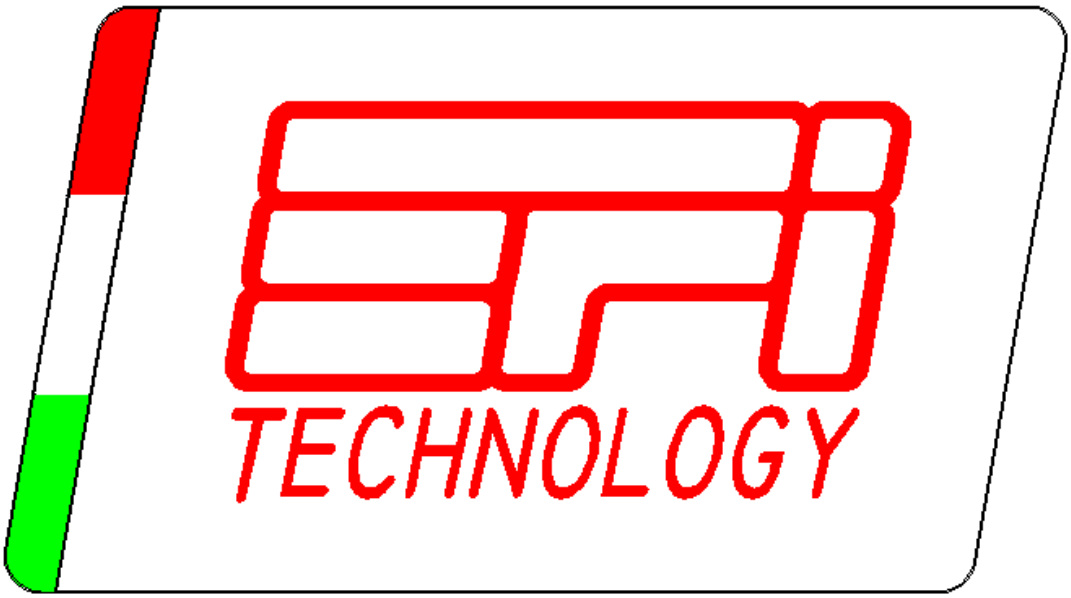

ECT MODULAR SOFTWARE DESCRIPTION

User Manual

Version: **3.7.23**

Date: **September 2012**

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ECT Modular 3.7.23

1 INSTALLATION GUIDE

ECT Modular is the latest PC software from EFI Technology for use with its market leading ECU's. ECT Modular 3.7.23 should only be used with the following EFI Technology CAN interfaces:

1. Aluminium USB interface version 0AEFB37B00200, yellow label.
2. EFL06 Plastic USB interface (released 06/2008).
3. EFP02 USB-CAN opto-isolated interface (released 09/2012).

1.1 INSTALLATION

ECT Modular 3.7.23 should be installed either from a CD supplied by Ole Buhl Racing or having downloaded the setup file from **www.obr.uk.com under Support – Software.**

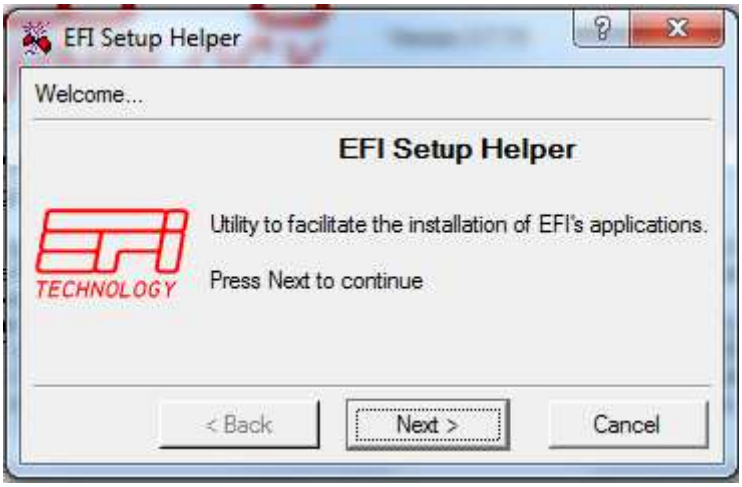
If installing the software from an OBR supplied disc you will see the following folders by exploring the disc:

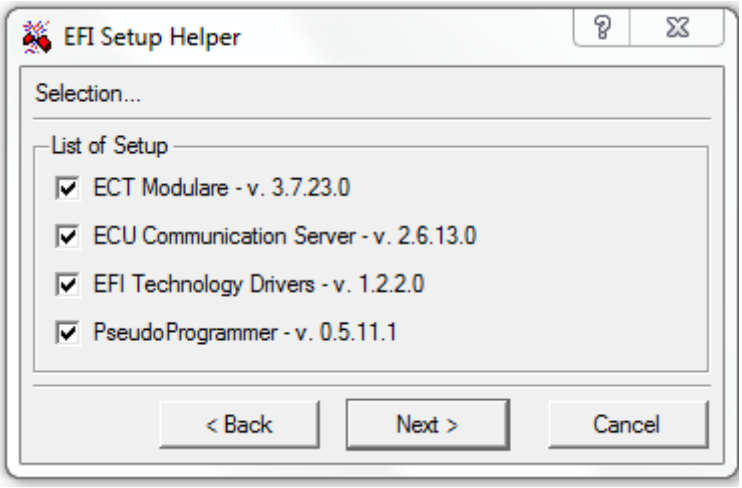
1. 2D Handbooks – Handbooks for 2D products
2. 2D licenses – A guide to the difference license options available for 2D Winarace software
3. 2D Products – A guide to all of 2D's latest motorsport products
4. Dash + Data logging files – Configuration files for 2D's range of loggers and dashboards
5. ECU Data files – Configuration files for EFI ECU's
6. EFI Technology ECU – A guide to all the EFI ECU's available
7. EFI _SetupHelper – Automatic software installer
8. PCM Installation – OBR's power control module software
9. Pricelist 2012 – OBR's 2012 price list
10. SetupDepot – Individual EFI software installations – manual installation
11. WinARace 2006.1 – 2D's free version of its popular WinARace software to be used with ECU internal data logging. You will also find last minute updates for the program and an installation and registration instruction file.

To start installing ECU modular 3.7.23 insert the CD in your CD drive. If you have selected to explore the disc, select the "setuphelper" icon from the CD under "EFI_SetupHelper" or as downloaded from the website, and select "Run".

This will launch the Setup Helper shown below:

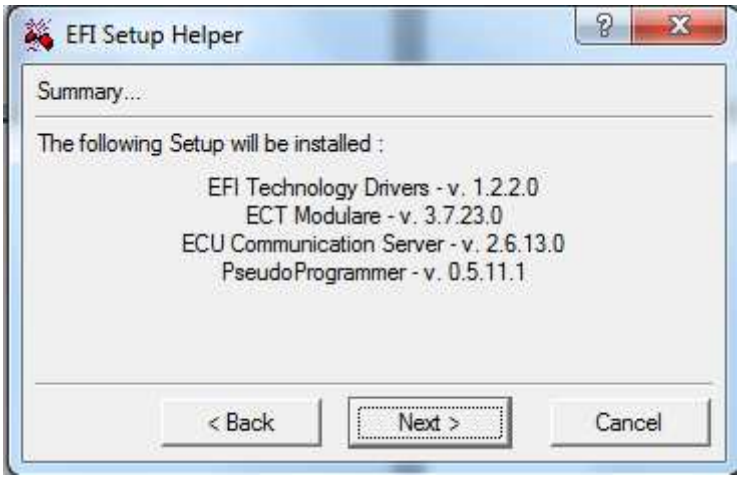
Select “Next” and then ensure you have all three programmes selected as shown:





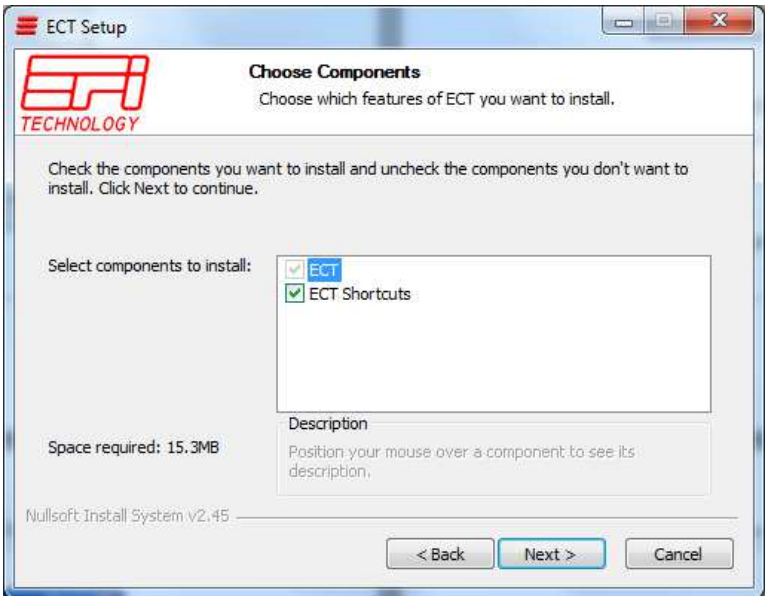
Select “Next” again.

You will then get a summary of what will be installed. Click “Next”



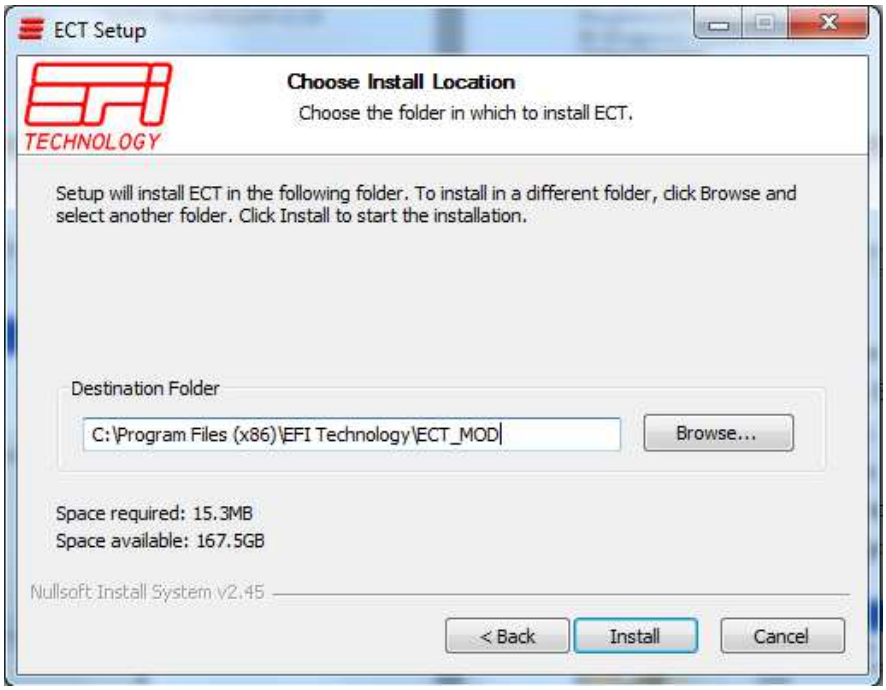
The installer will then start to install the first programme; ECT Modular 3.7.23. You will then be asked to select which language you require, English or Italian.

Next you are given the option of installing a desktop Icon.



You are then asked to specify the destination folder for the installation. If you have had any previous versions of ECT or ECT Modular installed then select C:\ ECT. ECT modular will then work with your existing Editor, Device and User folders.

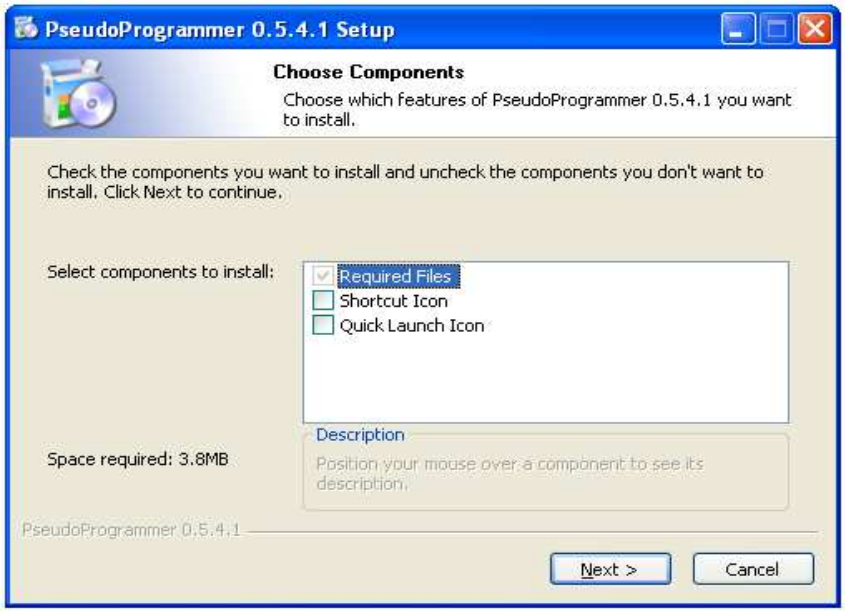
If this is a fresh installation, you have the option to select suggested installation path.



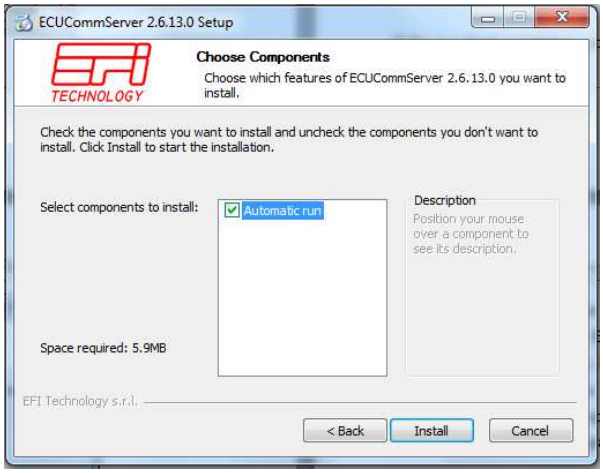
The installation of ECT Modular 3.7.23 is then complete. Select “close”.

The Setup Helper will then automatically start installing the Pseudo Programmer. The Pseudo programmer runs in the background to allow transmission of firmware. You do not however need to enter into the PseudoProgrammer software itself.

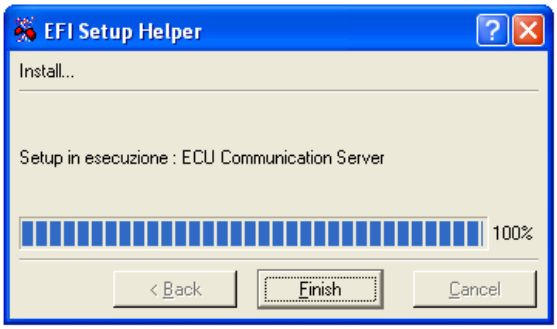
Select both the shortcut and quick launch components and select “Next”. The recommended installation path for the programmer is the configured default. Select “Install”. The Pseudo Programmer will then complete.



The Setup Helper will then start to install the ECU Comm Server. The Server allows communication between the ECU and ECT Modular. As with ECT Modular, you will be asked to select your language choice, English or Italian. You then have the choice to select the "Startup Run" option. This activates the server as soon as you are signed into your PC or laptop. Alternatively, the server just opens when you open a communication function within ECT Modular, i.e. display, map editor, programme (mem interface) and Log interface (data logger).



The Server installation will then be completed. As will the Setup Helper. Press "Finish".



IMPORTANT: If the installation window for **TDLPortIO** appears, select **INSTALL if your PC is running Windows 2000, XP, NT or Vista**. The installation is complete when you accept to reboot the PC.

With the setup complete you should now have (depending on your selections) three new icons on your desktop:

2 CONFIGURING ECT

Now the programme is installed there are just 4 further steps before it is ready to use:

2.1 TRANSFER THE DATA FILES (See note below)

Using Windows Explorer, copy the data files from the CD-ROM provided (stored in **ECU data files**) to the directories automatically created on your hard drive when the ECT Modular programme was installed (These may have alternatively been e-mailed to you). To achieve this follow the procedure below:

- Using Windows Explorer, right click on your CD drive (normally D).
- From the drop-down menu, select **Explore**.
- From the list of files now shown on the CD, double click on the **ECU DATA FILES** folder.
- Open the folder corresponding to your ECU type, i.e. Euro 4-v305.
- Unzip the large file by double clicking on it. This will open to three folders, a **.DEV** folder**, .USR** folder and an **.EDT** folder.
- Move the **.DEV** folder into the **DEVICE** folder created on your hard drive in the ECT* directory.
- Move the **.USR** folder into the **USER** folder created on your hard drive in the ECT* directory.
- Now create a new folder for storing your engine maps, anywhere convenient for you on your hard disk, but it is suggested to do so alongside the DEVICE and USER folders. For example, name this folder “EDITOR” or “MAPS". Move the remaining **.EDT** file from the CD to your newly created (“EDITOR”, “MAPS”) file.

NOTE: *

If this is a new installation of EFI software (including the old version of ECT) the software could have installed to the default location of C:\Program Files\EFI Technology\ECT_MOD.

The DEVICE, USER & EDITOR folders may need to be manually created with a new installation.

