The following is a summary of the updates present in Holley EFI V5 versions Build 100 through Build 171.   All of these update are present in Build 171.

Build 171 SOFTWARE AND FIRMWARE UPDATES

Build 171 was created due to a bug introduced in Build 170 software, where the "right click" features aren't active on some tables (this occurs on tables where values are larger than its display box, typically only seen on the Base Fuel table). This is resolved in Build 171.

Other Software Updates:
  o Custom ignition type of 12-1 Crank and GM LSx 4x Cam was incorrectly shown as invalid.
  o Resolved issue where Ignition Reference Angle wasn't correctly auto-populated when changing from HEI and TFI Ignition Types to other types.

Build 171 software is compatible with V5 Build 160 and 170 Firmware. Build 170 Firmware is the version included with V5 Build 171 software.

Who should update: Anyone that wants features found in Build 160 and Build 170 Software and Firmware. Anyone with Build 160/170 should update to Build 171 software for the bug fix above.

Build 170 SOFTWARE AND FIRMWARE UPDATES

Build 170 Software was created due to resolution issues that occurred with Build 160 software when used on laptops/PC's with higher screen resolutions. This resulted in icons and fonts being visually small on the screen. These issues were resolved with Build 170 software. Build 170 firmware is identical to Build 160. Build 160 firmware can be used with Build 170 software, there is no need to update from Build 160 to 170 firmware.

There were two updates performed in Build 170 software. There is now an option to use a different font for the tables and axis values. This font is the "system font" which is what is used on your laptop/PC in areas such as the fonts for all the main icons. The default font in Build 170 is the same font that has been always used in Holley EFI. If you change to the system font, note that the size may be too large to see all the values in some tables. If this is the case, just use the original font. To change the font type go to "Toolbox" and "Preferences". There is a new checkbox called "Use Custom Table Font". If this is checked, the original font type is used. If it is un-checked, the system font will be used.
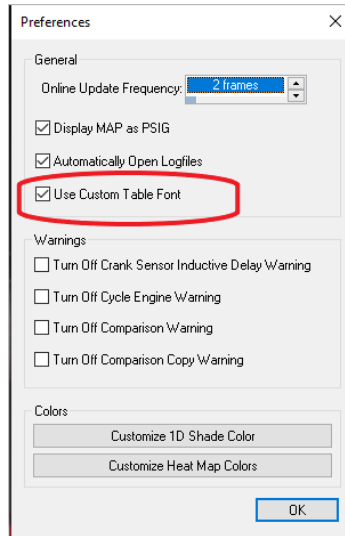
The second update relates to all 1x16 graphs. An option called "Space X Axis Evenly", which can be viewed by right-clicking on any 1x16 graph, is now in a disabled state when the software is installed. When disabled, the X axis will reflect uneven spacing of the X axis values. This can be toggled on and off by right clicking your mouse. Note that changing this on any 1x16 graph affects all 1x16 graphs throughout the software.

Who should update: Anyone having resolution issues with Build 160 software and desire any of the updates in Build 160 software/firmware.

V5 Build 160 SOFTWARE AND FIRMWARE UPDATES

Who should update: Any user needing any of the new Crank/Cam sensor combinations. There is an update to the MSD Pro 600-8 output, it is recommended but not required for those users to update.

Auxiliary CAN Devices (Dashes): No updates are required as long as devices were previously updated for V5 versions Build 100-140. Updates are available on Holley.com for all devices if needed.

Updates to V5 Build 160 primarily are the addition of various new canned and customer crank/cam selections. They are as follows. After is a chart showing which crank and cam patterns are allowed. Use of a non-allowed combination will bring up a warning message and the engine will not fire.

- New Canned Ignition Types:
    - o "Sniper Hyperspark Sequential" (4, 6, 8 cylinder; clockwise and counterclockwise) – For Sniper Hyperspark distributors
        - Follow installation and setup instructions included with distributor for install, uses reference angle of 0
        - Configures Ignition Output as Points Out (dwell = 2.0msec). Can trigger CD box of Sniper EFI coil driver module.

    - o "Sniper Hyperspark TBI" – 1 pulse/fire non-sequential – For Sniper Hyperspark Distributors

- ▪ Follow installation and setup instructions included with distributor for install, uses reference angle of 57.5
  - ▪ Configures Ignition Output as Points Out (dwell = 2.0msec). Can trigger CD box of Sniper EFI coil driver module.

