in which you must enter the corresponding volume. Get the volume for the displayed heights from the tank chart and enter that volume in the window.
 - Take care to enter the exact value from the tank chart for the labeled height. Out of range entries will not be accepted.
 - If the 4-point or 20-point profile is selected, you must enter a volume for each point or the system will compute a volume of 0 for any height.

Tank Setup parameters continue on next page.

[125-128] Tank Setup Screen 3

Legend for numbered boxes

This screen concludes Tank Setup.

- 1 Thermal Coefficient [125] - Touch the Down Arrow button to the right of the window and enter the diameter of the tank.

To ensure accurate temperature compensated volume conversions the product's thermal coefficient of expansion must be correctly entered. An incorrect value will adversely affect leak detection testing and temperature compensated inventory values.

Table 2 lists the U.S. and Metric coefficients for approved fuels and liquids. Enter the coefficient in U.S. or Metric units, depending on the units specified in System Setup (page 9). **Be careful to add the correct number of zeros to the right of the decimal point. Incorrect entry can cause test failures and other problems.**

- 2 Tank Tilt [126] - Touch the Down Arrow button to the right of the window and enter the tank tilt. The allowable range is -144 to +144 inches (-365.76 to +365.76 cm) and the default is 0.

Tank Tilt allows you to adjust for a difference between fuel height at the probe location and fuel height at the center of the tank caused by a tilt in the tank. You must enter a minus (-) if the Tank Tilt is a negative value. A Tank Tilt value is not required if the probe is located in the center of the tank. If the probe is located in the center of the tank, the value entered is 000.00 U.S. units or 0000.0 Metric units. If the probe is not in the center of the tank, calculate the tank's tilt using the directions in Table 3. Enter the value from Column G in the worksheet as the Tank Tilt.

- 3 Float Size [127] - Touch the Down Arrow button to the right of the window and from the float sizes presented, enter the Mag probe float size that you installed on the tank's probe

- 4 Stick Offset [128] - Touch the Down Arrow button to the right of the window and enter a Stick Offset value. The allowable range is -144 to +144 inches (-365.76 to +365.76 cm) and the default is 0.

Note: To enter a Stick Offset value, the Stick Offset option must have been enabled (page 35), and you must have calculated and entered the tank tilt (if necessary). A Stick Offset can be entered so that the probe (product) height "appears" to be equal to a stick gauge reading of the product height - *This entry is for operator convenience only, and as such it has no bearing on product volume calculations.*

To determine the value to enter for Stick Offset, record the probe height reading and record a stick height reading from the tank. If the probe's fuel height reading is lower than the stick reading, enter the positive difference between the two. If the probe's reading is higher than the stick reading, enter the negative difference between the two. For example, if stick height = 52 and probe height = 48, you enter +4; if stick height = 52 and probe height = 54, you enter -2.

Table 2: U.S. and Metric Thermal Coefficients

| Product | Thermal Coefficient (U.S. Units) | Thermal Coefficient (Metric Units) |
|------------------------|----------------------------------|------------------------------------|
| Alcohol | 0.00063 | 0.00114 |
| Aviation Gas | 0.00075 | 0.00135 |
| Biodiesel B20 | 0.00045 | 0.00081 |
| Biodiesel B100 | 0.00044 | 0.00079 |
| Diesel (fuel oil #2) | 0.00045 | 0.00081 |
| Ethylene Glycol | 0.00037 | 0.00067 |
| Fuel Oil #4 | 0.00047 | 0.00085 |
| Gasohol | 0.00069 | 0.00125 |
| Gear Oil, 90W | 0.00047 | 0.00085 |
| Hydraulic Oil | 0.00047 | 0.00085 |
| Jet Fuel | 0.00047 | 0.00085 |
| Kerosene (fuel oil #1) | 0.00050 | 0.00090 |
| LPG Butane* | 0.00109 | 0.00196 |
| LPG Propane* | 0.00160 | 0.00288 |
| Leaded | 0.00070 | 0.00126 |
| Low Benzene Unleaded | 0.00070 | 0.00126 |
| Motor Oil | 0.00047 | 0.00085 |
| Premium | 0.00070 | 0.00126 |
| Regular Unleaded | 0.00070 | 0.00126 |
| Super Unleaded | 0.00070 | 0.00126 |
| Transmission Fluid | 0.00047 | 0.00085 |
| Turbine Oil | 0.00047 | 0.00085 |
| Water | 0.00012 | 0.00022 |
| Washer Fluid | 0.00047 | 0.00085 |
| Used Oil | 0.00044 | 0.00079 |

*Coefficient dependent on temperature, 15°C is nominal.

Table 3: Calculating Tank Tilt

Use the worksheet below to record measurements and perform Tank Tilt calculations for each of the tanks.

1. Stick the tank at the fill riser opening at least three times. Record the average reading in column A of the chart.
2. Before beginning this step, make sure the Tank Tilt [126] on the screen = 0. Record the probe's Fuel Height (In-Tank Inventory Function) reading in column B of the chart.
3. Subtract the value entered in column B from the value entered in column A. Record the result in column C.
4. Measure the distance in inches (or millimeters if you use Metric Units) between the probe and fill risers. Record the measurement in column D.
5. Divide the value in column C by column D to determine the pitch. Record the results in column E.
6. Measure the distance in inches or millimetres from the probe riser to the center of the tank. Record the distance in column F.
7. Multiply column E by column F to determine Tank Tilt ($E \times F = \text{Tank Tilt Value}$). Record the value in column G.

Tank Tilt Calculation Worksheet

| | A | B | C | D | E | F | G |
|--|--------------------------------------|---|-------------|-------------------------------|-------------------|---|------------------------|
| Tank No. | Stick Gauge Avg. Height @ Fill Riser | Probe's Fuel Height Reading (Probe Riser) | (A - B = C) | Distance Fill to Probe Risers | Pitch (C / D = E) | Distance from Probe Riser to Center of Tank | Tank Tilt* (E x F = G) |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| *Tank Tilt may be a positive (+) or negative (-) value. If it is a negative value, BE SURE to change the value symbol to minus (-) when entering a negative Tank Tilt value. | | | | | | | |

[101-104] Tank Limits Setup Screen 1

Legend for numbered boxes

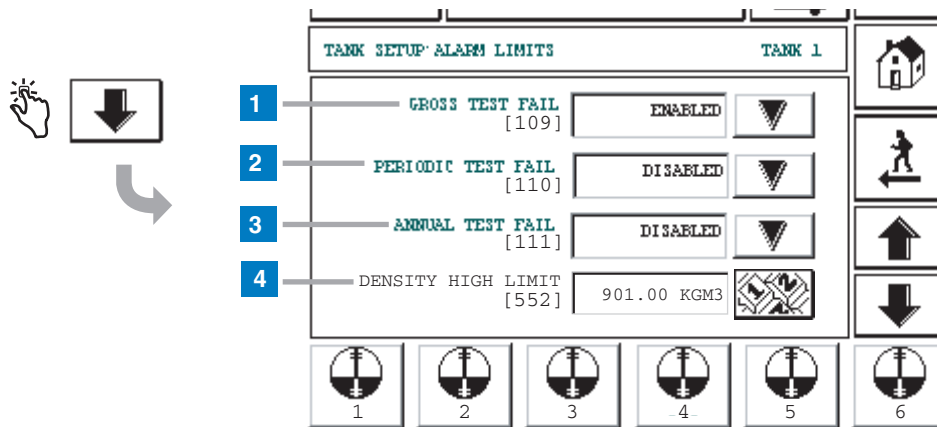
This screen begins Tank Alarm Limits setup.

- 1 Max Product [101] - Alarms when the level of fluid in the tank exceeds the volume you enter here. Allowable range is 0-26000 gallons (0-98420 L). Default is 0. If the value entered is 0 or full volume, this alarm is disabled. An active Probe Low Temperature Warning will disable this alarm. Touch the Down Arrow button to the right of the window and enter the max product for the tank.
- 2 Overfill [102] - Overfill Limit warns of a potential overfill during a delivery. When the volume reaches this limit, the system can activate an overfill alarm. The overfill alarm threshold is referenced to the Max Product value. If the Max Product value is 0, the Overfill Alarm threshold is referenced to the Full Volume capacity. Allowable range is 0 to 100%. Default is 0 (disabled). An active Probe Low Temperature Warning will disable this alarm.
- 3 Delivery Needed [103] - Delivery Needed warns when the level of fluid in the tank drops to a level at which the operator calls for a delivery. This value is a percentage of Full Volume with an allowable range of 0 to 100%. Default is 0% (which disables the alarm). Touch the Down Arrow button to the right of the window and enter a volume higher than that of the Low Product alarm.

