WWW.MORETRACTION.COM

TC-3

Traction Control System

Davis Technologies, LLC.
PO Box 8250
Asheville, NC. 28814
(828) 645-1505
email: support@moretraction.com
web: www.MORETRACTION.com

TRADEMARKS
All trademarks used herein are the property of their respective owners.
Holley® is a registered trademark of Holley Performance Products, Inc.

RacePak® is a registered trademark of Competition Systems, Inc.

FuelTech® is a registered trademark of FuelTech USA.

01/21

Table of Contents

THIS PAGE LEFT BLANK

Introduction

The TC3 Series of Traction Control is the most advanced and tunable system Davis Technologies has ever produced. With easy to use menus on the Remote LCD display or PC, adjustments are easy to make and very precise.

As with all technical devices such as engines, shocks, carburetors, clutches etc., the product's performance is based largely on your ability to use it properly. Testing in controlled circumstances will help you determine the proper settings for your application and your situation. Testing is very important since it will help you utilize this product to its full potential.

Please read all of the instructions and information thoroughly before attempting to install or use this product.

This manual covers all models in the TC3 Series, some features shown in each individual section may not apply to your specific model.

Remote Display

The TC3 series can use a Remote Display (purchased separately) for the user to interface with the unit for setup and configuration.

The Remote display can be used with many other Davis products such as the Profiler, PFEFI, Smart Relay, Digital Ignition Controller, and the VPS.

The Remote Display does not need to be plugged in for the TC3 to function, it may be used only as needed to access the TC3. However, there are no issues with leaving it connected at all times.

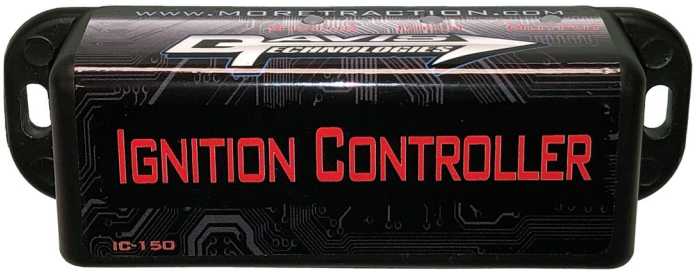
Be certain to return to the Home Screen before making a run.

IMPORTANT-Always plug the cord into the Remote first, then into the TC3.

Digital Ignition Controller

The TC3 can also be used in conjunction with the Digital Ignition Controller from Davis Technologies to control the ignition of most any type of stand-alone ignition system. The user does not need an EFI system to use the TC3 for Traction Control. This can be useful for updating an older technology race car with some of today's latest technology. The Digital Ignition Controller (DIC) can be used to control timing, rev limiters as well as SmartDrop® cylinder dropping.

The outputs from theTC3 can be used to signal the DIC to control the ignition to retard timing or drop cylinders. This signal can be analog or via CANBUS (CAN).



How Does It Work?

The *Non-Self-Learning* systems, like our TC-3, periodically compares the rate of acceleration of the driveshaft to an Adjustable Fixed Rate (AFR), known as Threshold. If the DS RPM rate of change is in excess of that Threshold, then a correction is made. The comparison is made every 1/32 of a turn of the driveshaft.

Basically, this Patented system looks for spikes in DS RPM that are caused by wheel slip. If these spikes are large enough, based on the threshold setting, then a correction is made thereby reducing the slip.

By adjusting the Threshold, the user can tune the system to correct larger slips, while not reacting to smaller, harmless, slips. This means the user does not have to figure out the desired DS/Engine RPM and build a preset "Dot Plot" (anybody got a crystal ball?).

***Self-Learning* systems, such as our TC3-SL, compare the rate of acceleration of the drive shaft to a calculated threshold value that is constantly updated based on the average of the previous measurements. This update occurs on every drive shaft revolution. So, if the last 1/32 of a turn of the drive shaft is faster than the average of the last full revolution, then a slip is detected. Through this very advanced Patented process, the system constantly accounts for track conditions, tire condition, etc. to constantly update the internal settings. These settings are updated as many as 1000 times a second to keep the unit calibrated to exactly the**

right settings regardless of changing conditions.

Basically, the system learns the average rate of acceleration of the drive shaft, and if there is a sudden spike in RPM above that learned rate, then a correction is made. With the Self-Learning feature, the user doesn't have to try to figure out the DS RPM rate of change and set a "Threshold", the system does it for you, every drive shaft revolution!

The user does have an adjustment referred to as "Mode" that sets the overall sensitivity of the system to make a correction based the extent of the tire slip. By adjusting the sensitivity, the user can tune the system to correct larger slips, while not reacting to smaller, harmless, slips.

This system is not simply a few lines of code added to an existing fuel injection or ignition system and called traction control. This system utilizes a patented method and multiple high-speed processors to very accurately and effectively monitor rates of acceleration to determine wheel speed, and tire slip. In fact, Davis Technologies' systems are at least 100 times faster than other systems which are integrated into the fuel injection or ignition system.

Our systems only job is Traction Control!

Control Methods

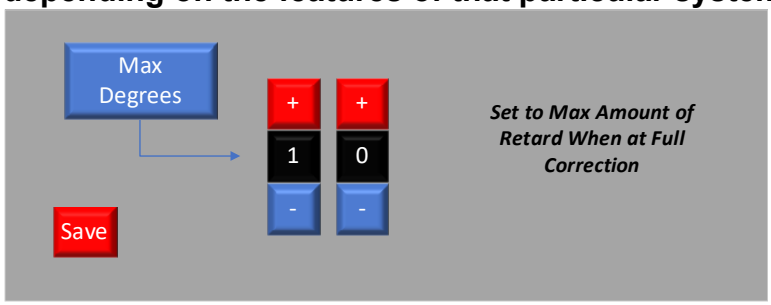
Timing Control

Retarding engine timing is an excellent way of controlling power output of an engine. The TC3 can control timing to within 1/10th of a degree up to 1000 times a second.

When tire slip is detected, the TC3 can retard timing to reduce power and control the tire slip. This is a very effective method of controlling the tire, but in some applications and conditions, even 25 degrees of retard may not be sufficient. In those cases, SmartDrop® control may also be implemented to add further power reduction to control the tire.

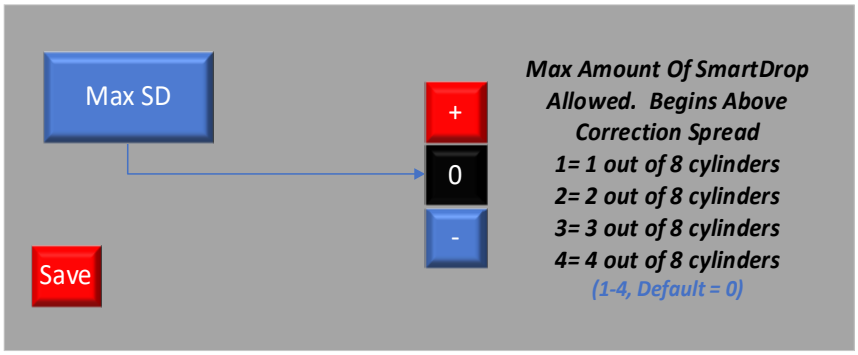
When the TC3 is connected to a Davis Technologies Digital Ignition Controller, up to 30 degrees of timing and SmartDrop® may be used to control the tire. When connected to a Holley EFI system, up to 25 degrees of timing retard and SmartDrop® may be commanded. FuelTech EFI systems allow for up to 35 degrees of timing retard, as well as SmartDrop®.

Other systems may be configured using a 0-5v analog output to control timing or cylinder cut, depending on the features of that particular system.



SmartDrop®

SmartDrop® is used to make a stronger correction than timing retard. SmartDrop® is an intelligent method of dropping cylinder ignition without dropping the same cylinder multiple consecutive times. The cylinders are seen as A,B,C,D,E,F,G,H as opposed to the firing order. We do not know which cylinder is #1 cyl, but we do know if we have dropped C, then don't drop C on the next revolution. SmartDrop® has 4 levels of intensity, with Level 1 being the "softest" and Level 4 being the "Harshest" Level 1 will drop 1 of 8 cylinders, and the cylinder dropped will fire 7 more times before being dropped again. Level 2 will drop 2 of 8 and fire each dropped cyl 6 times before dropping again. Level 3 drops 3 of 8 and Level 4 drops 4 of 8 and fires each cylinder once before dropping again. SmartDrop® is very smooth, even on Level 3 or 4. Level 2 is usually the most that is needed to control even a radial tire on a bad surface.

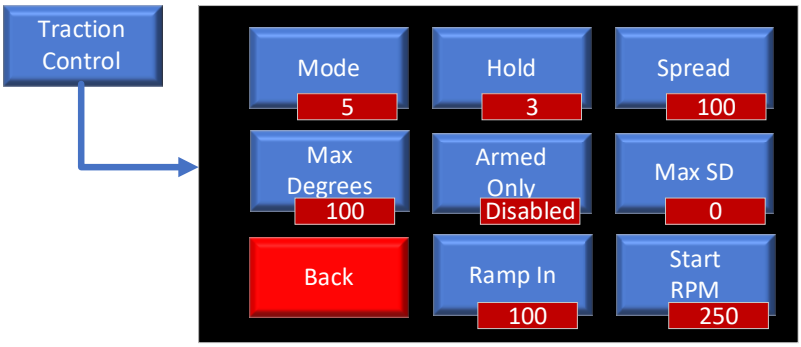


TC3 Options

The TC3 Series traction control can be in the form of either Davis Technologies' Non-Self Learning Traction Control (TC-3), Self-Learning (TC3-SL) or the most advanced version (TC3-SL-Pro) which gives individual control of the sensitivity and retard in different sections of the track. One set of parameters for the launch, another for the 60', and another from the 60' to the shift, and so on. The number of zones is unlimited. The TC3-SL-Pro also includes a Run Curve to control timing after the launch.

Contact Davis Technologies for more information on how to add the optional features.

Example Screen Traction Control



Self-Learning Traction Control

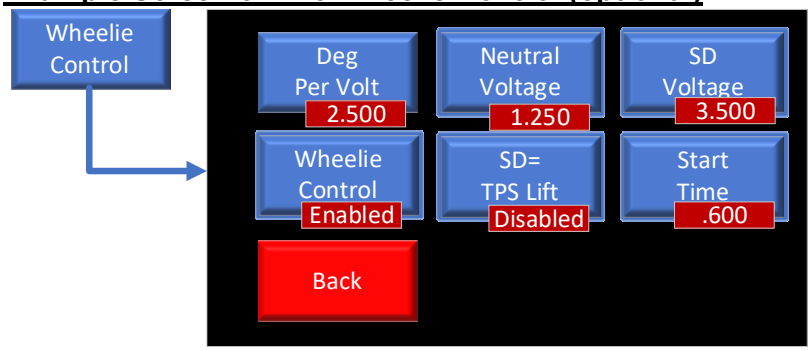
The optional Self Learning control strategy can be installed at any time to a non-SL TC-3 online using the onboard USB port, after a license is purchased from Davis Technologies.