  - o Holley Dual Sync – For Holley EFI Dual Sync Distributors
    - ▪ Follow installation and setup instructions included with distributor for install, uses reference angle of 50
    - ▪ Configures Ignition Output as Points Out (dwell = 2.0msec). Can trigger CD box of Sniper EFI coil driver module.

- • New Custom Crank Types:
  - o 12 Tooth (even spaced)
  - o 24 Tooth (even spaced)
  - o 24-2
  - o 32-2

	N = not allowed						
				Cam			
Crank	GM LSx 4x	Single Pulse	Chrysler V8 NGC	Coyote Cam Locked	Coyote VVT	Single Pulse Ignore	Not Used
LSx 58 Tooth			N	N	N	N	
LSx 24 Tooth			N	N	N	N	
60-2				N	N	N	
1 pulse/fire					N		
36-1			N				
Chrysler NGC 36-2+2	N			N	N	N	
12-1			N	N	N		
24-1	N		N	N	N	N	
12 Tooth	N		N	N	N		
24 Tooth	N		N	N	N		
24-2	N		N	N	N		
32-2	N		N	N	N		

- • MSD Pro 600-8 Ignition Output – An update was made to the output signal duty cycle, that mostly changes the signal at a crank RPM range. It's not a requirement to update from previous software/firmware versions when using the Pro 600-8, but recommended.

V5 Build 140 SOFTWARE AND FIRMWARE UPDATES

Updates to V5 Build 140 contain USB connectivity modifications. Updates should specifically resolve any issues with Windows 8/8.1 and could benefit other Windows versions as well.

Who should update: Any user experiencing USB connectivity dropouts. All users are recommended to update to this version.

Auxiliary CAN Devices: No updates are required as long as devices were previously updated for V5 versions Build 100-130. Updates are available on Holley.com for all devices if needed. It should be noted that version 5.0 Build 49 firmware is available for Pro Dash products that have a variety of updates including the ability for the ECU to utilize inputs from the Dash via CANbus.

NOTE: V5 Build 140 software IS compatible and can be used with V5 Build 130 FIRMWARE. You do not have to update from V5 Build 130 firmware to use V5 Build 140 software.

V5 Build 130 SOFTWARE AND FIRMWARE UPDATES

Who should update: It is recommended that any user update to this latest version of software and firmware. There are improvements to USB connectivity dropouts present in V5 versions Build 100-110 as well other items below.

The following cases are required to update:

- Users using MSD Pro 600 product driven by Holley EFI ECU
- Users wanting any of the new features below

The following are highly recommended to update:

- Users using the Ignition Output Type "Points Output Fixed Duty Cycle (MSD)"
- Drive By Wire Users

Auxiliary CAN Devices: This ECU update does NOT require a firmware update to all auxiliary CAN devices such as the 3.5 touch screen, 7" Digital Dash and Pro Dash Products as long as they were updated during a previous V5 Build 100/110 update. These are available on Holley.com if needed.

MSD Pro 600 Compatibility

- Added new ignition output type "MSD Pro 600-8"
- Dwell table becomes "Ignition Power" table for Pro 600
- "Dwell Time Offset" in Advanced ICF" becomes "Ignition Power Offset"
- See instructions for MSD Pro 600 for complete information

New Cam Sensor Type

- Added new Cam Sensor Type "Single Pulse – Ignore Cam After Start" – This choice operates the same as the "Single Pulse" selection, except once over the crank to run RPM the cam sensor input is ignored. If a loss or error occurs of the cam signal occurs, engine operation is not affected. This selection is not recommended for Coil-on-Plug applications as a loss of crank signal integrity can cause incorrect coil firing sequence.

