Holley 5.7" Full Color Touch Screen LCD
P/N 553-103

NOTE: You MUST have ECU firmware version 330 or HIGHER for the Touch Screen to function properly. ECU's with serial numbers BELOW 700 will NOT have the proper firmware from the factory. You can download the proper firmware from www.holley.com/TechService/Library.asp . Towards the middle of the page you will find downloads for "Holley EFI". You will need to use a laptop to upgrade the firmware this first time, future updates can be done via the touch screen. Download the latest SOFTWARE and FIRMWARE from www.holley.com.

1.0 TSLCD Overview:

The Holley 5.7" Touch Screen LCD is designed specifically for use with Holley Avenger, HP, and Dominator EFI systems. It contains separate software applications for tuning, gauge displays, and updating ECU firmware.

The Holley 5.7" Touch Screen LCD allows for tuning without the need for a laptop computer in the vehicle.

What the Touch Screen allows you to do in regards to tuning:
- Perform real-time tuning of all "tuning" parameters
- Enable and Disable certain inputs and output that have previously been enabled and pin-mapped in the calibration.
- Download internal ECU data logs to the SD memory card

What the Touch Screen does *not* allow you to do in regards to tuning and setup:
- Perform initial calibration setup of engine and ignition parameters
- Enable configure inputs and outputs
- Any modifications or setup to the "Inputs/Outputs" ICF.

These functions must be performed on a laptop or desktop computer. This initial setup can downloaded to the ECU via a laptop computer, or can be downloaded via the Touch Screen on the SD memory card. Using the SD card allows the initial setup to be performed on a desktop computer, copied to the SD card, then installed via the Touch Screen, eliminating any need for a "laptop" computer.

2.0 Installation

The touch screen can be flush-mounted into a dash, or installed on a mounting base/bracket. There are 8 threaded attachment points in the back of the touch screen. These are a 10-24 thread. When installing it, make sure the fasteners used don't bottom out in the touch screen. If they do, and you over-tighten them, damage will result. Eight 10-24 fasteners are included for mounting purposes. Depending on how things are mounted, you may need different fasteners. The mounting pattern used is an industry standard mounting

pattern that fits off-the-shelf mounts for most GPS's, fish finders, and other brackets. The center 4 positions are a "Rectangular AMPS" pattern (30mm x 38mm). The outside four positions are a 140mm x 32mm pattern.

The touch screen is not weather resistant and must be installed in a dry environment.

Mounting in Race Cars – Applications that will see significant vibration, such as off-road racing, drag race cars, must use either the included vibration damping hardware, or similar hardware. The touch screen should not be rigidly mounted to a roll cage, etc. The included vibration damping hardware allows for the touch screen to be mounted on a flat dash with a thickness of .050-.080". Installation requires drilling four 9/16" diameter holes to mount the vibration damping grommets. The included stainless steel shoulder screws and washers are used to install the touch screen through the grommets. The small orange washer should be installed over the threads first as shown in the picture (**Figure 1**). The grommets should be installed into the 9/16" diameter holes, then the shoulder screw inserted through, then the washer installed before mounting to the touch screen.

Figure 1

3.0 Wiring

Make sure the wiring for the connector at the touch screen is "stress relieved"; meaning it is not being pulled tightly after it is installed. There is one connector that plugs into the back of the touch screen that contains 5 wires (**Figure 2**). This is the only connection that needs to be made into the touch screen for proper touch screen operation. Carefully connect this connector into the back of the touch screen as a final wiring step, after the wiring connections are completed. Wiring connections are as follows:

Figure 2

White Wire – Connect to SWITCHED +12v ignition power. This power should only be active when the ignition switch/key is in the run position and crank position. Connect to a clean, switched ignition power source.

Red Wire – Connect to +12v constant battery power. This connection should have battery power at all times. This wire should only be tied to a source that has "clean" power connections to it. Do not connect with "dirty" items such as ignition boxes, cooling fans, etc. It is best to connect to the battery.

Black Wire – Connect to a good ground source. This wire should only be tied to a source that has "clean" ground connections to it. Do not connect with "dirty" items such as ignition boxes, cooling fans, etc. It is best to connect to the battery.