Self-Learning TC is extremely useful for all type of racing, especially No-Prep, since there are few opportunities to get the system dialed in. Self-Learning is not recommended for use in normal driving, such as may occur on a "Drag Week" style car. When the vehicle is cruising at steady state, it learns that very low acceleration, and will try to react to almost any change in throttle, causing a surge. SL systems can be placed in non-SL mode for these instances and back to SL when track racing.

Wheelie Control (add-on purchased separately)

The TC3 can have a Wheelie Control strategy installed to control excessive pitch. This is triggered via an analog signal such as from an optical sensor outputting 0-5v. The much-preferred method of Wheelie Control is through the use of a Davis Technologies VPS, which measure vehicle pitch, not height. However, if you already have a ride height sensor, this option may be useful.

Example Screen of TC3 Wheelie Control (optional)



Installation

Installation of the system is very simple. It is very important to make all connections correctly. Improper installation could result in poor system performance or damage to the system.

Keep all wires away from any spark plug wires and coils or other sources of electrical noise and heat.

The unit should be mounted away from any sources of electrical noise or high heat.

It is recommended to connect the power and ground leads for the traction control directly to the ECU when possible to reduce electrical noise issues.

Inputs such as ARM and Trans Brake Sync can be triggered by either a positive or negative signal. This can be configured using the Profiler PC Software. Default input is POSITIVE trigger.

The RPM input needs to be a 5-12 volt square wave typically found with a 3 wire Hall effect type sensor or a standard tach signal.

See Appendix C

Wiring

As with all electronic devices, proper wiring techniques and methods will result in the best performance. Proper terminations, wire routing and overall quality of work are required for proper operation. You may want to refer to this document for some tips on basic wiring principles- https://moretraction.com/wp-content/uploads/2019/01/Wiring-How-To_Web.pdf.

The TC3 requires power and ground from the car. We recommend powering the TC3 with the ignition switch providing 12-18 volt. As always, a good ground must be provided.

A trans brake signal is required reset the TC3 and start a recording when released. The TC3-SL-Pro also uses the TB signal to start a run when using individual zone settings and the Run Timing Curve. The TB signal can be a positive or negative trigger.

An arming switch can also be installed to enable/ disable the Traction Control if desired. The ARM signal can be a positive or negative trigger.

If the TC3 is installed in conjunction with other Davis products that are CANBUS enabled, it is recommended to connect the CAN wires between devices. In this case, the ARM and TB signal as well as Timing and SmartDrop® commands will be sent via CAN to all devices on the Bus. When the TC3 is used in conjunction with the Digital Ignition Controller (DIC), CAN is the preferred method of connection. CAN may also be used with other manufactures equipment as those protocols are published and integrated.

The harness is populated with the wires for the most common installation. All other wires are included and can be installed by the user, along with spare pins.

A special tool is recommended for pin removal (Molex #63824-4600 CT15), however a .025" round pin may work.

If pins are removed, the lock tab will need to be bent back into place if reinstalled in the connector.

Connector is a Molex Nano-Fit, using pin number #1053002200

Extraction Tool and replacement pins can be obtained from Digi-Key.

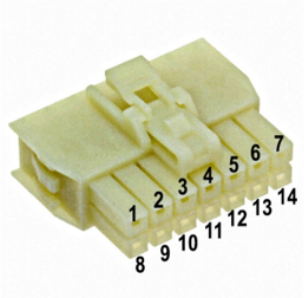
Extraction Tool-	**WM11927-ND**
Pins-	**WM14957CT-ND**

Pin Out

TC-3 Series P1 (20ga)		
Pin	Color	Function
1	Red	Battery Positive / Ignition Switch
2* #	Yellow w/ Black Stripe	CAN Low
3* #	Green	Drive Shaft RPM VR Sensor Input+
4	White	Drive Shaft RPM In
5	Orange w/ Black Stripe	Trans Brake Sync In
6	Tan	Arming Switch
7*	Orange w/ White Stripe	Analog Input
8	Black	Battery Ground
9* #	Yellow w/ Red Stripe	CAN High
10* #	White w/ Black Stripe	Drive Shaft RPM VR Sensor Input-
11*	Orange	DS RPM Output
12*	Blue	Launch Sync Trigger Out 750mA Pos-Neg
13	Light Green	Correction Output
14	Gray	SmartDrop Output

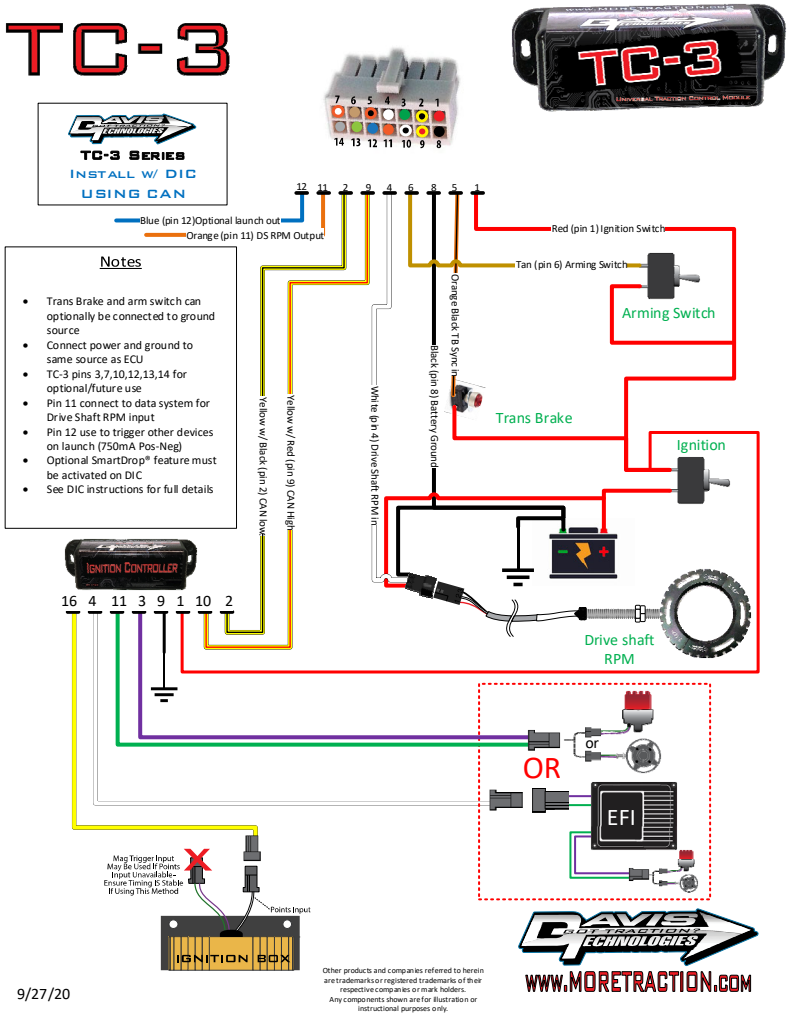
* Optional / Future use (included, but not installed in connector)

Twisted Pair

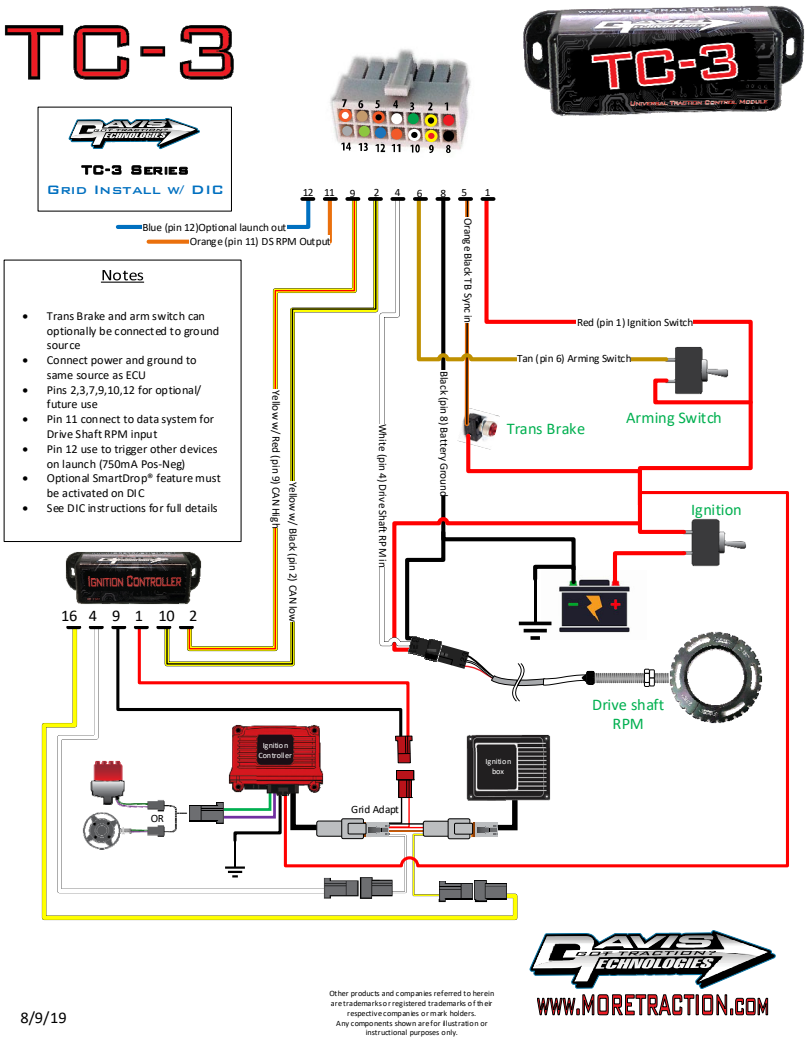


Schematics

Digital Ignition Controller (DIC)



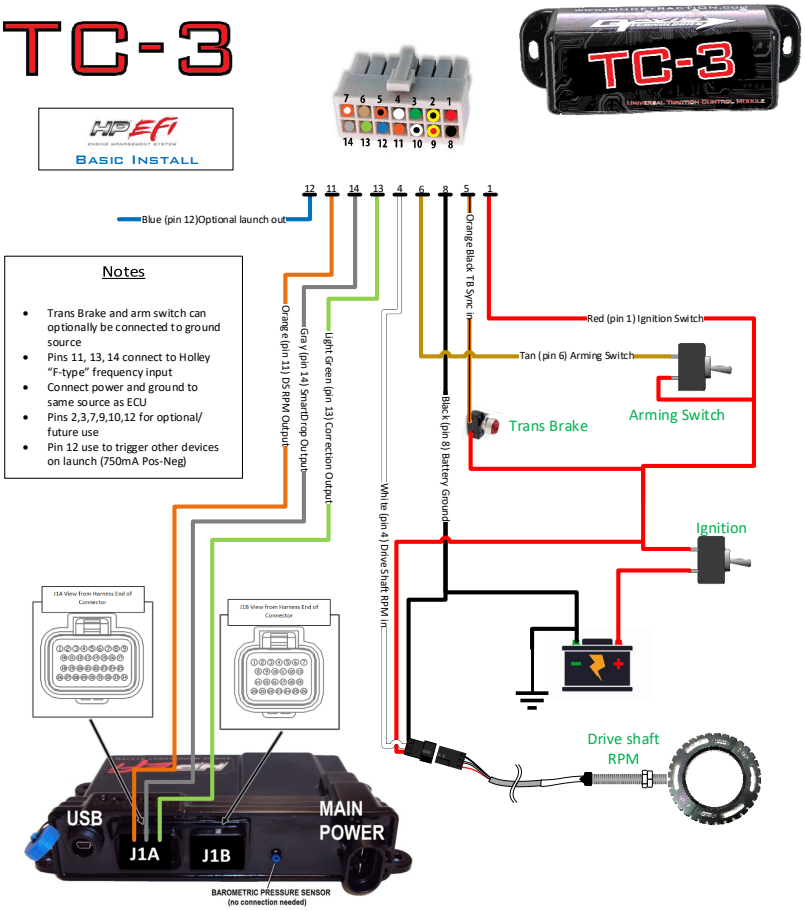
MSD Grid



8/9/19

Other products and companies referred to herein are trademarks or registered trademarks of their respective companies or mark holders. Any components shown are for illustration or instructional purposes only.

