T8 SUITE USER MANUAL

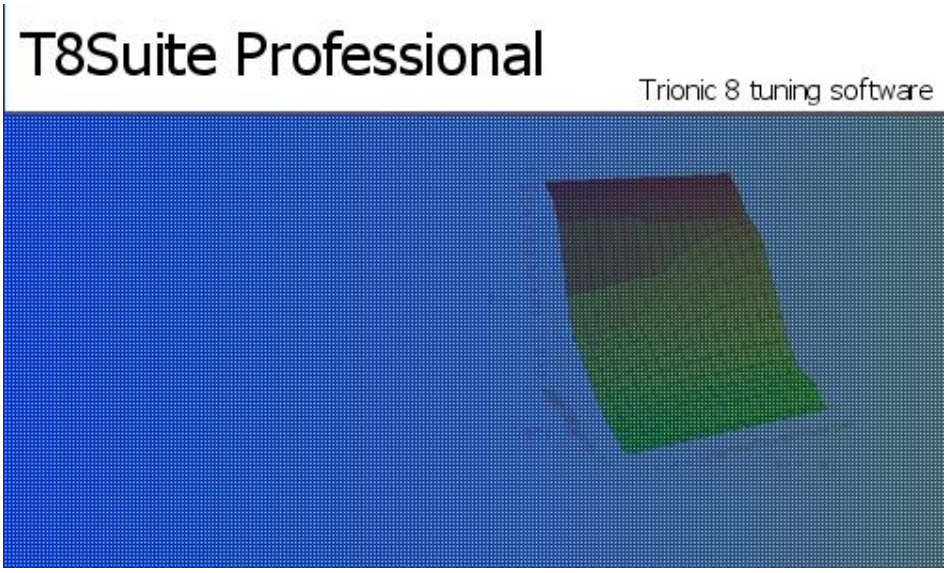


TABLE OF CONTENTS

PURPOSE AND SCOPE

By using this document users are assured to use the correct functionality of the software. The information from this document should be followed as stated and compared with expected output from the software.

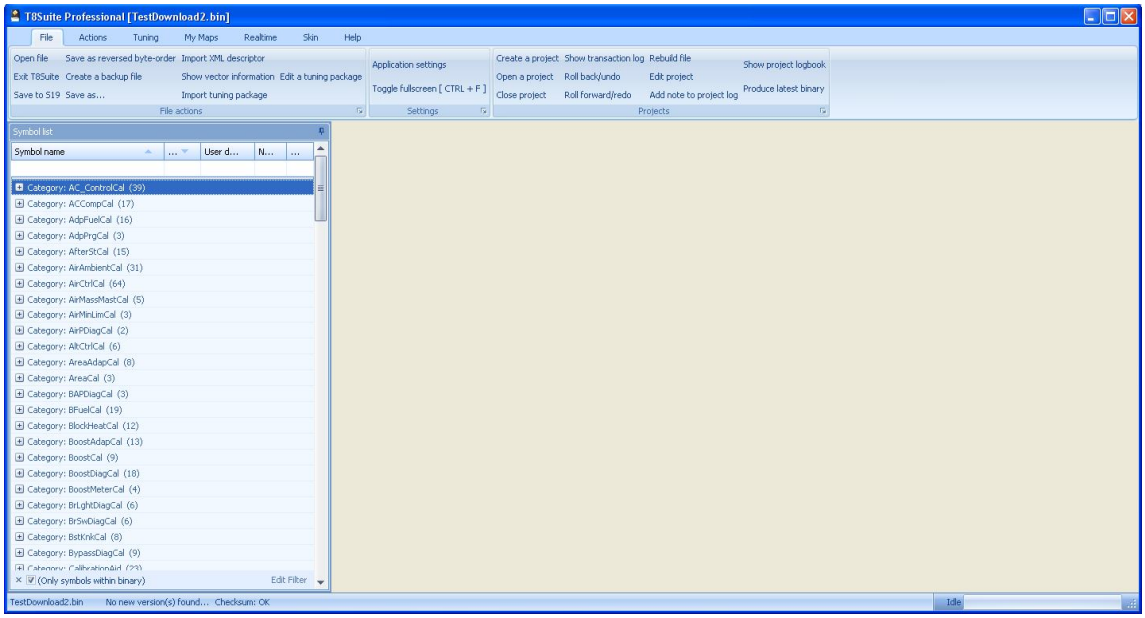
REFERENCES

This section references, by identity and title, documents that facts in this document depend upon. Those documents are not necessarily the latest version.

Document	Title	Rev
Analyzing Trionic 8 with T8Suite	Trionic 8	1.03

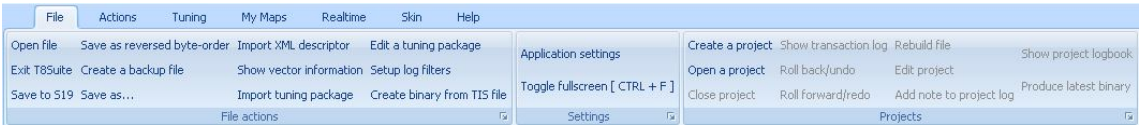
GENERAL INFORMATION

Thank you for downloading and installing T8Suite. In this manual you will find an overview of the most commonly used functions. After starting T8Suite a splash screen will be displayed and after all components are loaded and the application is initialized the main screen will be displayed.



The top menu is a ribbon style menu also found in the latest Microsoft Office environments. It allows you to navigate through the available options quickly and easily. This first chapter will show you around the available options one by one.

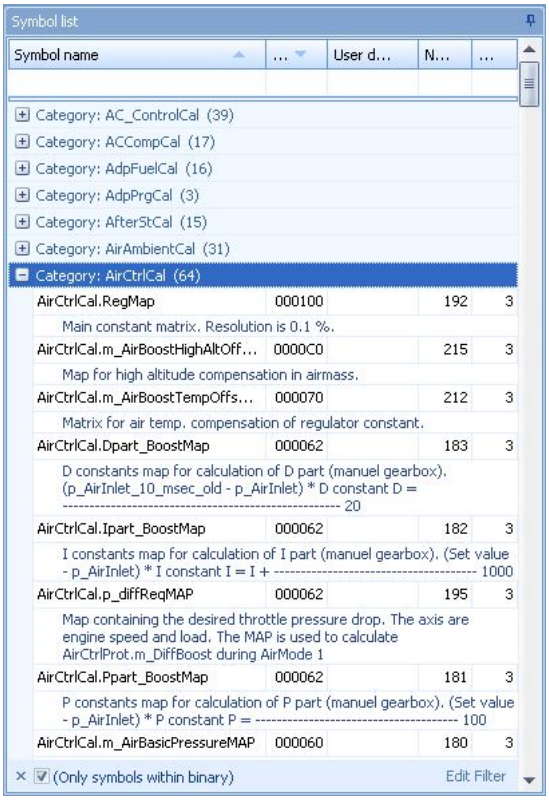
FILE MENU



FILE ACTIONS – OPEN A BINARY FILE

This option allows you to open a binary file. T8Suite will automatically extract all the relevant information from the file after selecting it in the open file dialog.

Once the file is opened and all information is extracted the symbol list on the left hand side of the main screen will be filled with information.



Note that by default there is a filter active on the view, showing only the symbol that are actually stored in flash memory (e.g. flash address > 0). You can disable this filter by clicking the little cross in the bottom left hand side of the symbollist.

File actions – Exit T8Suite

Exits the application in a safe manner.

File actions – Save as

This lets you choose a different location and/or filename for the binary file you currently have open.

File actions – Export to S19

This allows you to save the binary file in Motorola S19 format which can be used to program the ECU with a BDM interface.

File actions – Create a backup file

Lets you create a backup file for the binary at this point. It is wise to create backups before you start to make big changes to your file. If a project is opened, the backup file will be stored within the project folder otherwise it will be stored in the folder where the bin file is located.

File actions – Show vector information

This is a little tool for techies. It shows the start-up vector information for the Motorola MC68337 microprocessor.

File actions – Import XML descriptor

Lets you import a symboltable from an existing XML file. Binaries without a symboltable can be user-described and if you have an XML file for your binary file you can import it with this function.

File actions – Import tuning package

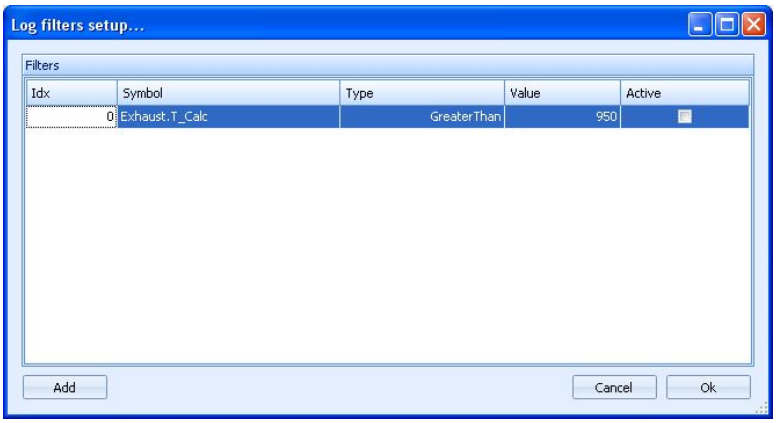
Lets you import a tuning package which holds generic map information.