CANbus Wires – There is an orange and orange/black wire terminated at a two pin metripak connector. This is the CANbus communication cable. This is the path the touch screen uses to communicate with the ECU. There is also another orange and orange black cable included with the kit (**Figure 3**). This harness must be installed as well. This other harness includes "CANbus Terminators" that are required for proper communication. These terminators are pre-installed in the harness. This second harness is plugged into the touch screen LCD harness, and then connects to the CANbus plug located in the EFI main harness. The male connector with the blue colored retainer clip plugs into the main EFI harness. The male connector with the black colored retainer clip plugs into the touch screen LCD harness. All of these connections directly plug into each other and should require no modification to the harnesses. If the wires are too short, the following CANbus extensions are available:
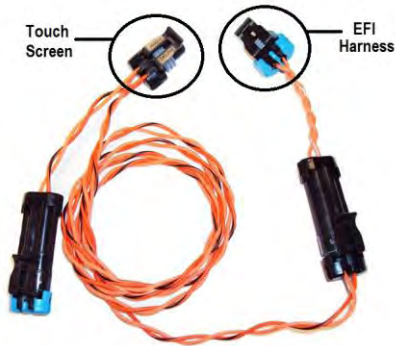
Figure 3

1 foot extension – Part Number 15663NOS
4 foot extension – Part Number 15665NOS
8 foot extension – Part Number 15666NOS
12 foot extension – Part Number 15644NOS

NOTE: Do NOT use a Holley Avenger Handheld controller in conjunction with the touch screen LCD. Use only one or the other. Do NOT have both connected to the CANbus wiring at the same time.

USB Connections – There is a standard USB connection on the back of the touch screen as well as a mini USB connection on the side. These are NOT used at this time and are for future upgrades.

4.0 SD Memory Card

The SD memory card supplied with the touch screen (in the lower right side of the case) are a "SDHC" type (HC = High Capacity). If you have a problem reading these cards, make sure your card reader can read the "HC" type. If you have problems, either procure a newer card reader that can, or use a non-HC memory card. The Memory card is used for the following:

- Saving Global Folders
- Downloading Internal ECU Data Logs
- Downloading new firmware to the ECU

5.0 Main Windows Screen

The Holley touch screen LCD operates on a Microsoft Windows CE platform. However, do not install applications other than what is already installed as delivered. The basic operation on the main windows screen is the same with a windows PC. The "Start" bar allows access to typical functions, such as "Settings" and "Programs". Other than changing the power settings mentioned elsewhere in this manual, there should be no need to access any of these functions.

The three Holley EFI programs loaded on the touch screen are:

HEFI Config – Tuning application for all tuning parameters
HEFI Flasher – Allows for ECU firmware flashing/updating (once version 330 or higher has been installed via a laptop)
HEFI Gauges – A gauge program.

NOTE: Only one of these applications can be opened at the same time.

The "My Device" icon in the top left, allows access to files located in the TSLCD hard drive or the SD storage card. There should be no need to perform any changes in these areas. Files on the SD card are located under "Storage Card".

Should the system "lock up" – It is not an impossibility that something in the operating system can cause the Configuration Application to "lock up". If this is the case, you may need to perform a "suspend" operation. To do this, click on the "Start Bar" in the lower left and select "Suspend". This will turn off the unit. Then cycle the switched power (ignition key) and the unit will reboot.

5.1 Power Scheme –

The touch screen has a configurable time parameter such that when the ignition power is turned off and turned back on, the touch screen will come back up to the same screen as when the power was shut off (for example if you want to always have a gauge screen appear). After this time expires, the system will completely suspend/turn off, and when the unit is turned back on, it reboots back to the main windows screen. The unit will draw a very small amount of current in this mode. This value can be changed between 1 second and up to 7 days. The default value is 24 hours. To change this, select "Start", "Settings", "Control Panel", the "Power" icon, then "schemes". You will see a parameter called "Power Scheme". You can select between "Ignition ON" and "Ignition OFF" for the power

scheme. Do NOT change the "Ignition On" settings. Leave them set to "never". For the "Ignition Off" settings, you will see the following three items:

Switch State to User Idle – Leave at "After 1 second"
Switch State to System Idle – Leave at "After 1 second"
Switch State to Suspend – You can change this time to increase or decrease the amount of time the touch screen waits to go into a full suspend after you turn the ignition power off.

