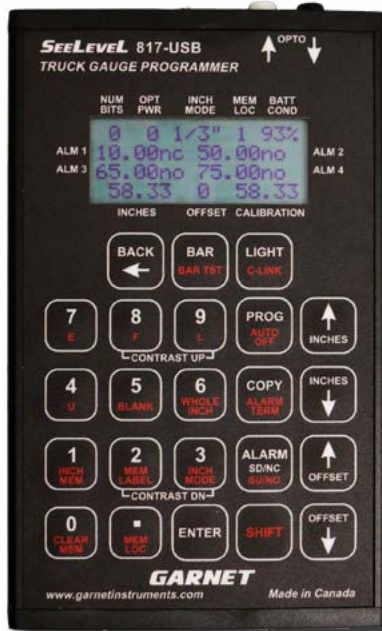


SEELEVEL™

Truck Gauge Programmer



MODEL 817-USB MANUAL

For All Garnet Truck Gauges Using the
14 Pin Programming Connector

Printed in Canada

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Liquid management solutions, your way.

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MODEL 817-USB

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1. The serial port has been upgraded to a USB port.
2. The number of calibration memory locations has been increased from 8 to 32. The full 32 locations are available for all inch modes. The range of the 1/4" mode has been reduced to 256" from 512" to free up memory and reduce the amount of scrolling required.
3. The programmer will now automatically power off after a preset time of no activity. This time can be set from 1 to 99 minutes. This feature reduces the possibility of accidentally draining the batteries.
4. A new whole inch mode has been added to simplify calibration point entry. Now the operator can just enter values at the whole inches (0.00, 1.00, 2.00, etc.) and the programmer will automatically calculate the fractional values in between using linear interpolation.
5. The functions of program, copy, inch to memory and clear memory now require an acknowledgement by pressing the ENTER button. This is to avoid accidental erasure of calibration programs.
6. The alarm polarity terminology can now be selected as start up - shut down (su/sd) or normally open - normally closed (no/nc).
7. The communication cord for 806 connections now plugs into a dedicated 1/8" headphone style jack instead of the serial connector.
8. The LCD window now has a hard polycarbonate panel to improve LCD visibility.
9. An LCD contrast adjustment has been added.
10. The LCD backlight is now brighter.
11. The PC software version has been updated to 3.1.0

The 817-USB Truck Programmer is used to program all 800 series SeeLevel gauge displays to show either inches or volume (such as cubic metres or barrels) and to set the alarms. The calibration can be entered on the keypad or transferred from a computer via the USB port. The 817-USB can also diagnose sender bars and displays, and measure optical power.

The 817-USB operates on four user replaceable "AA" batteries which should operate the programmer for approximately 360 hours (2 weeks straight) without the display backlight, and approximately 12 hours with the backlight on. The programmer is turned on and off with a recessed toggle switch, and will automatically shut off after the specified shutdown delay when there are no buttons pressed. All calibrations, inch values, and offset values are retained even when the power is turned off. If programmer is in the computer link mode or bar test mode it will not shut off automatically.

Description of Displays:

NUM BITS: This shows the number of bits being received by the optical or electrical input on the 817-USB. Bars for the 808/810 series in 1/3" mode should send 8 bits. Bars for the 808/810 series in 1/6" and 1/10" should send 11 bits. The 806 bar should send 20 bits.

OPT PWR: This shows the optical power being received by the optical input on the 817-USB.

INCH MODE: This shows which type of inch increment the programmer is set for. The options are 1/3", 1/4", 1/6", 1/10", and 806 (which is always 1/4"). The inch mode must be set to match the sender bar and display being used.

MEM LOC: This shows which memory location is being used. There are 32 memories numbered 1 to 32, each memory can store a complete calibration including alarms.

BATT COND: This shows the battery condition, when the batteries are new it should show 99%. When the battery condition gets down to 35%-40%, the backlight will stop working but the rest of the functions will still work. At 10% the batteries are almost dead and should be replaced.

ALARM DISPLAYS (MIDDLE TWO LINES OF THE DISPLAY):

These 4 displays show the settings of the 4 alarms. They always read the calibrated value of the alarm, not the inch value. If the alarm has been cleared, the display will be blank. The last two characters show the polarity of the alarm, su (start up) means that the alarm turns on as the level rises past the alarm point, and sd (shut down) means that the alarm turns off as the level rises past the alarm point. Alternately, the alarms can be set to show normally open (no) and normally closed (nc).

INCHES: This shows the equivalent inch value of the calibration. The bar goes from 0.00 to 85.00 in steps of 0.33 (.00/.33/.66) for the 1/3" mode; from 0.00 to 85.16 in steps of 0.16 (.00/.16/.33/.50/.66/.83) for the 1/6" mode; from 0.00 to 102.30 in steps of 0.1 (.0/.1/.2-.9) for the 1/10" mode, from 0.00 to 127.75 in steps of 0.25 (.00/.25/.50/.75) for the 806 mode, and from 0.00 to 255.75 in steps of 0.25 for 1/4" mode.

OFFSET: This shows whether the offset value is 0, positive, or negative. For virtually all applications, the offset should be 0 or negative (-). This is shown for convenience so that you know if there is an offset or not. Note: the offset measurement is approximately the inch difference between a full length sender bar and the actual sender bar.

CALIBRATION: This shows the display calibration that corresponds to the inch value shown on the INCHES display. This is what will be seen on the gauge display.

Description of Keypad Buttons:

BACK ← button: This is used to exit various menus and to delete the most recent calibration digit entered.

BAR button: This is used to get a reading from the sender bar via the optical input connector or the programming plug. The INCHES and CALIBRATION displays are updated to the sender bar reading each time the bottom is pressed.

BAR TST button (SHIFT - BAR): This is used to continually get readings from the sender bar via the optical input connector or the programming plug. The INCHES and CALIBRATION displays are updated each time the sender bar sends a reading. This button is used when testing sender bars. To exit bar test mode press the **BACK** button.

BAR and BAR TEST Notes:

If no light is received, the INCHES display shows "no L" ("no S" meaning no signal for the 806) and the inch and calibration values are not changed. If poor light is received, or the number of bits does not match the mode, the INCHES display shows "bad L" and the inch and calibration values are not changed.

If the programmer is being used outside in bright sunlight, the sunlight may penetrate right through the black optical input connector housing and overwhelm the optical input. If this happens the programmer will appear to not respond to pressing the **BAR** or **BAR TST** button. Shading the connector with your hand should restore proper operation.

LIGHT button: This turns the display backlight on and off. The backlight always turns on momentarily when the programmer is turned on, and then turns off. Battery power consumption is increased by approximately 30 times when the backlight is on.

C-LINK button (SHIFT - LIGHT): This puts the programmer into the computer link mode so that calibrations can be sent between the computer and the programmer. Exit this mode with the **BACK** button.

0 to 9, decimal, E, F, L, U, BLANK buttons (E,F,L,U,BLANK require the SHIFT button): These are used for entering a calibration. The **BLANK** button is used for entering blanks. The "E" can be used to show empty, the "F" can be used to show full, etc.

WHOLE INCH button (SHIFT - 6): This puts the programmer into whole inch mode in which the calibration values only need to be entered on the whole inches (i.e. 0.00, 1.00, 2.00, etc.), and the programmer will fill in the values between the whole inches.

PROG button: This button is used to transfer the calibration table from the currently selected memory into the gauge. After the **PROG** button is pressed, the **ENTER** button must be pressed to confirm the operation. This is to prevent unintentional erasure of calibrations. The programming plug must be plugged into the gauge for the programming process to work.