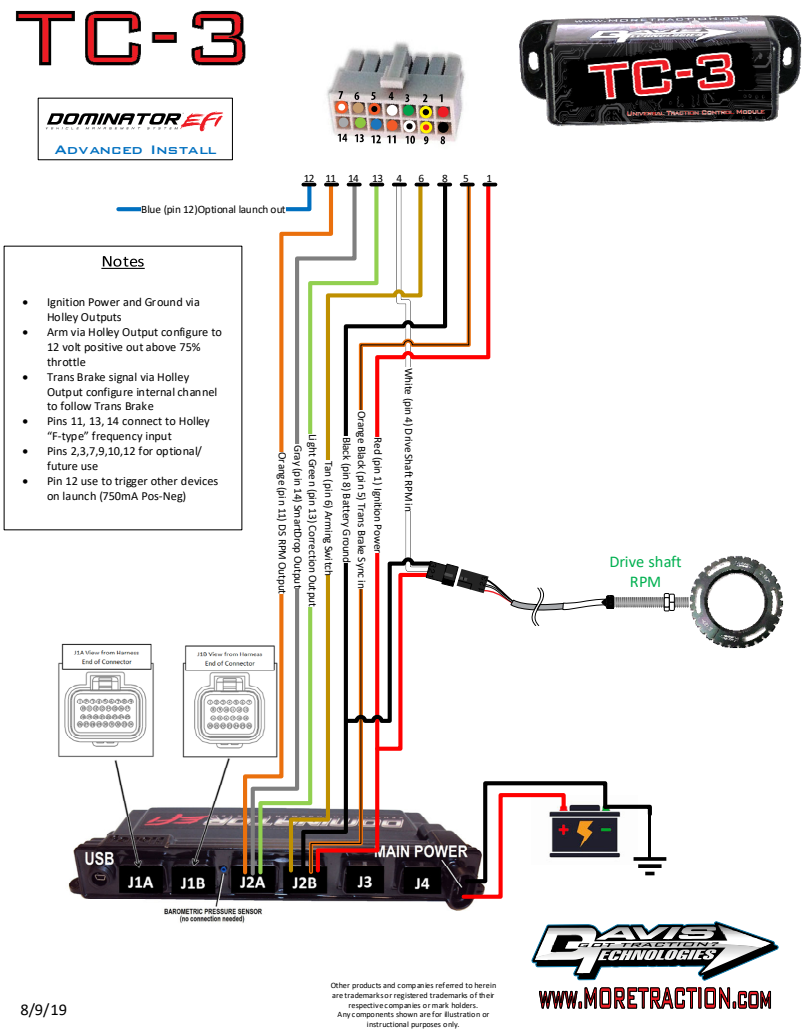
Holley Basic

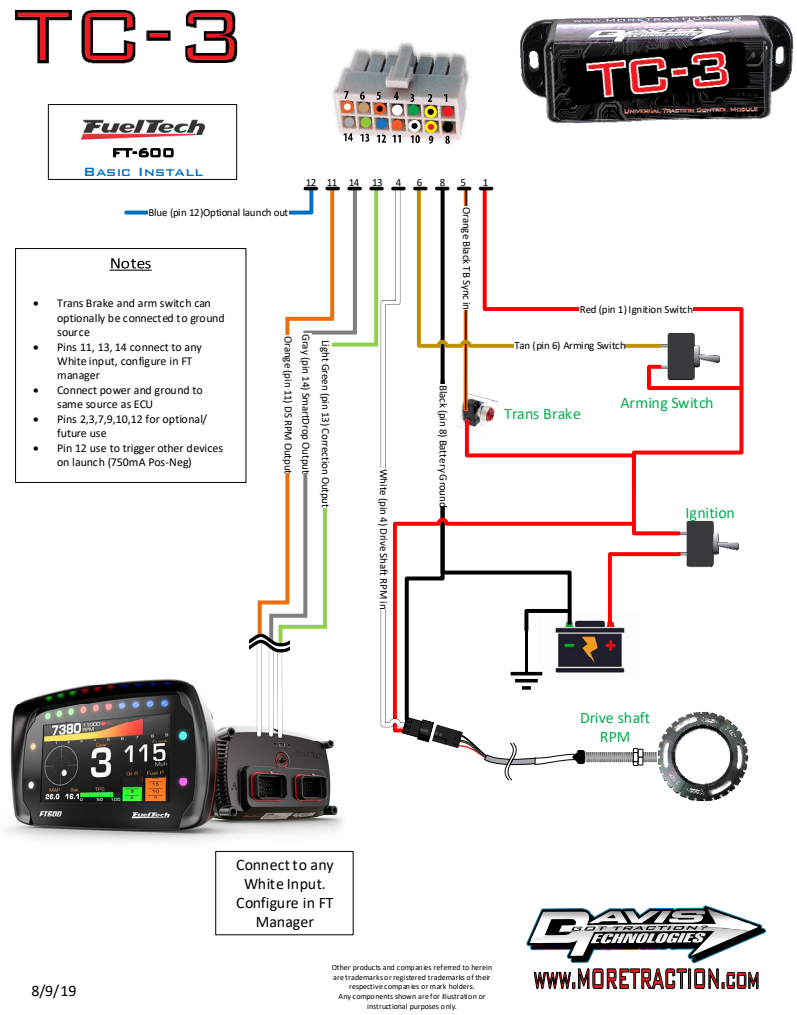


8/9/19

WWW.MORETRACTION.COM

Holley Advanced




TC-3
FuelTech
FT-600
Basic Install
7 6 5 4 3 2 1
14 13 12 11 10 9 8
TC-3
Universal Traction Control Module
12 11 14 13 4 6 8 5 1
Blue (pin 12)Optional launch out
Notes
Trans Brake and arm switch can optionally be connected to ground source
Pins 11, 13, 14 connect to any White input, configure in FT manager
Connect power and ground to same source as ECU
Pins 2,3,7,9,10,12 for optional/ future use
Pin 12 use to trigger other devices on launch (750mA Pos-Neg)
Orange (pin 11) DS RPM Output
Gray (pin 14) SmartDrop Output
Light Green (pin 13) Correction Output
White (pin 4) Drive Shaft RPM In
Black (pin 8) Battery Ground
Orange Black TB Sync In
Red (pin 1) Ignition Switch
Tan (pin 6) Arming Switch
Arming Switch
Trans Brake
Ignition
Drive shaft RPM
Connect to any White Input. Configure in FT Manager
8/9/19
Other products and companies referred to herein are trademarks or registered trademarks of their respective companies or mark holders. Any components shown are for illustration or instructional purposes only.
Davis Performance Technologies
WWW.MORETRACTION.COM

Testing After Installation

After installation, it is recommended that you test all inputs and outputs before headed to the track. This can be achieved by a few different methods. The easiest is with a Remote Display. Using the Utilities Menu described later in this manual, you can test all inputs and outputs.

If the Remote Display is not available, you can use the Test button on the bottom of the unit to run some simple test. This method will allow you to test the output of the Timing Retard and SmartDrop® outputs as well as RPM signal in. To activate the test, follow these steps.

- **Press and Hold the Test Button**
- **The Status LED will begin to rapidly flash Green then turn to Orange.**
- **Release the Test button to start the Timing Retard Test**
- **During the Timing test, the Launch LED will go from dim to bright red over a few seconds.**
- **SmartDrop® will then begin to output, indicated by the ARM LED intensity increasing in 4 steps**
- **At the end of the test the Launch LED will be off and will turn on if an RPM signal is received from the sensor.**

Setup and Configuring

The TC3 is configured using either a Remote Display or the Profiler Software on a PC. Let's take a look at the display screens and how to configure the various settings and options.

NOTE: ALL SETTINGS SHOWN ARE FOR EXAMPLE ONLY-INDIVIDUAL SETTINGS WILL VARY

Remote Display Screens

Buttons in Black are features that are not licensed.

Gray Buttons select Sub-Menus

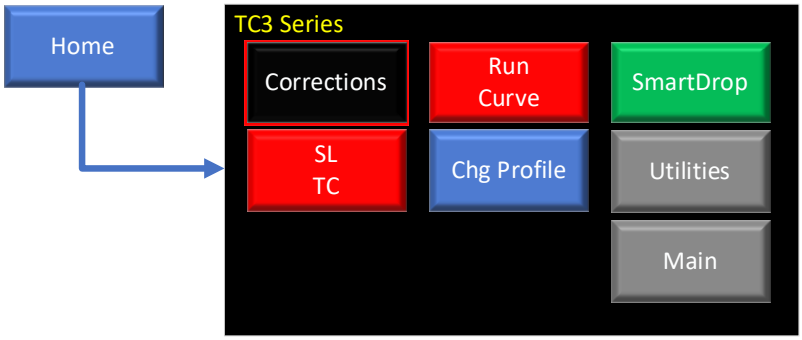
Blue Buttons are selectable Menus

Green Buttons indicate activated features that are turned on currently.

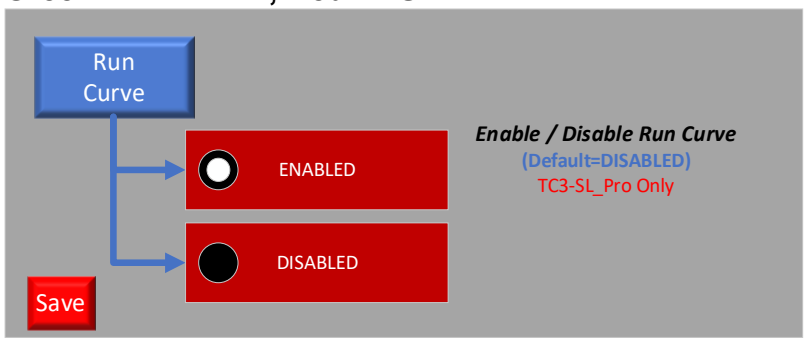
Red Buttons indicate activated features that are turned off currently.