6.0 Configuration Application

The Configuration Application is an "On-line Only" tuning device. This means the ECU must be powered and the touch screen connected to it. You modify the file within the ECU "real time" with the touch screen. You cannot modify the file "off-line". You can however save files to the SD card and revert back to them if needed. It is always advisable to save a "good" baseline file to revert to if needed.

The following will guide you through the various screens in the Configuration Application. Note that this instruction manual does NOT cover the following. These are covered in the lengthy instructions included in the PC software.
- ECU and system wiring
- Initial system configuration and setup
- Detailed EFI tuning (there is a help screen available on every screen in the TSLCD with basic tuning information)

"Help" Screen – There is help information for every screen within the touch screen. To access it for a specific screen, click once on the title of the screen (directly below the "Holley EFI" in the top/middle of the screen).

"Enter" Screen: When the Configuration Application is first opened you will see this screen. Click once anywhere on the screen and you will be taken to the "Sync" screen.

Figure 4

Sync Screen: After the "Enter" screen, you will be taken to the sync screen. At this point the touch screen will download the configuration in the ECU. This will take a moment. Progress is shown on the screen as each ICF is shown as "synced" or "not present". The ECU must be powered and the CANbus cables connected to properly sync.

The following information is shown in the upper/middle left side of the screen:

Touch Screen Serial Number, Date Flashed, ECU Firmware Version, Profile Number for the Global Folder in the ECU (1 if HP ECU, 1 through 4 for Dominator is possible)
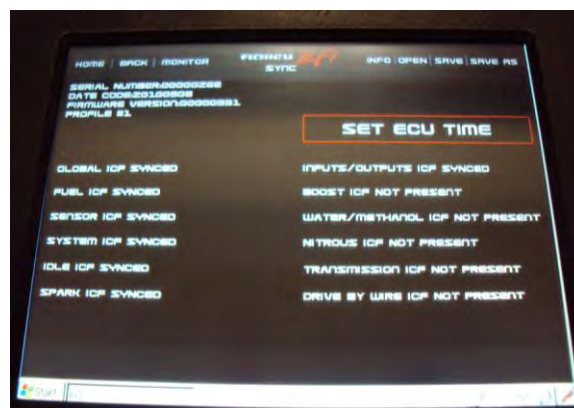

Figure 5

At the top left of the Screen you see the following:

Home – Moves to the main home screen at any time.

Back – Moves to the previous screen.

NOTE: The "Home" and "Back" buttons are the primary navigation methods.

Monitor – Opens a small "Data Monitor" view (**Figure 6**). This can be opened on ANY screen and will remain open until it is closed. This can be dragged and moved anywhere on the screen by holding your finger/stylus on the top area over the view name and dragging it. The red left and right arrows move back and forth between views. The views are fixed, but all of the base parameters are shown on a view at some point. For each parameter, the value is shown as well as if there is a caution or warning present. To close the monitor, select the "x". Note that on the 31x31 and 16x16, the update rate of the monitor may be very slow.

Figure 6

"TPS Autoset" – If a TPS Autoset has not been performed, you will see a "TPS Autoset" message/button on the right side of the screen. Before the engine will start, you must perform a TPS Autoset. If one has been performed, you will not see this message. To perform a TPS Autoset once one has been already done, go into the "Tools" function.

Set ECU Time – On a fresh installation, or when the battery has been disconnected, the ECU loses the actual time. To set the ECU time to what the touch screen clock reads, press the "Set ECU Time" button. If the touch screen time is incorrect, double-click the TSLCD time in the bottom right of area of the screen on the time and set it properly. Note that the time won't be reset in the touch screen until you restart the Configuration Application.

At the top right you will see the following:

Info – Shows information for the Global Folder and Individual Configuration Files present.

