PROTEUS®

SYSTEM PROGRAMMING MANUAL

Part No. OEL8000III-B, OEL8000III-K, & OEL8000III-X

Software Release 8.0
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1. Navigating to Setup

**Home Screen:** The SETUP MENU is located under UTILITIES. (See Figure 1.1)

**Utilities Screen:** To enter setup press SETUP MENU. (See Figure 1.2)

**Enter Password:** Enter the manufacturer default password “000000” when prompted by the unit to proceed to the SETUP MENU. (See Figure 1.3)

To change the password: Go to Section 5, Miscellaneous Settings.
Setup Menu (Page 1): Used to navigate to corresponding system setup options. (See Figure 1.4)

![Figure 1.4]

Setup Menu (Page 2): Used to navigate to additional system setup options. (See Figure 1.5)

![Figure 1.5]

a) **Backup System Parameters**: Backs up programming to SD Card.

b) **Restore System Parameters**: Restores programming from SD Card to Proteus ATG.

c) **Print System Parameters**: Prints entire system programming. Each prompt will have a confirmation message for “YES” or “NO.” (See Figure 1.5)

*SD Card features and printing for Proteus K & X only*
2. System Units

Site Units of Measurement: The default unit settings are displayed using the imperial system, press the unit you would like to change for the list of options. You may also change the date view between MM/DD/YYYY and YYYY-MM-DD. (See Figure 2.1)

Set Units of Measurement: Select units desired for volume, level, and temperature. (See Figure 2.2)
3. Printer Settings (Proteus K & X only)

**Print Line Headers:** Information printed on the system status report header.

**Printer Settings:** Selects on-board printer or network printer. (See Figure 3.1)

![Figure 3.1](image)

a) **Print Line Headers:** The headers are used to program site specific information that will print on the header of the system status report. Examples of the information to be entered here would be site name, site address, site phone number, and manager’s name.

b) **Printer Settings:** Selecting internal printer will use the Proteus printer; selecting TCP/IP printer will use printer linked to the same network as the Proteus ATG. Put the printer’s IP address and port number in the fields provided.
4. Shift Time Settings

Shift Time Settings: Setup for generating daily shift reports. (See Figure 4.1)

- **Number of Shifts**: Number of shift reports to be generated daily.
- **Auto Print**: Will enable or disable an automatic printout at each shift end time.
- **Shift Open Time**: The time that starts the first shift.
- **Shift End Times**: End times for the number of shifts that were selected. If multiple shifts are selected, the end time of the last shift will also be the shift open time.

![Figure 4.1](image)
5. Misc. Settings

Miscellaneous Settings: Settings for remote horns and alarm, as well as auto print options for other settings. SETUP MENU password can be changed here as well. (See Figure 5.1)

- **Remote Horn Timeout**: Amount of time the horn will sound before automatically silencing.
- **Remote Horn Timeout Enable**: Used to enable or disable the horn timeout.
- **Remote Alarm ACK Timeout**: Amount of time before re-sounding the horn after it is silenced (Remote horn settings for Proteus K & X only).
- **Ullage %**: The percent used to calculate ullage on printouts.
- **Setup Password**: To change the password press the box and enter new password. When finished press the save button.
- **Alarm Auto Printout**: Used to enable or disable an automatic printout of Alarm report.
- **Drop Auto Printout**: Used to enable or disable the automatic printout of Drop report.
- **Shift Auto Printout**: Used to enable or disable the automatic printout of Shift report.
- **VLD Auto-print**: Used to enable or disable the automatic printout of VLD report.
- **Interstitial Auto Print**: Used to enable or disable the automatic printout of an interstitial sensor report (Printing for Proteus K & X only).
Miscellaneous Settings page 2:
Additional settings to adjust Homepage and page change to delivery in progress. (See Figure 5.2)

a) **Delivery Page Change**: Automatically wakes up the display to show a tank with delivery in progress.

b) **Backlight Timeout**: Can be changed to dim the display between 1-255 minutes. Can also be set to zero which leaves the display always ON (Inventory and Homepage only).