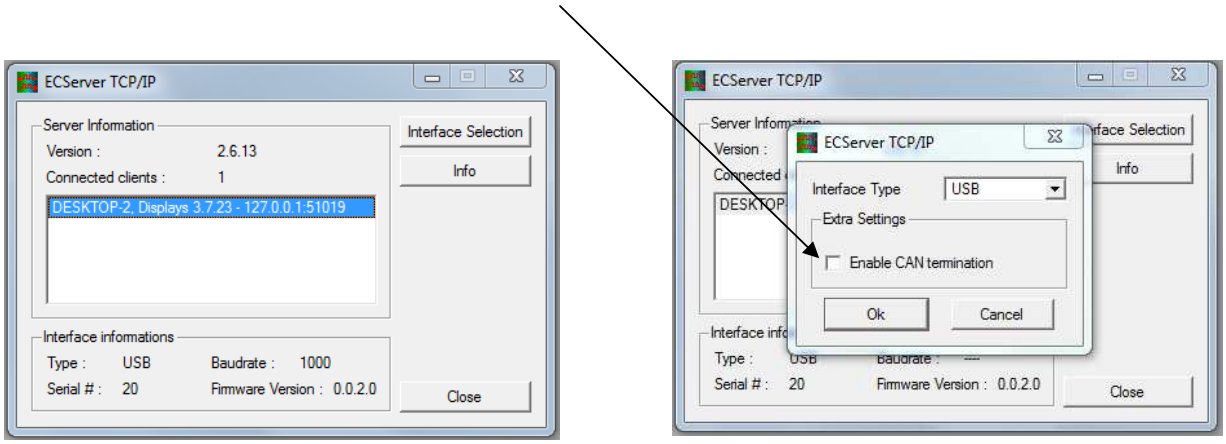
2.2 CONFIGURING THE CAN INTERFACE

The CAN interface is the communication module supplied by EFI Technology and it is used to establish connection between your PC and the ECU. The ECT Modular programme has the capability to run either a parallel port or USB CAN link. The CAN link settings are selected by opening the ECU Comms server programme individually from ECT – Select the main windows "**Start**" button, then "**All Programs**" – "**ECUCommServer**".
The programme will open to a small icon on your lower windows toolbar:

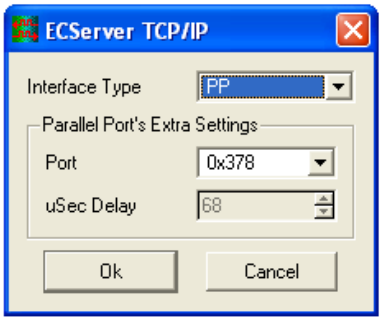
Left click ECU Comms server to open it. 

Select "Interface Selection" to configure your interface settings, either USB or PP (Parallel Port).

Here you may also select whether or not to activate the interfaces 'termination resistor' (Only when using EFL06 or EFP02 interfaces). ***only when interface is plugged in.**

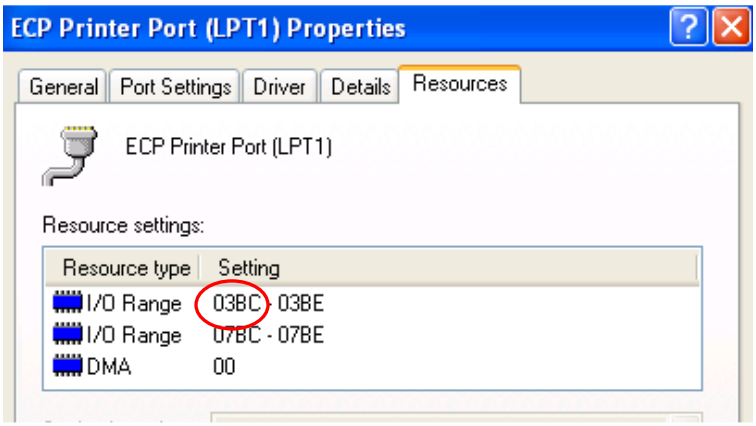


If you are using a PP interface you also need to configure the port address, typically either 0x378 (most common) or 0x3BC (standard configuration for IBM or Lenovo laptops).



2.3 PARALLEL PORT CAN INTERAFCE

- To use a parallel port CAN interface the port must be **ECP** rated (a windows configuration).
- To find which parallel port is **ECP** rated click on the Windows main **START** menu:
- Select **CONTROL PANEL**
- Select **SYSTEM**
- Select **HARDWARE**
- Select **DEVICE MANAGER**. In Device Manager you will see the **PORTS (COM & LPT)** branch. Double click on it to expand the ports directory. It will then list all the parallel ports available within your PC.
- Double click on the port that has ECP as part of its name, i.e. ECP Printer port. In the **RESOURCES** section note down the top left hand setting, e.g. 03BC as shown below:



Match this LPT address to the options available in the Server settings as shown above.

IMPORTANT - If your computer doesn't display an **ECP** configured parallel port then refer to your Windows manual or PC Handbook.

2.4 USB CAN INTERFACE

- Plug in your **USB CAN interface** and wait for the Windows installation option to appear on your screen. Select to install the driver **AUTOMATICALLY**.
- If you select manual installation, follow the on-screen instructions, directing the search to C:\Program Files\EFI Technology\drivers folder installed on your hard drive. Double click on the efiusbcan_drv folder to enter it.
- Click on the **EFIUSBCAN** icon. The driver will now install.
- In the Server programme, ensure the **USB** option is selected (as shown on the previous page.)

3 USING ECT

With the data files and communication settings finalised its time to configure the ECT Modular programme.

- Open the **ECT Modular** programme from the icon on your desktop or from the "All Programmes" option from the main windows "Start" button. ECT Modular opens as a

toolbar at the top of your screen as show below:

- **LINE** toggles the default PC communication link between default ON-LINE and OFF-LINE.
- **COMMUNICATION INTERFACE SETUP** gives access to the server address. Under normal conditions, do not alter this setting.
- **DEVICE SETUP** gives access to the system database. This is for experienced ECT users only.
- **PROFILES** allows you to select between display screens for various ECU versions.
- **DISPLAYS** gives you access to the display manager and to display screens for your ECU.
- **MAP EDITOR** gives access to the engine maps, ECU setup maps and learn maps. You can also delete selected maps in this section.
- **MEM INTERFACE** opens up the programming tool and allows you to send and receive maps between the ECU and your PC.
- **LOG INTERFACE** gives access to the ECU on-board data logger (if available).
- **COMPONENTS ARRANGEMENT** allows you to arrange the screen layout when multiple windows are opened.
- **LANGUAGE** gives access to select Italian or English language.
- **EXIT** shuts the programme down.

3.1 DEVICE SETUP

This section is used to access the ECU database or to install a new database to be used with the ECT program.
A new database is required when you upgrade an existing version of an ECU firmware and when you install a new system. The database is supplied by OBR, (contact us with your details).
Experienced users can access the database properties and change the configuration of individual channels to suit specific needs and save different configurations.

3.2 PROFILES

Each individual ECU uses a specific communication protocol for data communication with your PC. In this section, you can select the type of ECU currently used. A window on the icon bar shows the actual ECU communication protocol selected, i.e. **EURO4-305**.

Within **PROFILES**, **PROFILES MANAGEMENT** can be accessed, here you can open new profiles, copy, delete, update, load new and reassign devices.

3.3 DISPLAYS

You can create screens displaying any ECU parameter measured and calculated for each type of ECU. A screen can display any number of channels in any size, font and colour.

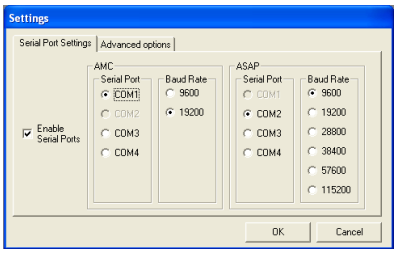
Data can be displayed or linked as:

- Data windows
- LED, red or green colours
- Trim potentiometers, for example for global trims of fuel, spark, phase etc. These potentiometers can be controlled by software (your mouse) or by our Active Mapping Controller. This is a mapping controller having 6 individually programmable potentiometers plus a STORE button.
- Strip charts, giving a graphic visualisation of up to 5 channels simultaneously.
- Read or write directly into ECU memory locations (requires a dedicated license)

Using the Displays Manager, you can open a display, create a new display, copy a display file, delete a display, and rename a display.

Refer to the latter parts of this handbook in section 9 for instructions on how to create and configure your own display screen and the use of templates.

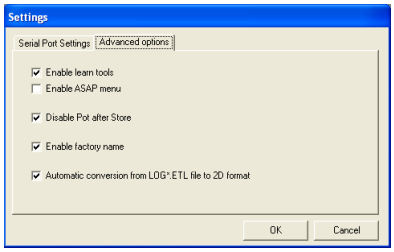
When you click in DISPLAYS a list of available display screens is displayed. Click on the one you want to load with the mouse or move the cursor with the arrow keys and hit Enter. Pressing the first letter of a screen name, i.e. **F** for FUEL makes the cursor jump to the first screen starting with this letter and - if none other exists - opens it. Refer to section **9** for information on altering display screen layout.



3.4 DISPLAY SETTINGS

To access the basic display options, click on DISPLAYS in the ECT Main menu. When the window EFI DISPLAYS opens, click MAIN and then SETTINGS.

If you use the Active Mapping Controller or the ASAP3 serial link, you must enable the serial ports and configure the settings.



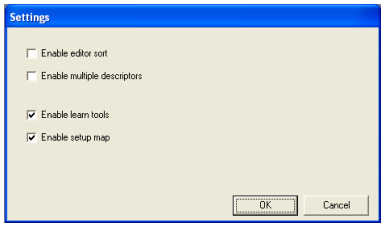
In Advanced Options select your preferred options.

3.5 MAP EDITOR

The Map Editor opens the editor and gives access to the data in both the engine and the ECU Setup maps. Both types of maps can be accessed working either online with the ECU or offline.

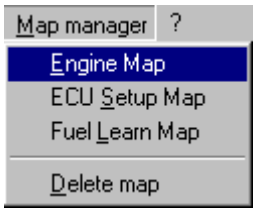
3.6 MAP SETTINGS

To access the basic map editor options, click on MAP EDITOR in the ECT Main menu. When the window EFI MAP EDITOR opens, press ESC to close the engine map template. Now click MAIN and then SETTINGS.



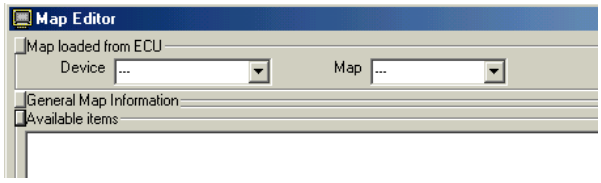
Select your preferred options.
It is strongly recommended to enable the learn tools which are used by all our ECU's.
Enable the access to ECU setup maps if you are working with other ECU's than just Euro-1.

3.7 ENGINE MAP

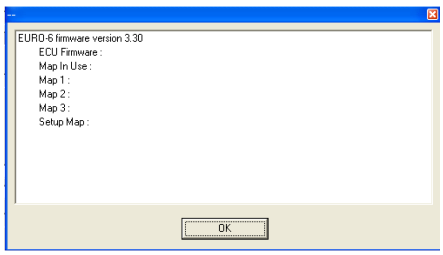


Selecting ENGINE MAP gives access to the maps containing data for the engine calibration for all our systems.
These maps can be modified working either online with the ECU or by loading the map from your PC.

To load a map whilst working online with the ECU, click on Map Manager and an engine map template open. Look for the small square next to **Map loaded from ECU**.

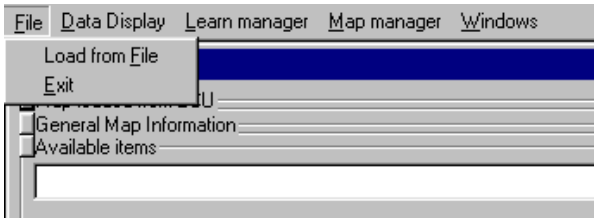


Click on the arrow in the **DEVICE** window and click on the ECU configuration you are using.
Click on the arrow in the **MAP** window and select the map you want to load. You can load the map from any of the available locations.
You may be prompted for a password. Type the correct password to proceed. If you do not know the password, you cannot access the map.



If you have more than one map loaded into the ECU and you are unsure which map is in which location you can do the following:
Load up any display screen (see section 9) and then right click in any empty part of that display screen. A drop down menu will appear. Select **Device Information**.

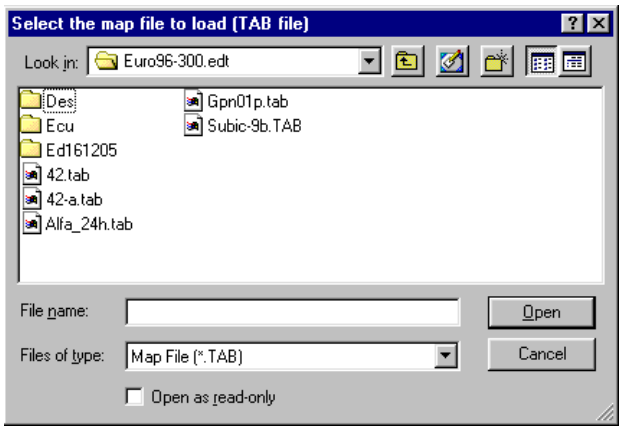
To load a map from your PC, click on **ENGINE MAP**, then click on **FILE** from the main ECT toolbar and finally click on **LOAD FROM FILE**.



Make sure the window **LOOK IN** displays the data directory related to the ECU in use. Click on the map and then click **OPEN**.

An engine map consists of 3 files, all with the same name, but different extensions:

- One without extension, containing information about required descriptor file, commentary file, notepad file and data file
- One with *.NTP extension, a notepad file in which you can include information about the engine, sensors etc. **
- One with *.TAB extension, the actual data file.



If the ECT cannot find the file without extension or the specified descriptor file, it asks you which descriptor file you want to load.

The editor uses the descriptor file to visualise the data from the engine map. The descriptor file is given a unique name identifying it to the type and version of ECU and whether the engine load is throttle based (AN) or pressure based (SD). Click on the correct version and click OK to load the map.

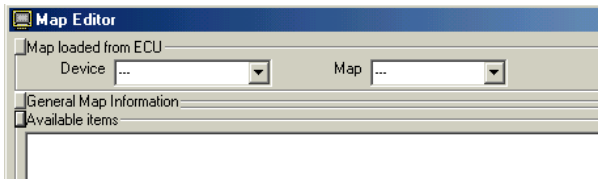
The engine map descriptor file extension is *.DES.

3.8 ECU SETUP MAP

Selecting ECU SETUP MAP gives access to the map containing data configuring the ECU's to specific engines and their sensors. Please note that Euro-1 does not use an ECU setup map.
The map can be modified working either online with the ECU or by loading the map from your PC.

IMPORTANT: Do not change the ECU Setup Map online while the engine is running. The ECU has to be reset before the engine is running on the new map.

To load a map working online with the ECU, click on Map Manager and an select ECU Setup Map. Look for the small square next to **Map loaded from ECU**.



Click on the arrow in the **DEVICE** window and click on the ECU configuration you are using.

Click on the arrow in the **MAP** window and select the map.

Loading a map from your PC, click on **ECU SETUP MAP**, then click on **FILE** and finally click on **LOAD FROM FILE**.
Make sure the window **LOOK IN** displays the data directory related to the ECU in use.
Click on the map and then click **OPEN**.

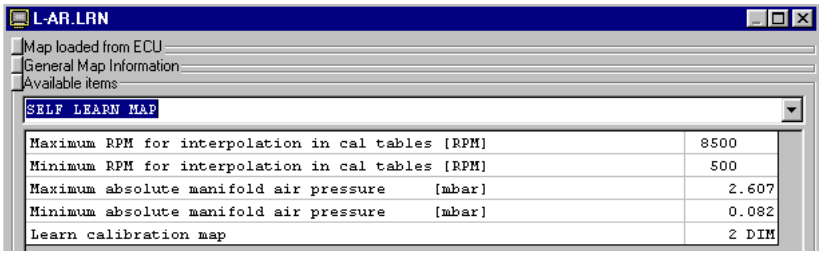
An ECU setup map consists of 3 files, all with the same name, but different extensions:

- One without extension, containing information about required descriptor file, commentary file, notepad file and data file
- One with *.NTP extension, a notepad file in which you can include information about the engine, sensors etc.
- One with *.ECF extension, the actual data file.

If the ECT cannot find the file without extension, it has to ask you which descriptor file you want to load.
The editor uses the descriptor file to visualise the data from the engine map. The descriptor file is given a unique name identifying it to the type and version of ECU.
The ECU setup map descriptor file extension is *.CDS.

3.9 FUEL LEARN MAP

The learn map created by the self-learning fuel injection facility can be download as described in section 4.12 and then loaded into the editor for a closer analysis.



Loading a map from your PC, click on **FUEL LEARN MAP**, then click on **FILE** and finally click on **LOAD FROM FILE**. Make sure the window **LOOK IN** displays the data directory related to the ECU in use. Click on the map and then click **OPEN**.

When the map is loaded, click the arrow in the section **AVAILABLE ITEMS**.

Click **SELF LEARN MAP**.

Double click **LEARN CALIBRATION MAP** to visualise the learn map.

All non-corrected breakpoints show **1**. Fuel has been added if the breakpoint shows a value higher than 1, i.e. 1.09 shows that the fuel injection pulse width in this breakpoint has been increased by 9% to reach the target lambda value.

The amount of fuel has been reduced if the breakpoint shows a value less than 1, i.e. 0.82 shows that the fuel injection pulse width in this breakpoint has been reduced by 18% to reach the target lambda value.

Refer to section 13 on how to mix the learn map with the existing fuel map.

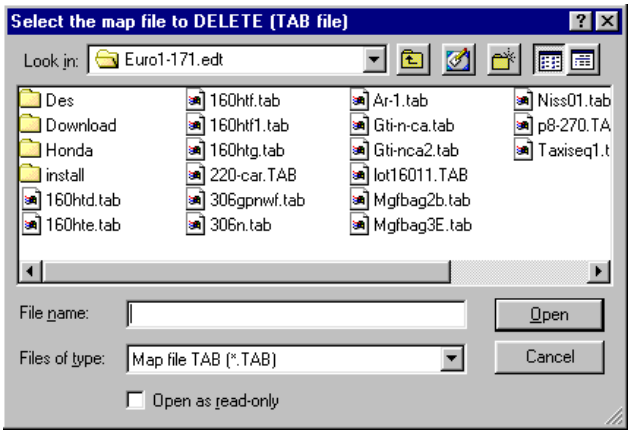
3.10 DELETE MAP

If you want to delete a map from your hard disk, click **MAP EDITOR** and then **DELETE MAP**.