- 4 Low Product [104] - Low Product warns when volume in the tank pumps down to the level you enter here. Allowable range is 0-26000 gallons (0-98420 L). Default is 0 (which disables the alarm). An active Probe Low Temperature Warning will disable this alarm. Touch the Down Arrow button to the right of the window and enter this value at a volume lower than that of the Delivery Needed alarm.
NOTE: Typically this alarm is set to the lowest level before the pump runs dry. All dispensing should stop when this alarm is active.

The Tank Alarm Limit Setup continues on next page.

[105-108] Tank Limits Setup Screen 2



Legend for numbered boxes

This screen continues Tank Alarm Limits setup.

- 1** High Water [105] - Alarms when the level of water in the tank exceeds the height you enter here. Set this value at a level lower than the pickup for the submersible pump or suction line. Allowable range is 0-9 inches (0-228.6 mm). Default is 0 (which disables the alarm). Touch the Down Arrow button to the right of the window and enter the desired high water limit.
- 2** Delivery Delay [106] - Use this display to set a delay time between the completion of a bulk delivery and the Delivery Increase Report. This feature prevents generation of multiple reports during the intervals between multi-compartment drops to one tank. The feature also allows fuel to "settle out" after a delivery, which is especially important in manifolded tank groups. Allowable delay is 1 to 60 minutes. Default is 1. Touch the Down Arrow button to the right of the window and enter a desired delay.
- 3** Ann Leak Test Min [107] - This value sets the minimum tank volume required to record a passed annual leak test. The value reflects federal, state, and local requirements. This value is a percentage of Full Volume with an allowable range of 1.0 to 100%. Default is 0 (which disables the alarm). Touch the Down Arrow button to the right of the window and enter a volume.

- 4** Per Leak Test Min [108] - This value sets the minimum tank volume required to record a passed periodic leak test. The value reflects federal, state, and local requirements. This value is a percentage of Full Volume with an allowable range of 1.0 to 100%. Default is 0 (which disables the alarm). Touch the Down Arrow button to the right of the window and enter a volume.

The Tank Alarm Limit Setup continues on next page.

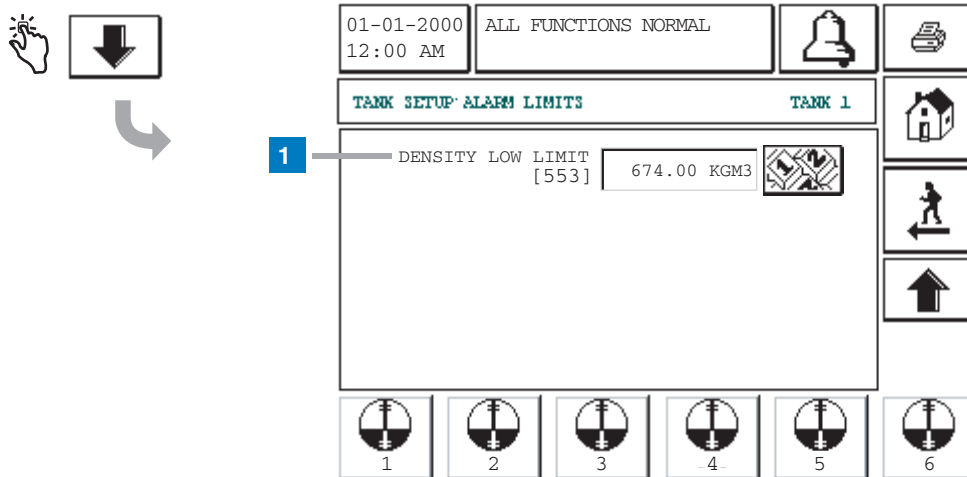
109-111, 552] Tank Limits Setup Screen 3

Legend for numbered boxes

This screen concludes Tank Alarm Limit setup.

- 1 Gross Test Fail [109] - Gross Test Fail allows you to disable or enable an alarm that triggers if a 3 gph (11.3 lph) leak test fails. Choices are Alarm Enabled or Disabled. Default is Disabled. Touch the Down Arrow button to the right of the window and enter the desired choice.
- 2 Periodic Test Fail [110] - Periodic Test Fail allows you to disable or enable an alarm that triggers if a 0.2 gph (0.76 lph) leak test fails. Choices are Alarm Enabled or Disabled. Default is Disabled. Touch the Down Arrow button to the right of the window and enter the desired choice.
- 3 Annual Test Fail [111] - Annual Test Fail alarms when an annual leak test has not passed. Choices are Alarm Enabled or Disabled. Default is Disabled. Touch the Down Arrow button to the right of the window and enter the desired choice.
- 4 Density High Limit [552] - touch the numeric button to enter a high limit at which you want to set the density warning. Allowable Tank Density High Limit range is: 674.00 to 901.00 kg/m³ (42.076 TO 56.248 lbs/ft³). Default high limit is 901.00 kg/m³ (56.248 lbs/ft³).

[553] Tank Alarm Limits Setup Screen 4

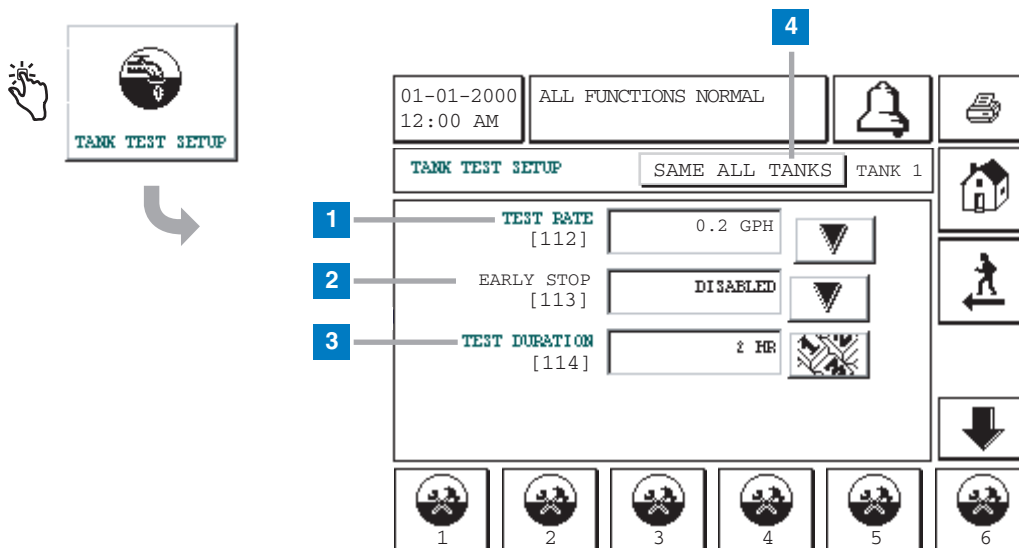


Legend for numbered boxes

This screen concludes Tank Alarm Limit setup.

- 1 Density Low Limit [553] - touch the numeric button to enter a low limit at which you want to set the density warning. Allowable Tank density low limit range is: 674.00 to 901.00 kg/m³(42.076 to 56.248 lbs/ft³). Default low limit is 674.00 kg/m³ (42.076 lbs/ft³).

[112-114] Tank Leak Test Setup Screen 1



Legend for numbered boxes

The Tank Leak Test Setup allows you to establish and enter the method, timing, and duration of automatic leak tests. You must have a Mag 1 or 2 probe installed to perform leak tests.

If you are using the In-Tank Leak Test feature for underground storage tank regulatory compliance, be sure the leak test limits you establish and enter comply with the test type, accuracy, and frequency requirements as defined by local, county, state, federal and any other regulatory authority governing your site.

In addition, set the test time for a period when no fueling from or bulk delivery to the tank will occur. Such activity during a leak test procedure will result in inaccurate leak test results.

- 1** Test Rate [112] - You can set the leak test rate at 0.2 gph (0.76 lph) (default) or 0.1 gph (0.38 lph). Selecting 0.1 gph (0.38 lph) requires a Mag 1 probe. Touch the Down Arrow button to the right of the window and enter the desired choice.
- 2** Early Stop [113] - Disabled is the default setting. When enabled this feature will prevent an In-Tank Leak Test from starting under the following conditions:
 - Tank volume is less than Leak Min Periodic value or Leak Min Annual value.
 - It is less than 8 hours from a delivery.
 - The product temperature is less than 0°F (-17.6°C) or more than +100°F (+37.4°C).

- There is too little fuel in tank.

Touch the Down Arrow button to the right of the window and enter the desired choice.