c) **Home Screen**: Choose which page you would like to set as the Home Screen. Choose from System Status, 4 Tank Inventory, Single Tank Inventory, or Single Tank Zoomed Inventory.

d) **Home Screen Tank #**: If a single tank inventory page is chosen, this will select which tank is shown.

e) **Information**: Will show and explain what each parameter does within miscellaneous settings.
6. Tank Parameters

**Setup-Tank Parameters:** Various parameters that are needed to obtain proper and accurate functionality. (See Figure 6.1)

- **a) Tank Number:** Selects a tank for setup.
- **b) Product Type:** Product type label (up to 17 characters).
- **c) Product Null:** Amount subtracted from gauging probe product level measurement to match actual product level measurement (Enter product height from stick reading).
- **d) Water Null:** Amount subtracted from gauging probe water level measurement to match actual water level measurement (Enter water height from stick reading).
- **e) Enable/Disable:** Enable or disable the corresponding tank.
- **f) Tank Capacity:** Total volume of tank (obtained from tank chart).
- **g) Tank Diameter:** Height of tank (highest point on tank chart).
- **h) Probe Length:** Overall probe length (last 3 digits from CAT # on the head of the probe).
- **i) Wire Speed:** Factory defined wire speed (obtained from probe label).
- **j) Volume Correction:** Thermal coefficient of expansion x 10^-5 (obtained from thermal coefficient table, enter only most significant digits ex. Gasoline = 70).
- **k) Probe Type:** Shows how many temperature thermistors are in the probe. (Obtained from CAT# on the head of the probe). **If using a “redhead” probe, enter 4.**
- **l) Volume Offset:** Amount added to volume reading for further calibration.

Enter corresponding values on each box then press the “NEXT PAGE” icon to continue programming alarm parameters on the same tank.

Figure 6.1
Volume Correction (cont.): After selecting volume correction you can select which correction method you will use (See Figure 6.2). You may also remove the water volume from the temperature compensated measurement by pressing the check box (will show net volume).
7. Tank Alarm Settings

Tank Alarms and Set Points:
Parameters used to control how the alarms will function. (See Figure 7.1)

- **Tank Number**: Selects a tank for setup.
- **High Product**: Percentage of volume that will trigger a high/high level alarm (max 95%).
- **Overfill**: Percentage of volume that will trigger an overfill alarm, set for the same percentage as High Product. Triggers during delivery in progress (101 disabled).
- **High Warning**: Percentage of volume that will trigger a high warning level.
- **Low Product**: Percentage of volume that will trigger a low/low level alarm.
- **Delivery Needed**: Percentage of volume that will trigger a delivery needed alarm (0 disabled).
- **High Water**: The water level that will trigger a high water alarm.
- **Sudden Loss**: Rate of increase/decrease needed during a VLD test to trigger a sudden loss alarm.
- **Probe Temp High**: Temperature needed to activate probe high temp alarm.
- **Probe Temp Low**: Temperature needed to activate probe low temp alarm.

Enter corresponding values on each box then press the “NEXT PAGE” icon to continue programming the strapping chart for the same tank.
8. Tank Table (Strapping)

Tank Chart Points: Used to create the chart for each tank. (See Figure 8.1)

a) **Tank Number**: Selects a tank for setup.

b) **Chart Increment**: Used to create how many points will be entered into the tank chart. Divides the tank diameter equally by this number. Enter the correct volume for the levels given.

![Figure 8.1](image)

Enter corresponding values on each box then press the “NEXT PAGE” icon to continue programming the delivery parameters for the same tank.
9. Tank Drop and Other

**Setup-Tank Parameters:** Information needed to provide more accurate inventory and delivery data. (See Figure 9.1)

a) **Tank Number:** Selects a tank for setup.

b) **Drop Threshold:** The volume amount needed to initiate a delivery in progress.

c) **Drop Dwell Time:** Time delayed after a drop is completed before generating the drop report.

d) **Product Code:** User number that identifies the product.

e) **Temperature Thermisters Offset:** Used to offset temperatures for gauging probe. (See Figure 9.2)

f) **Increment Factor:** Requires password. Used to change probe sensitivity, only change with OMNTEC permission.
g) **Tank Tilt:** Number obtained by the tank tilt formula to further calibrate probe levels.

