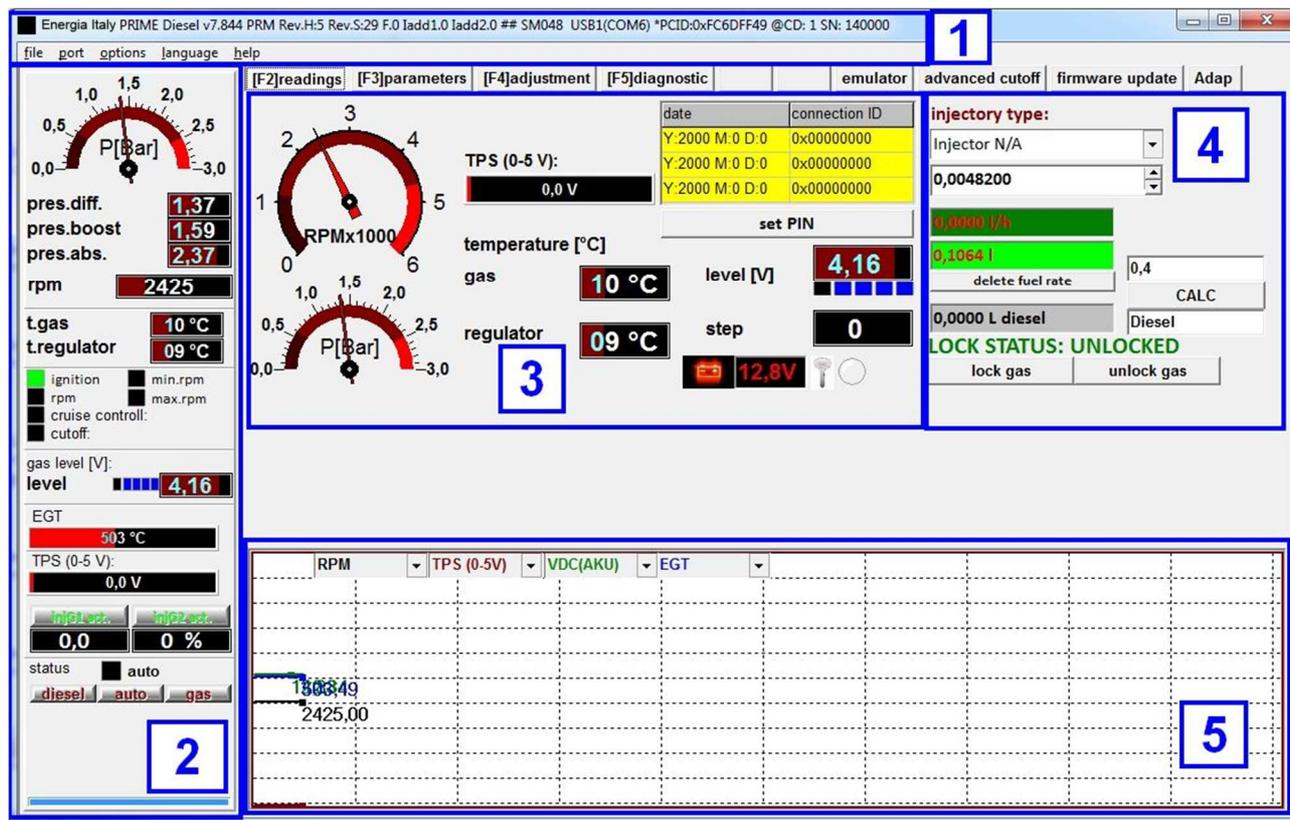




E-100DG
Diesel Conversion
Kits Manual

Software Manual

I. [F2] readings



1. Software name, version and menu bar. Top bar displays software version and the number of COM port where the PC interface is connected. Available options in the software menu.: save/load parameters, language selection, help, etc.

2. Side visualization panel. Visible on every screen. Displayed parameters (form the top):

- Pressure: differential (displayed also graphically on a meter), vacuum (in the intake manifold) and gas pressure in the injectors (absolute).
- RPM: engine's revolution speed.
- Temperature: gas and reducer's temperature.
- Lights indicating when following options are active:

- ignition

- rpm (red light if rpm signal is missing)

- cut off

- cruise control

- min and max rpm

- Gas level in the tank –displaying level sensor's voltage and visualization of LEDs in the switch.
- EGT temperature.
- TPS voltage .
- Injector 1 and 2 status (click to switch injectors on and off).
- Current map value (gas dosage) and injectors' load in %.
- System status.
- Work mode (diesel, automatic, gas) – click to select.

3. Central visualization panel. Displayed parameters:

- Rpm and pressure – displayed graphically on meters.
 - Temperature: gas and reducer's temperature.
 - Gas level in the tank.
 - Step – current map value (gas dosage).
 - Date and connection ID – list of computers that have been connected to current ECU.
 - Set PIN – option used to secure the ECU from unauthorized entry. Connection will be possible only after input of PIN number – set by the installer. This function is optional.
4. Fuel rate panel. Used to determine fuel consumption. Available only with telemetry ECU (offered separately).
5. Oscilloscope. Graphic display of selected parameters in real time.