Miscellaneous

- Unlocked J4-B21 Pin of Ford Transmission Types in order to be able to read line pressure which is prewired in the harness.
- Updates made to Ignition Output Type "Points Output Fixed Duty Cycle (MSD)". If you are using this type it is highly recommended to update firmware.
- Fixed bug with "After Start Holdoff" value. Value previously was not being utilized.
- Fixed bug with "VE Conversion" when using 16x16 fuel table
- Fixed several log viewer random crash issues

Drive By Wire Updates

- Updated "Ford PN 7R3Z-9E926-AA, 9R3Z-9E926-A, 9C3Z-9E926-C (3V/GT500 Modular) and "Ford PN BR3E-9F991-AB/BR3Z-9E926-C (11-14 Coyote) to allow for lesser minimum throttle opening. Update firmware if a low enough target idle cannot be met.
- Drive By Wire Update – Extended Range on allowable Pedal limits during TPS Autoset. Update firmware if pedal fails during TPS Autoset.
- Updates to reduce false error detection.

V5 Build 100/110 SOFTWARE AND FIRMWARE UPDATES

Who should update: It is recommended that any user update to this latest version of software and firmware. There are improvements to laptop communication speeds and other areas that will benefit any user.

The following are highly recommended to update:

- V5 Build 30-32 software users
- People using internal data logging at higher sampling rates
- Drive By Wire applications
- Any Davis Traction Control User (TC1/2, Profiler, etc.)
- Users wanting any of the new features outlined below
- Coyote applications with VVT using V5
- V5 Build 100 Users with Water/Meth ICF

Auxiliary CAN Devices: This ECU update requires a firmware update to all auxiliary CAN devices such as the 3.5 touch screen, 7" Digital Dash and Pro Dash Products. These are available on Holley.com.

"Custom" Injection Type for 4 and 6 Cylinder Applications

This software/firmware version allows the user to utilize the "Custom" "Injection Type" for 4 and 6 cylinder applications that allow fully sequential operation and control of 2 and 3 injector sets as well as allowing more customized injector driver settings with the ECU based drivers. A 4 cylinder engine can run three sets of injectors with the native ECU drivers. A 6 cylinder can run two sets with ECU drivers and a third set with a Holley external driver module. See the "V5 Software Update Overview" for thorough information on setting this up.

"Duty Cycle" in Custom Injection

When the Injection Type is set to custom, Injection Set 1/2/3 tables are now viewable (all sets) and editable (Sets 2 and 3) in Duty Cycle. This is in addition to Base Percent and Fuel Flow. This can be selected in the top of the screen in the dropdown.

Boost Control Dropdown for 557-201 High Flow Solenoids and PID Precision Update

The Boost ICF has a new "Solenoid Configuration" selection called "Holley High Flow (557-201)" that is recommended for use with these solenoids. Users that had previously used the "Dual Holley (557-200)" can change to this new selection if they want. This could require some small changes to the PID values when making this change. Not making this change will not cause

any issue if the PID's have already been optimized however. The frequency (30Hz) is the same for both selections, but the solenoid dead time values are slightly different.

Also note that due to the high flow of the 557-201 solenoid, the PID values will likely be in this range (although every application is different):

P: 1.00 to 2.00 -- Recommend changing by .1-.2 at a time
I: 2.00 to 6.00 – Recommend changing by .2-.4 at time
D: Recommend leaving at 0

Starting values of P = 1.00 and I = 3.00 could be used.   It is HIGHLY advised to do a "shop air" setup to get these values sorted before running on the car.

Also updated is a change to in the PID precision to allow the user to edit hundredths (previously tenths). Although tuning these to the nearest tenth should suffice, this option gives further fining tuning options.

GM and Ford Electronic Transmission Updates

Ford – This software/firmware version supports the following Ford overdrive transmissions:

AODE – Uses Holley harness PN 558-471
4R70W – 1992-1997 – Uses Holley harness PN 558-471
4R70W – 1998-2003 -- Uses Holley harness PN 558-470
4R70/75W – 2003+ -- Uses Holley harness PN 558-470

GM – This software firmware version supports the following GM overdrive transmissions:

GM 4L60/65E w/ 1.63 2nd Gear (pre 2009) – Uses Holley harness PN 558-405
GM 4L60/65E w/ 1.75 2nd Gear (pre 2009) – Used Holley harness PN 558-405
GM4L80/85E – Uses Holley harness PN 558-405
GM 4L70/75E (2009+)** - Uses Holley harness PN 558-455