![Diagram of tank tilt](image)

**Figure 9.3**

\[
P = \text{The center of fill riser opening to the center of probe riser opening.}
\]

\[
M = \text{The distance of the center of probe riser opening to the center of the tank.}
\]

\[
D = \text{The difference in gross liquid level between fill opening and riser opening (fill – probe).}
\]

*Note: Not required if MTG probe is located in the center of the tank or if the tank is level.* (See Figure 9.2)
10. Tank Colors & Orientation

Setup Tank View: Used to control display settings for each tank. (See Figure 10.1)

![Figure 10.1](image)

- **Select Product Color:** Choose a color to distinguish the contents of each tank.
- **Select Tank Profile:** Choose the orientation for either horizontal, vertical, or oil water separator profile. When choosing OWS, the tank alarm points will change to gross high product, gross high warning, and high oil alarm.
11. Copy Tank Parameters

“Copy Tank”: Used to copy the full set of tank parameters from one tank to another tank. You must still however program unique parameters for each tank such as product type and probe wire speed (See Figure 11.1).

![Figure 11.1]
12. BX Sensor Control

Sensor Control: This page is used to add or delete sensors. When replacing a sensor, it is recommended to delete the old sensor first so when you add the new sensor it will take the place of the old sensor. This will be helpful to keep relay events from being reprogrammed. (See Figure 12.1)

Adding a Sensor:
1. Turn off the unit and connect the new sensor.
2. Turn on the unit; check SENSOR STATUS from the home screen.
3. Go into BX SENSOR PARAMETERS in the SETUP MENU to set the sensor’s labels.
4. You may also find new sensors by pressing “Find New Sensors.” (See Figure 12.2)

Deleting a Sensor:
1. Turn off the unit and disconnect the sensor.
2. Turn on the unit and go to SETUP.
3. Go into SENSOR CONTROL and choose which sensor to delete.
13. BX Sensor Parameters

Sensor Parameters: Parameters used to define the sensor type, location, and labeling. (See Figure 13.1)

a) Sensor Number: Sensor number assigned by system, selects a sensor for setup.
b) Sensor Type: Sensor Type assigned by system based upon serial number.
c) Location: User selectable to describe where the sensor is located.
d) Location #: If more than one sensor is present in the same location and tank # then you may have a location number to differentiate between both sensors.
e) Enable/Disable: Shows if the selected sensor is enabled or disabled.
f) Serial Number: Serial number that is programmed on each sensor.
g) Tank #: The tank number assigned to this sensor for labeling purposes.
h) Print Status on Shift Report: Enables/Disables sensor status for shift report.

Sensor Parameters: BX-TC-1 temperature sensor, designed to monitor temperatures ranging from -58°F to 302°F (-50°C to 150°C) with an accuracy of ±2°F. (See Figure 13.2)

a) Temp – High: Temperature above this value will create a High Temperature alarm.
b) Temp – Low: Temperature below this value will create a Low Temperature alarm.
c) Temp – Offset: Temperature offset if needed.

*Note: Temp High, Low, and Offset are for BX-TC-1 only.*
14. Comm Ports

Comm Port Settings: Used to program settings for on-board RS-232 or RS-485 port. (See Figure 14.1)

![Comm Port Settings Diagram](image)

Figure 14.1

a) **Comm Port**: Selects between RS-232 and RS-485 port settings (RS-485 for Proteus K & X only).

b) **Baud Rate**: Selections available are 1200, 2400, 4800, 9600, 19200, 38400, or 57600 baud.

c) **Data Bits**: Selections available are 8 or 7.

d) **Parity**: Selections available are none, odd, and even.