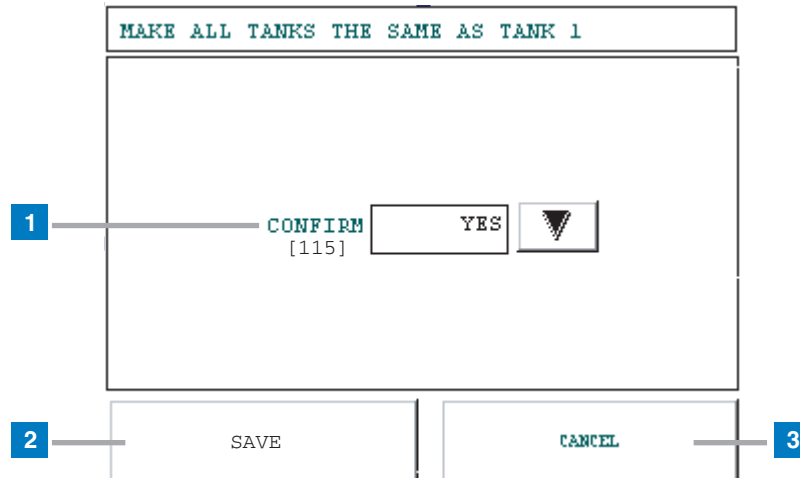
- 3** Test Duration [114] - The maximum duration is 24 hours. There is a minimum duration of two hours for 0.2 gph (0.76 lph) tests and three hours for 0.1 gph (0.38 lph) tests.

Note: If you have Early Stop enabled and the console determines that an Tank Leak Test has passed the test is completed before the duration times out. Default duration is 2 hours. Touch the Down Arrow button to the right of the window and enter the desired choice.

- 4** Same All Tanks button - Touch this button to transfer identical selections made on this screen for Tank 1 to All Tanks (opens the confirm Same All Tanks Screen on page 49).

The Tank Leak Test setup concludes on page 47.

[115] Same All Tanks Screen

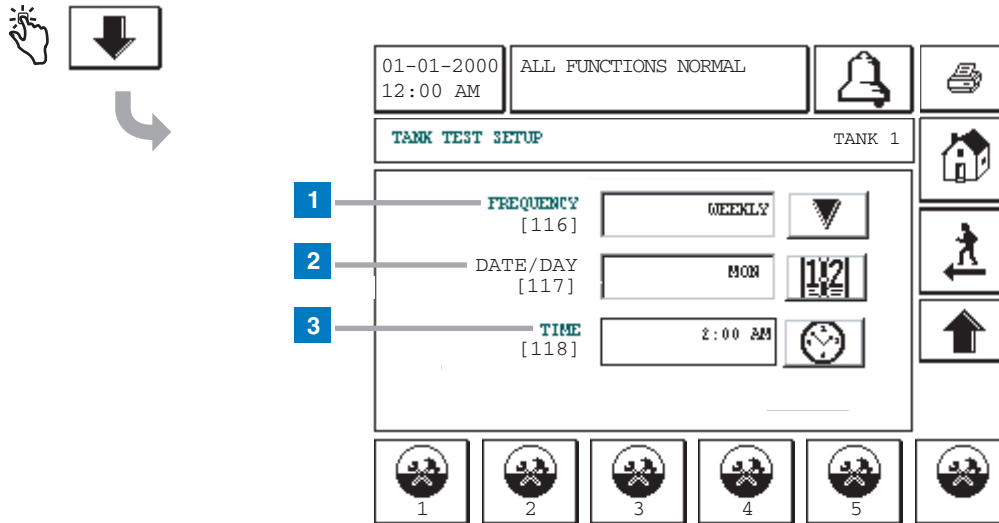


Legend for numbered boxes

This screen appears if you touch the SAME ALL TANKS button on the Tank Leak Test Setup screens.

- 1 Confirm [115] - Select Yes to transfer the Tank 1 setup selections on the Tank Leak Test Setup screens to all configured tanks in the system. Select No not to transfer the Tank 1 setup to all tanks. Default is No. If necessary, touch the arrow button on the right of the window and change the entry.
- 2 Save button - Touch this button to save your selection and return to the Tank Leak Test Setup screen.
- 3 Cancel button - Touch this button to cancel your choice and return to the Tank Leak Test Setup screen.

[116-118] Tank Leak Test Setup Screen 2



Legend for numbered boxes

This screen concludes Tank Leak Test Setup.

- 1** Frequency [116] - You can choose from several Tank Leak Test frequency options:

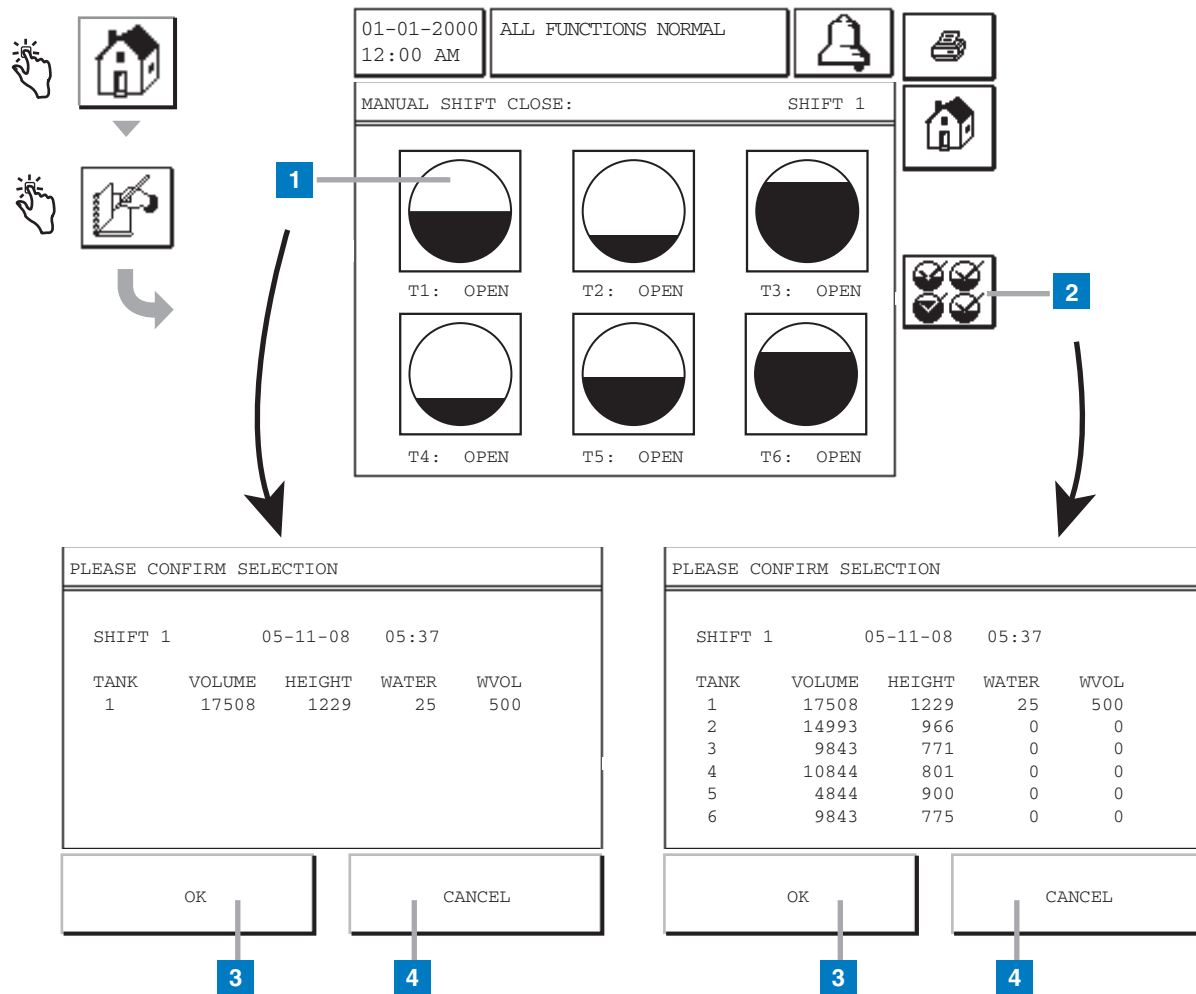
- On Date
- Annually
- Monthly
- Weekly
- Daily

Touch the Down Arrow button to the right of the window and enter the desired choice.

- 2** Date/Day [117] - Touch the Date button to enter the day, month, and year on which to run the test.
- 3** Time [118] - Touch the Time button to enter the Time of Day for the leak test.