** The "2009+" specifically applies to OEM/factory original applications. When dealing with a GM Performance Parts, reman, or unknown year transmission the transmission connector should be checked per the image below. If pin "F" (shown in the black square below) IS PRESENT, you need the 558-455 harness. If it is NOT present you need the 558-405 harness. Go by THIS PIN ONLY as the other pins may vary transmission to transmission. Be sure you compare your connector to the image below by "clocking" the pins based on the connector slot.
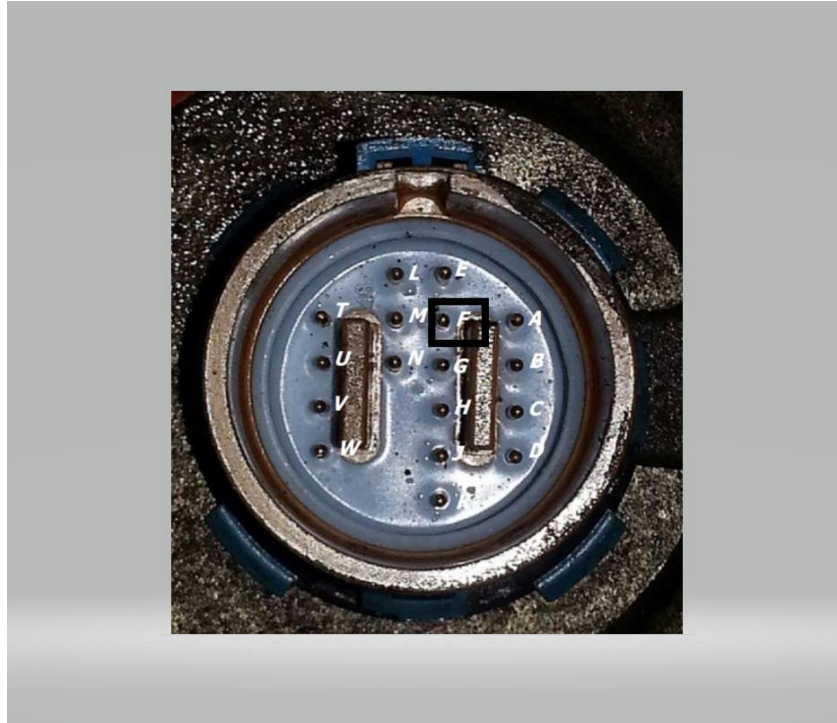
Comparison/Copy Feature

The software now contains an integrated Comparison/Copy feature. Previously this was a separate executable program. This tool can be opened by selecting the "Comparison" icon to the left of the Pin Map icon (has left/right arrows). You must first open a base calibration. Once a base calibration is open, select the Comparison icon. You are allowed to select up to four comparison files, but can only compare one versus the base file at one time. At the top of screen select the file icon for each you wish to open. You then select which individual file you are actively comparing/copying from.

The Comparison bar will be open on the left of the screen and will show a "calibration tree". Any area that is different will be in bold. You can drill down until you find out exactly what area of the calibration is different. Once you reach that area, it will be shown on the screen.

For a 2D table, you have the option of viewing the base calibration values (Base), Comparison calibration values (Comp), a different in the values (Delta) or a percentage difference (Percent). For the axis values you have the option to view the comparison value (Comp), a difference in values (Delta) or a percentage difference (Percent). There is also a checkbox to show a color gradient on any table which can be custom edited.

1D tables operation in the same manner as a 2D table except they will show a nice graphical view of both calibrations.

There is a "Copy to Base" button on the upper left. If selected this will copy the COMPARISON values to the base calibration. You have the ability to copy a single screen of values (whatever is open) or you can copy multiple screens up to a complete Individual Configuration File (ICF) depending on what level you select on the calibration tree on the left.

Graphical Updates

- Heat Map Color Editing – The heat map colors on the 1D and 2D tables can now be customized by the user (separately for 1D and 2D). There are two ways to edit them:
    - Under Toolbox > Preferences
    - Right mouse-clicking on any table

- "Graph" button added for most 2D tables – A "Graph" button has been added to almost all 2D tables to allow viewing and editing in a graphical format.
- 2D tables offer a "Smooth Selected" option (right click mouse)
- Duplicated AE vs TPS RoC and AE vs MAP RoC variables to the complimentary calibration tables.
- Updated "Preferences" screen to add more options.