Home Screen

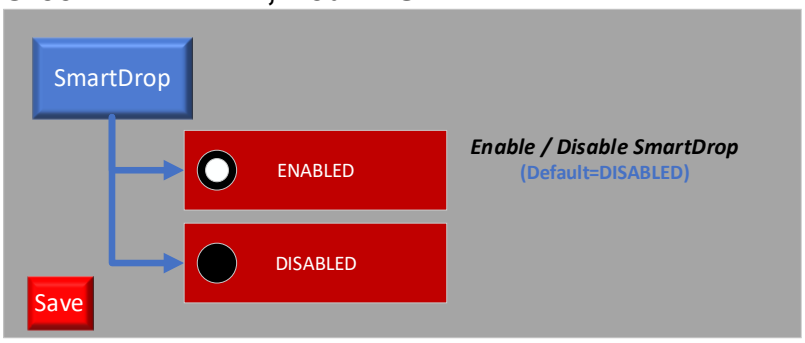
The Home screen gives quick access to some parameters and allows access to other Menus.



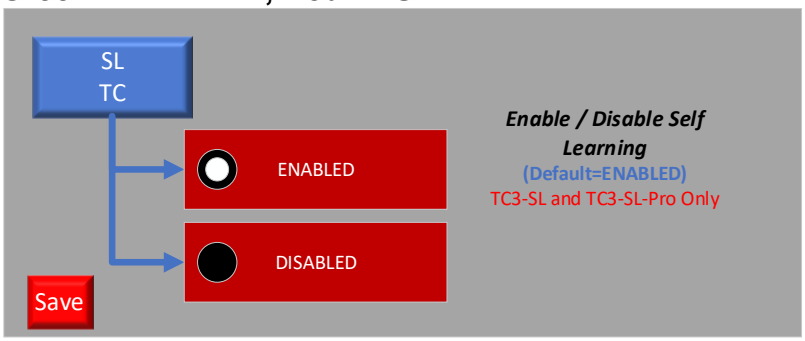
Run Curve is used to enable/disable the Run Timing Curve after TB release. (TC3-SL-Pro Only) Green=ENABLED, Red=DISABLED



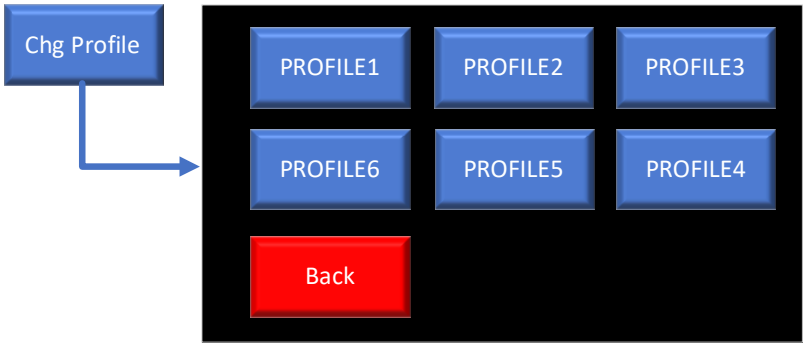
<u>SmartDrop®</u> is used to Enable/Disable the SmartDrop® cylinder cut feature. Green=ENABLED, Red=DISABLED



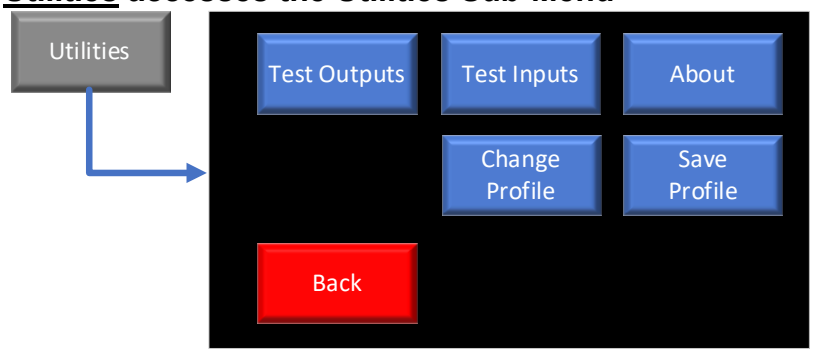
<u>SL TC</u> is used to Enable/Disable the Self Learning strategy if activated.
Green=ENABLED, Red=DISABLED



<u>Chg Profile</u> is used to recall saved configurations from the SD card.



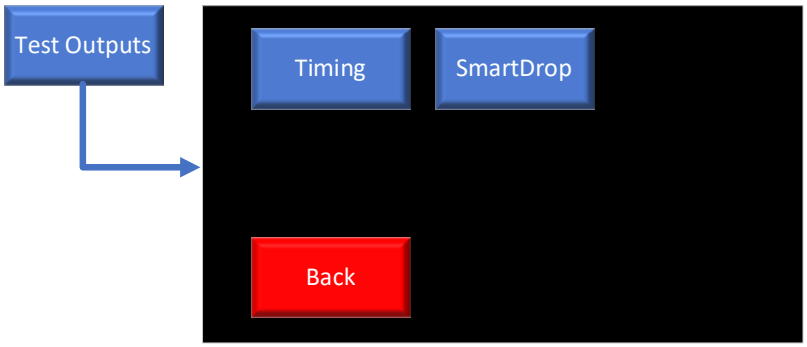
<u>Utilities</u> accesses the Utilities Sub-Menu



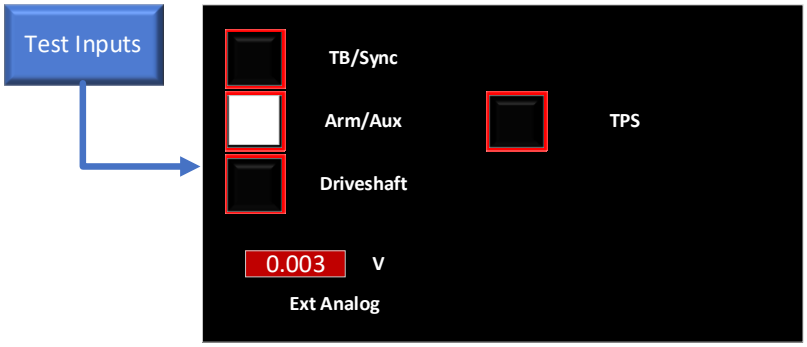
Utilities

Press the Timing button to run a timing test. Once pressed the TC3 should cause a timing retard sweep up to the Max Retard set.

Press the SmartDrop® button to test SmartDrop®. Once pressed the TC3 will drop cylinders up to the maximum set in the Max SmartDrop® settings.

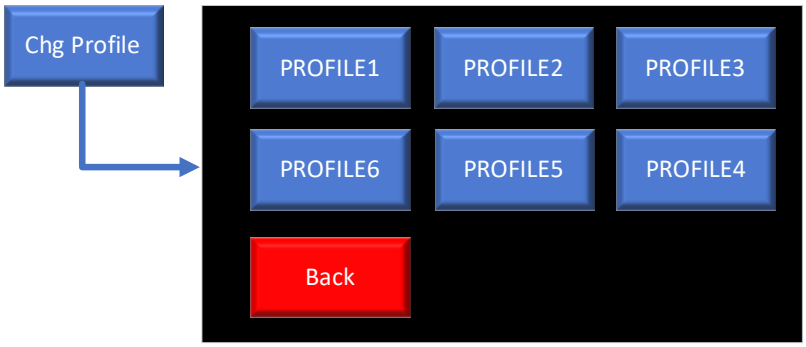


The Test Inputs screen is used to test various inputs of the system. The red boxes will fill with a white square when triggered. Ext Analog shows the voltage input on the analog input wire.
Press the Test button on the bottom of the TC3 to exit this screen.

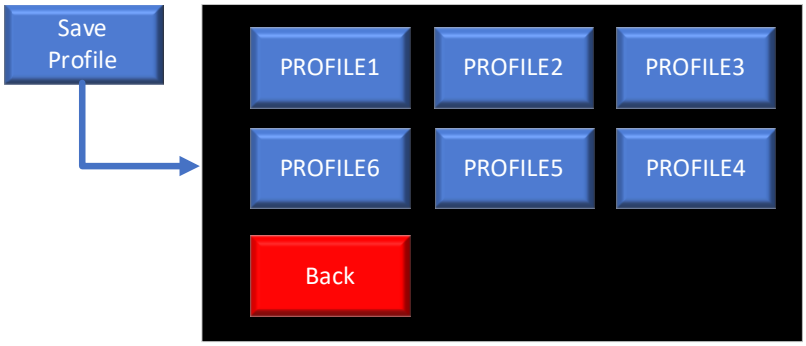


The <u>About</u> Screen provides info about current firmware and status.

<u>Chg Profile</u> is used to recall saved configurations from the SD card.

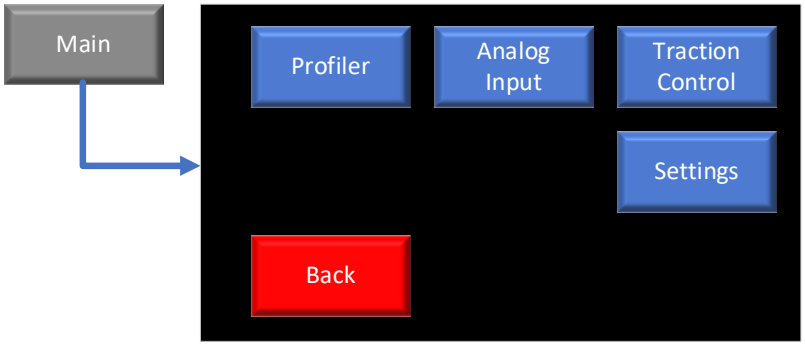


<u>Save Profile</u> is used to save the current configuration to the SD card. Select one of the 6 slots to save to.



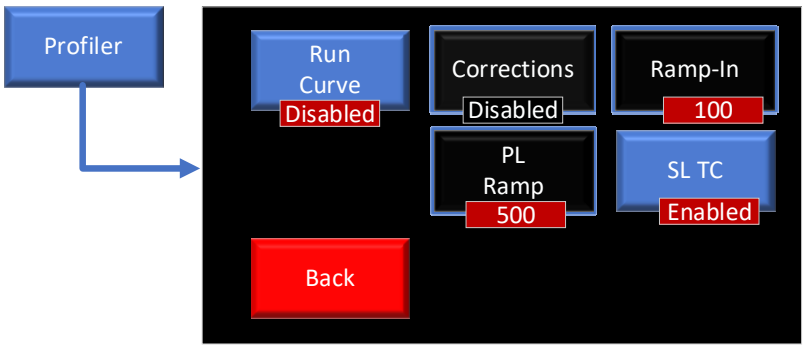
Main Screen

The Main Screen accesses all the primary functions of the system. Most adjustments are made in these menus.