e) **Stop Bits**: Selections available 1 or 2.

f) **Comm Type**: 4 Selections available: Remote (OMNTEC PC, Mini-Me with RS-232, or industry standard protocol), Modbus, RD-625, or RD7CTS (Mini-Me with RS-485).

g) **Remote Security Code**: Enabled/Disabled for Ethernet ports to allow data protection. Must enter security code before industry standard command but after “control a” (example â000000120100). **Not currently used via RS-232.**

h) **Setup Modbus**: Navigates to Modbus Settings Page as shown in the next section.

i) **Save**: Must be pressed for any changes to take effect.
15. Modbus

**Modbus Settings:** Used to program settings for Modbus. (See Figure 15.1)

![Figure 15.1](image)

a) **Modbus Address:** Unique Modbus Slave Address.

b) **Register Offset:** Holding register offset, typically set to 0 or 40001.

c) **Enable Code:** Need an enable code from OMNTEC to run this optional feature.

d) **Reverse Mode:** When enabled, reverses high and low registers for certain PLCs or computer software that accepts a different Modbus format.

e) **Communication Setup:** Will navigate to Comm Ports setup from the previous section.

f) **Print Modbus Map:** Prints the current register range for enabled probes and sensors.
16. Network Properties (Proteus K & X only)

**Network Protocol Properties:** Used to setup either a static or dynamic IP address by toggling “obtaining address automatically.” (See Figure 16.1)

- **a)** **IP Address:** IP address assigned to the Proteus.
- **b)** **Subnet Mask:** Subnet Mask to match existing network.
- **c)** **Default Gateway:** Default Gateway to match existing network.
- **d)** **Preferred DNS:** Primary Domain Name Server address.
- **e)** **Alternate DNS:** Secondary Domain Name Server Address.
- **f)** **MAC Address:** Each Proteus is programmed with a unique MAC address.
- **g)** **Telnet Ports:** The default telnet ports are set to 502 for Modbus TCP and 4001, 8001, and 10001 for Remote. Modbus allows for Modbus communication, can also be set for Modbus RTU. Remote mode allows for compatible industry standard commands. These can be changed for user preference.

![Figure 16.1](image-url)
17. Interface Boards & Relays (Proteus K & X only)

Interface Boards Relays: Depending on which unit you have; more boards may be displayed.

Press the MCU Events icon in the top left corner to configure the on-board relays. Press each red relay board to program 8 channel boards. (See Figure 17.1)

Program Relay Events: Used to select which events (ex. High Level) will trigger the relays

Program Relay/Input Modes: Used to select the mode of each relay (Light, Horn, or Relay) and input (See Figure 17.2)
There are a total of 30 events that can be programmed for the on-board MCU relays. To program an event, press on the event you would like to program and navigate to the event programming page. (See Figure 17.3)

The figure below can be used as a visual aid to gain an understanding of where each alarm point is typically located. (See Figure 17.5)

Note: Overfill alarm is only active during a delivery in progress.

Relay Modes: Each relay can be programmed to operate in one of three modes: Relay mode, light mode, and horn mode; a description of each mode is shown on the screenshot above.

Input Modes: Both inputs can be programmed for different functions such as local acknowledge, page change, counter, etc. See DI00014 DI00015 DI00020-2 rev1726 for specific input mode functions.

Setting the relay modes as shown above will allow an RAS-2 to work properly when connected to the MCU on board relays. R1 will act as the light for tank #1, R2 will act as the light for tank #2, and R3 will act as the general horn. Input 1 will act as the local acknowledge (See Figure 17.4).