Figure 7

Open – Opening a file will bring up what Global Folders are present on the SD card. Global Folders are indicated by a "Holley ECU" icon next to them. Click once on the Global Folder you want to open and load, then select "Open". NOTE: This loads the global folder into the ECU and OVERWRITES that was in there.
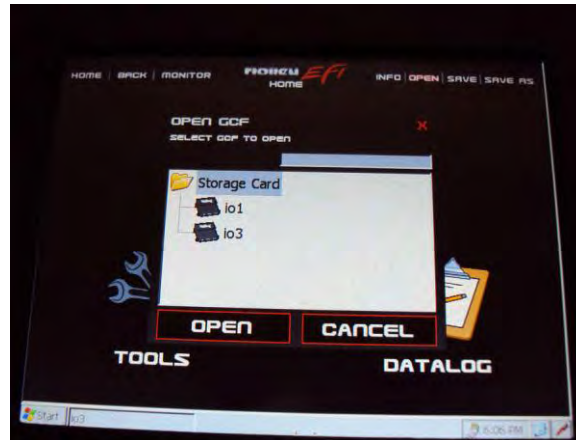

Figure 8

File Save - Will save the existing file to the SD card. The first time you do this, you may be prompted to do the save.

File Save As – Allows you to save a Global Folder to the SD card as a new name. Click on "Save As", next click once on the blank white space next to where it says "New Folder". This will bring up a "keyboard". You can drag and move the keyboard to any location on the screen.

To open or minimize the keyboard, click on the very bottom right corner on the stylus (pen) icon. Select "Hide Input Panel" to close the keyboard.

General System Use:

Once the system has synced, select the "Home" button in the upper left. This will take you to the main selection screen consisting of "Configuration" (Tuning), Tools, and Datalog functions. To exit the program you must select "Tools" and "Exit Program".

6.1 Configuration

The "Configuration" area allows for tuning of all parameters.

Figure 9

Once opened, you will see the 9 icons (**Figure 10**) for all the Individual Configuration Files (except for the "sensors" which can only be changed via laptop or PC). Ones that are not active in the existing Global Folder will be grayed out and not editable. Tuning any of the Individual Configuration Files is identical to using the PC Software interface, except due to space limitations, some will require multiple screens on the touch screen LCD. This manual does not cover tuning and use of all of these screens. This is covered in the extensive instructions included with the PC software. Each screen throughout the touch screen has tuning information however, which can be accessed by clicking once on the title of the screen, just below the "Holley EFI" in the top center. Some things that are unique to the touch screen, compared to the PC software, are covered next.
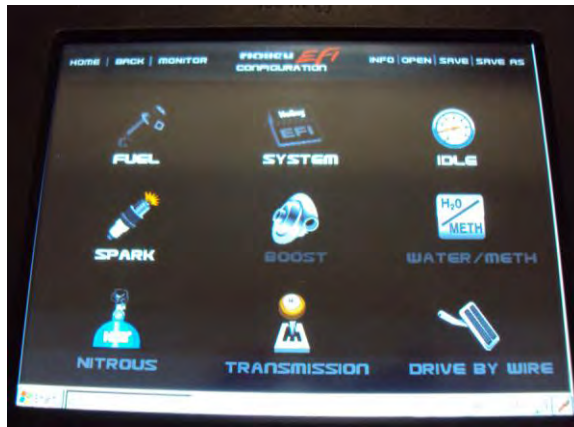
Figure 10

6.2 Editing 31x31 screens:

Due to the size of the screen, the 31x31 fuel or ignition timing tables can't be shown on one view. There are some very helpful tools that allow for quick changes to these views however. The Base Fuel table is shown below. In this view, you can see the lowermost, left area. If you want to see other areas, there are two options.

1) Use the "Move Left/Right/Up/Down" buttons at the top right of the screen to move one row or column at a time.

2) Use the "Move" button at the lower left corner of the screen. Click on it once and a Move Table opens. Then drag the red box to the new area you want to view. Then click OK or Cancel.

Figure 11

Figure 12

6.3 Editing Numeric Entries

There are two ways to edit numeric entries such as the one below (**Figure 13**).
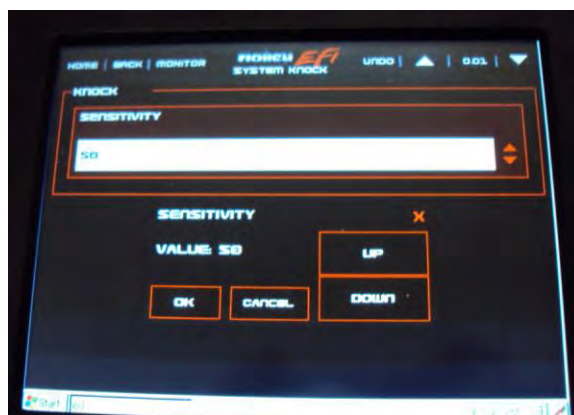
Figure 13