Manually Closing a Shift

Manual Shift Close Screen



Legend for numbered boxes

- 1 You can manually close the shift for any tank by touching the desired tank's graphic on the screen, or
- 2 You can manually close the shift for all tanks by touching the All Tanks button.
- 3 For either Single or All Tank shift closure, touch the OK button to confirm the closing.
- 4 For either Single or All Tank shift closure, touch the Cancel button to abort the closing.

NOTES:

Pressing a tank that is already closed will not display the confirmation close screen.

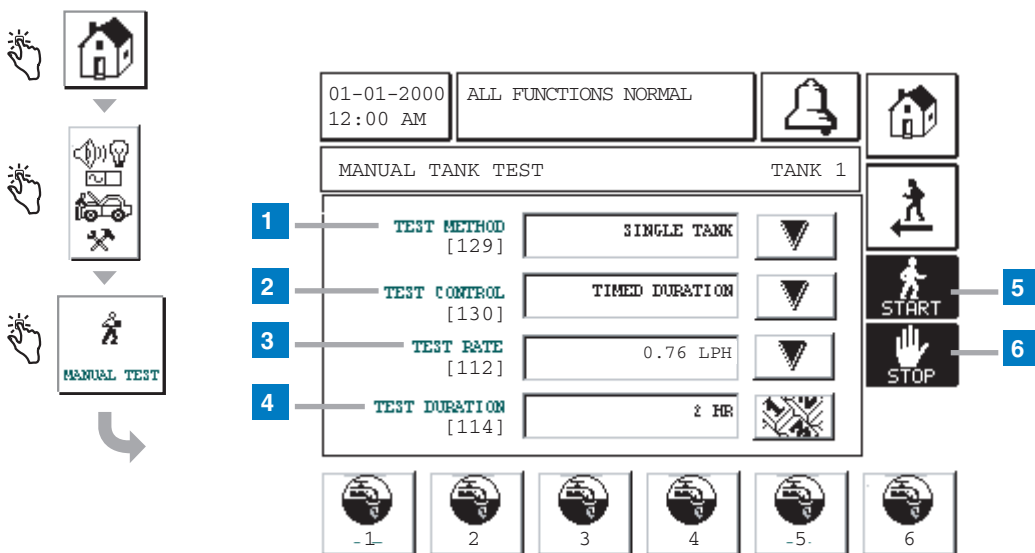
Once all tanks are closed, you can not close another shift until 2 hours after the last tank was closed.

From midnight to 11:59 pm, you can manually close a maximum of four shifts.

Manually Starting/Stopping Tank Leak Tests

Use this screen to manually start or stop a Tank Leak Test.

Manual Test Start/Stop Screen



Legend for numbered boxes

- 1** Test Method [129] - Select Single Tank or All Tanks. Touch the Down Arrow button to the right of the window and enter the desired choice.
- 2** Test Control [130] - Select Timed Duration or Manual Stop (test runs until you stop it, or for 24 hours, whichever comes first). Touch the Down Arrow button to the right of the window and enter the desired choice.
- 3** Test Rate [112] - Select a leak test rate of 0.2 gph (0.76 lph) (default) or 0.1 gph (0.38 lph). The 0.1 gph (0.38 lph) rate requires a Mag 1 Probe. Touch the Down Arrow button to the right of the window and enter the desired choice.
- 4** Test Duration [114] - Select a test duration of from 0 to 24 hours. There is a minimum duration of two hours for 0.2 gph (0.76 lph) tests and three hours for 0.1 gph (0.38 lph) tests. Default is 2 hours.
Note: this window only appears if you selected Timed Duration in the Test Control window. Touch the Down Arrow button to the right of the window and enter the desired choice.
- 5** Test Start button - Touch this button to begin the test.
- 6** Test Stop button - Touch this button to stop a tank leak test.

Reports

System Reports

System reports are accessed from the System Status (Home) Screen (see page 5) by touching one of the four report buttons at the bottom of the screen. Table 4 describes the available System reports.

Table 4: System Reports








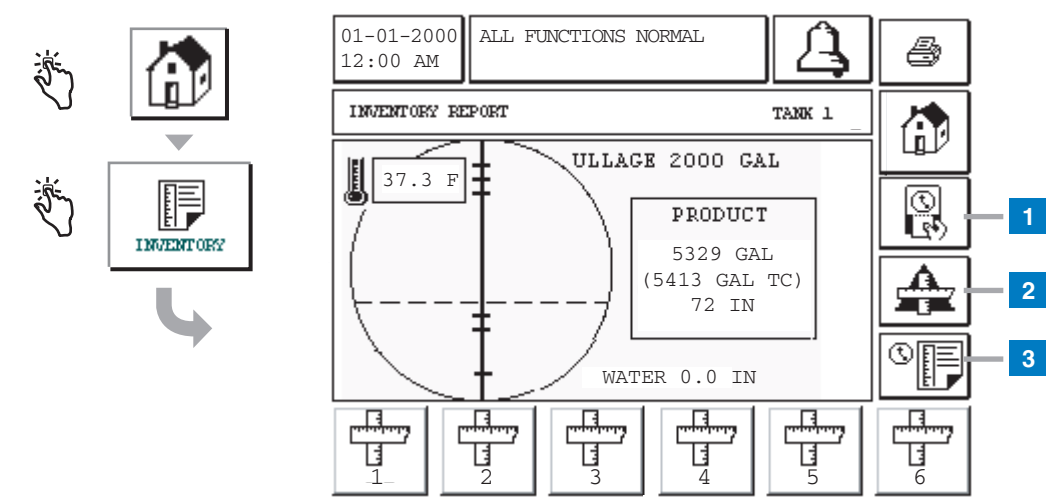
| Report Button | Report | Report Parameters |
|---|--|--|
|  | <p>Touch to display Inventory and Shift Inventory Reports for each tank. You can touch the Print button on the display to print the report to a connected printer.</p> | <p>INVENTORY REPORT (Non-Density Probe) Fuel Volume, TC Fuel Volume, Ullage, Fuel height, Water Height and Fuel Temperature. See example on page 55.</p> <p>INVENTORY REPORT (Density Probe) Fuel Volume, Mass, Density, Fuel height, Water Height and Fuel Temperature. See example on page 57.</p> |
| |  <p>Touch to display the Hourly Inventory Report for a selected tank. Touch the Print button to print the report to a connected printer.</p> | <p>HOURLY INVENTORY REPORT Date, Hour, Volume, Height, Water and Temp See example on page 56.</p> |
|  | <p>Touch to display Delivery Reports for each tank. Includes last delivery and up to previous 9 deliveries. You can touch the Print button on the display to print the report to a connected printer.</p> | <p>DELIVERY REPORT (Non-Density Probe) Start Date, Time, Volume, TC Volume, Water Height, Fuel Temp and Fuel Height End Date, Time, Volume, TC Volume, Water Height, Fuel Temp and Fuel Height Increase Volume Amount and TC Volume Amount See example on page 58.</p> <p>DELIVERY REPORT (Density Probe) Start Date, Time, Volume, Mass, Density, Water Height, Fuel Temp and Fuel Height End Date, Time, Volume, Mass, Density, Water Height, Fuel Temp and Fuel Height Increase Volume Amount and Mass Amount See example on page 59.</p> |

Table 4: System Reports



| Report Button | Report | Report Parameters |
|---|--|---|
|  <p>Touch to display the Environmental Reports Screen. When this screen displays you can select one of two test reports.</p> |  <p>Touch the Last Results button to display the results of the last passed Annual, Periodic, and Gross tests. You can touch the Print button on the display to print the report to a connected printer.</p> | <p>CURRENT TEST RESULTS Test Type, Start Date/Time, Test Result, Hours Run, %Volume in Tank at Time of Test</p> |
| |  <p>Touch the Fullest Pass button to display the results of the last 12 Periodic (1 for each month) tests and Last Annual test in which the tank had the most volume. You can touch the Print button on the display to print the report to a connected printer.</p> | <p>FULLEST LAST PASS REPORT Test Type, Start Date/Time, Hours Run, %Volume in Tank at Time of Test</p> |
|  | <p>Touch to display the Active Alarm Reports Screen. You can touch the Print button on the display to print the report to a connected printer.</p> | <p>ACTIVE ALARM REPORT Device (T = Tank, C = Comm), Alarm Type, Date, Time See example on page 60.</p> |

Inventory Report (US Units and Non-Density Probe)





To view the inventory report for a tank, touch the inventory report button for the desired tank at the bottom of the screen. To view the Shift Inventory report for the selected tank, touch the Shift Inventory button (item 1 in the screen above). To view the stick height (if enabled) for the selected tank, touch the Delta Stick button (item 2 in the screen above). To view the Inventory Log report for the selected tank, touch the Inventory Log Report button (item 3 in the screen above).