Make sure the window **LOOK IN** displays the data directory related to the ECU in use.

Click on the map you want to delete, and then click **OPEN**.

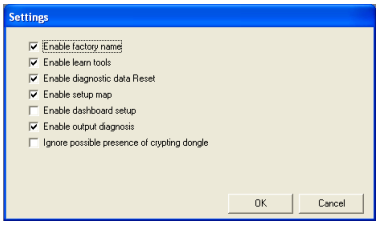
The map is now removed from your hard disk.



4 MEMORY INTERFACE

This section is used to send and receive all types of maps and to access the lean system.

4.1 SETTINGS



To access the communication interface options, click on MEM INTERFACE in the ECT Main menu. When the window EFI MEM INTERFACE opens, click MAIN and then SETTINGS.

Select your preferred options.

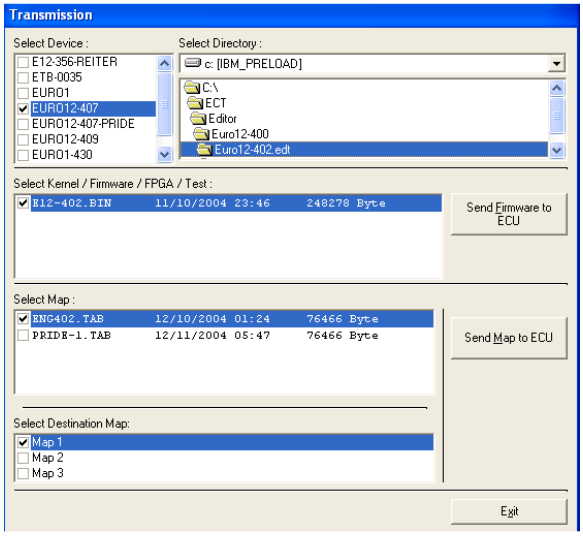
4.2 ECU COMMS

You can transmit engine maps, ECU setup maps, ECU firmware and learn maps from your PC to any of our systems. Maps can be received from the ECU's to your PC as well.

Engine maps in the ECU can be password protected from non-authorised access. Specially encrypted ECU's are also available for special applications.

This section also gives access to the learn system and to resetting the diagnostic memories and timers.

4.3 TRANSMIT



Since each version of ECU's uses a different communication protocol, it is important to specify to which ECU you want to transmit the map. Select the correct type of ECU in the upper left window, **Select Device,** by ensuring the box has a tick in it. Next, specify in which data directory the map is located. Make sure the correct directory is highlighted in the upper right corner, **Select Directory**.

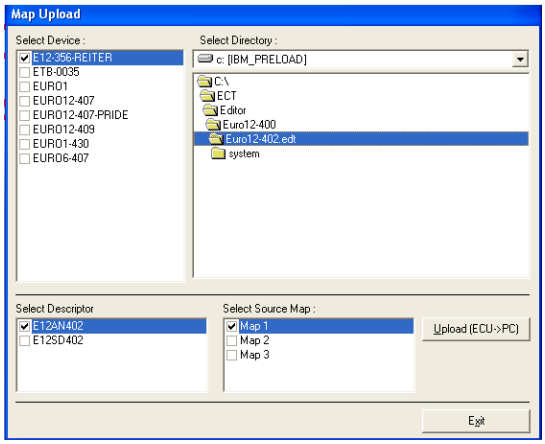
Section **Select Kernel / Firmware / FPGA / Test** lists the ECU firmware. You will have to transmit the firmware to the ECU when you receive a new ECU or when you need to update the current software version. Click on the square box to select the firmware version, then click Send Firmware, and follow the instruction given on screen.

The engine maps are listed in the **Select Map** section. Click on the square box to select the desired engine map.

All ECU's except Euro-1 can be programmed with 2 to 6 different maps. The option for the desired map location is listed in section **Select Destination Map**. Click on the location number desired and then click **Send Map to ECU**. After transmitting the map to the ECU you will be prompted for a password. You can use maximum 8 characters (15 with Euro-4/Euro-8) and any key combination except **/**, ****, **,** and **..** If you do not want to protect your map with a password, simply press Enter.

IMPORTANT: If you transmit a new map generated by mixing the old map and a learn map, you must reset the learn map.

4.4 RECEIVE



Since each version of ECU's uses a different communication protocol, it is important to specify from which ECU you want to receive the map. Select the correct type of ECU in the upper left window, **Select Device**. Next, specify the data directory in which you want the map to be located. Make sure the correct directory is highlighted in the upper right corner, **Select Directory**.

In **Select Descriptor** you must select which descriptor file is selected.

The editor uses the descriptor file to visualise the data from the engine map. The descriptor file is given a unique name identifying it to the type and version of ECU and whether the engine load is throttle based (AN) or pressure based (SD).

In the section **Select Source Map** select from which map location, you want to download the engine map.

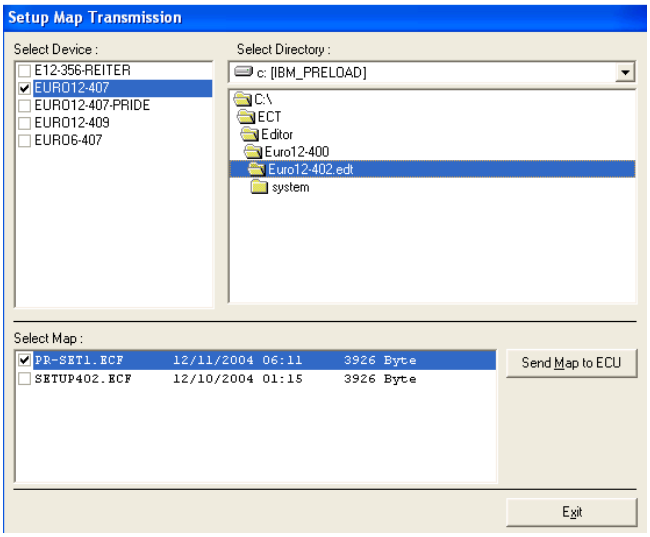
Click **UPLOAD (ECU → PC)** to start receiving the map. You may be prompted for a password. Type the correct password to proceed. If you do not know the password, you cannot receive the map.

When are asked for a file name for the map, you can choose any key combination except **<space>**, **/**, ****, **,** and **.**. You may choose to use the existing file name again, overwriting the existing file.

Finally, you will be asked if you want to mix the map with the learn map. Select **YES** or **NO**.

Note – To establish which maps are loaded in the ECU connect to it and open any display screen. Right click on any part of the grey area inside the screen and then select **Device Information** from the pop up menu.

4.5 TRANSMIT SETUP MAP



This section is not relevant for Euro-1. The setup map is used to configure the ECU to the setup of your engine, (sensors being used, triggering configuration etc).

Since each version of ECU's uses a different communication protocol, it is important to specify to which ECU you want to transmit the ECU setup map. Select the correct type of ECU in the upper left window, **Select Device**.

Next, specify in which data directory the map is located.

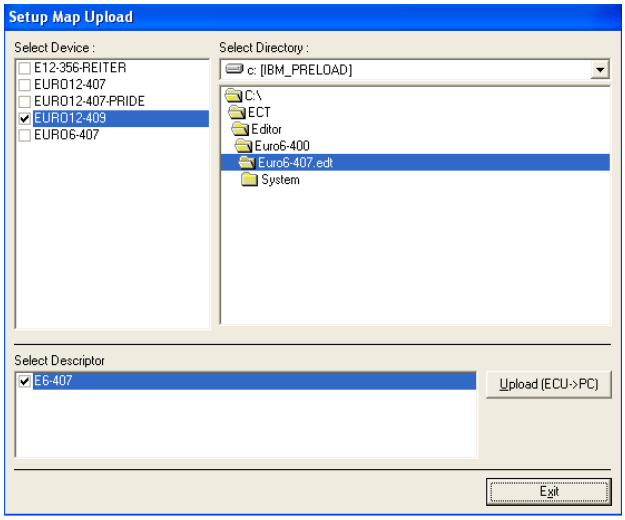
Make sure the correct directory is highlighted in the upper right corner, **Select Directory**.

The ECU setup maps are listed in the **Select Map** section.

Click on the square box to select the desired map.

Click on **SEND MAP to ECU** to transmit the ECU setup map to the ECU. Click OK to confirm **Reset ECU OK**.

4.6 RECEIVE SETUP MAP



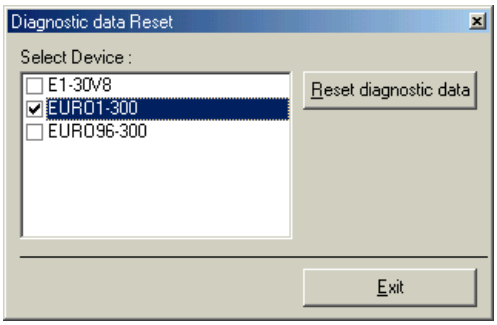
This section is not relevant for Euro-1.

Since each version of ECU's uses a different communication protocol, it is important to specify from which ECU you want to receive the map. Select the correct type of ECU in the upper left window, **Select Device**. Next, specify

the data directory in which you want the map to be located. Make sure the correct directory is highlighted in the upper right corner, **Select Directory**.

In **Select Descriptor** you must select which descriptor file is selected. The editor uses the descriptor file to visualise the data from the engine map. Click **UPLOAD (ECU→PC)** to start receiving the map. When are asked for a file name for the map, you can choose any key combination except **<space>**, **/**, ****, **,** and **..** You may choose to use the existing file name again, overwriting the existing file.

4.7 RESET DIAGNOSTIC DATA

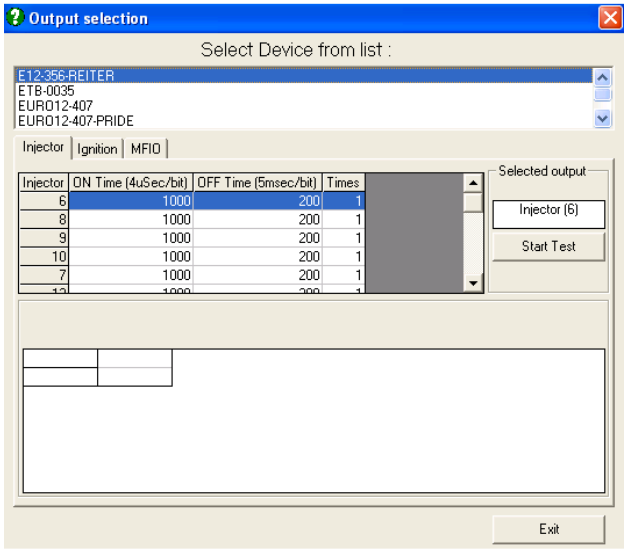


This section is relevant for Euro-1 and Euro-96 ECU's only.

To reset the diagnostic memory in Euro-1 or Euro-96 ECU's, click the **Reset Diagnostic Data** button.

To cancel any action, click on **Exit**.

4.8 OUTPUT DIAGNOSTICS



This section is not relevant for Euro-1.

The output diagnostics function allows you to test your output drivers, both injection and ignition.

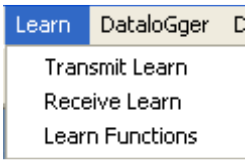
Firstly select your **device** then use the screen tabs to select between **Injector** and **Ignition** testing. Select the driver you want to test, for how long and for how many cycles. Then click the **Start Test** button.

The output diagnostics also allows you to test **MFIO's** (multi function Inputs or outputs).

4.9 RESET COUNTERS

The reset counter allows the user to zero the time counters within the ECU. The counters log the time from ECU power up and engine start.

4.10 LEARN

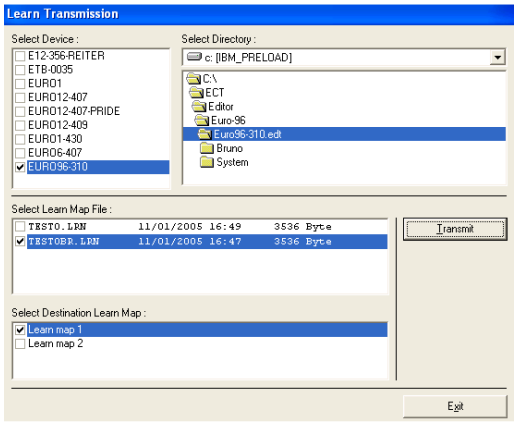


Each ECU features a unique self-learn management of the fuel injection.
By the use of a NTK linear lambda sensor and a lambda target map, the injector pulse width measured in each fuel map breakpoint is adjusted automatically until the measured lambda value corresponds with the target value.
Adjustments are stored in a separate map, called the learn map in the ECU. This map has identical breakpoints to the fuel map, but instead of listing pulse width the corrections are listed as multiplication factors between 0 and 2, where 1 is the neutral value.
Learn maps can be downloaded to the PC for analysis and transmitted back to the ECU.

Note – Learn files save with the file extension .LRN.

4.11 TRANSMIT LEARN

Since each version of ECU's uses a different communication protocol, it is important to specify to which ECU you want to transmit the learn map.



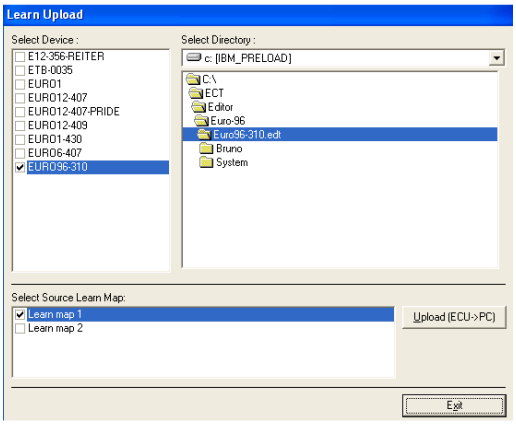
Select the correct type of ECU in the upper left window, **Select Device**.

Next, specify in which data directory the map is located. Make sure the correct directory is highlighted in the upper right corner, **Select Directory**.

The learn maps are listed in the **Select Map** section. Click on the square box to select the desired map.

Click on **TRANSMIT** to transmit the learn map to the ECU.

4.12 RECEIVE FUEL LEARN



Since each version of ECU's uses a different communication protocol, it is important to specify from which ECU you want to receive the map.

Select the correct type of ECU in the upper left window, **Select Device**.

Next, specify the data directory in which you want the map to be located. Make sure the correct directory is highlighted in the upper right corner, **Select Directory**.

In section **Select Source Map** select from which map location you want to download the learn map.

Click **UPLOAD (ECU→PC)** to start receiving the map. When are asked for a file name for the map, you can choose any key combination except **<space>**, **/**, ****, **,** and **..**

You may choose to use the existing file name again, overwriting the existing file.

4.13 LEARN FUNCTIONS

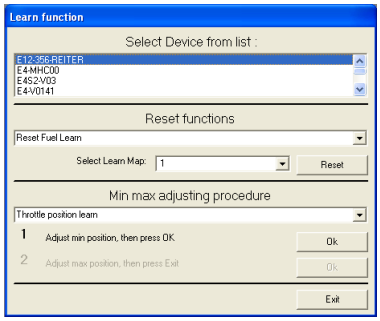
This section gives access to various functions of the learn system.

Since each version of ECU's uses a different communication protocol, it is important to specify with which ECU you want to communicate. Select the correct type of ECU in the upper left window, **Select Device from list**.

4.14 RESET

You can reset the stored corrections within the fuel injection self learn map for all ECU's and stored corrections within the boost pressure map and the ignition map for Euro-6 and Euro-12.

Select which type of reset function you require, and then select which learn map to reset and click OK.



4.15 THROTTLE POSITION CALIBRATION

The **Min max adjusting procedure** is used to calibrate the range of the throttle potentiometer in all ECU's apart from Euro-1's.

You can only use this feature if you have selected the manual throttle calculation method in the ECU Setup Map.

Before you carry out the calibration use the Analogue display screen to check that the raw data of the potentiometer's working range is within the recommended 50 - 1,000 bits value as displayed in the TPSI window.

To adjust the minimum setting, make sure any throttle stop screws are backed off fully.
Click OK adjusting the minimum position. The system will confirm, click OK.
Do not move the throttle valve before you have confirmed the position.

Now open the throttle valve fully and click OK to set the maximum position. The system will confirm, click OK.
Do not move the throttle valve before you have confirmed the position.

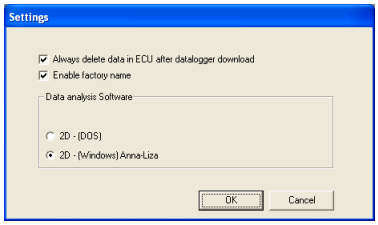
5 LOG INTERFACE

All ECU's but Euro-1 / Euro-2 features an on-board data logger with a memory capacity of 8-16 Mb. It can log any data from any ECU input or data calculated by the ECU. Sampling rates can be selected individually for each channel logged.

An analysis software package is supplied by **2D,** allowing the user to visualise the logged data.

5.1 SETTINGS

To access the data logger options, click on LOG INTERFACE in the ECT Main menu. When the window EFI LOG INTERFACE opens, click MAIN and then SETTINGS.



Select your preferred options, but always select "2D Windows".

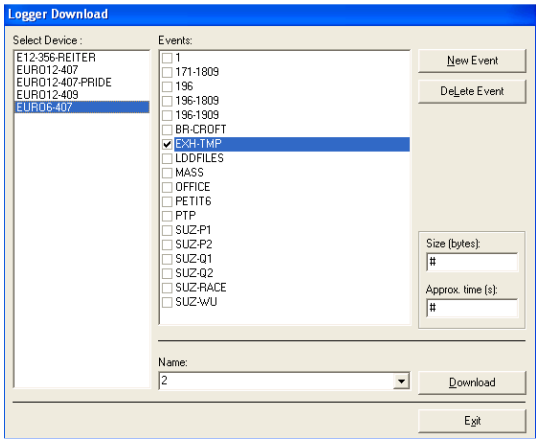
5.2 RECEIVE

Click **DATALOGGER**, and then **RECEIVE**.

