

# EcoCAL User Manual for EFI

V1.8

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Note: If you are not sure about any specific details, please contact us at info@ecotrons.com

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### Introduction

EcoCAL is the Calibration software of EFI system from Ecotrons, you can use the EcoCAL to tune the maps of ECU, start fuel/ ignition angle, warm-up fuel, idle ignition advanced angle, ignition timing MAP, fuel injection MAP, ... etc. Our ECU is programmable, so if you want to change the setting of EFI, you need to connect ECU to laptop via EcoCAL.

### **Chapter 1 Basic operation of EcoCAL**

### 1.1 Installation of EcoCAL

### 1.1.1 Download the EcoCAL Software

**1)** Download the EcoCAL calibration software from the website:





Click the "EcoCAL for EFI", and then download the software "EcoCAL-Setup.exe"

**2)** Maybe, you get the software through the E-mail. So you need to rename the installation file name that is attached in the Email:

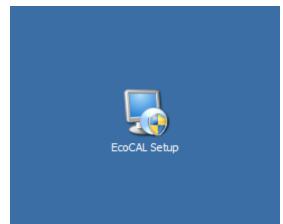
### "EcoCAL-setup.exe.remove".



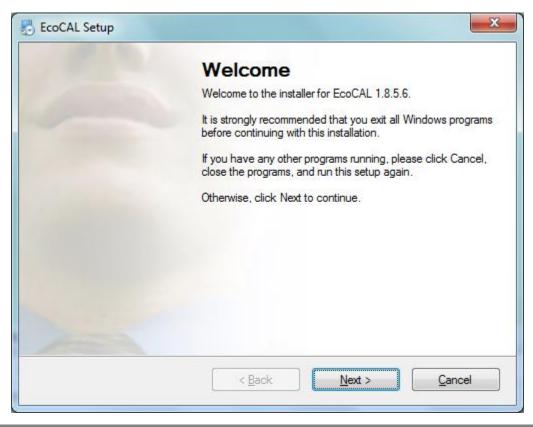
Please modify the attached file name extension, and remove the "**.remove**", then run the file: "EcoCAL-setup.exe" to install the tool software.

### 1.1.2 Install EcoCAL

1) Double-click the ICON "EcoCAL setup.exe" to install the EcoCAL:



### 2) Click "Next"



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3) Click "Next" and choose the path to install EcoCAL

Installation Folder	
Where would you like EcoCAL	to be installed?
The software will be installed in new path, or click Change to bi	the folder listed below. To select a different location, either type in a rowse for an existing folder.
Install EcoCAL to:	
C:\EcoCAL	Change
Space required: 120.1 MB	
Space required: 120.1 MB Space available on selected dr	ive: 6.77 GB
	ive: 6.77 GB
	ive: 6.77 GB

4) Click "Next"



Shortcut Folder	
Where would you like the shorter	uts to be installed?
folder, you can either type a new	d in the folder indicated below. If you don't want to use the default name, or select an existing folder from the list.
Shortcut Folder: EcoCAL	
<ul> <li>Install shortcuts for current u</li> <li>Make shortcuts available to</li> </ul>	

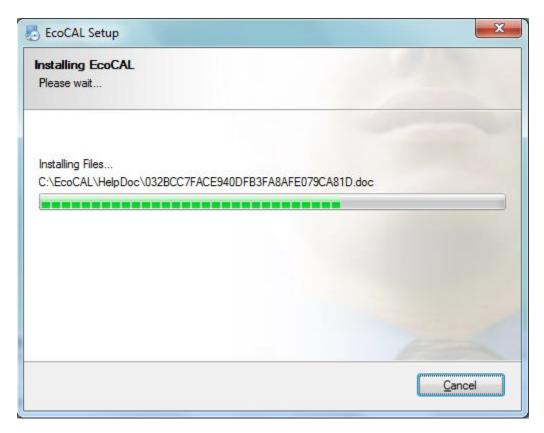
5) Click "Next"



Ready to Install					
You are now ready to	install EcoCAL	1.8.5.6			
The installer now has	enough informa	tion to install Ec	CAL on your con	nputer.	
The following settings	will be used:				
nstall folder: C:\E	EcoCAL				
Shortcut folder: Eco	CAL				
Please click Next to p	roceed with the	installation.			

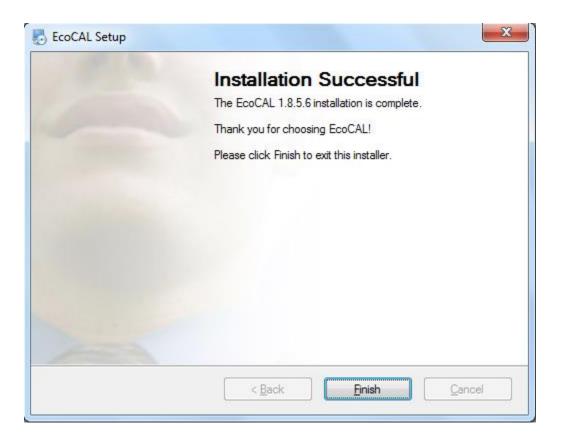
6) Click "Next" and wait for installing





7) Click "Finish"

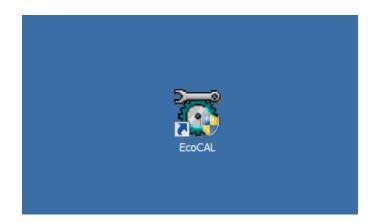




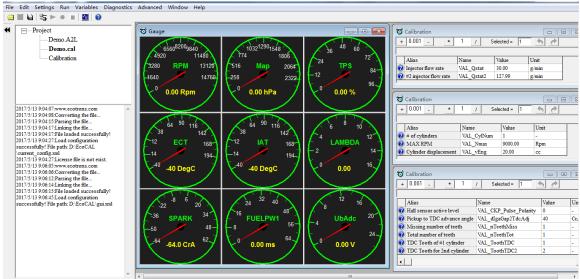
The installation of "EcoCAL" is successful.

### 1.2 Start EcoCAL

- 1.2.1 Start EcoCAL software
- (1) Double-click the ICON "**EcoCAL**" on the desktop to start the EcoCAL software:



(2) When you start the EcoCAL at the first time after you finish installation, the EcoCAL will load the Demo files automatically with the default page settings.



EFI basic setting Servo Motor Idle controls Global fuel enrichment Start fuel After-start Warm-up Fuel Steady-State Acceleration Deceleration Performance WOT Altitude Calibration Advanced Tuning f

### Note:

If EcoCAL does NOT automatically load the default configuration, likely you do not have the necessary A2L file and CAL file, in the installation folder of "C:\EcoCAL". Usually, the Demo files are not correct for user, you can find the correct A2L, CAL files in CD. You should copy and paste the necessary A2L file and CAL file into that folder, if the folder contains no such files, then Open the correct A2L file and CAL file in EcoCAL.



### 1.2.2 Load the Calibration files

### 1) File types and definitions

**S19 file**: this is a Motorola format microprocessor executable file; **A2L file**: this is an ECU description file that contains variant ECU info for EcoCAL to know where to get what, etc.;

CAL file: this is a calibration data file that contains parameters users can tune.

Note: Ecotrons A2L file follows the ASAP2 standards (defined by the automotive standard association ASAM).

Note: most users don't need the S19 file; unless an ECU firmware update is necessary; it is enough to have the A2L file and CAL file to run EcoCAL and tune your engines.

### 2) Load the correct A2I and CAL files

Note: If you have not got correct A2L file and CAL file in your CD or in the software package, please email us: <u>info@ecotrons.com</u> or <u>support@ecotrons.com</u>.

Often the user will need to load different A2L file and CAL file than the default ones coming with the EcoCAL.

For example, an ECU software update will give you a new A2L file and a new CAL file.

Or new calibration release will give you just a new CAL file (A2L file stays same).

### In EcoCAL, go to menu->File->Open

Find out the place that you put the A2L and CAL files, and then choose the correct files

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**Note**: EcoCAL always need to open 2 files, open A2L first, and then open CAL file next,

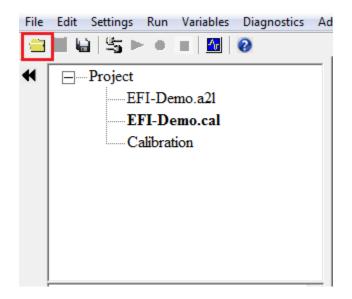
😈 Open							x
Comput	ter → Local Disk (C:) → EcoCAL			✓ <sup>€</sup> → Search Ec	oCAL		م
Organize 🔻 New fold	der				:== •		0
☆ Favorites	Name	Date modified	Туре	Size			
🧮 Desktop	\mu HelpDoc	2017/7/12 15:19	File folder				
🚺 Downloads	kerneldlis	2017/7/12 15:18	File folder				
🖳 Recent Places 🗏	Picture	2017/7/12 15:18	File folder				
	record	2017/7/21 14:00	File folder				
🥽 Libraries	퉬 Uninstall	2017/7/12 15:19	File folder				
Documents	Demo.A2L	2015/6/17 16:10	A2L File	1,077 KB			
J Music	FI-Demo.a2l	2017/8/22 10:48	A2L File	1,077 KB			
Pictures							
Subversion							
Videos							
-							
File	name: EFI-Demo.a2l			- ASAM-2M	C(*.a2l)		•
						<u> </u>	
				Open		Cancel	
							57
open 😈						l	×
Comput	ter  ► Local Disk (C:)  ► EcoCAL			✓ 4→ Search Ec	oCAL		م
Organize 🔻 New fol	der				:== •		?
☆ Favorites	Name	Date modified	Туре	Size			
Nesktop	HelpDoc	2017/7/12 15:19	File folder				
Downloads	kerneldlis	2017/7/12 15:18	File folder				
🖳 Recent Places 🗏	Picture	2017/7/12 15:18	File folder				
-	record	2017/7/21 14:00	File folder				
🔚 Libraries	Uninstall	2017/7/12 15:19	File folder				
Documents	Demo.cal	2015/6/24 9:38	CAL File	17 KB			
Music	FI-Demo.cal	2017/8/22 10:48	CAL File	17 KB			
Pictures				27.10			
Subversion							
Videos							
Videos 🗸	TEL-Demo cal						•
Videos 🗸	name: EFI-Demo.cal			▼ cal(*.cal)			•
Videos 🗸	name: EFI-Demo.cal			← cal(*.cal) Open		Cancel	

Click "Open", and then load the A2I and CAL files successfully.





Note: You also can use the shortcut button of "Open" to open the files.



Note: The default Demo file is not correct for user. Please find the correct A2L, CAL files in CD.



EcoCAL will pop up one prompt box "Message" to indicate what variables do not exist when you reload A2L, CAL files.

To Message	X
Does not exist variables:	A
VAL Nsta	
CUR_NstaEnd_Tm	E
CUR_fCldSta_TmSta	
B_StaEnd	
fAlt	
fFlSta	
fPreCtl	
LamWO2	
Ld	
LdPrd	
N	
N_b	
nInj	
Nraw	
Pam	
Та	
tInj0	
Tm	
TmSta	
Tps	
UbAdc	-
ľ	
	OK

### **1.3 Activate EcoCAL**

EcoCAL for EFI is a completely free SW, if users encounter a situation that it requires the license to be activated, you must have downloaded the wrong version.



### Chapter 2 Connect to ECU and Record Data

### 2.1 Connect ECU to laptop

**Note**: When you want to connect the ECU to laptop via EcoCAL, you must make sure you have powered on the ECU-when you power on the ECU, you can hear the noise of pump working about 5 seconds.

### 2.1.1 Communication Settings

You should select the communication mode first based on which way you use, COM or USB or CAN or Ethernet.

In default, we provide the COM RS232 cable and USB adapter, so you can use the COM or USB for communication.

#### Go to menu->Settings->Communication Settings:



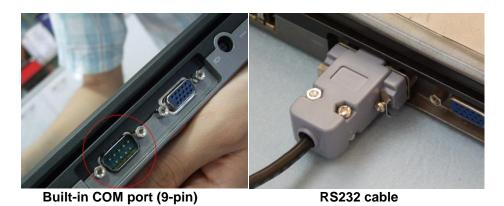
Communication Settings	X
Select the communication mode.	
	Open Device
	Close Device
	Cancel

Note: By default, EcoCAL uses USB communication mode (Note: insert the Ecotrons' USB adaptor into the laptop first for USB mode). This

configuration is consistent with most of the computers.

### 1) COM communication mode

If the user is using the **COM** mode (**Note: for this mode, your laptop need to have a built-in COM port**). Select COM and set the COM port, the default COM port is **COM1**. (**Note:** To check the computer COM port availability, see Chapter 13.2 "Failed to connect to the ECU")



The default baud rate is 115200, which the fastest of the serial comm. rate of the PC. It is not supposed to change.

Communication Settings Select the communication mode. Communication COM COM CAN CAN Select the communication CAN CAN CAN CAN	COM Settings Port Num Baud Rate 115200 -
	Open Device
	Close Device Cancel

### 2) USB communication mode

Most new computers do NOT have a built-in COM port any more. You should insert the USB adaptor (Ecotrons' USB Adaptor) to the laptop, and then select the **USB** in the communication settings window of EcoCAL.

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**Note**: We do not support the 3rd party USB-RS232 adapters, even though they might work sometime. The problem is that those consumer electronics rated USB adapters only works in a noise-free environments. This means, once the engine is running, it generates a lot of electronic magnetic noises. And those USB adapters, though looking pretty, will not stay working when you are driving. That's why we developed our own.

**Note**: Make sure the connection between laptop and USB adaptor (Serial communication cable) is **FULLY** plugged in.

Communication Settings	×
Select the communication mode.	Open Device Close Device Cancel

Choose the USB first, and then click "Open Device".

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### 3) CAN communication mode

Our customized ECU supports the CAN communication. If the ECU of the EFI system supports the CAN communication, you can use this communication mode to connect ECU.

Communication Settings	×
Select the communication mode.	CAN Settings Device Type Kvaser Device Index Kvaser EcotronsCAN Channel 1 Baud Rate 500kbs Open Device Close Device Cancel

Select the device you are using. There are two choices of Device Type in CAN Settings: EcotronsCAN and Kvaser. If you get the CAN device from Ecotrons, please choose the "EcotronsCAN", and we send the CAN device to user in default.

You also can choose "Kvaser" if you have the Kvaser device.

You need to choose the CAN device Type, Baud Rate, after finishing setting, then click "**Open Device**" to open the CAN device.

And if you don't want to use the CAN device, you also need to click "**Close Device**" to close the CAN device.



Communication Settings	<b>×</b>
Select the communication mode.	CAN Settings Device Type EcotronsCAN -
JISR	Device Index 0
CAN Line Ethernet	Channel 1
	Baud Rate 500kbs -
	Open Device
	Close Device
	Cancel

### 4) Ethernet communication mode

Our customized ECU also support the Ethernet communication, if the ECU of EFI system supports the Ethernet communication, you can use this communication mode to connect ECU.

You need to make Ethernet connect laptop with Ethernet cable, choose the Ethernet device Type, click "**Search Module**", after IP and Port appear, then click "**Open Device**" to open the Ethernet device.

And if you don't want to use the Ethernet, you also need to click "**Close Device**" to close the Ethernet device.



Communication Settings	×
Select the communication mode.	EtherNet Settings IP Address 169.254.187.28 Port 12345 Search Module
	Open Device
	Close Device
	Cancel

### 5) Open device successfully

**Note**: when you click the "Open Device", if the equipment is existed and working, the message will pop up, "Open device successfully!" Then you can connect to ECU.

	rrent config.ini	i	
Open device	successfully!		
			Ē

### 2.1.2 Connect to ECU

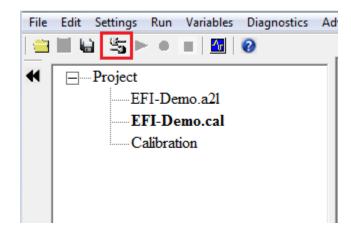
After finishing communication setting, you can try to connect ECU to laptop.



#### Go to menu->Run->Connect

File	Edit Settings	Run Variables	Diagnostics	Ad
	Connect	F5	0	
	Disconnect	Ctrl+R		- [
	Fetch from ECU			
	Burn to ECU			
	Start Measuring	F8		
	Start Recording	F9		1
	Stop Measuring	F11		
	Play Back			
_				
				_

Note: You also can use the shortcut button (<sup>11</sup>) of "Connect" to Connect to ECU



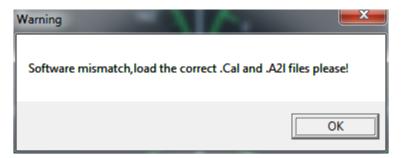
When you connect to ECU successfully, the left lower corner of window will show "Connect" in Green color.

"This calibration data set matches with the ECU's"



2017/8/22 15:35:35.26 successfully! File patt \current_config.xml 2017/8/22 15:35:33:Th successfully resolved 2017/8/22 15:35:36:Con 2017/8/22 15:35:36:Th matches with the ECU	h: C:\EcoCAL e license file is l. nnect successfully! is calibration data set	6 38 12	4 90 116 142 ECT 168
EFI basic setting Idle	controls Global fuel enri	chment Start fuel	After-start Warr
Connected	This calibration data set match	es with the ECU's	

**Note 1**: If there is a warning window popped up as below, this means the software version of A2I and CAL files you loaded doesn't match the ECU, and you need contact us to get the right files.



**Note 2**: If there is a message window popped up as below, it means the settings of Calibration data file (CAL file) is different from the ECU in, you need to "Burn to ECU", burn the CAL files you use to ECU.

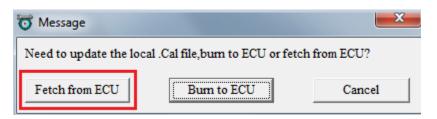
😈 Message		×
Need to update the loca	1.Cal file,burn to ECU or fetc	ch from ECU?
Fetch from ECU	Burn to ECU	Cancel

And if burn to ECU successfully, you will hear fuel pump running for a couple seconds. If not, please do again and check all of connection is right.

And if you do not have other operations, you should click "Cancel".



**Note 3**: If you want to know the settings in ECU, you also can click "Fetch from ECU", this will save one new CAL file.



Save it as to be "Fetch from ECU.CAL" file

😈 Upload						X
😋 🔵 🗢 📕 🕨 Comp	uter 🕨 Local Disk (C:) 🕨 EcoCAL			✓ <sup>€</sup> → Search EcoCA	L	Q
Organize 🔻 New fo	lder				•	?
☆ Favorites	Name	Date modified	Туре	Size		
E Desktop	\mu HelpDoc	2017/7/12 15:19	File folder			
Downloads ≡	퉬 kerneldlis	2017/7/12 15:18	File folder			
🖳 Recent Places	퉬 Picture	2017/7/12 15:18	File folder			
	퉬 record	2017/7/21 14:00	File folder			
🥃 Libraries	퉬 Uninstall	2017/7/12 15:19	File folder			
Documents	🗹 Demo.cal	2015/6/24 9:38	CAL File	17 KB		
J Music	😰 EFI-Demo.cal	2017/8/22 10:48	CAL File	17 KB		
Pictures						
🗟 Subversion 🔻						
File name Fet	ch from ECU					-
Save as type: cal	(*.cal)					•
Hide Folders				Save	Cance	4

Then, the EcoCAL will load the CAL file automatically.

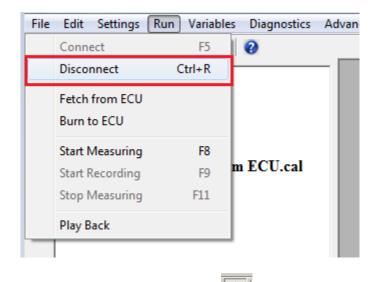
**Note:** make sure your 12V battery is healthy, before you do any "burn to ECU" or "fetch from ECU"!

During the upload or download, users are not allowed to do any operations to the EFI system.

Do not turn off the ECU power or disconnect the serial cable before the upload/download is finished.

### 2.1.3 Disconnect to ECU

Go to menu->Run->Disconnect

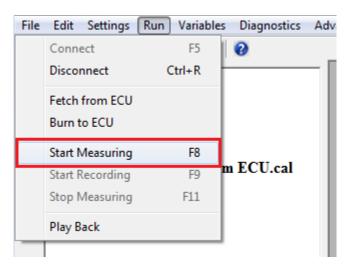


Note: You also can click the shortcut button (<sup>151</sup>) to disconnect to ECU

### 2.1.4 Start Measuring

When you connect to ECU successfully, you can measure the data of sensors' and engine running, to see the running state of engine.

### Go to menu->Run->Start Measuring



Then you can see the values of measured variables.



		gs Run Variables Diagno	stics A	dvanced Window H	slp											
• •	- Projec	at in the second se	_	<b>T</b> Calibration					• 🖾	<b>™</b>	leasurements					
		EFI-Demo.a21		+ 0.001 .	• 1	/ Selected = 1	5 0				Alias	Name	Value	Unit	Rate	
		EFI-Demo.cal		Input: Tm, [DegC], "t							Engine-start end	B StaEnd	1	Cint	100ms	
		Calibration		Output: CUR_Ns	taEnd_Tm, [R	pm],"Engine speed thresh	old for end of start				Altitude factor	fAlt	1.00		100ms	
				Tm/[DegC]		0 0 90					Start fuel factor	fFISta	1.00		100ms	
				CUR NstaEnd Tm						0	Pre-control fuel factor	fPreCtl	1.76		Svn	
					194-01 - 10						Lambda	LamWO2	1.00		Syn	
										0	Load	Ld	45.00	%	Syn	
											Predicted Load	LdPrd	45.00	%	Syn	
				Engine start end							Engine Speed	N	16383.00	Rpm	Syn	
			-								Engine-speed of byte v		15300	Rpm	100ms	
	RPM	16383.00 Rpm									Number of injections	nInj	8		Syn	
	Map	1047.70 hPa		To Calibration							Raw engine speed	Nraw	0.00	Rpm	20ms	
				+ 0.001	* 1	/ Selected = 1	50				Ambient pressure	Pam	1010.00	hPa	100ms	
	TPS	35.16 %					21.5				Intake air temperature	Ta	28	DegC	100ms	-
	ЕСТ	28 DegC		Alias	Name	Value	Unit				Fuel Pulse Width #1	tInj0	0.00	ms	Syn	
				Ringine cranking			Rpm	-			Engine temperature	Tm	28	DegC	100ms	
	AT	28 DegC		Cingine cranking	VAL_IVSIA	120	ropin				Engine temperature who Throttle Position Sense		35.16	DegC %	100ms 20ms	
	D2S	0.45 V									Battery voltage from Al		12.38	76 V	20ms 20ms	
				r							Battery voltage from Al	DC channel UDAdc	12.58	v	20ms	-
-	SPARK	3.0 CrA		Calibration												
. 1	-UELPW	0.00 ms		+ 0.001 .	* 1	/ Selected = 1	60									
		0.00 ms		Input: TmSta. [Deg0	1."break poin	ts,engine temperature at st	tart "									
						[-],"start fuel factor for col		on engine start te	np. "							
	_amWO2	1.00							<u>i</u>		_					
		8:49:Connect successfully!	*	TmSta/[DegC]	-30		-15 -10	0 10	20	30						
	2017/8/22 11:28 matches with t	8:49:This calibration data set		CUR_fCldSta_Tm	Sta 25.00	20.00 16.00 1	13.00 10.00	8.50 6.50	5.50	4.0	<u>0</u>					
		8:57:Load configuration									1					
	successfully! I	File path: E:\software\ECOCA	L							_	<u> </u>					
	V1.8.6.3 Beta1.	.0\gui.xml 9:00:Start measuring!		Start fuel factor												
		9:21:Stop measuring														
	2017/8/22 11:29	9:27:Start measuring!														
	2017/8/22 11:29	9:31:Stop measuring 9:52:Start measuring!	E													
	2017/8/22 11:25	9.52.Start measuring:														
			-													
EFI	basic setting	Servo Motor Idle contr	ols G	lobal fuel enrichment	Start fuel	After-start Warm-up F	uel Steady-State	Acceleration	Deceler	ation	Performance WOT	Altitude Calibration	Advanced	Funing for inje	ction Ad	vanced Tuning for ignitic
	Connecte	d Start measuring!				Working Page:	C:\EcoCAL\EFI-De	mo.cal								Activated

**Note**: You also can use the shortcut button (**IP**) of "Start Measuring" to measure the value of measured variables.

File	Edit	Settings	Run	Variables	Diagnostics
		1 🖳 🕨	•	- <u>-</u>	
•		Project			

#### Note: The "Start measuring" only works when connect to ECU successfully.

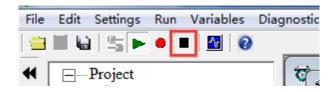
#### 2.1.5 Stop Measuring

When you finish the test and want to do other operation, for example, **read the DTC**, **or add measurement variable, burn to /fetch from ECU**, you should stop measuring first.

#### Go to menu->Run->Stop Measuring

File	Edit Settings	Run Variables	Diagr
	Connect	F5	0
	Disconnect	Ctrl+R	
	Fetch from ECU		
	Burn to ECU		
	Start Measuring	F8	
	Start Recording	F9	
	Stop Measuring	F11	
	Play Back		

**Note**: You also can use the shortcut button (**I**) of "Stop Measuring" to stop measuring.



### 2.2 Record data and Play-back

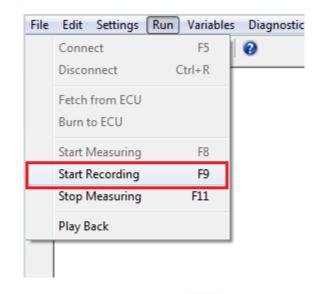
### 2.2.1 Record data

Sometimes, you need to record the data of engine running to analyze for EFI tuning, or you need us to help you on tuning, so you need to log data while do test and send us.

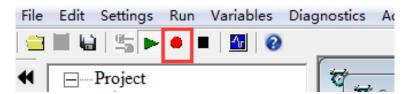
### Start Recording

After successfully to connect ECU and start measuring, you can read the values of measured variables, then you can click the "Start recording" button to record the data.

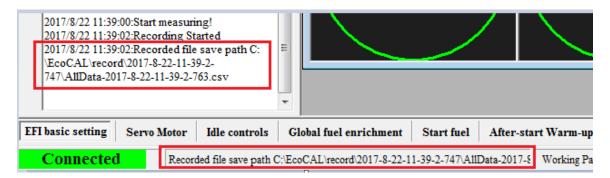
### Go to menu->Run->Start Recording



**Note**: You also can use the shortcut button (<sup>●</sup>) of "Start Recording" to record the data.



When you click down the button, EcoCAL will record the data automatically. And save the record file at the installation path of EcoCAL, "C:\EcoCAL\record", and it is named with the time of recording.



For example, the record named "2017-8-22-11-39-2-747" is the record file in record.



🔆 Favorites	<ul> <li>Name</li> </ul>			
	IName	Date modified	Туре	Siz
🧮 Desktop	2017-8-22-11-39-2-747	2017/8/22 11:39	File folder	
<ul> <li>Downloads</li> <li>Recent Places</li> <li>Libraries</li> <li>Documents</li> <li>Music</li> <li>Fictures</li> <li>Subversion</li> <li>Videos</li> </ul>	E Frror_Message.bxt	2017/7/21 14:00	Text Document	

## Note: If you need us to help you on tuning, please send the recorded files to us.

### **Stop Recording**

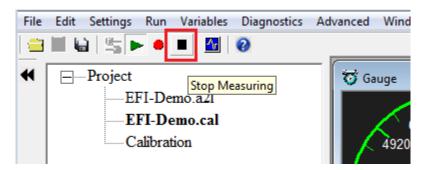
When you finish the test and want to see the record file, please stop recording first.

### Go to menu->Run->Stop Measuring

File	Edit Settings	Run Variables	Diagnostics
	Connect	F5	0
	Disconnect	Ctrl+R	
	Fetch from ECU		
	Burn to ECU		
	Start Measuring	F8	
	Start Recording	F9	
	Stop Measuring	F11	
	Play Back		

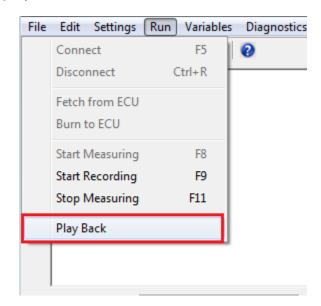


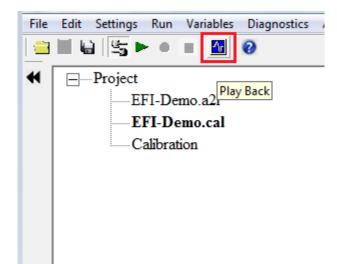
**Note**: You also can use the shortcut button (**I**) of "Stop Measuring" to stop recording.



### 2.2.2 Play-back with data analyzer

After the data files are recorded, the user can select "**Run**  $\rightarrow$  **Play Back**" or click the button to play back the data.





The play-back software, "Data Analyzer", can start as below:

File Edit Help         Open       Plot       Show Cursor       Show All Signal       Show Full Range         Variables	ECOTRONS Data Analyzer	V4.1					
	File Edit Help						
	Open Plot	Show Cursor Show All S	ignal Show Full Range			Tim	0 to 0 0
						Variables	]
acoo acoo acoo acoo acoo acoo acoo acoo	0.000 0.0	00 0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.0	00 0.0	
Active: T1[s]: T2[s]: T2-T1[s]: Working page:	Active: T1[s]:	T2[s]: T2-T1[s]:	Working page:				

Data Analyzer

### **Open Data Files**

In **Data Analyzer**, Go to "File  $\rightarrow$  open", select the data file you want to analyze:

Again, by default, your saved files are under: "...\EcoCAL\record"; where "..." is your EcoCAL installation folder, usually it is "C:\EcoCAL\record".