AUTO OFF button (SHIFT - PROG): If the programmer is not in use then after a certain amount of time it will shut itself off. This button is used to set the amount of time that the programmer will wait before shutting itself off when it is not in use. Any value between 1 and 99 minutes can be entered. It also shows the current setting of the auto off function.

Note: If the programmer has shut itself off automatically, the power switch will still be in the “on” position. To turn the programmer on again, turn the power switch off for a couple of seconds and then back on again.

Note: The programmer will not shut off if in computer link mode or bar test mode.

COPY button: This button is used to transfer the calibration table from the gauge into the currently selected memory. After the **COPY** button is pressed, the **ENTER** button must be pressed to confirm the operation. This is to prevent unintentional erasure of calibrations. The programming plug must be plugged into the gauge or zeros will be copied.

ALARM TERM button (SHIFT - COPY): This is used to change the alarm terminology between start up/shut down (su/sd) and normally open/normally closed (no/nc). Use whichever terminology you are most comfortable with.

ALARM SD/NC and ALARM SU/NO (SU/NO requires the SHIFT button) buttons: These set the alarm point to the value currently shown on the calibration display. The programmer will prompt for the alarm number after the button is pressed. SD/NC causes the alarm to turn off (shut down) as the level rises past the alarm point, and SU/NO causes the alarm to turn on (start up) as the level rises past the alarm point. Normally closed (NC) is equivalent to shut down (SD). Normally open (NO) is equivalent to start up (SU).

INCHES ↑ and INCHES ↓ buttons: These buttons are used to change the value of the INCHES display. If either one is held down for one second the INCHES display changes quickly. If they are both held down at the same time the INCHES display is reset to zero. If SHIFT – INCHES is pressed then the INCHES display goes up or down by 10 inches.

OFFSET ↑ and OFFSET ↓ buttons: These buttons are used to change the value of the offset between the INCHES display and CALIBRATION display for setting the correct bottom reading of the gauge. As the offset is changed the calibration value will change but the inch value will remain the same. If either one is held down for one second the offset changes quickly. If they are both held down at the same time the offset is reset to zero. If **SHIFT– OFFSET** is pressed then the offset goes up or down by 10 inches.

INCH MEM button (SHIFT – 1): This button puts an inch calibration into the currently selected memory. The inches will correspond to the inch mode selected. After the **INCH MEM** button is pressed, the **ENTER** button must be pressed to confirm the operation.

CLEAR MEM button (SHIFT – 0): This button erases the calibration in the currently selected memory by filling the memory with blanks. The other memory locations are not affected. After the **CLEAR MEM** button is pressed, the **ENTER** button must be pressed to confirm the operation.

MEM LOC button (SHIFT – decimal): This button is used to select which memory location is to be used, from 1 to 32. The programmer will prompt for the memory number after the button is pressed. The **ENTER** button must be pressed to complete the entry. If an invalid entry is made such as 0 or greater than 32, the programmer will reject it.

MEM LABEL button (SHIFT – 2): This button is used to display the 16 character memory label, which is useful for keeping track of which calibration is which. The memory label can only be entered on the computer using the Truck Gauge Programmer software.

INCH MODE button (SHIFT – 3): This button is used to set the inch mode to 1/3", 1/4", 1/6", 1/10" or 806 mode. The programmer will prompt for the inch mode desired after the button is pressed. The 806 mode is 1/4" as well, but the signal format from the bar is different, which is why there is a separate 806 mode from the optical 1/4" mode.

ENTER button: This button stores the calibration just entered on the keypad into programmer memory. The INCHES display will increase by one increment so that the next calibration point can be entered. It is also used to complete a number of other functions.

SHIFT button: This button is used to select the button functions printed in red. **SHIFT** must be held down while pressing the other button.

CONTRAST UP buttons (8 and 9): When these two buttons are pressed simultaneously the LCD contrast is increased, which darkens the display.

CONTRAST DN buttons (2 and 3): When these two buttons are pressed simultaneously the LCD contrast is decreased, which lightens the display. Adjust the contrast to make the display comfortable to read. The battery power consumption is not affected by the contrast.

Description of Optical Connectors:

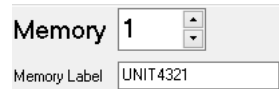
OPTO ↓: This is the black optical input connector used to obtain the reading from a sender bar, and is used when setting the offset or testing a sender bar for proper operation. It is also used to show the number of bits and optical power. When setting the offset, the optical power can be verified at the same time.

OPTO ↑: This is the white optical output connector which produces an optical signal like a bar to test displays. The output corresponds to the reading on the INCHES display, and is in the inch mode that is selected. This output is used for testing displays for proper operation, verifying the calibration in displays, and checking alarm operation without having to access the float. During bar test (**BAR TST** button) or when taking a reading from a bar (**BAR** button) the optical output is still enabled, so a piece of fiber can be tested by plugging it into both connectors.

The Truck Gauge Programmer software is used to communicate with the 817-USB Truck Gauge Programmer (TGP) through a USB cable. This allows loading and saving of all calibration charts in the PC, as well as allowing the user to copy and paste calibration charts from Excel to the Truck Gauge Programmer software. The old 817 TGP had eight memory locations for storing calibration charts. The new 817-USB TGP has thirty-two memory locations for storing calibration charts.

Note: The software requires a PC running Windows 10/8.1/XP, a USB-B cable, and your new 817-USB Truck Gauge Programmer. The software can also work with the old 817 TGP with a RS232 cable connected to the PC.

Each of the 32 memory locations of the 817-USB TGP are independently accessible. Each memory location can also be labeled for easy reference, for example UNIT4321 (max of 16 characters)

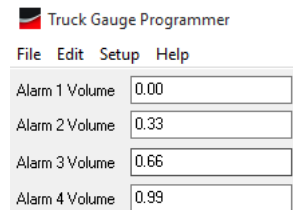


Each of the five inch modes are selectable.
Note:

- 1/10" for HX Bars
- 806 Mode for 806 Bars



Alarm points can be set in the software and are displayed in an easy to read format.



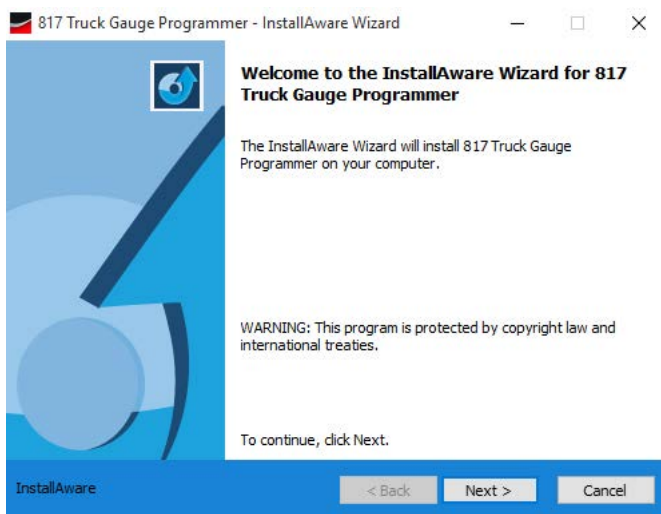
The inch and volume calibration chart is displayed in an easy to read format.