Example Report Printout - Inventory Report with TC volume



| | | | | | | | |
|----------------------|--------|-----------|--------|--------|-------|------|--|
| T 1:REGULAR UNLEADED | | | | | | | |
| TANK | VOLUME | TC VOLUME | ULLAGE | HEIGHT | WATER | TEMP | |
| 1 | 5329 | 5413 | 4500 | 48.8 | 0.0 | 37.3 | |
| 2 | 5329 | 5413 | 4500 | 48.8 | 0.0 | 37.3 | |

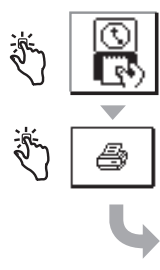
Example Report Printout - Timed Shift Inventory Report with TC volume





| | | | | | | | |
|------------------------|------------------|--------|-----------|--------|--------|-------|------|
| T 1 : REGULAR UNLEADED | | | | | | | |
| TANK PRODUCT | | | | | | | |
| 1 | REGULAR UNLEADED | VOLUME | TC VOLUME | ULLAGE | HEIGHT | WATER | TEMP |
| SHIFT 1 | STARTING VALUES | 8518 | 8492 | 1482 | 76.26 | 0.0 | 64.7 |
| | ENDING VALUES | 8518 | 8492 | 1482 | 76.26 | 0.0 | 64.7 |
| | DELIVERY VALUE | 0 | | | | | |
| | TOTALS | 0 | | | | | |
| SHIFT 2 | STARTING VALUES | 8518 | 8492 | 1482 | 76.26 | 0.0 | 64.7 |
| | ENDING VALUES | 8518 | 8492 | 1482 | 76.26 | 0.0 | 64.7 |
| | DELIVERY VALUE | 0 | | | | | |
| | TOTALS | 0 | | | | | |

Example Report Printout - Snapshot Shift Inventory Report




SHIFT 1 05-11-08 05:37

| TANK | VOLUME | HEIGHT | WATER | WVOL |
|------|--------|--------|-------|------|
| 1 | 17508 | 1229 | 25 | 500 |
| 2 | 14993 | 966 | 0 | 0 |
| 3 | 9844 | 771 | 0 | 0 |
| 4 | 10844 | 801 | 0 | 0 |
| 5 | 4844 | 900 | 0 | 0 |
| 6 | 9843 | 775 | 0 | 0 |

Inventory Report Notes

- TC Volume and temperature columns are printed only for the probes in the system that have temperature measurement capability.
- If system setup parameter Print TC Volumes is set to NO, the TC Volume and temperature columns are not printed.
- The water column is printed only for probes in the system that have water measurement capability.

Example Report Printout - Inventory Log Report

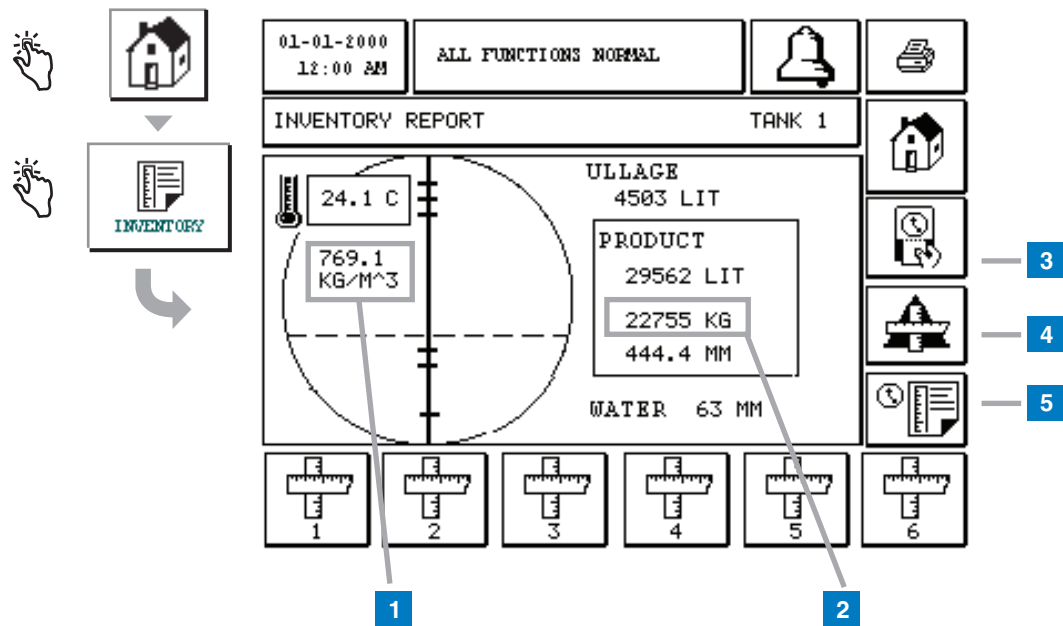


| DATE | VOLUME | HEIGHT | WATER | TEMP |
|---------------|--------|--------|-------|------|
| 08-5-08 09:00 | 17508 | 1229 | 25 | 15 |
| 08-5-08 08:00 | 16508 | 1129 | 25 | 12 |
| 08-5-08 07:00 | 15508 | 1029 | 25 | 12 |
| 08-5-08 06:00 | 14508 | 929 | 25 | 12 |
| 08-5-08 05:00 | 137508 | 829 | 25 | 12 |
| 08-5-08 04:00 | 12508 | 729 | 25 | 12 |

Inventory Log Report Notes

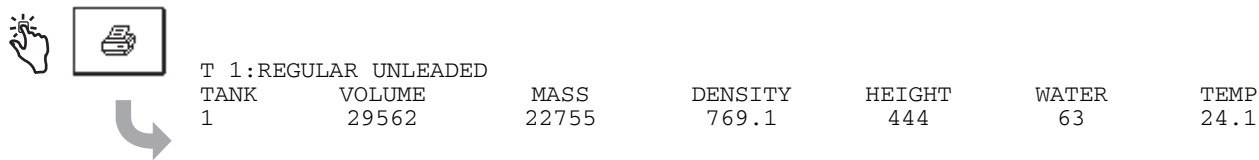
The Inventory Log report (reference page 18) is a rolling log of 72 (max.) records.

Inventory Report (Metric Units and Density Probe)



The inventory report for a tank with a density probe has the density value displayed in the tank graphic (item 1 in the screen above) and the mass value displayed in the Product box (item 2 in the screen above). If Temperature Compensated Density is enabled, TC will follow the density value, e.g., 769.1 kg/m³ TC). The other values are in the same locations as for the non-density probe. Touch the inventory report button for the desired tank at the bottom of the screen. To view the Shift Inventory report for the selected tank, touch the Shift Inventory button (item 3 in the screen above). To view the stick height (if enabled) for the selected tank, touch the Delta Stick button (item 4 in the screen above). To view the Inventory Log report for the selected tank, touch the Inventory Log Report button (item 5 in the screen above).

Example Report Printout - Inventory Report with Density Probe



Delivery Report (US Units and Non-Density Probe)

31-07-2003
12:00 AM

ALL FUNCTIONS NORMAL

DELIVERY REPORT

TANK 1

START

END

DATE 05-06-09 05-06-09

TIME 4:06 PM 4:10 PM

VOLUME 7656 GAL 9493 GAL

TC VOLUME 7560 GAL 9474 GAL

AMOUNT 1837 GAL

TC AMOUNT 1814 GAL

Touch the Tanker button at the bottom of the screen to view a delivery for that tank.

Example Printout - Delivery Report with Non-density Probe

T 1:REGULAR UNLEADED

INCREASE

DATE/TIME

VOLUME

TC VOLUME

WATER

TEMP

HEIGHT

END:

05-06-09 4:10PM

9493

9474

5.3

76.9

21.6

START:

05-06-09 4:06PM

7656

7560

5.1

77.0






17.2

AMOUNT:

1837



1814

Delivery Report (Metric Units and Density Probe)

31-07-2003
12:00 AM


ALL FUNCTIONS NORMAL









DELIVERY REPORT

TANK 1

| | START | END |
|--------|-----------|--------------|
| DATE | 05-06-09 | 05-06-09 |
| TIME | 4:06 PM | 4:10 PM |
| VOLUME | 28978 LIT | 35929 LIT |
| MASS | 22183 KG | 29358 KG |
| AMOUNT | 6952 LIT | DENSITY |
| MASS | 7175 KG | 978.1 KG/M^3 |





1

2

3




4

5

6

Note: If TC Density is enabled, then TC Density will be displayed instead of Density.