	ECOTRONS Data Analyzer V4.1		
	File Edit Help		
	Open Plot Show Cur	sor	
🚹 Open			×
Coordinate of the second s	cord > 2017-8-22-11-39-2-747 - 49	Search 2017-8-2	22-11-39-2-747 🔎
Organize 🔻 Ne	w folder	=	I 🕶 🔲 🔞
☆ Favorites	Name	Date modified	Туре
Nesktop	AllData-2017-8-22-11-39-2-763.csv	2017/8/22 11:39	Microsoft Excel
Downloads	E		
词 Libraries			
Documents			
Pictures			
Subversion			
📑 Videos	III		•
	File name: AllData-2017-8-22-11-39-2-763.csv -	csv(*.csv) Open	▼ Cancel



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- 5	1000													1	Current Timer		2949678-43	20m	Lines	"ouner
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														V.	Le	0	2	20mm		Lards
	1000													Π¢ Ι	Landas	- 6	2	20ma		base
3	1.25+08 -													V.	Lanlo/02	- 0	16	20m		hote
	1000													V	Last Falling Tidg	0	2949677-4	20mi		'LLD N
														V	Last Rong Edg	0	2949672-0	20m		110
3	185+03-													v	Lad Rong Edg	- 0	2949676-0	20me		1101
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	100													N I	N.S.	0	15300	20ms	<b>Fpn</b>	"might
à	46+08 -													V.	Now	0	16383.75	20mi	Rpn	Trop
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	1			114										v	Pes	0	2553 961	20m	NPa.	100.00
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### Show/Hide all signals

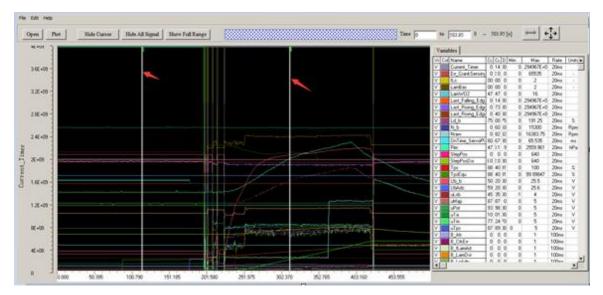
Click "show all signals / hide all signals", toggle the signal displays.

File Edit Help				
Open Plot	Show Cursor	Hide All Signal	Show Full Range	
46.403				

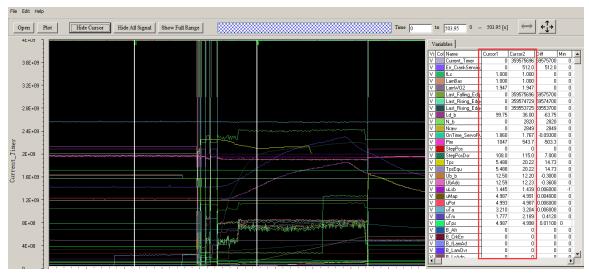
### Show/Hide Cursors

Click "show cursors / hide cursors", toggle the cursors. There are 2 cursors in the scope window. The values of all signals at the 2 cursor locations will be displayed on the right, in the variable list window:

## ECITRON

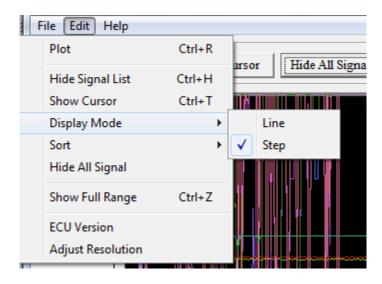


You can move the either cursor by put your mouse on it, press the mouse button and drag it to your desired location. It will show the values of all the signals at the new cursor location.



#### Line/Step curve type

Select curve type: Step / Line, to see the different curve effect. "Line" means between 2 sample points the curve is connected by a straight line. "Step" means between 2 sample points the curve is connected by a step change.



#### Zoom in/out X-axis

Input the "start time" value, and "end time" value, shown as below, to zoom in/zoom out the X-axis.

Click "show all time", to get the full time range of the data file.

You can also the mouse to zoom in the X-axis direction. Just press, drag and release.



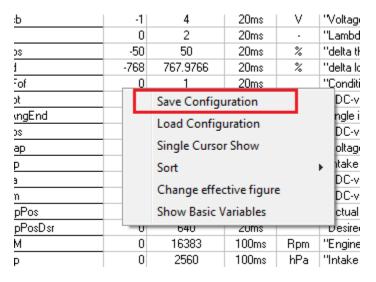
#### Zoom in/out Y-axis

Double click the "Max / Min" fields in the signal list, you can modify the max and min range of the signals, it will automatically zoom in/zoom out the Y-axis for the signals.

Vi	Col	Name	Min	Max	Rate	Units	[▲]
V		B_LcAdp	0	1	100ms		'
V		B_MapDrpErr	0	1	100ms		1
$\vee$		B_PamAdp	0	1	100ms		1
$\vee$		B_Pwf	0	1	100ms		1
$\vee$		B_StaEnd	0	1	100ms		1
V		Err_Fuel_Flag	0	255	100ms	-	1
V		fAst	0	16	100ms		1
V		fLcAd	0	2	100ms		1
V		FITrsCr	-1536	1536	100ms	%	1
V		fPreCtl	0	64	100ms		1
$\vee$		fWmp	0	2	100ms		1
V		LamDsr	0	16	100ms	-	1
V		N_61	0	15300	100ms	Rpm	1
			700	707	100	<u>.</u>	

#### Save the Data Analyzer configuration

After you spend time to zoom in/out and/or select signals, you want to save these configurations. Just right click and choose "save configuration" and store it in a configuration file. Next time you run Data Analyzer; you can open that configuration file and load all your previous settings.



You also can click the "Load Configuration" that you have saved before.



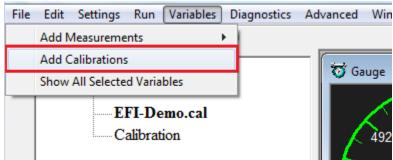
## Chapter 3 Operation for tuning

### 3.1 Add and Delete Calibration Variables

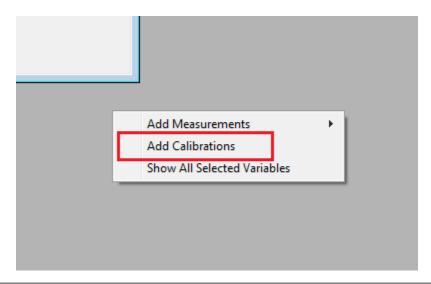
There are two types of Calibration variables window,

One calibration window is for "VAL\_XXX" and "CV\_XX" variables, and another calibration window is for "CUR\_XXX\_XXX" and "MAP\_XXX\_XXX" variables.

- 3.1.1 Add Calibration variables
- 1) Go to menu->Variables-> Add Calibrations



2) Right click on the blank area of window, click "Add Calibrations"





All calibration datas		Selected calibration datas
		Next
Name	A	
CUR_Customer_Inf		
CUR_dIgaIdc_Tm	Add >>	
CUR_dIgaIdc_Ub		
CUR_dIgaOpt_Lam		
CUR_dNRsm_Ng		
CUR_dPamPbtp_Maf		
CUR_dTaHotSta_TaOff		
CUR_dTexEstm_Tam	<< Delete	
CUR_dTmCr_dTmTa	Delete	
CTID Dutribume Drime Ten	•	,
Descriptions :		

Then, the "Add Advanced Calibrations" window wills pop-up,

Input the variable on the left side, then you can see the calibration variable, for example, "MAP\_LdTp\_Tps\_N", then click "Add" button, add it to be right side, then Click "OK", you can see the calibration window.



o Add Advanced Calibrations	X
TC 14 1	
All calibration datas MAP_1dTp_Tps_N	Selected calibration datas Next
Name MAP_LdTp_Tps_N	MAP_LdTp_Tps_N
<< Delete	
Descriptions :"characteristic map, normalized load based on TPS	and engine speed (Alpha/N model)"
	OK Cancel

0.001		1 /	Selected =		1							
		NTITY, [Rpm]								on "		
Output: R	AM_MAP_L	dTp_Tps_N, [	%],"characteri	stic map, nom	alized load ba	sed on TPS an	d engine spee	d (Alpha/N m	odel)"			
X/Y	1000.00	1500.00	1700.00	2000.00	2800.00	3600.00	4400.00	5000.00	6000.00	7000.00	8000.00	9000.00
0.0000	37.9219	36.0234	34.8984	33.4453	32.0156	31.0078	30.2578	30.0000	30.0000	30.0000	30.0000	30.0000
3.9139	37.6875	37.3125	36.9609	35.5313	34.1719	33.0000	31.5234	30.7500	30.0000	30.0000	30.0000	30.0000
6.5262	37.9922	37.9922	38.1094	37.4297	36.3516	35.1094	33.7734	32.2500	31.4531	30.3281	30.0000	30.0000
9.1324	39.3984	38.5781	39.0000	40.1953	39.9609	38.6719	37.0313	36.0000	34.2891	33.3281	32.8359	30.9844
13.0478	40.0078	40.0781	38.4844	37.5703	41.9063	40.0078	38.9063	37.8281	36.7734	36.0469	36.0000	36.0000
16.9632	41.5078	41.5078	40.9922	38.8594	44.7422	43.8281	41.9531	40.5703	39.8906	38.1563	36.9844	34.0078
20.8786	45.8906	45.8906	45.1172	46.9922	51.8672	49.1719	46.9688	45.0000	43.0078	40.7578	39.2813	38.6953
24.7925	50.7891	50.7891	49.9922	49.9922	56.2500	52.0078	52.7344	50.4609	48.1172	46.9688	44.1563	42.1406
30.6168	61.6875	61.0078	60.3047	60.0469	70.1250	60.7734	58.8984	55.8984	53.1328	51.5859	50.6016	49.9922
38.1454	75.9609	74.8594	73.7578	72.6563	85.1719	74.4609	71.3438	69.2109	67.9688	66.2578	65.0156	64.0078
45.6711	92.0859	92.0859	92.0859	95.0859	103.0078	102.0234	96.3047	94.3828	91.7109	88.8750	83.8594	76.9922
52.1927	103.0078	103.0078	103.0078	103.9922	103.9922	103.9922	103.9922	103.0078	101.1094	98.8828	96.9609	91.0078
58.7158	111.0000	111.0000	112.0078	112.0078	112.9922	109.9922	109.9922	110.0391	109.9453	108.8203	106.1250	100.0078
65.2420	118.9922	118.9922	118.9922	119.0859	120.0000	119.2969	118.8047	117.9141	116.2969	113.4844	108.5859	104.5313
78.2898	132.4922	132.4922	132.4922	132.4922	130.1016	129.3281	128.1328	127.1484	126.1406	124.4297	122.4844	117.7969
99.9939	139.9922	139.9922	139.9922	139.9922	139.9922	139.9922	139.9922	139.9922	139.9922	139.2422	135.0000	130.8047

**Note:** Above method is to add new calibration window, if you want to add the calibration variables at the current calibration window, please use following method.



#### Right click on the calibration window, and then click "Add Calibrations"

0.001	- *	1 /	Selected =		1						
put-X: NO	INPUT_QUA	NTITY, [Rpm]	,"break point,	engine speed	" Input-	Y: TpsEqu, [%],"input <tpsequ< td=""><td>ı&gt;, break points,</td><td>throttle positi</td><td>on "</td><td></td><td></td></tpsequ<>	ı>, break points,	throttle positi	on "		
Output: R	AM_MAP_L	dTp_Tps_N, [	%],"characteri	stic map, nom	n <b>alized lo</b> a	d based on TPS and engine sp	eed (Alpha/N m	ođel)"			
X/Y	1000.00	1500.00	1700.00	2000.00	28(		5000.00	6000.00	7000.00	8000.00	9000.00
0.0000	37.9219	36.0234	34,8984	33,4453	32.	Add Calibrations	30.0000	30.0000	30.0000	30.0000	30.0000
3.9139	37.6875	37.3125	36,9609	35,5313	34.	Delete	30,7500	30.0000	30.0000	30.0000	30.0000
6.5262	37.9922	37.9922	38,1094	37.4297	36.	Incorect	32.2500	31,4531	30.3281	30.0000	30.0000
9.1324	39.3984	38,5781	39.0000	40.1953	39.	Import	36.0000	34.2891	33.3281	32.8359	30.9844
13.0478	40.0078	40.0781	38,4844	37,5703	41.	Export	37.8281	36,7734	36.0469	36.0000	36.0000
16.9632	41,5078	41,5078	40,9922	38,8594	44.	Сору	40,5703	39,8906	38.1563	36,9844	34.0078
20.8786	45,8906	45,8906	45.1172	46.9922	51.	Paste	45,0000	43.0078	40,7578	39.2813	38.6953
24,7925	50,7891	50,7891	49,9922	49,9922	56.	Smooth Cells	50,4609	48.1172	46,9688	44,1563	42.1406
30.6168	61.6875	61.0078	60,3047	60.0469	70.		55,8984	53,1328	51,5859	50,6016	49,9922
38,1454	75,9609	74,8594	73,7578	72.6563	85.	Change Alias	69.2109	67,9688	66.2578	65.0156	64.0078
45.6711	92.0859	92.0859	92.0859	95.0859	103	Decimals Display	94.3828	91.7109	88.8750	83.8594	76.9922
52.1927	103.0078	103.0078	103.0078	103.9922	103	2D View	103.0078	101.1094	98.8828	96.9609	91.0078
58.7158	111.0000	111.0000	112.0078	112.0078	112	3D View	110.0391	109.9453	108.8203	106.1250	100.007
65.2420	118.9922	118.9922	118.9922	119.0859	120	Fit Window	117.9141	116.2969	113.4844	108.5859	104.531
78.2898	132.4922	132.4922	132.4922	132.4922	130	Fit Grid	127.1484	126.1406	124.4297	122.4844	117.796
99.9939	139.9922	139.9922	139.9922	139.9922	139	in one	139.9922	139.9922	139.2422	135.0000	130.804
	r					Variable Properties					
PS based l	oad mapping					Window Properties					

of Add Advanced Calibrations で 1点 智			
All calibration datas		Selected calibration datas	Next
Name         CUR_Customer_Inf         CUR_dIgaIdc_Tm         CUR_dIgaIdc_Ub         CUR_dIgaOpt_Lam         CUR_dNRsm_Ng         CUR_dPamPbtp_Maf         CUR_dTaHotSta_TaOff         CUR_dTexEstm_Tam         CUR_dTmCr_dTmTa         CUR_Dutt/PumpPrime_Trm	Add>>	MAP_LdTp_Tps_N	
Descriptions :		OK	Cancel

Then, use the same method to add the calibration variables.



If you want to add the "VAL\_XXX" and "CV\_XX" variables, please right click on the corresponding window to add the calibration variables.

🔯 Calibration				_ • •							
+ 0.001 - *	1 / Sele	ected = 1	5 0								
Data: VAL_vEng,[cc],"volume of engine displacement in cc or mL "											
Alias	Alias Name Value Unit										
🕜 # of cylinders	VAL_CylNum	1	-								
🕜 MAX RPM	VAL_Nmax	8600.00	Rpm								
Cylinder displacement	VAL_vEng	60.01	Add Calibrations Delete Change Alias Decimals Display Hide Alias Column Variable Properties Window Properties								

Ø	Calibration						
+	0.001 _	* 1 ,	/ Selec	ted = 1 🦘	1		
Dat	ta: CV_SSWO2,[	[-],"code variant	, sensor sigr	nal MAP "			
	Alias	Name	Value		Unit		
0	CV_LSB	CV_LSB	0		-		
0	CV_SSWO2	CV_SSWO2	1		-		
				Add Calibr Delete Change Alia Decimals D Hide Alias Variable Pr Window Pr	as visplay Column roperties		

#### 3.1.2 Delete Calibration variables

1) Right click on the current window; you can click "Delete" to delete the calibration variables. Or click "Add", pop-up the "Add Calibrations" window, to delete the calibration variables that you have added it once.



🔯 Calibration													×
+ 0.001 - +	- 1	/ Sel	lected = 1										
Input: TmSta, [DegC],"1	break point			at start "									
Output: CUR_fCldS					, dependen	t on engine	start temp	."					
TmSta/[DegC] CUR_fCldSta_TmSta	-30.00 10.00	-20.00 9.00	-10.00 7.50	0.00	10.00 4.25	20.00 3.00	25.00 2.00	30.00 1.50	35.00 1.50	40.00 1.25	55.00 1.00	70.00	
COR_ICIUSta_TINSta	4.2.5		alibration		1.50	1.25	1.00	1.00					
		Delete											
						Impo	rt						
						Expor	t						
						Сору							
General Com						Paste							
Start fuel factor						Smoo	th Cells						
						Chang	ge Alias						
							, nals Displa	ау					
						2D Vie							
						3D Vie	ew						
						Fit Wi	ndow						
						Fit Gri	d						
						Varial	ole Prope	rties	- 100				
							ow Prope						
							our rope		_				
					L_								
Calibration													
Calibration	• 1	/ Se	lected = 1										
+ 0.001 - +	_		lected = 1	at start "									
+ 0.001	break point	s,engine te	mperature :	at start "		it on engine	e start temp	). "					
+ 0.001	break point ta_TmSta,	s,engine te [-],"start fu	emperature : iel factor for	at start " r cold start	t, dependen							]	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00	25.00	30.00	35.00	40.00	55.00	70.00	
+ 0.001	break point ta_TmSta,	s,engine te [-],"start fu	emperature : iel factor for	at start " r cold start	t, dependen	20.00 3.00	25.00 2.00	30.00 1.50	35.00	40.00	55.00	]	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add 0	25.00 2.00 Calibration	30.00 1.50				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add 0 Delete	25.00 2.00 Calibration	30.00 1.50				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add 0	25.00 2.00 Calibration	30.00 1.50				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add 0 Delete Impo Export	25.00 2.00 Calibration e rt	30.00 1.50				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add C Delete Impo Expor	25.00 2.00 Calibration e rt rt	30.00 1.50				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add C Delete Impo Export Copy Paste	25.00 2.00 Calibration e rt rt	30.00 1.50				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add C Delete Impo Export Copy Paste	25.00 2.00 Calibration e rt rt	30.00 1.50				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add C Delete Impo Expor Copy Paste Smoo	25.00 2.00 Calibration e rt rt	30.00 1.50				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add C Delete Impo Expor Copy Paste Smoc Chang	25.00 2.00 Calibration e rt t t	30.00 1.50 ns				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add C Delete Impo Expor Copy Paste Smoc Chang	25.00 2.00 Calibration e rt rt t t t t t cells ge Alias pals Displ	30.00 1.50 ns				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add C Delete Impo Expor Copy Paste Smoo Chang Decin	25.00 2.00 Calibration e rt t t t t t t t t t t t t t t t t t	30.00 1.50 ns				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add C Delet Impo Expor Copy Paste Smoo Chan; Decin 2D Vi	25.00 2.00 Calibration e rt t t t t t t t t t t t t t t t t t	30.00 1.50 ns				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add C Delet Impo Expor Copy Paste Smoc Chan, Decin 2D Vi 3D Vi	25.00 2.00 Calibration e rt rt rt ge Alias ge Alias bals Displ ew ew ew ew	30.00 1.50 ns				70.00	
+ 0.001	break point ta_TmSta, -30.00	s,engine te [-],"start fu -20.00	emperature a tel factor for -10.00	at start " r cold start 0.00	t, dependen	20.00 3.00 Add C Delete Impo Export Copy Paste Smoc Chang Decin 2D Vi 3D Vi Fit Wi Fit Gr	25.00 2.00 Calibration e rt rt rt ge Alias ge Alias bals Displ ew ew ew ew	30.00 1.50 ns				70.00	

Click the calibration variable which one do you want to delete, then click "Delete" button, then click "OK"



°C 1 🕰	
All calibration datas	Selected calibration datas
	Next
Name	CUR_fCldSta_TmSta
CUR_Customer_Inf	Add >>
CUR_dIgaIdc_Tm	Add
CUR_dIgaIdc_Ub	
CUR_dIgaOpt_Lam CUR_dNRsm_Ng	
CUR dPamPbtp Maf	
CUR_dTaHotSta_TaOff	
CUR_dTexEstm_Tam	
CUR dTmCr dTmTa	<< Delete
CITD fAst TenSta	* L
Descriptions :"input <bp_fast_tmsta>, f</bp_fast_tmsta>	actor for ign. sync. decreasing of afterstart enrichment at cold start r
	OK Cancel

Choose the calibration variable that you want to delete, right click, then click "Delete", it will delete the variable directly.

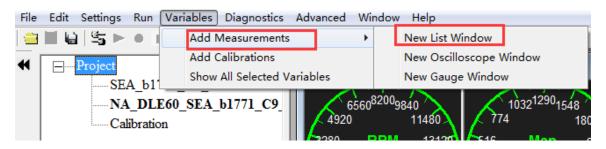
ø	Calibration					- • •
+	0.001 _ *	1 / Sele	ected = 1	50		
Da	ta: VAL_vEng,[cc],"volu	me of engine displ	lacement in co	ormL"		
	Alias	Name	Value		Unit	
0	# of cylinders	VAL_CylNum	1		-	
0	MAX RPM	VAL_Nmax	8600.00		Rpm	
0	Cylinder displacement	VAL_vEng	60.01			
				Delete Change Decimal Hide Ali Variable	librations Alias ls Display as Column e Properties / Properties	

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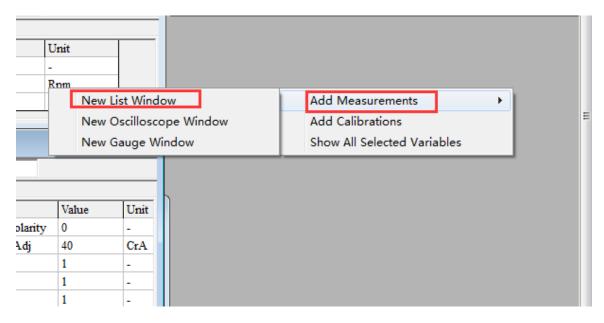
### 3.2 Add and Delete Measured Variables

#### 3.2.1 Add Measured variables

#### 1) Go to menu->Variables-> Add Measurements



#### 2) Right click on the blank area of window, click "Add Measurements"



Then, the "Add Measurements" window wills pop-up,



Add Measurements		1 · 31 ·	-			<b>—</b> ×
	Search					Search
Accum fLc S32 Accumulator_SSTM2 AccumulatorEnable FIRSM	<b>^</b>	Add To Syn >>	Name		Rate	
Acl ALM_Lambda_FromCAN ALM_IsuDTC_FromCAN		Add To 20ms >>				
ALM_IsuHtDtcy_FromCAN ALM_IsuO2_FromCAN ALM_IsuTemp_FromCAN B_2ndFuelSw B_Acl		Add To 100ms >>				
B_ACIEnr B_Afr B_AfrIni	-	<< Delete				
A11:918		Syn :0	20ms :0	100ms :0	OK	Cancel

Input the variable on the left side, then you can see the measured variable, for example, "UbAdc", then click "Add to 100ms" button, add it to be right side, and then click "OK", you can see the measured window.

Note: You also can add the variables to be "Syn", "20ms", this means the display frequency.

ibadc	Search			Search
UbAdc	*	Add To Syn >>	Name	Rate
UbAdc_b UbAdcIni			OnTime_ServoPWM_In	20ms
Baro			Pam	100ms
JD_B_PWPumpPrimeEn		Add To 20ms >>	Ta	100ms
JD_B_WmpEnd			Tm	100ms
JD_Cnt_1s		Add To 100ms >>	Tps	20ms
JD_CSIMM_Ld JD_CSIMM_Ld1		Add to tooms >>	UbAdc	20ms
JD CSIMM Ld2			uTps	20ms
JD CSIMM Map2				
D_CSLDP_LdPrd	*	<< Delete		
UD_CSIMM_Map2 UD_CSIMM_PimMod UD_CSIMM_Pmap UD_CSLDP_LdPrd	-	<< Delete		

Here, we also add some other variables as example.



**Note:** Above method is to add new measured variables window, if you want to add the measured variables at the current Selected Variables window, please use following method.

# Right click on the Selected Variables window, and then click "Add Measurements".

Ambient pressure     Pam     hPa     100ms       Intake air temperature     Ta     DegC     100ms       ingine temperature     Tm     DegC     100ms       Throttle Position Sensor     Tps     %     20ms       Battery voltage from ADC channel     UbAdc     Add Measurements     20ms	lias	Name		Value	Unit	Rate
ntake air temperature Ta DegC 100ms Engine temperature Tm DegC 100ms Chrottle Position Sensor Tps % 20ms Battery voltage from ADC channel UbAdc 4dd Measurements 20ms Change Alias Hide Alias Column Variable properties	OnTime_ServoPWM_In	OnTime_Ser	voPWM_In		ms	20ms
Engine temperature     Tm     DegC     100ms       Chrottle Position Sensor     Tps     %     20ms       Battery voltage from ADC channel     UbAdc     Add Measurements     20ms       CPS sensor voltage     uTps     Change Alias     20ms       Hide Alias Column     Variable properties     Variable properties	Ambient pressure	Pam			hPa	100ms
Throttle Position Sensor     Tps     %     20ms       Battery voltage from ADC channel     UbAdc     Add Measurements     20ms       CPS sensor voltage     uTps     Change Alias     20ms       Hide Alias Column     Variable properties     Variable properties	Intake air temperature	Ta			DegC	100ms
Battery voltage from ADC channel UbAdc 20ms CPS sensor voltage uTps Change Alias Hide Alias Column Variable properties	Engine temperature	Tm			DegC	100ms
Battery voltage from ADC channel UbAdc 20ms 20ms 20ms 20ms 20ms 20ms 20ms 20ms 20ms	Throttle Position Sensor	Tps			%	20ms
IPS sensor voltage     u1ps     20ms       Change Alias     Hide Alias Column       Variable properties	Battery voltage from ADC channel					20ms
Hide Alias Column Variable properties	TPS sensor voltage	uTps				20ms
Variable properties			Change	Alias		
			Hide Ali	as Column		
Window Properties			Variable	e properties		
			Window	Properties		
		L				

Then you can see all of the variables that you have chosen, and then you can add the new measure variables as you want by using the above method.



	Search				Search
Accum fLc S32	<u> </u>	Add To Syn>>	Name	Rate	
Accumulator_SSTM2 AccumulatorEnable FIRSM			OnTime_ServoPWM_In	20ms	
Acl			Pam	100ms	
ALM_Lambda_FromCAN		Add To 20ms >>	Та	100ms	
ALM_1suDTC_FromCAN			Tm	100ms	
ALM_IsuHtDtcy_FromCAN		Add To 100ms >>	Tps	20ms	
ALM_1suO2_FromCAN ALM_1suTemp_FromCAN		1100 10 100003 >>>	UbAdc	20ms	
B 2ndFuelSw			uTps	20ms	
B_Acl					
3_ActEnr					
B_Afr					
B_AfrIni	Ψ.	<< Delete			

#### 3.2.2 Delete Measured variables

1) Right click on the Selected Variables, choose "Add Measurements", and then delete the variables those you want.

hrottle Position Sensor     Tps     %     20ms       attery voltage from ADC channel     UbAdc     20ms     20ms	lias	Name		Value	Unit	Rate
take air temperature Ta DegC 100ms agine temperature Tm DegC 100ms mottle Position Sensor Tps % 20ms tttery voltage from ADC channel UbAdc 20ms S sensor voltage uTps Change Alias Hide Alias Column Variable properties	nTime_ServoPWM_In	OnTime_ServoP	WM_In		ms	20ms
gine temperature Tm DegC 100ms rottle Position Sensor Tps % 20ms ttery voltage from ADC channel UbAdc Add Measurements 20ms S sensor voltage uTps Change Alias Hide Alias Column Variable properties	ibient pressure	Pam			hPa	100ms
Arrottle Position Sensor Tps % 20ms Attery voltage from ADC channel UbAdc 20ms 20ms 20ms 20ms 20ms 20ms 20ms 20ms 20ms 20ms 20ms 20ms 20ms	take air temperature	Ta			DegC	100ms
Battery voltage from ADC channel UbAdc Add Measurements 20ms 20ms 20ms 20ms 20ms 20ms 20ms 20m	Engine temperature	Tm			DegC	100ms
Add Measurements     20ms       TPS sensor voltage     uTps     Change Alias       Hide Alias Column     Variable properties	Throttle Position Sensor	Tps			%	20ms
IPS sensor voltage     u1ps     20ms       Change Alias     Hide Alias Column     Variable properties	Battery voltage from ADC channel	UbAdc				20ms
Hide Alias Column Variable properties	TPS sensor voltage	uTps				20ms
Variable properties			Change	Alias		
			Hide Ali	as Column		
			Variable	e properties		
thindow respected						
				- Toperaco		



o Add Measurements		_	-	
	Search			Search
Accum_fLc_S32	•	Add To Syn >>	Name	Rate
Accumulator_SSTM2 AccumulatorEnable FIRSM			OnTime_ServoPWM_In	20ms
Acl			Pam	100ms
ALM_Lambda_FromCAN		Add To 20ms >>	Ta	100ms
ALM_1suDTC_FromCAN			Tm	100ms
ALM_1suHtDtcy_FromCAN		Add To 100ms >>	Tps	20ms
ALM_1suO2_FromCAN ALM_1suTemp_FromCAN			UbAdc	20ms
B 2ndFuelSw			uTps	20ms
B_Act				
B_ActEnr				
B_Afr B_AfrIni	-			
JB_Amm	•	<< Delete		
A11 :918		Syn :0	20ms :4 100ms :3	OK Cancel

#### 2) Go to menu->Variables-> Show All Selected Variables

<b>v</b> -		. 1.0.0.0													-	_	_
File	Edit	Settings	Run	Vari	ables	Diagnostics	Adv	anced	Wind	dow H	elp						
🗃		1 5 0	6		Add N	Measurement	s		+								
•		Project			-	Calibrations										• 🔀	
		SE.	А_61		Show	All Selected	Variab	les	_	*	1 /	Select	ed = 1				
		NA	_DLI	E60_	SEA_	b1771_41	Inpu	it: Tm, [D	egC]	"break p	oints, eng	ine tempera	ature "				
		Cal	ibratio	on			0	Output: C	UR_1	VstaEnd_	_Tm, [Rpn	ı],"Engine s	peed thres	hold for e	end of start		
									[Deg(		-30.00		90.00				
							·	alibratio			1200	1200	1200				
	4						+	0.001	-	*	1 /	Selecte	ed = 1				

Or right click on the blank of window, then choose "Show All Selected Variables"



A window will pop-up, all of the selected measured variables showing are there, then you can find out the variable that you want to delete, and then delete it.

