

Holley V2 Software Update Overview

Holley has made many updates and improvements with the V2 software and firmware update for HP and Dominator ECU's. This document covers all of these changes. All users are highly recommended to thoroughly read and digest all of this information. These changes are covered by reviewing each specific Individual Configuration Files (ICF) as well as other specific areas such as datalogging.

FIRMWARE: V2 software (designated by software versions 2.1.0 and higher) and above MUST be used with firmware versions 510 and up.

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1.0 Installing Software

Software installation occurs as with previous versions. Auto-installation should occur once the disk is inserted, or when the installer program is executed. If there is a previous version of the Holley EFI software installed (version 1.5, etc.), and the V2 software is installed to the default directories, the previous software version executable WILL be overwritten. If you don't want this to occur, name/create another directory path when you install the V2 software. However, previous Global Folders, Datalogs, Configs will NOT be removed/overwritten. See "Opening/Saving Files" below on information regarding where new Global Folders, Data Logs, etc. will be stored.

Note: If your current ECU is using software version 1.3, you need to contact Holley tech at 1-270-781-9741.

2.0 Opening/Saving Files

There are new screens and navigations when opening and saving Global Folders. These make it easier to differentiate a Holley EFI Global Folder from a regular Windows directory.

The major change with the V2 software (to eliminate file permissions problems in previous software when saving files) when saving Global Folders, Data Logs, and all Configurations files, is they are saved to the "My Documents" area (under Documents\Holley\HEFI\). These files will NOT be located in the program files directory anymore. The same directories are installed here that were previously installed in the Program Files directory. Previous Global Folders, Datalogs, etc., can be copied/moved to this new location.

2.1 Opening a Global Folder

When you first open a Global Folder, you will see the following in **Figure 1**. Newly installed software will show the familiar "Base Cals" and "Custom Cals" directories. Directories will appear with a standard Windows icon. The "Location of Global Folder" shows the directory path at the top.

Open Global Config	×
Location of Global Folder	
C:\Users\fleminwb\Documents\Holley\HEFI\Global Folders	
Home	Choose or Create New Directory
Go up one level (Parent Directory)	
Custom Cals	
Base Cals	
Global Folder Name	
	Open Cancel

Figure 1

When you look in a directory that has Global Folders present, they will appear as a "Holley ECU" icon (**Figure 2**). To open a Global Folder, select it (which will then appear in the "Global Folder Name" area at the bottom, and select the "Open" button.

Open Global Config		x
Location of Global Folder		
C: \Users\fleminwb\Documents\Holley\HEFI\Global Folders\Base Cals		
Home	Choose or Create New Directory	
Go up one level (Parent Directory) TBI85SB225HE		
MPI36SB215HE TBI85SB245HE		
MPI36SB225HE		
MPI36SB245HE		
MPI4888215HE		
MPI4888225HE		
MPI48BB245HE		
TBI858B215HE		
TBI85BB225HE		
TBI85BB245HE		
TBI85SB215HE		
Global Folder Name		
	Open Cancel	
Fig	ure 2	

If you want to go up a directly level, select the "Go up one level (Parent Directory) selection. If you want to select an entirely new directory or drive when opening or saving, select the "Choose or Create New Directory" button. You will then see the window shown in **Figure 3**. This will allow you to browse to a different location.

Open Global Config		L ×
Location of Global Folder C: \Users\fleminwb\Documents\Holley\HEFI\Global Fold	ders	
Home		Choose or Create New Directory
Go up one level (Parent Directory)	Browse For Folder Pick a Directory	
Base Cais	 Desktop Libraries Wendy B. Fleming Contacts Desktop Desktop Downloads Favorites Links My Documents AdobeStockP Fav 	ng
Global Folder Name		Open Cancel

Figure 3

2.2 Saving a Global Folder

When you save a file, the same formatting is used as when you open one. The Global Folder name that is currently open in the software is automatically populated in the "Global Folder Name" at the bottom of the screen. You can change it if desired. To create a new directory, or navigate to another drive or directory, select the "Choose or Create New Directory" button. To go up one directory level, select the "Go up one level (Parent Directory)" button.

Save	e Global Config			— X —
Lo	cation of Global Folder			
E	:			
	H	lome	Choose or Create New Di	rectory
	Go up one level (Parent Directory)	Doug LS Base		
6	Training 10-18-12	67 Truck		
	Training 4-19-12	Doug LS 3 Bar		
	boost	DEMO GF ALL ICFS		
	2.0.7.1	Doug LS good 8-28-12		
	🥏 software	Doug LS 2.0.8.2 sw		
	LS	8-28 2.0.8.2 Boost (use in car)		
	HEFI 2.0.6.5	engine 1 final		
	laptop backup	Holley TBI 4-28-12 good		
	🔵 stocker	2.0.9.1 Test		
5	nitrous	V2 Software		
	abal Falder Name			
V	2 Software			
				Save Cancel

Figure 4

3.0 Preferences

There are two new options in the "Preferences" selection (found under "toolbox"). The first is the option to display the Y axis in many tables in PSIA instead of kPa. Select the checkbox if this is desired. The second allows for a logfile to automatically open after it is saved.