Inches	Volume
0.00	0.00
0.33	FFFF
0.67	FFFF
1.00	FFFF

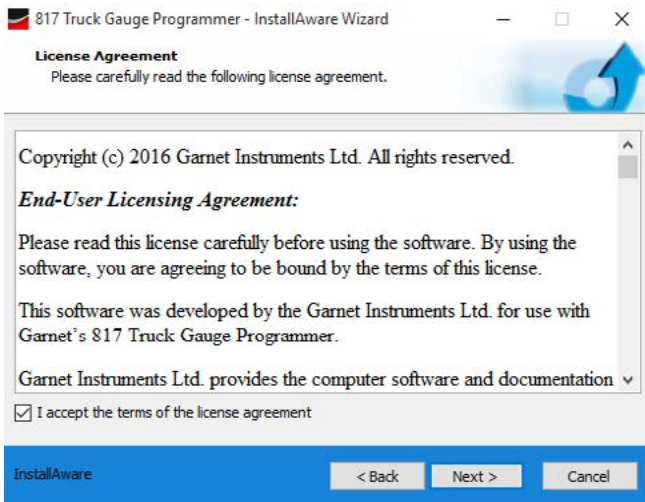
Download the software installation file from the Garnet Instruments website under "Support":

www.garnetinstruments.com/support/software-downloads/

Software Installation Guide

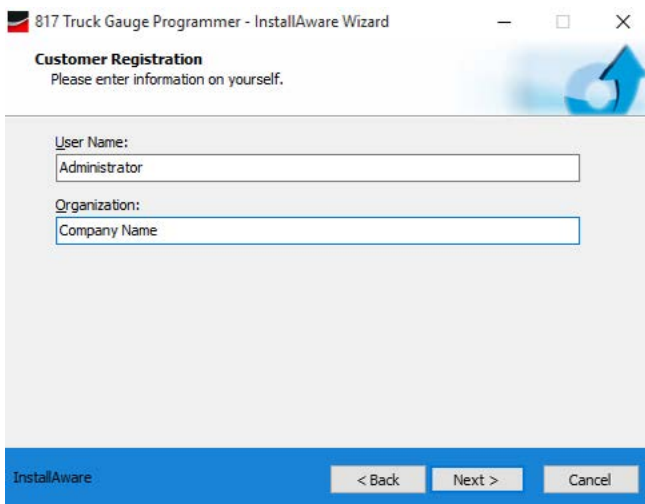


1. Run the "817 Truck Gauge Programmer Software" installer file. Click "Next" to continue.



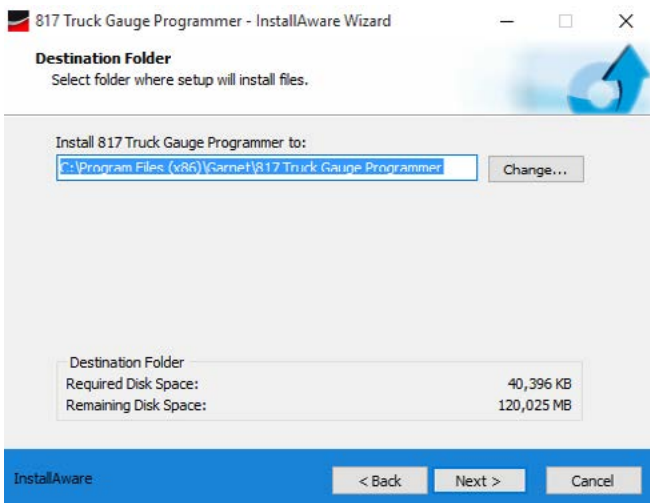
2. Make sure you read the Garnet Instruments Ltd. licensing agreement before proceeding. To agree click the "I accept the terms of the license agreement" box.

Click "Next" to continue.



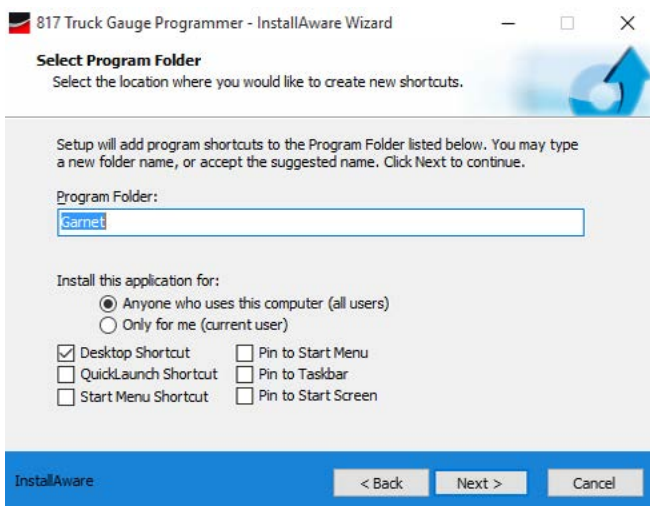
3. Now you will be taken to the customer registration. Enter in your desired user name and the organization or company that will be using this program.

Click "Next" to continue.



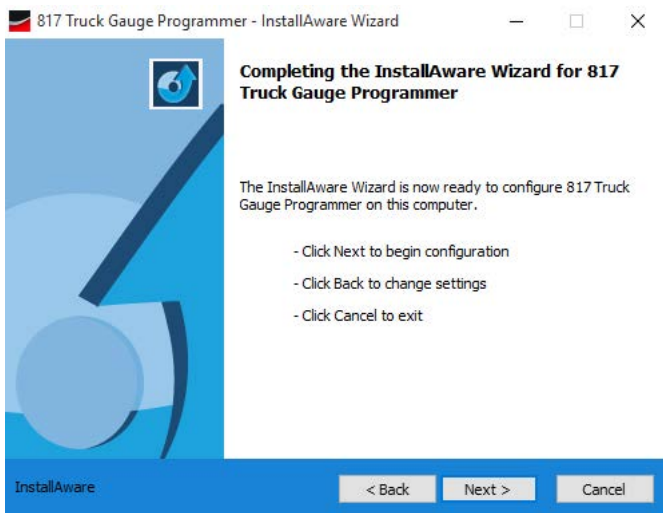
4. Now you will be asked to decide where you would like to install the software application. We recommend that you keep the default location for the program.

Click "Next" to continue.



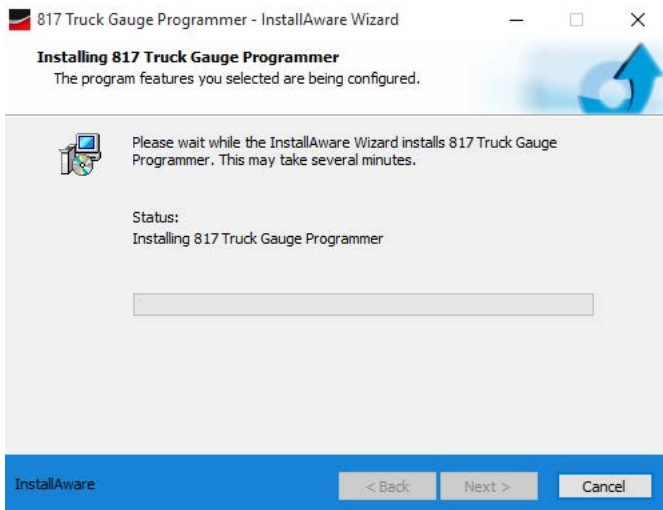
5. You may now choose a folder for the main program (we recommend the default), if you want to install the program for all user profiles or just the current one, and which shortcuts or pins you would like for the program.