**Note**: if you add one variable in all of the layers, this way will delete the measured variable in all layers.

		Search	
Name	Rate	*	Syn :19
B_Fof	20ms	=	- )
B_Id1	100ms		
B_LamOvr	100ms		20ms :18
B_LdPrd	100ms		
B_StaEnd	100ms		100
B_Wot	100ms		100ms :29
dLd	20ms		
dTps	20ms		
ECT	100ms		Delete >>
fAlt	100ms		
fAst	100ms	-	

### 3.3 Change Calibrations (Tuning)

Calibration variables are 3 types: Values, Curves and Maps. The labels start with the prefix so you can tell immediately. VAL\_ means it's a calibration value. CUR\_ means it is a curve with one input. MAP\_ means it is a map with 2 inputs.

#### 3.3.1 Change the value directly

1) Double click the value cell that you want to modify,



<u> </u>	Calibration	1 / Sele	ected = 1	50		
Dat	a: VAL_vEng,[cc],"volu	me of engine disp	lacement in	cc or mL "		
	Alias	Name	Value		Unit	
0	# of cylinders	VAL_CylNum	1		-	
0	MAX RPM	VAL_Nmax	8600.00		Rpm	
0	Cylinder displacement	VAL_vEng	60.01		cc	
I						

🔯 Calibration												. • <b>x</b>	
+ 0.001 - *	1	/ Sel	ected = 1	•	1								
Input: TmSta, [DegC],"b	reak point	s,engine te	mperature a	at start "									
Output: CUR_fCldSt	a_TmSta, [	-],"start fu	el factor for	cold start,	depende	nt on engin	e start temp	o. "					
						1							
TmSta/[DegC]	TmSta/[DegC]         -30.00         -20.00         -10.00         0.00         10.00         20.00         25.00         30.00         35.00         40.00         55.00         70.00												
CUR_fCldSta_TmSta	10.00	9.00	7.50	6.00	4.25	3.00	2.00	1.50	1.50	1.25	1.00	1.00	
Start fuel factor													

put-X: Pim, Output: R.						-					-	, [repul], i	mput <tv,< th=""><th>, oreak po</th><th>int, engin</th><th>e speed, i</th></tv,<>	, oreak po	int, engin	e speed, i
Jourpuiru			PLANE D			, , , , , , , , , , , , , , , , , , ,	acpende	n on pros	Juituna	-inguite op						
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	700.00	750.00	800.00	850.00	900.00	970.00	1050.00
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63	0.66	0.68	0.68	0.68	0.65	0.63	0.62	0.61
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65	0.67	0.69	0.69	0.68	0.66	0.64	0.62	0.61
1650.00	0.47	0.48	0.51	0.55	0.57	0.58	0.64	0.65	0.69	0.70	0.70	0.68	0.67	0.66	0.64	0.62
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	0.65	0.66	0.69	0.72	0.72	0.69	0.68	0.67	0.65	0.63
2500.00	0.49	0.50	0.52	0.56	0.59	0.62	0.66	0.68	0.72	0.75	0.74	0.72	0.70	0.69	0.66	0.65
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	0.67	0.70	0.75	0.78	0.77	0.75	0.73	0.72	0.71	0.69
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	0.70	0.74	0.78	0.81	0.80	0.77	0.76	0.75	0.72	0.71
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.76	0.82	0.85	0.83	0.82	0.81	0.80	0.76	0.75
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81	0.86	0.89	0.87	0.84	0.84	0.82	0.80	0.78
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85	0.89	0.91	0.89	0.87	0.87	0.86	0.84	0.83
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86	0.89	0.91	0.89	0.87	0.87	0.86	0.86	0.83
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86	0.89	0.91	0.89	0.87	0.87	0.86	0.86	0.83

### 2) Input the value that you want



<u> </u>	Calibration	1 / Sele	cted = 1	7 1		
Dat	a: VAL_vEng,[cc],"volu	me of engine displ	acement in cc or m	īL "		
	Alias	Name	Value	Unit	t	
0	# of cylinders	VAL_CylNum	1	-		
0	MAX RPM	VAL_Nmax	8600.00	Rpm	1	
0	Cylinder displacement	VAL_vEng	120	cc		

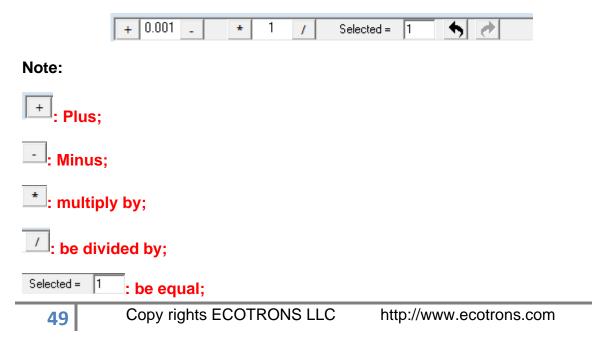
Press Enter to finish it. The modified data will show as "red" color.

ø	Calibration				- • <b>•</b>
+	0.001 _ *	1 / Selec	cted = 1 🔸 🥐		
Dat	a: VAL_vEng,[cc],"volu	me of engine displa	acement in cc or mL "		
	Alias	Name	Value	Unit	
0	# of cylinders	VAL_CylNum	1	-	
0	MAX RPM	VAL_Nmax	8600.00	Rpm	
0	Cylinder displacement	VAL_vEng	120.00	cc	

Note: This method applies to break points, too.

#### 3.3.2 Change the value with Formula

EcoCAL supports to use Formula to modify the calibration data.



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## 🕈 : Undo;



#### 1) Plus and Minus

You can input the value that you want to increase or decrease, and then choose the cell or area of table you want to change

Click the Plus or Minus button to change the value.

#### For example:

Input 0.1 in the box

If you want to change one cell, click cell to choose it.

🗑 Calibratic	on									
+ 0.1	- *	- 1	1	Selected =	1	5 (	•			
Input-X: Pim,	[hPa],"inp	out <map></map>	, break po	oint, manif	old absol	ute pressi	ire, for Vo	lumatric E	fficiency	fac
😧 Output: R.	AM_MAI	P_fVe_Ma	ap_N, [-],"	Factor Vo	lumatric I	Efficiency,	, depende	nt on pres	sure and	enş
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	1
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63	0.66	
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65	0.67	
1650.00	0.47	0.48	0.51	0.55	0.57	0.58	0.64	0.65	0.69	
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	0.65	0.66	0.69	
2500.00	0.49	0.50	0.52	0.56	0.59	0.62	0.66	0.68	0.72	
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	0.67	0.70	0.75	
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	0.70	0.74	0.78	
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.76	0.82	
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81	0.86	
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85	0.89	
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86	0.89	
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86	0.89	

If you want to increase value by 0.1 step based on the stock value, please click the "++" button.

🕇 Calibratic	on										
<del>+</del> 0.1	- *	• 1	1	Selected =	1	•	•				
nput-X: Pim,	[hPa],"inp	out <map></map>	, break po	int, manif	old absolu	ute pressu	ire, for Vo	lumatric E	fficiency	factor"	Inpu
🕖 Output: R.	AM_MAF	_fVe_Ma	вр_N, [-],"	Factor Vo	olumatric I	efficiency,	depende	nt on pres	sure and	engine sp	eed"
Х/Ү	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	700.00	750
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63	0.66	0.68	0.
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65	0.67	0.69	0.
1650.00	0.47	0.58	0.51	0.55	0.57	0.58	0.64	0.65	0.69	0.70	0.
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	0.65	0.66	0.69	0.72	0.
2500.00	0.49	0.50	0.52	0.56	0.59	0.62	0.66	0.68	0.72	0.75	0.
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	0.67	0.70	0.75	0.78	0.
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	0.70	0.74	0.78	0.81	0.
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.76	0.82	0.85	0.
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81	0.86	0.89	0.
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85	0.89	0.91	0.
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86	0.89	0.91	0.
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86	0.89	0.91	0.

And if you want to decrease the value, click" -" button

😽 Calibratio	on								
+ 0.1	- *	1	1	Selected =	1	•	•		
Input-X: Pim,	[hPa],"inp	ut <map></map>	, break po	oint, manif	old absolu	ute pressu	ire, for Vo	lumatric E	fficiency f
Output: R	AM_MAI	_fVe_Ma	ap_N, [-],"	Factor Vo	lumatric I	fficiency,	depende	nt on pres	sure and e
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63	0.66
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65	0.67
1650.00	0.47	0.58	0.51	0.55	0.57	0.58	0.64	0.65	0.69
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	0.65	0.66	0.69
2500.00	0.49	0.50	0.52	0.56	0.59	0.62	0.66	0.68	0.72
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	0.67	0.70	0.75
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	0.70	0.74	0.78
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.76	0.82
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81	0.86
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85	0.89
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86	0.89
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86	0.89



- 0.1 [	- *	1	1	Selected =	1	50	•			
put-X: Pim,	[hPal."inp	 ut <map></map>	break po	int. manif	old absolu	ite pressu	ure, for Vo	lumatric F	fficiency	factor"
Output: R		-	-			-				
			17.01.10			,				
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	700.00
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63	0.66	0.68
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65	0.67	0.69
1650.00	0.47	0.58	0.51	0.55	0.47	0.58	0.64	0.65	0.69	0.70
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	0.65	0.66	0.69	0.72
2500.00	0.49	0.50	0.52	0.56	0.59	0.62	0.66	0.68	0.72	0.75
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	0.67	0.70	0.75	0.78
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	0.70	0.74	0.78	0.81
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.76	0.82	0.85
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81	0.86	0.89
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85	0.89	0.91
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86	0.89	0.91
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86	0.89	0.91

Note: You also can tune more than one cell together by using the buttons.

Choose the area of cells, then click + or - button.

🝯 Calibratic	on							
+ 0.1	- *	• 1	1	Selected =	1	•	•	
Input-X: Pim,	[hPa],"inp	out <map></map>	, break po	int, manif	old absol	ute pressi	ıre, for Vo	lumatric I
Output: R	AM_MAI	_fVe_Ma	ap_N, [-],"	Factor Vo	lumatric I	efficiency,	depende	nt on pre
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65
1650.00	0.47	0.58	0.51	0.55	0.47	0.58	0.64	0.65
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	0.65	0.66
2500.00	0.49	0.50	0.52	0.56	0.59	0.62	0.66	0.68
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	0.67	0.70
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	0.70	0.74
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.76
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86

<b>∓</b> ] 0.1	- *	• 1	1	Selected =	1	- ♠ - ₹	•	
iput-X: Pim,	[hPa],"inp	ut <map></map>	, break po	oint, manif	old absolu	ute pressu	ire, for Vo	lumatric
Output: R	AM_MAI	_fVe_Ma	ap_N, [-],"	Factor Vo	lumatric I	efficiency,	depende	nt on pr
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65
1650.00	0.47	0.68	0.61	0.65	0.47	0.58	0.64	0.65
2000.00	0.48	0.59	0.61	0.65	0.58	0.59	0.65	0.66
2500.00	0.49	0.60	0.62	0.66	0.59	0.62	0.66	0.68
3000.00	0.50	0.61	0.63	0.66	0.60	0.63	0.67	0.70
3800.00	0.51	0.62	0.65	0.68	0.61	0.67	0.70	0.74
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.76
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86

### 2) Multiply and divided by

n						
	* 1.2	1	Selected =	1	◆ ₹	•
[hPa],"m	put <map></map>	, break po	oint, manif	old absolu	ute pressu	ire, for Vo
AM_MA	P_fVe_Ma	ıp_N, [-],"	Factor Vo	lumatric I	Efficiency,	depender
300.00	350.00	400.00	430.00	460.00	500.00	550.00
0.46	0.47	0.51	0.55	0.57	0.58	0.63
0.46	0.47	0.51	0.55	0.57	0.58	0.63
	[hPa],"in AM_MA 300.00 0.46	*         1.2           [hPa],"input <map>           AM_MAP_fVe_Ma           300.00         350.00           0.46         0.47</map>	*         1.2         /           [hPa],"input <map>, break po           AM_MAP_fVe_Map_N, [-],"           300.00         350.00         400.00           0.46         0.47         0.51</map>	*         1.2         /         Selected =           [hPa],"input <map>, break point, manif           AM_MAP_fVe_Map_N, [-],"Factor Vo           300.00         350.00         400.00         430.00           0.46         0.47         0.51         0.55</map>	*         1.2         /         Selected =         1           [hPa],"mput <map>, break point, manifold absolution         Map_N, [-],"Factor Volumatric E           300.00         350.00         400.00         430.00         460.00           0.46         0.47         0.51         0.55         0.57</map>	*       1.2       /       Selected =       1       •       •         [hPa],"input <map>, break point, manifold absolute pressure         AM_MAP_fVe_Map_N, [-],"Factor Volumatric Efficiency,         300.00       350.00       400.00       430.00       460.00       500.00         0.46       0.47       0.51       0.55       0.57       0.58</map>

This is the same to the Plus or Minus function, it is to multiply or divided by the factor that you input.

#### 3) Be equal

This is used to change the value of cell to be one constant value.

Choose the cell or area of cells you want to change, and then input the value which you want in the box, then press the Enter button of keyboard to finish it.

Calibratio	on														
- 0.1	- *	1.2	1	Selected =	0.8	- <b>*</b> - <b>(</b>	•								
put-X: Pim,	[hPa],"inp	ut <map></map>	, break po	int, manif	old absol	ute pressu	ire, for Vo	lumatric H	fficiency	factor"	Input-Y: N	I, [Rpm],"	input <n></n>	, break po	int, engi
Output: R	AM_MAH	_fVe_Ma	ap_N, [-],"	Factor Vo	lumatric I	Efficiency,	, depende	nt on pres	sure and	engine sp	eed"				
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	700.00	750.00	800.00	850.00	900.00	970.00
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63	0.66	0.68	0.68	0.68	0.65	0.63	0.62
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65	0.67	0.69	0.69	0.68	0.66	0.64	0.62
1650.00	0.47	0.48	0.51	0.55	0.57	0.58	0.64	0.65	0.69	0.70	0.70	0.68	0.67	0.66	0.64
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	0.65	0.66	0.69	0.72	0.72	0.69	0.68	0.67	0.65
2500.00	0.49	0.50	0.52	0.56	0.59	0.62	0.66	0.68	0.72	0.75	0.74	0.72	0.70	0.69	0.66
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	0.67	0.70	0.75	0.78	0.77	0.75	0.73	0.72	0.71
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	0.70	0.74	0.78	0.81	0.80	0.77	0.76	0.75	0.72
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.76	0.82	0.85	0.83	0.82	0.81	0.80	0.76
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81	0.86	0.89	0.87	0.84	0.84	0.82	0.80
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85	0.89	0.91	0.89	0.87	0.87	0.86	0.84
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86	0.89	0.91	0.89	0.87	0.87	0.86	0.86
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86	0.89	0.91	0.89	0.87	0.87	0.86	0.86

-														
+ 0.1	- *	1.2	1	Selected =	0.8	- <b>5</b> - C	*							
nput-X: Pim,	[hPa],"inp	ut <map></map>	, break po	int, manif	old absolu	ute pressu	ire, for Vo	lumatric E	fficiency	factor" l	nput-Y: N	l, [Rpm],"i	input <n></n>	, break p
Output: R	AM_MAI	_fVe_Ma	ıp_N, [-],"	Factor Vo	lumatric I	Efficiency,	depende	nt on pres	sure and	engine sp	eed"			
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	700.00	750.00	800.00	850.00	900.00
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63	0.66	0.68	0.68	0.68	0.65	0.63
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65	0.67	0.69	0.69	0.68	0.66	0.64
1650.00	0.47	0.48	0.51	0.55	0.57	0.58	0.64	0.65	0.69	0.70	0.70	0.68	0.67	0.66
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	0.65	0.66	0.60	0.72	0.72	0.69	0.68	0.67
2500.00	0.49	0.50	0.52	0.56	0.59	0.62	0.66	0.80	0.80	0.80	0.80	0.80	0.70	0.69
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	0.67	0.80	0.80	0.80	0.80	0.80	0.73	0.72
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	0.70	0.80	0.80	0.80	0.80	0.80	0.76	0.75
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.80	0.80	0.80	0.80	0.80	0.81	0.80
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81	0.86	0.89	0.87	0.84	0.84	0.82
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85	0.89	0.91	0.89	0.87	0.87	0.86
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86	0.89	0.91	0.89	0.87	0.87	0.86
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86	0.89	0.91	0.89	0.87	0.87	0.86

#### 4) Undo / Redo

The user click the button " **\***" /" **\***" to undo or redo the calibration as below.

🔯 Calibratio	n									
+ 0.1	- *	1.2	1	Selected =	0.8	5				
Input-X: Pim,	[hPa],"inp	ut <map></map>	, break po	oint, manif	old absol	ute pressi	ire, for Vo	lumatric E	fficiency	factor" It
Output: R.	AM_MAF	_fVe_Ma	p_N, [-],"	Factor Vo	olumatric I	Efficiency,	depende	nt on pres	sure and	engine spe
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	700.00
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63	0.66	0.68
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65	0.67	0.69

#### 3.3.3 Export / Import Calibration Data for tuning

You can also do data export to Excel sheet, and modified the data in Excel. After finishing the modification, you can import data back to EcoCAL. This is most useful for Curve and Map tables.

Right-Click the parameter window, select the **Export** option.