File actions – Edit a tuning package

If you want to remove maps from a tuning package or you want to add maps, you can edit the tuning package with this option.

File actions – Setup log filters

This allows you to setup filters for realtime logging. If you setup filters you can reduce the amount of data logged in the logfiles by telling T8Suite which data to log and which not to log.

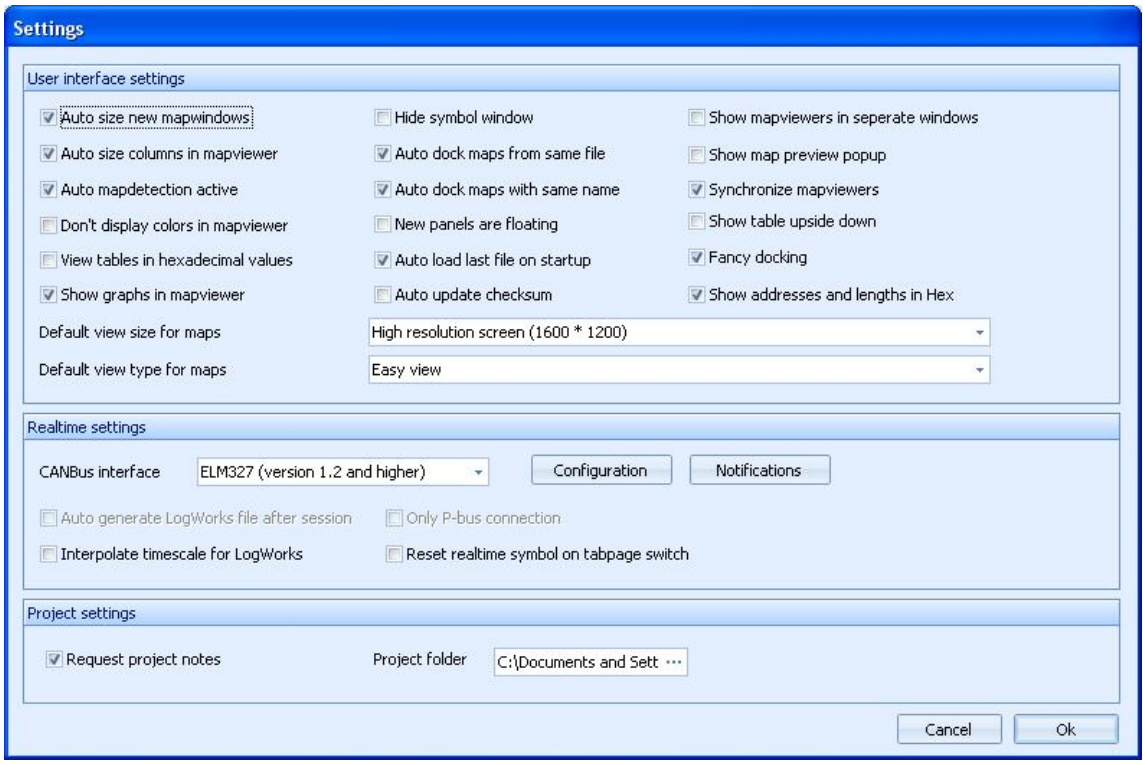


FILE ACTIONS – CREATE BINARY FROM TIS FILE

SAAB has stored Trionic 8 application files in its Technical Information System (TIS). These files have an extension .gbf and they only contain a part of the complete binary file. To make things worse, these files are encrypted as well. Lucky for you, T8Suite can decrypt and build a new binary file for you based on another binary file and a compressed gbf file.

FILE ACTIONS – SETTINGS – APPLICATION SETTINGS

This will show the options screen for T8Suite.



FILE ACTIONS – SETTINGS – APPLICATION SETTINGS – AUTO SIZE NEW MAPWINDOWS

Determines whether or not new map windows will automatically be resized to fit their respective contents.

FILE ACTIONS – SETTINGS – APPLICATION SETTINGS – AUTO SIZE COLUMNS IN MAPVIEWER

Determines whether or not the map viewers should try to resize the columns they contain to make the content fit. As you can imagine ignition advance for example expressed in whole and fractional degrees takes more space than a simple decimal number ranging from 0-10.

FILE ACTIONS – SETTINGS – APPLICATION SETTINGS – SHOW GRAPHS IN MAPVIEWER

To gain performance in lightweight computers you can switch off the graphical display in the mapviewer altogether with this option.

FILE ACTIONS – SETTINGS – APPLICATION SETTINGS – SHOW ADDRESSES IN HEX

T8Suite can display addresses and lengths of symbols in decimal form or in hexadecimal form. This option allows you to switch between the two.

File actions – Settings – Application settings – Auto load last file on start-up

If you work on one file for a prolonged period of time you might want T8Suite to reopen the last file automatically when you start it. This option allows you to control that behaviour. If the last opened item was a project, T8Suite will automatically reopen that project for you at start-up.

File actions – Settings – Application settings – Fancy docking

If the dragging and docking of windows (map viewers) is slow or causes issues, please turn this option off.

File actions – Settings – Application settings – Auto dock maps from same file

If you open more than one map from the same file (for example fuel and ignition maps) you can choose to have those docked together using this option. If the option is turned off, windows will be tiled next to each other.

File actions – Settings – Application settings – Auto dock maps with same name

If you open the same maps from different files (for example the main ignition map from 2 files) you can choose to have those docked together using this option. If the option is turned off, windows will be tiled next to each other.

File actions – Settings – Application settings – New panels are floating

Upon opening a new mapviewer you can choose to have this window docked in the main screen or have it floating.

File actions – Settings – Application settings – Auto update checksum

Having this checked will rid you of the constant worry whether or not the checksum of your file is valid. We advise you to keep this turned on!

File actions – Settings – Application settings – Synchronize mapviewers

With this enabled, T8Suite will try to keep multiple opened mapviewers synchronized with eachother. Cell selections, graph rotation etc will be done in all open mapviewers.

File actions – Settings – Application settings – Default view size for maps

Allows you to adjust the map viewers size for different screen resolutions.

File actions – Settings – Application settings – Default view type for maps

Easy view is best if you don't know what this means ;)

File actions – Settings – Application settings – Request a note on changes

If you are working in a project you can have T8Suite ask you for a comment every time you make a change to one of the maps. This way, you can keep track of changes very easily.

File actions – Settings – Application settings – Project folder

Allows you to set an alternate project root folder for creating projects. You can use this if you want all the projects to be located on a separate disk partition for example.

File actions – Settings – Application settings – Auto generate LogWorks file after session

If you run a live session on your ECU with the canbus connection, T8Suite can automatically generate a LogWorks file from that session and start LogWorks (not yet implemented)

File actions – Settings – Application settings – CAN Bus interface

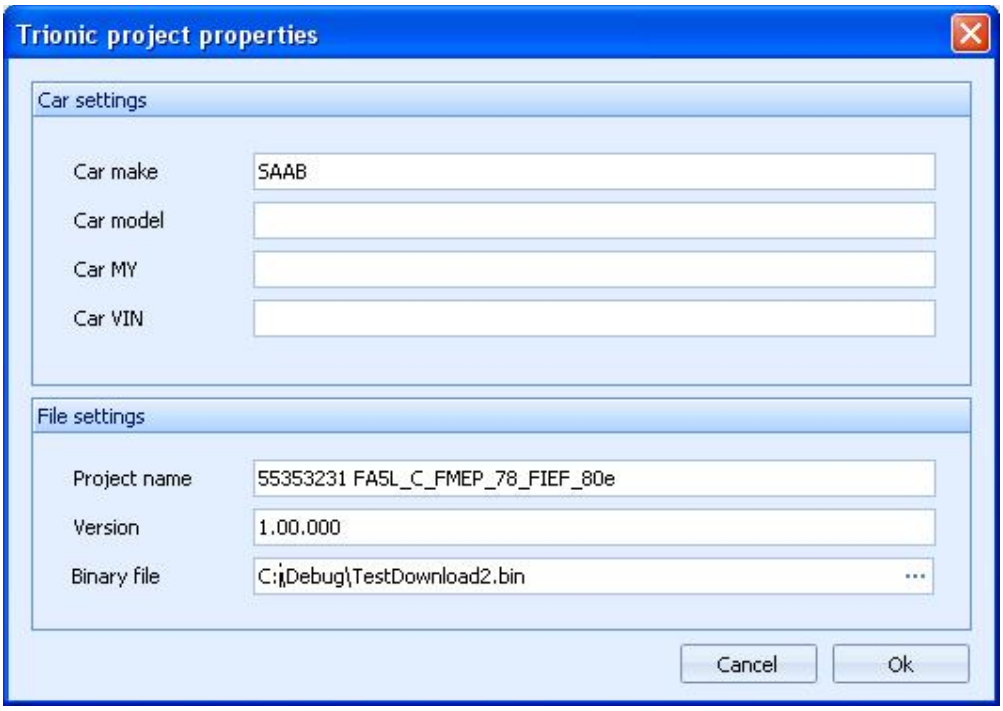
Three devices are currently supported, the Lawicel device (www.canusb.com), ELM327 v1.2+ devices and the multi-adapter that has a canbus interface a BDM interface, 5 AD inputs and a thermocouple input, both designed by ecuproject members. The multi-adapter and the ELM327 devices will require more configuration so when one of these is selected, the extra configuration button next to the drop down box will be enabled. By selecting it you can set the extra options.