The XB-RB8 board can have up to 100 programmed events. It is programmed the same way as the MCU but has a total of 8 relays instead of 3. However, horn acknowledge must be wired to the MCU if using a RAS series remote.
a) **Tank #:** This icon is used to select a tank event to enable the relay. Each time the “Tank#” icon is pressed, the Tank# is advanced up to how many tanks are available.

b) **Sensor #:** This icon is used to select a sensor event to enable the relay. Each time the “Sensor#” icon is pressed, the Sensor# is advanced up to how many sensors are enabled. (See Figure 17.6)

c) **Board #:** This icon is used to select a system board to enable the relay.

d) **Select Event Type:** The event type is selected from the center of the page, press “more” for additional event options.

e) **Select Relay and/or Email Recipient:** The R1, R2, & R3 checkboxes will determine which relays are enabled by the event. And the checkboxes EMAIL1, EMAIL2, EMAIL3, EMAIL4 and EMAIL5 will determine which email will receive the alarm notices.

f) **Relay On:** Turns on relay at programmed set point.

g) **Relay Off:** Turns off relay at programmed set point.

h) **Save Event:** Save selections before going to the next event or exiting screen.

Here is an example of the setup for tank one of two, showing how the relay events are configured if the 3 on-board MCU relays are configured to be used with a RAS-2.

**Note:** Only one event type can be selected for each event number; however multiple relays can be triggered for each event number as shown. (See Figure 17.7)
18. Clear Logs

Data Logs Page: From this menu it is possible to individually clear each log from the unit memory. Useful after site commission to clear out test data. (See Figure 18.1)

a) Clear Alarm Log: Clears all alarms in log.

b) Clear Shift Log: Clears all shifts.

c) Clear VLD Log: Clears all VLD data from log.

d) Clear Delivery Log: Clears all previous deliveries but keeps the latest delivery saved.

e) Clear CITLD Log: Clears all CITLD data log.

f) Clear Current Alarm Log: Clears the current alarm screen.
19. VLD – Leak System Settings

Tank Volumetric Leak Detection: This feature is used for setting a specific time interval for running the VLD test. It can be run automatically every day, once a week, or once a month at a specific time of the day. (See Figure 19.1)

- **Test Level**: Choose which type of VLD test you would like to run.
- **Test Time**: Total time the test will run with a minimum of four hours.
- **Dwell Time**: Product must remain constant for a minimum of 30 minutes before running a test.
- **Enable/Disable**: Enable the VLD test feature. Must also enable VLD test for each tank.

**IMPORTANT!**

Remember that the VLD test time is 4 hours long plus the dwell time. During this time the product level must remain constant. If you have a delivery before a VLD test, you must wait at least 4-8 hours (dependent on tank size) before the start of the test.
20. VLD – Leak Tank Settings

Tank Volumetric Leak Detection: This page is used to control the desired testing frequency for each tank. (See Figure 20.1)

Figure 20.1

a) **Tank Number**: Assign which tanks need to run testing.

b) **Test Start Time**: The time at which the VLD test should start.

c) **Set Interval**: Must choose Monthly, Weekly or Daily to be able to run VLD test for that particular tank. Otherwise, leave on Disabled option.

d) **Set Date**: What date in the month should the test run.

e) **Set Day**: What day of the week should the test run.
21. CITLD – Leak System Settings

Continuous In-Tank Leak Detection: Allows a leak test to be run in a tank that is in continuous use. Takes 20-minute time intervals to determine if the tank has a leak and will generate a monthly report. (See Figure 21.1)

Figure 21.1

- **CITLD Enable Code**: Need an enable code from OMNTEC to run this optional feature.
- **Auto Print Enable**: Enables the unit to print out the CITLD results automatically.
- **Print Report Monthly/Weekly**: Allows the user to change between printing a monthly or weekly report for CITLD.
22. Email Account (Proteus K & X only)

Email Properties: Setup page for enrolling in automatic email updates. (See Figure 22.1)

![Figure 22.1](image)

- **User Name**: Login name used for sending email.
- **Password**: Password for the above user name.
- **Sender Name**: Name of email originator.
- **Sender Email Address**: Address of the email originator. Appears on the email together with the controller’s “EL” number.
- **Mail Server Address**: IP address of the mail server or the mail server domain name.
- **Mail Server Port**: Default is 25, can be changed to match site’s mail server port.
- **Server Requires Authentication**: (check with Network Administrator)
23. Email Setup (Proteus K & X only)