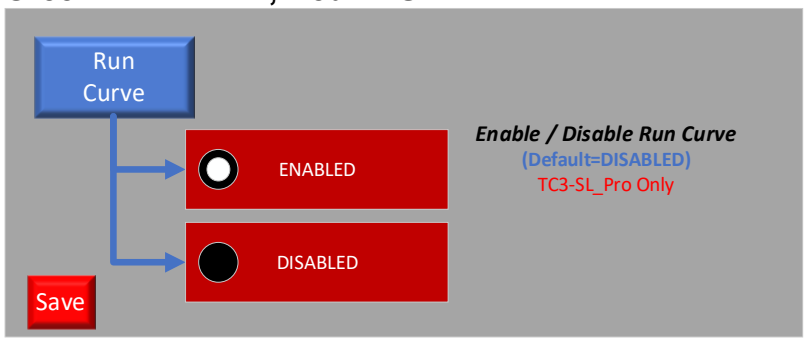


Profiler

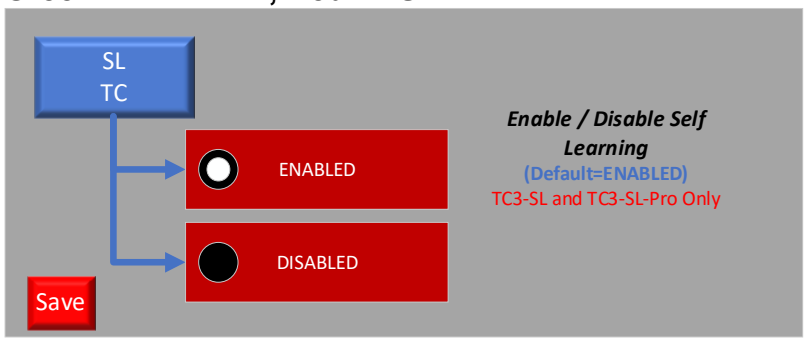
When features such as Self Learning (TC3-SL) or Run Curve (TC3-SL-Pro) are enabled, The Run Curve and SL TC buttons are active. These features are also accessible from the Main screen if enabled.



<u>Run Curve</u> is used to enable/disable the Run Timing Curve after TB release. (TC3-SL-Pro Only)
Green=ENABLED, Red=DISABLED

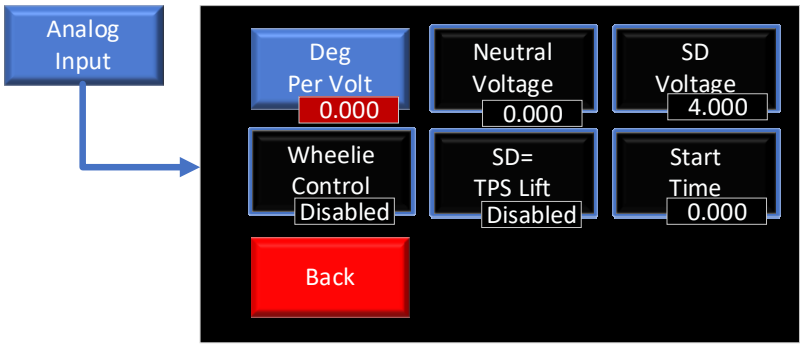


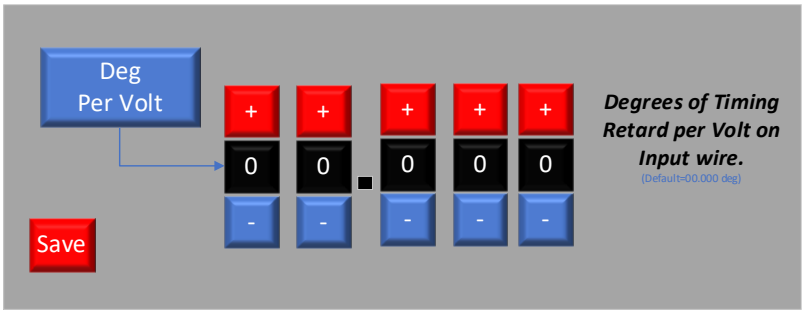
<u>SL TC</u> is used to Enable/Disable the Self Learning strategy if activated.
Green=ENABLED, Red=DISABLED



Analog Input

This parameter is used to configure a retard as analog voltage increases on the analog input wire. This can be used as a wheelie control in conjunction with an optical ride height sensor or analog pitch sensor.
The blacked-out buttons would be active if the Davis Technologies Wheel Control strategy were installed. (optional add on)

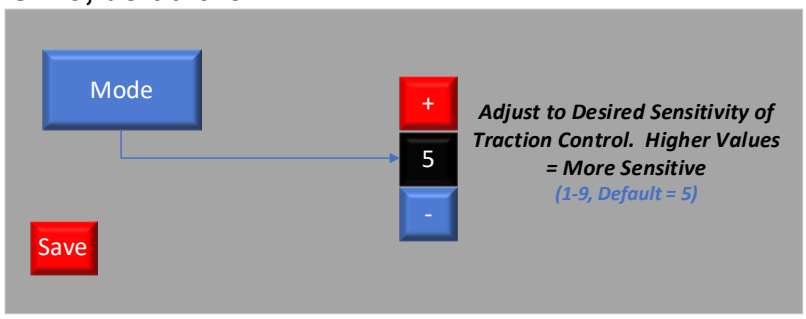




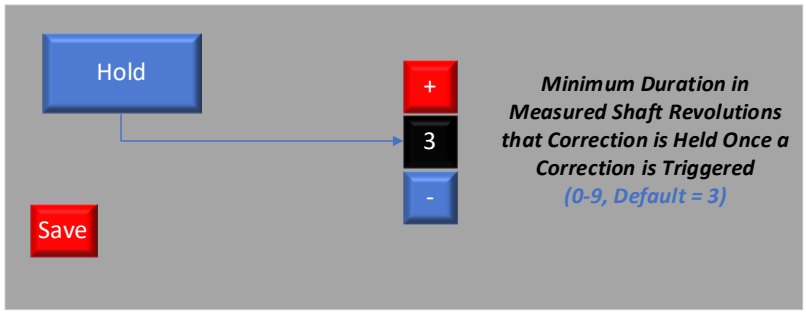
Traction Control

This is the primary menu used to tune the traction control. These parameters can be adjusted using the Remote Display or optionally using the Profiler interface software on a PC (Settings>Traction Control, See Appendix C).

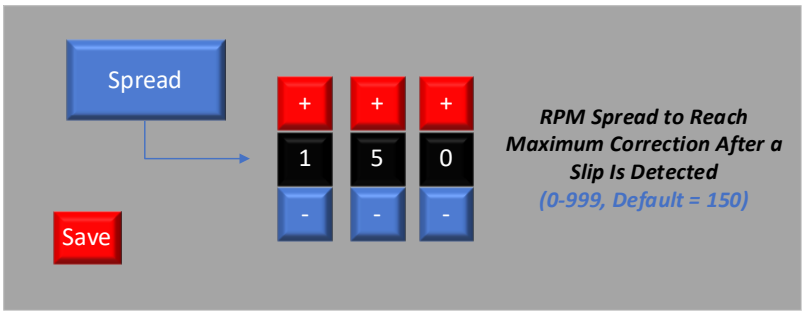
Mode is used to set the overall sensitivity of the system. The larger the setting the more sensitive, thereby making corrections on smaller slips. Range is 1-9, default=5.



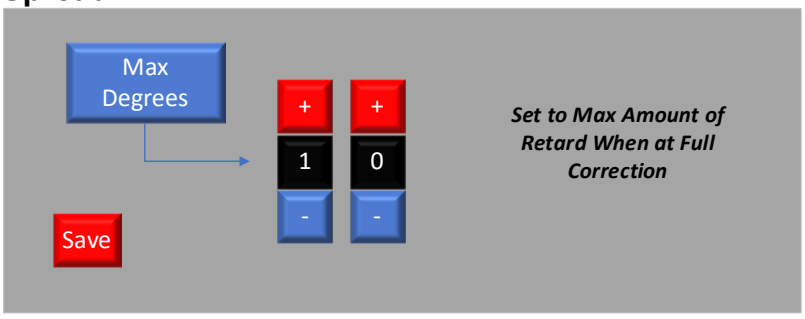
Hold is used to force the TC system to hold the correction for X many revolutions of the measured shaft to give the vehicle some time to recover before the correction is removed.



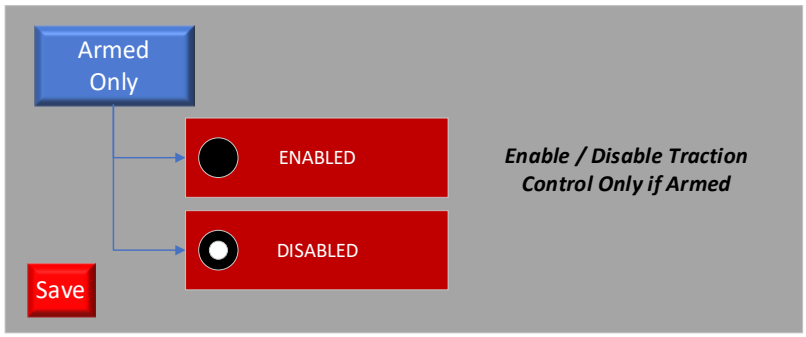
<u>Spread</u> controls the rate at which the system reaches the maximum correction allowed. Once a slip is detected, if the RPM reaches the top of the correction spread, then the correction will reach maximum. The correction is linear, so if the RPM spike only reaches 50% of the spread, then only 50% of the max correction will be allowed.



<u>Max Degrees</u> is the maximum allowable retard that will be allowed if the tire slip reaches the maximum Spread.

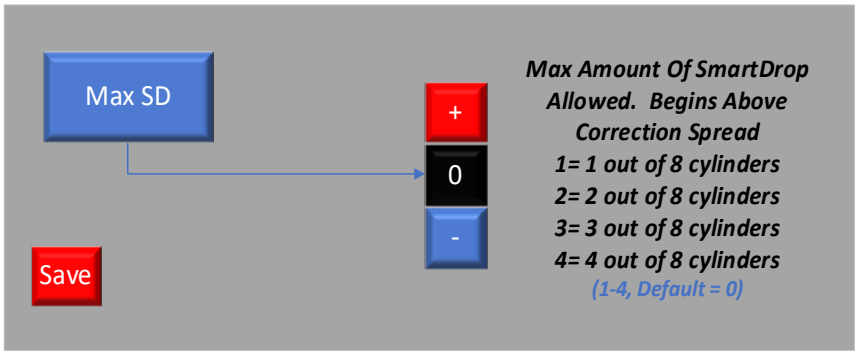


<u>Armed Only</u> is used to set whether the arming switch input is required to allow corrections. If Enabled, the Arm switch must be on to allow corrections. If Disabled, the corrections will be made anytime slip is detected. An arming switch and Enabling this feature allows you to deactivate the TC if desired.