0.001	- *	1 /	Selected =	1 🌖	1							
ut-X: N, [	Rpm],"break p	oint, engine s	peed" Input-	Y: Tps, [%],"i	input <tpsequ></tpsequ>	>, break point	ts, throttle posit	ion "				
		-					and engine spee		odel)"			
			-		I							1
X/Y	1000.00	1500.00	1700.00	2000.00	2800.00	3600.00	4400.00	5000.00	6000.00	7000.00	8000.00	9000.00
0.0000	40.9453	39.6797	39.1875	38.4141	37.8047	33.5850	Add Calibra		1.4297	31.4297	31.4297	31.4297
3.9139	41.6484	40.0313	38.7891	37.9219	36.6797	35.76		uons	2.5547	31.6875	30.9141	30.3047
6.5262	41.6484	40.4531	39.7500	38.8828	37.0078	36.56	Delete		4.5938	33.5625	33.3047	32.5547
9.1324	42.6563	41.8125	40.9453	40.0313	38.0391	37.59	Import		4.1484	33.1641	31.5938	30.7500
13.0478	43.4063	42.2578	41.6953	40.2188	38.6016	36.77	Export	-	5.2031	35.6484	34.8281	34.4063
16.9632	47.6953	46.6406	46.1484	45.0703	39.9141	38.97		-	6.1172	34.9219	33.7500	32.8594
20.8786	53.1328	51.5625	50.2500	49.1719	48.5156	46.89	Сору		3.9453	42.7500	40.7578	39.6563
24.7925	55.9453	53.8125	53.5547	52.9922	58.4531	54.820	Paste		7.9766	46.8516	46.1484	43.1016
30.6168	61.5234	60.8672	60.8906	59.9063	59.8594	59.57	Smooth Cel	ls	5.8281	54.6094	52.2891	49.8516
38.1454	80.1797	79.0781	77.5078	76.6875	75.7500	75.07	ol		3.0547	72.4922	72.1875	70.1016
45.6711	93.0703	91.6406	90.0000	88.8047	87.2578	85.992	Change Alia		3.6250	82.9922	82.1484	81.8672
52.1927	102.9375	101.2734	199.7344	97.5000	95.7656	94.52	Decimals Di	isplay	4.0547	93.3750	91.0313	89.7188
58.7158	111.0469	110.0156	109.8516	108.9141	107.3438	105.86	2D View		3.4766	102.8906	101.6719	99.7734
65.2420	120.1641	119.1094	118.0781	117.0703	115.8281	114.09	3D View		1.4922	110.1797	109.3828	107.4375
78.2898	126.1875	124.9219	123.8672	122.5781	121.1250	119.92	Fit Window		6.0625	114.2813	111.3047	109.7578
99.9939	147.7031	146.6016	145.5000	144.0000	142.3125	140.20	Fit Grid		3.9375	152.1094	144.9844	139.8750
Calibrati							Variable Pro Window Pro	· · · · · · · · · · · · · · · · · · ·				
∮Calibrati + 0.001	on - *	1 / oint, engine sp	Selected = 1 peed" Input-Y		nput <tpsequ>,</tpsequ>	break points		operties				
Calibrati + 0.001 put-X: N, [I	on - * Rpm],"break p	oint, engine sp	peed" Input-Y	(: Tps, [%],"ir	nput <tpsequ>,</tpsequ>		Window Pro	n "	lef)"			
Calibration + 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001	on - * Rpm],"break p RAM_MAP_L	oint, engine sp dTp_Tps_N, [	oeed" Input-Y %],"characteris	i': Tps, [%],"ir stic map, nom	nput <tpsequ>, nalized load bas</tpsequ>	ed on TPS an	Window Pro	n "		7000.00	8000.00	
Calibrati + 0.001 put-X: N, [I Output: R	on - * Rpm],"break p CAM_MAP_L 1000.00	oint, engine sp dTp_Tps_N, [ 1500.00	peed" Input-Y %],"characteris 1700.00	č: Tps, [%],"ir stic map, nom 2000.00	nput <tpsequ>, nalized load bas 2800.00</tpsequ>	ed on TPS an	Window Pro	n "	6000.00	7000.00	8000.00	9000.00
<ul> <li>Calibrati</li> <li>+ 0.001</li> <li>aput-X: N, [i</li> <li>Output: R</li> <li>X/Y</li> <li>0.0000</li> </ul>	on * Rpm],"break p RAM_MAP_L 1000.00 40.9453	oint, engine sp dTp_Tps_N, [ 1500.00 39.6797	oeed" Input-Y %],"characteris 1700.00 39.1875	7: Tps, [%],"ir stic map, nom 2000.00 38.4141	nput <tpsequ>, nalized load bas 2800.00 37.8047</tpsequ>	ed on TPS an 3 Ad	Window Pro	n "	6000.00 31.4297	31.4297	31.4297	9000.00 31.4297
Calibrati + 0.001 put-X: N, [ Output: R X/Y 0.0000 3.9139	on - * Rpm],"break p RAM_MAP_L 1000.00 40.9453 41.6484	oint, engine sp dTp_Tps_N, [ 1500.00 39.6797 40.0313	%],"characteris 1700.00 39.1875 38.7891	7: Tps, [%],"ir stic map, nom 2000.00 38.4141 37.9219	pput <tpsequ>, nalized load bas 2800.00 37.8047 36.6797</tpsequ>	ad on TPS an 3 Ad 3 De	Window Pro	n "	6000.00 31.4297 32.5547	31.4297 31.6875	31.4297 30.9141	9000.00 31.4297 30.3047
Calibrati + 0.001 put-X: N, [] Output: R X/Y 0.0000 3.9139 6.5262	on - * Rpm],"break p AM_MAP_L 1000.00 40.9453 41.6484 41.6484	oint, engine sp dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531	%],"characteris %],"characteris 1700.00 39.1875 38.7891 39.7500	[: Tps, [%],"ir stic map, nom 2000.00 38.4141 37.9219 38.8828	put <tpsequ>, nalized load bas 2800.00 37.8047 36.6797 37.0078</tpsequ>	and on TPS and Add Add Be Be Be Be Be Be Be Be Be Be	Window Pro	n "	6000.00 31.4297 32.5547 34.5938	31.4297 31.6875 33.5625	31.4297 30.9141 33.3047	9000.00 31.4297 30.3047 32.5547
Calibrati + 0.001 put-X: N, [] Output: R X/Y 0.0000 3.9139 6.5262 9.1324	on - * Rpm],"break p AM_MAP_L 1000.00 40.9453 41.6484 41.6484 42.6563	oint, engine sp dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125	%],"characteris %],"characteris 1700.00 39.1875 38.7891 39.7500 40.9453	(: Tps, [%],"ir stic map, nom 2000.00 38.4141 37.9219 38.8828 40.0313	put <tpsequ>, nalized load bas 2800.00 37.8047 36.6797 37.0078 38.0391</tpsequ>	Add Add Add Add Add Add Add Add Add Add	Window Pro	n "	6000.00 31.4297 32.5547 34.5938 34.1484	31.4297 31.6875 33.5625 33.1641	31.4297 30.9141 33.3047 31.5938	9000.00 31.4297 30.3047 32.5547 30.7500
Calibrati + 0.001 pput-X: N, [i Output: R X/Y 0.0000 3.9139 6.5262 9.1324 13.0478	on - * Rpm],"break p RAM_MAP_L 1000.00 40.9453 41.6484 41.6484 42.6563 43.4063	oint, engine sp dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125 42.2578	Deed"         Input-Y           %],"characteris           1700.00           39.1875           38.7891           39.7500           40.9453           41.6953	7: Tps, [%],"ir stic map, nom 2000.00 38.4141 37.9219 38.8828 40.0313 40.2188	aput <tpsequ>, nalized load bas 2800.00 37.8047 36.6797 37.0078 38.0391 38.6016</tpsequ>	and on TPS and	Window Pro	n "	6000.00 31.4297 32.5547 34.5938 34.1484 35.2031	31.4297 31.6875 33.5625 33.1641 35.6484	31.4297 30.9141 33.3047 31.5938 34.8281	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063
Calibrati + 0.001 pput-X: N, [] Output: R X/Y 0.0000 3.9139 6.5262 9.1324 13.0478 16.9632	on - * Rpm],"break p AM_MAP_L 1000.00 40.9453 41.6484 41.6484 41.6484 42.6563 43.4063 47.6953	dTp_Tps_N, [ dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125 42.2578 46.6406	Joseed"         Input-S           %],"characteris           1700.00           39.1875           38.7891           39.7500           40.9453           41.6953           46.1484	7: Tps, [%],"ir stic map, nom 2000.00 38.4141 37.9219 38.8828 40.0313 40.2188 45.0703	nput <tpsequ>, nalized load bas 2800.00 37.8047 36.6797 37.0078 38.0391 38.6016 39.9141</tpsequ>	Add Add Add Add Add Be Add Be Add Be Add Be Add Co Co	Window Pro	n "	6000.00 31.4297 32.5547 34.5938 34.1484 35.2031 36.1172	31.4297 31.6875 33.5625 33.1641 35.6484 34.9219	31.4297 30.9141 33.3047 31.5938 34.8281 33.7500	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063 32.8594
<ul> <li>Calibratii</li> <li>0.001</li> <li>put-X: N, [i</li> <li>Output: R</li> <li>X/Y</li> <li>0.0000</li> <li>3.9139</li> <li>6.5262</li> <li>9.1324</li> <li>13.0478</li> <li>16.9632</li> <li>20.8786</li> </ul>	on - + Rpm],"break p AAM_MAP_L 1000.00 40.9453 41.6484 41.6484 42.6563 43.4063 43.4063 43.4063 53.1328	dTp_Tps_N, [ dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125 42.2578 46.6406 51.5625	eed" Input-Y %],"characterii 1700.00 39.1875 38.7891 39.7500 40.9453 41.6953 46.1484 50.2500	7: Tps, [%],"ir stic map, nom 2000.00 38.4141 37.9219 38.8828 40.0313 40.2188 45.0703 49.1719	put <tpsequ>, alized load bas 2800.00 37.8047 36.6797 37.0078 38.0391 38.6016 39.9141 48.5156</tpsequ>	ad on TPS ar Ad Ad Ad Baseline Ad Baseline Ad Baseline Ad Ad Ad Co Ad Ad Ad Ad Ad Ad Ad Ad Ad Ad	Window Pro	n "	6000.00 31.4297 32.5547 34.5938 34.1484 35.2031 36.1172 43.9453	31.4297 31.6875 33.5625 33.1641 35.6484 34.9219 42.7500	31.4297 30.9141 33.3047 31.5938 34.8281 33.7500 40.7578	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063 32.8594 39.6563
<ul> <li>Calibratii</li> <li>0.001</li> <li>put-X: N, [i</li> <li>Output: R</li> <li>X/Y</li> <li>0.0000</li> <li>3.9139</li> <li>6.5262</li> <li>9.1324</li> <li>13.0478</li> <li>16.9632</li> <li>20.8786</li> <li>24.7925</li> </ul>	on - * Rpm],"break p RAM_MAP_L 1000.00 40.9453 41.6484 41.6484 41.6484 42.6563 43.4063 47.6953 53.1328 55.9453	oint, engine sp dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125 42.2578 46.6406 51.5625 53.8125	eed" Input-Y %],"characterii 1700.00 39.1875 38.7891 39.7500 40.9453 40.94544 40.94544 40.94544 40.94544 40.94544 40.94544 40.94544 40.94544 40.945444 40.9454444444444444444444444444444444444	7: Tps, [%], "ir stic map, nom 2000.00 38.4141 37.9219 38.8828 40.0313 40.2188 45.0703 49.1719 52.9922	put <tpsequ>, natized load bas 2800.00 37.8047 36.6797 37.0078 38.0391 38.6016 39.9141 48.5156 58.4531</tpsequ>	ad on TPS ar Ad Ad B B B B B B B B B B B B B B B B B	Window Pro	n "	6000.00 31.4297 32.5547 34.5938 34.1484 35.2031 36.1172 43.9453 47.9766	31.4297 31.6875 33.5625 33.1641 35.6484 34.9219 42.7500 46.8516	31.4297 30.9141 33.3047 31.5938 34.8281 33.7500 40.7578 46.1484	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063 32.8594 39.6563 43.1016
Calibrati + 0.001 put-X: N, [ Output: R X/Y 0.0000 3.9139 6.5262 9.1324 13.0478 16.9632 0.8786 24.7925 30.6168	on - * Rpm],"break p LAM_MAP_L 1000.00 40.9453 41.6484 41.6484 42.6563 43.4063 47.6953 53.1328 55.9453 61.5234	oint, engine sp dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125 42.2578 46.6406 51.5625 53.8125 60.8672	beed"         Input-Y           1700.00         39.1875           39.1875         38.7891           39.7500         40.9453           41.6953         41.6953           46.1484         50.2500           53.5547         60.8906	7: Tps, [%], "ir stic map, nom 2000.00 38.4141 37.9219 38.8828 40.0313 40.2188 45.0703 49.1719 52.9922 59.9063	put <tpsequ>, adized load bas 2800.00 37.8047 36.6797 37.0078 38.0391 38.6016 39.9141 48.5156 58.4531 59.8594</tpsequ>	Add Add Add Add Add Add Add Add	Window Pro	n "	6000.00 31.4297 32.5547 34.5938 34.1484 35.2031 36.1172 43.9453 47.9766 55.8281	31.4297 31.6875 33.5625 33.1641 35.6484 34.9219 42.7500 46.8516 54.6094	31.4297 30.9141 33.3047 31.5938 34.8281 33.7500 40.7578 46.1484 52.2891	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063 32.8594 39.6563 43.1016 49.8516
Calibrati 0.001 put-X: N, [l Output: R X/Y 0.0000 3.9139 6.5262 9.1324 13.0478 16.9632 20.8786 30.8786 30.6168 38.1454	on - * Rpm],"break p RAM_MAP_L 1000.00 40.9453 41.6484 41.6484 42.6563 43.4063 47.6953 53.1328 55.9453 61.5234 80.1797	oint, engine sp dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125 42.2578 46.6406 51.5625 53.8125 60.8672 79.0781	beed"         Input-V           %],"characteris         1700.00           39.1875         38.7891           39.7500         40.9453           41.6953         41.6953           46.1484         50.2500           53.5547         60.8906           77.5078         11.5078	C: Tps, [%],"ir           stic map, nom           2000.00           38.4141           37.9219           38.8828           40.0313           40.2188           45.0703           49.1719           52.9922           59.9063           76.6875	put <tpsequ>, alized load bas 2800.00 37.8047 36.6797 37.0078 38.0391 38.6016 39.9141 48.5156 58.4531 59.8594 75.7500</tpsequ>	add on TPS ar           3         Add           3         De           3         Im           3         Ex           3         Co           4         Pa           5         Ch           7         Ch	Window Pro	n " (Alpha/N mod	6000.00 31.4297 32.5547 34.5938 34.1484 35.2031 36.1172 43.9453 47.9766 55.8281 73.0547	31.4297 31.6875 33.5625 33.1641 35.6484 34.9219 42.7500 46.8516 54.6094 72.4922	31.4297 30.9141 33.3047 31.5938 34.8281 33.7500 40.7578 46.1484 52.2891 72.1875	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063 32.8594 39.6563 43.1016 49.8516 70.1016
Calibrati 0.001 put-X: N, [ 0.0000 3.9139 6.5262 9.1324 13.0478 16.9632 20.8786 24.7925 30.6168 30.6168	on - * Rpm],"break p AM_MAP_L 1000.00 40.9453 41.6484 41.6484 42.6563 43.4063 47.6953 53.1328 55.9453 61.5234 80.1797 93.0703	oint, engine sy dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125 42.2578 46.6406 51.5625 53.8125 60.8672 79.0781 91.6406	beed"         Input-Y           %],"characteris         1700.00           39.1875         38.7891           39.7500         40.9453           41.6953         41.6953           46.1484         50.2500           53.5547         60.8906           77.5078         90.0000	Type         [%]           2000.00         38.4141           37.9219         38.8828           40.0313         40.2188           45.0703         49.1719           52.9922         59.9063           76.6875         88.8047	adized load bas 2800.00 37.8047 36.6797 37.0078 38.0016 39.9141 48.5156 58.4531 59.8594 75.7500 87.2578	ed on TPS ar 3 Ad 3 De 3 Im 3 Co 3 Co 4 Pa 5 Ch 7 Ch 8 De	Window Pro	n " (Alpha/N mod	6000.00 31.4297 32.5547 34.5938 34.1484 35.2031 36.1172 43.9453 47.9766 55.8281 73.0547 83.6250	31.4297 31.6875 33.5625 33.1641 35.6484 34.9219 42.7500 46.8516 54.6094 72.4922 82.9922	31.4297 30.9141 33.3047 31.5938 34.8281 33.7500 40.7578 46.1484 52.2891 72.1875 82.1484	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063 32.8594 39.6563 43.1016 49.8516 70.1016 81.8672
Calibrati 0.001 put.X: N, [] 0utput: R X/Y 0.0000 3.9139 6.5262 9.1324 9.1324 16.9632 20.8786 24.7925 30.6168 38.1454 45.6711 52.1927	on _ * Rpm],"break p AAM_MAP_L 1000.00 40.9453 41.6484 41.6484 42.6563 43.4063 47.6953 53.1328 55.9453 61.5234 80.1797 93.0703 102.9375	oint, engine 3, dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125 42.2578 40.64406 51.5625 53.8125 60.8672 79.0781 91.6406 101.2734	beed"         Input-3           %],"characteriz         1700.00           39.1875         38.7891           39.7500         40.9453           41.6953         44.16953           46.1484         50.2500           53.5547         60.8906           77.5078         90.0000           199.7344         1	T: Tps, [%],"in           5: Tps, [%],"in           2000.00           38.4141           37.9219           38.8828           40.0313           40.218           45.0703           49.1719           52.9963           76.6875           88.8047           97.5000	adized load bas 2800.00 37.8047 36.6797 37.0078 38.6016 39.9141 48.5156 58.4531 59.8594 75.7500 87.2578 95.7656	ed on TPS ar 3 00 0 3 Ad 3 De 3 Im 3 Im 3 Co 4 Pa 5 Sr 7 Ch 8 De 9 2D	Window Pro	n " (Alpha/N mod	6000.00 31.4297 32.5547 34.5938 34.1484 35.2031 36.1172 43.9453 47.9766 55.8281 73.0547 83.6250 94.0547	31.4297 31.6875 33.5625 33.1641 35.6484 34.9219 42.7500 46.8516 54.6094 72.4922 82.9922 93.3750	31.4297 30.9141 33.3047 31.5938 34.8281 33.7500 40.7578 46.1484 52.2891 72.1875 82.1484 91.0313	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063 32.8594 39.6563 43.1016 49.8516 70.1016 81.8672 89.7188
Calibrati 0.001 put-X: N, [ Output: R X/Y 0.0000 3.9139 6.5262 9.1324 13.0478 16.9632 20.8786 24.7925 30.6168 38.1454 45.6711 52.1927 58.7158	on _ * Rpm],"break p KAM_MAP_L 1000.00 40.9453 41.6484 41.6484 42.6563 43.4063 47.6953 53.1328 55.9453 61.5234 80.1797 93.0703 102.9375 111.0469	oint, engine 3, dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125 42.2578 40.6406 51.5625 53.8125 60.8672 79.0781 91.6406 101.2734 110.0156	beed"         Input-1           1700.00         39.1875           38.7891         39.7500           40.9453         41.6953           46.1484         50.2500           53.5547         60.8906           77.5078         90.0000           199.7344         109.8516	f: Tps, [%],"in           stic map, nom           2000.00           38.4141           37.9219           38.8828           40.0313           40.2183           45.0703           49.1719           52.99063           76.6875           88.8025           97.5000           108.9141	put <tpsequ>, nalized load bas 2800.00 37.8047 36.6797 37.0078 38.0391 38.0391 38.6016 39.9141 48.5156 58.4531 59.8594 75.7500 87.2578 95.7656 107.3438</tpsequ>	ed on TPS ar           3         Add           3         De           3         Da           3         De           3         De           3         Co           4         Pa           5         Sr           7         Ch           8         De           9         2D           10         3D	Window Pro	n " (Alpha/N mod	6000.00 31.4297 32.5547 34.5938 34.1484 35.2031 36.1172 43.9453 47.9766 55.8281 73.0547 73.0547 103.4766	31.4297 31.6875 33.5625 33.1641 35.6484 34.9219 42.7500 46.8516 54.6094 42.7500 46.8516 54.6094 72.4922 82.9922 93.3750 102.8906	31.4297 30.9141 33.3047 31.5938 34.8281 33.7500 40.7578 46.1484 52.2891 72.1875 82.1484 91.0313 101.6719	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063 32.8594 39.6563 43.1016 49.8516 70.1016 81.8672 89.7188 99.7734
Calibrati 0.001 put-X: N, [ 0.000 3.9139 6.5262 9.1324 13.0478 16.9632 20.8786 38.1454 45.6711 52.1927 58.7158 65.2420	on	oint, engine s dTp_Tps_N, 1500.00 39.6797 40.0313 40.4531 41.8125 44.6406 51.5625 53.8125 60.8672 79.0781 91.6406 101.2734 110.0156 1110.0156	weed" Input-Y %],"characteris 1700.00 39.1875 38.7891 39.7500 40.9453 41.6953 46.1484 50.2500 53.5547 60.8906 77.5078 90.0000 199.7344 109.8516 118.0781	F: Tps, [09,1] <sup>w</sup> f: Tps, [09,1] <sup>w</sup> stic map, nom           2000.00           38.4141           37.9219           38.824           40.0313           40.2188           45.0703           49.1719           59.9063           76.6875           88.8047           97.5006           108.9141           117.0703	2800.00 37.8047 36.6797 37.0078 38.0391 38.6016 39.9141 48.5156 58.4531 59.8594 75.7500 87.2578 95.7656 107.3438 115.8281	ed on TPS ar           3         Add           3         De           3         Da           3         De           3         Co           4         Pa           5         Srr           5         Ch           9         2D           10         3D           11         Fit	Window Pro	n " (Alpha/N mod	6000.00 31.4297 34.5938 34.1484 35.2031 36.1172 43.9453 47.9766 55.8281 73.0547 83.6250 94.0547 103.4766 111.4922	31.4297 31.6875 33.5625 33.1641 35.6484 34.9219 42.7500 46.8516 54.6094 72.4922 82.9922 93.3750 102.8906 110.1797	31.4297 30.9141 33.3047 31.5938 34.8281 33.7500 40.7578 46.1484 52.2891 72.1875 82.1484 91.0313 101.6719 109.3828	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063 32.8594 39.6563 43.1016 49.8516 70.1016 81.8672 89.7188 99.7734 107.4375
Calibrati 0.001 put-X: N, [ 0.0000 X/Y 0.0000 3.9139 6.5262 9.1324 13.0478 16.9632 20.8786 24.7925 30.6168 38.1454 45.6711 52.1927 58.7158	on _ * Rpm],"break p KAM_MAP_L 1000.00 40.9453 41.6484 41.6484 42.6563 43.4063 47.6953 53.1328 55.9453 61.5234 80.1797 93.0703 102.9375 111.0469	oint, engine 3, dTp_Tps_N, [ 1500.00 39.6797 40.0313 40.4531 41.8125 42.2578 40.6406 51.5625 53.8125 60.8672 79.0781 91.6406 101.2734 110.0156	beed"         Input-1           1700.00         39.1875           38.7891         39.7500           40.9453         41.6953           46.1484         50.2500           53.5547         60.8906           77.5078         90.0000           199.7344         109.8516	f: Tps, [%],"in           stic map, nom           2000.00           38.4141           37.9219           38.8828           40.0313           40.2183           45.0703           49.1719           52.99063           76.6875           88.8025           97.5000           108.9141	put <tpsequ>, nalized load bas 2800.00 37.8047 36.6797 37.0078 38.0391 38.0391 38.6016 39.9141 48.5156 58.4531 59.8594 75.7500 87.2578 95.7656 107.3438</tpsequ>	ed on TPS ar           3         Add           3         De           3         Da           3         De           3         Co           4         Pa           5         Srr           5         Ch           9         2D           10         3D           11         Fit	Window Pro	n " (Alpha/N mod	6000.00 31.4297 32.5547 34.5938 34.1484 35.2031 36.1172 43.9453 47.9766 55.8281 73.0547 73.0547 103.4766	31.4297 31.6875 33.5625 33.1641 35.6484 34.9219 42.7500 46.8516 54.6094 42.7500 46.8516 54.6094 72.4922 82.9922 93.3750 102.8906	31.4297 30.9141 33.3047 31.5938 34.8281 33.7500 40.7578 46.1484 52.2891 72.1875 82.1484 91.0313 101.6719	9000.00 31.4297 30.3047 32.5547 30.7500 34.4063 32.8594 39.6563 43.1016 49.8516 70.1016 81.8672 89.7188 99.7734

The program will pop-up a "save as" dialog window.

If you click **save**, the program will save **CSV** file and open it. The default name of the **CSV** file is the calibration label name.

And the **CSV** file will be opened automatically. You can choose to open the file by anyone method from your laptop, and the below showing opens as **xIs** file by Excel.



	S12	•		f <sub>x</sub>											
	А	В	С	D	E	F	G	Н	1	J	К	L	М	N	0
1	RAM_MAP	_LdTp_Tps	_N [Outpu	ut: RAM_M	AP_LdTp_1	Грs_N, [%]	character,	ristic map,	normalize	d load base	ed on TPS a	nd engine	speed (Al	oha/N mo	del)"]
2	Input-X: N	, [Rpm],"b	reak point,	, engine sp	eed" Inp	ut-Y: Tps, [	%],"input<	TpsEqu>, k	reak point	ts, throttle	position "				
3															
4	X/Y	1000	1500	1700	2000	2800	3600	4400	5000	6000	7000	8000	9000		
5	0	40.9453	39.6797	39.1875	38.4141	37.8047	33.5859	31.6641	31.4297	31.4297	31.4297	31.4297	31.4297		
6	3.9139	41.6484	40.0313	38.7891	37.9219	36.6797	35.7656	34.5469	33.4922	32.5547	31.6875	30.9141	30.3047		
7	6.5262	41.6484	40.4531	39.75	38.8828	37.0078	36.5625	35.7656	35.1094	34.5938	33.5625	33.3047	32.5547		
8	9.1324	42.6563	41.8125	40.9453	40.0313	38.0391	37.5938	35.8828	34.8281	34.1484	33.1641	31.5938	30.75		
9	13.0478	43.4063	42.2578	41.6953	40.2188	38.6016	36.7734	36.7266	35.7891	35.2031	35.6484	34.8281	34.4063		
10	16.9632	47.6953	46.6406	46.1484	45.0703	39.9141	38.9766	37.8516	36.8906	36.1172	34.9219	33.75	32.8594		
11	20.8786	53.1328	51.5625	50.25	49.1719	48.5156	46.8984	45.5859	44.3672	43.9453	42.75	40.7578	39.6563		
12	24.7925	55.9453	53.8125	53.5547	52.9922	58.4531	54.8203	51.9141	49.9219	47.9766	46.8516	46.1484	43.1016		
13	30.6168	61.5234	60.8672	60.8906	59.9063	59.8594	59.5781	59.1563	57.75	55.8281	54.6094	52.2891	49.8516		
14	38.1454	80.1797	79.0781	77.5078	76.6875	75.75	75.0703	74.4375	74.0859	73.0547	72.4922	72.1875	70.1016		
15	45.6711	93.0703	91.6406	90	88.8047	87.2578	85.9922	84.9844	84.2578	83.625	82.9922	82.1484	81.8672		
16	52.1927	102.9375	101.2734	199.7344	97.5	95.7656	94.5234	94.4531	94.2656	94.0547	93.375	91.0313	89.7188		
17	58.7158	111.0469	110.0156	109.8516	108.9141	107.3438	105.8672	104.8594	104.1094	103.4766	102.8906	101.6719	99.7734		
18	65.242	120.1641	119.1094	118.0781	117.0703	115.8281	114.0938	113.5547	112.5938	111.4922	110.1797	109.3828	107.4375		
19	78.2898	126.1875	124.9219	123.8672	122.5781	121.125	119.9297	118.1016	117.0938	116.0625	114.2813	111.3047	109.7578		
20	99.9939	147.7031	146.6016	145.5	144	142.3125	140.2031	139.9219	155.0391	153.9375	152.1094	144.9844	139.875		
21															

It is recommended to modify your curve and map tables in Excel, and smoothen them in Excel and then imported back to EcoCAL. And please save it after you finish tuning.

- 2010	A	В	С	D	E	F	G	Н	1	J	K	L	М
1	RAM_MAP	_LdTp_Tps	_N [Outpu	ut: RAM_M	AP_LdTp_	Tps_N, [%]	,"character	ristic map,	normalize	d load base	ed on TPS a	and engine	speed (Alph
2	Input-X: N	, [Rpm],"b	reak point,	, engine sp	eed" Inp	ut-Y: Tps, [	%],"input<	TpsEqu>, b	oreak point	ts, throttle	position "		
3													
4	X/Y	1000	1500	1700	2000	2800	3600	4400	5000	6000	7000	8000	9000
5	0	45	45	39.1875	38.4141	37.8047	33.5859	31.6641	31.4297	31.4297	31.4297	31.4297	31.4297
6	3.9139	47	47	38.7891	37.9219	36.6797	35.7656	34.5469	33.4922	32.5547	31.6875	30.9141	30.3047
7	6.5262	49	49	39.75	38.8828	37.0078	36.5625	35.7656	35.1094	34.5938	33.5625	33.3047	32.5547
8	9.1324	51	51	40.9453	40.0313	38.0391	37.5938	35.8828	34.8281	34.1484	33.1641	31.5938	30.75
9	13.047 <mark>8</mark>	53	53	41.6953	40.2188	38.6016	36.7734	36.7266	35.7891	35.2031	35.6484	34.8281	34.4063
10	16.9632	55	55	46.1484	45.0703	39.9141	38.9766	37.8516	36.8906	36.1172	34.9219	33.75	32.8594
11	20.878 <mark>6</mark>	53.1328	51.5625	50.25	49.1719	48.5156	46.8984	45.5859	44.3672	43.9453	42.75	40.7578	39.6563
12	24.7925	55.9453	53.8125	53.5547	52.9922	58.4531	54.8203	51.9141	49.9219	47.9766	46.8516	46.1484	43.1016
13	30.6168	61.5234	60.8672	60.8906	59.9063	59.8594	59.5781	59.1563	57.75	55.8281	54.6094	52.2891	49.8516
14	38.1454	80.1797	79.0781	77.5078	76.6875	75.75	75.0703	74.4375	74.0859	73.0547	72.4922	72.1875	70.1016
15	45.6711	93.0703	91.6406	90	88.8047	87.2578	85.9922	84.9844	84.2578	83.625	82.9922	82.1484	81.8672
16	52.1927	102.9375	101.2734	199.7344	97.5	95.7656	94.5234	94.4531	94.2656	94.0547	93.375	91.0313	89.7188
17	58.7158	111.0469	110.0156	109.8516	108.9141	107.3438	105.8672	104.8594	104.1094	103.4766	102.8906	101.6719	99.7734
18	65.242	120.1641	119.1094	118.0781	117.0703	115.8281	114.0938	113.5547	112.5938	111.4922	110.1797	109.3828	107.4375
19	78.2898	126.1875	124.9219	123.8672	122.5781	121.125	119.9297	118.1016	117.0938	116.0625	114.2813	111.3047	109.7578
20	99.9939	147.7031	146.6016	145.5	144	142.3125	140.2031	139.9219	155.0391	153.9375	152.1094	144.9844	139.875

If you want to import just edited calibration tables, Right-Click the parameter window, select the **Import** option.



N000         40.9453         39.6797         39.1875         38.4141         37.8047         33.587         Add Calibrations         1.4297           1.9139         41.6484         40.0313         38.7891         37.9219         36.6797         35.767         Delete         4.5938           1.322         41.6484         40.4531         39.7500         38.8828         37.0078         36.567           1.324         42.6563         41.8125         40.9453         40.0313         38.0391         37.59           3.0478         43.4663         42.2578         41.6953         40.2188         38.03616         36.77           3.0478         43.4663         42.2578         41.6953         40.2188         38.0161         36.77           5.6652         47.6953         46.6466         46.1484         45.0703         39.9141         38.97           0.8786         53.1328         51.5625         50.2500         49.1719         48.5156         46.897           4.7925         55.9453         53.8125         53.5547         52.9922         58.4531         54.827         Copy         3.9433           9.1927         102.9375         101.2754         199.7344         97.500         95.7656 <td< th=""><th></th><th></th><th></th><th></th></td<>				
X/Y         1000.00         1500.00         1700.00         2000.00         2800.00         3600.00         4400.00         5000.00         6000.00           0.0000         40.9453         39.6797         39.1875         38.4141         37.8047         33.587         Add Calibrations         1.4297           3.9139         41.6484         40.0313         38.7891         37.9219         36.6797         36.6797         Add Calibrations         2.5547           6.5262         41.6484         40.4531         39.7500         38.8828         37.0078         36.56         9.1324         42.6563         41.8125         40.9453         40.0313         38.0391         37.59         38.141         52.037         9.1324         42.6563         41.8125         40.9453         40.0188         38.0016         36.77         9.0397         9.1324         42.6563         41.8125         40.9453         40.2188         38.0016         36.77         9.2037         9.9141         38.97         2.091         2.0172         Copy         3.9453         2.0210         2.0172         Copy         3.9453         2.9453         5.821         5.821         5.821         5.821         5.821         5.821         5.821         5.821         5.821         5.821 <th></th> <th></th> <th></th> <th></th>				
0.0000         40.9453         39.6797         39.1875         38.4141         37.8047         33.58         34.201         14.297           3.9139         41.6484         40.0313         38.7891         37.9219         36.6797         35.76         Add Calibrations         2.5547           6.5262         41.6484         40.4531         39.7500         38.8228         37.0078         36.56         9.1324         42.6563         41.8125         40.9453         40.0313         38.091         37.59         9.656         9.1324         42.6563         41.8125         40.2188         38.6016         36.77         14.844         5033         39.9141         38.971         39.9141         38.971         57.99         0.6172         Copy         3.9414         52.031         52.031         52.031         52.031         53.9914         38.975         3.9414         52.031         54.822         7.9766         53.1328         51.5625         50.2500         49.1719         48.5156         46.89         9.9453         3.9433         9.8453         9.8453         9.8453         9.9453         3.9433         9.8453         3.0547         52.9922         58.4531         54.825         58.2814         53.547         52.9926         58.84531         54.825	1 1	)"		1
0.0000         40.943         39.8/9/         39.13/9         39.14/1         37.84/1         35.84/1         36.87/1         36.84/1         36.87/1         36.87/1         36.87/1         36.87/1         37.92/1         38.93/1         38.93/1         38.93/1         38.93/1         38.93/1         38.93/1         38.93/1         38.93/1         38.93/1         38.93/1         38.93/1         38.93/1         38.93/1         38.93/1         39.93/3         39.94/3	7000.00	5000.00	0 8000.00	9000.00
3.9139         41.8484         40.0313         38.891         37.9219         58.697         55.765         Delete         4.5938           6.5262         41.6484         40.4531         39.7500         38.8828         37.0078         36.676         4.5938           9.1524         42.6563         41.8125         40.9433         40.0313         38.091         37.979           13.0478         43.4063         42.2578         41.6953         40.2188         38.6016         36.77           16.9632         47.6953         46.6406         46.1484         45.0703         39.9141         38.97         20.9786         53.1328         51.5625         50.2500         49.1179         48.5156         46.897         Copy         39453           3.0478         55.9453         53.5547         53.5547         53.5547         53.5547         53.5547         53.5547         53.5547         53.5547         53.5547         58.4531         54.823         Paste         79766         58.281         30.617         19.97071         79.0781         77.5078         76.575         75.7500         75.077         Change Alias         36.547         36.547           52.1927         102.9375         101.2734         199.7344         97.5000 </td <td>31.4297</td> <td>1.4297</td> <td>7 31.4297</td> <td>31.4297</td>	31.4297	1.4297	7 31.4297	31.4297
0.502         41.0454         40.0313         35.3542         57.508         30.358         50.359         50.358         50.358         50.359         50.351         50.351         50.35	31.6875	2.5547	5 30.9141	30.3047
13.0478         43.4063         42.2578         41.6953         40.2188         38.6016         36.77         Import         5.2031           16.9632         47.6953         46.6406         46.1484         45.0703         39.9141         38.97         Copy         3.9453           20.8786         53.1328         51.5625         50.2500         49.1719         48.5156         46.89         7.9766           30.6168         61.5234         60.8672         60.8906         59.9063         59.8594         59.57         S.mooth Cells         5.281           38.1454         80.1797         79.0781         77.5078         76.6875         75.7500         75.07         76.07         76.07           45.6711         99.0703         91.6406         90.0000         88.8047         87.278         85.99         2.57.75         Smooth Cells         3.6250           52.1927         102.9375         101.2734         199.7344         97.5056         94.522         Decimals Display         4.0547           58.118         110.0459         110.0156         109.8316         105.861         94.522         Decimals Display         4.0547           52.1927         120.1641         119.1094         118.0781         117.0703	33.5625	4.5938	5 33.3047	32.5547
13.0478         43.4063         42.2578         41.6953         40.2188         38.6016         36.77         Export         5.2031           16.9632         47.6953         46.6406         46.1484         45.0703         39.9141         38.97         20.8786         53.1328         51.5625         50.2500         49.1719         48.5156         46.899         2092         39.453           20.8786         53.1328         51.5625         50.2500         49.1719         48.5156         46.899         2092         38.4531         54.821         20.8786         39.9141         38.975         39.9153         39.454         39.776         39.776         59.777         59.777         59.777         59.777         59.777         59.777         59.7778         85.99         59.577	33.1641	4.1484	1 31.5938	30.7500
10.952         47.6953         46.6406         46.1434         45.0703         39.9141         38.979         Copy         39.453           20.8786         53.1328         51.5625         50.2500         49.1719         48.5156         46.897         Copy         39.453           20.8786         53.1328         51.5625         50.2500         49.1719         48.5156         46.897         Paste         7966           30.6168         61.5234         60.8672         60.8906         59.9063         59.8594         59.57         Smooth Cells         58281           38.1454         80.1797         79.0781         77.5078         76.6875         75.7500         75.07         Change Alias         3.6250           52.1927         102.9375         101.2734         199.7344         97.5000         95.7656         94.522         Decimals Display         4.0547           58.7158         111.0469         110.0156         109.8316         105.861         3D.584         3D.546         3D.View         1.4922	35.6484	5.2031	4 34.8281	34.4063
22.3780         D3.1228         D3.2300         43.119         43.130         43.3	34.9219	6.1172	9 33.7500	32.8594
24.752         55.753         55.751         54.851         57.651           30.6168         61.5234         60.8672         60.8906         59.9063         59.8594         59.571         Smooth Cells         5.8281           38.1454         80.1797         79.0781         77.5078         76.6875         57.5700         95.767         Smooth Cells         5.8281           38.1454         80.1797         79.0781         77.5078         75.7500         95.757         Change Alias         3.6547           52.1927         102.9375         101.2734         199.7344         97.5000         95.7656         94.52         Decimals Display         4.0547           58.7158         111.0469         110.0156         109.8516         108.9141         107.348         105.86         2D View         3.4766           65.2420         120.1641         119.1094         118.0781         117.0703         115.8281         114.09         3D View         1.4922	42.7500	3.9453	0 40.7578	39.6563
38.1454         80.1797         79.0781         77.5078         76.6875         75.7500         75.070         Change Alias         3.0547           45.6711         93.0703         91.6406         90.0000         88.8047         87.2578         85.99         Change Alias         3.6547           52.1927         102.9375         101.2734         199.7344         97.5000         95.7656         94.52         Decimals Display         4.0547           58.7158         111.0469         110.0156         109.8516         108.9141         107.3438         105.86         2D View         3.4766           65.2420         120.1641         119.1094         118.0781         117.0703         115.8281         114.09         3D View         1.4922	46.8516	7.9766	6 46.1484	43.1016
45.6711         93.0703         91.6406         90.0000         88.8047         87.2578         85.99         Change Alias         3.620           52.1927         102.9375         101.2734         199.7344         97.5000         95.7656         94.52         Decimals Display         4.0547           58.7158         111.0469         110.0156         109.8516         108.9141         107.3438         105.86         2D View         3.4766           65.2420         120.1641         119.1094         118.0781         117.0703         115.8281         114.09         3D View         1.4922	54.6094	5.8281	4 52.2891	49.8516
43.6/11         93.0/05         91.6406         90.0000         88.84/1         87.25/8         85.99         52.19         52.19           52.1927         102.9375         101.2734         199.7344         97.5000         95.7656         94.52         Decimals Display         4.0547           58.7158         111.0469         110.0156         109.8516         108.9141         107.3438         105.86         2D View         3.4766           65.2420         120.1641         119.1094         118.0781         117.0703         115.8281         114.09         3D View         1.4922	72.4922	3.0547	2 72.1875	70.1016
52.158         111.0469         110.0156         109.8514         110.3438         105.86         2D View         3.4766           65.2420         120.1641         119.1094         118.0781         117.0703         115.8281         114.09         3D View         1.4922	82.9922	3.6250	2 82.1484	81.8672
65.2420 120.1641 119.1094 118.0781 117.0703 115.8281 114.09 3D View 14922	93.3750	4.0547	0 91.0313	89.7188
	102.8906	)3.4766	6 101.6719	99.7734
	110.1797	1.4922	7 109.3828	107.4375
78.2898 126.1875 124.9219 123.8672 122.5781 121.1250 119.92 Fit Window 6.0625	114.2813	6.0625	3 111.3047	109.7578
99.9939 147.7031 146.6016 145.5000 144.0000 142.3125 140.20 Fit Grid 3.9375	152.1094	3.9375	4 144.9844	139.8750

Import the **CSV** file you just modified.