Data can be downloaded at a typical rate of 2.5 Mb per minute.

Create a directory by clicking on **NEW EVENT**.

Select the correct type of ECU in section **SELECT DEVICE** and click on the target directory for the data. Then click **DOWNLOAD**.

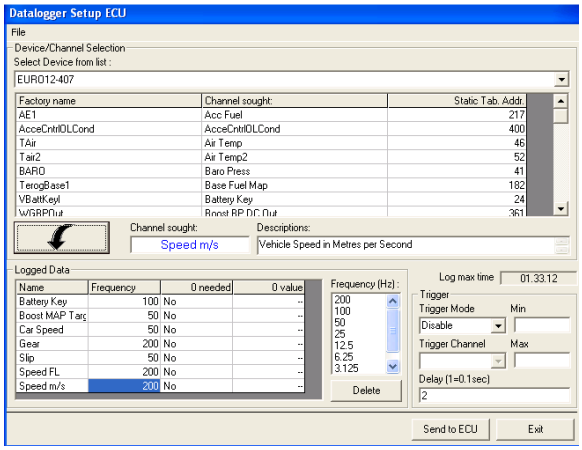


A status window appears showing the amount of bytes downloaded. If you have disabled the automatic deletion of data after downloading in the main ECT LOG INTERFACE **SETTINGS** section, you will now be asked if you want to delete the data in the ECU.

Click **YES** or **NO**.

As soon as the message **Data Download OK** appears and you see the blue bar, you can disconnect from the ECU while ECT writes the data to disk.

5.3 DATALOGGER SETUP



The logger can record data from any ECU channel. You can create a file containing the channels you want to log, either working online or offline with the ECU. In both cases, you must initially specify which version of ECU and firmware you are using.

From the drop down menu in section **SELECT DEVICE** select the right configuration.

If you are working online with the ECU, the logger configuration is downloaded from the ECU and visualised in “Logged Data”.

If your ECU hasn’t previously been configured, a message saying **Cannot Read Logger Setup from ECU** will appear.

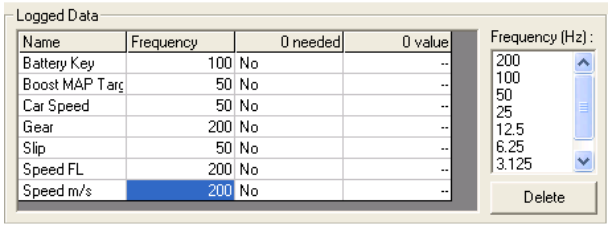
Click on OK to proceed with your configuration.

The window below the ECU selection displays all channels available for the logger. Use the slider to scroll through the channels.

To search for a channel, type the name or part of it in the **Channel sought** window and press Enter.

The channel will appear highlighted in blue and its function appears in Description.

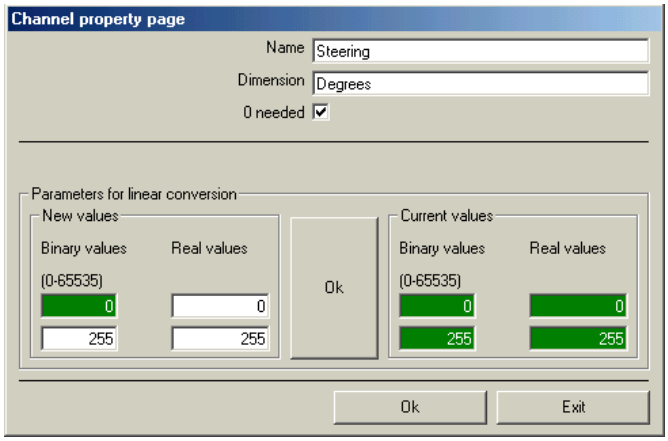
If it is the correct channel, click the arrow icon to add the channel to Logged Data.



By default, ECT proposes the maximum sampling rate specified for each channel. You can alter this by clicking once on the channel, then click on the desired sampling rate displayed in the **FREQUENCY** window.

To delete a channel click on its name shown in **LOGGED DATA** and then click **DELETE**.

Logged channels can be set for a quick reset to **zero value**, i.e. before the car is leaving the pit garage. This way, it is possible to set i.e. lateral G, steering angle, suspension travel etc. to zero.

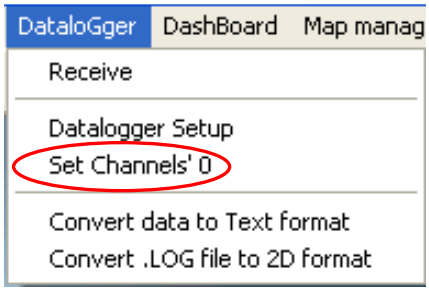


In the Logged Data window, **double click** on the channel you want to configure for resetting and the Channel Property Window opens. Tick the box for **0 needed**.

You can configure the logged channel data independently of the original settings in the database. Enter the requested data values in the **Real values,** window and click the centre OK button.

When completed, click OK to confirm changes and to return to the logger setup screen.

(E.g. the steering might be showing 12° when the whe el is straight, so enter 0)



To set the newly configured channels to 0, select **Set Channels '0' from the datalogger menu** on the main ECT Toolbar**.** Make sure the correct ECU is selected and that the channels are listed.

Click OK to set channel values to 0 and to return to ECT's main screen.

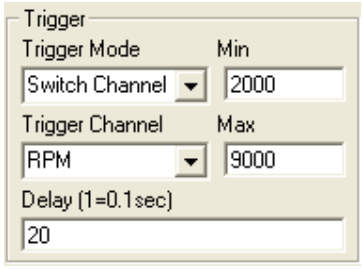
Note

When you **'zero'** a channel the ECU applies an offset to the current settings and recalculates the corrected values in a post processor. This leaves the live channel value unchanged and hence you will see no change in its value on a display screen. The correction is only applied to the existing values during the logger download.

Adding a channel or changing a sampling rate the maximum available logging time is displayed in the window **LOG MAX TIME**. In this example, data can be logged for 11 hours, 39 minutes and 3 seconds. Depending on the settings in the ECU setup map, the recording either stops when the memory is full or the data is cleared and the recording just continues.

When you have selected all the channels you wish to log, you must define how you want to activate the logger.

In **TRIGGER MODE,** you can select between:



- **Disable** Logging switched off
- **Continuous** Logging when ECU is switched ON
- **Ex. Switch** Logging is activated by external switch
- **Switch Channel** Logging when channel thresholds are true

The triggering channel must be one of the logged channels and is most commonly selected as either the engine RPM or the car speed.

In MIN and MAX you specify the activation and de-activation values.
DELAY sets (in 1/10th of a second) the delay for activation and de-activation of the logger.

When you have created a logger setup you can save it to a file.
Click on **FILE**, then **SAVE** and type a file name. Click OK to save the file.
These files are saved in DEVICE*.DEV directory for the ECU used.

To transmit the logger setup to the ECU, click on **Update in ECU**.
When the ECU logger has been programmed, this message appears:

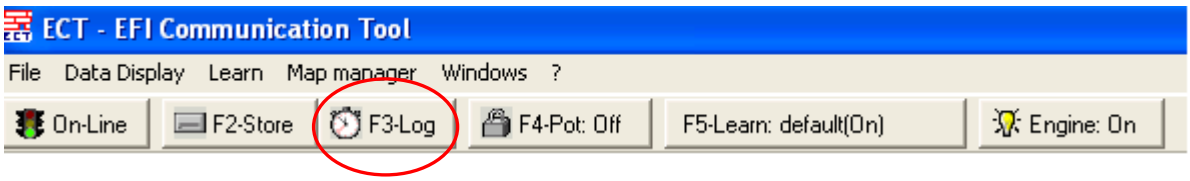
Logger setup successfully updated in ECU.

5.4 CLEARING LOGGER MEMORY

When you transmit a configuration file to the logger, the memory will be cleared.

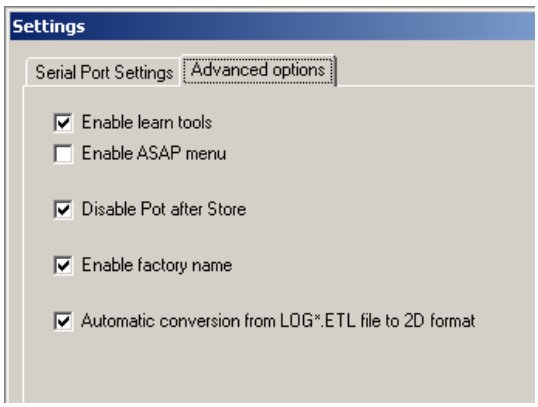
5.5 CONVERT LOGGED DISPLAY DATA TO 2D FORMAT

Data can also be logged directly onto your PC. Working with any display screen, you can store data from all windows on the screen into a file on your PC's hard drive by pressing **F3**.



The information logged to your PC will be stored as a comma-file in your User folder within the main ECT-MOD folder.

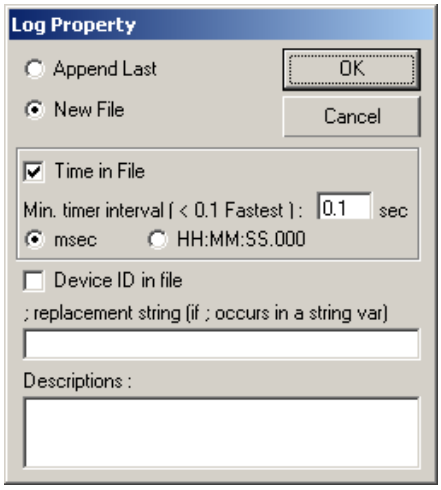
ECT can automatically convert the recorded data to 2D's data format. Recorded data can therefore be visualised using 2D's WinaRace data analysis software.



To enable this feature, click Displays. When the Property Window opens, click on Main, then Settings and finally Advanced Options. Tick the box "Automatic conversion from LOG *.ETL file to 2D format".

Start logging data from the selected display screen by pressing **F3** storing the data to your PC.

In the Log Property window you have the following options:

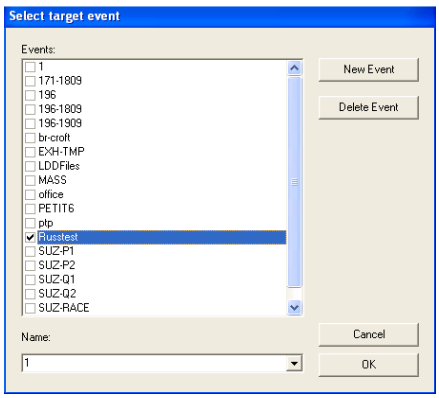


- **Append Last:** Add new log to existing file.
- **New File:** Create a new log file.
- **Time In File:** Add time stamp for each sampling of data.
- **Min timer interval:** Set sampling interval in seconds or specify 0 for fastest possible sampling rate.
- **Device ID in file:** ECU status is included in log file.
- **Description:** Add your comments to this log file.

Press OK start logging data.

Press **F3** again to stop logging data.

Specify a name for the **EVENT**, which will become the subfolder in the \DATA folder where the data is saved to.



Specify a file name for the data at the bottom of the screen.

The log file will automatically convert and you will be asked to specify a time axis channel.

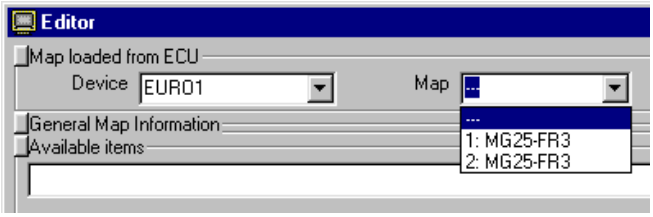
Now select file again and exit

The original comma separated file is still available in the User folder and it can be imported into Excel.

6 WORKING WITH THE EDITOR

6.1 HOW TO LOAD A MAP WORKING ON-LINE WITH THE ECU

Selecting ENGINE MAP gives access to the map containing data for the engine calibration for all our systems.



To load a map working online with the ECU, go to section **Map Loaded from ECU**. If this section is not visible, click the small button to the left of the text.

Click on the arrow in the **DEVICE** window and click on the ECU configuration you are using.

Click on the arrow in the **MAP** window and select the map you want to load.

You can load the map from any of the available locations. You may be prompted for a password, then type the correct password to proceed. If you do not know the password, you cannot access the map.

An engine map consists of 3 files, all with the same name, but different extensions:

- One without extension, containing information about required files to load.
- One with *.NTP extension, a notepad file including your notes about the map.
- One with *.TAB extension, the actual data file.

If the ECT cannot find a file without extension matching the map file or the specified descriptor file, it asks you which descriptor file you want to load. The editor uses the descriptor file to visualise the data from the engine map. The descriptor file is given a unique name identifying it to the type and version of ECU and whether the engine load is throttle based (AN) or pressure based (SD).

Click on the correct version and click OK to load the map.

The engine map descriptor file extension is *.DES. In this case, you may see the message:

The length of the Map does not match with the length specified by the descriptor

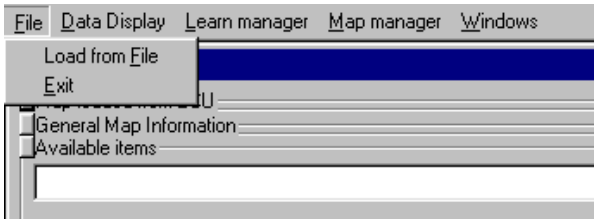
Click **OK** to continue. This message appears due to a difference in the map file size in the ECU and on your PC. Clicking **OK** references the two together and corrects any misalignment.

Selecting **ECU SETUP MAP** gives access to the map containing data configuring the Euro-6 and Euro-12 ECU's to specific engines and their sensors.

IMPORTANT: It is not recommended to alter the ECU setup map online while the engine is running!

Note: Euro 1, Euro 2 and Euro 96 ECU's do not have a separate ECU setup map.

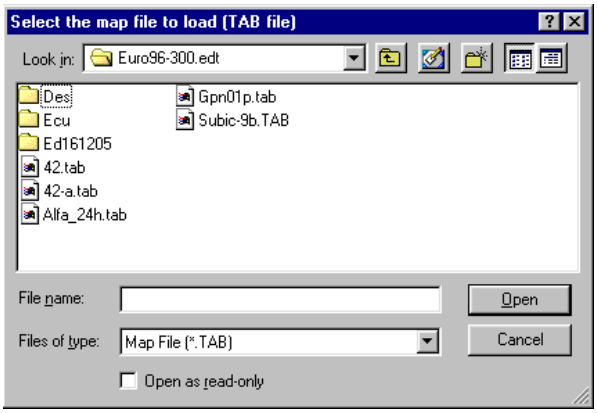
6.2 HOW TO LOAD A MAP WORKING OFF-LINE



Loading a map from your PC, click on **ENGINE MAP** or **ECU SETUP MAP**, then click on **FILE** and finally click on **LOAD FROM FILE**.

Make sure the window **LOOK IN** displays the data directory related to the ECU in use. Click on the map and click **OPEN**.

A map consists of 3 files, all with the same name, but different extensions:



- One without extension, containing information about required descriptor file, commentary file, notepad file and data file
- One with *.NTP extension, a notepad file in which you can include information about the engine, sensors etc.
- One with *.TAB extension, the actual data file.

If the ECT cannot find the file without extension or the specified descriptor file, it asks you which descriptor file you want to load. The editor uses the descriptor file to visualise the data from the engine map. The descriptor file is given a unique name identifying it to the type and version of ECU and whether the engine load is throttle based (AN) or pressure based (SD) or if it is a setup file. **

Click on the correct version and click OK to load the map. The engine map descriptor file extension is *.DES and the setup map file extension is *.CDS.

In this case you may see the message:

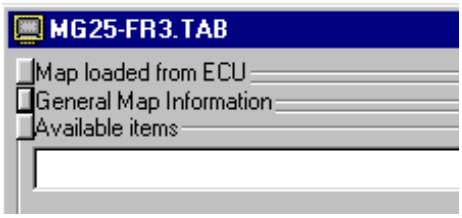
The length of the Map does not match with the length specified by the descriptor

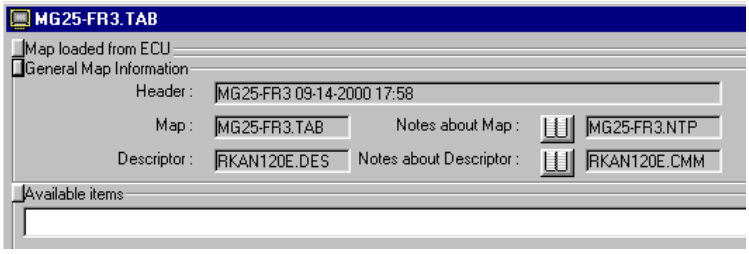
Click **OK** to continue.

****Note:** If you are unsure whether the engine has been mapped under throttle load, (referring to an AN type descriptor file) or pressure based (referring to a SD type descriptor file) then check under the **SYSTEM SETUP** item in the main engine map options.

6.3 GENERAL MAP INFORMATION

Once a map is loaded, its name appears in the upper left corner of the editor window.
You can get more information about the map by opening the section GENERAL MAP INFORMATION.
This section might be minimised, but a click on the button to the left of the text opens the section.