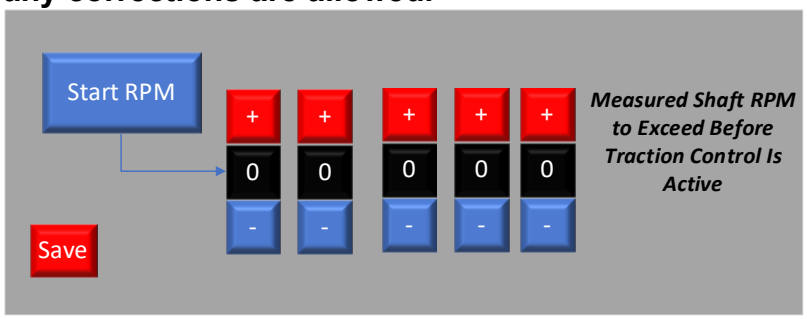


<u>SmartDrop®</u> is used to make a stronger correction than timing retard. If a correction is active, and the RPM spike exceeds the Correction Spread Value, then SmartDrop® is initiated. If spread is set to 150, then at 151 RPM the first level of SmartDrop® will be triggered. After that, if the RPM continues to spike, the SmartDrop® will increase to the next level when the RPM increases another ½ of the correction spread setting. So, if spread = 150, then SmartDrop® will increase every 75 RPM. The SmartDrop® will only increase in level to the Max SD Limit. SmartDrop® 0=Retard Only

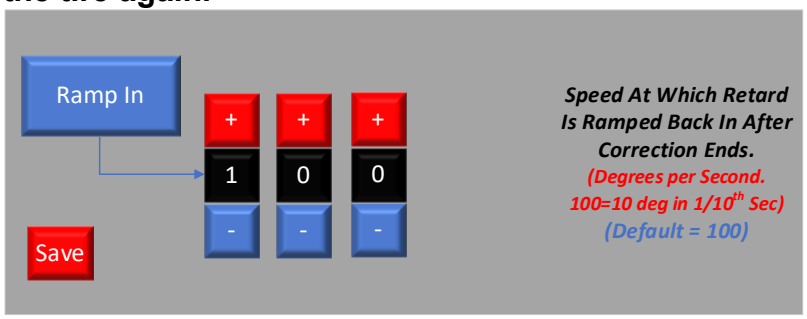
Example (correction spread 150 / SD increase every 75)-
Spike up to 150 RPM=Retard Only
Spike of 151-225 RPM=Full Retard and SD level 1
Spike of 226-300 RPM=Full Retard and SD level 2
Spike of 301-376 RPM=Full Retard and SD level 3
Spike of 377-xxx RPM=Full Retard and SD level 4



<u>Start RPM</u> sets the RPM of the measured shaft below which the TC is not able to make a correction. This allows some cars to "Get Up On The Tire" before any corrections are allowed.

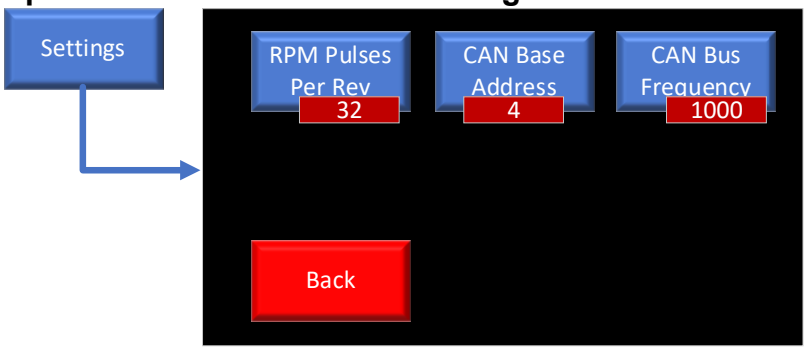


<u>Ramp In</u> is the rate at which timing retard is restored after a correction has ended. Ramp in is calibrated in deg per sec. A value of 100 restore rate will take 1 sec to restore 100 degrees of retard, or 1/10th of a second to restore 10 degrees. This is a linear rate, so the retard is "eased" back in so as not to upset the tire again.

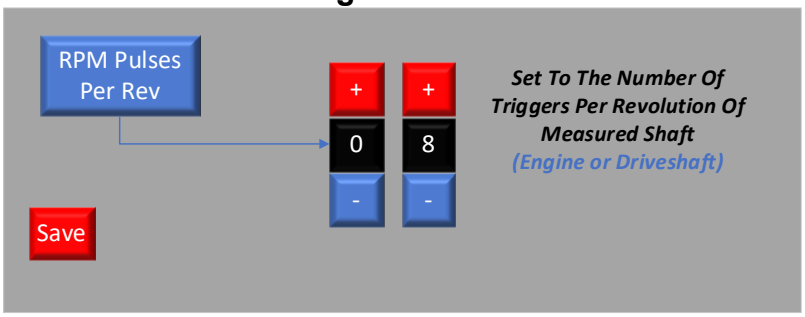


Settings

The Settings screen is used to set a few system parameters, such as pulses per revolution being input and the CAN network settings.

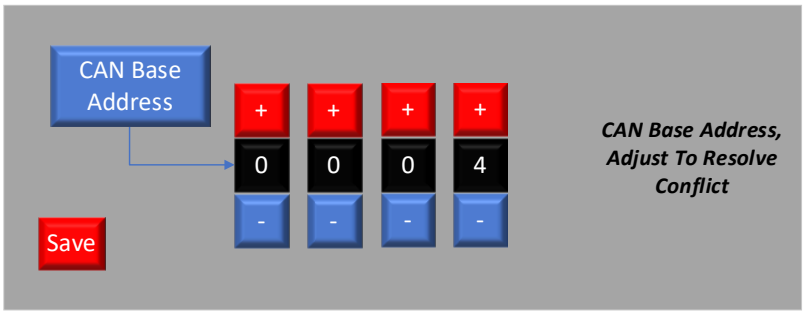


<u>RPM Pulses Per Rev</u> needs to be set to the number of pulses output per revolution of the measured shaft. Example, Davis DSRPM ring would be set to 32, other rings may be 8 or 16 and engine RPM would be 4 on a V8 engine.



The TC3 can transmit selected data via CAN Bus. When using multiple CAN Bus equipped products from Davis Technologies in a vehicle, the CAN Bus connections may simplify the installation.
The CAN Bus can also share information with other systems in the vehicle, such as data or EFI systems. Information on this can be found in the appendix C.
Davis Technologies does not provide extensive support for CAN. An experienced CAN Bus programmer should find the necessary information in appendix C.

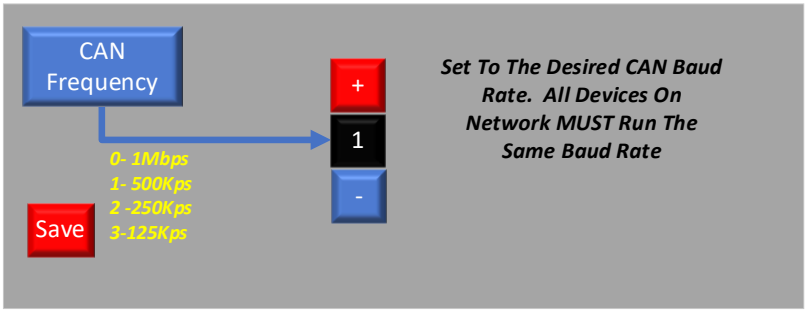
The <u>CAN Base Address</u> may be used to resolve addressing conflicts should they arrive due to 2 systems using the same base address. Davis Technologies' devices are set by default to Base Address 0004. All Davis devices must be set to the same base address to communicate to each other.

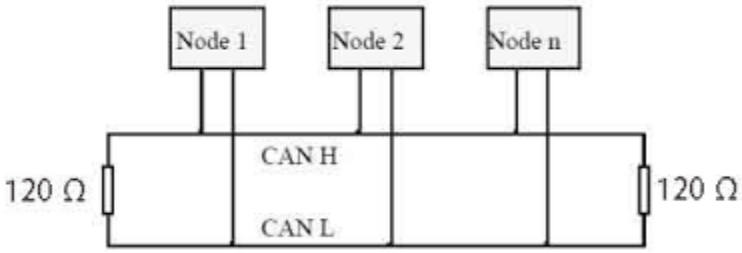


The <u>CAN Frequency</u> determines the transmit rate at which the network sends and receives data. Higher speed requires proper wiring techniques, such as twisted pair and shorter (<25ft) runs. Higher speeds also require a termination resistor (120ohm) installed at the end of the wiring run to prevent signal bounce-back. We have found that in most

applications, a single resistor anywhere in the system provides stable communications. This resistor is built into some devices, such as the Davis Digital Ignition Controller, and most EFI systems. Simply tying into these devices network may provide sufficient signal control.

If termination resistor is not available, lower speeds may be used with excellent results.





See appendix B for info on CAN transmit Detail.

Firmware Updating

Davis Technologies may release firmware updates or upgrades periodically to ensure the best possible functionality of the system. These are typically installed using the USB connector and the supplied USB cable. Instructions for this procedure will be included in the firmware update file located on the web site.
Users should log onto https://moretraction.com/support/ occasionally to check for updates. And make sure their device has the most recent firmware.

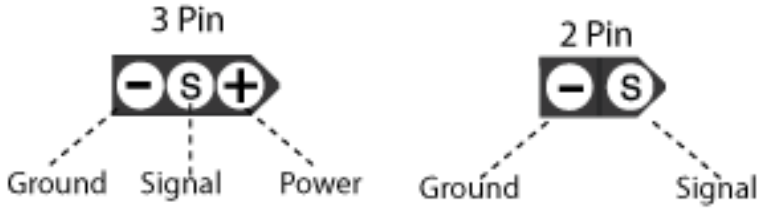
Appendix A

The TC3 data can be recorded on a RacePak via a V-Net module.

RacePak part # 230-VM-5VDIFF can be used to record 1 channel. (approx. $160)

RacePak part # 230-VM-USM can be used to record 4 channels. (approx. $300)

RacePak® V-Net Pin Out



Appendix B

CAN Transmit Detail

Unless otherwise specified, Davis CAN-capable devices communicate using the CAN extended data frame with 29-bit ID. There may be up to 8 bytes of data in a frame. The first byte received in a frame is considered byte-0 and the last byte received is considered byte-7. Data is encoded as Big Endian.

The most significant 13 bits in the 29-bit ID may be configured in the device's setup screens. The default value is hexadecimal 0x04. This allows the CAN priority of the device to be changed if the receiving device is also advised of the address change.

The 16 least-significant bits identify the type of data in the 8-byte data stream. The following table details the available data frames from Davis devices along with their default CAN ID numbers.