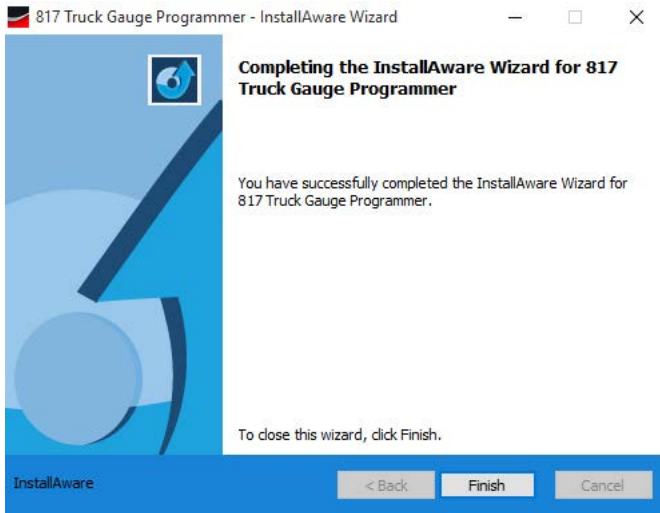
Click "Next" to continue.



6. This is where you will be asked to confirm that you would like to continue with the installation.
Click "Next" to continue.

Note: If there is an error in during installation go to "Error in Installation" section.





7. Now have now successfully completed the installation. Click "Finish" to complete installation.

The installation of the software for the 817 Truck Gauge Programmer is now complete!

COM Port Driver Installation

On some computers the USB driver may need to be downloaded and installed before the PC software can connect to the 817-USB Truck Gauge Programmer.

1. Download "CDM 2.12.12 WHQL Certified" or most current version of the USB driver from:

www.ftdichip.com/Drivers/VCP.htm

Click "setup executable".

For Internet Explorer and Microsoft Edge, click "Run".

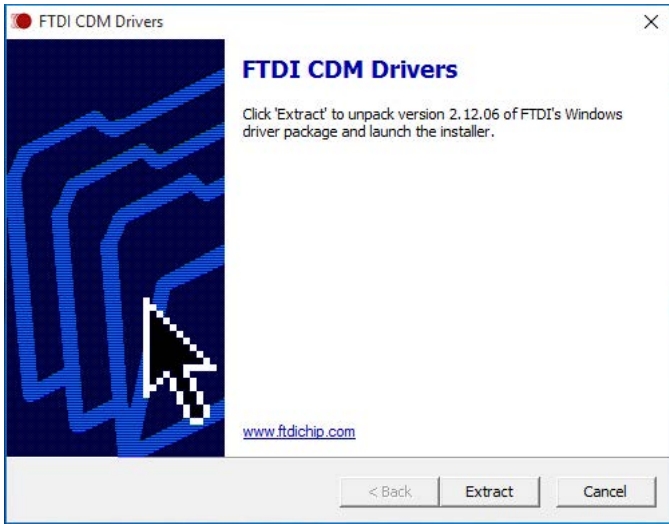
For Google Chrome click the file on the bottom left when it is finished downloading, and then click "Run".

For Firefox, click "Save File", click the down arrow for "Downloads" at the top right of your screen, then click on the download, and then click "Run".

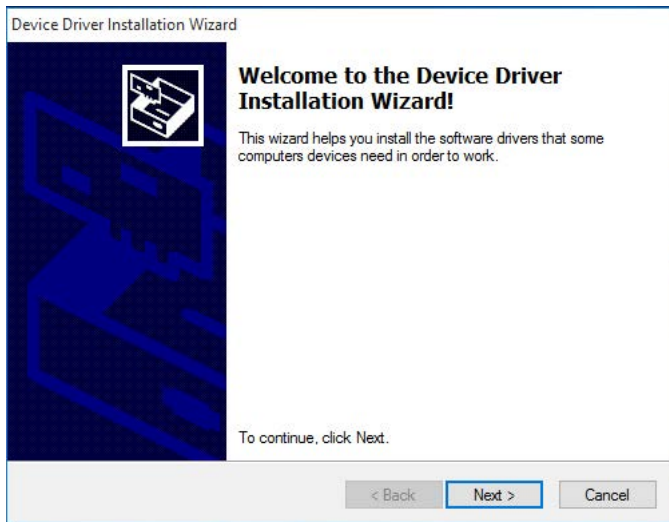
2. Now click "Extract" to begin the process of installing the FTDI driver.

Currently Supported VCP Drivers:

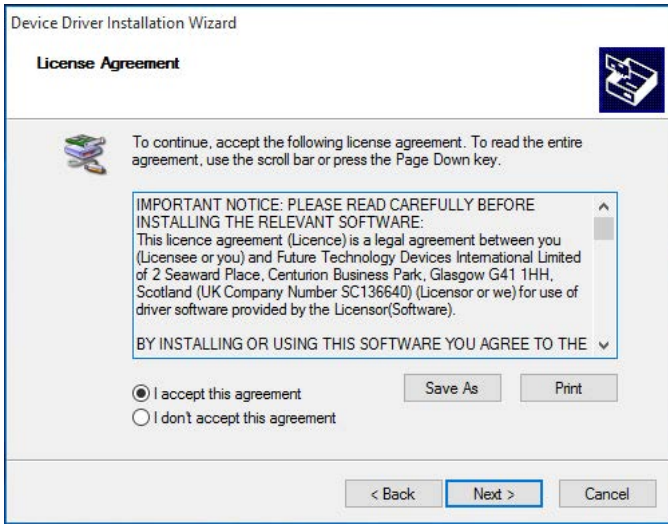
Operating System	Release Date	Processor Architecture							Comments
		x86 (32 bit)	x64 (64 bit)	PPC	ARM	MIPSII	MIPSIV	SH4	
Windows*	2016-01-18	2.12.12	2.12.12	-	-	-	-	-	2.12.12 WHQL Certified Available as a setup executable Release Notes



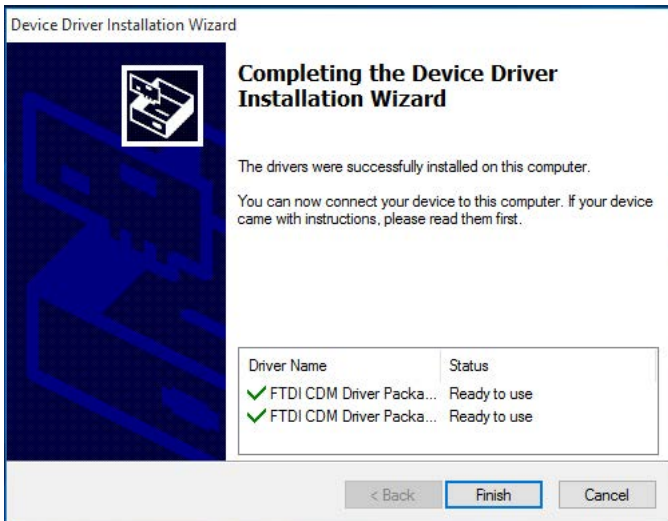
3. You are now at the welcome screen of the driver installation. Click "Next" to continue.



4. Read the license agreement, and then you may agree to the terms and conditions of using this driver. Then click "Next".

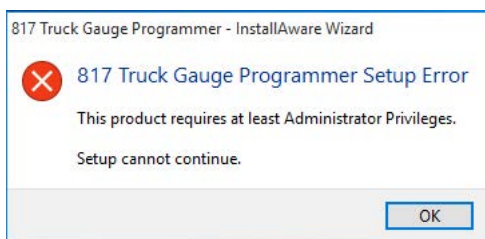


5. Finally ensure that both items have check marks, and then click "Finish".



The most common reasons for an error occurring during installation are:

- a. The computer does not have Windows 10/8.1/7/Vista/XP
- b. You are not logged in as an administrator

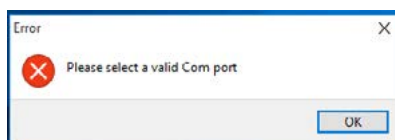


This message means that you need to log out of your current profile and log into a profile with administrative privileges. Click "Okay".