The modified cells will show as "red".

0.001	- *	/	Selected =	•	<u>e</u>							
out-X: N, [	Rpm],"break p	oint, engine sp	peed" Input-	Y: Tps, [%],"ir	nput <tpsequ></tpsequ>	, break points,	throttle positi	ion "				
Output: R	AM_MAP_L	dTp_Tps_N, [	%],"characteri	stic map, nom	alized load ba	sed on TPS an	id engine spee	d (Alpha/N m	odel)"			
X/Y	1000.00	1500.00	1700.00	2000.00	2800.00	3600.00	4400.00	5000.00	6000.00	7000.00	8000.00	9000.00
0.0000	45.0000	45,0000	39.1875	38,4141	37.8047	33,5859	31.6641	31.4297	31.4297	31,4297	31.4297	31,4297
3.9139	46,9922	46,9922	38,7891	37.9219	36.6797	35,7656	34,5469	33,4922	32,5547	31.6875	30.9141	30,3047
6.5262	49.0078	49.0078	39,7500	38.8828	37.0078	36.5625	35,7656	35.1094	34.5938	33.5625	33.3047	32.5547
9.1324	51.0000	51.0000	40.9453	40.0313	38.0391	37.5938	35.8828	34.8281	34.1484	33.1641	31.5938	30.7500
13.0478	52.9922	52.9922	41.6953	40.2188	38.6016	36.7734	36.7266	35.7891	35.2031	35.6484	34.8281	34.4063
16.9632	55.0078	55.0078	46.1484	45.0703	39.9141	38.9766	37.8516	36.8906	36.1172	34.9219	33.7500	32.8594
20.8786	53.1328	51.5625	50.2500	49.1719	48.5156	46.8984	45.5859	44.3672	43.9453	42.7500	40.7578	39.6563
24.7925	55.9453	53.8125	53.5547	52.9922	58.4531	54.8203	51.9141	49.9219	47.9766	46.8516	46.1484	43.1016
30.6168	61.5234	60.8672	60.8906	59.9063	59.8594	59.5781	59.1563	57.7500	55.8281	54.6094	52.2891	49.8516
38.1454	80.1797	79.0781	77.5078	76.6875	75.7500	75.0703	74.4375	74.0859	73.0547	72.4922	72.1875	70.1016
45.6711	93.0703	91.6406	90.0000	88.8047	87.2578	85.9922	84.9844	84.2578	83.6250	82.9922	82.1484	81.8672
52.1927	102.9375	101.2734	199.7344	97.5000	95.7656	94.5234	94.4531	94.2656	94.0547	93.3750	91.0313	89.7188
58.7158	111.0469	110.0156	109.8516	108.9141	107.3438	105.8672	104.8594	104.1094	103.4766	102.8906	101.6719	99.7734
65.2420	120.1641	119.1094	118.0781	117.0703	115.8281	114.0938	113.5547	112.5938	111.4922	110.1797	109.3828	107.4375
78.2898	126.1875	124.9219	123.8672	122.5781	121.1250	119.9297	118.1016	117.0938	116.0625	114.2813	111.3047	109.7578
99.9939	147.7031	146.6016	145.5000	144.0000	142.3125	140.2031	139.9219	155.0391	153.9375	152.1094	144.9844	139.8750

Note: when you finish the data changed, please save it as one new CAL file.

Please read the flowing chapter for how to save the new CAL files.

#### 3.3.4 On-the-fly Calibration

## ECITRON

**On-the-fly** calibrations are something must to have when tuning the engine on the dyno, so that you can make you calibration changes taking effect immediately by hit a "ENTER" key. No need to "Burn to ECU" or reprogram the ECU. Only by this way, you can keep the engine running without interrupted and at the same time find the sweet spots of the certain operating conditions. And you can tune your fuel / spark maps very quickly.

But the drawback of the "on-the-fly" calibrations is to use a lot of memory of ECU. Basically any calibration data you want to do "on-the-fly" changes, you must double or even triple the size of the memory for that set of data. That would significantly increase the ECU cost.

We have a compromise to do this: only make certain critical calibration maps as "on-the-fly" capable. And most other non-critical calibrations, which are seldom changed by customers, stay the old way.

Mainly for most customers, the calibrations that need to be tuned for their engines are basic Fuel maps (VE table, TPS-load table), Spark maps, and some supplemental fuel/spark characteristic curves.

You can also use "**Save CAL as**" feature at "File" menu to save your new calibrations to a new CAL file. And later on load it into EcoCAL.

At this moment the below calibration maps, curves, and values are made "on-the-fly" capable:

RAM\_MAP\_LdTp\_N\_Tps; RAM\_MAP\_fVe\_Map\_N; RAM\_MAP\_Iga\_N\_Ld RAM\_CUR\_fAst\_TmSta; RAM\_CUR\_fWmp\_Tm; RAM\_VAL\_fFIApp

You can add the calibration variables in EcoCAL.

### 3.4 Save as calibration data file

## ECOTRON

When you finish EFI tuning or do some fine tuning, please save the tuning data before you exit the EcoCAL, otherwise, you will lost the tuning that you did.

File	Edit Settings Run Variables	5 Diagnosti	cs Advanced Window Help
	Open	Ctrl+O	
	Save CAL	Ctrl+S	Calibration
	Save CAL as		+ 0.001 - + 1 /
	Save Configuration	Ctrl+F2	I Input: Tm, [DegC],"break points, engi
	Save Configuration as		Output: CUR_NstaEnd_Tm, [Rpm]
	Load Configuration Default Configuration Reset	Ctrl+F3	Tm/[DegC] -30.00
	Exit		O Calibration
	•	Þ	+ 0.001 _ * 1 /

#### Go to menu->File->Save CAL as

Save As	puter ▶ Local Disk (C:) ▶ EcoCAL ▶		The fullete	✓ <sup>4</sup> → Search EcoCAL	
Organize 🔻 New f	folder				!≡ ▼ (
🔆 Favorites 📩	Name	Date modified	Туре	Size	
📃 Desktop	🐌 HelpDoc	2017/8/22 11:38	File folder		
📙 Downloads 🗧	📕 kerneldlis	2017/8/22 11:38	File folder		
📃 Recent Places	퉬 Picture	2017/8/22 11:38	File folder		
	퉬 record	2017/8/22 11:40	File folder		
🥃 Libraries	퉬 Uninstall	2017/8/22 11:38	File folder		
Documents	📓 Demo.cal	2015/6/24 9:38	CAL File	17 KB	
🌙 Music	🛒 EFI-Demo.cal	2017/7/26 15:44	CAL File	14 KB	
Pictures	Fetch from ECU.cal	2017/8/22 11:11	CAL File	4 KB	
Subversion 💌					
File name: Da	ata tuning-21070822				
Save as type: ca	al(*.cal)				
Hide Folders				Save	Cancel
- Flue Folders				Jure	Cancer

You can save it as the new calibration CAL file.

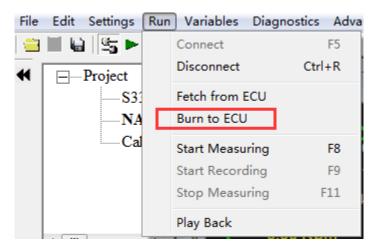
## 3.5 Burn to ECU and Fetch from ECU

#### 3.5.1 Burn the CAL file to ECU



When you finish the data tuning, you want to see the performance of engine, please burn the data to ECU, then ECU will use the data that you changed to control the engine.

Connect to ECU first, and then click the "burn to ECU "button to burn the CAL file or data changed to ECU.



😈 Burn or Fetch ProgressBar	<u> </u>
	Cancel

When burn to ECU successfully, you will hear the noise of fuel pump working.

**Note:** make sure your 12V battery is healthy, before you do any "burn to ECU" or "fetch from ECU"!

During the upload or download, users are not allowed to do any operations to the EFI system.

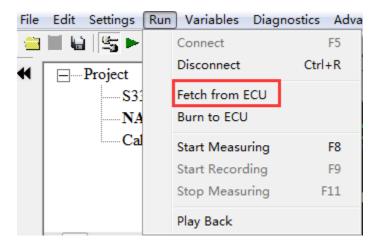
Do not turn off the ECU power or disconnect the serial cable before the upload/download is finished

#### 3.5.2 Fetch the CAL file from ECU



Sometimes, maybe you want to know which version of Calibration data is in ECU or you forgot the change that you did, you can fetch the data from ECU to compare.

#### Connect ECU only; Go to menu->Run->Fetch from ECU



Save it as CAL file.

## Chapter 4 Tuning help and support

### 4.1 Pop-up the Help and support window

In EcoCAL, there are many emarks in the window, you can click this to get the details of calibration variables and measure variables, and you can get the method of tuning and the meaning of measure variables.

😽 Calibrati	on						ଷ	Measurements			-	
+ 0.001	- *	1 /	Selected =	1	6 2		Г	Alias	Name	Value	Unit	Rate
Input-X: N, [	Rpm],"break	point, engine	speed" Inp	ut-Y: TpsEqu	1, [%],"input	<tpsequ>,</tpsequ>	6	Altitude factor	fAlt			100ms
🕜 Output: R	AM_MAP_	LdTp_Tps_N	, [%],"charad	teristic map,	normalized lo	ad based o	C	Fuel factor closed-loop control	fLc		-	20ms
							6	Pre-control fuel factor	fPreCtl			100ms
X/Y	1400.00	2000.00	2600.00	3200.00	3800.00	4400.00	6	Correction factor based on air temperatur	fTcmb			100ms
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	6	Volumetric Effciency	fVe			Syn
3.9139	35.0391	30.1172	26.1094	20.1094	18.9375	18.7969	l (	Desired Lambda	LamDsr		-	100ms
6.5262	36.1641	32.0625	28.3125	24.6797	22.6172	20.8594		Lambda	LamWO2			20ms
9.1324	40.3125	36.2813	32.2969	30.2813	26.1094	25.5469		Load	Ld		%	Syn
13.0478	45.1641	44.7422	40.8047	34.9922	32.6016	28.5469		Predicted Load	LdPrd		%	Syn
16.9632	54.5391	50.5313	46.2422	42.4688	38.9297	34.2891		Load based on TPS	LdTp		%	Svn
20.8786	60.7266	58.7344	54.4688	48.8672	44.3203	40.0781		Intake manifold pressure	Map		hPa	Svn
24.7925	65.2969	63.3516	58.1719	54.0469	50.4609	46.9922		Engine Speed	N		Rpm	Syn
32.6172	68.1797	66.1641	62.7422	58.4766	56.6016	56.2969		Engine-speed of byte value	Nb		Rpm	100ms
30 1440	70 7344	68 7188	64 4063	62 6016	60 6797	58 6875		Number of injections	nInj			Syn
							6	Raw engine speed	Nraw		Rpm	20ms
TPS based 1	oad mapping	J						Ambient pressure	Pam		hPa	100ms
<u></u>								Intake air pressure	Pim		hPa	Syn
🌀 Calibratio	on							Intake air temperature	Ta		DegC	100ms
+ 0.001	- *	1 /	Selected =	1	> 🛃 👘		l (	Fuel Pulse Width #1	tInj0		ms	Syn
Input: N_b, [I	Rpm],"input<	N b>, break t	ooints, engin	e speed "				Engine temperature	Tm		DegC	100ms
		p N, [%], "thr		-	load, depend	ent on the		Throttle Position Sensor	Tps		%	20ms
							l 🤅	Battery voltage from ADC channel	UbAdc		v	20ms
N_b/[	Rpm]	780	1020 14	40 1980	2340	2760		O2 sensor voltage	uLsb		v	20ms
•												
Throttle posi	ition threshol	d to split the l	load calculati	on between V	E and Alpha-	N	1					Þ
- storae post		a to spin die i										

There is also help for each layer; you can click the main 🔞 in EcoCAL to get the layer help.

File	Edit	Settings	Run	Variables	Diagnostics	Advanced	Window	Help
		i ⊈5 ⊫	- •	- 2	0			C

In different layer, the help document is also different.

For example, in the "Steady-State" layer window, click the 100 button, the help and support window will pop-up.



? EcoCAL Help and Support-Steady-State	?
Steady-State Save Edit	
Using the wideband ALM, you can read the AFR or lambda directly, and also log the real-time lambda (lamWO2) in ProCAL. Then you can tune the mapping based the real-time lambda.	
For details on how to integrate the wideband ALM to the ECU and enable the ALM based auto-tuning, please download our documen of "ALM-ECU integration Manual" here: <u>www.ecotrons.com/suppport <http: suppport="" www.ecotrons.com=""></http:></u>	t
Specific examples:	
Ok, you have read and known the above information, let's try to tune it.	
If your engine is running rich or lean in different throttle positions, you need do some advanced calibrations. There are two fuel mapping	ıg
tables, one is "RAM_MAP_fVe_Map_N" which is based on pressure signal "Map" and RPM, the other table is	
"RAM_MAP_LdTp_Tps_N" which is based on Tps and RPM. For four-stroke engines, the default fuel mapping usually is volumetric efficiency table (MAP fVe Map N), at least for all low RPM	
and mid-range RPM. For high RPM and WOT, it is based on "MAP_LdTp_Tps_N". The split between the 2 tables is defined in	
"CUR_TpsUnTp_N":	
Throttle position threshold to split the load calculation between VE and Alpha-N      + 0.001     + 1 / Selected = 1  Input: N_b, [Rpm], "input <n_b>, break points, engine speed "</n_b>	
Output: CUR_TpsUnTp_N, [%],"throttle position for 95 % of load, dependent on the engine speed"  III	*

### 4.2 Edit the Help and support window

You also can edit the content by yourself for easy to read based on your own understand.

First, click the 100 button to open the Help and support window,

## ECOTRON

## EcoCAL User Manual for EFI - V1.8

Alias	Name	Value	Unit	Rate
Altitude factor	fAlt			100ms
Fuel factor closed-loop control	fLc		-	20ms
Pre-control fuel factor	fPreCt1			100ms
Correction factor based on air temperatur	re fTcmb			100ms
Volumetric Effciency	fVe			Syn
Desired Lambda	LamDsr		-	100ms
Lambda	LamWO2			20ms
Load	Ld		%	Syn
Predicted Load	LdPrd		%	Syn
Load based on TPS	LdTp		%	Syn
Intake manifold pressure	Map		hPa	Syn
Engine Speed	N		Rpm	Syn
Engine-speed of byte value	N_b		Rpm	100ms
Number of injections	nInj			Syn
Raw engine speed	Nraw		Rpm	20ms
Ambient pressure	Pam		hPa	100ms
Intake air pressure	Pim		hPa	Syn
Intake air temperature	Та		DegC	100ms
Fuel Pulse Width #1	tInj0		ms	Syn
Engine temperature	Tm		DegC	100ms
Throttle Position Sensor	Tps		%	20ms
Battery voltage from ADC channel	UbAdc		V	20ms
O2 sensor voltage	uLsb		v	20ms

LamWO2	Search	Save	🗖 Edit	
Actual Lambda measured by WO2 control	ller"			



Then choose the Edit option, from to to , then you can edit the content by yourself.

For example, add the "Lambda reading from wideband controller ALM" content.

🕐 EcoCAL Help and Support-LamWO2		? <b>×</b>
LamWO2 Search Save	Z Edit	
"Actual Lambda measured by WO2 controller"		
"Lamnda reading from wideband controller ALM"		

After finishing, please click "Save" to save the change, otherwise, the change will be lost.



## Chapter 5 Advanced operation of EcoCAL

### 5.1 EcoCAL setting in Customers' demand

EcoCAL supports custom design; you can set the window as your demand.

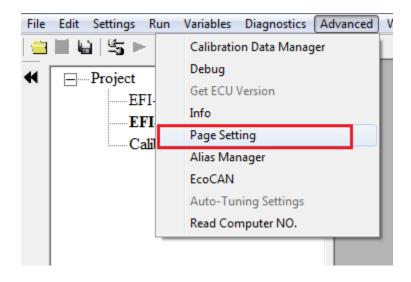
#### 5.1.1 Page setting

In the default page setting of EcoCAL, you can see there are many pages, for example "Desired idle speed", "Start fuel", "Start ignition",..., etc., they are the named "layer".



You can add or delete the layer as you want, for example, you don't want the "Servo motor" layer, you can delete it, if you want to add the "Custom Calibration" layer, you can add the layer and re-set it as you want the calibration variables, measure variables, etc.

#### Go to menu->Advanced->Page setting, the page setting window will pop-up.



**Note**: you also can right click on the layer label, and then click the "Page setting", the window will pop-up.

l fuel enrichment	Start fuel	٨f	Page Setting	iteady-State	Acceleration	1
File path: C:\EcoCAL\	gui.xml		Working Page: C: EC	CAL\EFI-Demo	o.cal	

Page setting window:



😈 Pa	ige Setting	X
No.	Layer Name	*
1	EFI basic setting	
2	Servo Motor	
3	Idle controls	
4	Global fuel enrichment	
5	Start fuel	
6	After-start Warm-up Fuel	
7	Steady-State	=
8	Acceleration	
9	Deceleration	
10	Performance WOT	
11	Altitude Calibration	
12	Advanced Tuning for injection	
13	Advanced Tuning for ignition	
14	Sensors Calibration	Ŧ
	III	Þ
1	New Delete Up Down OK Canc	el

How to delete the layer?

# ECOTRON

First, click the label to choose it, then click "Delete", for example, delete the "Servo motor" layer,

Ç	🅉 Pa	ge Setting	x
			_
	No.	Layer Name	<u>_</u>
	1	EFI basic setting	
	2	Servo Motor	
	3	Idle controls	
	4	Global fuel enrichment	
	5	Start fuel	
	6	After-start Warm-up Fuel	
	7	Steady-State	=
	8	Acceleration	
	9	Deceleration	
	10	Performance WOT	
	11	Altitude Calibration	
	12	Advanced Tuning for injection	
	13	Advanced Tuning for ignition	
	14	Sensors Calibration	Ŧ
	•	4 III	
	N	New Delete Up Down OK Cancel	

When you click the "Delete" button, there is one message window to ask you whether you want to delete the layer, choose "Yes", the layer will be deleted.



<b>ö</b> P	age Setting	23
No 1	D. Layer Name EFI basic setting	•
2		
3	Idle controls	
4	Global fuel enrichment Message	
5	Start fuel	
6	After-start Warm-up F	
7	Steady-State Do you want to delete this layer?	=
8		
9	Deceleration	
10	Performance WOT	
11	Altitude Calibration Yes No	
12	Advanced Tuning for	
13	Advanced Tuning for ignition	
14	Sensors Calibration	-
•	III	Þ.
	New Delete Up Down OK Car	icel

Then you can see there is no "Servo motor" layer in display.

Q	Pa	ge Setting
N	lo.	Layer Name
	1	EFI basic setting
	2	Idle controls
	3	Global fuel enrichment
	4	Start fuel
	5	After-start Warm-up Fuel
	6	Steady-State
	7	Acceleration
	8	Deceleration
	9	Performance WOT
	0	Altitude Calibration
	1	Advanced Tuning for injection
	2	Advanced Tuning for ignition
	3	Sensors Calibration
		• III
	N	Vew Delete Up Down OK Cancel
-	_	
	_	



#### How to add one new layer?

Click the "New" button to set up one new layer.

1	🕉 Pa	ge Setting	×
ſ	No.	Layer Name	
L	2	Idle controls	- -
	3	Global fuel enrichment	
L	4	Start fuel	
	5	After-start Warm-up Fuel	
L	6	Steady-State	
L	7	Acceleration	
	8	Deceleration	Ξ
	9	Performance WOT	
	10	Altitude Calibration	
	11	Advanced Tuning for injection	
	12	Advanced Tuning for ignition	
L	13	Sensors Calibration	
	14	New Layer	
	•		
	1	Vew Delete Up Down OK Canc	el

Double click the "New Layer" words, input the word as you want to re-name it, there, we re-name it be "Custom Calibration", then press the Enter button of keyboard to finish it.



Ö	Pa	ge Setting	X
l F	No.	Layer Name	*
	2	Idle controls	
	3	Global fuel enrichment	
	4	Start fuel	
	5	After-start Warm-up Fuel	
	6	Steady-State	
	7	Acceleration	
	8	Deceleration	Ξ
	9	Performance WOT	
	10	Altitude Calibration	
	11	Advanced Tuning for injection	
	12	Advanced Tuning for ignition	
	13	Sensors Calibration	
I L	14	Custom Calibration	
			Ŧ
	٠.	4	
	N	New Delete Up Down OK Cance	1

After finishing, click "OK".

Then you can see there is the new "Customer Calibration" layer in the window.

Altitude Calibration	Advanced Tuning for injection	Advanced Tuning for ignition	Sensors Calibration	Custom Calibration
: C:\EcoCAL\EFI-Demo.	cal			

You can use the "Up" and "Down" button to de change the display order of layers.



Ö	Pa	ge Setting	x
N	о.	Layer Name	*
1		EFI basic setting	
2	2	Idle controls	
3	;	Global fuel enrichment	
4	Ļ	Start fuel	
5	5	After-start Warm-up Fuel	
6	5	Steady-State	
7	1	Acceleration	=
8	3	Deceleration	
9	)	Performance WOT	
1	0	Altitude Calibration	
1	1	Advanced Tuning for injection	
1	2	Advanced Tuning for ignition	
1	3	Sensors Calibration	
1	4	Custom Calibration	Ŧ
₹		4	
	N	Iew Delete Up Down OK Cancel	

#### 5.1.2 Layer setting

You can edit the Layer showing via adding calibration variables and measured variables.

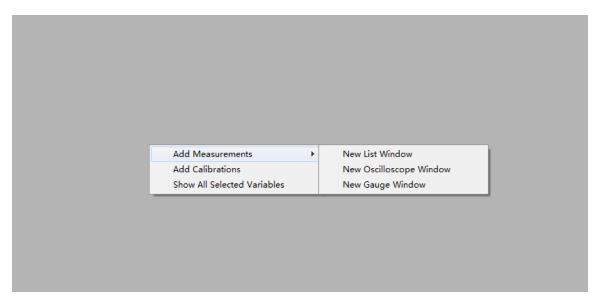
First, click the layer that you want to edit, for example, "Customer Calibration" layer.





Right click on the window, there some menu you can choose, to set this layer.

About add Calibration variables and Measure variables, please read the chapter 3.1 and chapter 3.2. You also can **Right click on the blank area of window**, **click** "Add Measurements->New Oscilloscope Window", more details, you can refer to the chapter 5.3.5





#### 5.1.3 Alias setting

Maybe you don't know the meaning of calibration variables and measured variables, we have set the alias of variables in default, and you also can edit it for easy reading and remembering.

Calibration				- 19	Measurements				
+ 0.001 _ *	1 / Selected =	1	<u>5 2</u>		Alias	Name	Value	Unit	Rate
nput: Tm, [DegC],"break p	ooints, engine temperatur	e "			Engine-start end	B_StaEnd	-		100m
Output: CUR_NstaEnd	_Tm, [Rpm],"Engine spee	d threshold f	or end of start "		Altitude factor	fAlt	-		100m
					Start fuel factor	fF1Sta	-		100m
Tm/[DegC]	-30 0	90			Pre-control fuel factor	fPreCt1	-		Syn
CUR_NstaEnd_Tm/[Rpm	] 1020 1020	1020			2 Lambda	LamWO2	-		Syn
					2 Load	Ld	-	%	Syn
					Predicted Load	LdPrd	-	%	Syn
				· 🛛 🌘	Engine Speed	Ν	-	Rpm	Syn
Engine start end					Engine-speed of byte value	N_b	-	Rpm	100m
					Number of injections	nInj	-		Syn
of Calibration					Raw engine speed	Nraw	-	Rpm	20ms
+ 0.001 _ *	1 / Selected =	1 6			Ambient pressure	Pam	-	hPa	100m
			2	- 🛛 🧕	Intake air temperature	Ta	-	DegC	100m
Data: VAL_MedRpmThr,[]			-		Fuel Pulse Width #1	tInj0	-	ms	Syn
Alias	Name	Value	Unit		Engine temperature	Tm	-	DegC	100m
VAL_dMapRaw	VAL_dMapRaw	150.00	hPa		Engine temperature when start	TmSta	-	DegC	100m
<pre> VAL_dMedRpmThr </pre>	VAL_dMedRpmThr	600	Rpm		Throttle Position Sensor	Tps	-	%	20ms
VAL_dNFofH	VAL_dNFofH	300	Rpm		Battery voltage from ADC channel	UbAdc	-	V	20ms
VAL_dNFofId1	VAL_dNFofId1	300	Rpm						
VAL_dNFofL	VAL_dNFofL	60	Rpm						
VAL_MedRpmThr	VAL_MedRpmThr	3000	Rpm						
VAL_MnStCLc	VAL_MnStCLc	0.70	-						
VAL_NmnVspErr	VAL_NmnVspErr	1500	Rpm						
😧 VAL NmnVspErr1	VAL NmnVspErr1	4020	s						

The words in red area are alias of variables, you can re-edit it or add new alias.

#### How do edit the alias?

First, choose the variable name that you want to change, and then right click.

Alias	Name	Value	Unit	Rate
Engine-start end	B StaEnd	-		100ms
Altitude factor	fAlt	-		100ms
Start fuel factor	fF1Sta	-		100ms
Pre-control fuel factor	fPreCtl	-		Syn
Lambda	LamWO2	-		Syn
Load	Lđ	-	%	Syn
Predicted Load	LdPrd	-	%	Syn
Engine Speed	N	-	Rpm	Syn
Engine-speed of byte value	N_b	-	Rpm	100ms
Number of injections	nInj	-		Syn
Raw engine speed	Nraw	-	Rpm	20ms
Ambient pressure	Pam	-	hPa	100ms
Intake air temperature	Ta	-	DegC	100ms
Fuel Pulse Width #1	tInj0	-	ms	Syn
Engine temperature	Tm	-	DegC	100ms
Engine temperature when start	TmSta	-	DegC	100ms
Throttle Position Sensor	Tps	-	%	20ms
Battery voltage from ADC channe	1 UbAdc	Add N	leasurements	-
	[	Chang	je Alias	
		Hide A	lias Column	
		Variab	le properties	

Here, we change the alias of UbAdc, the current Alias is "Battery voltage from ADC channel"

Then click "Change Alias", the window will pop-up,



AliasMar	nage		Tagen qual d'Arts das 1	×
No.	Variable	Alias		
1	UbAdc	Battery voltage from AD	DC channel	
2	UbAdcIni			
3	UbAdc_b			
Searc	ch: UbAdc		Search By: Variab	le 💌
			OK	Cancel

Double click the Alias, then input the words that you want to change, for example, "Voltage of battery", then press the Enter button of keyboard to finish it.

Then, click "OK"

AliasMan	age	Topo or	×
No.	Variable	Alias	
1	UbAdc	Voltage of battery	
2	UbAdcIni		
3	UbAdc_b		
Searc	h: UbAdc		Search By: Variable
			OK Cancel

So, we can see the Alias of UbAdc is changed.



Alias	Name	Value	Unit	Rate
Engine-start end	B_StaEnd	-		100ms
Altitude factor	fAlt	-		100ms
Start fuel factor	fF1Sta	-		100ms
Pre-control fuel factor	fPreCt1	-		Syn
🕖 Lambda	LamWO2	-		Syn
🕖 Load	Ld	-	%	Syn
Predicted Load	LdPrd	-	%	Syn
Engine Speed	Ν	-	Rpm	Syn
Engine-speed of byte value	N_b	-	Rpm	100ms
Number of injections	nInj	-		Syn
Raw engine speed	Nraw	-	Rpm	20ms
Ambient pressure	Pam	-	hPa	100ms
🕖 Intake air temperature	Ta	-	DegC	100ms
Fuel Pulse Width #1	tInj0	-	ms	Syn
Engine temperature	Tm	-	DegC	100ms
Engine temperature when start	TmSta	-	DegC	100ms
Throttle Position Sensor	Tps	-	%	20ms
Voltage of battery	UbAdc	-	v	20ms

**Note**: when you change the Alias of variables, the Alias of same variable will be changed in all layers.

Note: If you want to change the Alias of MAP and CUR variables, you need right click on the table, then to choose "Change Alias".