Preferences		x
Online Update Frequency:	2 frames	▲
ECU is HP EFI		
🔲 Display Pressure as PSIA		
🔲 Automatically Open Logfiles		
	OK	

Figure 5

4.0 Fuel ICF

4.1 Base Fuel Table Changes

1) Volumetric Efficiency (VE) Conversion – The ability to view the "Base Fuel" table as a VE table is possible. When viewing the Base Fuel table, click on the "Conversion" box at the top. The base fuel table will then be shown as a VE table. This is very useful when doing a quick check as to the "legitimacy" of the base fuel calibration. At 100 kPa, above approximately 3000 RPM, values should typically read between 90-105% VE. If this is not the case, information may not be correct for the "Engine Displacement" or Injector Fuel Flow. If this information is correct, values below 90% typically mean the Base Fuel table is too lean, and values above would indicate too much fuel. The VE curve should be highest at peak torque, and less before and after that point. This conversion is available in both the Base Fuel Table, as well as the Graph.

Alternately, the conversion button can be used to convert a VE table to a fuel flow table, if a VE based fueling strategy is used.

NOTE: This is for viewing only, if you want to have the system operate and be tuned as a VE based fueling strategy, see #2 just below "Volumetric Efficiency (VE) Operation".

Gra	ph i	/ Lar	ge Ta	ble	V Co	nvers	sion		/olu	met	ric E	ffici	enc	у Та	ble	(%)		6	7.843	3		Smo	oth								
21	67.0	69.8	72.5	75.2	77.8	80.3	85.1	89.7	94.0	98.1	102	106	110	113	113	110	111	116	123	125	128	126	125	124	123	122	119	119	119	119	119
20	3 66.4	69.2	72.0	74.6	77.2	79.8	84.6	89.2	93.5	97.5	101	106	109	113	113	110	111	116	122	124	125	125	124	124	122	121	118	118	118	118	118
19	64.9	67.7	70.4	73.0	75.6	78.1	82.9	87.4	91.7	95.6	99.3	104	107	111	111	109	110	114	120	122	122	122	122	121	120	118	116	116	116	116	116
-18	64.3	67.1	69.8	72.5	75.0	77.5	82.3	86.8	91.1	95.0	98.7	103	107	110	111	109	110	114	120	121	122	122	121	120	119	117	115	115	115	115	115
18	2 62.7	65.5	68.2	70.8	73.3	75.8	80.5	85.0	89.1	93.1	96.7	101	105	108	109	108	108	113	117	119	119	119	118	117	116	114	112	112	112	112	112
17	5 62.1	64.9	67.5	70.2	72.9	75.3	80.0	84.4	88.6	92.5	96.2	100	104	107	109	108	109	113	117	118	118	118	118	117	115	113	111	111	111	111	111
16	8 60.4	63.1	65.8	68.3	70.8	73.3	78.0	82.4	86.5	90.3	93.9	98.0	102	105	107	106	107	111	114	115	116	115	115	114	112	110	108	108	108	108	108
16	1 59.7	62.4	65.1	67.9	70.6	73.0	77.6	81.9	86.0	89.8	93.4	97.5	101	104	106	106	107	111	114	115	115	115	114	113	111	109	107	107	107	107	107
15	4 57.9	60.6	63.2	65.8	68.2	70.7	75.3	79.6	83.7	87.5	91.0	95.0	98.6	102	104	104	106	109	111	112	112	112	111	110	108	106	104	104	104	104	104
14	7 57.2	59.9	62.5	65.1	67.5	70.0	74.8	79.2	83.2	87.0	90.4	94.4	98.0	101	104	104	106	108	110	111	111	111	110	109	107	105	103	103	103	103	103
14	55.3	57.9	60.5	63.0	65.5	67.9	72.4	76.7	80.7	84.4	87.9	91.8	95.3	98.4	101	102	103	106	107	108	108	108	107	106	104	102	99.5	99.5	99.5	99.5	99.5
13	3 54.5	57.2	59.8	62.3	64.8	67.1	71.7	76.1	80.2	83.9	87.3	91.3	94.8	97.8	100	102	103	105	107	107	107	107	106	105	103	101	98.5	98.5	98.5	98.5	98.5
12	52.5	55.1	57.7	60.2	62.6	64.9	69.4	73.6	77.6	81.3	84.7	88.5	92.0	95.0	97.5	99.2	101	102	104	104	104	104	103	101	99.8	97.6	95.1	95.1	95.1	95.1	95.1
a 11	52.5	55.2	57.8	60.3	62.8	64.8	68.7	72.9	76.9	80.6	84.1	88.0	91.4	94.4	97.0	98.8	100	102	103	103	103	103	102	101	98.9	96.7	94.1	94.1	94.1	94.1	94.1