Internal Data Logging Updates

There are several updates/changes to the internal datalogger:

- Internal Datalog Time/Date file naming structure changed from MMDDHHMM to DDHHMMSS (Day/Hour/Minute/Second). What this means is that the "log time" can be set to seconds (for example 10 seconds) and subsequently recorded datalogs will not overwrite each other, compared to previous versions which recorded to the minute, where the logs needed to be 60 seconds or greater to ensure they were never overwritten. However, the "month" designation is gone so it is recommended to clear out logs monthly to avoid confusion.

- Datalogging Recording Speed – Is now selectable up to 300 fps (frames per second). It should be clearly noted that "data skipping" may occur at speeds over 100 fps, depending on many variables such as the number of channels being recorded and other items.

System Log Updates

- Mouse movements/click mimic data log with highlighting and time notification
- Clicking on channel name brings up customization menu

USB/CAN Communications/Dongle

This software supports the use of a "CAN to USB Dongle" instead of using the USB connection on the ECU. Notes on this:

- Requires use of Holley PN 558-443 (This module works with Sniper EFI as well as this new version of Holley EFI software and HP and Dominator ECU's)
- The CAN Bus type must be set to "Holley Standard" (not "Racepak")
- This method can be used to update ECU firmware. In the event the first update does not occur properly, cycle battery and ignition power and repeat.
- This method can be used on an ECU if the USB connector is damaged
- The software will automatically detect this module as long as the USB cable is not connected (which has first connection priority)

USB Communications

Updates have been made to the USB Communications to greatly increase their speed. This will make the following much quicker:

- Data Monitor and gauge screen update rate
- PC data logging
- Strip chart

Fixed Duty Cycle Points Ignition Output

Custom Ignition Parameters have a new "Output Type" called "Points Output Fixed Duty Cycle (MSD).   The previous "Points Output" has been renamed to "Points Output Adjustable Dwell". Its operation remains the same which is a user programmable fixed dwell used to typically trigger a MSD/CD box.   The new type has an output that creates a fixed dwell output of 20-30 crank degrees no matter what the engine speed. This output is intended to trigger a MSD/CD ignition system. This new selection would be the preferred choice to trigger a CD/MSD box. The previous choice works fine, but the new selection is a more ideal method.

Drive By Wire Updates
Firmware updates to drive by wire operation have been performed. These include:

- Throttle body can be "awakened" from sleep position when pedal is moved. Previous firmware only awoke the throttle body when an RPM signal occurred.

- Updated peddle error detection

- Updates to throttle body error detection

- Renamed Ford dropdown to add additional applications (GT500)

Davis Technologies Traction Control Updates

There are several firmware updates to the Davis Traction Control as follows:

TC1/TC2

- Timing REMOVAL operation remains as previous. When responding to a "Small" input, timing is stepped to that value. When responding to a "Large" input, timing is stepped to that value. If the "Large" input is held, timing will ramp at the "Removal Rate" to the "Maximum" timing retard value.

- Timing RESTORE functionality has changed from previous V5 operation which previously stepped timing back in when the slip signal was removed. Updates to this firmware version change this such that when the slip detection inputs are gone, timing will be ramped back in *from wherever the retard value is (small, large, maximum)* at a rate determined by the "Restore" value. This helps to not upset the chassis.

TC1/TC2/Profiler

- Updates were made to improve "noise rejection" that could cause false timing retard.

Nitrous Timing Update

The "Retard Hold After Deactivation" operation has an update. This version of firmware is such that this parameter is utilized if the rev limiter shuts the nitrous off, as well as if Input 1-8 is used to turn the nitrous off. These previously did not utilize this parameter.

Base Timing Table Update

The minimum value on the Base Timing value table allowed was changed from 0 degrees to -10 degrees.

V5 Software with Coyote using Ti-VCT Module

Resolved previous V5 CAN compatibility issues with Ti-VCT module.

GM LSx Oil Pressure Sensor

Added OEM GM LSx oil pressure sensor selection to oil pressure and all sensor dropdowns.

New Base Calibrations

- "2x4 Terminator 8-71 540CI.hefi" – Base calibration for 2x4 Terminator TBI blown applications

Pro Dash CAN Channel Updates

The following channels can be read by an HP or Dominator ECU from a Pro Dash product with the ability to view/log them as well as utilize them the I/O and Advanced ICF:

- Accel X
- Accel Y
- Accel Z
- GPS Latitude
- GPS Longitude
- GPS Elevation
- GPS Speed