If you click once on the "up/down arrows" on the right of the entry, it will bring up a numeric increment window (**Figure 14**). If you click TWICE on the number, it will bring up a keypad (**Figure 15**).
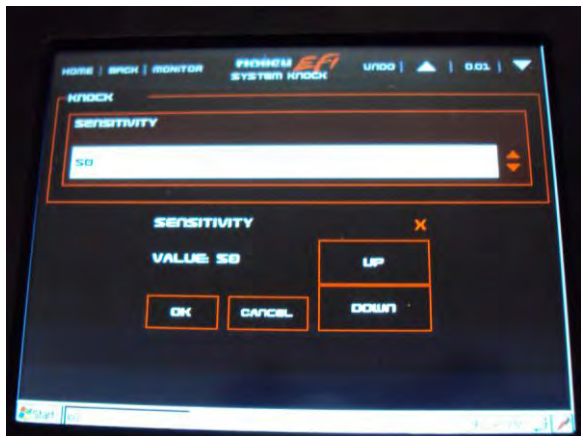

Figure 14

Figure 15

To change the values on any table, select the values you want to change (touch and drag over an area as shown in **Figure 16**). Then click TWICE on the LAST value you selected. This will bring up a calculator (**Figure 17**). You can type in a single number for all the cells (14 for example) or perform a math offset (/ = divide by, * = multiply, + = addition, - = subtraction). There is also a "fill column" and "fill row" option which will provide a linear fit between end values.

Also, at the top right side of the screen, there is an up and down arrow, and an increment number in between. Clicking on the increment number will scroll through different values. Clicking on the up and down arrows will increment a single selected value or a group of values on certain screens.
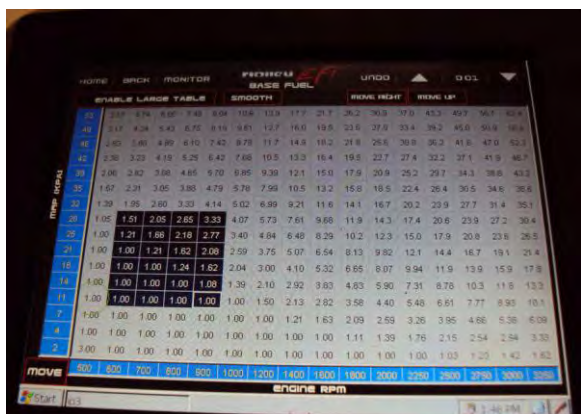

Figure 16

Figure 17

6.4 Graph Editing

To edit a graphical table, you can do the following:

1) Drag points on the graph up or down (**Figure 18**).

2) Click twice on the numeric value to bring up the calculator (**Figure 19**). **NOTE**: the number you change may not reflect your edit until you refresh the screen or move off the value.
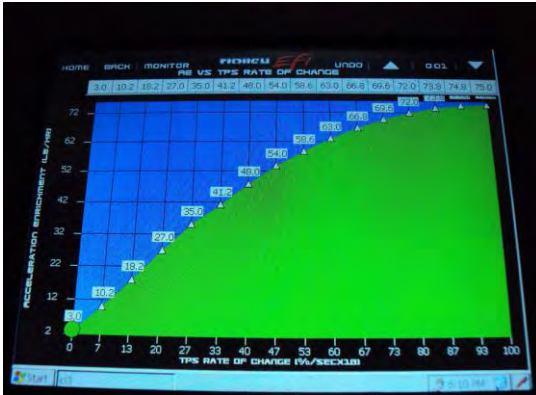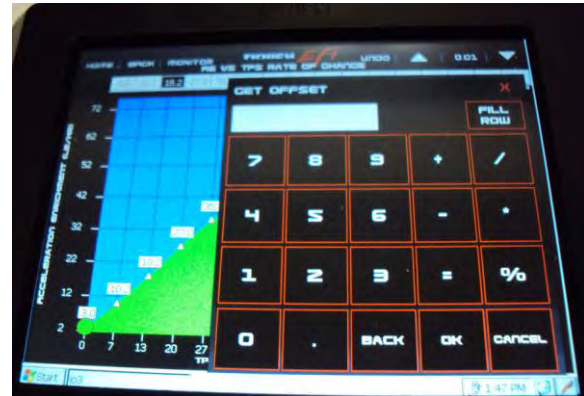

Figure 18

Figure 19

7.0 Tools

The Tools section contains the following (**Figure 20**):

TPS Autoset – Performs the TPS Autoset function. This is required on any new installation or if the TPS is changed/adjusted.