File actions – Toggle full screen

Lets you run T8Suite full screen for maximum usage of screen space.

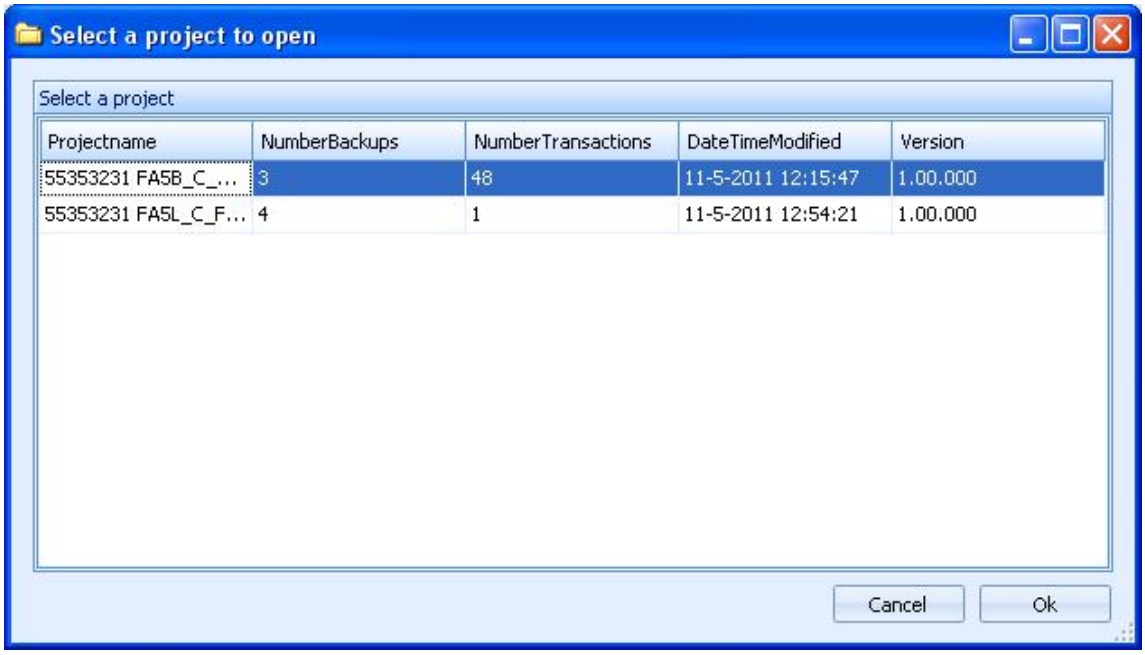
FILE PROJECTS – CREATE A PROJECT

T8Suite allows you to work on your tune in a project based fashion. This option lets you create a new project. Projects have the advantage of having roll-back and roll-forward functions, having versioning and keeping things tidy and together. You are advised to work in a project if you do more than simple easy-tune your binary file.



FILE PROJECTS – OPEN A PROJECT

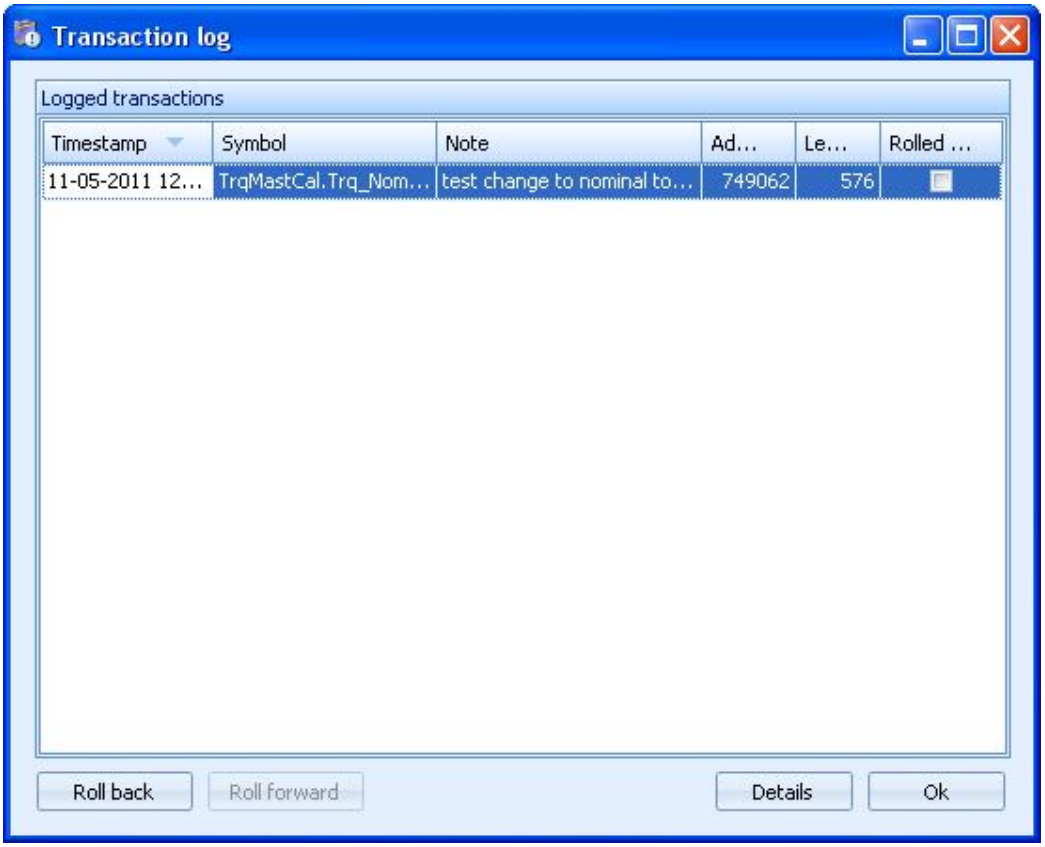
Lets you select and open a previously created project. If no projects are available (none were created before) T8Suite will notify you with a message box.



FILE PROJECTS – CLOSE PROJECT
Closed the project and allows you to work on single files again.

FILE PROJECTS – SHOW TRANSACTION LOG

Shows the transaction log for the current project. Since a project contains only one binary file, you could see this as an undo/redo list for the project binary file.



FILE PROJECTS – ROLL BACK/UNDO

Lets you rollback the last transaction made to the binary file. If no transactions are available to rollback, the button will be disabled.

FILE PROJECTS – ROLL FORWARD/REDO

Lets you roll forward (redo) the last transaction that was undone/rolled back. If no transaction are available to roll forward, the button will be disabled.

FILE PROJECTS – REBUILD FILE

This enables you to rebuild a project file (binary) up to a certain point in time. T8Suite will ask you

for a date and it will restore – if possible – the file that you had at that specific date.

FILE PROJECTS – EDIT PROJECT

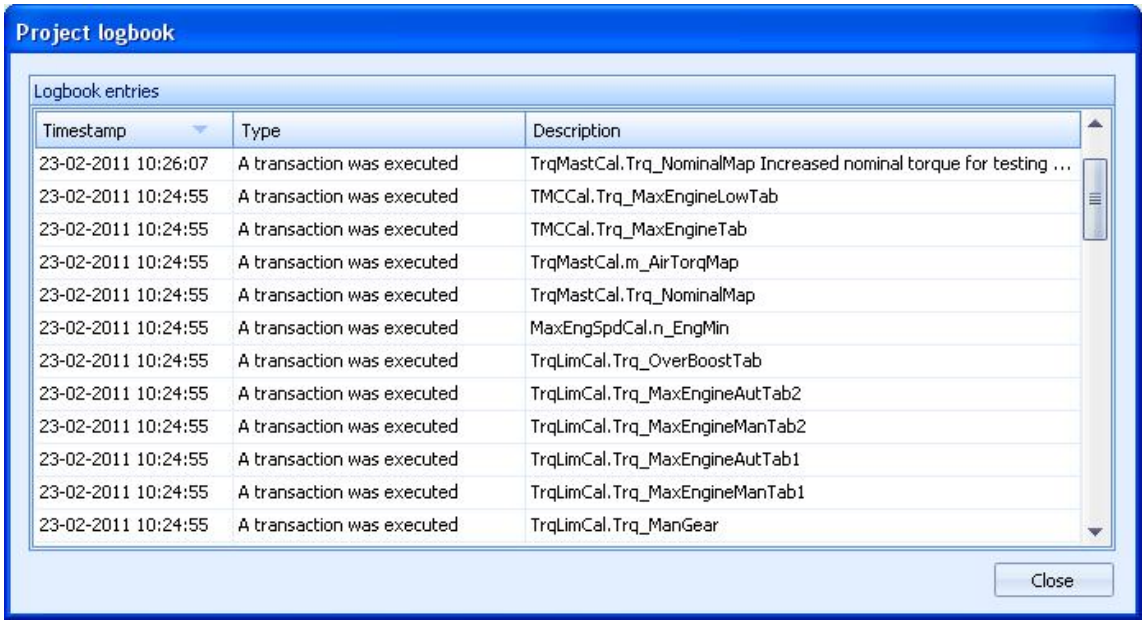
Lets you edit the project properties for any project. This enables you to manage your version numbering yourself. Version numbers are stored, together with all other project properties, in the xml file in the project folder.