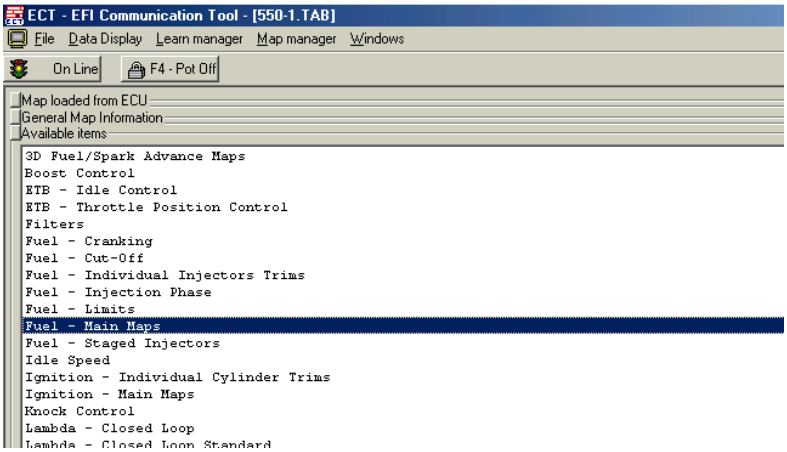


In **Header** you can see the date and time the map file was created. The actual map file name is displayed in **Map** and the descriptor file in **Descriptor**.

If you click the button next to **Notes about Map,** you open a notepad file, which is linked to the map file. You can use this file to list information i.e. about the engine, sensors etc. This file is not transmitted to the ECU, but remains on your hard disk. The notepad file is very useful for keeping track of changes you make to the map as you go along.

If you click the button next to **Notes about Descriptor,** you open a notepad file, which is linked to the system descriptor. You can use this file to list general information about the system, the software release, the mapping procedure etc.
In both cases remember to save the changes you have made to the notepad file and then close it down.

6.4 AVAILABLE ITEMS



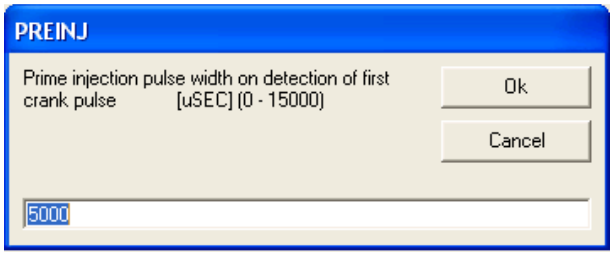
Data in the map file is divided into various groups relevant to their function. You can scroll though the groups with the arrow keys or mouse. When you see the group you were searching for, click on it and press Enter – or double-click it to display its content.

You can use a speed-search, too. Type the first letter or two of a group, i.e. FU for FUEL. The cursor jumps to this group. Press Enter or double click to display its content.

Use the TAB key to move the cursor to the contents of the group or click on the parameter with your mouse.

The items available in the group are constants; calibration tables (1 dimensional arrays) and maps (2 dimensional arrays). To open a table or alter a setting press ENTER. To exit, press Esc.

6.5 MODIFY A CONSTANT



To change the value of a constant, double-click on the text line to open its property window.

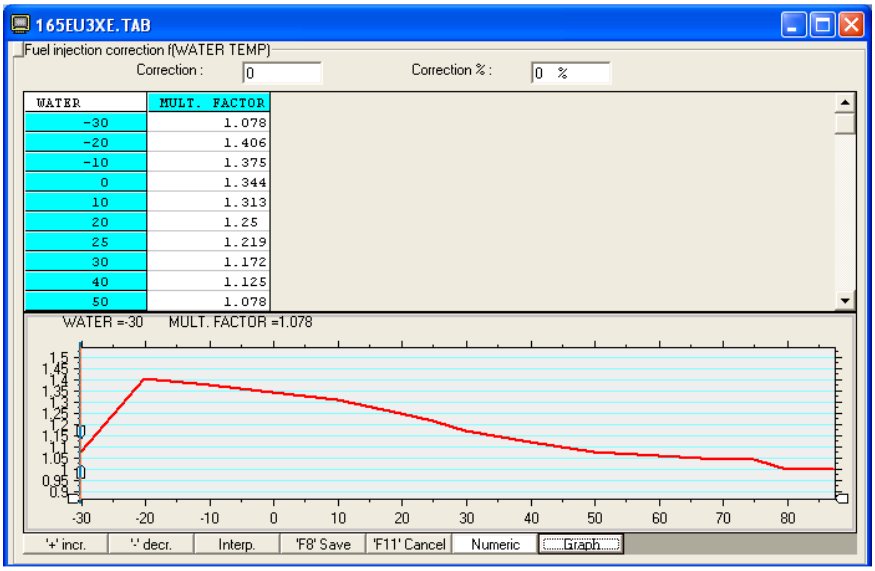
Its current value is highlighted in blue. When you start to type a new value, the old is deleted.

Press Enter to confirm the change.

If you are working online with the ECU, the new value is stored within the ECU.

6.6 MODIFY A CALIBRATION TABLE (1-DIMENSIONAL)

A calibration table links values of a sensor or a calculated parameter with a variable output, which can be i.e. an offset or a multiplication factor.



Click on the text line of the calibration table to display its data for a particular reference point. The values are then displayed above and to the left of the table/graph.

If you are working online, an animated cursor displays the current load condition.

6.7 CHANGE THE VALUE OF ONE CELL

Move the cursor to the cell, which value you want to alter:

- Press Enter to open the property window. Type a new value. Press Enter to confirm.

or

- Use the **+** to increase or **-** keys to decrease the cell value.

or

- Type an offset value, positive or negative, in the window **CORRECTION**. Press Enter to confirm.

or

- Type a percentage correction, positive or negative, in the Window **CORRECTION %**. Press Enter to confirm.

When a cell's value is changed, the background colour changes to red to indicate that a new value has been entered. To cancel all changes, press **F11**. If you want to store this value in your map, press **F8**.

By pressing F8 this sends the information to the ECU or stores it in the map on your computer. The changes however are not saved on your computer hard drive until you save the map.

Remember to give the altered map a new name if you wish to keep the original.

6.8 CHANGING THE VALUE OF SEVERAL CELLS

Click the first cell to mark it, hold the left mouse button, drag the cursor to the end, and then release the button. All marked cells then turn blue.

When multiple cells are marked, you must use the "**%**" key or click the %Abs% tab below the table/graph to select either an absolute correction or percentage correction.

- Press Enter to open the property window. Type a new value, which will be applied on all marked cells. Press Enter to confirm.

or

- Use the keyboard or display buttons **+** to increase or **-** to decrease the cell values.

or

- Type an offset value, positive or negative, in the window **CORRECTION**. Press Enter to confirm.

or

- Type a percentage correction, positive or negative, in the Window **CORRECTION %**. Press Enter to confirm.

When a cell's value is changed, the background colour changes to red to indicate a new value. To cancel all changes, press **F11**.

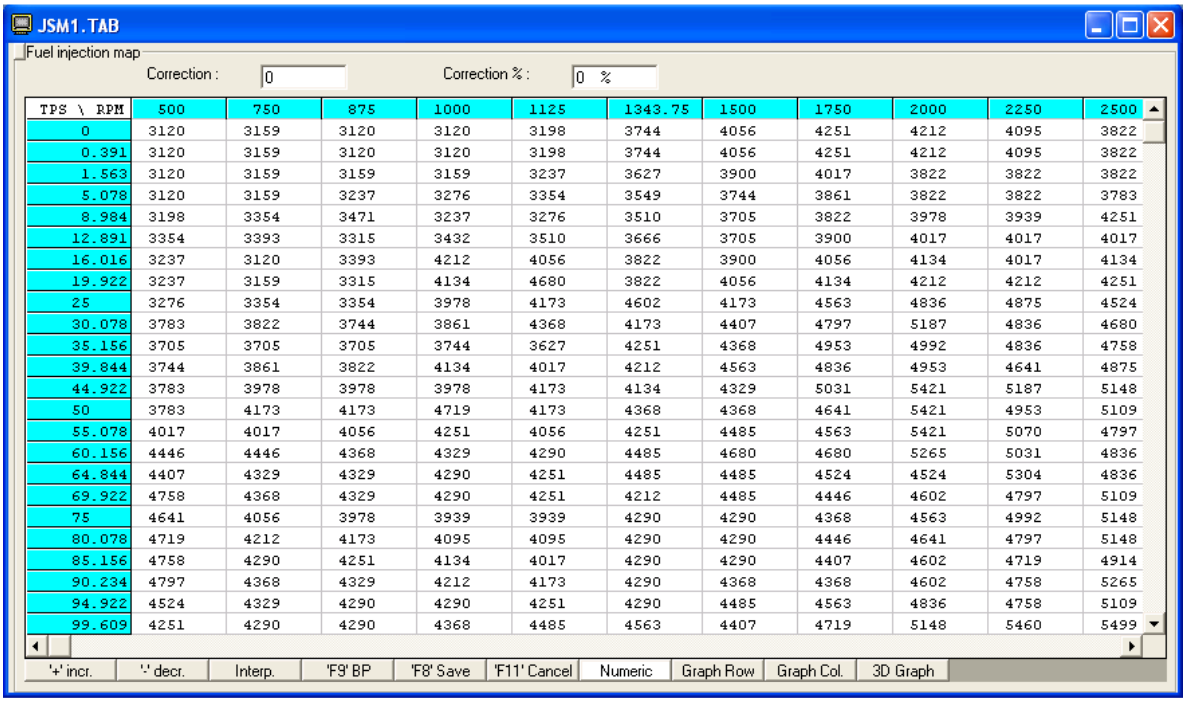
If you want to store this value in your map, remember to press **F8**. This sends the information to the ECU and stores it in the map on your computer. The changes however are not saved on your computer until you save the map.

Remember to give the altered map a new name if you wish to keep the original.

6.9 MODIFY A MAP

A map links values of two measured channels to a calculated parameter with a variable output, which can be i.e. injection pulse width, spark advance degrees, solenoid valve duty cycles, offsets or multiplication factors.

Double-click on the text line of the map to display its data table.
If you are working online, an animated cursor displays the current load condition.



TPS \ RPM	500	750	875	1000	1125	1343.75	1500	1750	2000	2250	2500
0	3120	3159	3120	3120	3198	3744	4056	4251	4212	4095	3822
0.391	3120	3159	3120	3120	3198	3744	4056	4251	4212	4095	3822
1.563	3120	3159	3159	3159	3237	3627	3900	4017	3822	3822	3822
5.078	3120	3159	3237	3276	3354	3549	3744	3861	3822	3822	3783
8.984	3198	3354	3471	3237	3276	3510	3705	3822	3978	3939	4251
12.891	3354	3393	3315	3432	3510	3666	3705	3900	4017	4017	4017
16.016	3237	3120	3393	4212	4056	3822	3900	4056	4134	4017	4134
19.922	3237	3159	3315	4134	4680	3822	4056	4134	4212	4212	4251
25	3276	3354	3354	3978	4173	4602	4173	4563	4836	4875	4524
30.078	3783	3822	3744	3861	4368	4173	4407	4797	5187	4836	4680
35.156	3705	3705	3705	3744	3627	4251	4368	4953	4992	4836	4758
39.844	3744	3861	3822	4134	4017	4212	4563	4836	4953	4641	4875
44.922	3783	3978	3978	3978	4173	4134	4329	5031	5421	5187	5148
50	3783	4173	4173	4719	4173	4368	4368	4641	5421	4953	5109
55.078	4017	4017	4056	4251	4056	4251	4485	4563	5421	5070	4797
60.156	4446	4446	4368	4329	4290	4485	4680	4680	5265	5031	4836
64.844	4407	4329	4329	4290	4251	4485	4485	4524	4524	5304	4836
69.922	4758	4368	4329	4290	4251	4212	4485	4446	4602	4797	5109
75	4641	4056	3978	3939	3939	4290	4290	4368	4563	4992	5148
80.078	4719	4212	4173	4095	4095	4290	4290	4446	4641	4797	5148
85.156	4758	4290	4251	4134	4017	4290	4290	4407	4602	4719	4914
90.234	4797	4368	4329	4212	4173	4290	4368	4368	4602	4758	5265
94.922	4524	4329	4290	4290	4251	4290	4485	4563	4836	4758	5109
99.609	4251	4290	4290	4368	4485	4563	4407	4719	5148	5460	5499

You can toggle the cursor ON and OFF by clicking the button **F12 ANIMATION**.

6.10 CHANGE THE VALUE OF ONE CELL

Move the cursor to the cell, which value you want to alter:

- Press Enter to open the property window. Type a new value. Press Enter to confirm.

or

- Use the **+** to increase or **-** keys to decrease the cell value.

or

- Type an offset value, positive or negative, in the window **CORRECTION**. Press Enter to confirm.

or

- Type a percentage correction, positive or negative, in the Window **CORRECTION %**. Press Enter to confirm.

When a cell's value is changed, the background colour changes to red to indicate a new value. To cancel all changes, press **F11**.

If you want to store this value in your map, press **F8**. The changes however are not saved on your computer until you save the map.

Remember to give the altered map a new name if you wish to keep the original.

6.11 CHANGE THE VALUE OF SEVERAL CELLS

Click the first cell to mark it, hold the left mouse button, drag the cursor to the end, and then release the button. All marked cells turn blue.
When multiple cells are marked, you must use **F12** to select either absolute or percentage correction.

Press Enter to open the property window. Type a new value, which will be applied on all marked cells. Press Enter to confirm.

- Use the keyboard or display buttons **+** to increase or **-** to decrease the cell values.

or

- Type an offset value, positive or negative, in the window **CORRECTION**. Press Enter to confirm.

or

- Type a percentage correction, positive or negative, in the Window **CORRECTION %**. Press Enter to confirm.

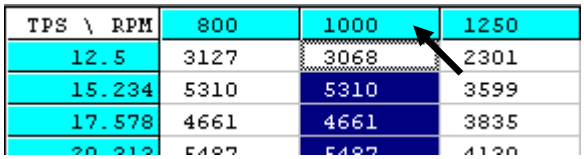
When a cell's value is changed, the background colour changes to red to indicate a new value. To cancel all changes, press **F11**.

If you want to store this value in your map, press **F8**. The changes however are not saved on your computer until you save the map.

Remember to give the altered map a new name if you wish to keep the original.

6.12 CHANGE THE VALUE OF ALL CELLS IN A COLUMN

Click the breakpoint cell on top of the column to mark all cells in the column. All cells turn blue.
When all cells are marked, you must use **%**-key to select either an absolute or a percentage correction.



- Press Enter to open the property window. Type a new value, which will be applied on all cells. Press Enter to confirm.

or

- Use the keyboard or display buttons **+** to increase or **-** to decrease the cell values.

or

- Type an offset value, positive or negative, in the window **CORRECTION**. Press Enter to confirm.

or

- Type a percentage correction, positive or negative, in the Window **CORRECTION %**. Press Enter to confirm.

When a cell's value is changed, the background colour changes to red to indicate a new value.
To cancel all changes, press **F11**

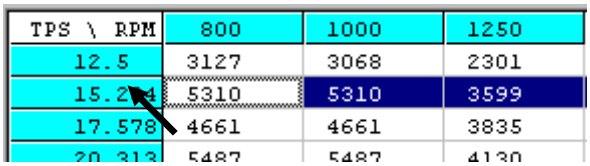
If you want to store this value in your map, press **F8**. The changes however are not saved on your computer until you save the map.

Remember to give the altered map a new name if you wish to keep the original.

.

6.13 CHANGE THE VALUE OF ALL CELLS IN A ROW

Click the breakpoint cell to the left of the row to mark all cells in the row. All cells turn blue.
When all cells are marked, you must use **%**-key to select either an absolute or a percentage correction.



- Press Enter to open the property window. Type a new value, which will be applied on all cells. Press Enter to confirm.

or

- Use the keyboard or display buttons **+** to increase or **-** to decrease the cell values.

or

- Type an offset value, positive or negative, in the window **CORRECTION**. Press Enter to confirm.

or

- Type a percentage correction, positive or negative, in the Window **CORRECTION %**. Press Enter to confirm.

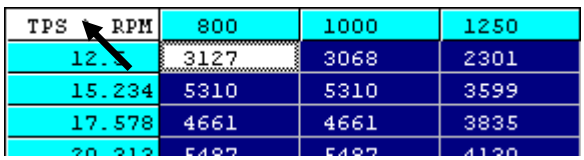
When a cell's value is changed, the background colour changes to red to indicate a new value. To cancel all changes, press **F11**.

If you want to store this value in your map, press **F8**. The changes however are not saved on your computer until you save the map.

Remember to give the altered map a new name if you wish to keep the original.

6.14 CHANGE THE VALUE OF ALL CELLS IN THE MAP

Click the text cell in the **upper left** corner of the map to mark all cells. All cells turn blue.
When all cells are marked, you must use **%**-key to select either an absolute or a percentage correction.



- Press Enter to open the property window. Type a new value, which will be applied on all cells. Press Enter to confirm.

or

- Use the **+** to increase or **-** keys to decrease all cell values.

or

- Type an offset value, positive or negative, in the window **CORRECTION**. Press Enter to confirm.

or

- Type a percentage correction, positive or negative, in the Window **CORRECTION %**. Press Enter to confirm.

When a cell's value is changed, the background colour changes to red to indicate a new value. To cancel all changes, press **F11**.

If you want to store this value in your map, press **F8**. The changes however are not saved on your computer until you save the map.

Remember to give the altered map a new name if you wish to keep the original.

6.15 CHANGING THE VALUE OF A BREAKPOINT

A **breakpoint** is the name given to the **"points"** used to map over a range of values, e.g. 800 , 1000, 1250 are RPM breakpoints and 12.5, 15.234, 17,578 are throttle position breakpoints (the engine load).

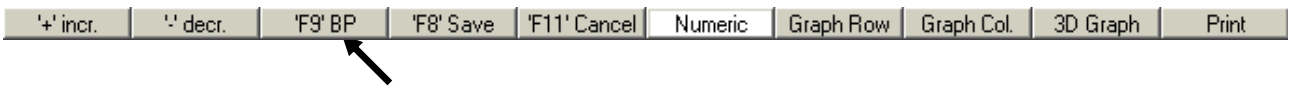
TPS \ RPM	800	1000	1250
12.5	3127	3068	2301
15.234	5310	5310	3599
17.578	4661	4661	3835

The value of breakpoints available in tables and maps are individually configurable.

Press the **F9** key or click the **'F9' BP** tab to activate the breakpoint editor.

Breakpoint values are modified similarly to cell changes as previously described. E.g. + or -.