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+ 0.001	- *	+ 1	1	Selected =	1	5 0								
put-X: Pim	, [hPa],"inp	ut <map></map>	, break po	int, manif	old absolu	ite pressu	re, for Volumatric Efficiency factor"	Input-Y: N	, [Rpm],"i	nput <n></n>	, break po	oint, engin	e speed, f	or Volun
							dependent on pressure and engine s			-	-			
							550.00 600.00 650.00 700.00							
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	Add Calibrations	750.00	800.00	850.00	900.00	970.00	1050.00	
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	Delete	0.68	0.68	0.65	0.63	0.62	0.61	
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	Delete	0.69	0.68	0.66	0.64	0.62	0.61	
1650.00	0.47	0.48	0.51	0.55	0.57	0.58	Import	0.70	0.68	0.67	0.66	0.64	0.62	
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	Export	0.72	0.69	0.68	0.67	0.65	0.63	
2500.00	0.49	0.50	0.52	0.56	0.59	0.62		0.74	0.72	0.70	0.69	0.66	0.65	
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	Сору	0.77	0.75	0.73	0.72	0.71	0.69	
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	Paste	0.80	0.77	0.76	0.75	0.72	0.71	
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	Smooth Cells	0.83	0.82	0.81	0.80	0.76	0.75	
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	Change Alias	0.87	0.84	0.84	0.82	0.80	0.78	
7000.00	0.55	0.56	0.61	0.66	0.73	0.78		0.89	0.87	0.87	0.86	0.84	0.83	
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	Decimals Display	0.89	0.87	0.87	0.86	0.86	0.83	
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	2D View	0.89	0.87	0.87	0.86	0.86	0.83	
							3D View							
							Fit Window							
							Fit Window Fit Grid							
Volumetric	Efficiency	[able]					Fit Grid							
'olumetric	Efficiency	Table					Fit Grid Variable Properties							
olumetric	Efficiency 7	Table					Fit Grid Variable Properties							
		[able]					Fit Grid Variable Properties							
		<u>Fable</u>					Fit Grid Variable Properties							
Calibratic	on		/ Sel	lected = 1			Fit Grid Variable Properties			_				
Calibratic	on	1					Fit Grid Variable Properties Window Properties							
Calibratic 0.001 put: LdPrd,	on - * [%],"break	1	el wall film	, depenede	nt on Loa	d predicte	Fit Grid Variable Properties Window Properties							
Calibratic 0.001 put: LdPrd, Output: Cl	n - * [%],"break UR_Wf_Ld		el wall film aracteristi	, depenede c curve: fu	nt on Loa el wall film	d predicte , depened	Fit Grid Variable Properties Window Properties d" ent on Load predicted "							
Calibratic 0.001 out: LdPrd, Output: CU LdPrd/[ <sup>4</sup>	n - * [%],"break UR_Wf_Ld %]	1	el wall film aracteristic 6.00	, depenede c curve: fu 12.00	nt on Loa el wall film 18.00	d predicte , depened ) 24.	Fit Grid Variable Properties Window Properties d" ent on Load predicted " 00 Add Calibrations					66.00	72.00	78.0
Calibratic 0.001 ut: LdPrd, Output: CU LdPrd/[ <sup>4</sup>	n - * [%],"break UR_Wf_Ld %]		el wall film aracteristi	, depenede c curve: fu	nt on Loa el wall film	d predicte , depened ) 24.	Fit Grid Variable Properties Window Properties d" ent on Load predicted " 00 Add Calibrations	J0 94				66.00 232.88		78.00
Calibratic 0.001 out: LdPrd, Output: CU LdPrd/[ <sup>4</sup>	n - * [%],"break UR_Wf_Ld %]	1	el wall film aracteristic 6.00	, depenede c curve: fu 12.00	nt on Loa el wall film 18.00	d predicte , depened ) 24.	Fit Grid Variable Properties Window Properties d" ent on Load predicted " Add Calibrations 06 9 Delete	-					72.00	78.00
Calibratic 0.001 put: LdPrd, Output: Cl	n - * [%],"break UR_Wf_Ld %]	1	el wall film aracteristic 6.00	, depenede c curve: fu 12.00	nt on Loa el wall film 18.00	d predicte , depened ) 24.	Fit Grid Variable Properties Window Properties d" ent on Load predicted " 00 4 Calibrations 06 5 Delete Import	-					72.00	78.00
Calibratic 0.001 ut: LdPrd, Output: CU LdPrd/[ <sup>4</sup>	n - * [%],"break UR_Wf_Ld %]	1	el wall film aracteristic 6.00	, depenede c curve: fu 12.00	nt on Loa el wall film 18.00	d predicte , depened ) 24.	Fit Grid Variable Properties Window Properties d" ent on Load predicted " 00 s 06 s Delete Import Export	-					72.00	78.0
Calibratic 0.001 ut: LdPrd, Output: CU LdPrd/[ <sup>4</sup>	n - * [%],"break UR_Wf_Ld %]	1	el wall film aracteristic 6.00	, depenede c curve: fu 12.00	nt on Loa el wall film 18.00	d predicte , depened ) 24.	Fit Grid Variable Properties Window Properties d" ent on Load predicted " 00 4 Calibrations 06 5 Delete Import	-					72.00	78.0
Calibratic 0.001 out: LdPrd, Output: CU LdPrd/[ <sup>4</sup>	n - * [%],"break UR_Wf_Ld %]	1	el wall film aracteristic 6.00	, depenede c curve: fu 12.00	nt on Loa el wall film 18.00	d predicte , depened ) 24.	Fit Grid Variable Properties Window Properties d" ent on Load predicted " 00 4 06 5 00 5 00 1 00 1 00 1 00 1 00 1 00 1 00	-					72.00	78.0

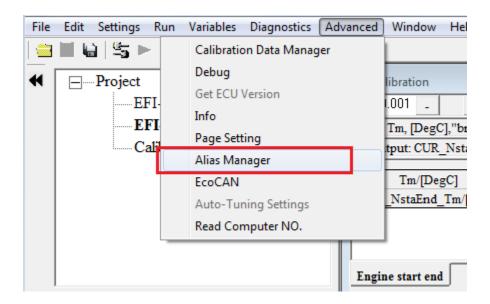
Note: You can change and manage the alias of all variables at the same time **Go to menu->Advanced->Alias Mange**, when you finish it, please click "OK".

Decimals Display 2D View 3D View Fit Window Fit Grid

Variable Properties Window Properties

•

Wall film fuel depending on the predicted load



No.	Variable	Alias		-
L	fWmpRmp			
2	fWmp1			
;	fWmp2			_
Ļ	fWmp3			
5	UD_fWmp1			
5	UD_B_WmpEnd			
7	LPK_fWmpRmp_U8			
3	ER_fWmpRmp			
)	B_WmpEnd			
0	B_WmpRmp			
1	RAM_SelfLeamHistory			
2	SLM_StableCondition			
13	SLM_Tps_StableRef			
14	SLM_N_StableRef			
15	SLM_StableCounter			
16	SLM_fLamAdIn_StableRef			
17	Nraw	Raw engine speed		
18	uTps	TPS sensor voltage		
19	uMap	MAP sensor voltage		
20	UbAdc	Voltage of battery		
21	uTa	Intake air temp sensor voltage		
22	uTm	Engine temp sensor voltage		
23	uLsb	O2 sensor voltage		
24	uPot	Potentiometer voltage		•
Searc	h:		Search By: Variable	

# 5.1.4 Window setting



You also can change the name of different window in different layers, for example, the name of following window is "Desired lambda /AFR", now we change it to be "Desired lambda from customer"

🍯 Calibrati	on													• <b>•</b>
+ 0.001	-	* 1	1	Selected =	= 1		*							
nput-X: N, [	Rpm],"bre	ak point,	engine sp	eed" Inj	out-Y: Tp	s, [%],"inp	ut <tpse< td=""><td>qu&gt;, breal</td><td>k points, t</td><td>hrottle po</td><td>sition "</td><td></td><td></td><td></td></tpse<>	qu>, breal	k points, t	hrottle po	sition "			
Output: N	MAP_Lam	Drv_Tps_	N, [-],"cł	naracterist	ic map, D	river desir	ed lambd:	a, depend	ent on TP	S and N"				
Х/Ү	1000.00	1500.00	1700.00	2000.00	2800.00	3600.00	4400.00	5000.00	6000.00	7000.00	8000.00	9000.00		
0.0000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
3.9139	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
6.5262	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
9.1324	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
13.0478	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
16.9632	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
20.8786	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
24.7925	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
30.6168	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
38.1454	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
45.6711	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
52.1927	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
58.7158	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
65.2420	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
78.2898	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
99.9939	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Driver desir	ed lambda													

Right click on the window, and choose "Window Properties"

Calibrat					<u> </u>						
0.001	-	* 1	1	Selected = 1	<u>ð</u>						
1t-X: N,	[Rpm],"bre	ak point,	engine sp	eed" Input-Y: Tps, [%],"in	put <tpse< td=""><td>qu&gt;, breal</td><td>k points, t</td><td>hrottle po</td><td>sition "</td><td></td><td></td></tpse<>	qu>, breal	k points, t	hrottle po	sition "		
Dutput: I	MAP_Lam	Drv_Tps_	N, [-],"cł	naracteristic map, Driver desi	red lambda	a, depend	ent on TP	S and N"			
Х/Ү	1000.00	1500.00	1700			5000.00	6000.00	7000.00	8000.00	9000.00	
				Add Calibrations							
0.0000	1.00	1.00	1.	Delete	.00	1.00	1.00	1.00	1.00	1.00	
3.9139	1.00	1.00	1.	Delete	00	1.00	1.00	1.00	1.00	1.00	
5.5262	1.00	1.00	1.	Import	.00	1.00	1.00	1.00	1.00	1.00	
9.1324	1.00	1.00	1.	Export	00	1.00	1.00	1.00	1.00	1.00	
3.0478	1.00	1.00	1.	Сору	.00	1.00	1.00	1.00	1.00	1.00	
6.9632	1.00	1.00	1.		.00	1.00	1.00	1.00	1.00	1.00	
0.8786	1.00	1.00	1.	Paste	00	1.00	1.00	1.00	1.00	1.00	
4.7925	1.00	1.00	1.	Smooth Cells	.00	1.00	1.00	1.00	1.00	1.00	
0.6168	1.00	1.00	1.	Change Alies	.00	1.00	1.00	1.00	1.00	1.00	
8.1454	1.00	1.00	1.	Change Alias	00	1.00	1.00	1.00	1.00	1.00	
5.6711	1.00	1.00	1.	Decimals Display	.00	1.00	1.00	1.00	1.00	1.00	
2.1927	1.00	1.00	1.	2D View	00	1.00	1.00	1.00	1.00	1.00	
8.7158	1.00	1.00	1.	3D View	00	1.00	1.00	1.00	1.00	1.00	
5.2420	1.00	1.00	1.	Fit Window	00	1.00	1.00	1.00	1.00	1.00	
8.2898	1.00	1.00	1.	Fit Grid	00	1.00	1.00	1.00	1.00	1.00	
9.9939	1.00	1.00	1.	rit onu	00	1.00	1.00	1.00	1.00	1.00	
				Variable Properties							
iver desi	red lambda			Window Properties							

A little window pop-up, change the stock words to be "Desired lambda from customer", and then click "OK".

To Window Property	y 🗆 🗆 🗙
Window Name:	Calibration
OK	Cancel
😈 Window Property	y D X
Window Name:	Desired lambda from customer
OK	Cancel



0.001		*	/	Selected =	1		2						
	[Rpm],"bre				-		-			-	sition "		
Output: I	MAP_Lam	Drv_Tps_	_N, [-],"cł	naracterist	ic map, D	river desir	ed lambda	a, depend	ent on TP	S and N"			
X/Y	1000.00	1500.00	1700.00	2000.00	2800.00	3600.00	4400.00	5000.00	6000.00	7000.00	8000.00	9000.00	
0.0000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
3.9139	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
6.5262	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
9.1324	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
13.0478	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
16.9632	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
20.8786	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
24.7925	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
30.6168	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
38.1454	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
45.6711	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
52.1927	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
58.7158	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
65.2420	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
78.2898	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
99.9939	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Then, the name of window is changed as you want.

Note: the method to change other windows is the same.

5.1.5 Fit window and grid



+ 0.001	-	*	1	1	Sel	ected =	1		5 0	•			
Input-X: N	, [Rpm],"	break po	oints,	engin	e spee	d, for s	tepper	r moto	r contro	o1''	Input-Y: Tm,	[DegC],"br	eak points
Output:	MAP_S	tepPreP	os_T	m_N, [	[-],"ch	aracter	istic m	ap, Pre	e-positi	onin	ig value of ste	pper motor	n.
Х/Ү	500.00	800.00											
-30.00	80	80											
-20.00	85	85											
-10.00	90	90											
0.00	95	95											
10.00	100	100											
20.00	105	105											
30.00	110	110											
40.00	115	115											
50.00	120	120											
60.00	125	125											
70.00	130	130											
90.00	135	135											
98.75	140	140											
110.00	145	145											
125.00	150	150											
(													

Right click on the window, click "Fit Window",



To Calibration	x
+ 0.001 _ * 1 / Selected = 1 *	
Input-X: N, [Rpm], "break points, engine speed, for stepper motor control" Input-Y: Tm, [DegC], "break points	ints
Output: MAP_StepPrePos_Tm_N, [-],"characteristic map, Pre-positioning value of stepper motor"	
	_
X/Y 500.00 800.00 Add Calibrations	
-30.00 80 80 Delete	
-20.00 85 85	
-10.00 90 90 Import	
0.00 95 95 Export	
10.00 100 100 Copy	
20.00 105 105 Paste	
30.00 110 110 Smooth Cells	
40.00 115 115	
50.00 120 120 Change Alias	
60.00 125 125 Decimals Display	
70.00 130 130 2D View	
90.00 135 135 3D View	
98 75 140 140	
110.00 145 145	
125.00 150 150 Fit Grid	
Variable Properties	
Window Properties	
window Properties	
Stepper motor pre-start position	

Then the width of grid the can be adjusted, according to the width of window,



Output: M/	AP_StepPrePos_Tm_N, [-],"cha	racteristic map, Pre-positioning va	lue of stepper motor"
Х/Ү	500.00	800.00	
30.00	80	80	
20.00	85	85	
10.00	90	90	
0.00	95	95	
10.00	100	100	
20.00	105	105	
30.00	110	110	
40.00	115	115	
50.00	120	120	
60.00	125	125	
70.00	130	130	
90.00	135	135	
98.75	140	140	
10.00	145	145	
25.00	150	150	

Right click on the window, click "Fit Grid", the width of cells will be adjusted, according to the content-length.

+ 0.001	ion -	*	1 / Selected = 1 5
nout-X: N.	[Rpm]."	break po	pints, engine speed, for stepper motor control" Inp
-		-	os_Tm_N, [-],"characteristic map, Pre-positioning va
	_	-	
X/Y	500.00	800.00	
-30.00	80	80	
-20.00	85	85	
-10.00	90	90	
0.00	95	95	
10.00	100	100	
20.00	105	105	
30.00	110	110	
40.00	115	115	
50.00	120	120	
60.00	125	125	
70.00	130	130	
90.00	135	135	
98.75	140	140	
110.00	145	145	
125.00	150	150	

Then the width of grid the can be adjusted, according to the width of window,

## 5.1.6 Smooth Cells

This function is designed just for curve type variable, the function do not support map type now. The function is that you can set a maximum valve and a minimum, then make all other valves move into the section. The detail operation is like this:

Set a maximum and a minimum:



Select this section, then right click on the window, select "Smooth Cells":

😽 Calibration							
+ 0.001 - * 1 / Selected = 1 🔷							
Input: Tm, [DegC],"breat	k points, eng	gine tempera	ature "				
Output: CUR_tlacSo	LAst_Tm, [-]	"char. curv	e, time to op	en the idle a	air control s	olenoid afte	r engine starts"
Tm/IDerCl	-30.00	0.00	20.00	60.00	90.00	120.00	-
Tm/[DegC] CUR tIacSolAst Tm	0.00	50.00	10.00	5.00	5.00	25.00	
COR_dacoonst_1m	0.00	50.00	10.00	5.00	5.00	25.00	1
Г							
CUR_tlacSolAst_Tm							

Add
Delete
Import
Export
Сору
Paste
Smooth Cells
Change Alias
Decimals Display
2D View
3D View
Fit Window
Fit Grid
Variable Properties
Window Properties

You can see the data which will be adjusted smoothly in this section, as below.

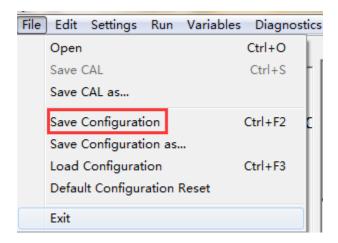


😽 Calibration								
+ 0.001 - * 1 / Selected = 1 🔷								
Input: Tm, [DegC],"brea	k points, en	gine tempera	ature "					
Output: CUR_tlacSo	1Ast_Tm, [-]	,"char. curv	re, time to op	pen the idle a	air control s	olenoid after	engine starts"	
Tm/[DegC]	-30.00	0.00	20.00	60.00	90.00	120.00	_	
CUR_tIacSolAst_Tm	0.00	5.00	10.00	15.00	20.00	25.00		
CUR_tlacSolAst_Tm								

#### 5.1.7 Save configuration

When you re-set the window by using above methods, you can save the settings as one new configuration, so you can save it, and use it when you want.

#### Go to menu->File->Save Configuration



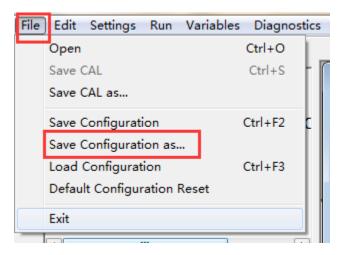
Then, name the new configuration file, "customer", and then click "Save".



)rganize 🔻 New fol	der					6
Favorites	Name	Date modified	Type	Size		
Marktop	kerneldlis	2017/4/17 9:52	File folder			
Downloads	Picture	2017/4/17 9:52	File folder			
Recent Places	🔒 record	2017/4/15 8:57	File folder			
and an	Uninstall	2017/4/17 9:52	File folder			
🗃 Libraries	current_config.xml	2017/5/13 11:39	XML Document	3 KB		
Documents	Current_VariblesAlias.xml	2017/5/13 11:39	XML Document	11 KB		
J Music	📄 gui.xml	2016/12/12 10:30	XML Document	31 KB		
E Pictures	VariblesAlias.xml	2015/11/30 16:08	XML Document	130 KB		
Subversion						
📑 Videos						
Computer						
File name cust	omer					
Save as type: XML	(* xml)					_

You also can save the setting based on the current loading configuration.

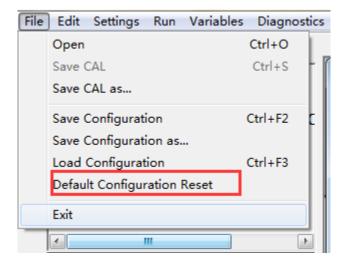
#### Go to menu->File->Save Configuration as



### 5.1.8 Reset default configuration

If you don't want to use the page configuration setting after you change much, you can use this to reset to be default configuration of EcoCAL.





Then, click "Yes

EcoCAL	X
Do you want to reset default co	onfiguration?
Yes	No

The current setting is the default configuration setting.

## 5.1.9 Load configuration

Sometimes, we will send the page configuration based on your custom EFI system for your tuning purpose. So you can load the configuration.

You also can load the configuration that you saved.

#### Go to menu->File->Load configuration

File	Edit	Settings	Run	Variables	Diagno	stics
	Open				Ctrl+O	
	Save (	CAL			Ctrl+S	Η
	Save	CAL as				
	Save	Configurat	ion		Ctrl+F2	c
	Save	Configurat				
	Load	Configurat	ion		Ctrl+F3	
	Defau	lt Configur	Reset			
	Exit					

Choose the configuration file then click "Open".

rganize 🔻 🛛 New fold	er				•		
Favorites	Name	Date modified	Туре	Size			
🔜 Desktop	le kerneldlis	2017/4/17 9:52	File folder				
🐌 Downloads	Picture	2017/4/17 9:52	File folder				
📃 Recent Places	📕 record	2017/4/15 8:57	File folder				
	퉬 Uninstall	2017/4/17 9:52	File folder				
Libraries	current_config.xml	2017/5/13 11:39	XML Document	3 KB			
Documents	Current_VariblesAlias.xml	2017/5/13 11:41	XML Document	11 KB			
J Music	customer.xml	2017/5/13 11:41	XML Document	3 KB			
E Pictures	🔮 gui.xml	2016/12/12 10:30	XML Document	31 KB			
Subversion	📄 VariblesAlias.xml	2015/11/30 16:08	XML Document	130 KB			
📕 Videos							
Computer							
🕌 Local Disk (C:)							
👝 Local Disk (D:) 👻							
File n	ame: customer.xml			▼ XI	ml(*.xml)	_	

# 5.1.10 Language Setting



The user can select "**Settings**  $\rightarrow$  **Language**", then select the language you want.

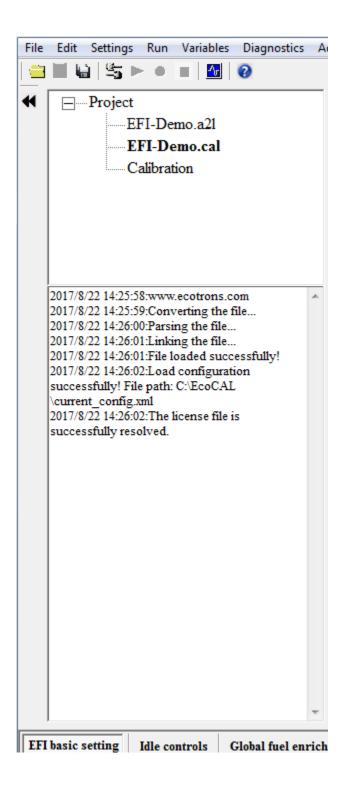
Note: click "English" to get the English interface;

click "Chinese" to get the Chinese interface;



# 5.1.11"Show"/"Hide" Default List

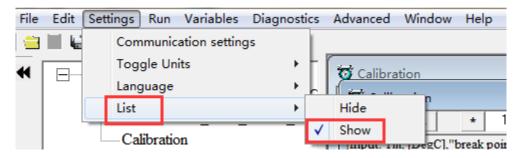
The shown effect of Hide list:



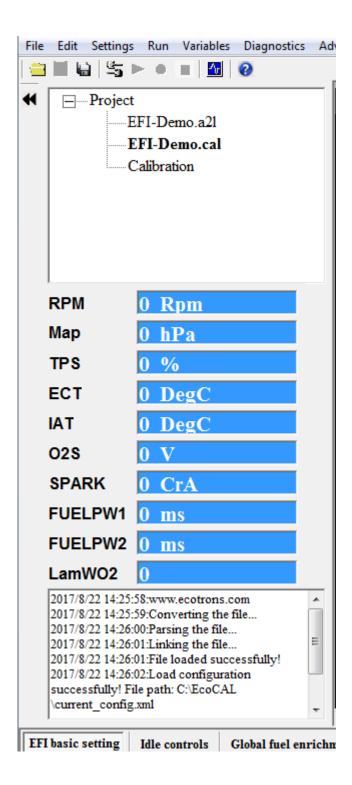


You also can load the configuration that you saved.

# Go to menu->Settings->List->Show



The shown effect of this list:





# 5.2 Diagnostics

### 5.2.1 Read the DTC of EFI

When you connect ECU to laptop successfully, you can run the diagnostics window to read the DTC, if there is something wrong, you can see the message in the diagnostics window.

**Note**: The diagnostics window only wills pop-up when the ECU is connected. If the ECU is not connected, you can't click the button to pop-p the window.

#### Go to menu->Diagnostics->ECU Diagnostics

	-		Variables				Wine	low	Help
	🔄 🕨	•	- 1	EC	:U Dia	gnostics		1	
•	 Project		<b>v</b>	_				_	

Diagnostic Tro	DTC Code (HEX)	Error	Whether the error has been healed	History
MAP				
TPS				
СКР				
IAT				
ECT				
Battery				
02 sensor1				
02 sensor2				
Read I	отс	Clear DTC	Exit	



Click Read DTC, if all are right, the message will be "Working Properly".

If there is something wrong in EFI, the fault message will be shown; you need to check the part of EFI.

Component	DTC Code (HEX)	Error	Whether the error has been healed	History
MAP	010B	Max error;	YES	NO
TPS	020B	Max error;	YES	NO
CKP	0302	Working Properly	YES	NO
IAT	0402	Working Properly	YES	NO
ECT	0502	Working Properly	YES	NO
Battery	0602	Working Properly	YES	NO
02 sensor1	0800	Working Properly	YES	NO
02 sensor2	0900	Working Properly	YES	NO

If you have fixed the issue, you can click "Clear DTC" to clear DTC code.

Click "Exit" to exit the Diagnostic window.

## 5.2.2 Failed to connect to ECU

If you can't connect to ECU, please do following steps to fix it.

- 1. Is the ECU power is ON? (The fuel pump will run for a few seconds when you key-on).
- 2. Do you have the latest and greatest EcoCAL version?
- 3. If you are running EcoCAL in Win Vista, have you set EcoCAL in "Win XP compatibility" mode? (Refer to the manual on how to do that).

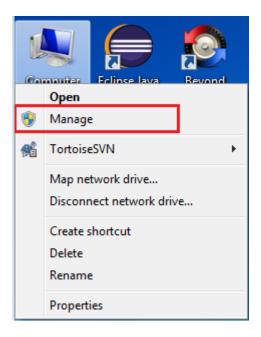


- 4. Are you connecting the computer to the ECU via a built-in COM port or USB adaptor?
- 5. If you use a built-in COM port of the computer, please go to "setting  $\rightarrow$  communication settings" and select COM port.
- If you use an USB adaptor, is it made by ECOTRONS? If yes, you need to go to "Setting → communication settings" and select USB.
- 7. If you use an USB adaptor from a third party, you need to select COM port and manually set the COM port number.

🖏 Communication Settings	×
Select the communication mode.	Open Device Close Device Cancel

# How to manually set the COM port:

1) Find out the virtual COM port # from USB to RS232 converter, by going to "My Computer", right click and select "Mange".



2) Then click "Device Manager" tab.



3) You will get the below window:





- 4) Find the virtual COM port #, and write it down. Then start the EcoCAL:
- 5) Go to menu->Settings->Communication settings"; you will get the below

window, select the COM port # you wrote down. And "OK".

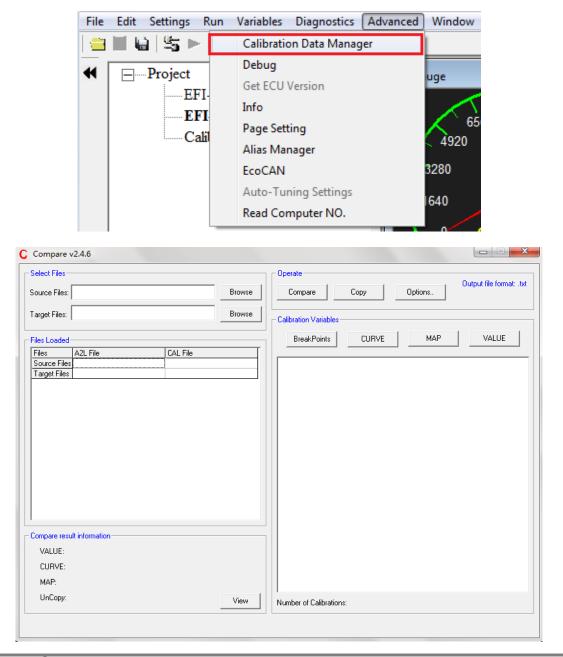
Communication Settings Select the communication mode. Communication COM COM CAN CAN Ethernet	COM Settings Port Num Baud Rate 115200 -
	Open Device
	Close Device
	Cancel



# 5.3 Advanced function of EcoCAL

#### 5.3.1 Calibrations Data manger

Go to menu->Advanced->Calibration Data Manger



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#### How to compare and copy files?

- 1) Open the software "Compare V2.3" first as above method.
- 2) Open the data file, to click "Browse" for opening file.

First, open the Source file (the file that you want to remain the same calibrated value by yourself)

Second, open the Target file (the file that replaced the some old variables value except your own calibrated value)

C Compare v2.4.6		
Select Files	Operate	
Source Files: Browse	Compare Copy Options.	Output file format: .txt
Target Files: Browse	Calibration Variables	
Files Loaded	BreakPoints CURVE MAP	VALUE

Wait for about ten seconds.

Note: If the file loaded successfully, lower left corner will pop up message "Analyze Successfully"

Compare result information	
VALUE:	
CURVE:	
MAP:	
UnCopy:	View
Analyze successfully!	

3) Copy the date file.