FILE PROJECTS – ADD NOTE TO PROJECT

You can add a note to you project with a timestamp attached to it, so you can keep track of changes you made in your setup. For example, if you start using different injectors or mount a bigger intercooler, you can enter a note of this into the project log for later reference.

FILE PROJECTS – SHOW PROJECT LOGBOOK

Shows you in details what has happened in your project.



FILE PROJECTS – PRODUCE LATEST BINARY

Lets you export the project binary in its current state so you can save it in another location easily.

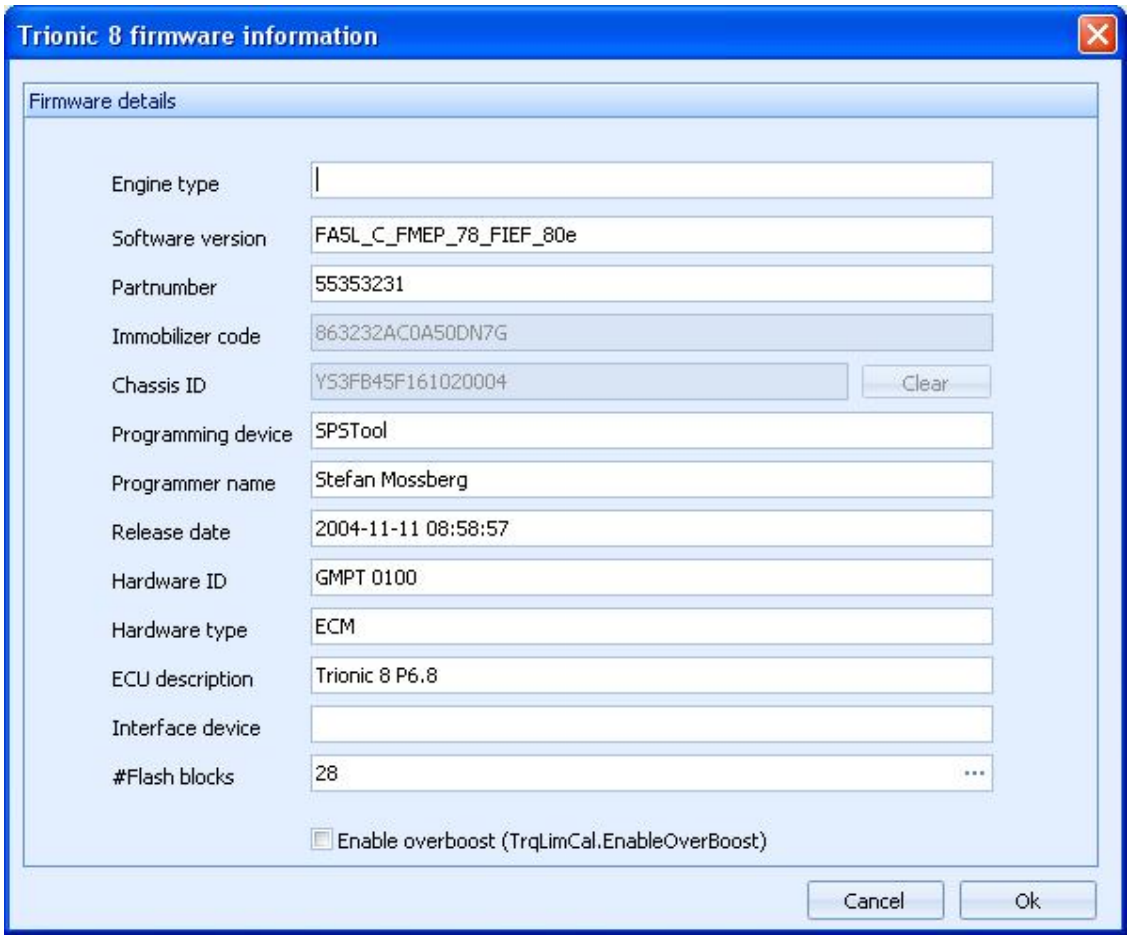
ACTIONS MENU

ACTIONS MENU – VERIFY CHECKSUM

If you don't have the automatic checksum routine turned on, you can manually verify and correct the files checksum with this option.

ACTIONS MENU – FIRMWARE INFORMATION

Lets you alter the settings for the current binary file.



ACTIONS MENU – FIRMWARE INFORMATION – ENGINE TYPE

Descriptive text for the current binary file.

ACTIONS MENU – FIRMWARE INFORMATION – SOFTWARE VERSION

Default software version numbering for the current binary file.

ACTIONS MENU – FIRMWARE INFORMATION – IMMOBILIZER CODE

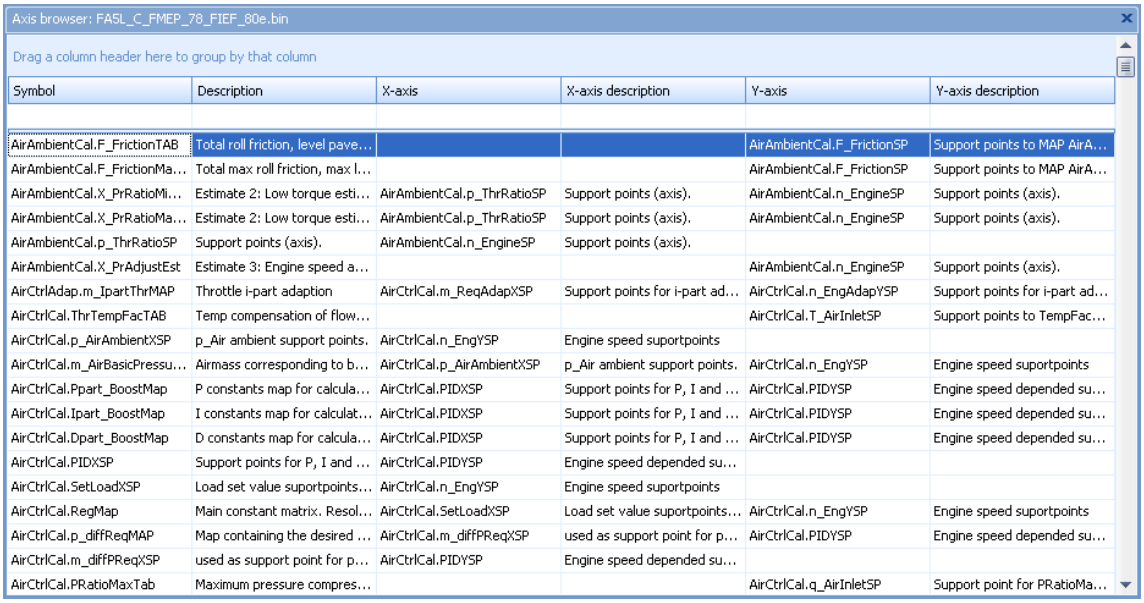
Current immobilizer code for this binary file. For more information about immo code please refer to the saab technical documentation.

ACTIONS MENU – FIRMWARE INFORMATION – CHASSIS ID

Vehicle Identification Number (VIN) for the current binary file. Should match you cars VIN number.

ACTIONS MENU – BROWSE AXIS INFORMATION

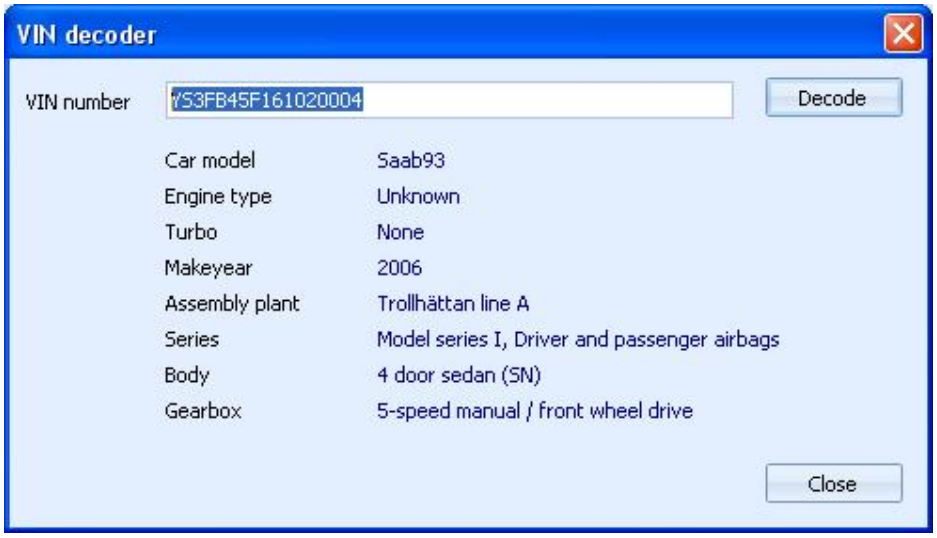
Shows you the relations between maps and axis symbols. This is very informative to browse and learn.