When you are happy with your breakpoints click **F9** again to close the breakpoint editor.



6.16 CONFIRM CHANGES

If you have changed values of one or more cells, the background colour changes to red.

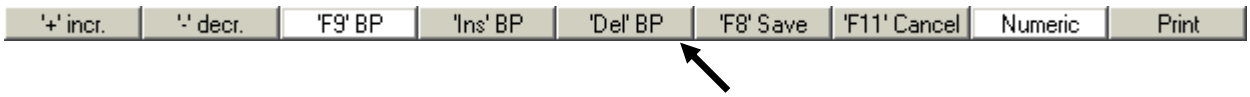
Press **F11** to discard changes. Press **F8** to save the changes.

Working online, the ECU will immediately run on the new data as soon as pressing **F8** has saved the data changes.

6.17 DELETE AND INSERT BREAKPOINTS

It is possible to delete breakpoints and re-insert breakpoints in a new location. When inserting a breakpoint in a new location, the values of the cells are interpolated in accordance with the surrounding cells.

Click **F9** to activate the breakpoint editor. The layout of the button bar changes to:



Click on '**Del' BP** to remove one or more break points from the map.

If you want to re-insert the deleted break points, click on '**Ins' BP**. Type the value of the new breakpoint in the property window and press Enter. The system uses linear interpolation when inserting new breakpoints.

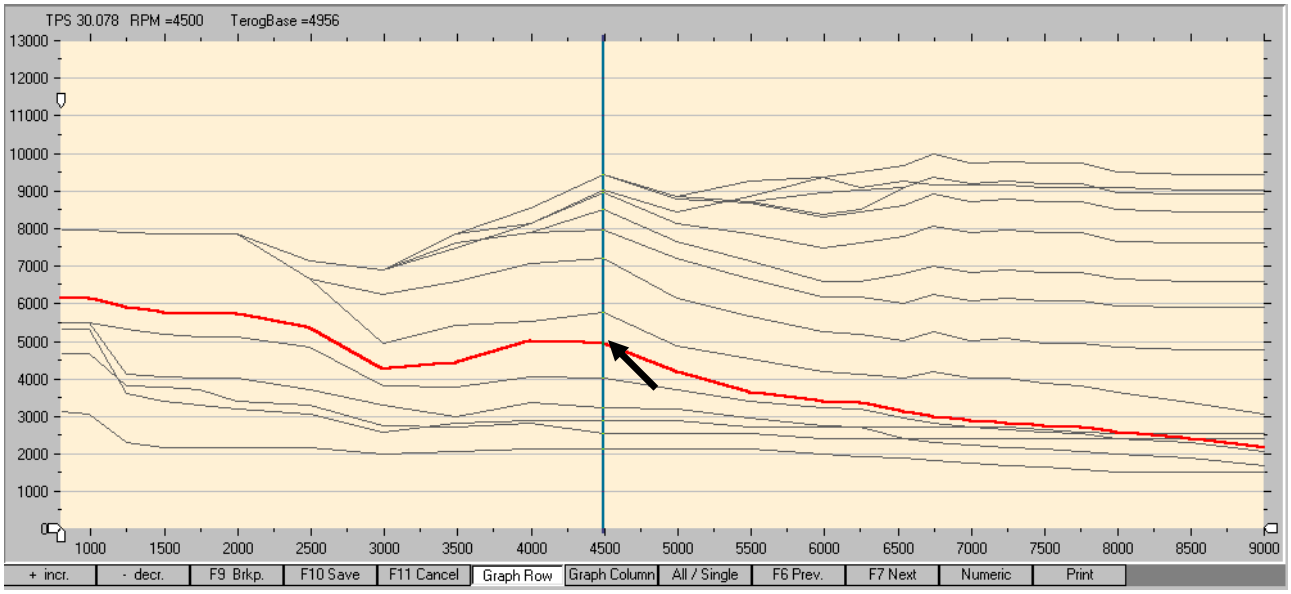
Click **or** press **F11** to discard changes or **F8** to save the changes

Click **F9** to close the breakpoint editor.

6.18 GRAPHIC DISPLAY

You can display the numerical data in a graphic view by clicking the **GRAPH** button. You can increase the size of the graphic display area by closing the numerical display with a click on the **NUMERIC** button.

Map data can be visualised in a 2-dimension graphic layout, expressing the map variable as a function of the breakpoints, expressed either by the column or row values.



Click on **GRAPH ROW** or **GRAPH COLUMN** to make your selection.

To view the data in a 3-dimensional mode, click **3D GRAPH**.

The values of the actual map breakpoint is visualised in the upper left corner of the graphic display.

It is possible to modify the map in graphic mode, too. Use the **F6** and **F7** keys or the **UP** and **DOWN** arrows keys to move from line to line and click on the graph to select a breakpoint. The point at which the marked line and blue breakpoint line cross indicates the cell being modified. The X & Y values of this point are displayed above and to the left of the graph/table.

- Use the keyboard or display buttons **+** to increase or **-** to decrease the cell values.

or

- Type an offset value, positive or negative, in the window **CORRECTION**. Press Enter to confirm.

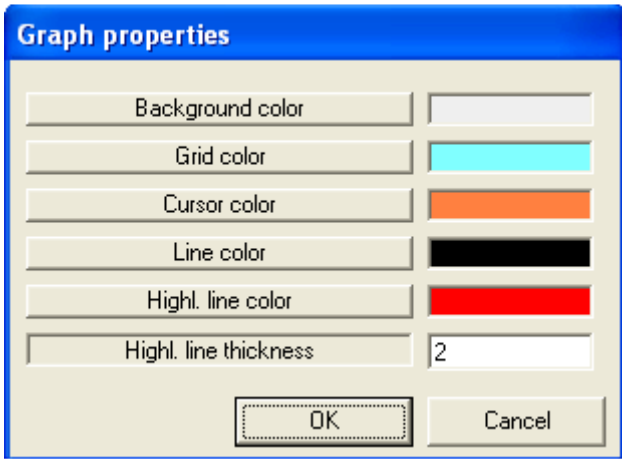
or

- Type a percentage correction, positive or negative, in the Window **CORRECTION %**. Press Enter to confirm.

Click **F11** to discard changes or **F8** to save the changes.

6.19 GRAPHIC DISPLAY PROPERTY

Double-click on either the horizontal or the vertical breakpoints to bring up the graphic display property window. You can personalise the layout of the display by modifying:

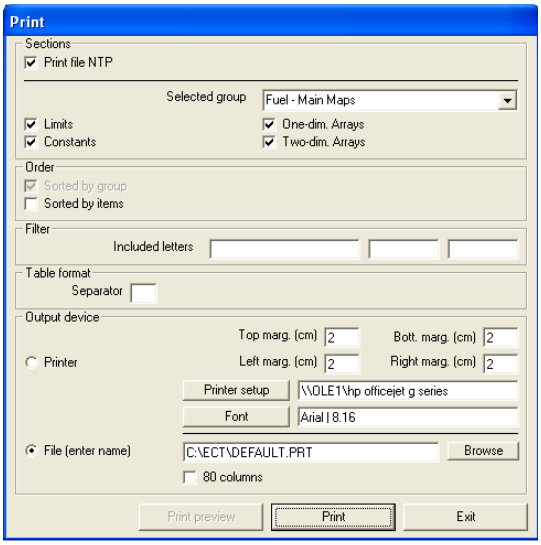


- Background colour
- Grid colour
- Cursor colour
- Line colour
- Highlighted line colour
- Highlighted line thickness

Click the button with the function required and select the desired colour. Click **OK** to confirm.

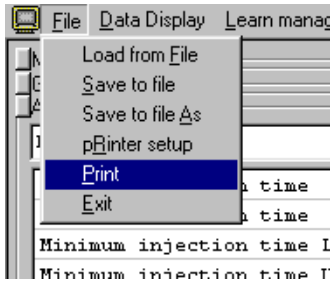
7 PRINT

To print the contents of a map, click on **FILE** and then click on **PRINT**. The print function allows map details to be printed directly or imported to a file see **Output device**. You are also given the option of what you wish to print. To print the complete map, select all the boxes i.e. Click on **LIMITS**, **CONSTANTS**, 1-**DIMENSIONAL ARRAYS** (calibration tables),



2-DIMENSIONAL ARRAYS (maps) and select all groups from the **group** drop down menu.

To select just a portion of the map select just the sections you want, e.g. 2 dimensional maps in the fuel injection group. You can also type phrases to specify which parameters to include when printing. Data not matching any words will not be printed.

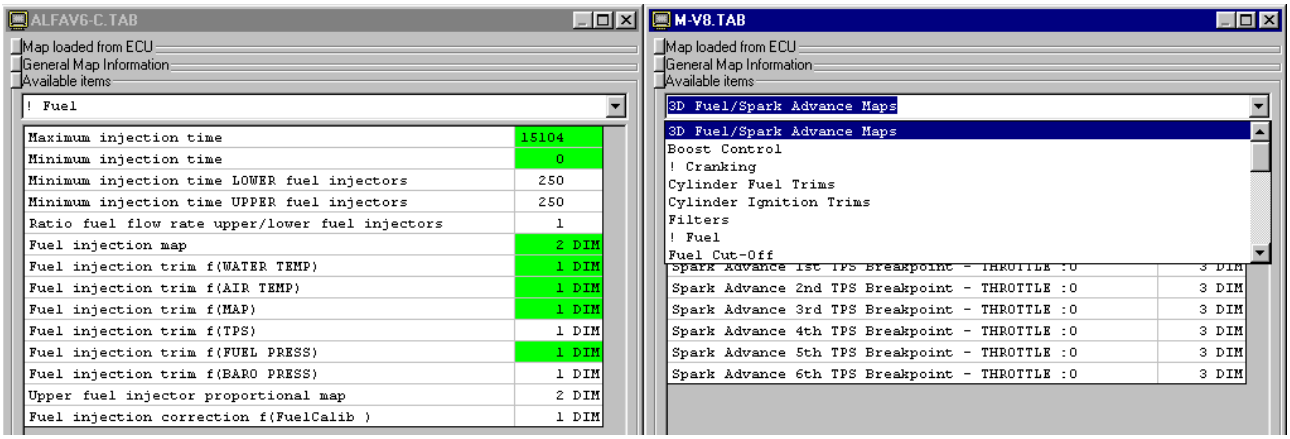


The data can be sorted either by type of data (limit, constant, calibration table or map) or listed according to the individual groups.
To include the notepad file (SECTION 6.3) used to give extra map details tick the select file NTP option.

Further options include **Printer Setup** and **Font**.

8 COMPARE MAPS

You can compare the contents of two maps from your PC.
Open the editor and load the first of the two maps to compare.
When loaded click on **MAP MANAGER,** and then **FILE** and **LOAD FROM FILE** and load the second map. Now click **WINDOWS** and then **TILE - VERTICAL**.



Now look into the groups listed in **AVAILABLE ITEMS**. Any group starting with an exclamation mark **"!"** indicates differences between the two maps.
Opening the group, any constant, calibration table or map marked in green will be different between the two maps.

To see the differences between i.e. the two fuel maps, open the fuel map in both maps. The coloured cells indicate that values differ between the two maps.

While online, you can compare maps in the ECU with maps on your PC's hard disk.

8.1 COPY AND INSERT DATA

You can copy parts of a map or complete maps and paste the data into the same map or different maps and documents, spreadsheets etc.

Mark the map cells to copy by clicking on the first breakpoint, hold the left mouse-button down and drag the cursor to the last breakpoint to copy.

Press **CTRL+C** to copy the data.

Now mark the other part of the map where you want to copy the data to. (Make sure you highlight the same number of cells in the map you are copying to).

Press **CTRL+V** to paste the data.

Click or press **F8** to save the changes or **F11** to discard changes.

You can copy the data to another engine map, too. Load the map and mark the map cells in the new map to be replaced by the new data.

Press **CTRL+V** to paste the new data.

Click or press **F8** to save the changes or **F11** to discard changes.

If you have to copy complete sections from one map to another, it is possible to export whole calibration tables and maps by the click of a single button.

From the main menu, open the map editor and load a map from either the ECU or your PC's hard disk.

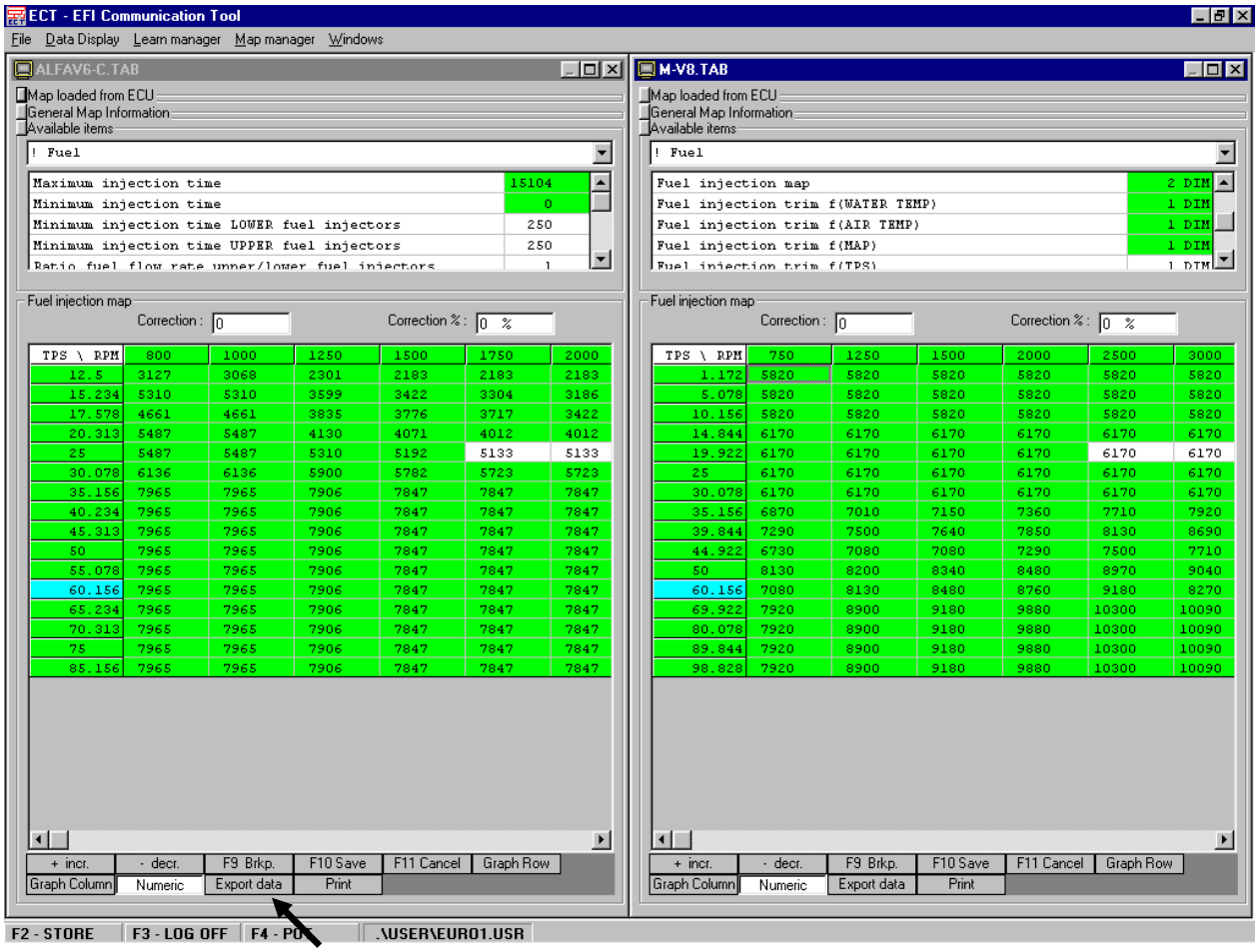
Open the editor once again and load a second map. Click on **WINDOWS** and click on **TILE - VERTICAL**. Now go to the group from which you want to export data and open the calibration table or the map.

Repeat for the procedure for the second map.

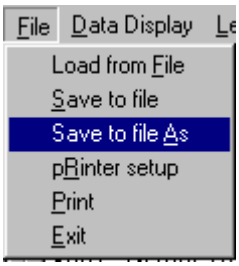
When you see the same map in both the left and right side of the screen e.g. Fuel injection map, click the **EXPORT or EXP. Data** tabs on the map **from** which you want to export the data.

The complete map, including breakpoints, is now being copied to the other map. All copied values if different from the imported map are highlighted in red.

To undo or discard changes select the map which has imported data and click or press **F11**. To then save changes click or press **F8**.



8.2 SAVE CHANGES



When you work online with the ECU, all changes to the map are stored in the ECU each time you press **F8**.

You can save the map, while it is loaded in the editor, on your PC's hard disk. Click on **FILE** and then **SAVE TO FILE AS**.

If you type a name of an existing file, you will be asked to confirm overwriting the old file.

If you are working offline, you can save the file whenever you want to.

Click **FILE**, then **SAVE TO FILE** to overwrite the existing file or **SAVE TO FILE AS** to create a new file.