Static Timing – Allows for a fixed timing to be entered and removed. This is used when syncing the timing. By fixing the timing to a single value, it is much easier to check for synchronized timing all engine speeds.

Set Password – Not currently an active feature. It does not lock out user changes via the touch screen.

Clear Password – Not currently an active feature.

Controller Info – Indicates ECU Firmware version (in hexadecimal format), ECU firmware version, ECU profile number, and the software version of the Touch Screen (**Figure 21**).
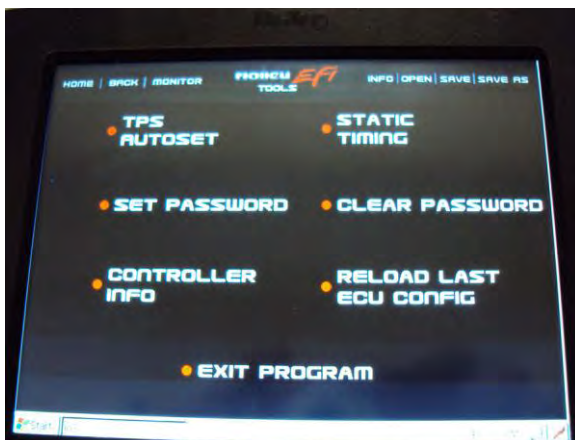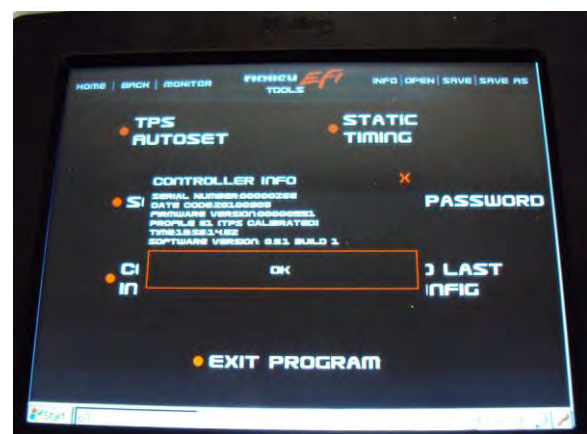

Figure 20

Figure 21

Reload Last ECU Config – Will reload the file that was last used/stored when the vehicle was last shut down.

Exit Program – Used to exit the program.

8.0 Data Log

Figure 22

Setup – Configures the internal ECU data logger (**Figure 23**). See the help instructions within the touch screen or PC software on proper configuration.   It is advised to use slower sampling rates unless needed to minimize file sizes and reduce download times (for basic logging, 5-10 samples per second is adequate. For troubleshooting, 50-100 is needed at times).
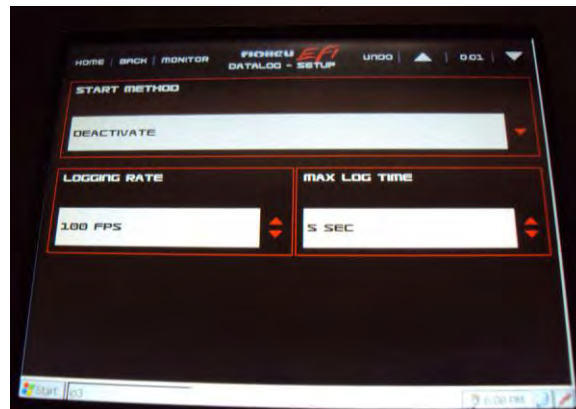

Figure 23

Download – Brings up all of the files in the internal ECU data logger (**Figure 24**). They can then be downloaded one at a time. Select one file, and then click the Download button. Delete will select a single file and Delete All will delete all the files. Note: Performing a "Delete All" may take a few minutes, so give the system time to complete.

Datalog File Naming Convention: A datalog taken by the TSLCD is an 8 character file name – MMDDHHMM.   MM = Month, DD = Day, HH = Hour, MM = Minute. A log taken in the same minute as a previous will overwrite the previous log.