Symbol	Description	X-axis	X-axis description	Y-axis	Y-axis description
AirAmbientCal.F_FrictionTAB	Total roll friction, level pave...			AirAmbientCal.F_FrictionSP	Support points to MAP AirA...
AirAmbientCal.F_FrictionMa...	Total max roll friction, max l...			AirAmbientCal.F_FrictionSP	Support points to MAP AirA...
AirAmbientCal.X_PrRatioMi...	Estimate 2: Low torque esti...	AirAmbientCal.p_ThrRatioSP	Support points (axis).	AirAmbientCal.n_EngineSP	Support points (axis).
AirAmbientCal.X_PrRatioMa...	Estimate 2: Low torque esti...	AirAmbientCal.p_ThrRatioSP	Support points (axis).	AirAmbientCal.n_EngineSP	Support points (axis).
AirAmbientCal.p_ThrRatioSP	Support points (axis).	AirAmbientCal.n_EngineSP	Support points (axis).		
AirAmbientCal.X_PrAdjustEst	Estimate 3: Engine speed a...			AirAmbientCal.n_EngineSP	Support points (axis).
AirCtrlAdap.m_IpartThrMAP	Throttle i-part adaption	AirCtrlCal.m_ReqAdapXSP	Support points for i-part ad...	AirCtrlCal.n_EngAdapYSP	Support points for i-part ad...
AirCtrlCal.ThrTempFacTAB	Temp compensation of flow...			AirCtrlCal.T_AirInletSP	Support points to TempFac...
AirCtrlCal.p_AirAmbientXSP	p_Air ambient support points.	AirCtrlCal.n_EngYSP	Engine speed suportpoints		
AirCtrlCal.m_AirBasicPressu...	Airmass corresponding to b...	AirCtrlCal.p_AirAmbientXSP	p_Air ambient support points.	AirCtrlCal.n_EngYSP	Engine speed suportpoints
AirCtrlCal.Ppart_BoostMap	P constants map for calcula...	AirCtrlCal.PIDXSP	Support points for P, I and ...	AirCtrlCal.PIDYSP	Engine speed depended su...
AirCtrlCal.Ipart_BoostMap	I constants map for calculat...	AirCtrlCal.PIDXSP	Support points for P, I and ...	AirCtrlCal.PIDYSP	Engine speed depended su...
AirCtrlCal.Dpart_BoostMap	D constants map for calcula...	AirCtrlCal.PIDXSP	Support points for P, I and ...	AirCtrlCal.PIDYSP	Engine speed depended su...
AirCtrlCal.PIDXSP	Support points for P, I and ...	AirCtrlCal.PIDYSP	Engine speed depended su...		
AirCtrlCal.SetLoadXSP	Load set value suportpoints...	AirCtrlCal.n_EngYSP	Engine speed suportpoints		
AirCtrlCal.RegMap	Main constant matrix. Resol...	AirCtrlCal.SetLoadXSP	Load set value suportpoints...	AirCtrlCal.n_EngYSP	Engine speed suportpoints
AirCtrlCal.p_diffReqMAP	Map containing the desired ...	AirCtrlCal.m_diffPReqXSP	used as support point for p...	AirCtrlCal.PIDYSP	Engine speed depended su...
AirCtrlCal.m_diffPReqXSP	used as support point for p...	AirCtrlCal.PIDYSP	Engine speed depended su...		
AirCtrlCal.PRatioMaxTab	Maximum pressure compres...			AirCtrlCal.q_AirInletSP	Support point for PRatioMa...

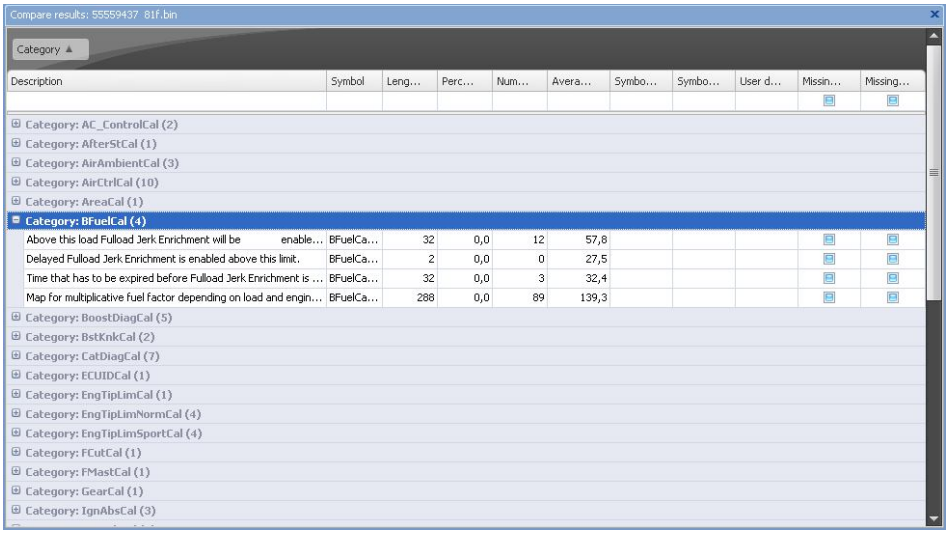
ACTIONS MENU – VIN DECODER

Lets you decode SAAB VIN numbers into readable format.



ACTIONS MENU – COMPARE WITH ANOTHER BINARY

The most time-consuming thing is comparing maps for different firmware versions by hand. T8Suite gives you the tools to compare maps in different binaries with a click of the mouse. To do this you must first open the primary binary you want to compare. Then, select "Compare maps with other binary" from the Actions menu under Actions. Now, select the secondary binary you wish to compare the first one with. T8Suite will now display a list of symbols that differ in the selected binaries.



ACTIONS MENU – TRANSFER MAPS TO ANOTHER BINARY

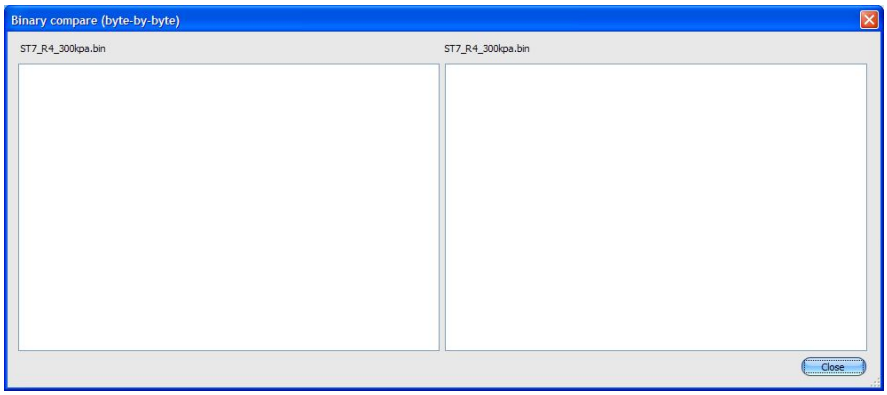
To be able to transfer map contents from a selected binary to another one a wizard has been created to copy all the contents for all symbols in the selected binary to another one that the wizard enables you to select.

ACTIONS MENU – BINARY COMPARE

Lets you do a binary (byte-by-byte) compare of two files. This is a good tool to verify whether a programming session was successful or not. Sequences of steps would be:

1. Program ECU
2. Read file from ECU
3. Compare original and downloaded file with Binary compare.

If the result screen is empty the files are identical (successful programming).



ACTIONS MENU – EXPORT MAP TO EXCEL

For easy export and import facilities an interface with MS Excel has been implemented into T8Suite. This option lets you export a selected map to Excel for viewing and editing.

ACTIONS MENU – IMPORT MAP FROM EXCEL

For easy export and import facilities an interface with MS Excel has been implemented into T8Suite. This option lets you import a selected map to Excel.

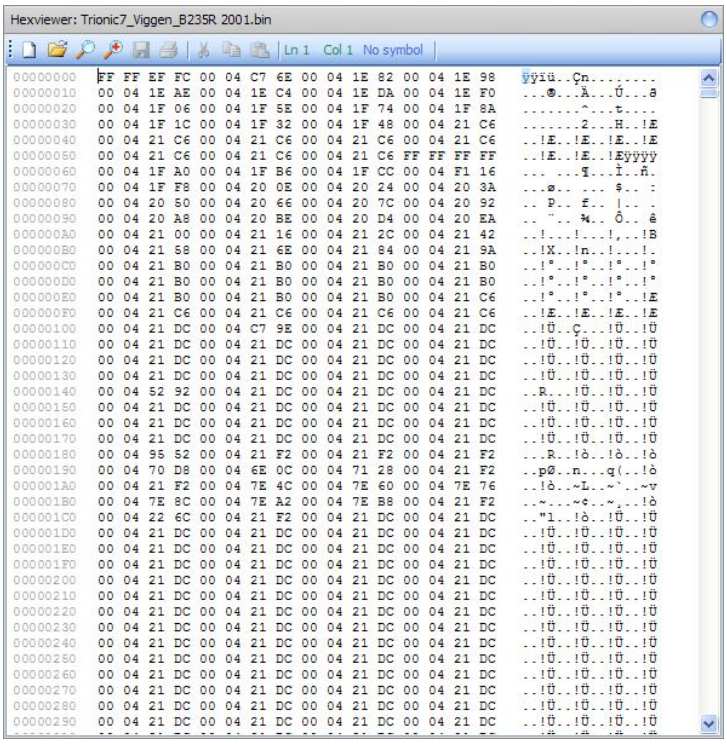
ACTIONS MENU – IMPORT SRAM FILE (NOT IMPLEMENTED YET)

ACTIONS MENU – EXTRACT SYMBOLTABLE

This option allows you to extract the symbol information from the loaded binary file. Normally T8Suite will automatically do this for you, but with this option you can force it to (re-) extract the information.