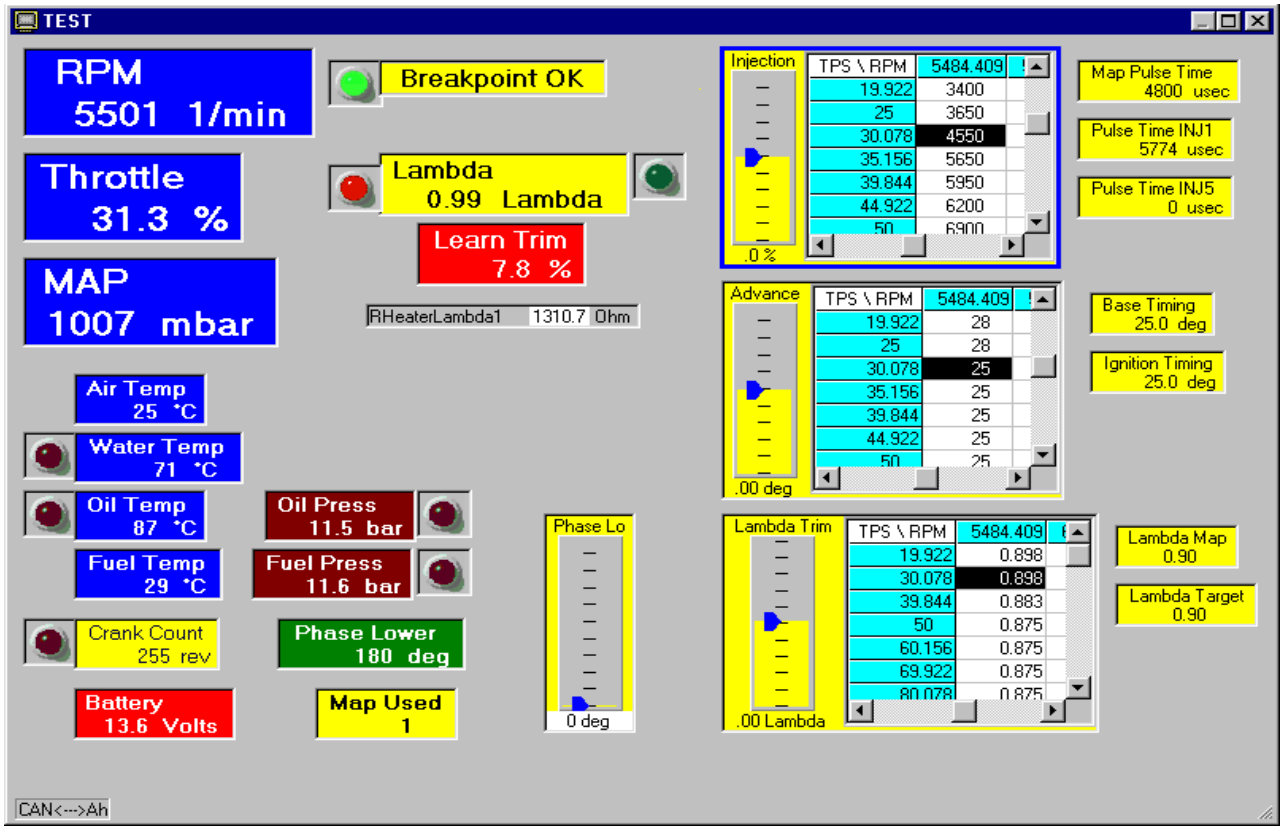
9 WORKING WITH THE DISPLAY MANAGER

9.1 DISPLAYING ENGINE DATA

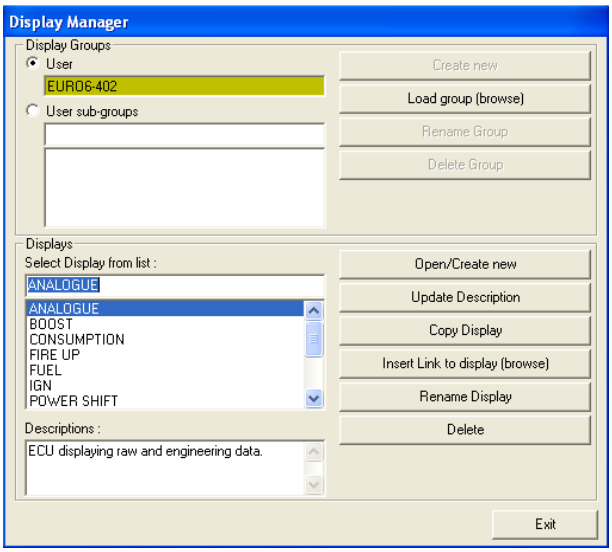
You can work online with the ECU map manager and simultaneous display engine data on a customised display screen. We supply several preconfigured display screens with the ECT software and you can easily design a new display screen to suit your needs.

These screens can, apart from displaying any measured or calculated engine parameter, also include LED's (used as warning lights) and potentiometers.

Potentiometers are intended to be an aid during the engine mapping. They express variables, such as injection trim, spark advance offset, boost pressure, lambda target etc.



9.2 DISPLAY MANAGER



Display screens can be created from a blank screen or easily adapted from existing layouts.
It is possible to copy existing layout's, rename layout's, delete layout's and create display pages by combining different display layout's on one single page.

Click on Data Display and select Display Manager.

9.3 CREATE DISPLAY GROUP

You can show several displays together on a single display page.
To create a new layout, click on **Profile sub-groups** in the **Display Groups** section.

Type a name of the new display page you want to create and then click **Create New**.

To allocate existing display layouts for the new display page, click **Insert Link to display (browse)**.

Search for the first display database file (located in **USER** directory), you want to allocate.

A database file is located in the .WIN directory for each display layout.

Click on the file name and then click Open. The display is now added to the display page.

To add additional pages, proceed by clicking **Insert Link** again and search for files.

9.4 COPY DISPLAY GROUP

You can copy an existing display group by clicking on **Load Group**.

Select the display group you want to copy and click **OK**.

Type the name of the copied display group and confirm by clicking on **OK**.

9.5 CREATE NEW DISPLAY

Load the Display Manager. The first available display layout is highlighted in section Displays.
To open this display, click **Open/Create New**.

To create a new display layout from scratch, type a **new** name in **Select Display from List**, overwriting the proposed existing layout.

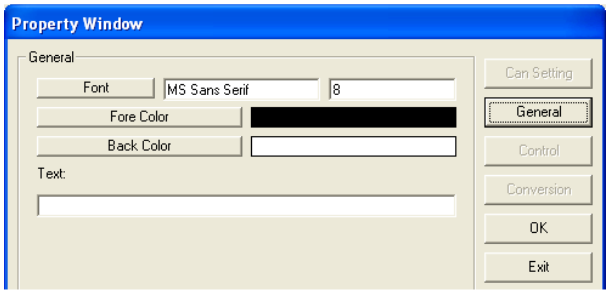
Then click **Open/Create New**. You will be asked to confirm the creation of the new layout.
Click **OK** to confirm and to open it.

9.6 EDIT A DISPLAY SCREEN

Click your right mouse button and select **ENABLE EDIT MODE** or Double click in any unused area of the display window to enable editing of your data display. The grey background should now feature a dotted grid pattern. Click you right mouse button again for editing options.

9.7 ADDING TEXT

Click on **TEXT** and type the text, as you want it to appear on the screen.
Click on **FORE COLOUR** to change the colour of the text.
Click on **BACK COLOUR** to change the background colour.

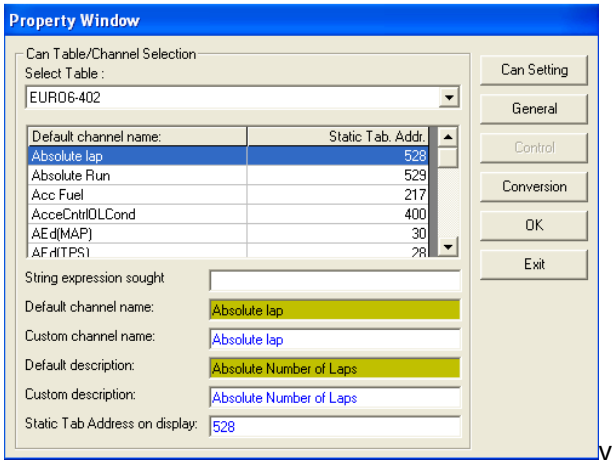


Click on **FONT** to change font, style and size.

Click on **OK** to confirm.

Click **EXIT** to cancel all changes. To remove a text box, simply right click and select **DELETE** whilst in **EDIT MODE**.

9.8 ADD CHANNEL

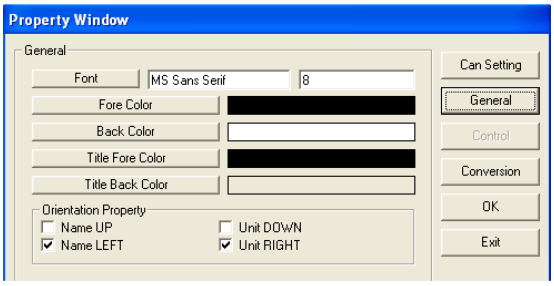


Since each version of ECU's uses a different communication protocol, it is important to specify from which ECU you want to display data.

Click on the arrow in **SELECT TABLE** to select the ECU type and version you are using.

Scroll through the available channels in search of your desired channel.

To ease the search, type the name of the channel you are looking for in **CHANNEL** and press Enter. To select the channel, click on it when it appears.



Click on **GENERAL** to change the text and background colour, font, style and size.

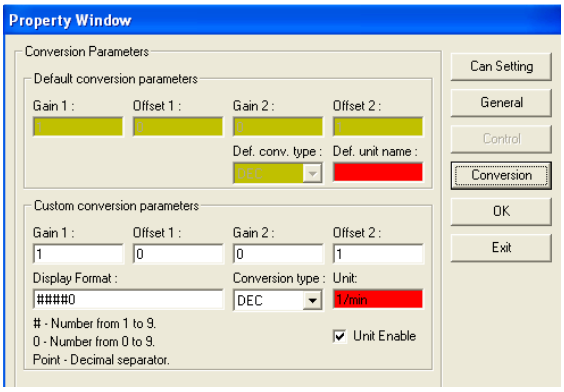
Click **NAME UP** if you want the channel name on top of the data.

Click **NAME LEFT** if you want the name to the left of the data.

Click **UNIT DOWN** if you want the channel unit on top of the data.

Click **UNIT RIGHT** if you want the unit to the right of the data.

Click **CONVERSION** to access the channel data configuration.



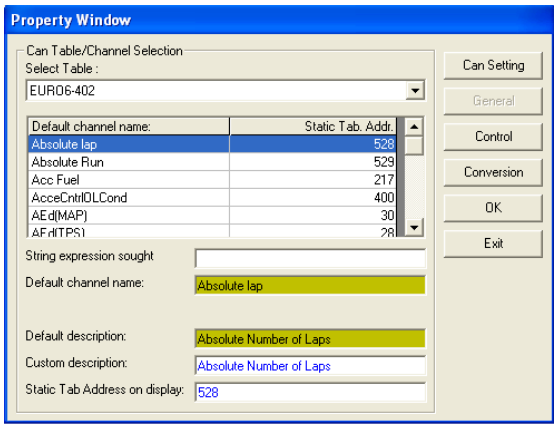
Click **UNIT ENABLE** to enable or disable the channel engineering unit.

DISPLAY FORMAT changes the number of digits before and after the decimal point.

IMPORTANT: Do NOT alter any other data in this section without consulting us first!

Click **OK** to add this new channel to your display screen.

9.9 ADD LED



Since each version of ECU's uses a different communication protocol, it is important to specify from which ECU you want to display data.

Click on the arrow in **SELECT TABLE** to select the ECU type and version you are using.

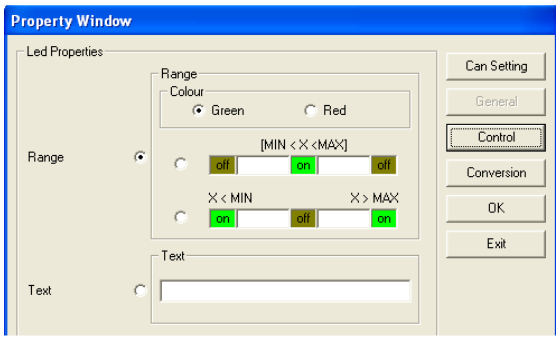
Scroll through the available channels in search of your desired channel.

To ease the search, type the name of the channel you are looking for in **CHANNEL** and press Enter. To select the channel, click on it when it appears.

Click on **CONTROL** to access the LED configuration.

Click on either **GREEN** or **RED** to select the colour of the LED.

Click to select the strategy for the LED.



Click **CONVERSION** to access the channel data configuration.

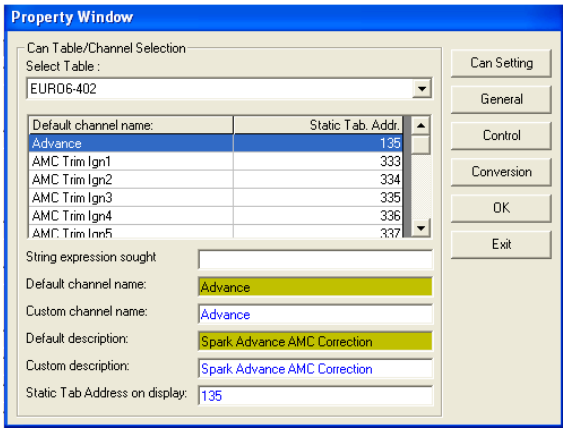
Click **UNIT ENABLE** to enable or disable the channel engineering unit.

DISPLAY FORMAT changes the number of digits before and after the decimal point.

IMPORTANT: Do NOT alter any other data in this section without consulting us first!

Click **OK** to add this new LED to your display screen.

9.10 ADD POTENTIOMETER

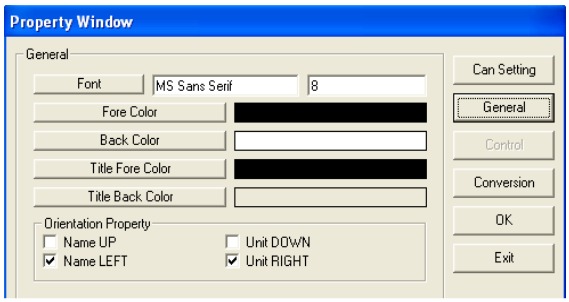


Since each version of ECU's uses a different communication protocol, it is important to specify from which ECU you want to display data.

Click on the arrow in **SELECT TABLE** to select the ECU type and version you are using.

Scroll through the available channels in search of your desired potentiometer.

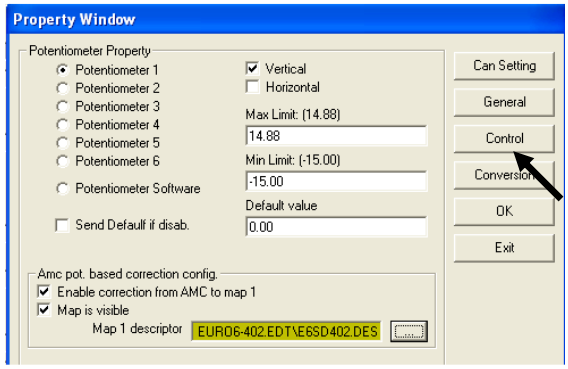
To ease the search, type the name of the channel you are looking for in **CHANNEL** and press Enter. To select the potentiometer, click on it when it appears.



Click on **GENERAL** to change the text and background colour, font, style and size.
Click **NAME UP** if you want the channel name on top of the data.
Click **NAME LEFT** if you want the name to the left of the data. Not recommended for a potentiometer.

Click **UNIT DOWN** if you want the channel unit on top of the data.
Click **UNIT RIGHT** if you want the unit to the right of the data. Not recommended for a potentiometer.

Click **CONTROL** to access the potentiometer property.
You can assign any selected potentiometer to any of the 6 potentiometers available on the Active Mapping Controller (AMC). Its potentiometers are numbered from left to right, starting with the left large main potentiometer as # 1, the right large main potentiometer as # 2. The minor 4 potentiometers are numbered # 3…6.
Click on the desired AMC potentiometer or click **POTENTIOMETER SOFTWARE** to disable the AMC and switch to a keyboard-operated potentiometer.



AMC Controller

In this case you can use the mouse to operate the slider or **PgUp** and **PgDn** keys.

Click **VERTICAL** or **HORIZONTAL** to select the potentiometer orientation.

NOTE: Do not change the setting in **MAX LIMIT** and **MIN LIMIT**.

It is possible to display a part of the map on which the potentiometer is active. Mapping breakpoints are clearly visible and corrections can be stored directly into the ECU map from either the AMC or the keyboard.
Click **ENABLE CORRECTION FROM AMC TO MAP 1** to activate this facility. To enable the map visualisation click on **MAP IS VISIBLE**. If no text is visible in the window, click on the button and then double-click on the descriptor file valid for the ECU map.
Click **OK** to add this new potentiometer to your display screen.

Press **F4** to activate the potentiometers. Press **F4** again to deactivate the potentiometers.

9.11 ADD MEMORY ADR

Is a special insertion of a firmware stored detail held within the ECU. This is not configurable by the user directly. Please contact us if you want any more information on this feature.

9.12 ADD MEMORY DUMP

Is a special insertion of a firmware stored log held within the ECU. This is not configurable by the user directly. Please contact us if you want any more information on this feature.

9.13 CHANGE PROPERTY OF CHANNEL, LED AND POTENTIOMETER

To access the property of a channel, LED or a potentiometer on your display screen, place the cursor on the coloured part of the window you wish to edit, click your right mouse button, and then click **PROPERTY**, Or alternatively Double-click on it.

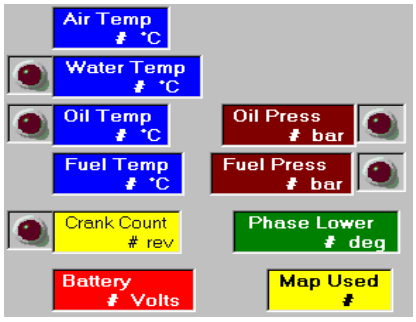
Click **OK** to close the channel property window again.

9.14 POSITION OF ITEMS ON DISPLAY SCREEN

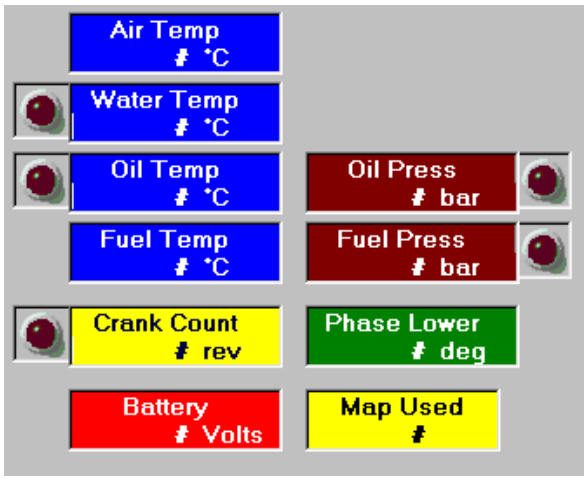
Point your cursor to the display screen and click the right mouse button. Click **ENABLE EDIT MODE**. Place the mouse on the upper left corner of the window you want to move, click the left mouse button. Move the cursor to the position where you want to display the channel and click the left mouse button again.