č 11	51.4	54.1	56.7	59.3	61.7	63.4	66.3	70.4	74.3	77.9	81.3	85.1	88.4	91.4	93.8	95.8	97.3	98.7	99.6	99.9	99.9	99.4	98.5	97.1	95.3	93.1	90.5	90.5	90.5	90.5	90.5
Č 10	5 51.4	54.1	56.8	59.4	61.9	63.6	66.5	70.2	73.6	77.2	80.5	84.3	87.7	90.6	93.1	95.1	96.7	98.0	98.8	99.1	99.0	98.5	97.5	96.1	94.3	92.0	89.3	89.3	89.3	89.3	89.3
9	50.1	52.8	55.5	58.1	60.7	62.3	65.3	68.3	70.9	74.5	77.7	81.5	84.7	87.6	90.0	92.0	93.5	94.7	95.5	95.7	95.6	95.0	94.0	92.6	90.7	88.5	85.8	85.8	85.8	85.8	85.8
9	49.1	51.9	54.6	57.2	59.8	61.8	65.6	68.6	71.3	74.3	77.0	80.7	84.0	86.9	89.3	91.3	92.8	94.0	94.7	94.9	94.7	94.1	93.1	91.6	89.7	87.4	84.6	84.6	84.6	84.6	84.6
84	46.6	49.3	52.0	54.6	57.1	59.5	64.1	67.2	69.9	72.1	74.1	77.7	80.9	83.7	86.0	88.0	89.5	90.5	91.2	91.4	91.2	90.5	89.4	87.9	86.0	83.7	80.9	80.9	80.9	80.9	80.9
77	45.6	48.4	51.1	53.7	56.2	58.6	63.3	67.0	70.2	72.6	74.5	78.2	81.5	84.3	86.7	88.7	90.2	91.2	91.9	92.0	91.8	91.1	89.9	88.4	86.4	83.9	81.0	81.0	81.0	81.0	81.0
70	42.9	45.6	48.3	50.8	53.3	55.7	60.3	64.6	68.5	70.9	72.8	76.5	79.8	82.6	84.9	86.9	88.3	89.4	89.9	90.1	89.8	89.0	87.9	86.2	84.1	81.6	78.6	78.6	78.6	78.6	78.6
63	42.0	44.7	47.4	49.9	52.4	54.9	59.5	63.8	67.8	70.8	73.4	77.2	80.5	83.3	85.7	87.7	89.2	90.2	90.8	90.9	90.5	89.7	88.5	86.7	84.6	81.9	78.8	78.8	78.8	78.8	78.8
56	39.2	41.8	44.4	46.9	49.4	51.7	56.2	60.5	64.4	68.0	71.4	75.1	78.4	81.2	83.6	85.5	87.0	87.9	88.5	88.5	88.1	87.3	86.0	84.2	82.0	79.3	76.1	76.1	76.1	76.1	76.1
49	37.6	40.2	42.8	45.3	47.7	50.1	54.6	58.8	62.7	66.3	69.6	73.3	76.6	79.4	81.8	83.6	85.1	86.0	86.5	88.5	86.1	85.2	83.9	82.0	79.8	77.0	73.8	73.8	73.8	73.8	73.8
42	33.9	38.5	38.9	41.3	43.7	45.9	50.2	54.2	57.9	61.4	64.5	68.1	71.2	73.8	76.0	77.8	79.1	80.0	80.4	80.4	79.9	79.0	77.7	75.9	73.6	71.0	67.8	67.8	67.8	67.8	67.8
35	39.6	35.1	37.6	40.0	42.3	44.6	48.9	52.9	56.6	60.1	63.2	66.8	69.9	72.5	74.7	76.4	77.7	78.6	79.0	78.9	78.4	77.5	76.1	74.3	72.0	69.2	66.0	66.0	66.0	66.0	66.0
28	48.5	40.4	34.7	35.9	38.1	40.2	44.3	48.1	51.6	54.9	57.8	61.2	64.1	66.6	68.6	70.2	71.4	72.2	72.5	72.5	71.9	71.0	69.6	67.8	65.6	62.9	59.8	59.8	59.8	59.8	59.8
21	64.7	53.9	48.2	40.4	38.1	40.3	44.5	48.5	52.2	55.5	58.6	62.1	65.1	67.7	69.8	71.4	72.7	73.4	73.8	73.6	73.1	72.0	70.6	68.6	66.3	63.4	60.2	60.2	60.2	60.2	60.2
14	97.0	80.9	69.3	60.6	53.9	48.5	40.4	43.8	47.3	50.5	53.4	56.7	59.5	61.9	63.9	65.4	66.6	67.3	67.5	67.3	66.8	65.7	64.3	62.4	60.1	57.4	54.2	54.2	54.2	54.2	54.2
7	186	158	139	121	108	97.0	80.9	69.3	60.6	55.5	58.8	62.5	65.7	68.4	70.6	72.4	73.6	74.4	74.6	74.4	73.7	72.5	70.8	68.6	66.0	62.8	59.2	59.1	59.2	59.1	59.1
1	57.0	49.5	44.1	38.6	34.3	30.9	25.7	22.1	19.3	17.2	15.4	13.7	12.3	11.2	10.3	9.50	8.82	8.23	7.72	7.26	6.86	6.50	6.17	5.88	5.61	5.37	5.15	4.94	4.75	4.57	4.41
	500	600	700	800	900	1000	1200	1400	1600	1800	2000	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000	5250	5500	5750	6000	6250	6500	6750	7000
															ngi	ne k	PM														

Figure 6

- 2) Volumetric Efficiency (VE) Operation The option of a Volumetric Efficiency based tuning strategy is now optional. This changes the Base Fuel Table units from pounds/hour of fuel to VE%. VE fueling calculations are calculated from the following inputs:
 - Engine Displacement (NOTE: Make sure this is input properly in the Engine Parameters!!)
 - Target Air/Fuel Ratio
 - Engine Speed
 - MAP Sensor Value
 - Input from Air Temp Sensor/Air Temp Enrichment Table
 - Value from the Base Fuel Table (VE%)
 - Fuel Injector Size
 - Fuel System Pressure

From this information, a fuel flow and consequent injector pulse width is determined by the ECU.