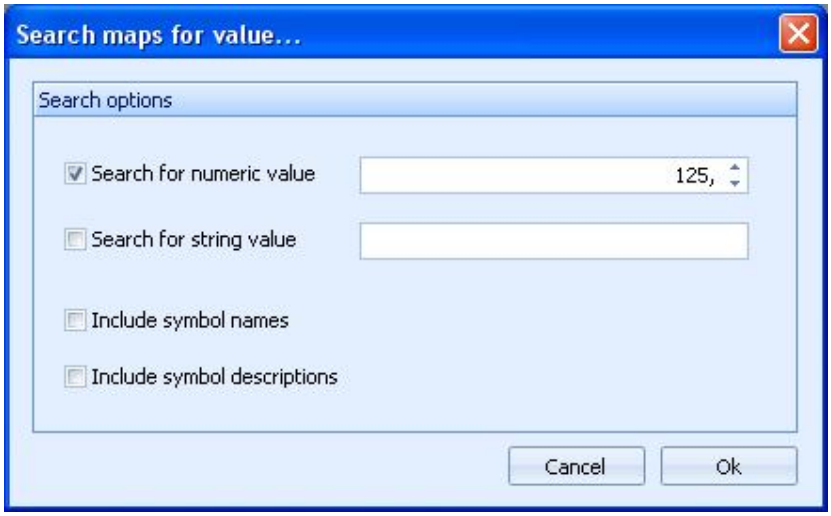
ACTIONS MENU – VIEW FILE IN HEX

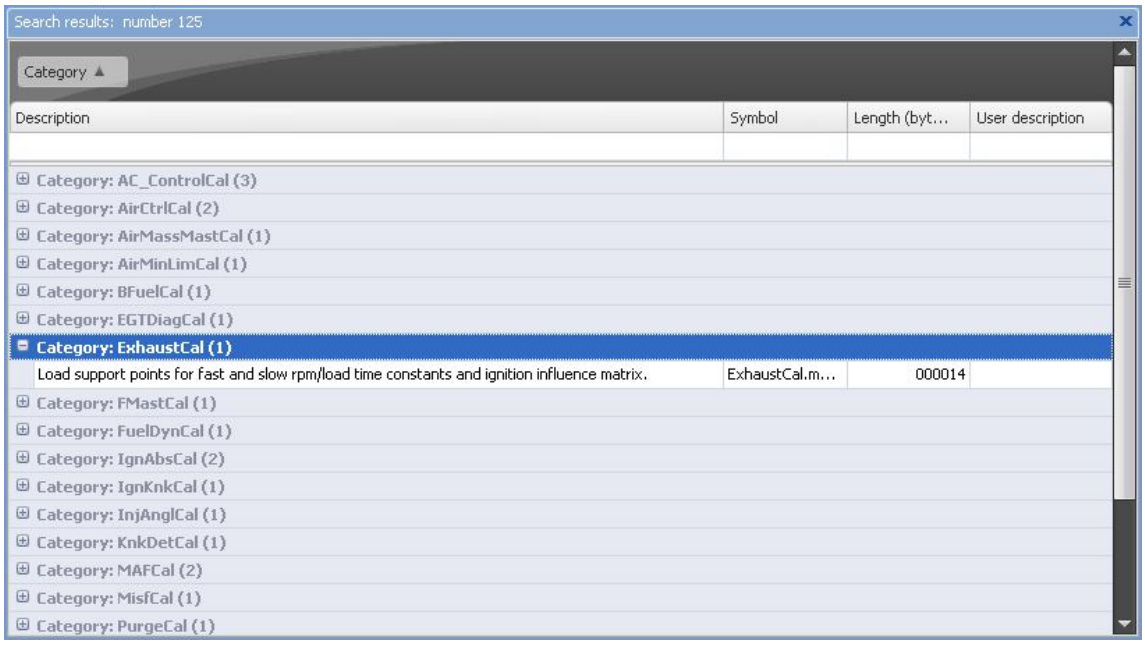
Lets you explore the binary file in hexadecimal form (advanced users!)



ACTIONS MENU – SEARCH MAP CONTENT

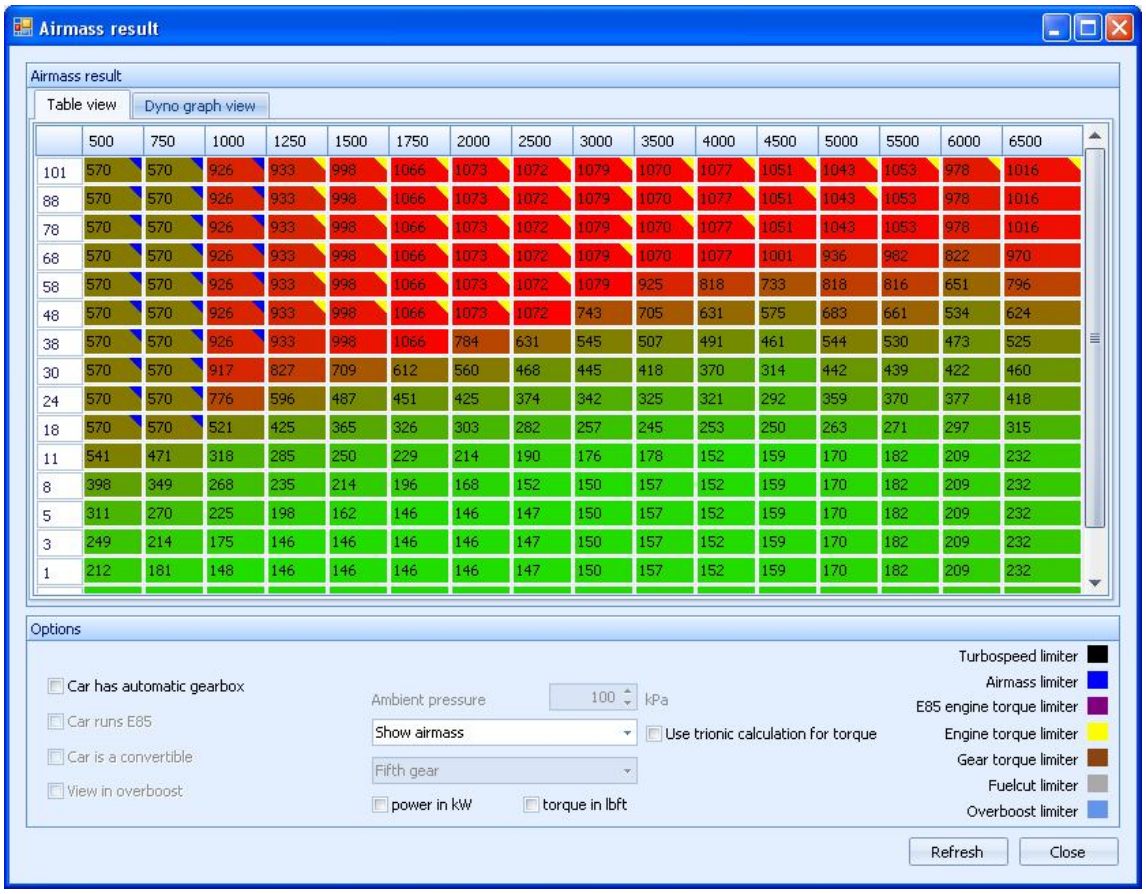
Allows you to search maps for a specific value. The result will be shown in a list.





ACTIONS MENU – SHOW AIRMASS RESULT

T8Suite incorporates a function to verify the final (estimated) airmass results based on the most common airmass and torque limiters). The result from these calculations are shown in a table that also shows the limiter that is holding more airmass per combustion back.



ACTIONS MENU – COPY ADDRESSTABLE TO ANOTHER BINARY

Some tuning companies choose to damage information inside the binary file to prevent users to have a look at them. Mostly the addresstable is damaged. With this option you can easily copy the address table from a MATCHING file (original file) to the corrupted file. It you don't know what this is about, please don't use it!

TUNING MENU

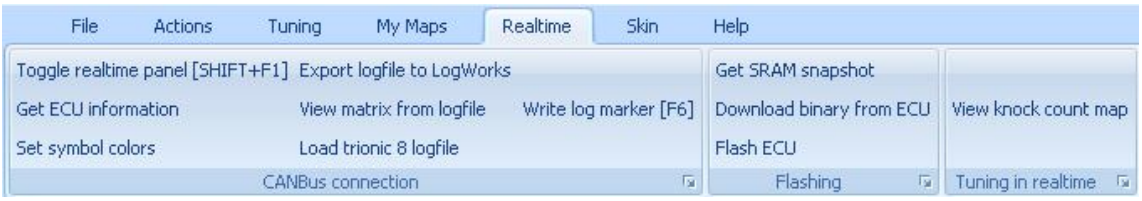
ACTIONS MENU – TUNE ME UP

Lets you alter the binary file to match a certain torque and power. This is an automated wizard that changes all the relevant maps for you. Please DO make sure that you have the hardware to support what you enter in the wizards input screen. If you go above a stage 3 configuration, please also make sure that your AFR values are in range and your EGT does not go over 950 degrees celcius.