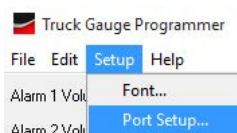


Right-click the installer file and select "Run as administrator", and have an administrator authorize the installation by entering their login information.

Start up the program from the desktop shortcut or Start Menu. When you start up the program you may see the message on the right here. Press "Okay", and follow the instructions below:



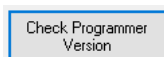
- a. Click on "Setup" in the menu then click on "Port Setup..." from the dropdown menu.



- b. The following window will open. To determine correct COM port number use instructions on next page. Use the dropdown box to select the COM port of your 817 Truck Programmer, and then press "Apply".



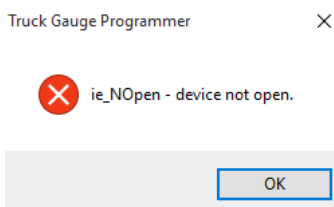
- c. To verify that the PC and 817 TGP are communicating, connect the 817 TGP to the USB or serial port with the supplied cable. Put the 817 TGP in PC communications mode by pressing shift and LIGHT/C-LINK buttons on the programmer. Click the "Check Programmer Version".



- d. If the 817 TGP is connected then you will see a message similar to this one that will display both the version of software (or firmware) and the version of the hardware.



- e. If you see this message then the 817 TGP is either disconnected, not in "Computer Link Mode", or the COM port is incorrect.



Note: If the software and programmer are not communicating, please check for software running in the background that could be using the serial port.

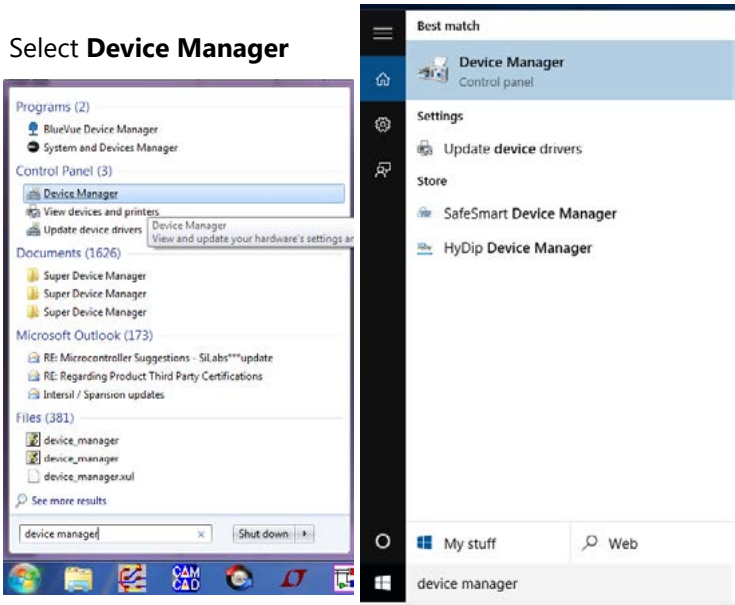
Even if the devices using the serial port have been disconnected, there could still be software running that will stop our software from communicating.

After installing the proper drivers on the computer and connecting the computer with Garnet hardware it may be necessary to check the COM port the Garnet hardware is using on the computer.

Here's how:

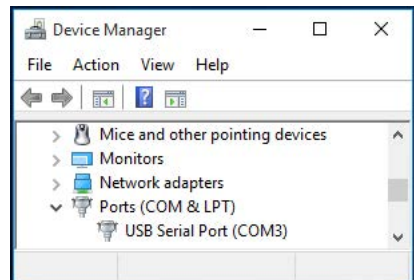
1. Type "device manager" into the search bar.

Select **Device Manager**



Under "Ports" you can see the COM ports currently used on the computer.

"USB Serial Port (COM3)", in the window on the right, shows the COM port needed. Your COM port number may be different.



1. MANUALLY ENTERING A CALIBRATION

The Truck Gauge Programmer software allows the user to manually enter a calibration chart. Enter the calibration chart values under the "Volume" column for each of the entries under the "Inch" column.

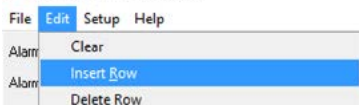
Inches	Volume
0.00	0.00
0.33	FFFF
0.67	FFFF
1.00	FFFF

2. INSERT ROW OR DELETE ROW

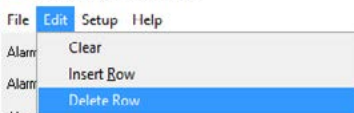
If a calibration value is missed, then "Insert Row" may be used to enter in the missed calibration value, and all the entered values will be shifted down to make room for the new row.

If an extra calibration value is entered or too many rows were added, then "Delete Row" may be used to remove a row from calibration chart.

Truck Gauge Programmer



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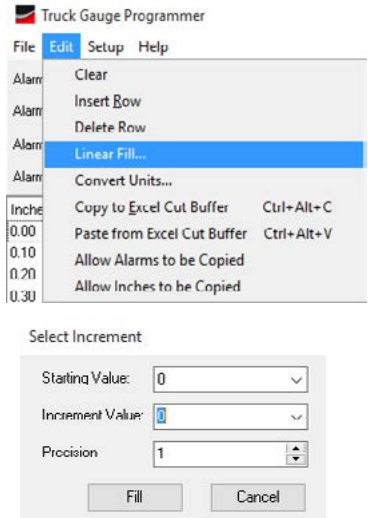
Insert Row		Insert Row		Delete Row		Delete Row	
Whole Inch Mode off		Whole Inch Mode on		Whole Inch Mode off		Whole Inch Mode on	
Inches	Volume	Inches	Volume	Inches	Volume	Inches	Volume
0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
0.33	0.3	0.33	0.3	0.33	0.3	0.33	0.3
0.67	0.6	0.67	0.6	0.67	0.6	0.67	0.6
1.00	0.9	1.00	0.9	1.00	0.9	1.00	0.9
1.33	1.2	1.33	1.2	1.33	1.2	1.33	1.2
		1.67	1.5			1.67	1.5
		2.00	1.0			2.00	1.0
						2.33	2.1

Inches	Volume	Inches	Volume	Inches	Volume	Inches	Volume
0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
0.33	0.3	0.33	0.3	0.33	0.3	0.33	FFFF
0.67	0.6	0.67	0.6	0.67	0.9	0.67	FFFF
1.00	0.6	1.00	1.2	1.00	1.2	1.00	
1.33	0.9	1.33	FFFF	1.33	1.5	1.33	2.1
		1.67	FFFF			1.67	2.4
		2.00	0.9			2.00	2.7

3. LINEAR FILL A CHART

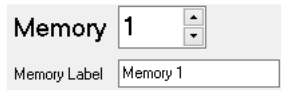
Linearly calibrating the table (or a section of it) will allow you to enter the amount you are incrementing by and then allow this tool to populate the volume calibration table for you.

Use "Edit" then "Linear Fill..." to access this tool, and then fill in the value you will be starting from, the incremental value, and the precision (number of decimal places). Dropdowns product calculators for digit entry.