Figure 24

Start Log – Manually starts an internal data log.

Stop Log – Manually stops an internal data log.

9.0 Gauge Application

9.1 Overview

The gauge application offers several different styles of gauges and numeric readouts. They can be used to completely replace conventional gauges or supplement them as needed. There are different types of gauges and views that all can be custom configured. User programmable caution and warning limits can be assigned to every channel.

9.2 View Selection

There are 5 different types of views (with multiple views for some types) that can be configured. The views can easily be changed at any time. A base configuration for all the gauges is provided. They can be changes as desired. To change the view, click on the "V" in the upper right of the screen and a "View Selection Screen" will appear (**Figure 25**).

Figure 25

9.3 View Types

1) **Needle Gauges** – Conventional round needle gauges which include 2 large and 4 smaller gauges. There are two of these screens that can be configured. These gauges can be configured to show a limited amount of channels.

Figure 26

2) **Needle/Data Gauges** – Two large conventional round needle gauges with a "data monitor" below it. There are four of these screens that can be configured. The large gauges have a limited amount of channels that can be configured. The "data monitor" channels can be selected such that ANY parameter available can be viewed.

Figure 27

3) **Digital Gauges** – Modern looking digital bar tachometer and readouts. There are two screens that can be configured. These readouts have a limited amount of channels that can be configured.

Figure 28

4) **Bar Tachometer** – Large tachometer readout display.

Figure 29

5) **Switch Panel** – The switch panel can be used to replace physical input switches that are used to trigger an input into the ECU.

NOTE: When you turn the ignition power OFF, any of these switches will be turned OFF at this time.
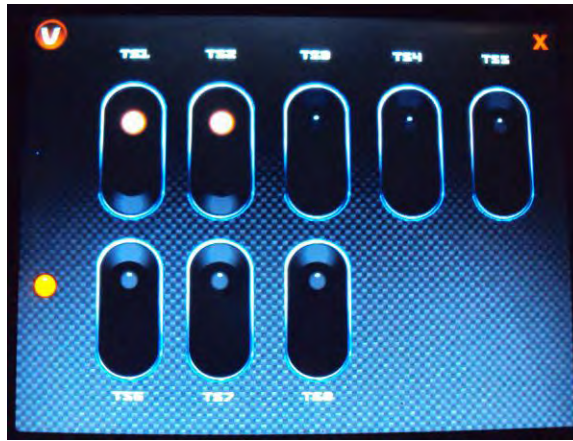
Figure 30

Touch Screen Switches may be used as "enable/input" from software created I/O (for example nitrous enable) or from a user defined Inputs from the I/O ICF. These switches may also be used to trigger an output once the desired Input has been created. Note** A switched output used in conjunction with a sensor input **both switch and sensor input must be enabled** for output to trigger.

A TSLCD "Switch" must first be created in the PC software. To create, you must first define a +12v (H) or Ground (G) input. Go to the Pin Map and the "View LCD" screen. Then "drag and drop" the input onto one of the 10 available positions on the LCD Pin Map.

9.4 Caution Warning/Setup

Overview

Any item with a numeric reading can be configured with both high side and low side Caution and Warning outputs. These are configured using one of the "Needle/Data Gauge" screens. Once configured there, a caution or warning will be indicated on a Dial (the background will turn yellow or red) or Digital (the number will turn yellow or red) gauge. This system defines a "caution" as a first notification of trouble. A "warning" is a value that is a "worse condition" than a caution. For example, you may set up engine coolant temperature to have a "caution" trigger at 220°F, and a warning to occur at 240°F. You can configure a "low side" caution and warning as well. You would use this for oil pressure, for example. You can set up a low side caution to occur at 25 PSI and a low side warning to occur at 15 PSI.

To configure a caution/warning for a certain channel, perform the following:

1) Go to a "Needle/Data" gauge view.