Converting an existing Base Fuel Table that is in the units of lb./hr. to VE is a manual process that is simple to perform. To make this conversion, perform the following:

- A) Make sure your Global Folder is saved.
- B) Open two instances of the software and open the same Global Folder you are using. One will become the new VE Global Folder (we'll call that "Cal VE" in this example) and one will be used to copy and paste from (we'll call that "Cal" in this example). It is recommended to do a "save as" to the one file you will be changing to VE fueling after you open both to differentiate it easily.
- C) In the "Cal VE" Global Folder, change the "Load Sensing" option in the Engine Parameters to "VE Based" (see section 6.1 in these instructions).
- D) In the "Cal" Global Folder, open the Base Fuel Table and check the "Conversion" box as described in #1 (VE Conversion) above.
- E) Copy and Paste the entire Base Fuel Table AND the RPM and Load X and Y axes from the "Cal" folder to the "Cal VE" folder.

The conversion is complete at this point.

Note the way the "air temperature" is handled with the way the VE fueling strategy is used. The calculation still uses the "Air Temperature Enrichment" table in calculations. If all values are "100%", fueling calculations are never modified based on this table/manifold air temperature. If a percentage multiplier is in the table that is greater or less than 100%, it is used for the fueling calculation based on the intake air temperature (multiplies the final fuel calculation by this percentage). Some VE calculations use the air temp to modify the pulse width as a "background" calculation whereas the user can do this via the air temperature enrichment table.

The intent of this feature is for it to be used by tuners more familiar/comfortable with VE tables or those wishing to enter a fuel table from another system that was VE based.

- 3) Smoothing There is now a "Smoothing" button in the Base Fuel Table (located in the upper right). When the smoothing button is selected, it will perform a smoothing operation to all the cells that are selected. To smooth an area, grab and drag the cursor over the desired cells. Then push the smoothing button. You can push it more than once, and the cells will continue to be smoothed. If you push it too many times, you may lose some of the desired integrity of the map, so be conscious of what you are doing.
- 4) Minimum Value As a note, the minimum allowable value has been lowered from 1.0 lb./hr. to 0.0.

4.2 Base Fuel Graph Changes

1) Volumetric Efficiency (VE) Conversion – The Base Fuel Graph, like the Base Fuel Table, also has an option for a "Conversion" checkbox, so that it can be viewed as a VE table.

4.3 Target Air Fuel Ratio Table

Target Air Fuel Ratio Table – With the V2 software, after you adjust the Target Air Fuel Ratio Table (TAFR), and move from that screen, you will be asked "The TAFR Values have changed, would you like the fuel map automatically adjusted?" See **Figure 7**. If you select "Yes", the affected area of the target fuel map will be offset based on the change in the air fuel ratios that were performed. If the TAFR table was richened by 10%, this would add 10% more fuel in that area. If a fuel map is well tuned, it is advised to select "Yes", as this should automatically update the base fuel table, eliminating the need for it to re-learn, or be tuned. If you are just creating a base calibration, you may decide to leave the Base Fuel Table alone at that time.



Figure 7

4.4 Acceleration Enrichment Tables/Fuel Modifiers

AE vs. TPS Rate of Change and AE vs. MAP Rate of Change - Acceleration Enrichment (AE) fuel is added when there is a change/movement in the TPS or MAP sensors. There has to be some minimum threshold of movement/Rate of Change (ROC) below which fuel is not added due to signal "noise". For a TPS, this might be vibration, or "very slow" movement of the throttle during which you would not want added fuel. For a MAP sensor, this might be MAP signal movement due to idle fluctuations. In previous Holley EFI software/firmware versions, this "blanking" level was fixed in the background. In V2 versions, the user is allowed to edit this parameter. These parameters are found in the Fuel ICF under "Fuel Modifiers" > "Fuel Control". See **Figure 8**. These values may need to be edited for AE vs. TPS, due to the use of very large throttle bodies, which may need more AE vs. TPS sensitivity. On the other hand, engines with large cams and idle vacuum fluctuations may need a larger MAP vs. AE value, due to MAP sensor fluctuations. The baseline values, that were hard-coded into previous software and hardware versions, were the following: AE vs. TPS RoC Blanking: 15.0

AE vs. MAP RoC Blanking: 7.0

Coolant Temp Enrichment	Air Temp Enric	:hment	Fuel Control		
DECEL FUEL CUT	DFF	ACC	CEL ENRICH	MENT	
Enable			AE vs TPS	15.0	
Decel Wait Time	1.0 sec 🔺		RoC Blanking		
RPM Added to Idle for Fuel Reactivation	400 RPM		AE vs MAP RoC Blanking	7.0	•



These values are moderately conservative and should work on most applications. However, some applications with large throttle bodies might prefer to use a lower AE vs. TPS RoC Blanking value. It is recommended to be very cautious when changing these values, as too low of a value will invoke unwanted added TPS vs. AE fuel, causing the engine to run sporadically, adding extra fuel when it is not needed. When lowering either value, it is beneficial to look at the data monitor and/or data logs at the "MAP RoC" and "TPS RoC" values, and see if there is unwanted activity with either.