4. SELECTING MEMORY LOCATIONS

The 817 TGP has 32 internal memory locations available and these memory locations can be accessed by the Truck Gauge Programmer Software software. The memory location can be changed using the arrows. The Memory Label allows the user to specify the chart's use or name so it can be easily identified on the 817 TGP. The maximum length of this memory label is 16 characters.



5. SETTING ALARMS

Alarms are set in the last 4 columns and are also displayed at the top of the window. To set an alarm, click on the box at the inch value you want the alarm to be and from the pull down menu choose either "START UP" (or "NO") or "SHUT DOWN" (or "NC"). To remove an alarm chose "Disabled" from this pull down menu. The checkmarks represent where the display will provide a ground for each alarm.

Inches	Volume	Alarm 1	Alarm 2	Alarm 3	Alarm 4
0.00	FFFF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.33	FFFF	DISABLED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.67	FFFF	START UP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.00	FFFF	SHUT DOWN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inches	Volume	Alarm 1	Alarm 2	Alarm 3	Alarm 4
0.00	FFFF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.33	FFFF	DISABLED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.67	FFFF	NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.00	FFFF	NC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Alarm Format:

Programmer:

Use the "Alarm Format" drop down box to choose between START UP/SHUT DOWN terminology versus NO/NC terminology.

Truck Gauge Programmer

File Edit Setup Help

Alarm 1 Volume:

Alarm 2 Volume:

Alarm 3 Volume:

Alarm 4 Volume:

6. IMPORT FROM EXCEL

The Truck Gauge Programmer software has the ability to import the selected memory location from Excel.

- Using Excel, highlight the data that is to be imported. The data to be imported from Excel needs to be in a single column for volume.
- Right click on the highlighted area and select "Copy"
- Choose the appropriate inch mode in the Truck Gauge Programmer Software. Then press Ctrl+Alt+v, click the "Paste from Excel" button, or go to the "Edit" menu and select "Paste from Excel Cut Buffer".

Truck Gauge Programmer

File Edit Setup Help

Alarm

Alarm

Alarm

Alarm

Inches

0.00

0.10

0.20

0.30

Clear

Insert Row

Delete Row

Linear Fill...

Convert Units...

Copy to Excel Cut Buffer Ctrl+Alt+C

Paste from Excel Cut Buffer Ctrl+Alt+V

Allow Alarms to be Copied

Allow Inches to be Copied

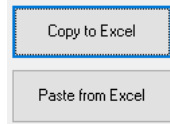
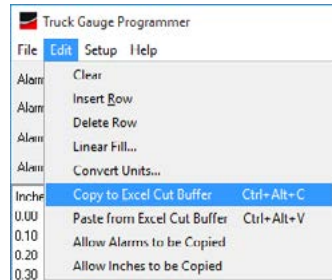
Copy to Excel

Paste from Excel

The imported data should appear in the Volume column.

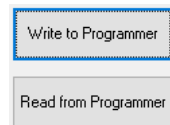
7. EXPORT TO EXCEL

- d. Go to the "Edit" menu to choose to copy the inches and/or the alarms.
- e. Using the Truck Gauge Programmer software press Ctrl+Alt+c, click the "Copy to Excel" button, or go to the "Edit" menu and press "Copy to Excel Cut Buffer".
- f. Using Excel, right click on the cell where you wish the data to be located and select "Paste".



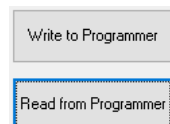
8. PROGRAM TO 817 TGP

Connect the USB to the PC and the 817 TGP. Select the correct memory location. Put the 817 TGP in PC communication mode by pressing the "Connect/Release Programmer" button, or by pressing and holding the shift and LIGHT/C-LINK buttons. The message on the 817 TGP should read "Computer link on / "BACK"...to exit". Click on the "Write to Programmer" button. Wait until new window reads "Finished!"



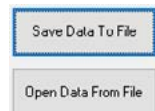
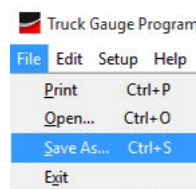
9. COPY FROM 817 TGP

Connect the serial cable to the PC and the 817 TGP. Put the 817 TGP in PC communication mode by pressing and holding the shift and LIGHT/C-LINK buttons. The message on the 817 TGP should read "Computer link on / "BACK"...to exit". Click "Read from Programmer" button. Wait until new window reads "Finished!"



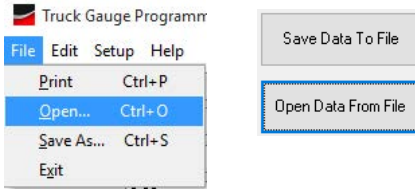
10. SAVE CALIBRATION CHART

The "Save Data To File" button (or "File" then "Save As...") will save the calibration chart currently in the Truck Gauge Programmer Software's selected memory location to a file.



11. OPEN CALIBRATION CHART

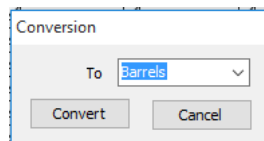
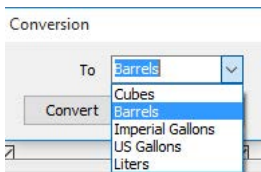
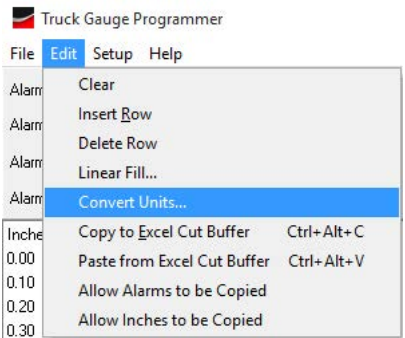
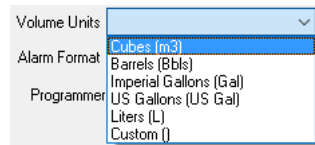
The “Open Data From File” button (or “File” then “Open...”) will load a previously saved file into the Truck Gauge Programmer software’s selected memory location.



12. CONVERT CALIBRATION UNITS

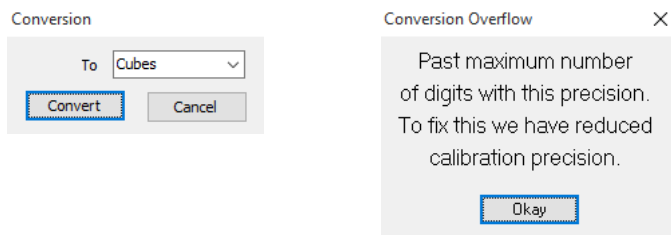
After you have entered the volume calibration table you can then choose to convert to different units. First, make sure that you have selected the units of your calibration table with the “Volume Units” drop down menu.

- Make sure that you have selected the units of your calibration table with the “Volume Units” drop down menu.
- In the main menu go to “Edit” then “Convert Units...” select what units you would like to convert to.
- Use the “To” drop down menu to select what units you would like to convert to. Then click the “Convert” button.



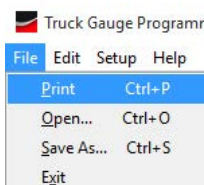
- d. Click "Accept" to save conversion, or "Cancel" to revert back.

Note: Conversion only works for Cubes, barrels, gallons (US & Imperial), and liters. Conversion will auto fix precision if overflowed.



13. PRINT CALIBRATION

The calibration can also be printed out if desired by selecting "Print" under the File menu. This will create a PDF that you can now print or save.