When done, click the right mouse button and click **SAVE DISPLAY**. Click the right mouse button again and click **ENABLE EDIT MODE** to close the window editor.
A faster method is to close the screen and click **OK** to save the changes.

9.15 RESIZE CHANNEL WINDOWS



You can resize any channel window in order to create a more harmonic display screen.



To re-size the channel windows, click right mouse button and click on **ENABLE EDIT MODE**.

Click right mouse button and click on **SELECT GROUP**.

Place the cursor in the upper left corner of the group of windows to mark and click left mouse button.
Move the cursor to the lower right corner of the group of windows and click again.

Click on **REDIM**, then choose a **reference** channel window and click on it.

When done, click the right mouse button and click **SAVE DISPLAY**.

Click the right mouse button again and click **ENABLE EDIT MODE** to close the window editor.

A faster method is to close the screen and click **OK** to save the changes.

You can align the channel windows in a similar manner vertically or horizontally, move a group or delete a group of windows.

9.16 DISPLAY LAYOUT DESCRIPTION

To change the display description, first select a layout in **Select Display from List** from the main display manager menu. Change the text in **Descriptions**. Click **Update Description** to save changes. Click **Exit** to return to main menu.

9.17 COPY DISPLAY

To copy an existing screen display, click **Copy Display**. Browse through the files and directories to find the display layout database file to copy. Click on the file to mark it, and then click **Open**. Type a name for the copied file and press **Enter**.

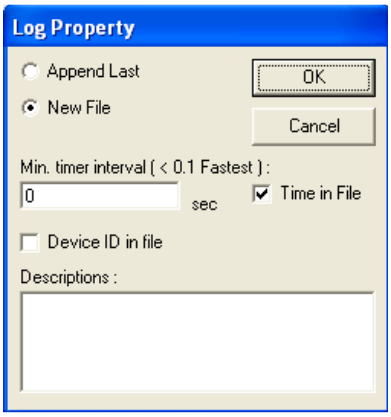
9.18 RENAME DISPLAY

To rename a display, first select a layout in **Select Display from List**. Click **Rename Display**, type a new name for the display and click **OK**. The display will now appear in the display list under its new name.

9.19 DELETE DISPLAY

To delete a display, first select a layout in **Select Display from List**. Click **Delete** and click **OK** to confirm. The display will be deleted from your PC's hard disk.

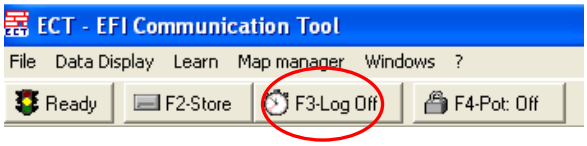
9.20 LOGGING DATA



All data displayed on a selected display screen can be logged in a file on your PC's hard disk.

Click your right mouse button in a clear area of a display screen; select **Output order for Log, Store and Strip Chart** if you want to alter the acquisition order.

Press **F3 or click on the Log Icon** to open the Log Property window. Click to select a new log file or to append data to an existing file. Set the Log Timer to zero for maximum sampling rate supported by your PC's parallel port.



Data is stored in a comma-file, which can be analysed in either Excel or converted into a 2D data file. You can type a brief description of the test. Click **OK** to start logging data. Press **F3** again to stop logging. The Icon on the main toolbar shows the logging status.

Refer to section 1.4.5.3.

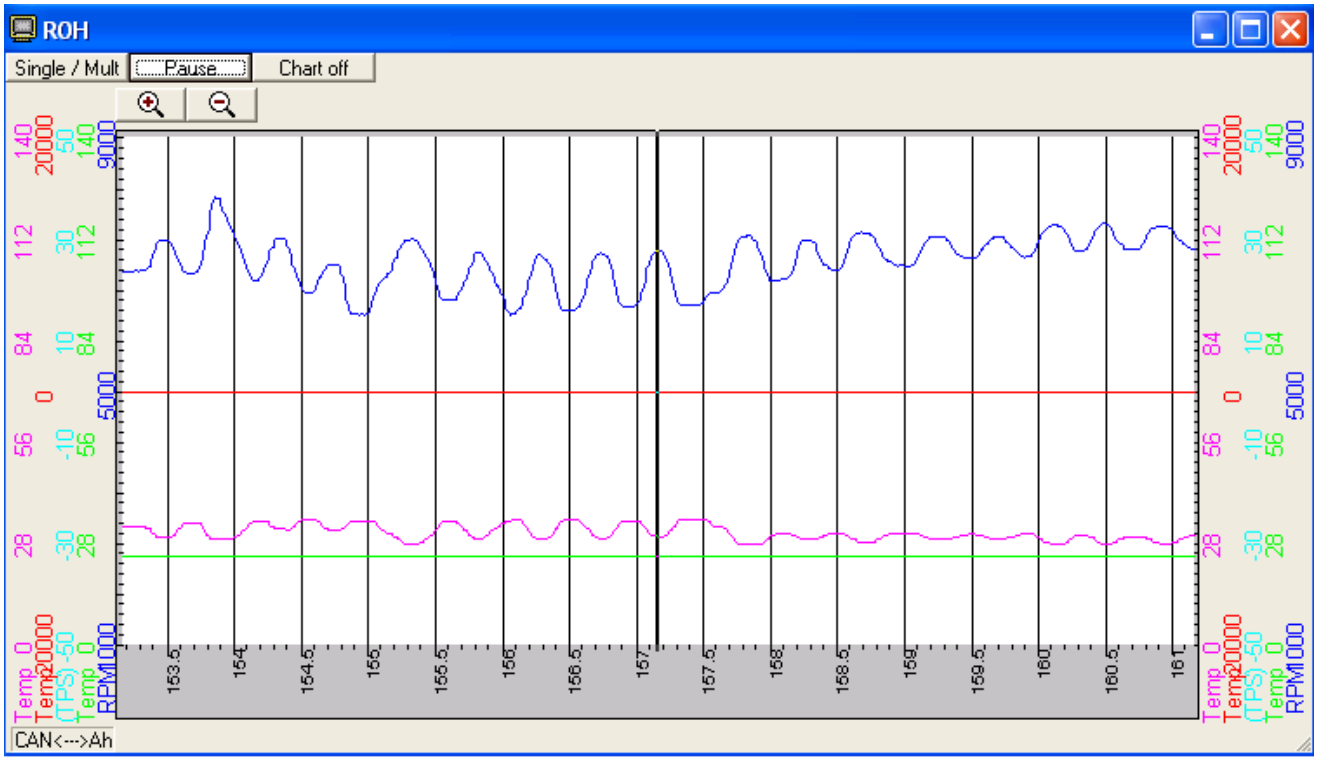
9.21 ECU STATUS

Use a display screen to check the status of the ECU in use. Click your right mouse button in a clear part of the display screen and then select **Device Information**. A window now opens with information on:

- ECU version
- Firmware version
- Maps loaded

10 STRIP CHART

Strip charts are a valuable aid in engine analysis work. The strip chart included with the ECT software is a sophisticated, flexible tool. Any ECU channel can be monitored and each chart can be individually configured. A maximum of five channels can be visualised in any display format including full screen.



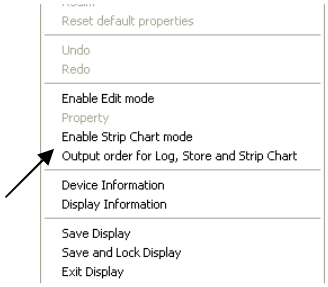
10.1 CREATE A STRIP CHART

A strip is created from a display screen. You can use an existing display screen but remember that you can only display 5 channels, (a display with more than that won't activate a strip chart).

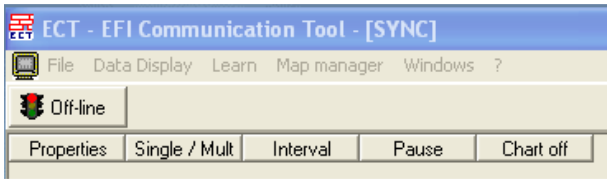
You can sort the channels in strip chart mode in any order.

Click your right mouse button, then click on **OUTPUT ORDER** and arrange the channels. Click **OK** when done.

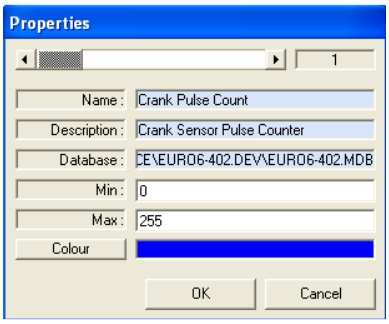
Click your right mouse button, and then click on **ENABLE STRIP CHART MODE** to switch to the graphic display.



10.2 PROPERTIES



The channel properties are set within the ECU database, but can be individually altered in this section. Select **Properties** from the top left of this strip chart screen**.** Click on the arrow to change channels.
If you want to change the displayed limits of a channel, change the settings found in **MIN** and **MAX**.
Click on **COLOUR** to change the channel colour.

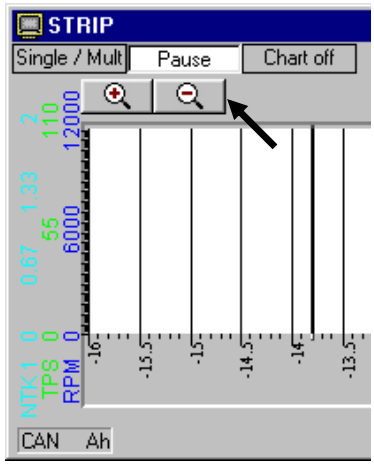


10.3 SINGLE / MULTIPLE

Click on **SINGLE / MULT** either to display independent charts for each of the select channels or to display all channels simultaneously.

10.4 INTERVAL

Click **INTERVAL** to change the time scale for the viewable part of the chart scale. The time interval can be set from 2 seconds to 256 seconds.



10.5 PAUSE

Clicking on **PAUSE** freezes the chart screen. Point your cursor to any part of the scale you want to investigate further and click to place a marker.
By clicking on the buttons with the **+** and **-** you can zoom in or out around the marker.

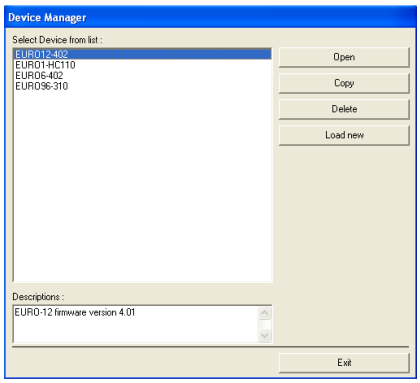
10.6 CHART OFF

Click on **CHART OFF** if you want to return to the numerical display screen.

11 WORKING WITH THE ECU DATABASE

11.1 GENERAL

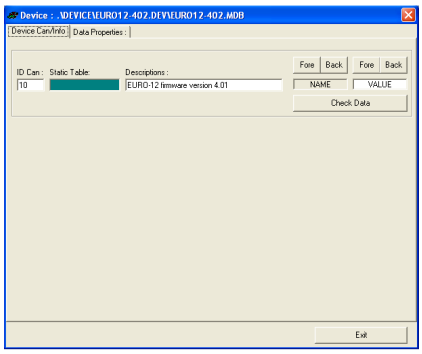
The ECU's uses a database for storage of general information about the internal data channels. The database holds information about the ECU communication, positions of the channels in the memory, configuration of channels etc.



11.2 OPEN THE DATABASE

From within the main menu click on **DEVICE SETUP** to enter into the **DEVICE MANAGER**. Click on the name of the device that applies to you then click **OPEN**.

When it opens, you will see the following screen.



Do *NOT* change the CAN ID.

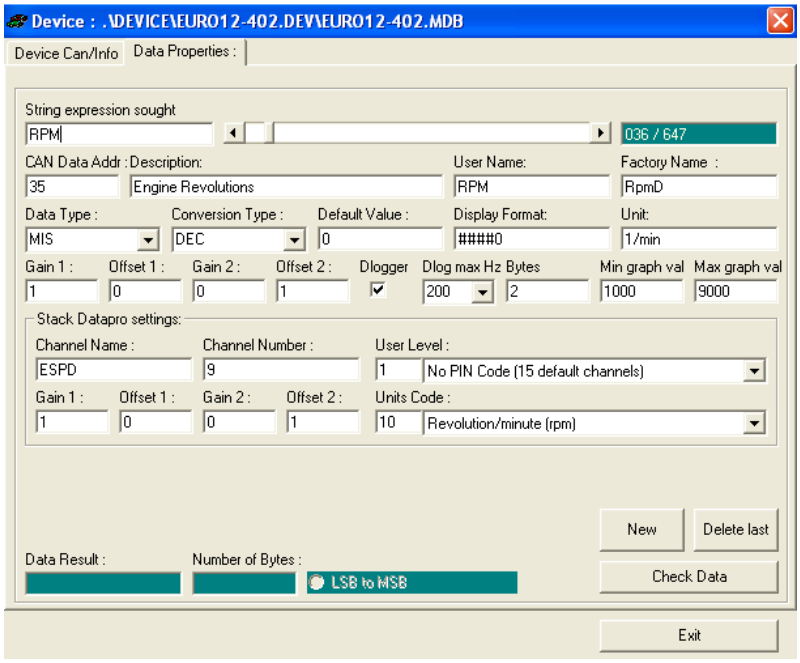
You can set the channel default colour for display screens by selecting FORE and BACK buttons for both the channel name and the channel value.

11.3 DATA PROPERTIES

Click the tab **CHANNELS.** If you are searching for a specific channel, type its name in the **STRING EXPRESSION** and press Enter. You can also search for it manually using the slider bar.

You can change the **USER NAME** and the **UNIT** of a channel to suit your requirements.

Do NOT change the **FACTORY NAME**.



If you want to change the specification of a channel to suit a different application and input, the gains and offsets have to be altered.

Please contact us before changing any settings within DEVICE SETUP or any of the gain or offset parameters.

For Euro 6 and 12 users a channel can be logged by the onboard data logger if it has a tick in the **DLOGGER** box. The channel's number of bytes and the maximum allowed sampling rate must be specified, too.
Please contact us for advice on configuring your logger.

The **MIN GRAPH VAL** and **MAX GRAPH VAL** set the range for the channel when selected for use in a strip chart.

12 Remarks

12.1 ON-LINE

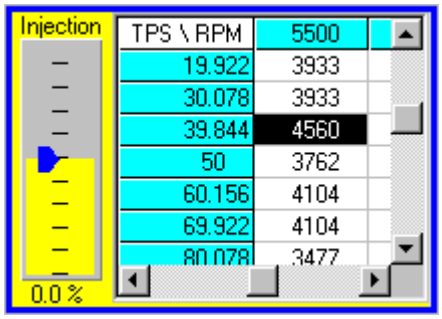
- You can open one or several display screens when working online with the ECU.
- Simultaneously, you can have the map loaded into the editor online. The animated cursor displays the current engine load condition.

12.2 STRING EXPRESSION SOUGHT

- When using the **String Expression Sought** tool to find a channel keep pressing enter to see more channels containing the expression you entered.

12.3 POTENTIOMETERS AND ACTIVE MAPPING CONTROLLER

- If you have chosen to display part of the related map with a potentiometer, an animated cursor displays the current engine RPM and load condition.
- Press **F4** to activate the AMC or the potentiometers on a display screen.



- The AMC does not work if there are no potentiometers on the display screen.

- The AMC does not work if the potentiometers on the display screen have been configured for keyboard control.

- The AMC does not work if the serial port and baud rate in section **SETTINGS** does not correspond with your PC hardware.

- When activated, the AMC applies an overall trim of i.e. the fuel map. Press **STORE** on the AMC (or **F2** on your keyboard) to store the trim into the highlighted breakpoint. Corrections applied by any potentiometer are stored into their respective maps.

13 SELF-LEARNING

- The use of the automatic self-learn mapping of the fuel injection drastically reduces the time spent mapping the engine.

- Press **F5** to toggle the self-learn between **DEFAULT**, **LEARN ON** and **LEARN OFF**. The default setting is selected within the engine map.

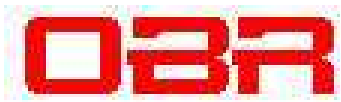
- If you want to map using the self-learn system, bring the engine RPM and load to a breakpoint position as seen i.e. on the potentiometer map on the display screen. Screens created for Euro-96, Euro-6 and Euro-12 has a green LED that will light up indicating **BREAKPOINT OK**. A red LED indicates that the measured lambda value is outside the selected bandwidth for the target lambda value (Euro-6 and Euro-12 only). A green LED indicates that the measured lambda value is within the selected bandwidth for the target lambda value (Euro-6 and Euro-12 only). The LEARN TRIM indicates the correction to the base map pulse width. When the measured lambda value and the target lambda value matches, the LEARN TRIM is stable.

- The stored self-learn map can be reset from the main menu selecting **LEARN** and then **LEARN FUNCTIONS**. Furthermore, switching the VBATT KEY (Ignition) on without starting the engine, fully open and close the throttle valve 3 times and then wait in excess of 20 seconds without starting the engine also resets the learn map.

- The learn map is created in RAM. Switching VBATT KEY off, but leaving the VBATT DIR (isolator) on, stores data from RAM into flash.

- Downloading an engine map from any location in the ECU allows you to mix a created learn map with the base fuel map. Select **YES** when asked ***Perform corrections based on Learn Map?***

- Remember to reset the learn map when you have transmitted a new engine map with a corrected base fuel map to the ECU.



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www.obr.uk.com