- **NOTE:** Due to this update, there has been a change in the software that forces the first value in the AE vs. TPS and AE vs. MAP tables to always be forced to zero. If you found the need to raise this first cell in previous software/firmware versions, you should attempt to lower the blanking values for that parameter as a method of tuning slow TPS or MAP movements.
- **NOTE:** When you load/use the V2 software, it will automatically change the first AE vs. TPS and AE vs. MAP values to ZERO. It will also automatically populate the Blanking tables with the default values shown above.

4.5 Learn Table

When a "Transfer Learning to Base" operation is performed with the V2 software, a message appears with the option to smooth the fuel table with the learn values. This will perform a smoothing operation to the fuel map between the areas that have learning applied and those that don't. You typically always want to select the option to have the smoothing performed, as there is really no downside, and this helps reduce the need to manually smooth the Base Fuel Table, after the learning is transferred.

4.5 Alpha-N Idle Fuel

The nomenclature in this table has been edited, but none of the functionality has been changed. What used to be called "RPM Activation" is now called "Max Alpha-N RPM". What used to be called "TPS Activation" is now called "Max Alpha-N RPM". See **Figure 9**.

AC	TIVA	FION V		S-					
	Max	Alpha-N F	RPM	2000 RPM	×				
	Max	Alpha-N	TPS	5.0 %	* *				
The	se value	s also de	termine	Alpha-N n	nap axis i	anges			
FU	EL FL	OW (It	o/hr)—						
	5.0	0.0	0.0	0.0	0.0	0.0	0.0		
	4.0	0.0	0.0	0.0	0.0	0.0	0.0		
	3.0	0.0	0.0	0.0	0.0	0.0	0.0		
TPS	2.0	0.0	0.0	0.0	0.0	0.0	0.0		
	1.0	0.0	0.0	0.0	0.0	0.0	0.0		
	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		333	667	1000	1333	1667	2000		
RPM									
				KP III					

Figure 9

5.0 Sensor ICF

In each sensor in the "Sensor ICF", there is a new "Offset" variable available for each sensor. If needed, these can be used to "offset" the calibration curve due to a minor drift or offset to a sensor. These should be defaulted to 0.00 and not affect previous calibrations.

MAP Sense	or				
Sensor Type	Holley 2bar 🔹 🔻	Offset	0.00 kPa	×	

Figure 10

6.0 System ICF

There are a variety of new features in the System ICF. They are described below.

6.1 VE Fueling Mode

V2 software provides the option of using a Volumetric Efficiency (VE) table for tuning. You must select "VE Based" in the "Load Sensing" selection. See section 4.1 for more information on tuning and setup. See **Figure 11**.

- ENGINE Number of Cylinders	▼ LOAD SENSING	WIDEBAND 02 SENSOR Sensor Type Bosch
Engine 454 Cl Displacement	FUEL TYPE	
STARTUP SETTINGS		
Clear Flood TPS 35.0%	Enable Fuel Prime 🔽	Percent 0%
FILEL SYSTEM		
Injection Type Multiport 🗸	Fuel Pump Prime 5.0 sec	Minimum Injector 1.00 msec
System Type Custom 👻	Actual System 43.0 psi 2 Pressure	Total System 288.0 lb/hr Fuel Flow
-FUEL INJECTOR INFO		
Number of Injector Sets	Injector 0.0* End Angle	Injection Sequential ▼
► INJECTOR SET 1		
Injector Wiring	Rated Flow 36.0 lb/hr	Total Injector 36.0 lb/hr Flow
Injector Type High Impedance 🔻	Rated Injector 43.0 psi	
Injector Off Time		
1.19 1.02 0.85 0.72 0.62	2 0.52 0.43 0.34 0.28 0.26 0	.23 0.19 0.15 0.11 0.07 0.04
8.0 V 8.8 V 9.6 V 10.4 V 11.2	V 12.0 V 12.8 V 13.6 V 14.4 V 15.2 V 16	.0 V 16.8 V 17.6 V 18.4 V 19.2 V 20.0 V

Figure 11

6.2 Fuel Prime

There is a new fuel priming "Quick Start" feature available for every type of system. For MPFI applications, the system will inject a single pulse of fuel, after the first crank pulse is detected. This will only re-occur after an engine starts. In other words, if you try to start an engine and it doesn't successfully fire, it will not keep adding this fuel - only the first time it sees a crank tooth, for that run event. For TBI applications, the system will inject a single pulse of fuel when the key turns on to wet the intake manifold. This will only re-occur, after an engine has started. If you cycle the ignition key multiple times, it will only perform the first prime.

This feature must be enabled, by selecting the "Enable Fuel Prime" checkbox located in the System ICF under System Parameters > Engine Parameters > Startup Settings. Once the "Enable Fuel Prime" box is checked, it will show the "Fuel Prime Percent" parameter. The "Fuel Prime Percent" is a multiplier that works off the "Cranking Fuel" Value in the Startup Enrichment table. The pulse width of the single shot of fuel prime fuel is based off the Cranking Fuel value (which is temperature based) and multiplied by the "Fuel Prime Percent". A starting value of 200% is usually a good point for MPFI engines and 50% for TBI applications, with a range of 40%-250% usually being an acceptable range. This can be adjusted as needed.