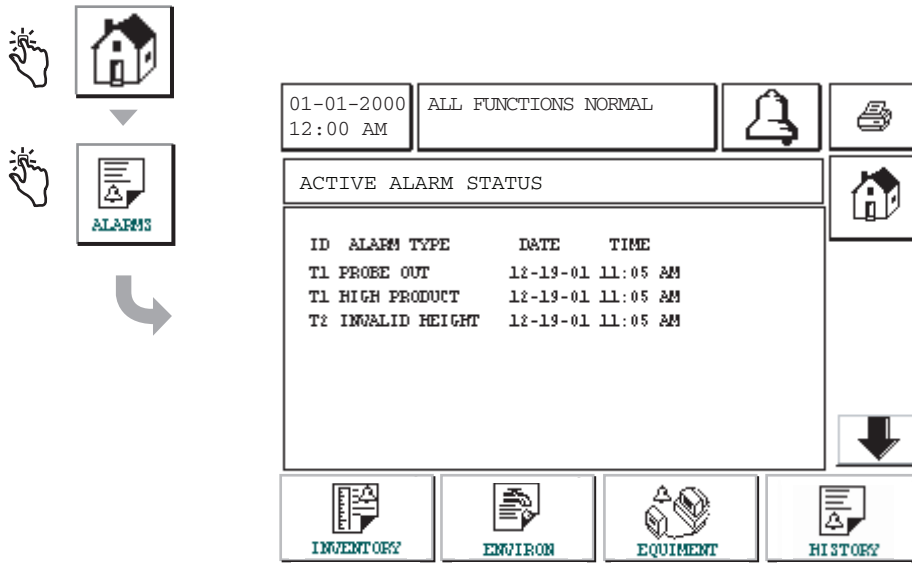
Example Printout - Delivery Report with Density Probe

T 1:REGULAR UNLEADED

| INCREASE | DATE/TIME | VOLUME | MASS | DENSITY | WATER | TEMP | HEIGHT |
|----------|-----------------|--------|-------|---------|-------|------|--------|
| END: | 05-06-09 4:10PM | 35929 | 29358 | 817.0 | 134.8 | 24.9 | 549.7 |
| START: | 05-06-09 4:06PM | 28978 | 22183 | 764.9 | 130.5 | 25.0 | 436.1 |
| AMOUNT: | | 6952 | 7175 | | | | |

Active Alarm Status Screen



Alarm Reports

Alarm reports are accessed from the Active Alarm Reports Screen above by touching the report buttons across the bottom of the screen. Table 5 describes the available reports.

Table 5: Alarm Reports







| Button | Report | Report Parameters |
|---|--|--|
|  | Touch to display the Inventory Alarm Report. Touch the Down/Up arrow buttons to scroll through all alarms. Touch the Print button on the display to print the report to a connected printer. | INVENTORY ALARM REPORT Date/Time of the following last 3 inventory alarms: Max Product, Overfill Limit, Invalid Fuel Level, High Water, Delivery Needed, Low Product, and Low Temperature. |
|  | Touch to display the Environmental Alarm Report. Touch the Down/Up arrow buttons to scroll through all alarms. Touch the Print button on the display to print the report to a connected printer. | ENVIRONMENTAL ALARM REPORT Date/Time of last 3 Gross, Periodic, and Annual Test Fails |
|  | Touch to display the Equipment Alarm Reports Screen. From this screen you can choose to view Tank Equipment Alarm Reports | TANK EQUIPMENT ALARM REPORT Date/Time of last 3 Probe Out alarms for each tank. |

Table 5: Alarm Reports

| Button | Report | Report Parameters |
|--|--|--|
| <p>4</p>  <p>Touch to display the Alarm Reports - Alarm History Screen. From this screen you can choose to view history of High or Low Priority Alarms.</p> |  <p>Touch to display the High Priority Alarm Report. Touch the Print button on the display to print the report to a connected printer</p> | <p>HIGH PRIORITY ALARM REPORT</p> <p>Displays Device (T = Tank, C = Comm) number, Alarm Type, Date, Time, and status of last 50 High Priority alarms: Max Product, Overfill, Low Product, High Water, Gross Test Fail, Periodic Test Fail, Annual Test Fail, Probe Out, and Auto-dial Failure. For Probe Outs only, The printed version also includes a Count column which lists the number of times the alarm had repeated since the Start Date.</p> |
| |  <p>Touch to display the Low Priority Alarm Report. Touch the Print button on the display to print the report to a connected printer.</p> | <p>LOW PRIORITY ALARM REPORT</p> <p>Displays Device (T = Tank, C = Comm) number, Alarm Type, Date, Time and status of last 50 Low Priority alarms: Delivery Needed, Invalid Fuel Height, and Low Temperature,</p> |

Important Alarm Notes

Touching the Alarm Ack button (item 3 on page 5) turns off the beeper even if the alarm is still active. The Alarm Status Screen displays the alarm until it is cleared. When an alarm condition returns to the normal state, the alarm will be removed from the list of active alarms.

When no alarms are active, the front panel LED is in the Normal state (continuous green) and the System Status (Home) Screen Message Window reads All Functions Normal (Item 2 on page 5).

An active Probe Out or Low Temperature Warning will inhibit all level alarms (Max Product, Overfill, Low Product, Delivery Needed, and High Water).

Information on Alarm States

Active Alarm

When an alarm goes active, the console's internal beeper activates, the alarm relay activates (if enabled), the front panel LED flashes red, and the Screen's Message Window (item 2 on page 5) displays an alarm message. In the case of multiple alarms, the Message Window will automatically scroll through the active alarms. In the case of an alarm assigned to autodial, the console dials out and establishes a connection with the remote host. The host can then send requests to the console to determine the reason for the call.

Acknowledging an Active Alarm

When an alarm is active, the user can turn the beeper off and deactivate the alarm relay by touching the ALARM Button (Item 3 on page 5). The front panel LED will stay in the ALARM state and the alarm will remain in the active alarm list until the alarm returns to normal state. If the alarm is inactive but not acknowledged, it will remain in the alarm list and the beeper and alarm relay (if enabled) will remain active until it is acknowledged.

Returning to Normal State

With any alarm when an out-of-limit condition(s) is corrected, or a faulty device is replaced with a properly operating one, the alarm is automatically cleared. To clear a failed leak test alarm, a passing leak test must be run.

In-Tank Alarm Information

Max Product Alarm

If the product level volume exceeds the Max Product value, the Max Product Alarm will activate. If the alarm is active and the product level volume is lower than the Max Product value by at least 0.005 times the full volume capacity or 10 gallons [37.8 L] (whichever is greater), the alarm will deactivate. The Max Product value is entered as a volume with the default value equal to 0. If the Max Product value is equal to 0 or the full tank volume capacity, the alarm is disabled. An active Probe Low Temperature Warning will disable the alarm.

Overfill Alarm

If the product level volume exceeds the Overfill Alarm threshold and there is a delivery in progress, the Overfill Alarm will activate. When the delivery stops, the alarm will deactivate. The Overfill alarm value is entered as a percentage with the default value equal to 0%. An overfill threshold value of 0% disables the alarm. The overfill alarm threshold is referenced to the Max Product value. If the Max Product value is 0, the overfill value is referenced to the Full volume capacity. An active Probe Low Temperature Warning will disable the alarm.

Low Product Alarm

If the product level volume is less than the Low Product threshold, the Low Product Alarm will activate. If the alarm is active and the product level volume is higher than the threshold by at least 0.005 times the full volume capacity or 10 gallons [37.8 L] (whichever is greater), the alarm will deactivate. The Low Product value is entered as a volume with the default value equal to 0. If the value is equal to 0, the alarm is disabled. An active Probe Low Temperature Warning will disable the alarm.

High Water Alarm

If the water level height continuously exceeds the High Water threshold for a period exceeding 3 minutes, the High Water Warning will activate. The high water alarm will not activate if there is a delivery in progress. If the alarm is active and the water level height is lower than the threshold by at least 0.2 inches (5 mm), the alarm will deactivate. The High Water value is entered as a height with the default value equal to 0. If the value is equal to 0, the alarm is disabled. An active Probe Low Temperature Warning will disable the alarm.

Probe Out Alarm

If the console is not reliably communicating with the probe, the Probe Out alarm will activate.

Invalid Fuel Height

If the water float and the product float are too close together to provide reliable height data, the Invalid Fuel Height alarm will activate.

Probe Low Temperature Warning

Standard Probe: If the Probe is reporting a temperature lower than -4°F (-20°C), the Low Temperature warning will activate. If the alarm is active and the temperature rises above 0°F (-17.7°C) the alarm will deactivate.

Low Temperature Probe: Alarm -40°F (-40°C), Clear -36°F (-37.7°). When the low temperature warning is active the High Water, Low Product, Max Product, Delivery Needed, and Overfill alarms are disabled.