ACTIONS MENU – MAPS

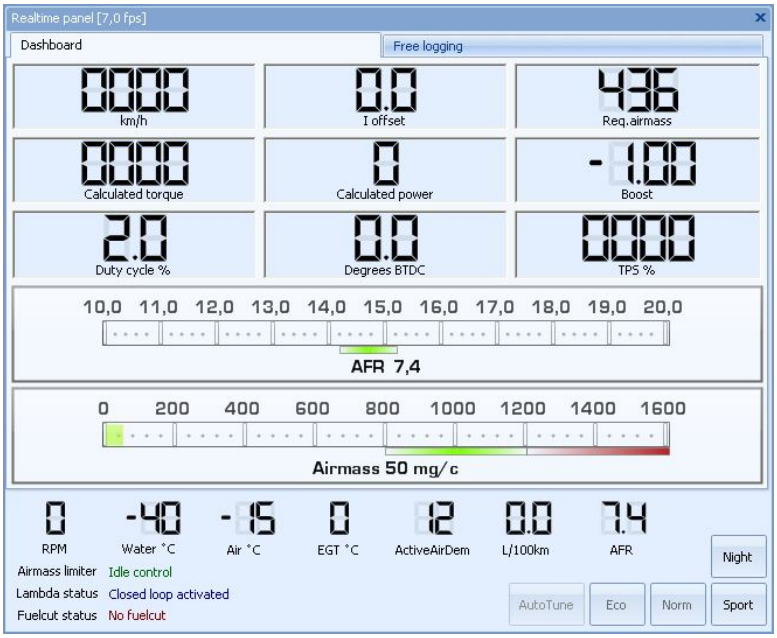
Lets you directly start a mapviewer with the specific map for quick access to the most imporant maps.

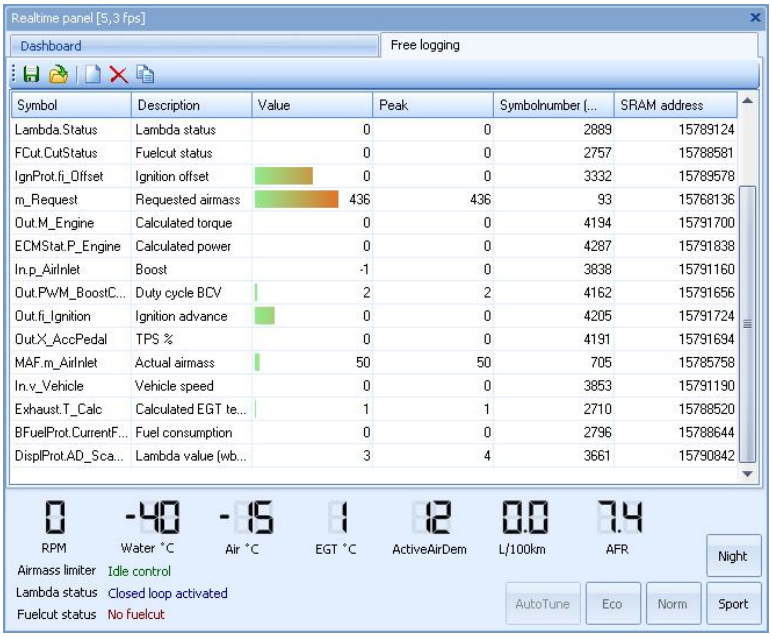
REALTIME MENU



REALTIME – TOGGLE REALTIME PANEL

Allows you to start a real-time session. If all connections are done well, T8Suite should be able to connect to the ECU and show you real-time information. You can move symbols up and down in the real-time free-logging list with CTRL-UP and CTRL-DOWN.

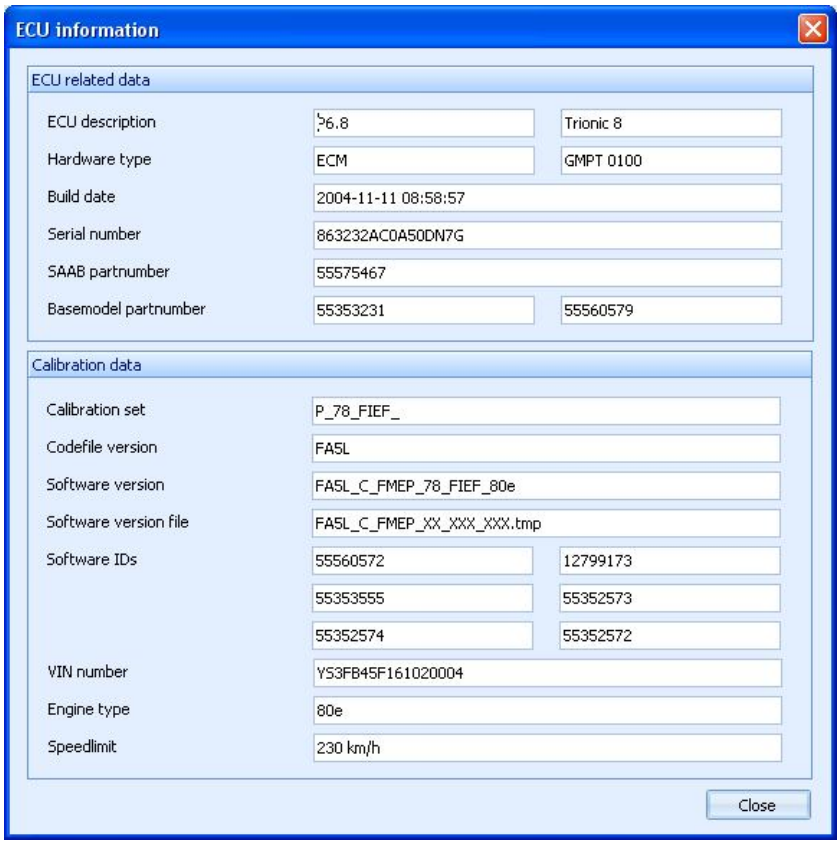




nightpanel mode

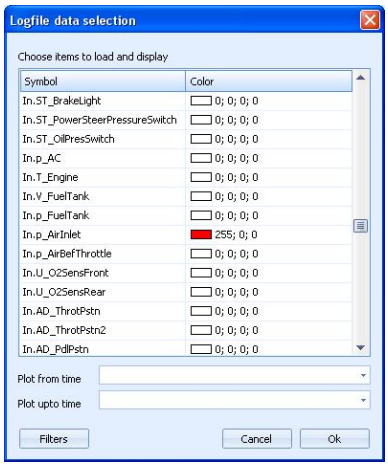
REALTIME – GET ECU INFORMATION

Allows you to extract all relevant information from the ECU using the canbus interface.



REALTIME – SET SYMBOLCOLORS

Lets you choose the colors that will be used for the symbols that are logged in realtime.



REALTIME – EXPORT FILE TO LOGWORKS

Will convert and export logged data (a t8l file) to LogWorks format and start LogWorks with that file automatically.

REALTIME – VIEW MATRIX FROM FILE

Allows you to create a 3D matrix from a logfile for further analysis.

REALTIME – LOAD TRIONIC 8 LOGFILE

Loads a logfile into the internal logviewer in T8Suite.

REALTIME – WRITE LOG MARKER

While running a real-time session this enables you to write a marker in the log which you can track back easily later on.

REALTIME – GET SRAM SNAPSHOT

Lets you download the ECUs working memory as a snapshot for comparing and backup.

REALTIME – DOWNLOAD BINARY FROM ECU

Downloads the flash content from the connected ECU. Please note that this will take approximately 20 minutes to complete. Progress will be shown in the lower right corner of T8Suite's main screen.

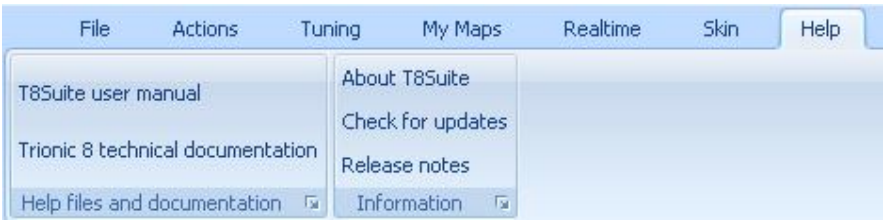
REALTIME – FLASH ECU

Flashes a given binary file to the connected ECU. Please note that this will take approximately 10 minutes to complete. Progress will be shown in the lower right corner of T8Suite's main screen.

REALTIME – VIEW KNOCK COUNT MAP

If connected to a T8 ECU, this will read the knock counter map from the ECU and display it in a mapviewer so you can keep track of where (which load/rpm sites) the system has detected knock.

HELP MENU


File
Actions
Tuning
My Maps
Realtime
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SELECTING SYMBOLS

After the symbol list has been displayed you can choose a symbol from the list by double clicking it or by highlighting it and pressing <enter>. Whenever you do this a new panel is shown with the detailled information about the symbol in question.