6.3 MPFI Injector Auto-Populate

A number of MPFI injectors have been added to the "System Type" dropdown in the Fuel System area. If selected, they will auto-populate the injector flows, system pressure, and Injector Off Time curves automatically.

6.4 Custom Ignition Types

Two new crank tooth types have been added in the Custom Ignition Parameters. These include a 36-1 and a 12-1 crank trigger wheel. They can be found when selecting an "Ignition Type" of "Custom". They are configured the same as the previous 60-2 type where the user programs a "TDC Tooth" number and can use the "Timing Offset" for minor adjustment.

6.5 "Quick Start" LSx Ignition Types

A new firmware feature that is rolled out with the V2 software is quicker crank and cam signal recognition on 58x and 24x GM LSx engines. Note that you need to use the "Fuel Prime" feature in section 6.2 to recognize the benefits. Also note that this different crank/cam signal is NOT used with "LSx 58 Tooth" and "LSx 24 Tooth" if selected in the "Custom"

ignition parameters. This is due to the fact that the camshaft sensor type or location may not be in the OEM location and problems can arise.

6.6 Basic I/O Timing Retards

The ignition timing retards in the Basic I/O (System Parameters > Basic I/O > Timing Retard) now have a time based option, in addition to the existing RPM based retards. Retard #1 has a fixed linear range from 0-5.00 seconds. Retard #2 has a fixed linear range of 0-8.00 seconds. If the time exceeds 5 or 8 seconds, the retard will remain at the final value.

f you need to have more resolut	on to the time axis, the retar	ds in the nitrous ICF	can be used.
---------------------------------	--------------------------------	-----------------------	--------------

Fans/Pumps/AC TCC					Tii	Timing Retard			Datalog						
TIMI Ret	TIMING RETARDS														
0.0	1.0	2.0	4.0	5.0	6.0	8.0	9.0	10.0	12.0	13.0	14.0	16.0	17.0	18.0	20.0
0.00	0.33	0.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00
						x	Axis	Time	•						
📝 Re	tard #2	2													
0.0	1.0	2.0	4.0	5.0	6.0	8.0	9.0	10.0	12.0	13.0	14.0	16.0	17.0	18.0	20.0
0.00	0.53	1.07	1.60	2.13	2.67	3.20	3.73	4.27	4.80	5.33	5.87	6.40	6.93	7.47	8.00
						x	Axis	Time	•						

Figure 12

6.7 Diagnostic Channels

There is a new option to log various diagnostic channels in a datalog. These can be used by Holley Technical Services to help a customer diagnose various issues. They are split up into "Type 1" through "Type 10". Type 1 contains information on crank and cam signal integrity and errors. It is recommended to keep this selected. Type 2 and 3 are for 02 sensor data. Types 4 through 10 will be used for future purposes.



Figure 13

7.0 Idle ICF

The are no updates to the Idle ICF.

8.0 Spark ICF

There are no updates to the spark ICF.

9.0 I/O ICF

The Input/Output ICF has several changes outlined below.

9.1 Internal Parameters

There are some parameters that are not formally displayed in the data monitor or data logger. Some of these could be beneficial when using certain features, performing troubleshooting, or doing some higher level tuning. These parameters are called "Internal Parameters". They can be added if desired via the I/O ICF. To add these, perform the following:

- 1) Activate the I/O ICF
- 2) Enable any "Input" channel. Under the "Type", select "Internal". See Figure 14.

INP	UTS				
	NAME	TYPE	ECU PIN	ENABLE	
#1		INTERNAL 🔻	NOT DEFINED	🚺 Enable	Configure
#2		GROUND -	NOT DEFINED	Enable	Configure

Figure 14

- 3) Select the "Configure" button.
- 4) Under "Source", you can see a dropdown of all of the internal parameters available. Review and select the desired channel. Most are self-explanatory. Ones that are specific and beneficial to areas such as boost control or traction control are covered in their respective manuals.



Figure 15

5) This I/O ICF channel can now be viewed in the Data Monitor, as well as in the data logs.

9.2 CAN 5V

The Input ICF contains a new Input "Type" in the dropdown called "CAN 5V". This is not utilized at this time.

9.3 Time Variable

Changes have been made in the firmware to better utilize a "Time" variable. Previous versions had the Time variable based on the RTC (Real Time Clock). This didn't allow for the Time variable to be very useful. V2 software and firmware allows for the time variable to be used as an axis on a PWM output table, for any desired use. The time axis on a PWM table can be activated at Time=0, when that output is triggered. **Figure 16** shows an example where an output can be active from the time it is activated, for 33.33 seconds, as well as only active above a MAP reading above 126 kPa. This can be useful for turning many devices on and off.