Click the" Copy "button, it will copy the file

Operate Compare	Сору	Options	Output file format: .cal
Calibration Variables	-		
BreakPoints	CURVE	MAP	VALUE

Copy rights ECOTRONS LLC http://w



#### EcoCAL User Manual for EFI - V1.8

# Precessing...

elect Files		Operate	
iource Files: C:\EcoCAL\EFI-Demo.cal	Browse	Compare Copy Options	out file format: .ca
arget Files: C:\EcoCAL\EFI-Demo1.cal	Browse	Calibration Variables	
ïles Loaded		BreakPoints CURVE MAP	VALUE
	File coCAL\EFI-Demo.cal coCAL\EFI-Demo1.cal		
	Message	x	
	Save f	the Data?	
Copy Result informations			
VALUE: 1 CURVE: 0			
MAP: 0			
UnCopy: 0	View	Number of Calibrations:	

Click "OK" button and save the result (a new CAL file).



Organize 🔻 New fo	older			!≡ ▼ (
A A A A A A A A A A A A A A A A A A A	*	Data and the st	<b>T</b>	
🚖 Favorites 👘	Name	Date modified	Туре	Size
🧮 Desktop	🐌 HelpDoc	2017/8/22 11:38	File folder	
\rm Downloads	퉬 kerneldlis	2017/8/22 11:38	File folder	
📃 Recent Places 🗏	Picture	2017/8/22 11:38	File folder	
	🐌 record	2017/8/22 11:40	File folder	
🔰 Libraries	🐌 Uninstall	2017/8/22 11:38	File folder	
Documents	📝 Demo.cal	2015/6/24 9:38	CAL File	17 KB
J Music	📝 EFI-Demo.cal	2017/7/26 15:44	CAL File	14 KB
Pictures	🖉 EFI-Demo1.cal	2017/8/22 14:34	CAL File	14 KB
Subversion	Fetch from ECU.cal	2017/8/22 11:11	CAL File	4 KB
😸 Videos				
-				
File name Co	py File			
Save as type ca	(*.cal)			

4) If you want to know whether the copy file is successfully you can compare the source file and the new saved file.

Using the above mentioned method to open the "Source file" that your own file and the "Target file" that the new saved file.

To click "Compare", button and save the compare result.

Operate Compare	Сору	Options.	Output file format: .cal
Calibration Variables			
BreakPoints	CURVE	MAP	VALUE



Compare v2.4.6	Couper Tom	
Select Files		Operate Operate
Source Files: C:\EcoCAL\EFI-Demo.cal	Browse	Compare Copy Options
Target Files: C:\EcoCAL\EFI-Demo1.cal	Browse	Calibration Variables
Files Loaded		BreakPoints CURVE MAP VALUE
Files         A2L File           Source Files         C.\EcoCAL\EFI-Demo.a2l           Target Files         C.\EcoCAL\EFI-Demo.a2l	CAL File C:\EcoCAL\EFI-Demo.cal C:\EcoCAL\EFI-Demo1.cal	
	Message	
	Save the Cor	mpare result information?
Compare Result informations		
VALUE: 1		
CURVE: 0		
MAP: 0		
UnCopy: 0	View	I Number of Calibrations:
ompare successful!		

► Local Disk (C:) ► EcoCAL ►				
		✓ Search Ec	oCAL	
			== -	0
ame	Date modified	Туре	Size	
HelpDoc	2017/8/22 11:38	File folder		
kerneldlls	2017/8/22 11:38	File folder		
Picture	2017/8/22 11:38	File folder		
record	2017/8/22 11:40	File folder		
Uninstall	2017/8/22 11:38	File folder		
New Text Document.txt	2017/8/22 10:35	Text Document	0 KB	
re				
		Save	Cance	el
	me HelpDoc kerneldlls Picture record Uninstall	ame         Date modified           HelpDoc         2017/8/22 11:38           kerneldlls         2017/8/22 11:38           Picture         2017/8/22 11:38           record         2017/8/22 11:38           Uninstall         2017/8/22 11:38           New Text Document.txt         2017/8/22 10:35	ame     Date modified     Type       HelpDoc     2017/8/22 11:38     File folder       kerneldlls     2017/8/22 11:38     File folder       Picture     2017/8/22 11:38     File folder       record     2017/8/22 11:38     File folder       Uninstall     2017/8/22 10:35     Text Document	me Date modified Type Size HelpDoc 2017/8/22 11:38 File folder kerneldlls 2017/8/22 11:38 File folder Picture 2017/8/22 11:38 File folder record 2017/8/22 11:38 File folder Uninstall 2017/8/22 11:38 File folder New Text Document.txt 2017/8/22 10:35 Text Document 0 KB

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You can see the result through follow method.

Compare Result informations	
VALUE: 1	
CURVE: 0	
MAP: 0	
UnCopy: 0	View
Compare successful!	

**Note**: if the result is 0, it means cope file is successfully.

Click" View" button to open the .txt file that just saved

Compare Result informations	
VALUE: 1	
CURVE: 0	
MAP: 0	
UnCopy: 0	View
Compare successful!	

Denseire - New	folde				
Organize 🔻 New	Tolde	r			
🔆 Favorites		Name	Date modified	Туре	Size
📃 Desktop		🐌 HelpDoc	2017/8/22 11:38	File folder	
鷆 Downloads		鷆 kerneldlis	2017/8/22 11:38	File folder	
📃 Recent Places	E	Picture	2017/8/22 11:38	File folder	
		📗 record	2017/8/22 11:40	File folder	
🥽 Libraries		🐌 Uninstall	2017/8/22 11:38	File folder	
Documents		Compare.txt	2017/8/22 14:43	Text Document	2 KB
🎝 Music		New Text Document.txt	2017/8/22 10:35	Text Document	0 KB
Pictures					
🗐 Subversion					
🛃 Videos					
	Ŧ				
F	ile na	me: Compare.txt		ASAM-2MC(*	.txt)



Compare.txt - Notepad	-	
File Edit Format View Help		
New Version Calibration Compari	son Report	
Reference calibration data:	C:\EcoCAL\EFI-Demo.cal	
Comparison calibration data:	C:\EcoCAL\EFI-Demo1.cal	
Created by: Defa	ault User	
Created on: 201	7/8/22 14:43:47	
Number of Differences:	VAL=1, CURVE=0, MAP=0	
Number of variables uncompared: 0		

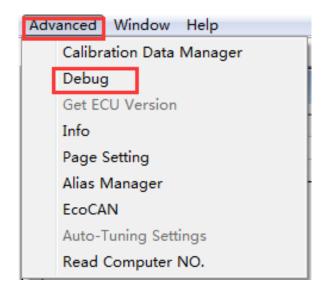
If the number is 0, it means copy file successfully, you can use the new saved file to run you bike.

Message: also, you can use above method to copy or compare other files.

#### 5.3.2 Debug

The Debug window reads the communication data between ECU and EcoCAL.

#### Go to menu->Advanced-> Debug



debug			
Time	Direction	ID	Message
2016/11/18 10:49:38:199	Send	-	80 8F EA 03 20 02 07 25 00 00 00
2016/11/18 10:49:38:279	Recv	-	EA 02 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:38:283	Send		80 8F EA 01 9B 95 00 00 00 00 00
2016/11/18 10:49:38:376	Recv		E1 16 5E 40 00 68 36 08 04 03 03 04 07 06 03
2016/11/18 10:49:40:622	Send	-	80 8F EA 2B 3D 00 40 00 20 01 F4 00 01 00 00
2016/11/18 10:49:41:39	Recv	-	7D 00 40 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:41:49	Send	-	80 8F EA 2B 3D 00 40 20 20 02 01 04 01 01 86
2016/11/18 10:49:41:131	Recv	-	7D 00 40 20 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:41:141	Send	-	80 8F EA 2B 3D 00 40 40 20 4E 20 20 1D 0B 0
2016/11/18 10:49:41:229	Recv	-	7D 00 40 40 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:41:243	Send	-	80 8F EA 2B 3D 00 40 60 20 00 01 01 0A FB 0
2016/11/18 10:49:41:304	Recv		7D 00 40 60 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:41:319	Send		80 8F EA 2B 3D 00 40 80 20 02 0C CD 04 08 0
2016/11/18 10:49:41:393	Recv	•	7D 00 40 80 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:41:411	Send	•	80 8F EA 2B 3D 00 40 A0 20 C4 07 D0 00 52 0
2016/11/18 10:49:41:490	Recv	•	7D 00 40 A0 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:41:516	Send	•	80 8F EA 2B 3D 00 40 C0 20 00 02 00 03 00 04
2016/11/18 10:49:41:597	Recv	•	7D 00 40 C0 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:41:619	Send		80 8F EA 2B 3D 00 40 E0 20 00 5A 64 6E 78 8
2016/11/18 10:49:41:705	Recv		7D 00 40 E0 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:41:728	Send		80 8F EA 2B 3D 00 41 00 20 64 85 5A 64 6E 7
2016/11/18 10:49:41:815	Recv		7D 00 41 00 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:41:847	Send		80 8F EA 2B 3D 00 41 20 20 04 08 10 14 19 1E
2016/11/18 10:49:41:940	Recv		7D 00 41 20 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:41:970	Send	•	80 8F EA 2B 3D 00 41 40 20 5A 64 6E 78 82 8I
2016/11/18 10:49:42:35	Recv	-	7D 00 41 40 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:42:73	Send	-	80 8F EA 2B 3D 00 41 60 20 03 20 03 90 03 F5
2016/11/18 10:49:42:146	Recv	•	7D 00 41 60 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:42:180	Send	-	80 8F EA 2B 3D 00 41 80 20 16 10 0C 06 04 8I
2016/11/18 10:49:42:267	Recv	-	7D 00 41 80 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:42:302	Send	-	80 8F EA 2B 3D 00 41 A0 20 89 88 88 88 80 04
2016/11/18 10:49:42:376	Recv	-	7D 00 41 A0 00 00 00 00 00 00 00 00 00 00 00 00
2016/11/18 10:49:42:414	Send	•	80 8F EA 2B 3D 00 41 C0 20 96 7D 7D 55 42 3
2016/11/18 10:49:42:501	Recv	-	7D 00 41 C0 00 00 00 00 00 00 00 00 00 00 00 00

# 5.3.3 Decimals Display

You can change the number of decimals of the values that are displayed in the variable window and calibration window.

### For example:

Right click on the window of calibration variables.



🕉 Calibratic	n															
+ 0.001	- *	1	1	Selected =	1	5 0										
nput-X: Pim,	[hPa],"inp	ut <map></map>	, break po	int, manif	old absolu	ite pressi	re, for	Volumatric Efficiency factor"	Input-Y: N	N, [Rpm],"i	input <n></n>	, break po	int, engin	e speed, for	Volu	
Output: R	AM_MAP	_fVe_Ma	ıp_N, [-],"	Factor Vo	lumatric E	fficiency,	deper	ndent on pressure and engine s	peed"							
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	5		150.00	800.00	850.00	900.00	970.00	1050.00		
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	1	Add Calibrations	0.68	0.68	0.65	0.63	0.62	0.61		
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	-	Delete	0.69	0.68	0.66	0.64	0.62	0.61		
1650.00	0.47	0.48	0.51	0.55	0.57	0.58	-	Import	0.70	0.68	0.67	0.66	0.64	0.62		
2000.00	0.48	0.49	0.51	0.55	0.58	0.59		Export	0.72	0.69	0.68	0.67	0.65	0.63		
2500.00	0.49	0.50	0.52	0.56	0.59	0.62			0.74	0.72	0.70	0.69	0.66	0.65		
3000.00	0.50	0.51	0.53	0.56	0.60	0.63		Сору	0.77	0.75	0.73	0.72	0.71	0.69		
3800.00	0.51	0.52	0.55	0.58	0.61	0.67		Paste	0.80	0.77	0.76	0.75	0.72	0.71		
4400.00	0.52	0.53	0.57	0.60	0.67	0.73		Smooth Cells	0.83	0.82	0.81	0.80	0.76	0.75		
5600.00	0.54	0.55	0.59	0.64	0.72	0.76				Change Alias	0.87	0.84	0.84	0.82	0.80	0.78
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	1	Decimals Display	0.89	0.87	0.87	0.86	0.84	0.83		
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	1		0.89	0.87	0.87	0.86	0.86	0.83		
10000.00	0.56	0.58	0.63	0.68	0.74	0.78		2D View	0.89	0.87	0.87	0.86	0.86	0.83		
								3D View								
								Fit Window								
								Fit Grid								
								Variable Properties								
Volumetric E	fficiency	Table						Window Properties								

The "Display setup" window pops up,

😈 Display setup
Value decimals       2       X-Axis decimals       2       Y-Axis decimals       2       2
OK Cancel

You can set the decimals, then click OK,

😈 Display setup	×
Value decimals	
4	
X-Axis decimals	
Y-Axis decimals 4	
ОК	Cancel

Then, you can see the difference.

Output: R			P				ucpeniue	n on pros	Jure una	engare op						
X/Y	300.0000	350.0000	400.0000	430.0000	460.0000	500.0000	550.0000	600.0000	650.0000	700.0000	750.0000	800.0000	850.0000	900.0000	970.0000	1050.0000
1200.0000	0.4627	0.4693	0.5119	0.5456	0.5662	0.5818	0.6253	0.6340	0.6634	0.6849	0.6841	0.6774	0.6546	0.6348	0.6159	0.6059
1400.0000	0.4637	0.4693	0.5119	0.5456	0.5662	0.5818	0.6253	0.6475	0.6707	0.6911	0.6941	0.6784	0.6562	0.6362	0.6180	0.6059
1650.0000	0.4737	0.4783	0.5119	0.5456	0.5662	0.5818	0.6353	0.6535	0.6889	0.6976	0.7043	0.6812	0.6661	0.6581	0.6359	0.6159
2000.0000	0.4837	0.4863	0.5119	0.5456	0.5762	0.5912	0.6453	0.6644	0.6937	0.7182	0.7161	0.6937	0.6758	0.6744	0.6491	0.6291
2500.0000	0.4937	0.4963	0.5219	0.5556	0.5862	0.6218	0.6553	0.6773	0.7173	0.7484	0.7412	0.7204	0.7019	0.6888	0.6616	0.6480
3000.0000	0.5039	0.5097	0.5341	0.5603	0.5962	0.6332	0.6732	0.6998	0.7474	0.7843	0.7742	0.7475	0.7350	0.7221	0.7069	0.6865
3800.0000	0.5098	0.5246	0.5473	0.5825	0.6117	0.6660	0.6985	0.7408	0.7839	0.8051	0.7964	0.7726	0.7602	0.7463	0.7218	0.7061
4400.0000	0.5241	0.5312	0.5657	0.6013	0.6658	0.7277	0.7447	0.7604	0.8223	0.8489	0.8293	0.8155	0.8052	0.7976	0.7607	0.7491
5600.0000	0.5404	0.5467	0.5851	0.6378	0.7195	0.7629	0.7886	0.8064	0.8623	0.8889	0.8693	0.8410	0.8356	0.8249	0.8015	0.7814
7000.0000	0.5471	0.5641	0.6118	0.6627	0.7284	0.7828	0.8156	0.8484	0.8923	0.9089	0.8893	0.8710	0.8656	0.8649	0.8423	0.8297
8000.0000	0.5522	0.5848	0.6247	0.6818	0.7369	0.7828	0.8156	0.8554	0.8923	0.9089	0.8893	0.8710	0.8656	0.8649	0.8591	0.8297
10000.0000	0.5573	0.5839	0.6258	0.6837	0.7369	0.7828	0.8156	0.8554	0.8923	0.9089	0.8893	0.8710	0.8656	0.8649	0.8591	0.8297

### 5.3.4 Signal/Parameters properties

The detailed properties of the variables (signals and parameter calibrations), can be viewed in the variable property window.

Right click on the variable; choose "Variable Properties", the properties window will pop up.



+ 0.001 _ *	1		ected = 1		1								
nput: TmSta, [DegC],"b													
Output: CUR_fCldSt	a_TmSta, [	-],"start fu	el factor for	cold start,	dependen	t on engin	e start temp	». "					
TmSta/[DegC]	-30	-25	-20	-15	-10	0	10	20	30	41	60	90	
CUR_fCldSta_TmSta	25.00	20.00	16.00	13.00	10.00	8.50	6.50	5.50	4.00	3.00	1.50	1.00	
							rt rt oth Cells						
						Decin 2D Vi 3D Vi	ew	у					
						Fit Gr Varial	ble Prope						
						Wind	ow Prope	ties					

Property	Value
Name	CUR fCldSta TmSta
Alias	Start fuel factor
Long Identifier	"start fuel factor for cold start, depend
Туре	CURVE
Unit	-
Record Type	UBYTE
Lower Limit	0
Upper Limit	63.75
X-Axis Points	BP_fCldSta_TmSta
X-Axis Reference to Inp	TmSta
X_Point Description	"break points,engine temperature at st
Memory Address	0x4179
Conversion Method	COMPU_METHOD_8
Conversion Formula	"Q = V*4.000000"



# Measure variables' properties:

Choose the variable that you want to see, then right click, and choose "Variable Properties"

Alias	Name	Value	Unit	Rate	
Engine-start end	B_StaEnd			100ms	
Altitude factor	fAlt			100ms	
3 Start fuel factor	fF1Sta			100ms	
Pre-control fuel factor	fPreCt1			Syn	
🗿 Lambda	LamWO2			Syn	
🕖 Load	Lđ		%	Syn	
Predicted Load	LdPrd		%	Syn	
🗿 Engine Speed	N		Rpm	Syn	
Engine-speed of byte value	N_b		Rpm	100ms	
3 Number of injections	nInj			Syn	
🗿 Raw engine speed	Nraw		Rpm	20ms	
3 Ambient pressure	Pam		hPa	100ms	
🗿 Intake air temperature	Ta		DegC	100ms	
🗿 Fuel Pulse Width #1	tInj0		ms	Syn	
Engine temperature	Tm		DegC	100ms	
Engine temperature when start	TmSta		DegC	100ms	
Chrottle Position Sensor	Tps		0/	20 ms	
Battery voltage from ADC channel	UbAd	Add Measu	rements	ns	
		Change Alia	s		
		Hide Alias C	olumn		
		Variable pro	operties		
		Window Pro			



roperty	Value
Name	Tps
Alias	Throttle Position Sensor
ong Identifier	"throttle position with respect to lower mechanical stop"
lype	UWORD
Jnit	
Record Type	
ower Limit	0
Jpper Limit	100
Memory Address	0x2F31
Conversion Method	COMPU_METHOD_25
Conversion Formula	"Q = V*655.360000"

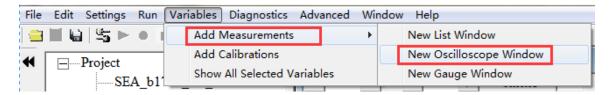
#### 5.3.5 Virtual Oscilloscope

1) Right click on the blank area of window, click "Add Measurements->New Oscilloscope Window"



										X
					<b>—</b>					^
sure, for V	olumatric	Efficiency		w List W		_	-	Add Measurements	-	_
:y, depend	ent on pre	essure and	- INEW LIST WINDOW					Add Calibrations		-
550.00	600.00	650.00	Ne	w Gauge	e Window			Show All Selected Varia	ables	- 11
0.74	0.73	0.77	0.77	0.83		_				_
0.74	0.80	0.81	0.78	0.83						
0.78	0.83	0.84	0.83	0.88						
0.74	0.01	0.74	0.05	0.04						

You also can go to menu->Variables->Add Measurements->New Oscilloscope Window", to add the oscilloscope window.



Note: You only can add one Oscilloscope in each layer.

2) Add the measured variables that you want to show in the Oscillscope window, here, we ass the "Tps", "N", "uMap", "UbAda" variables as example.



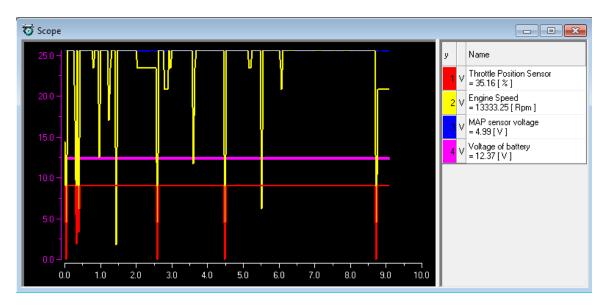
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umap	Search				Search
uMap	<b>^</b>	Add To Syn >>	Name	Rate	
uMapLa			N	20ms	
uMapM uPmapSum_1		1	Tps	20ms	
uPot		Add To 20ms >>	UbAdc	20ms	
uTa			uMap	20ms	
uTm		Add To 100ms >>			
uTps uWO2		Add To Tooms >>			
VPWR					
Vsp					
Vsp_b					
VspRaw					
VspWhlDrv		<< Delete			
VspWhlNonDrv	*				

# 3) Click "OK", the Scope will pop up.

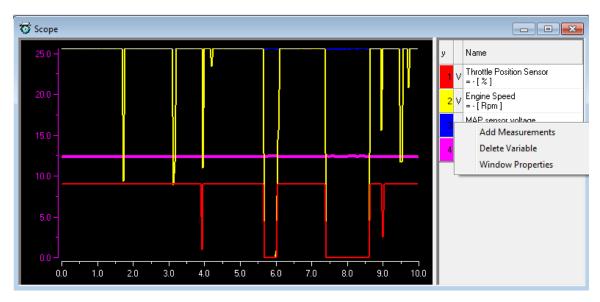
🗑 Scope			- • •
25.0 -	у	N	lame
	1		hrottle Position Sensor [%]
20.0 -	2	× =	ingine Speed [Rpm]
15.0 -			1AP sensor voltage [V]
-	4	V ¥	oltage of battery [V]
10.0 -	Γ		
5.0 -			

4) Connect to ECU, and start measuring, you can see the signal of variables.



# 5) You can add or delete the variable that you choose

Right click on the scope window, and then add or delete the variables that you want.



Note: when you add the variable, you should stop measuring first.

6) You also can change the properties of scope window.



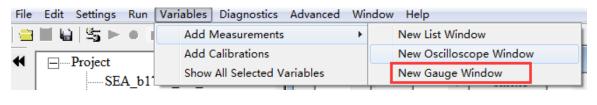
Right click on the scope window, and then click "Window Properties". You can change the Max/ Min value of variable, the lines color, etc. Click "OK" when finished.

General	ShowName	ShowType	YAxis Range	Line color Visible
Varibles	Throttle Position Sensor	Alias	0~100	Yes
	Engine Speed	Alias	0~16383	Yes
	MAP sensor voltage	Alias	0~5	Yes
	Voltage of battery	Alias	0~25.6	Yes

#### 5.3.6 Gauge monitoring

You can use this function to monitor the Gauge window of calibration data.

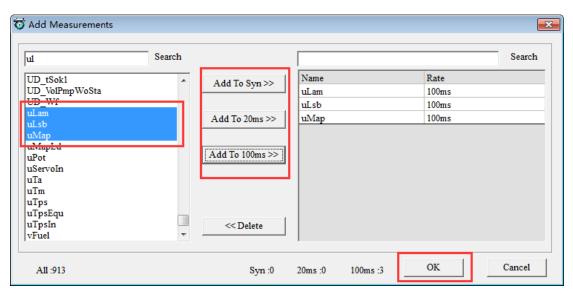
You can select "Variables  $\rightarrow$  Add Measurements  $\rightarrow$  New Gauge Window " or right click on the table, then choose "New Gauge Window", then you can see the gauge window as below.

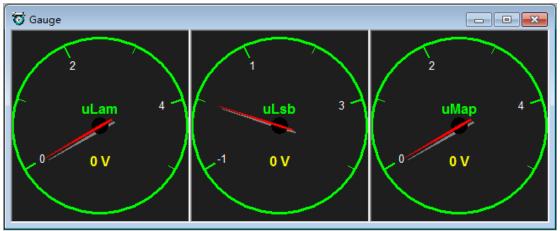


New Oscilloscope Window Add Calibrations	
	New Gauge Window Show All Selected Variables
New Gauge Window Show All Selected Variables	5

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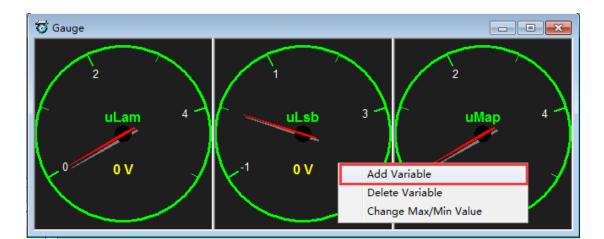
Add the measured variables that you want to show in the Gauge window, here, we select the "uLam", "uLsb", "uMap" variables as example.

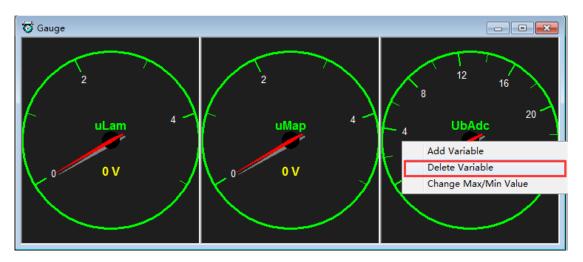




You can add or delete the variable that you choose

Right click on the Gauge window, and then add or delete the variables that you want.

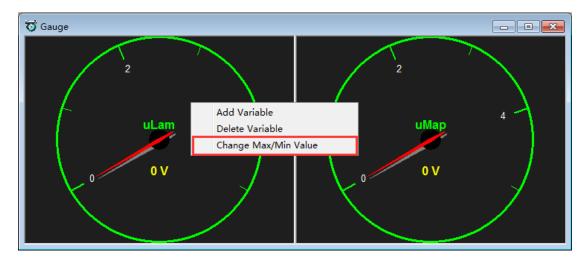




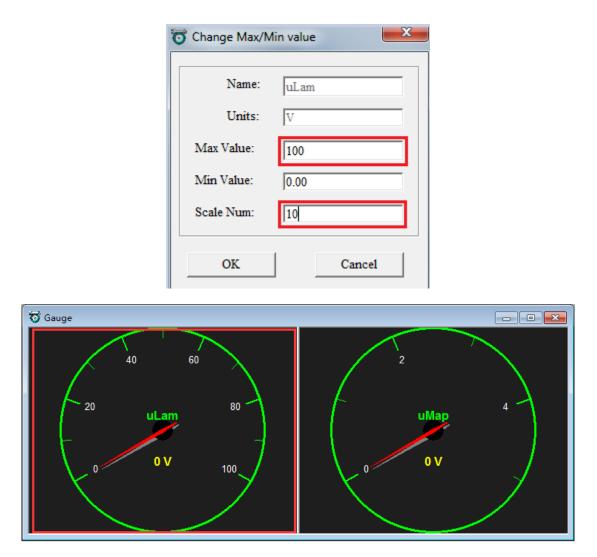
You also can change the value of variable.

Right click on the Gauge window, and then click "Change Max/Min Value". You can change the Max/ Min value of variable, the Scale Num, etc. Click "OK" when finished.





😈 Change Max/N	fin value
Name:	uLam
Units:	V
Max Value:	5.00
Min Value:	0.00
Scale Num:	1.00
OV	l Const
OK	Cancel



### 5.3.7 3D/2D view of maps

You can use this function to see the graph of calibration tables.

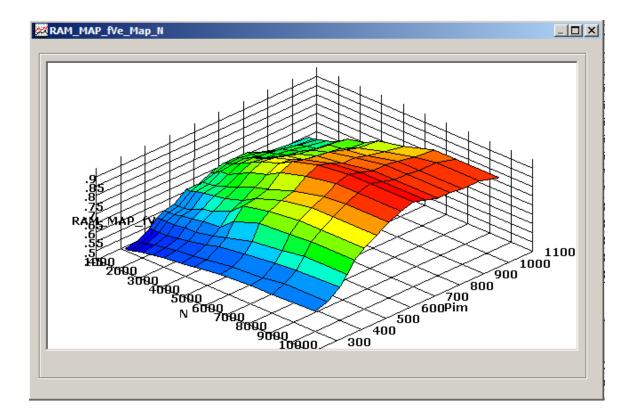
Right click on the table, then choose "3D View" or "2D View", then you can see the graph.

You can use this function to check the table whether is smooth. If it is not smooth, you need to smooth the value of table.