CAN ID	Rate (Hz)	Position	Channel	Units	Conversion
			VPS		
0x0040000	N/A	0-1	et60	1/100 S	y=x/100
		2-3	et330	1/100 S	y=x/100
		4-5	et660	1/100 S	y=x/100
		6-7	et1320	1/100 S	y=x/100
0x0040001	N/A	0-1	mph60	mph	y=x
		2-3	mph330	mph	y=x
		4-5	mph660	mph	y=x
		6-7	mph1320	mph	y=x
0x0040002	N/A	0-1	max mph 660	mph	y=x
		2-3	max mph 1320	mph	y=x
0x0040003	100	0	VPS Status Flags	N/A	
		1-2	Pitch	1/10 degree	y=x/10
		3-4	Forward Acceleration	1/1000 G	y=x/1000
		5	Retard	1 degree	y=x
		6	SmartDrop Level	1 cylinder	y=x
0x0040004	100	0	VPS Status Flags	N/A	
		1-2	Pitch	1/10 degree	y=x/10
		3-4	Yaw	1/10 degree	y=x/10
		5-6	Forward Acceleration	1/1000 G	y=x/1000
0x0040005	100	0	VPS Status Flags	N/A	
		1-2	Pitch	1/10 degree	y=x/10
		3-4	Roll	1/10 degree	y=x/10
		5-6	Yaw	1/10 degree	y=x/10
0x0040006	100	0	VPS Status Flags	N/A	
		1-2	Forward Acceleration	1/1000 G	y=x/1000
		3-4	Lateral Acceleration	1/1000 G	y=x/1000
		5-6	Vertical Acceleration	1/1000 G	y=x/1000
0x0040007	100	0-1	Forward Acceleration	1/1000G	Y=x/1000
		2-3	Lateral Acceleration	1/1000g	Y=x/1000
		4-5	Pitch	1/10 degree	Y=x/10
		6-7	Roll	1/10 degree	Y=x/10

PFEFI					
0x0040020	100	0	PFEFI Status Flags	N/A	
		1	Retard	degrees	y=x
		2	SmartDrop Level	cylinders	y=x
		3-4	Driveshaft RPM	rpm	y=x
		5	Analog Input	1/10 Volt	y=x/10
DIC					
0x0040030	N/A	0	DIC Status Flags	N/A	
		1	Reserved	N/A	
		2	Retard	degrees	y=x
		3	SmartDrop	cylinders	y=x
		4-5	Engine RPM	rpm	y=x
		6	Analog In 1	1/10 Volt	y=x/10
		7	Analog In 2	1/10 Volt	y=x/10
SmartRelay4					
0x0040040	50	0-1	SmartRelay Status Flags	N/A	
		2	Channel-1 Duty	percent	y=x
		3	Channel-2 Duty	percent	y=x
		4	Channel-3 Duty	percent	y=x
		5	Channel-4 Duty	percent	y=x
0x0040041	50	0-1	SmartRelay Status Flags	N/A	
		2	Channel-1 Event		
		3	Channel-2 Event		
		4	Channel-3 Event		
		5	Channel-4 Event		

Bytes described above as Status Flags are comprised of single-bit indicators of various conditions. The bit indicators are detailed in the table below.

Bit Number:	7	6	5	4	3	2	1	0
VPS Status Flags				TC Active	Run Stopped	Run Active	Armed	Transbrake
PFEFI Status Flags				TC Active	Run Stopped	Run Active	Armed	Transbrake
DIC Status Flags				TC Active	Run Stopped	Run Active	Armed	Transbrake
SmartRelay Status (0)				TC Active	Run Stopped	Run Active	Armed	Transbrake
SmartRelay Status (1)					Ch-4 On	Ch-3 On	Ch-2 On	Ch-1 On

The CAN IDs shown above are the default for all devices. For any device, the most-significant 13-bits of the CAN ID can be changed to any value from 0x0000 to 0x1FFF. This allows the CAN IDs to be moved as needed to avoid conflicts with other devices transmitting on the CAN bus. It also allows the CAN priority of the frames from a device to be changed. Lowering the value of the CAN ID will give the CAN frame a higher priority relative to other frames being transmitted. For example, consider the VPS frame shown above at address 0x00040005. In the VPS configuration screens, the base CAN ID can be changed from 4 to any value 0x0000 to 0x1FFF. If you change the base ID to 0x0DA0, the resulting frame ID will be 0x0DA00005.

Example of CAN frame for ID 0x405

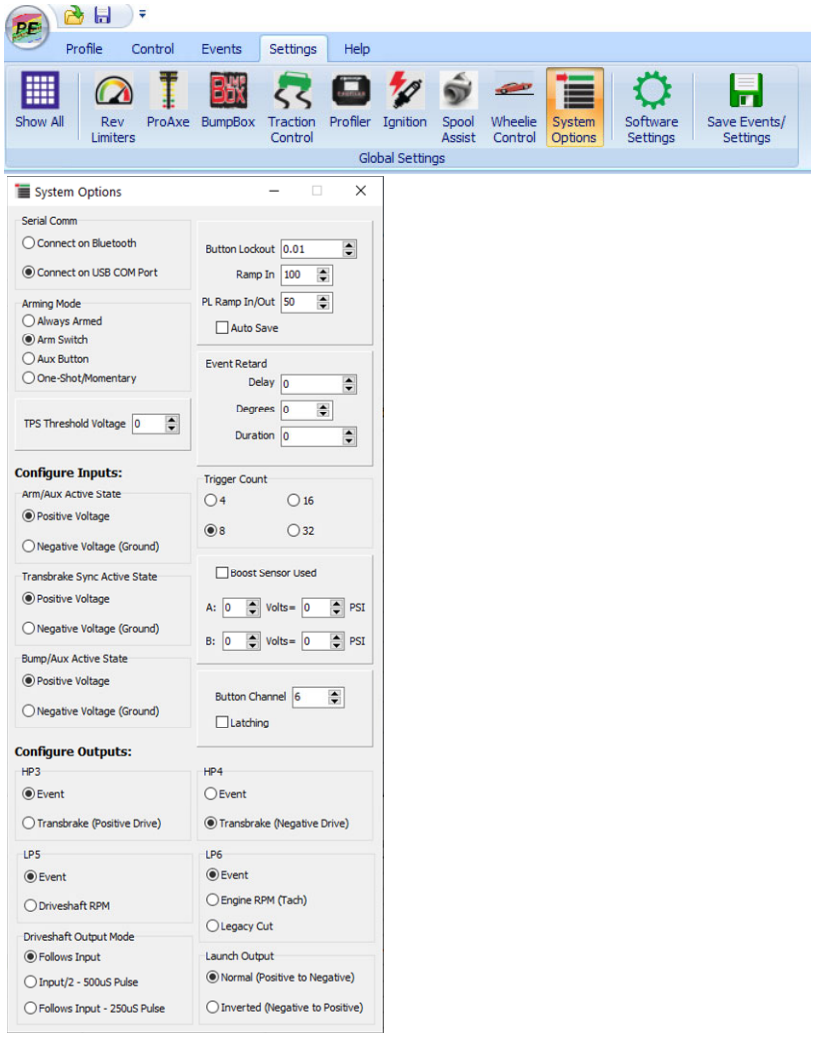
Here's an example of the CAN frame for VPS angular data at CAN ID 0x00040005. The data being transmitted is as follows:

Status Flags:	0x06	VPS Armed, Run in progress
Pitch:	0x000A	Pitch at +1.0 degree
Roll:	0xFFFD	Roll at -0.3 degree
Yaw:	0x0001	Yaw at +0.1 degree

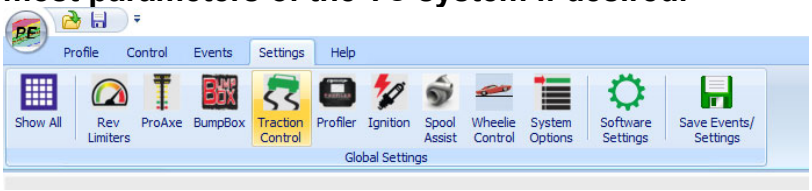
	CAN ID	BYTE 0	BYTE 1	BYTE 2	BYTE 3	BYTE 4	BYTE 5	BYTE 6
Data		Status	Pitch		Roll		Yaw	
Hex	0x00040005	0x05	0x00	0x0A	0xFF	0xFD	0x00	0x01
Binary	00000000001000000000000000101	00000101	00000000	00001010	11111111	11111101	00000000	00000001

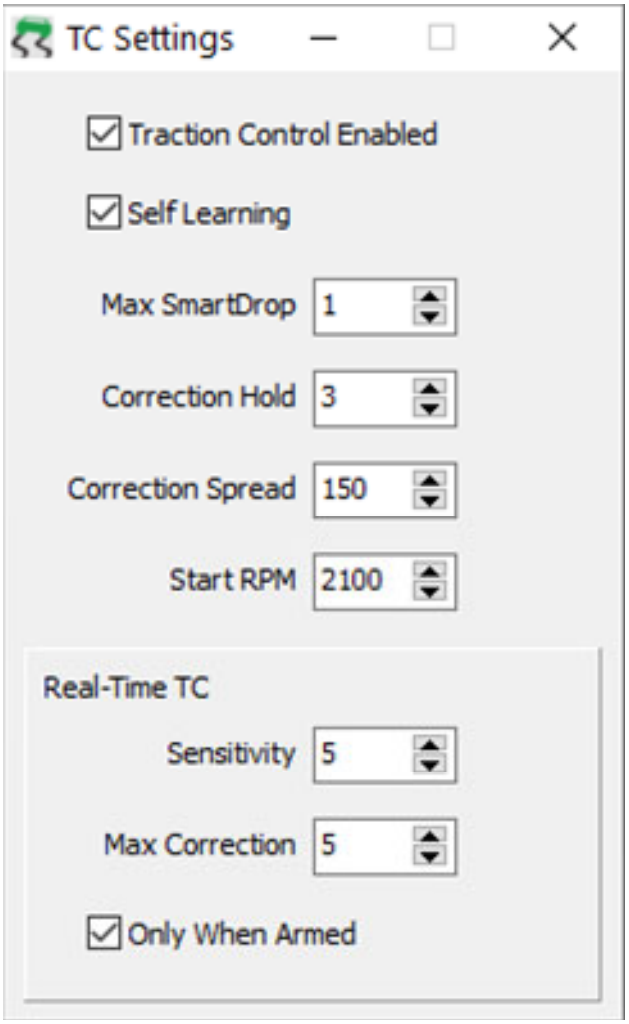
Appendix C

The Profiler PC Software interface may be used to set some parameters of the TC3. The Systems options window can be used to set input polarity of the Arm and Trans Brake Sync Input, as well as Pulses Per Rev.



The Traction Control window can be used to set most parameters of the TC system if desired.

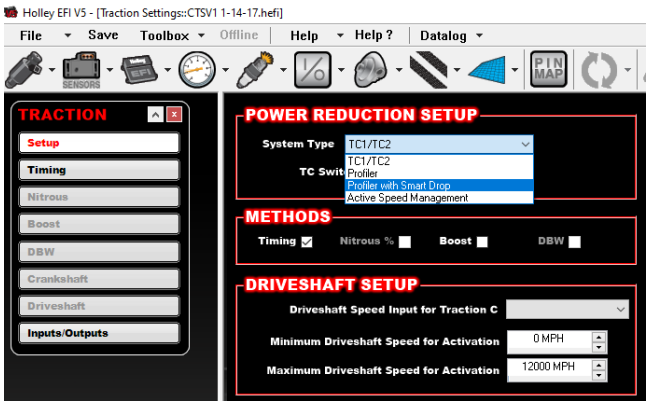




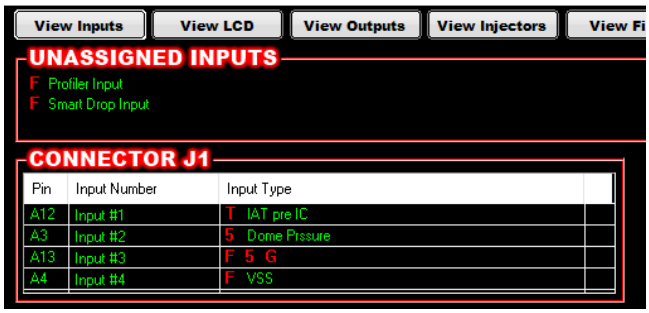
Appendix D

Holley EFI Config

When the TC3 is connected to a Holley EFI, you must install the Traction Control ICF using the Toolbox icon, and select "Profiler w/ SmartDrop®" This will create the required input Pins. Drag the Inputs to the desired "F" type (frequency) pin and connect the corresponding TC3 output to the appropriate pin. The Holley EFI is now configured to receive signals from the TC3 to initiate Timing Retard (25 deg retard Max) or SmartDrop®.