Delivery Needed Alarm

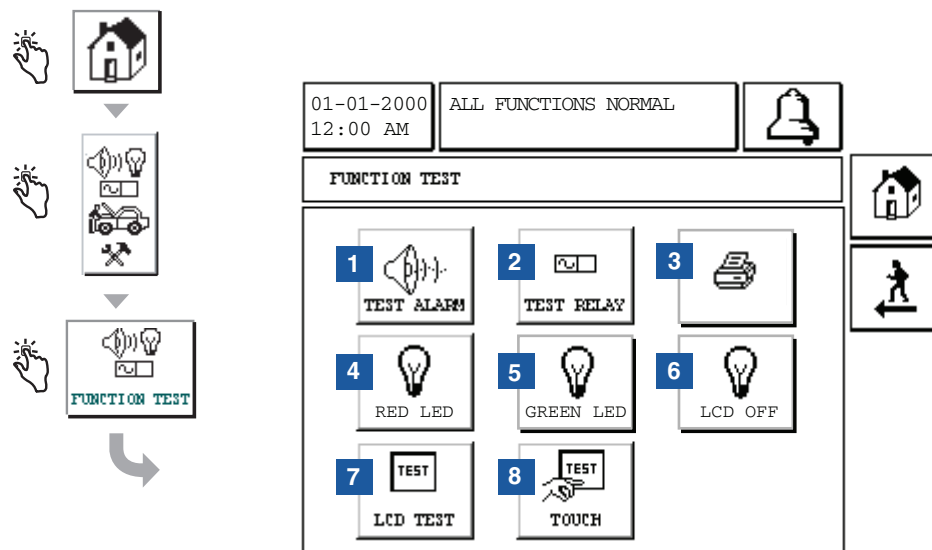
When the tank's product level drops below the preset limit, the Delivery Needed alarm will activate.

Leak Test Alarm

When a Gross, Periodic, or Annual leak test fails a Gross, Periodic, or Annual Leak Test Alarm will activate. To clear a failed leak test alarm, a passing leak test must be run.

Diagnostic Screens

Function Test Menu Screen

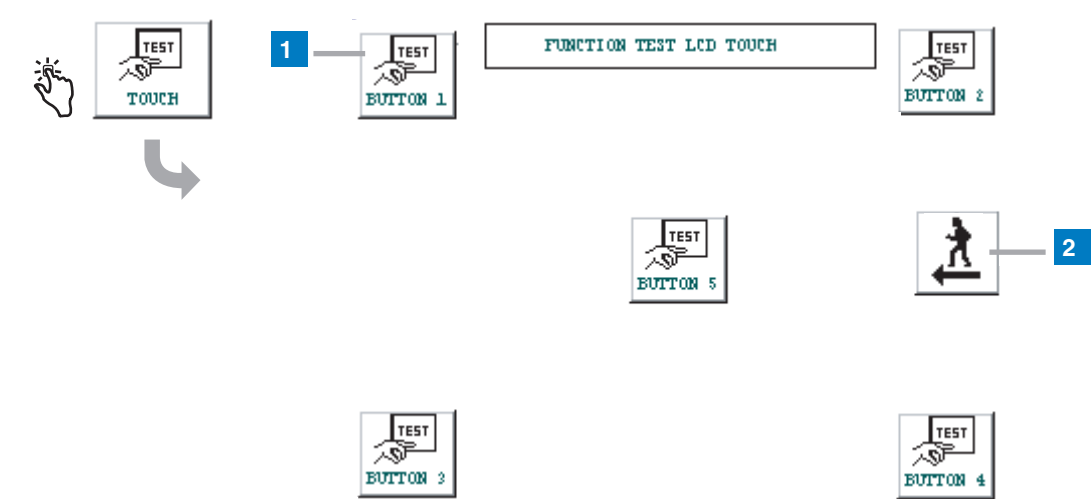


Legend for numbered boxes

This screen displays System Test Functions.

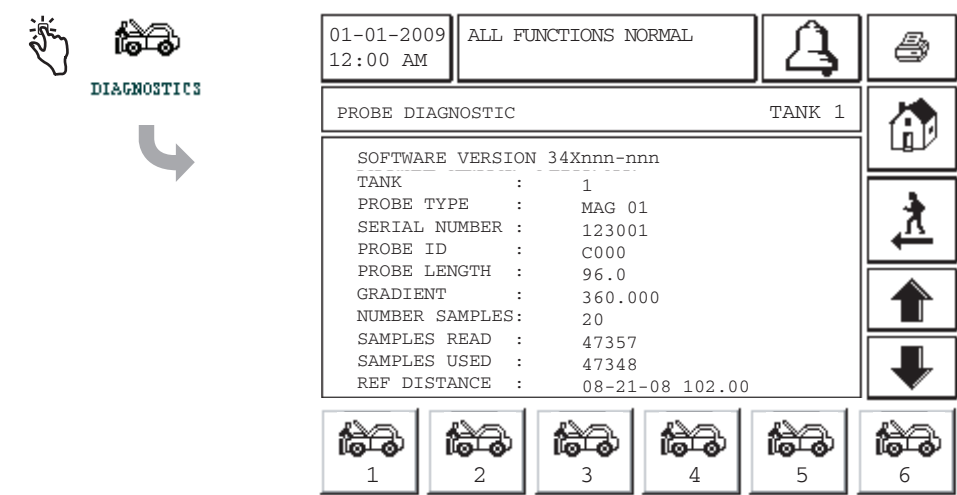
- 1 TEST ALARM button - Touch and the console beeper will beep.
- 2 TEST RELAY button - Touch and the relay is activated for 5 seconds.
- 3 Printer button - Touch and a test line will print to a connected printer.
- 4 RED LED button - Touch and the red front panel LED turns On for several seconds.
- 5 GREEN LED button - Touch and the green front panel LED turns On for several seconds.
- 6 LCD OFF button - Touch and the Display Screen backlight is turned Off. Touch this button again to turn the Display Screen backlight back On.
- 7 LCD TEST button - Touch and a video test pattern will run for several seconds and then clear.
- 8 TOUCH button - Touch to display the LCD Touch Test Screen (page 64).

LCD Touch Test Screen



This screen displays 5 test buttons (e.g., item 1) around the display. Touch one of these buttons and a message appears showing that button's corresponding x/y coordinates and a look up list with the correct coordinates for all 5 buttons). Touch the Back button (item 2) to return to the Function Test Menu Screen.

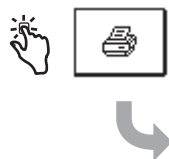
Probe Diagnostic Screen



Touch the down arrow to view available probe temperature data. To view another tank's probe diagnostics, touch the desired tank's Diagnostic button at the bottom of the screen.

Example Report Printout - Probe Diagnostic Report

SOFTWARE VERSION 349nnn-nnn-n



| | | | | |
|-----------------|---|-----------------|-----------------|-----------------|
| TANK | : | 1 | 2 | 3 |
| PROBE TYPE | : | MAG 1 | MAG 1 | MAG 1 |
| SERIAL NUMBER | : | 168809 | 50069 | 50069 |
| PROBE ID | : | 0XC000 | 0XC000 | 0XC000 |
| PROBE LENGTH | : | 30.00 | 18.0 | 18.0 |
| GRADIENT | : | 354.520 | 351.000 | 351.00 |
| NUMBER SAMPLES | : | 20 | 20 | 20 |
| SAMPLES READ | : | 47357 | 4730 | 4729 |
| SAMPLES USED | : | 47348 | 4706 | 4704 |
| REF DISTANCE | : | 08-21-08 102.00 | 08-21-08 102.00 | 08-21-08 102.00 |
| | | 08-27-08 102.01 | 08-27-08 102.01 | 08-27-08 102.01 |
| REF DISTANCE | : | 08-21-08 102.00 | 08-21-08 102.00 | 08-21-08 102.00 |
| | | 08-27-08 102.01 | 08-27-08 102.01 | 08-27-08 102.01 |
| TEMP 6 | : | 72.6 | 76.9 | 71.2 |
| TEMP 5 | : | 72.1 | 76.6 | 70.8 |
| TEMP 4 | : | 70.9 | 76.1 | 70.3 |
| TEMP 3 | : | 69.4 | 75.9 | 70.0 |
| TEMP 2 | : | 68.3 | 75.8 | 69.7 |
| TEMP 1 | : | 67.6 | 75.6 | 69.5 |
| TEMP 6 - TEMP 5 | : | 0.5 | 0.3 | 0.4 |
| TEMP 5 - TEMP 4 | : | 1.3 | 0.5 | 0.5 |
| TEMP 4 - TEMP 3 | : | 1.5 | 0.2 | 0.3 |
| TEMP 3 - TEMP 2 | : | 1.1 | 0.1 | 0.3 |
| TEMP 2 - TEMP 1 | : | 0.7 | 0.2 | 0.2 |
| COUNTS 00 | : | 001319 | 001405 | 001405 |
| | | | | |
| COUNTS 19 | : | 0X0000 | 0X0000 | 0X0000 |

Availability of Probe Data

Diagnostic probe data for configured tanks or for active tanks will be available in the Probe Diagnostic Screen above, in printed reports, and in serial commands. An active tank is defined as a tank that has a probe that is communicating with the system. If the tank is configured but not active, all data will be zero and the probe type will be unknown.