NOTE:	Although "Time" is available in the "Sensor Input Trigger" dropdown, it is not recommended to us	se it.	Use it only
	as an axis in a PWM output table.		

v				In	Input Triggers			l	Linked Outputs			PW	PWM Setup				
г	PWM	SET	UP-														
		Туре	Fixe	4													
	Free	quency		10													
	Table	e Units	Duty	Cycle (%)												
		X Axis	Time	•													
		Y Axis	MAF)													
	210	100.0	100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	196	100.0	100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	182	100.0	100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	168	100.0	100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	154	100.0	100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	140	100.0	100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a]	126	100.0	100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ΙK	112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ΑP	98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.00	6.67	13.33	20.00	26.67	33.33	40.00	46.67	53.33	60.00	66.67	73.33	80.00	86.67	93.33	100.00
								Tin	ie [se	ec]							

Figure 16

10.0 Boost Control ICF

The Boost Control feature is a brand new ICF, with full featured boost control for turbo and some supercharged applications. This area has its own dedicated instruction manual found in the help section of the software. The Boost ICF can be added the same as any other optional ICF.

11.0 Water/Meth ICF

There are no changes to the Water/Meth Injection software. V500 firmware has added a "filtering" to the "low reservoir warning" that stops false triggers from momentarily occurring. A low fluid condition must occur for a continuous five seconds before this output is activated.

12.0 Nitrous ICF

There is one change in the nitrous ICF. This is the addition of a "Timed Disable" feature that can be driven only off of "Input 3" on any of the four stages. The "Timed Disable" is designed to be utilized to turn off a stage for a programmed amount of time. A timed disable input can be a "momentary" or a "continuous" input. Once the input is triggered, the nitrous will turn off for the amount of time programmed via the "Reactivation Time" (available when "Timed Delay" is selected). It will then turn off after this time expires. It should be noted that if "Pause Enabled" is selected, the nitrous will turn on at the point during which it was disabled. If "Pause Enabled is NOT selected, the nitrous will revert back to its original starting value (Time = 0) when it turns back on. **Figure 17** shows an example when Input 3 is triggered, it will keep Stage one off for .50 seconds. One use of this feature would be to turn off a stage or stages of nitrous when a shift occurs.

STAGE 1 SET	UP			INPUTS		
Activate	Nitrous Type Dry/Pro	gressive	•]	Input 1 Will	Be Ignored By	▼ This Stage
Disable	RPM Trigger	3000 RPM	*	Input 2 Will	Be Ignored By	▼ This Stage
Pause Enabled	RPM Cutoff	8000 RPM	•	Input 3 Will	Timed Disable	▼ This Stage
Delay 0.0 sec	Boost Cutoff	0.0 psi	*	Reactivat	tion Time	0.50 sec 🔺

Figure 17

13.0 Transmission ICF

No changes.

14.0 Drive By Wire ICF

No changes.

15.0 Traction Control ICF

The Traction Control ICF is a brand new ICF intended for serious drag racing applications. It requires the use of a Davis Technologies Holley Traction Control Module and associated driveshaft speed signal hardware. The Davis box is utilized to detect tire slip and send that information to the Holley ECU. The Holley software is then user programmed to utilize a reduction in timing, nitrous, boost, or drive by wire power reduction to combat the spin. This ICF requires two "F" inputs and an option H or G input if a traction control enable/disable switch is desired. The traction control instructions are packed with the Davis Traction Control Module, designed specifically for Holley EFI. Contact Davis Technologies at 1-828-645-1505 for more information and purchase of this product.

The Traction Control ICF can be downloaded the same as all other optional ICF's.

16.0 Datalogging

There are a multitude of improvements to the datalogger. They are described below. One change to note is that a "Data Log Config" file is now changed to a ".graph" file, instead of the previous ".dlc" format.

16.1 Channel Modifications

- Filtering Each Channel can have "filtering" applied to smooth the data. To apply filtering to a specific channel, you must first have that channel selected to be graphed. Next, right mouse click on the right check box next to that channel and you will see the "Filter" option. Move over and select "None", or "Level 1", "Level 2", etc. The higher the number, the more filtering is performed. Note that these filtering options are applied and saved to the datalog config (.graph) file, so the filtering will be applied when the next datalog is opened. When a channel is filtered, there will be a "-F" next to it. See Figure 18 and the "AFR Right" channel as an example.
- Scaling Each channel can have the Y axis either auto-scaled or set to a fixed scale defined by the user. A fixed scale is needed when plotting something like 8 EGT's, where you want the same Y axis scaling for all 8 channels (vs. having them autoscale). To adjust the scaling of a specific channel, make sure that channel is graphed and right mouse click on the right check box (same as filtering). If "Autoscale" is desired, check next to that option. If user defined scaling is desired, make sure "Autoscale" is NOT checked, and select the "Minimum" and "Maximum" numbers with the mouse, and they can be defined.
- **Paneling** Sometimes it is desirable to put different channels on different "Panels", which are just multiple views on the same logging screen up to 5 can be used. To put different channels on different panels, make sure that channel is graphed and right mouse click on the right check box (same as Scaling and Filtering). Select the Panel number (1 through 5) you wish to view that channel on.



Figure 18

16.2 Properties/Notes

V2 software now has some predefined entry fields for datalogging notes. There is one for "General" notes, Drag Race data, Dyno data, weather conditions, and some chassis data. This area is found under "File" and "Properties" in the datalog viewer. See **Figure 19**.