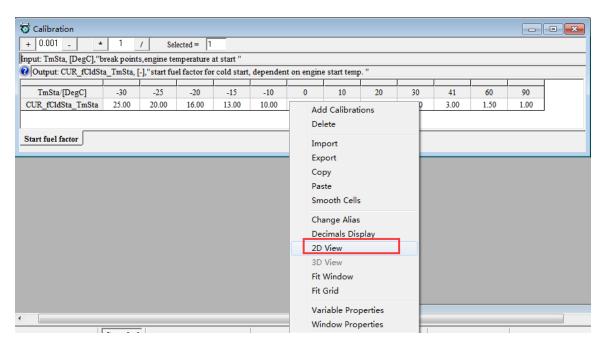


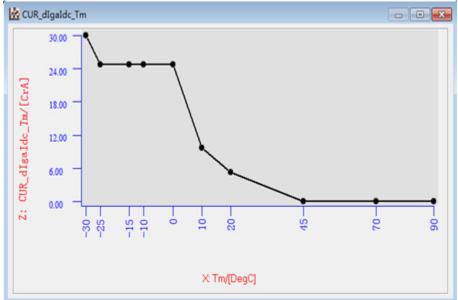
#### EcoCAL User Manual for EFI - V1.8

🝯 Calibratio	on																
+ 0.001	- *	1	1	Selected =	1	50											
nput-X: Pim,	[hPa],"inp	ut <map></map>	, break po	oint, manif	old absolu	ite pressur	e, for Vol	umatric E	fficiency	factor" l	Input-Y: N	I, [Rpm],":	input <n></n>	, break po	int, engin	e speed, fo	or Volumati
Output: R	AM_MAI	_fVe_Ma	ap_N, [-],"	Factor Vo	lumatric E	fficiency, d	lependen	t on pres	sure and	engine sp	eed"						
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	700.00	750.00	800.00	850.00	900.00	970.00	1050.00	
1200.00	0.46	0.47	0.51	0.55	Ado	d Calibrati	ons		0.66	0.68	0.68	0.68	0.65	0.63	0.62	0.61	
1400.00	0.46	0.47	0.51	0.55	Del	ete			0.67	0.69	0.69	0.68	0.66	0.64	0.62	0.61	
1650.00	0.47	0.48	0.51	0.55					0.69	0.70	0.70	0.68	0.67	0.66	0.64	0.62	
2000.00	0.48	0.49	0.51	0.55	Imp	port			0.69	0.72	0.72	0.69	0.68	0.67	0.65	0.63	
2500.00	0.49	0.50	0.52	0.56	Exp	ort			0.72	0.75	0.74	0.72	0.70	0.69	0.66	0.65	
3000.00	0.50	0.51	0.53	0.56	Cop	ру			0.75	0.78	0.77	0.75	0.73	0.72	0.71	0.69	
3800.00	0.51	0.52	0.55	0.58	Pas	te			0.78	0.81	0.80	0.77	0.76	0.75	0.72	0.71	
4400.00	0.52	0.53	0.57	0.60	Sm	ooth Cells			0.82	0.85	0.83	0.82	0.81	0.80	0.76	0.75	
5600.00	0.54	0.55	0.59	0.64	0				0.86	0.89	0.87	0.84	0.84	0.82	0.80	0.78	
7000.00	0.55	0.56	0.61	0.66	Cha	ange Alias			0.89	0.91	0.89	0.87	0.87	0.86	0.84	0.83	
8000.00	0.55	0.58	0.62	0.68	Dec	imals Dis	play		0.89	0.91	0.89	0.87	0.87	0.86	0.86	0.83	
10000.00	0.56	0.58	0.63	0.68	2D	View			0.89	0.91	0.89	0.87	0.87	0.86	0.86	0.83	
					3D	View	1										
						Window											
					Fit (	Grid											
					Var	iable Prop	perties										
						ndow Prop											
/olumetric I	fficiency	able				aow riop	Jerues -										







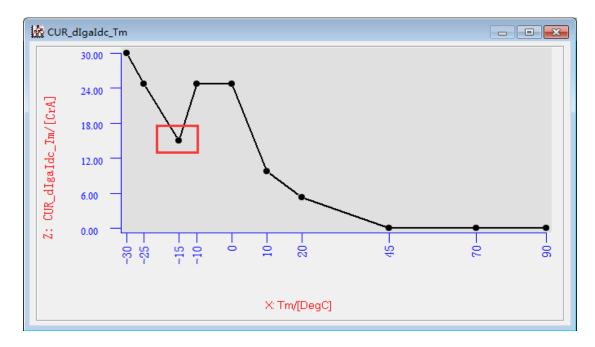


"2D View" window also support calibration-graph function. You can use mouse to drag one of the point to revise calibration value. You can operate it like the below steps:

Press the point you need without losing, then the mouse gets into the shape of

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the upper and lower arrow. And move the point to your target, then release your mouse, as below.



# 5.3.8 Cope/ Paste in tables

In EcoCAL, it supports the Copy and Paste function in CUR and MAP tables, the function is the same to Excel. You can copy the part of value then past it into the part of cells.

# For example

Move the mouse to choose the area of cell you want to copy, then right click, and click "Copy",



🤯 Calibratio	on																
+ 0.001	- *	1	1	Selected =	1	50	•										
Input-X: Pim,	[hPa],"inp	ut <map></map>	, break po	oint, manif	old absol	ute pressu	ire, for Vo	lumatric E	Efficiency	factor"	Input-Y: N	I, [Rpm],"	input <n></n>	, break po	int, engin	e speed, fo	or Volumatric
🕜 Output: R.	AM_MAI	_fVe_Ma	ıp_N, [-],"	'Factor Vo	lumatric I	efficiency,	depende	nt on pres	ssure and	engine sp	eed"						
	200.00	250.00	400.00	120.00	460.00	500.00	550.00		(50.00	700.00	750.00		050.00	000.00	070.00	1050.00	
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	700.00	750.00	800.00	850.00	900.00	970.00	1050.00	
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63	0.66	0.68	0.68	0.68	0.65	0.63	0.62	0.61	
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65	0.67	0.69	0.69	0.68	0.66	0.64	0.62	0.61	
1650.00	0.47	0.48	0.51	0.55	0.57	0.58	0.64	0.65	0.69	0.70	0.70	0.68	0.67	0.66	0.64	0.62	
2000.00	0.48	0.49	0.51	Add	Calibrati	ons		0.66	0.69	0.72	0.72	0.69	0.68	0.67	0.65	0.63	
2500.00	0.49	0.50	0.52	Dele	te		- H	0.68	0.72	0.75	0.74	0.72	0.70	0.69	0.66	0.65	
3000.00	0.50	0.51	0.53					0.70	0.75	0.78	0.77	0.75	0.73	0.72	0.71	0.69	
3800.00	0.51	0.52	0.55	Imp				0.74	0.78	0.81	0.80	0.77	0.76	0.75	0.72	0.71	
4400.00	0.52	0.53	0.57	Expo	ort			0.76	0.82	0.85	0.83	0.82	0.81	0.80	0.76	0.75	
5600.00	0.54	0.55	0.59	Сор	у		-	0.81	0.86	0.89	0.87	0.84	0.84	0.82	0.80	0.78	
7000.00	0.55	0.56	0.61	Past	e			0.85	0.89	0.91	0.89	0.87	0.87	0.86	0.84	0.83	
8000.00	0.55	0.58	0.62	Smo	oth Cells			0.86	0.89	0.91	0.89	0.87	0.87	0.86	0.86	0.83	
10000.00	0.56	0.58	0.63				- F	0.86	0.89	0.91	0.89	0.87	0.87	0.86	0.86	0.83	
				Cha	nge Alias												
				Deci	imals Dis	play											
				2D \	/iew												
				3D V													
					Vindow		- H										
Volumetric I	fficiency	Table		Fit G	irid												

Click the first cell of area you want to paste, then right click and click" Paste"

🅉 Calibratic		_					-										
+ 0.001	- *	1	1	Selected =	1	50											
put-X: Pim,	[hPa],"inp	ut <map></map>	, break po	oint, manif	old absolu	ite pressu	tre, for Vo	lumatric E	fficiency	factor" I	nput-Y: N	l, [Rpm],"i	input <n></n>	, break po	int, engin	e speed, fo	r Vol
Output: R.	AM_MAF	_fVe_Ma	p_N, [-],"	Factor Vo	lumatric E	fficiency,	depende	nt on pres	sure and	engine sp	eed"						
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	700.00	750.00	800.00	850.00	900.00	970.00	1050.00	
1200.00	0.46	0.47	0.51	430.00	400.00	0.58	0.63	0.63		700.00	/30.00	800.00	830.00	0.63	0.62	0.61	
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.65	0.66	Add	Calibrati	ons		0.65	0.62	0.61	
	0.40	0.47						0.65		Dele	te		- H		0.62	0.61	
1650.00			0.51	0.55	0.57	0.58	0.64		0.69	0.010				0.66			
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	0.65	0.66	0.69	Impo	ort		-	0.67	0.65	0.63	
2500.00	0.49	0.50	0.52	0.56	0.59	0.62	0.66	0.68	0.72	Expo	ort			0.69	0.66	0.65	
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	0.67	0.70	0.75					0.72	0.71	0.69	
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	0.70	0.74	0.78	Сор				0.75	0.72	0.71	
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.76	0.82	Past	e			0.80	0.76	0.75	
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81	0.86	Smo	oth Cells			0.82	0.80	0.78	
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85	0.89					0.86	0.84	0.83	
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86	0.89		nge Alias			0.86	0.86	0.83	
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86	0.89	Deci	mals Dis	play		0.86	0.86	0.83	
										2D V	liew						
										3D V	iew						
											/indow						
										Fit G	rid						

You can see the values of cells are changed.

0.001	- *	+ 1	1	Selected =	1	5 (	•									
out-X: Pim,	[hPa],"inp	ut <map></map>	, break po	int, manif	old absolu	ite pressu	ire, for Vo	lumatric E	fficiency	factor"	Input-Y: N	, [Rpm],"i	input <n></n>	break po	int, engin	e speed, fo
Output: R	AM_MAF	_fVe_Ma	p_N, [-],"	Factor Vo	lumatric E	fficiency,	depende	nt on pres	sure and	engine sp	eed"					
37.07	200.00	250.00	400.00	120.00	460.00	500.00	550.00		(50.00	700.00	750.00	000.00	050.00	000.00	070.00	1050.00
X/Y	300.00	350.00	400.00	430.00	460.00	500.00	550.00	600.00	650.00	700.00	750.00	800.00	850.00	900.00	970.00	1050.00
1200.00	0.46	0.47	0.51	0.55	0.57	0.58	0.63	0.63	0.47	0.51	0.55	0.68	0.65	0.63	0.62	0.61
1400.00	0.46	0.47	0.51	0.55	0.57	0.58	0.62	0.65	0.47	0.51	0.55	0.68	0.66	0.64	0.62	0.61
1650.00	0.47	0.48	0.51	0.55	0.57	0.58	0.64	0.65	0.48	0.51	0.55	0.68	0.67	0.66	0.64	0.62
2000.00	0.48	0.49	0.51	0.55	0.58	0.59	0.65	0.66	0.49	0.51	0.55	0.69	0.68	0.67	0.65	0.63
2500.00	0.49	0.50	0.52	0.56	0.59	0.62	0.66	0.68	0.50	0.52	0.56	0.72	0.70	0.69	0.66	0.65
3000.00	0.50	0.51	0.53	0.56	0.60	0.63	0.67	0.70	0.75	0.78	0.77	0.75	0.73	0.72	0.71	0.69
3800.00	0.51	0.52	0.55	0.58	0.61	0.67	0.70	0.74	0.78	0.81	0.80	0.77	0.76	0.75	0.72	0.71
4400.00	0.52	0.53	0.57	0.60	0.67	0.73	0.74	0.76	0.82	0.85	0.83	0.82	0.81	0.80	0.76	0.75
5600.00	0.54	0.55	0.59	0.64	0.72	0.76	0.79	0.81	0.86	0.89	0.87	0.84	0.84	0.82	0.80	0.78
7000.00	0.55	0.56	0.61	0.66	0.73	0.78	0.82	0.85	0.89	0.91	0.89	0.87	0.87	0.86	0.84	0.83
8000.00	0.55	0.58	0.62	0.68	0.74	0.78	0.82	0.86	0.89	0.91	0.89	0.87	0.87	0.86	0.86	0.83
10000.00	0.56	0.58	0.63	0.68	0.74	0.78	0.82	0.86	0.89	0.91	0.89	0.87	0.87	0.86	0.86	0.83

### 5.3.9 Highlight of table cells

When you tune the tables on the fly or you want to know which cell of tables is used, so we add the highlight function, when you add the Input-X and Input-Y variable in measured variables, the cell that used will be highlight.

#### Example #1:

RAM\_MAP\_LdTp\_Tps, the Input-X is "N", and the "Input\_Y" is "Tps", so we add the "N" and "Tps" variables in selected variables. When you start measuring, the "N" and "Tps" variables have value, and then the cell of table will be highlight.

TPS base	d load ma	oping and	Volumetri	ic Efficienc	v table							-1		Name	Value	Unit	Rate
0.001		1		elected =	1									LdPrd	20.86	%	Syn
	-			_										LdTp	36.80	%	Syn
	Rpm],"brea	-		_						-				N	4280.50	Rpm	Syn
Output: R	AM_MAI	_LdTp_T	ps_N, [%]	"character	ristic map,	normalized	load base	d on TPS :	and engine	speed (A	pha/N mo	del)"		tInj0	3.22	ms	Syn
X/Y	1400.00	2000.00	3000.00	4000.00	5000.00	6000.00	7000.00	7500.00	8000.00	8500.00	9000.00	10000.00		fVe	0.86		Syn
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		nInj	982		Syn
2.2995	25.1719	22.7813	22.0781	21.3984	21.3984	19.7578	18.1172	17.2969	16,4766	15.6328	14.8125	13,1719		Map	256.95	hPa	Syn
6.5811	28 8047	26 3438	25,5703	24,7969	24,7969	22.9453	21.0938	20,1563	19.2422	18,3047	17.3906	15,5391		Pim	256.95	hPa	Syn
9.2133	32,4375	28 9453	28,1250	27.3047	27.3047	25.3125	23.3438	22,3359	21.3516	20.3672	19.3594	17.3906		uTps	1.94	V	20m
13.1561	34,5703	32.0625	31.1719	30.3047	30.3047	28,1953	26.0859	25.0313	23.9766	22.9219	21.8906	19,7813		UbAdc	12.69	V	20m
17.1051	36,2813	33,7734	32.8828	31.9922	31.9922	29.8828	27,7500	26.6953	25.6406	24,5625	23,5078	21.3984		LamWO2	1.00		20m
21.0510	40,2891	36,7266	35.8125	34,8984	34,8984	32.6953	30,4922	29,3906	28,2891	27,1875	26.0859	23.8828		Task_Enable	1		20m
24.9985	42.8203	39,2813	38.3438	37,4063	37,4063	35,1563	32,9063	31.7813	30.6563	29,5547	28,4297	26,1797		Nraw	4289.00	Rpm	20m
32,8918	48.8203	46.2422	45.28 3	45.2813	43,2891	40.9688	38.6484	37,5000	36.3281	35,1563	34.0078	31.6875		Tps	28.94	%	20m
39,4699	52,5000	48,9609	48.9609	48.0000	48 0000	45.6797	43.3594	42.1875	41.0156	39.8672	38.6953	36.3750		uLsb	0.45	V	20m
46.0495	55,8984	52,3125	54.3516	53.2006	53,3906	51.0938	48,7969	47.6484	46.4766	45.3281	44.1797	41.8828		fLc	1.00	-	20m
52.6276	60 6328	55 0781	58,1484	59.2031	59.2031	56,9531	54,7031	53,6016	52,4766	51.3516	50.2266	47.9766		Tm	29	DegC	1001
59.2026	66.3516	60,7969	64.8750	66,9844	67.9922	66.8438	64.6875	63,6094	61.5234	59,4609	58.3828	56.2266		B_UnTp	0		1001
65,7822	70,7109	65.1797	68,3438	73,5000	76,5000	75,4922	75,4688	73,4531	72,4453	70,4766	68,4609	66,4453		Ta	28	DegC	100
78.9398	78.3516	73.9688	77.3906	80.7188	84.7266	85.2891	85.8281	85.0313	85.2891	83.6484	82.9219	80.6016		LamDsr	1.00	-	100
99.9878	82,7344	77,7422	84.7500	86,7656	88.7578	88.7578	88.7813	88,7813	88.7578	86,7656	86.7656	88,7578		fAlt	0.96		100
													_	fPreCt1	1.14		100

#### Example #2:



CUR\_fWmp\_Tm, the Input is "Tm", so we add the "Tm" variable in selected variables.

You can see the highlight cell in the table.

0.001 - +	• 1	1	Selected =	1								
put: Tm, DegC],"prei	ookup b	reak point	s, engine te	mperat	ture "							
Output: CUR_fWmp	_Tm, [-]	,"Char. Cu	irve, warm-u	ıp fact	or, depende	ent on engin	e temp."					
Tm/[DegC]	-30	-25	-20	-15		-	12	20	30	45	60	70
CUR_fWmp_Tm	1.25	1.25	1.25	1.00	0.60	0.40	0.25	0.16	0.13	0.10	0.08	0.00
arm up fuel factor									$\sim$			
Selected Variables	_			_								
Selected variables												
Alias			Name	V	alue	Unit	Rate					
🕜 Throttle Position	Sensor		Tps	0.	.00	%	20ms					
🕜 Raw engine spee	đ		Nraw	1	563.00	Rpm	20ms					
🕜 Lambda			LamWO2	1.	.00		20ms					
🕜 Battery voltage fi	rom AD(	channel	UbAdc	1	2.69	V	20ms					
🕜 Engine temperatu	ire		Tm	2	9	DegC	100ms					
🕜 Intake air tempera	ature		Ta	2	8	DegC	100ms					
🕜 Ambient pressur	e		Pam	1	010.00	hPa	100ms					
🕜 Pre-control fuel f	actor		fPreCtl	1.	.30		100ms					
🕜 After-start fuel fa	ctor		fAst	1.	.00		100ms					
🕜 Warm-up fuel fac	tor		fAstWmp	1.	.30		100ms					
🕜 Engine-start end			B_StaEnd	1			100ms					
🕜 Engine Speed			Ν	1	567.00	Rpm	Syn					
🕜 Load			Lđ	4	5.14	%	Syn					
🕜 Predicted Load			LdPrd	4	5.14	%	Syn					
Number of injecti			nInj	2	07		Svn					

**Note**: If the Input variable of table is not measured, the highlight will be disabled.



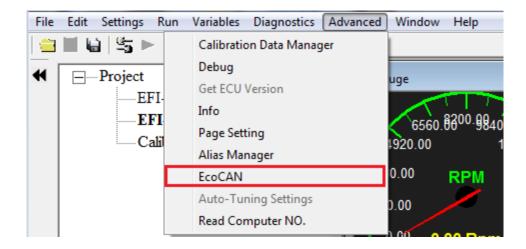
0.001		1 /	Selected = 1			-						
		NTITY, [Rpm]								on "		
Output: R	AM_MAP_L	dTp_Tps_N,[	%],"characteri	stic map, norm	alized load ba	sed on TPS an	d engine spee	d (Alpha/N m	odel)"			
X/Y	1000.00	1500.00	1700.00	2000.00	2800.00	3600.00	4400.00	5000.00	6000.00	7000.00	8000.00	9000.00
0.0000	40.9453	39.6797	39,1875	38,4141	37.8047	33,5859	31.6641	31,4297	31.4297	31,4297	31.4297	31,4297
3.9139	41.6484	40.0313	38,7891	37.9219	36.6797	35,7656	34,5469	33,4922	32.5547	31.6875	30,9141	30,3047
6.5262	41.6484	40.4531	39,7500	38.8828	37.0078	36,5625	35,7656	35,1094	34,5938	33,5625	33,3047	32,5547
9.1324	42.6563	41.8125	40.9453	40.0313	38.0391	37.5938	35.8828	34.8281	34.1484	33.1641	31.5938	30.7500
13.0478	43.4063	42.2578	41.6953	40.2188	38.6016	36.7734	36.7266	35.7891	35.2031	35.6484	34.8281	34,4063
16.9632	47.6953	46.6406	46.1484	45.0703	39.9141	38.9766	37.8516	36.8906	36.1172	34.9219	33.7500	32.8594
20.8786	53.1328	51.5625	50.2500	49.1719	48.5156	46.8984	45.5859	44.3672	43.9453	42.7500	40.7578	39.6563
24.7925	55.9453	53.8125	53.5547	52.9922	58.4531	54.8203	51.9141	49.9219	47.9766	46.8516	46.1484	43.1016
30.6168	61.5234	60.8672	60.8906	59.9063	59.8594	59.5781	59.1563	57.7500	55.8281	54.6094	52.2891	49.8516
38.1454	80.1797	79.0781	77.5078	76.6875	75.7500	75.0703	74.4375	74.0859	73.0547	72.4922	72.1875	70.1016
45.6711	93.0703	91.6406	90.0000	88.8047	87.2578	85.9922	84.9844	84.2578	83.6250	82.9922	82.1484	81.8672
52.1927	102.9375	101.2734	199.7344	97.5000	95.7656	94.5234	94.4531	94.2656	94.0547	93.3750	91.0313	89.7188
58.7158	111.0469	110.0156	109.8516	108.9141	107.3438	105.8672	104.8594	104.1094	103.4766	102.8906	101.6719	99.7734
65.2420	120.1641	119.1094	118.0781	117.0703	115.8281	114.0938	113.5547	112.5938	111.4922	110.1797	109.3828	107.4375
78.2898	126.1875	124.9219	123.8672	122.5781	121.1250	119.9297	118.1016	117.0938	116.0625	114.2813	111.3047	109.7578
99.9939	147.7031	146.6016	145.5000	144.0000	142.3125	140.2031	139.9219	155.0391	153.9375	152.1094	144.9844	139.8750

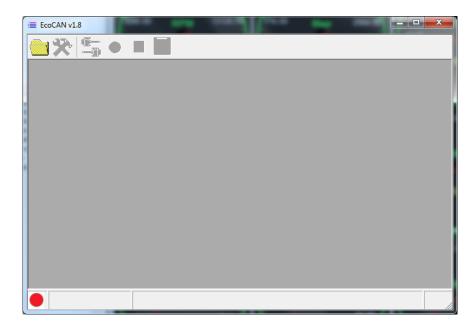
#### 5.3.10 EcoCAN

This software EcoCAN is used for CAN bus monitoring and recording CAN data.

#### **Open EcoCAN:**

Go to menu->Advanced->EcoCAN





## Open .dbc file:

Click the icon to open a .dbc file. On the opened window, select a .dbc file, then click the button "Open". Shown as below:



Comput	ter  Local Disk (C:)  EcoCAL		- + Search Eco	CAL	_
Organize 🔻 New fol	der				
☆ Favorites	Name	Date modified	Туре	Size	
🧮 Desktop	🐌 HelpDoc	2017/8/22 11:38	File folder		
🗼 Downloads	🌗 kerneldlis	2017/8/22 11:38	File folder		
📃 Recent Places 🗏	Picture	2017/8/22 11:38	File folder		
	I record	2017/9/13 11:28	File folder		
🥽 Libraries	📗 Uninstall	2017/8/22 11:38	File folder		
Documents	🛱 EFI-Demo.dbc	2016/7/29 10:08	Microsoft Visual	F	34 KB
🌙 Music					
Pictures					
Subversion					
Videos 👻					
	name: EFI-Demo.dbc		▼ DBC(*.dbc)		



When the EcoCAN has loaded a .dbc file, it will like this:

EcoCAN v1.8 - [ListView]	n Agent				-							×
😐 🎘 🖆 🔹 🔳												
- Network Nodes	Name	Phy Value	Hex Value	Start Bit	Length	Byte Order	Value Type	Factor	Offset	Max Value	Min Value	Unit
Vector_XXX	PWM_Duty			52		12 Intel	Unsigned	.08		0 10		%
ALM_CAN_	DTC			48		4 Intel	Unsigned	1		0 1	2 0	
	Temp			32		16 Intel	Unsigned	.023438		0 130	3 840	degK
	Lambda	•		16		16 Intel	Unsigned	.000244		0 1		
	02	•		0		16 Intel	Unsigned	.000514		12 2	1 -12	%
< <u> </u>												
	C:\Ec	oCAL\EFI_De	emo.dbc									

#### Set up device information:

1) Click the icon 3 to open setting window.



2) Select a CAN device and configure the correct parameters then click the button "OK". Shown as below:



E Communication Settings	×
Select the communication mode.	CAN Settings Device Type EcotronsCAN • Device Index 0 • Channel NO. 1 • Baud Rate 250kbs •

The EcoCAN window will show the device which you chose.

_	• •				
	Network Nodes ⊢Vector_XX	X _CAN	Name PwM_Duty DTC Temp Lambda 02	Phy Value - - - -	Hex Value - - - -
		۲.			
	EcotronsCAN,250kbs		C:\Ec	DCAL\EFI_De	emo.dbc

**Open CAN device:** 



Click the icon  $\stackrel{{\hbox{\scriptsize line}}}{\longrightarrow}$  to open device.



If open successfully, the status bar will show green light.

	=	
	😬 🎘 🖺 🖷	
	Network Nodes	Name
	- Vector_XXX	PWM_Duty
	ALM_CAN_	DTC
		Temp
		Lambda
		02
	۰ III ۲	
ľ	EcotronsCAN,250kbs	C:\Ec

#### Monitor CAN bus:

When connect successfully and the CAN device has received data, the software interface will show the values of the variables.

EcoCAN v1.8 - [ListView]							10-					
<b>=</b>												- 8 ×
🖲 🎘 🖆 🗕												
Network Nodes	Name	Phy Value	Hex Value 3	itart Bit	Length	Byte Order	Value Type	Eactor	Offset	Max Value	Min Value	Unit
- Vector_XXX	PWM_Duty		595	52		12 Intel	Unsigned	.08		0 100		) %
ALM_CAN_	DTC	0	0	48	1	4 Intel	Unsigned	1		0 12	2 (	)
	Temp	1052.88179956377	44922	32		16 Intel	Unsigned	.023438		0 1303	840	) degK
	Lambda	15.9898076914251	65532	16		16 Intel	Unsigned	.000244		0 16	i .t	5
	02	20.9802968942095	64164	0	1	16 Intel	Unsigned	.000514	-1	2 21	-12	2 %
< >												
EcotronsCAN,250kbs	C:\E	coCAL\EFI_Demo.dbc										

### Record CAN data:

134



1) Click the icon • to start record.



												_ đ
ù 🛠 🖺 🗖 🗖												
Network Nodes	Name	Phy Value	Hex Value	Start Bit	Length	Byte Order	Value Type	Factor	Offset	Max Value	Min Value	Unit
Wector_XXX	PWM_Duty	45.5199989825487	569	52		12 Intel	Unsigned	.08		0 100	I C	%
ALM_CAN_	DTC	0	0	48		4 Intel	Unsigned	1		0 12	: 0	
	Temp	1053.32712154835	44941	32		16 Intel	Unsigned	.023438		0 1303	840	degK
	Lambda	15.9898076914251	65532	16		16 Intel	Unsigned	.000244		0 16		
	02	20.9725868940004	64149	0		16 Intel	Unsigned	.000514	-1	2 21	-12	%

2) Click the icon **•** to stop record.

Eco	CAN v1.8 - [ListView]		-	_					_			_		• ×
														- 5
<u>'</u>	🎘 🔄 🔳													
-	Network Nodes	Name	Phy Value	Hex Value	Start Bit	Length	Byte Order	Value Type	Factor	Offset	M	ax Value	Min Value	Unit
	Wector_XXX	PWM_Duty	47.4399989396334	593	Ę	52	12 Intel	Unsigned	.08		0	100	0	%
	ALM_CAN_(	DTC	0	0		48	4 Intel	Unsigned	1		0	12	0	
		Temp	1053.20993155241	44936	3	32	16 Intel	Unsigned	.023438		0	1303	840	degK
		Lambda	15.9898076914251	65532	1	16	16 Intel	Unsigned	.000244		0	16		
		02	20.9802968942095	64164		0	16 Intel	Unsigned	.000514		-12	21	-12	%

3) The record file is saved in the "record" folder.



	and states		
COCAL COCAL	▶ record ▶ 2017-9-13-11-17-6-141	✓ 4→ Search	2017-9-13-1 🔎
Organize 👻 Include i	n library 🔻 Share with 👻 Burn	New folder	• 🔳 🔞
☆ Favorites	Name	Date modified	Туре
E Desktop	AllData-2017-9-13-11-17-6-187.csv	2017/9/13 11:17	Microsoft Excel
Downloads			
📜 Libraries			
Documents			
J Music	•		۱.
1 item			



# **Chapter 6 Exit or Uninstall the EcoCAL**

# 6.1 Exit EcoCAL

There are two ways to exit EcoCAL

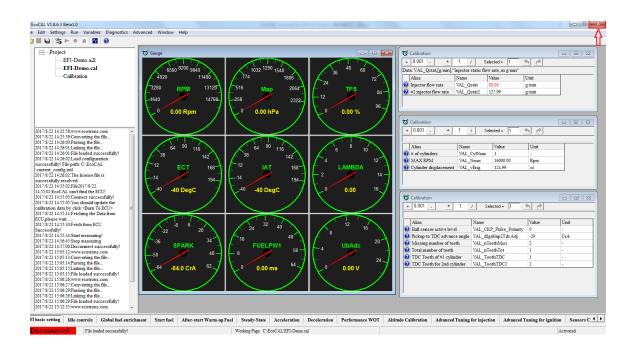
1) Use the menu to exit the EcoCAL

#### Go to menu->File->Exit

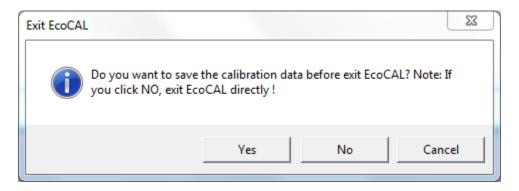
File	Edit Set	tings	Run	Variables	Diagno	stics			
	Open				Ctrl+O	1			
	Save CAL			Ctrl+S					
	Save CAL a	as							
	Save Conf	igurati	ion	Ctrl+F2					
	Save Conf	igurati	ion as.						
	Load Conf	igurat	ion						
	Default Co	nfigur	ation	Reset					
	Exit								

2) Close the EcoCAL directly on the upper right corner

# ECOTRON



**Note**: If you have done some tuning and change, and you don't save it, the "Exit EcoCAL" warning window will pop-up, please choose "Yes" or "No" or "Cancel" based on your demand.



# 6.2 Uninstall the EcoCAL

If you want to uninstall the EcoCAL, please click:

Start->All Programs->EcoCAL->Uninstall EcoCAL.