This panel will look something like in *Image 3*.

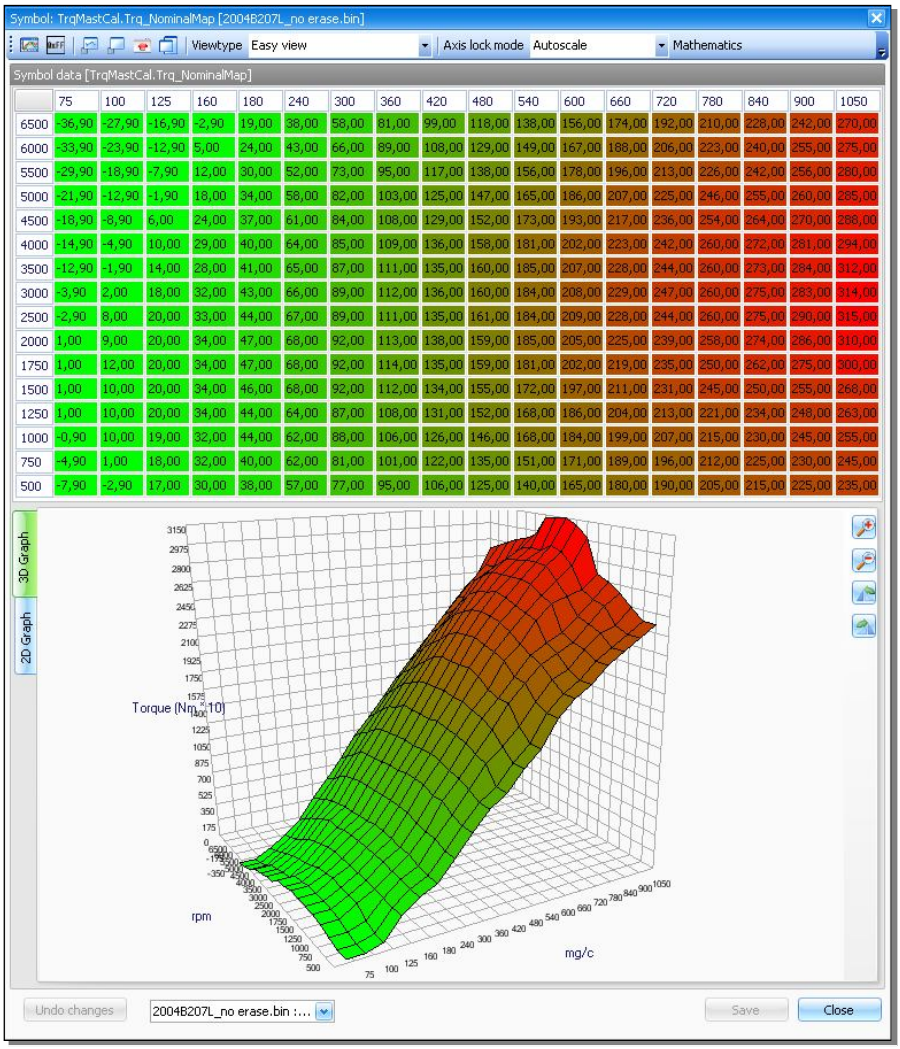


IMAGE 1: SYMBOL DISPLAYED IN EDITOR

SEARCHING FOR INFORMATION IN THE VIEWS

The used data viewers all support something called "incremental searching". If you select a value in one of the views and start typing the name or address you are looking for the view will automatically

scroll to the given entry (best match). You normally should have the column you are searching in as the primary sort column. To do this just click on the columnheader of the column in question.

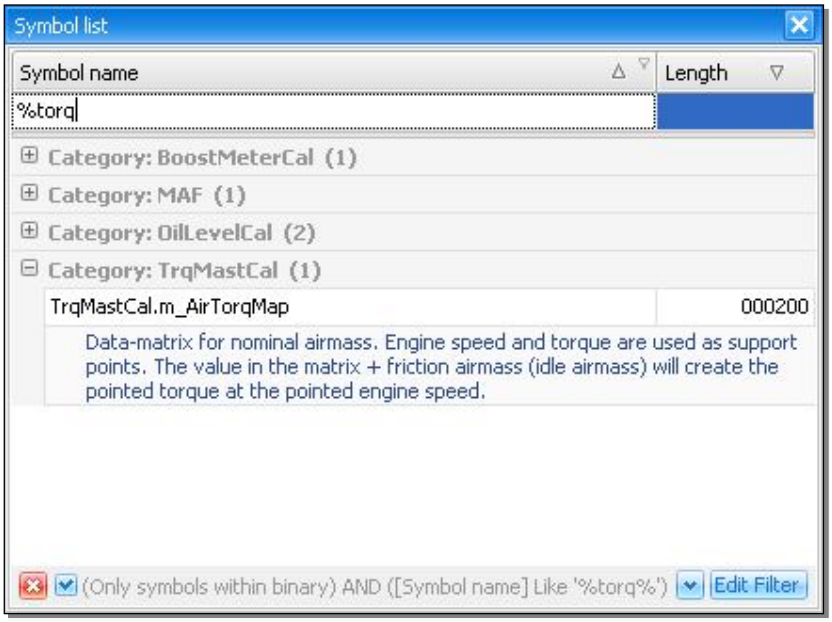


IMAGE 2: INCREMENTAL SEARCH IN ACTION

FILTERING INFORMATION

You can easily filter information in the views by selecting the little filter image in the column header and choosing one of the options. The most elaborate filters can be defined in "custom" of course. Here's a sample.

IMAGE 3: CUSTOM FILTER

SORTING INFORMATION

Information can be sorted ascending or descending by clicking the column header you want to sort on.

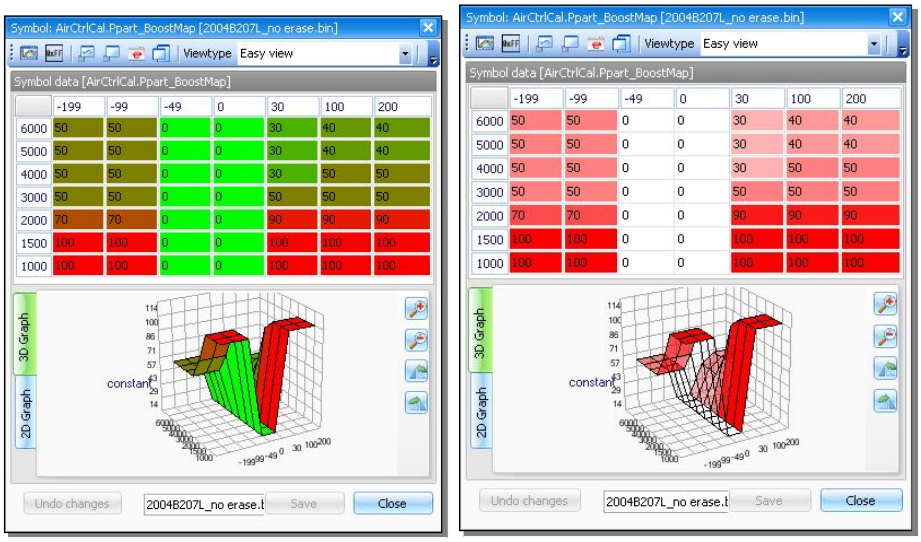
EDITING MAPS

HEXADECIMAL MODE

When you select "View tables in Hex" in the ribbon menu under Actions, Options all maps will be displayed in hexadecimal values. If you don't really know how to interpret hexadecimal number, you can also switch do decimal mode by unchecking the "View tables in Hex" option. This setting will be stored and retrieved the next time the application is started. In the images below you can see the difference of viewing in hex or in decimal format.

COLOR INDICATORS

You can adjust how the maps are displayed to some extend. By default all maps will be displayed having color from green (low values) to red (high values). If you find this confusing you can check the "Show red and white maps" option in Actions, Options and the maps will be displayed using red only. In the images below you can see the difference in viewing in red&green and red&white.


Symbol: AirCtrlCal.Ppart_BoostMap [2004B207L_no erase.bin]
Viewtype Easy view
Symbol data [AirCtrlCal.Ppart_BoostMap]
-199 -99 -49 0 30 100 200
6000 50 50 0 0 30 40 40
5000 50 50 0 0 30 40 40
4000 50 50 0 0 30 50 50
3000 50 50 0 0 50 50 50
2000 70 70 0 0 90 90 90
1500 100 100 0 0 100 100 100
1000 100 100 0 0 100 100 100
3D Graph
2D Graph
constant
Undo changes
2004B207L_no erase.b
Save
Close

ADJUSTING VALUES IN A MAP

To avoid that you have to adjust all values of a "large" map manually some features have been added to the mapeditor.

Plus key: adds 1 to all selected cells

Minus key: substracts 1 from all selected cells

PageUp key: adds 10 to all selected cells

PageDown key: substracts 10 from all selected cells

Home key: sets all selected cells to the maximal value

End key: sets all selected cells to the minimal values

To be able to get your work done faster you can selected one or more cells in a table and copy them to the clipboard by rightclicking and selecting "Copy selected cells".

To paste the cells select the location where you want to cells to appear – this could be in another map and even in another binary – rightclick and select "paste selected cells" and then "At original position" or "At currently selected location".