Datalog Properties			
General Drag Race Dyno Ambient Chassis			
	Track		
	Lane		
	Round		
	Reaction Time	0.000 sec	
	60ft Time	0.000 sec	
	330ft Time	0.000 sec	
	660ft Time	0.000 sec	
	660 ft Speed	0.000	
	1000ft Time	0.000 sec	
	1320ft Time	0.000 sec	
	1320ft Speed	0.000	
	Time Splits		
	60-330ft:0.000 se	ес	
	330-660ft: 0.000	sec	
	660-1000ft:0.000) sec	
OK Cancel	1000-1320ft:0.00)O sec	

Figure 19

16.3 Internal Datalog Downloads

Multiple internal datalogs can now be downloaded or deleted at the same time. To select multiple logs, simply hold the Ctrl key down and select as many internal logs as you would like.

17.0 Sync Screen

When a "sync" is performed with the V2 software, the Global Folder name is shown in the "Global Info" area.

19.0 System Log

A "System Log" is a new type of internal datalog that can take a high speed/resolution log of the crank and cam sensor signals. This can be extremely helpful and effective when trying to diagnose crank or cam signal integrity issues. An example log is shown in **Figure 20**. The crank and cam data is shown in a "digital" manner as the ECU sees internally, meaning it is active (signal is at a level of "1") or inactive (signal is at a level of "0"). If the signal is a hall-effect sensor, the SL crank and cam signals are indicative of the signal from the sensor (not actual voltage, but pattern). If the signal is from a magnetic/VR sensor, which puts out a sine wave form, the SL log indicates when the ECU is triggered, not the actual wave form or voltage level.

The SL log is used to view missing or extra crank or cam pulses and can view the cam and crank signal relative positions.

It also shows battery voltage, which is useful to see when an engine was cranking/starting (will show a drop in voltage). The Diag #1 and Diag #2 can be used by Holley Tech Service to further help.



Figure 20

20.0 Pin Map

The pin map has a new tab called "View Fixed". See **Figure 21**. This is a quick way to see some of the fixed ground, 5 volt reference, and other inputs and outputs of the ECU connectors, which is helpful when wiring or troubleshooting.

Holley EFI ECU Pin Map	· · · · · · · · · · · · · · · · · · ·
View Inputs View LCD View Outputs View Inje	ectors View Fixed Drag and Drop I/O to Available Pins Done
	CONNECTOR 12
CONNECTOR JT	CONNECTOR 52
Pin Name	Pin Name
A1 d Inductive Coil Input	A18 Ground
A2 Fuel Pump Relay Output (12V)	A22 Sensor Ground
A6 B Low Current Boints Output	B14 B Sensor Ground
A10 Switched +12V Input	B20 B20 Low Current 12V Output
A11 🔒 Manifold Temperature Input	
A14 🔒 Sensor Ground	CONNECTOR J3
A15 🖥 Digital Gauge Output	Die Name
A18 Sensor Ground	Pin Name
A19 Coolant Temperature Input	BI G Sensor Ground
A20 CI Pressure Input	
A21 CAM Sensor Input or Ignition Bunass	B16 Sensor Ground
A23 AAP Input	B20 CAN2 HI
A24 CAN1 LO	B22 🖥 Sensor 5V Output
A26 🔒 Sensor 5V Output	
A28 EST/SPOUT or Tachometer Output	CONNECTOR J4
A29 🖥 Knock#1 Input	
A30 Crank Sensor Input	Pin Name
A31 Tele Pressure Input	B14 B2 Sensor Ground
R1 ACALO Output	B2U To Sensor 5V Uutput
B2 ALCA HI Output	
B8 🔒 IAC B LO Output	
B9 🔒 IAC B HI Output	
B14 📅 Sensor Ground	
B20 🐱 Low Current 12V Output	

Figure 21

21.0 Gauge Panel

There is a new "Gauge Panel" Display available. It is only available when online. Select the small gauge icon at the top, right area of the screen. This will bring up **Figure 22**. There are four large gauges, four small gauges, and four full sets of "data monitor" type displays to show 40 channels of data. Each gauge channel is selectable, and the range fully editable. To change a gauge, double click it, and it will bring up a configuration screen (**Figure 23**). You select the channel, the name on the gauge, the numeric format, and the range. The four data monitors on the bottom share the same views as the single data monitor in the lower left of the regular PC software. Choose and edit these views the same as that single data monitor.



Figure 22



Figure 23

22.0 Strip Chart

The strip chart is a new feature that allows any channel to be viewed, real-time, while the ECU is on-line, in strip chart fashion. It shares the same "views" as the datalogger. The button at the top of the data allows either 1000 points of data to be graphed or 20 on the screen (giving much finer viewing resolution). About 28 seconds of data is retained that can be reviewed. The button at the top left can be used to "Pause" or "Play" data. See **Figure 24**.

The strip chart is very useful when looking for various anomalies real-time vs. looking just at the data monitor, or having to review a datalog.



Figure 24

23.0 MISC

- The software will now "auto-detect" whether the ECU is a HP or a Dominator previous software only autodetected a HP ECU.
- If you get a message similar to "Value Too Low. The value is lower than allowed, Click Yes to use the minimum value", when you enter an area, just click "Yes". This is likely a new parameter you are not using previously, that needs to be changed from a non-zero value.