Email Properties – User Addresses and Events: Allows user to send email and text message reports to programmed addresses or mobile numbers, up to 5 maximum. (See Figure 23.1)

Figure 23.1

Figure 23.2

a) Address # (address 1 on this screen): This shows the address or number of the recipient.

b) Delivery (Drop) Reports: If enabled, Delivery/drop report will be sent to assigned email or number.

c) Current Status Report: If enabled, current status report will be sent to the assigned address after every shift.

d) Alarms: If enabled, a report will be sent to the assigned address or number every time there is an alarm. Other option is to choose individual “alarm events”.

e) Input Events: If enabled, a report will be sent for each input that because active that has “email on input” checked (See Figure 23.2).
24. Diagnostics

Diagnostics: Found in the Utilities Menu, can be used to perform various tests. Only use Diagnostic Password Keypad if instructed by OMNTEC Technical Support. (See Figure 24.1)

a) Restart the System: Resets the entire system as if cycling power.

b) Restart the Display: Resets the display and refinds system boards.

c) Recalibrate the Display Screen: Brings up white screen in which user must press the center of each target for proper calibration.

View Probe (2222’s) Diagnostics:
Shows the probe connectivity with the Proteus ATG. All 2’s indicates a probe is functioning normally, if any other variation is displayed, check wiring or probe floats. Call OMNTEC Technical Support if further assistance is required. (See Figure 24.2)
View Probe Temperature

Thermistors: Allows user to view raw temperature data as the Proteus ATG receives it from the MTG probe. (See Figure 24.3)

<table>
<thead>
<tr>
<th>TANK #</th>
<th>T1 (L)</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5 (H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank 01:</td>
<td>74.5°F</td>
<td>74.7°F</td>
<td>75.0°F</td>
<td>75.1°F</td>
<td>75.2°F</td>
</tr>
<tr>
<td>Tank 02:</td>
<td>74.6°F</td>
<td>74.6°F</td>
<td>74.7°F</td>
<td>74.8°F</td>
<td>74.9°F</td>
</tr>
<tr>
<td>Tank 03:</td>
<td>74.4°F</td>
<td>74.5°F</td>
<td>74.5°F</td>
<td>74.7°F</td>
<td>74.8°F</td>
</tr>
<tr>
<td>Tank 04:</td>
<td>74.6°F</td>
<td>74.6°F</td>
<td>74.8°F</td>
<td>75.1°F</td>
<td>75.2°F</td>
</tr>
<tr>
<td>Tank 05:</td>
<td>TANK NOT ENABLED</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tank 06:</td>
<td>TANK NOT ENABLED</td>
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<td>Tank 07:</td>
<td>TANK NOT ENABLED</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tank 08:</td>
<td>TANK NOT ENABLED</td>
<td></td>
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</table>

Figure 24.3

Demo Mode (Level Change): Allows the user to simulate tank movement by changing the product and water volumes. Can also be used to raise and lower the temperature. (See Figure 24.4)

Figure 24.4
Demo Mode (Sensor Alarm Test): Allows the user to test each sensor alarm condition so that you can also test relay events. Pressing each alarm will show that condition for the chosen sensor. Return to this page by pressing “Sensor Status” then “View All Sensors.” Press “Demo Mode” again in “Diagnostics” to deactivate or it will stay active for 15 minutes then controller will exit demo mode automatically (See Figure 24.5)

Refresh Tank Order for New Boards: Will reset the boards installed (typically on X model) to the current slot number that it is in. Useful when replacing a board and it does not find its proper slot number (resets system).
**Start a VLD Test:** User can force a tank to perform a VLD test once start is pressed. Will wait user programmed dwell time in VLD Settings (section 18) before beginning test. (See Figure 24.7)

**Unit Type:** Used to change the unit type. Useful if the display is ever replaced and does not show the correct unit type. (See Figure 24.8)

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**Figure 24.7**

**Figure 24.8**