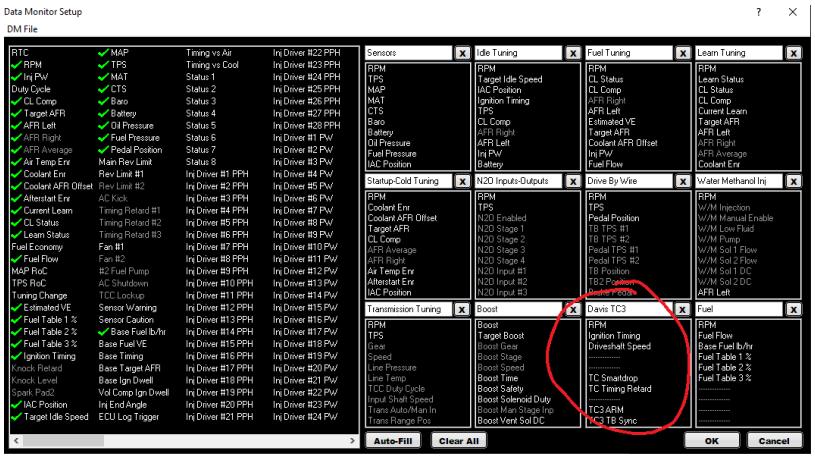
Holley EFI ECU Pin Map



If desired, you may want to set up outputs from the Holley to trigger the ARM and Trans Sync Inputs. Configure the ARM output (TC3 Arm) to trigger at 80% throttle position, and the TB Sync output (TC3 Launch) to trigger whenever TB button is pressed.

It is also very useful to set up a Data Monitor Window to test all inputs and outputs of the Holley EFI.

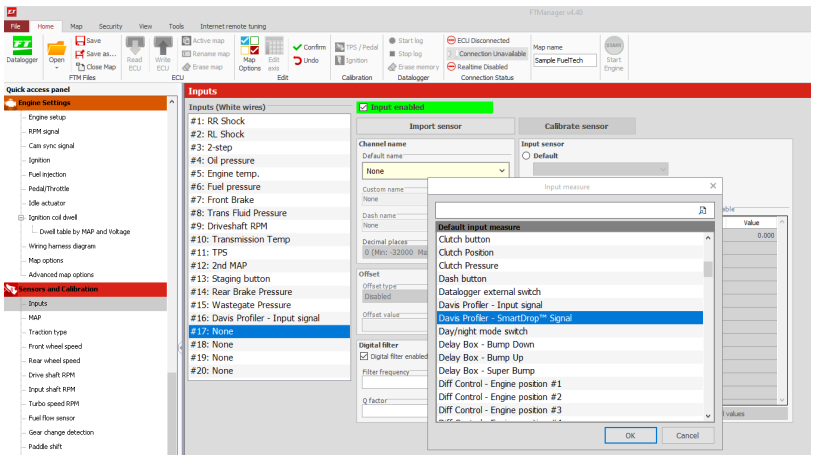
Note- The ignition timing parameter displayed will not change unless the engine is running.



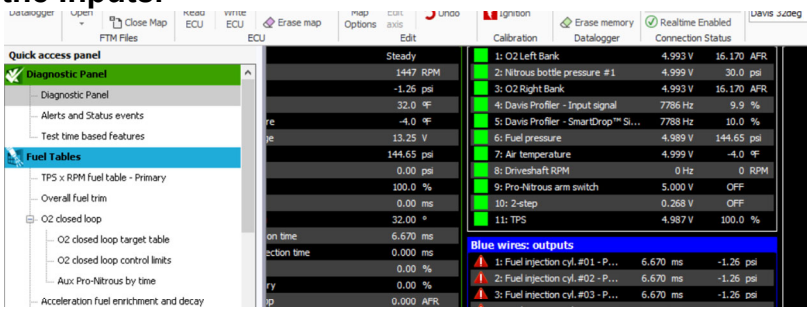
FuelTech Config

When the TC3 is connected to a FuelTech EFI, you must setup 2 input pins using the Inputs dialog in the FT Manager software. Set one pin up as Davis Profiler Input and one as Davis SmartDrop® Input.

Simply connect the corresponding TC3 output to the appropriate pins. The FuelTech EFI is now configured to receive signals from the TC3 to initiate Timing Retard (35 deg retard Max) or SmartDrop®.



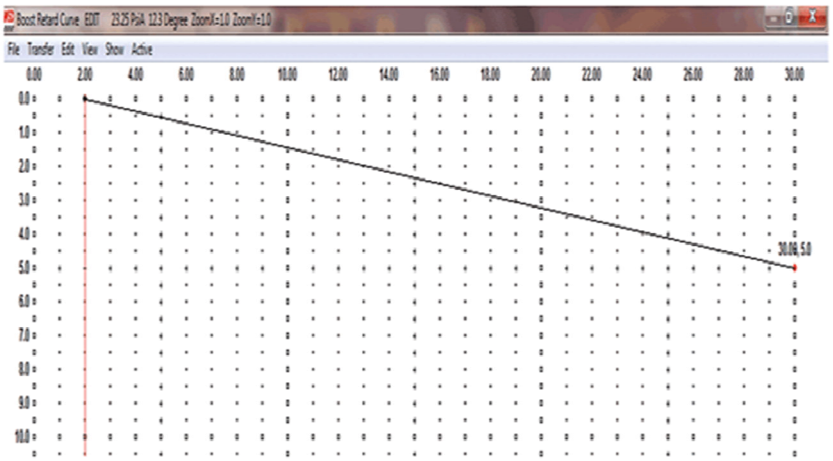
The FT Manager Diagnosis panel can be used to test the Inputs.



Analog Config

The TC3 can also be used with an ignition system that has an Analog Input to control timing. This is common for Boost Control via a MAP sensor. If the Boost Retard feature is not being used, the TC3 can utilize this built in feature. Many EFI systems also have Generic Inputs that may be configured to control timing and even cylinder drop.

Example of MSD 7531 setup with a linear retard of 0-10 degrees of retard for 0-5 volts of input from TC3.



Appendix E

Using Profiler Software for Data Log Download

The TC3 can log the DSRPM and timing changes made during a run. When using the TC3-SL-Pro, this is also where you can set up the Zone specific parameters and Run Curve. Refer to the Help file in the PC Software on using the interface, which can be downloaded from the support section of the website, as well as tutorial videos.

Disclaimer

FOR RACING PURPOSES and OFF-ROAD USE ONLY!

Vehicle racing is an inherently dangerous sport with significant risk of personal injury or even death. When a user participates in vehicle racing and/or track events, he accepts the risk inherent therein. Davis Technologies LLC ("DAVIS"), its employees, and affiliates makes no warranty that the use of its products or parts guarantees personal safety or freedom from physical injury or operates as a life saving device.

Davis Technologies LLC's ("DAVIS") PRODUCTS AND PARTS ARE SOLD "AS IS" WITHOUT ANY WARRANTY WHATSOEVER. EXPRESS WARRANTIES, IMPLIED WARRANTIES, WARRANTIES OF MERCHANTABILITY AND WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE ARE EXCLUDED. THE ENTIRE RISK OF QUALITY AND PERFORMANCE OF SUCH PRODUCTS AND PARTS IS WITH THE BUYER, USER, SUBSEQUENT USER, OR AGENT THEREOF (HEREIN "USER"). SHOULD SUCH PRODUCTS OR PARTS PROVE DEFECTIVE FOLLOWING THEIR PURCHASE, THE BUYER AND NOT THE MANUFACTURER(S), DISTRIBUTOR(S), OR RETAILER(S), ASSUME THE ENTIRE COST OF ALL NECESSARY SERVICES OR REPAIR AS RESULT OF A PART(S) FAILING.

Davis Technologies LLC ("DAVIS") disclaims all liability for any special, direct, incidental or consequential damages, or any damages whatsoever, including, without limitation, the loss of life or limb, or damages due to bodily or personal injury, which may arise or result from the sale, installation, or use of any of its products and parts.

It is the user's responsibility to inspect and verify the dimensions, specifications, and performance of all products and parts as being appropriate for the use to which the user will put them prior to any actual installation and/or use of said products and parts.

Davis Technologies LLC's ("DAVIS") products and parts are to be inspected by the user before each use for evidence of damage, defect or wear. Any deviation by the user from the manufacturer's specifications concerning use, maintenance, repair, alterations, and modifications constitutes willful negligence.

The installation of Davis Technologies LLC's ("DAVIS") products or parts may adversely affect other vehicle components, safety equipment or manufactured goods (collectively "goods"). Davis Technologies LLC ("DAVIS") assumes no responsibility for any damage to other goods, or bodily injury that may arise due to failure of other goods, due to installation and/or use, either proper or improper, of its products or parts.

The liability of Davis Technologies LLC ("DAVIS") is limited to the replacement of defective products or parts found under examination by manufacturer to be defective in material or workmanship within 60 days after purchase, and which has not been caused by an accident, improper use, alteration, tampering, excessive use, misuse,

modification or abuse. The damage of the user shall be deemed liquidated in the costs of replacement of the product or part.

Davis Technologies LLC's ("DAVIS") assumes no responsibility for errors, omissions, diagrams, pictures, illustrations or text in these instructions or the documents contained herewith.

By purchasing or using this product, the user agrees that if any provision of this Disclaimer is held to be illegal, invalid or unenforceable under present or future law, such provision shall be fully severed from the Disclaimer and this Disclaimer shall be construed and enforced as if such illegal, invalid or unenforceable provision never comprised a part hereof, and the remaining provisions hereof shall remain in full force and effect and shall not be affected by the illegal, invalid or unenforceable provision, there shall be added automatically as part of this Disclaimer a provision as similar in its terms to such illegal, invalid or unenforceable provision as may be possible and be legal, valid and enforceable.

Notes

Notes

Contact Information

Technical support and sales may be reached at:

Davis Technologies, LLC.
PO Box 8250
Asheville, NC. 28814
(828) 645-1505
(828) 645-1525 fax
email: support@moretraction.com
web: www.MORETRACTION.com

DAVIS TECHNOLOGIES

GOT TRACTION?

WWW.MORETRACTION.COM