14. WHOLE INCH MODE

Whole Inch Mode is most effective when entering the calibration for a straight sided tank. When Whole Inch Mode is on, enter the volume calibration values on the whole inch values, and then the fractional inch values (appearing in grey) will be automatically generated.

Inches	Volume	Alarm 1	Alarm 2	Alarm 3	Alarm 4
0.00	0.00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0.33	0.10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0.67	0.20	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1.00	0.30	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1.33	0.40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Because of the wide variety of computer hardware and software, it is nearly impossible to address all possible problems in this manual. Please call Garnet Instruments Ltd. if you are having trouble with our software.

If the software and programmer are not communicating, please check for software running in the background that could be using the serial port.

New versions of the Truck Gauge Programmer software will be available on our website:

www.garnetinstruments.com/support/software-downloads/

We at Garnet Instruments Ltd. are dedicated to giving our customers the best experience possible when using our products. If there is a problem with the software or you have an idea as to how to improve it, please let us know.

The programmer has a metal case to help avoid errors due to interference and static electricity. Even so, it is a good idea to avoid the use of two way radios and cell phones when using the programmer. Do not program in the immediate vicinity of arc welding.

The programmer is designed for use in dry, moderate temperature locations. Do not expose the programmer to rain or water, and avoid storing the programmer in cold locations since condensation will occur when it is brought into a warm location. If it is necessary to bring it in from a cold to a warm location, let it sit for an hour or two to dry out before using it. If any damage is visible to the cable or plug, or if the plug appears to be loose, replace them immediately to avoid programming errors.

Some operations take significant time, for example programming a gauge, copying a gauge, programming an alarm point, writing inches in the memory, and clearing the memory. During this time the programmer display will show the progress of the operation. When this progress indicator goes out, the programmer has finished with that operation. Do not disconnect the programmer plug or the USB cable, or turn off the power until the operation is complete.

If the programmer is being used outside in bright sunlight, the sunlight may penetrate right through the black optical input connector housing and overwhelm the optical input. If this happens the programmer will appear to not respond to pressing the **BAR** or **BAR TST** button. Shading the connector with your hand should restore proper operation.

When the programming plug is connected to the gauge, the gauge display will show “prog” within a couple of seconds. Do not start programming the gauge until “prog” is shown.

Program the gauge display into inches:

1. Turn on the programmer.
2. Make sure the inch mode is correct.
3. Select a memory location with **MEM LOC**.
4. Press the **INCH MEM** (SHIFT – 1) button to put inches into the memory. If the inches are already in memory from a previous calibration, it is not necessary to do it again, but make sure that they are the correct inches (1/3 or 1/6).
5. To program the alarm points, determine the level that they should be set at and whether they should be start up or shut down (no or nc). The start up (no) mode turns the alarm on as the tank level rises past the alarm point (i.e., the alarm is on at the top of the tank, and off at the bottom). The shut down (nc) mode turns the alarm off as the tank level rises past the alarm point (i.e., the alarm is on at the bottom of the tank, and off at the top).
6. For 808 and 810 models, if the automatic alarm (the purple wire) is to be used, program Alarm 4 as shut down (nc) at the point where the horn is to come on, and program Alarm 3 as shut down (nc) a few inches above where the float will sit at the bottom of the tank. The automatic alarm is a special output so that even though Alarm 4 is programmed as shut down (nc), the horn will be turned on when the level rises above the Alarm 4 point, and then will turn off when the alarm is silenced. When the fluid level goes below the Alarm 3 point, the alarm will be re-armed so it will sound the next time the level goes above Alarm 4.
7. To set Alarm 1, use the **INCHES** buttons to obtain the desired set point on the CALIBRATION display, and then press the **ALARM SD/NC** or **SHIFT-ALARM SU/NO** button followed by the 1 button. When the operation is complete, repeat this procedure for the other alarms, pressing 2, 3, and then 4 after the **ALARM** button. If an alarm is not used it does not need to be programmed.
8. Make sure that the fiber from the sender bar is connected to the gauge display, and plug the programmer plug into the gauge display. Press the **BAR** button. The INCHES display

should show some inch reading, if it shows "no L" or "bad L" check the fiber connection and the bar mode (1/3, 1/6, or 1/10 inch). **Note:** The black fiber optic cable connector **MUST** be shaded from direct sunlight. See the information in the Description of Keypad Buttons section for further information.

9. Measure the distance from the bottom of the tank to the middle of the float, this is the bottom reading. Use the **OFFSET** buttons to obtain this reading on the CALIBRATION display. **Note:** The calibration offset is carried over when memory locations are changed.
10. Press the **PROG** button and then the **ENTER** button to transfer the calibration to the gauge.
11. When the operation is complete, unplug the programmer from the gauge and verify gauge operation.

Copy one gauge display to another:

1. Turn on the programmer.
2. Make sure the inch mode is correct.
3. Select a memory location with **MEM LOC**.
4. Plug the programmer plug into the gauge display to be copied from. Press the **COPY** button and then the **ENTER** button to copy the gauge calibration into memory.
5. When the operation is complete, unplug the programmer plug from the first gauge and plug it into the gauge display to be programmed. Press the **PROG** button and then the **ENTER** button to transfer the calibration to the second gauge.
6. When the operation is complete, unplug the programmer from the gauge and verify gauge operation.

Program a gauge display from a table of calibration values:

1. Obtain a table of inches versus volume
2. Turn on the programmer.
3. Make sure the inch mode is correct.
4. Select a memory location with **MEM LOC**.
5. Press the **CLEAR MEM** button and then the **ENTER** button to erase any previous calibration.
6. Starting at the 0 inch value of volume calibration, use the 0 to 9, decimal, **E, F, L, U**, or **BL** buttons on the keypad to enter

the calibration. Press the **ENTER** button to store the value in memory. When **ENTER** is pressed, the inches will go to the next value. If you make a mistake, use the **BACK** button to erase the entry, or if **ENTER** has already been pressed, use **INCHES** $\uparrow\downarrow$ to go back to that inch value and re-enter the correct value. If more than 4 numbers are entered the previous ones will scroll off the left of the display. If **ENTER** is pressed before any numbers, nothing will happen.

7. After the table has been entered, use the **INCHES** buttons to review the table to make sure it is correct. If a calibration value is incorrect, simply re-enter it and press **ENTER**.
8. Continue with the same procedure as in Program the gauge display into inches from step 5. When setting the bottom reading, use the calibration table to look up the volume corresponding to the distance to the middle of the float. Use the **OFFSET** buttons to obtain this reading on the **CALIBRATION** display.

Transfer a calibration program between the programmer and a computer:

1. Turn on the programmer.
2. The computer controls the inch mode and memory location of the programmer, so these don't need to be set until the gauge is programmed.
3. Use a USB cable to connect the programmer to the computer.
4. Launch the software on the computer. Make sure the inch mode and memory locations are correct.
5. Press the **C-LINK (SHIFT-LIGHT)** button to put the programmer into the computer communication mode.
6. Click "Check Programmer Version" to verify that the computer is communicating with the programmer.
7. Click the desired button to read or write to the programmer. All commands are done from the computer. The programmer display will show the operations and the progress.
8. Make sure that the operation is complete before doing anything else. Some operations can take up to 30 seconds.
9. The memory label can have up to 16 characters. The label can only be entered on the computer, but can be read on the programmer or the computer. The label is not stored in the gauge.

10. After completion, press the **BACK** button to return the programmer to normal mode.

Note on alarm programming: Note that for the 815 SpillStop, all alarms are programmed as shut down or normally closed (nc). Alarm 1 is the engine shutdown, alarm 2 is the horn alarm, and alarm 3 is the tank empty point. Alarm 4 is available for other uses, if desired.