When the software identifies probes that do not have temperature measurement capability, it will inhibit temperature related data. For probes that do not have water measurement capability, it will inhibit water related data.

Label Code Index

Table 6 and Table 7 are included to help non-English speaking users find translations of all English labels used in the TLS2 Setup screens. Beneath each label is a unique code in brackets, e.g., [101]. This code is listed in the tables below and points to every Setup Screen in this manual where the label is used.

Table 6: Tank Setup Label Codes

| Label Code | Label | Where Used |
|------------|--------------------|------------------------|
| 101 | Max Product | page 44 |
| 102 | Overfill | page 44 |
| 103 | Delivery Needed | page 44 |
| 104 | Low Product | page 44 |
| 105 | High Water | page 45 |
| 106 | Delivery Delay | page 45 |
| 107 | Ann Leak Test Min | page 45 |
| 108 | Per Leak Test Min | page 45 |
| 109 | Gross Test Fail | page 46 |
| 110 | Periodic Test Fail | page 46 |
| 111 | Annual Test Fail | page 46 |
| 112 | Test Rate | page 48 and page 52 |
| 113 | Quick Mode | page 48 |
| 114 | Test Duration | page 48 and page 52 |
| 115 | Confirm | page 49 |
| 116 | Frequency | page 47 |
| 117 | Date/Day | page 47 |
| 118 | Time | page 47 |
| 119 | Configure | page 37 |
| 120 | Prod Label | page 37 |
| 121 | Manifold Status | page 37 |
| 122 | Diameter | page 40 |
| 123 | Full Volume | page 40 |
| 124 | Tank Profile | page 40 |
| 125 | Thermal Coeff | page 41 |

Table 6: Tank Setup Label Codes

| Label Code | Label | Where Used |
|------------|--------------|------------|
| 126 | Tank Tilt | page 41 |
| 127 | Float Size | page 41 |
| 128 | Stick Offset | page 41 |
| 129 | Test Method | page 52 |
| 130 | Test Control | page 52 |

Table 7: System Setup Label Codes

| Label Code | Label | Where Used |
|------------|------------------------|------------|
| 201 | System Language | page 9 |
| 202 | Units | page 9 |
| 203 | Serial Language | page 9 |
| 204 | Header 1 | page 10 |
| 205 | Header 2 | page 10 |
| 206 | Header 3 | page 10 |
| 207 | Header 4 | page 10 |
| 208 | Comm 1 Password Enable | page 13 |
| 209 | Comm 1 Password | page 13 |
| 210 | Comm 2 Password Enable | page 13 |
| 211 | Comm 2 Password | page 13 |
| 212 | Date | page 15 |
| 213 | Time | page 15 |
| 214 | Time/Date Format | page 15 |
| 215 | Shift 1 | page 19 |
| 216 | Shift 2 | page 19 |
| 217 | Shift 3 | page 19 |
| 218 | Shift 4 | page 19 |
| 219 | Daylight Savings | page 20 |
| 220 | Start Date | page 20 |
| 221 | Start Time | page 20 |
| 222 | End Date | page 20 |

Table 7: System Setup Label Codes

| Label Code | Label | Where Used |
|------------|---------------------|---------------------------------|
| 223 | End Time | page 20 |
| 224 | Phone Number | page 21 |
| 225 | Retries | page 21 |
| 226 | Retry Delay | page 21 |
| 227 | Max Product | page 22 |
| 228 | Overfill Limit | page 22 |
| 229 | Delivery Needed | page 22 |
| 230 | Low Product | page 22 |
| 231 | High Water | page 23 |
| 232 | Gross Test Fail | page 23 |
| 233 | Periodic Test Fail | page 23 |
| 234 | Annual Test Fail | page 23 |
| 235 | Invalid Fuel Height | page 24 |
| 236 | Probe Out | page 24 |
| 237 | Low Temperature | page 24 |
| 238 | Comm Type | page 26, page 27, page 32 |
| 240 | ISO 3166 Country | page 9 |
| 239 | Handshaking | page 26, page 27 |
| 241 | Page Eject | page 27, page 32 |
| 244 | Modem Type | page 28 |
| 245 | Dial Type | page 28 |
| 246 | Answer On | page 28 |
| 247 | Dial In | page 32 |
| 248 | Dial Out | page 32 |
| 249 | Baud Rate | page 29 |
| 250 | Parity | page 29 |
| 251 | Data Length | page 29 |
| 252 | Stop Bits | page 29 |

Table 7: System Setup Label Codes

| Label Code | Label | Where Used |
|------------|------------------------|---------------------|
| 253 | Printer Lang | page 27, page 32 |
| 254 | TC Density | page 34 |
| 256 | Alarm Relay | page 33 |
| 257 | TC Reference | page 34 |
| 258 | Print TC Volume | page 34 |
| 259 | H-Protocol Format | page 35 |
| 260 | Euro Protocol Prefix | page 35 |
| 261 | Stick Height Offset | page 35 |
| 262 | Leak Test Format | page 35 |
| 263 | Old Password | page 14 |
| 264 | New Password | page 14 |
| 265 | Confirm New | page 14 |
| 266 | Password | page 7 |
| 267 | Password | page 37 |
| 320 | Delivery Completed | page 24 |
| 321 | Autodial Confirm | page 21 |
| 500 | Shift Close Method | page 18 |
| 501 | Shift Close Timeout | page 18 |
| 502 | Inventory Log Time | page 18 |
| 503 | Inventory Log Interval | page 18 |
| 550 | Shift Close Event | page 25 |
| 551 | Density Warning | page 25 |
| 552 | Density High Limit | page 46 |
| 553 | Density Low Limit | page 47 |

Warranty Conditions and Limitations of Liability

Limitations Of Liability

We warrant that this product will be free from defects in materials and workmanship for a period of 1 year from the date of installation or 24 months from the date of invoice, whichever occurs first. During the warranty period, we or our representative will repair or replace the product, if determined by us to be defective, at the location where the product is in use and at no charge to the purchaser.

We shall not be responsible for any expenses incurred by the user.

This warranty applies only when the product is installed in accordance with Veeder-Root's specifications, and a Warranty Registration and Checkout Form has been filed with Veeder-Root by an Authorized Veeder-Root Distributor. This warranty will not apply to any product which has been subjected to misuse, negligence or accident; or misapplied; or used in violation of product manuals, instructions or warnings; or modified or repaired by unauthorized persons; or improperly installed.

Inspection

You shall inspect the product promptly after receipt and shall notify us at our Simsbury office in writing of any claims, including claims of breach of warranty, within 30 days after you discover or should have discovered the facts upon which the claim is based. Your failure to give written notice of a claim within the time period shall be deemed to be a waiver of such claim.

Limitation of Remedy and Warranty

The provisions of "Limitations Of Liability" above are our sole obligation and exclude all other remedies or warranties, express or implied, including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE, whether or not purposes or specifications are described herein. We further disclaim any responsibility whatsoever to you or to any other person for injury to person or damage to or loss of property or value caused by any product which has been subjected to misuse, negligence, or accident; or misapplied; or used in violation of product manuals, instructions or warnings; or modified or repaired by unauthorized persons; or improperly installed.

Limitation of Damages

Under no circumstances shall we be liable for any incidental, consequential or specific damages, losses or expenses arising from this contract or its performance or in connection with the use of, or inability to use, our product for any purpose whatsoever.

Limitation of Actions

No action regardless of form arising out of this contract may be commenced more than 1 year after the cause of action has accrued, except an action for nonpayment.

Collateral Promises

There are no representations, warranties, or conditions, express or implied, statutory or otherwise except those herein contained, and no agreement or waivers collateral hereto shall be binding on either party unless in writing and signed by you and accepted by us at our Simsbury office.

Interpretation

Rights and liabilities arising out of any contract with us shall be determined under the Uniform Commercial Code as enacted in Connecticut.



For technical support, sales or
other assistance, please visit:
www.veeder.com