2) If the channel you want to create a caution/warning for is available, click once on the name of that channel. This will bring up the "Data Monitor Set-Up Screen" (**Figure 31**). On this screen you can set the "normal" min and max range, and the caution min/max range. By doing so, you automatically set up the warning min/max range as well. To enter the values for the normal min/max and caution min/max, click once on the number you want to change. This will bring up a number editor (**Figure 32**). Type in the value you want and click once on "OK".
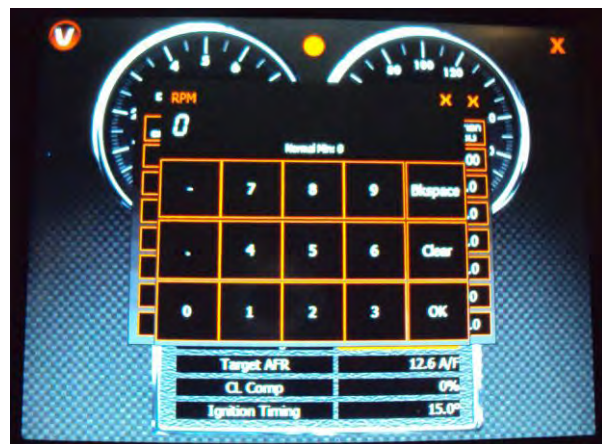

Figure 31

Figure 32

If the channel you want to edit is not available on any of the "Needle/Data" views (there are four of them), then you must remove one of the existing channels and add the one you desire. To do this, simply click on the channel you want to replace. This will bring up the "Data Monitor Set-Up Screen" (**Figure 33**). You can scroll through this list as necessary. Select the channel you want by clicking on it once. Channels that have a green checkmark next to it indicate that it is currently selected on some data monitor screen, however you can select the same channel multiple times. Once you select it, you can enter the normal and caution min/max values you want.
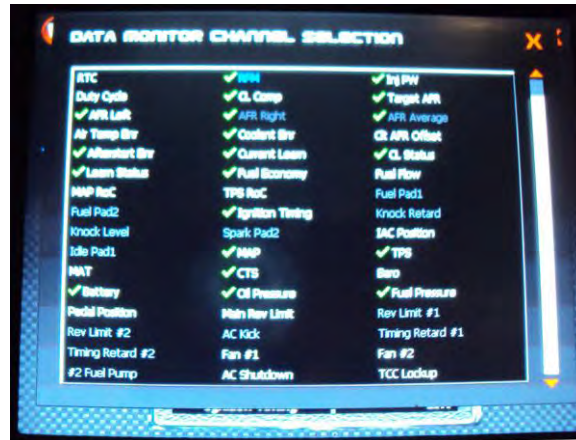

Figure 33

3) The following is an example of how you can full set up caution and warning values. Fuel Pressure is used as an example. If you want a normal range of 40-50 PSI, a caution to occur between both 35-39 PSI and 51-55 PSI, and warnings below 35 and above 55 PSI, you'd set as follows:

Channel	Normal (min)	Normal (Max)	Caution (Min)	Caution (Max)
Fuel Pressure	40	50	35	55

9.5 Caution/Warning Light

Every screen has a single caution/warning indicator position on it. If ANY channel has a caution or warning present, this indicator will light up. If there are none present, nothing is shown in this position. The Needle and Needle/Data gauge views location is between the two large gauges and the digital gauge location is in the upper left. Note that a PC Software created caution or warning output can turn these on as well.

10.0 Firmware Flashing Application

Once the ECU firmware is at version 330 or greater, you can use the Touch Screen to update the ECU firmware. Select the "HEFI Flasher" icon. This opens the screen below (**Figure 34**). Select the "Open Firmware File". This opens the directory of the SD memory card. Select the firmware you want to update to (which has to have been loaded on the SD card). This will update the ECU firmware.
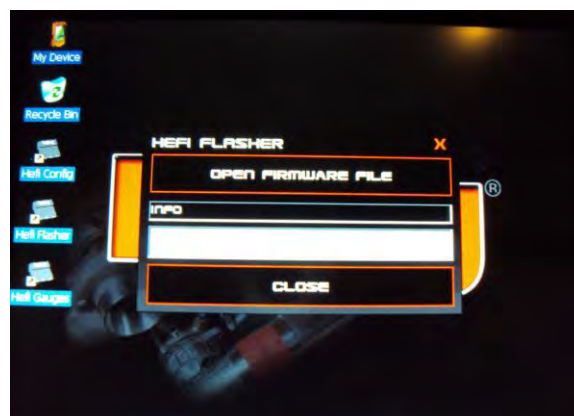

Figure 34

199R10524
Date: 12-8-10