Programming the 5 Digit Display:

It is important to know how the 5 digit display operates in order to understand how the programming is to be done. The 817-USB was originally designed for the programming of four digit gauges. Because of this it only has four digit LCD's so in order to program five digits a workaround had to be determined. The fifth digit is only used if the volume (typically in gallons or litres) of a tank is greater than 10,000. During the time that the gauge is showing volumes less than 10,000, four digits are all you need and these volumes are entered into the programmer following the instructions given above. The steps below indicate how to enter volumes of 10,000 and greater. The example in the steps is for entering the number 15,346.

1. On the chart of volume versus height, round all volumes 10,000 or greater to the nearest 10. This would give a number of 15,350 in our example.
2. Enter the first four digits only with a decimal point after the first digit. In our example you would press 1, followed by the decimal point then 5,3,5 and then ENTER.
3. Enter all of the volumes that are 10,000 or greater the same way.
4. When all numbers have been entered and checked you may enter the alarm points and set the bottom reading as described above and then program the gauge.
5. Verify proper gauge operation.

The fifth digit is always a zero which is why the numbers greater than 10,000 must be rounded to the nearest 10. When the display is programmed it is designed so that when it senses the decimal point after the first digit the zero in the fifth digit position is activated. So in the example, by entering 1.535 on the programmer, the number 15350 will be shown on the gauge display.

To test a sender bar:

1. If the sender is flashing, plug a piece of fiber into the sender white optical connector and the other end of the fiber into the black OPTO input connector on the 817-USB programmer. The display shows the number of bits the bar is sending and the optical power. If the optical power is poor (less than 70), then check the fiber, if it is good and fully inserted then the bar output is bad and the bar must be replaced. Ensure that the number of bits is correct (1/3" is 8 bits, 1/10", 1/6" or 1/4" is 11 bits). If the number of bits is not 8 or 11 then the bar is bad and must be replaced.
2. Make sure the programmer inch mode is correct to match the bar. Now press the **BAR TST (SHIFT-BAR)** button to put the programmer into the bar test mode. The INCHES display will now show what the bar is putting out. Slowly run a float up the bar while watching the INCHES display to verify bar operation. If the bar does not operate correctly then it must be replaced. To return the programmer to normal operation press the **BACK** button.

Note: If the programmer is being used to test a bar outside in bright sunlight, the sunlight may penetrate right through the black optical input connector and overwhelm the optical input. If this happens the programmer will appear to not respond to pressing the **BAR** or **BAR TST** button. It will be necessary to shade the connector with your hand to ensure proper operation.

To test a display:

3. Make sure the programmer inch mode is correct to match the display. Plug a piece of fiber from the white OPTO output connector of the 817-USB programmer to the black optical connector on the display (make sure the end of the fiber going into the display is flashing). If the display shows "no L" then it is bad and must be replaced.
4. If the display shows an incorrect reading when the fiber is plugged in, it may need reprogramming. Copy the existing programming into an unused memory on the 817-USB (just in case) and then program the display in inches or a known good program. The display should show "prog" within a couple of seconds of plugging in the programmer plug, if not it is bad.

After the programmer plug is removed the display should match the reading on the 817-USB calibration display, if it does not then the display is bad.

5. If only the alarms do not work then copy the calibration into the 817-USB to check if the points are programmed. If they are then connect a fiber from the 817-USB optical output to the display optical connector. Connect the positive terminal of an ohm meter to the display alarm wire, and the negative terminal of the ohm meter to the display ground wire. Use the inch up/down buttons on the 817-USB to run the display up to test the alarms. If the purple wire is being tested then make sure that both Alarm 3 and Alarm 4 are correctly programmed and run the display from below Alarm 3 to make sure that previous bypassing is cleared.

There are no user serviceable parts in the 817-USB other than the four "AA" batteries.

CHAPTER 13 - SPECIFICATIONS

817 ENCLOSURE	
Enclosure Material	Aluminum
Enclosure size	106 mm wide (4.175") x 160 mm high (6.30") x 28.5 mm deep (1.12")
Display type	LCD, backlit. Can be turned on or off to conserve batteries
Display size	60.96 mm (2.4") x 24.13 mm (0.95")
Battery power	Powered by alkaline AA batteries, field replaceable with no memory loss
Temperature range	Use in dry, moderate temperature locations
SAFETY INFORMATION	
Compliance and Certifications	<p>CAN ICES-001(A)/NMB-001(A)</p> <p>This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.</p> <p>Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.</p> <p>This product can expose you to chemicals including Nickel and Lead, which are known to the State of California to cause cancer, and lead which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov</p> <p>Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.</p>

Find warranty claim process information refer to our support page on our website:

www.garnetinstruments.com/support/

DISCLAIMER OF WARRANTY ON HARDWARE

Garnet Instruments warrants equipment manufactured by Garnet to be free from defects in material and workmanship under normal use and service for a period of three years from the date of sale from Garnet or an Authorized Dealer. The warranty period will start from the date of purchase or installation as indicated on the warranty card. Under these warranties, Garnet shall be responsible only for actual loss or damage suffered and then only to the extent of Garnet's invoiced price of the product. Garnet shall not be liable in any case for labor charges for indirect, special, or consequential damages. Garnet shall not be liable in any case for the removal and/or reinstallation of defective Garnet equipment. These warranties shall not apply to any defects or other damages to any Garnet equipment that has been altered or tampered with by anyone other than Garnet factory representatives. In all cases, Garnet will warrant only Garnet products which are being used for applications acceptable to Garnet and within the technical specifications of the particular product. In addition, Garnet will warrant only those products which have been installed and maintained according to Garnet factory specifications.

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These warranties are the only warranties, expressed or implied, upon which products are sold by Garnet and Garnet makes no warranty of merchantability or fitness for any particular purpose in respect to the products sold. Garnet products or parts thereof assumed to be defective by the purchaser within the stipulated warranty period should be returned to the seller, local distributor, or directly to Garnet for evaluation and service. Whenever direct factory evaluation, service or replacement is necessary, the customer must first, by either letter or phone, obtain a Returned Material Authorization (RMA) from Garnet Instruments directly. No material may be returned to Garnet without an RMA number assigned to it or without proper factory authorization. Any returns must be returned freight prepaid to: Garnet Instruments, 286 Kaska Road, Sherwood Park, Alberta, T8A 4G7. Returned warranted items will be repaired or replaced at the discretion of Garnet Instruments. Any Garnet items under the Garnet Warranty Policy that are deemed irreparable by Garnet Instruments will be replaced at no charge or a credit will be issued for that item subject to the customer's request.

If you do have a warranty claim or if the equipment needs to be serviced, contact the installation dealer. If you do need to contact Garnet, we can be reached as follows:

CANADA

Garnet Instruments
286 Kaska Road
Sherwood Park, AB T8A 4G7
CANADA
email: info@garnetinstruments.com

UNITED STATES

Garnet US Inc.
5360 Old Granbury Road
Granbury, TX 76049
USA
email: infous@garnetinstruments.com

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If you do have a warranty claim or if the equipment needs to be serviced, contact the installation dealer. If you do need to contact Garnet, we can be reached as follows:

CANADA

Garnet Instruments
286 Kaska Road
Sherwood Park, AB T8A 4G7
CANADA
email: info@garnetinstruments.com

UNITED STATES

Garnet US Inc.
5360 Granbury Road
Granbury, TX 76049
USA
email: infous@garnetinstruments.com