II. [F2] parametr

The screenshot shows the Energia Italy software interface. The main window title is "Energia Italy PRIME Diesel v7.844 PRM Rev.H:5 Rev.S:29 F.0 Iadd1.0 Iadd2.0 ## SM048 USB1(COM6) *PCID:0xFC6DFF49 @CD: 1 SN: 140000". The interface includes a menu bar (file, port, options, language, help) and a toolbar with buttons for [F2]readings, [F3]parameters, [F4]adjustment, [F5]diagnostic, emulator, advanced cutoff, firmware update, and Adap. The main display area is divided into several panels. On the left, there are several meters and gauges: a pressure gauge (0,0 to 3,0 Bar), a gas level gauge (0,0 to 4,16 V), and a temperature gauge (0,0 to 503 °C). The central panel is titled "parameters" and contains several sections: "rpm signal" (5V), "rpm type" (1), "EGT sensor" (on), "EGT max" (2,2V 629°C), "turbo" (turbo engine), "TG sensor" (4k7(SM033)), "TR sensor" (4k7(SM033)), "gas sensor" (Freescale 4.0 BAR(SN)), "MAP" (Freescale 4.0 Bar(SM)), "min.pres.[Bar]" (1,2), "delay[s]" (1,0), "on temp.[°C]" (35), "on rpm" (1200), "on Delay" (2,0), "minimum rpm:" (500), "maximum rpm:" (6000), "Regulator" (vacum/boost disconnected), "work time diesel: 7960 [s] 88,49 [%]", and "work time gas: 1035 [s] 11,51 [%]". The right panel is titled "Power" and contains "TPS connection" (TPS not connected!), "LPG" (LPG), "DOUBLE INJECTION TIME!", "Inj time x2:" (1x), and "save data if 24->12V converter". Below the "Power" panel is the "level" section, which contains "F" (0,35), "ref.time[s]" (25), "3/4" (0,3), "2/4" (0,22), "1/4" (0,12), "E" (0,12), "invert sensor" (unchecked), and "valve powered" (unchecked). At the bottom right, there is a checkbox "always save work time, fuel rate".

1. Main parameters:

- Rpm signal. Type of rpm signal.
- Rpm type. Type of rpm system.
- EGT sensor. Switches EGT readings on/off.

- EGT max. Select maximum EGT temperature. Gas supply will be cut above the selected value.
 - Turbo. Select engine type – with or without turbine.
 - Sensors (gas & reducer temp, gas pressure and MAP). The default settings are compatible with sensors provided in the set.
 - Min. Pres. Minimum work pressure. System will switch back to diesel mode below this value (empty tank).
 - Delay. The delay of switching of gas supply (when pressure below minimum) in seconds.
 - On temp. Temperature of switching on gas supply in °C.
 - On rpm. Revolutions of switching on gas supply.
 - Minimum / maximum rpm. Bottom and top values of rpm between which gas supply is on.
 - Regulator. Select whether the regulator has been connected to manifold with silicon hose or not. Standard configuration is without reducer connection to manifold. The vacuum nozzle of reducer should remain open and not connected.
 - Work time diesel / gas. Time of the system operation on diesel and diesel/gas given in seconds and %.
2. Additional parameters.
- Power. Select engine's horse power.
 - TPS connection. Select where the TPS is connected (which emulator).
 - LPG/CNG. Select gas type.
 - Double injection time. Doubles the values on the map (F4 → p.3). When choosing CNG in the option above, this parameter is automatically changed to x2, due to higher CNG gas demand.
 - Save data if 24V → 12V converter. Saves parameters. When using power converter, click this button before switching off ignition, to make sure that the parameters are saved.
3. Level sensor's settings. Select sensor from the list or input data manually.
4. Select if you want ECU to remember work times and fuel rates.

III. [F4] adjustment

The screenshot displays the Energia Italy PRIME Diesel software interface. The main window shows a table of gas dosage (bar/rpm) and various engine parameters. Three blue boxes highlight key features:

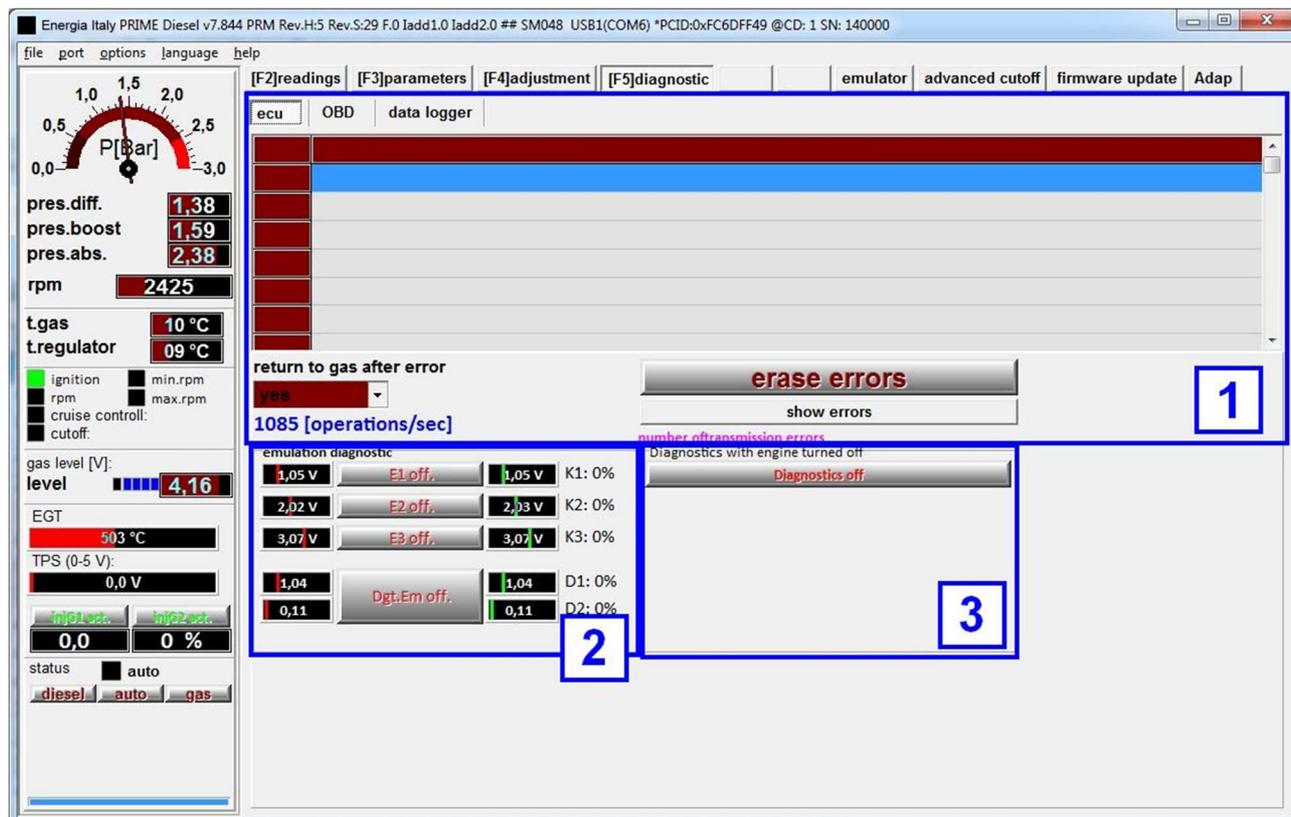
- 1**: Work pressure (1.5 Bar).
- 2**: Cruise control settings (1000 rpm, 1.1 Bar, 0.5 s).
- 3**: Map type (2: vacuum/rpm) and map smooth (smooth).

bar/rpm	800	1100	1500	2000	2500	2800	3000	3500
0,9	0	10	15	12	12	12	13	10
1,05	0	10	15	20	21	20	15	10
1,1	0	15	15	22	25	22	20	10
1,15	0	20	25	35	30	24	21	10
1,2	15	25	40	45	34	28	23	10
1,25	25	38	50	45	35	30	23	10
1,3	30	45	68	70	60	45	23	10
1,35	40	50	72	85	60	45	24	10
1,4	45	75	85	99	85	60	28	10
1,5	38	49	75	80	65	50	27	10
1,6	30	44	65	70	58	40	23	10
1,7	25	40	60	65	60	45	22	10
1,8	22	33	45	56	55	34	22	10
1,9	18	22	30	33	35	32	21	10
2	15	20	22	23	21	20	20	10
2,1	10	10	10	10	10	10	10	10

1. Work pressure. Set the actual reducer's pressure during drive.
2. Cruise control settings and map. When vehicle uses cruise control, the system can detect it and switch from the main map (p. 3) to cruise control map. Here you can enable this function, set detection parameters (rpm, pressure and time after which system switches to cruise control) and set cruise control map.
3. Main map. You can adjust gas dosage here. Values range from 0 to 254. 0 means no gas injected (cut off), 254 is maximum gas dosage. Gas dosage can be doubled (in case of extremely large engines) by choosing **double injection time** option on parameters page (F3). To change map parameters, select a single field or an area and click +/- 1, +/- 5 buttons, or press enter and input a specific value.
 - Map type. Allows to change type of map (vacuum/TPS, vacuum/rpm, vacuum/MAF TPS/rpm or vacuum only), depending which sensors are available in the vehicle.
 - Mod. char. points. Click the check-box to change range of X and Y axis of the map. You can input values manually or select predefined ranges from the list. **Un-check to save changes.**
 - Smooth. Click to make the map smoother – to diminish large differences between map values.
 - Map reset. Predefined map settings. Can be used as a base for further map adjustment.

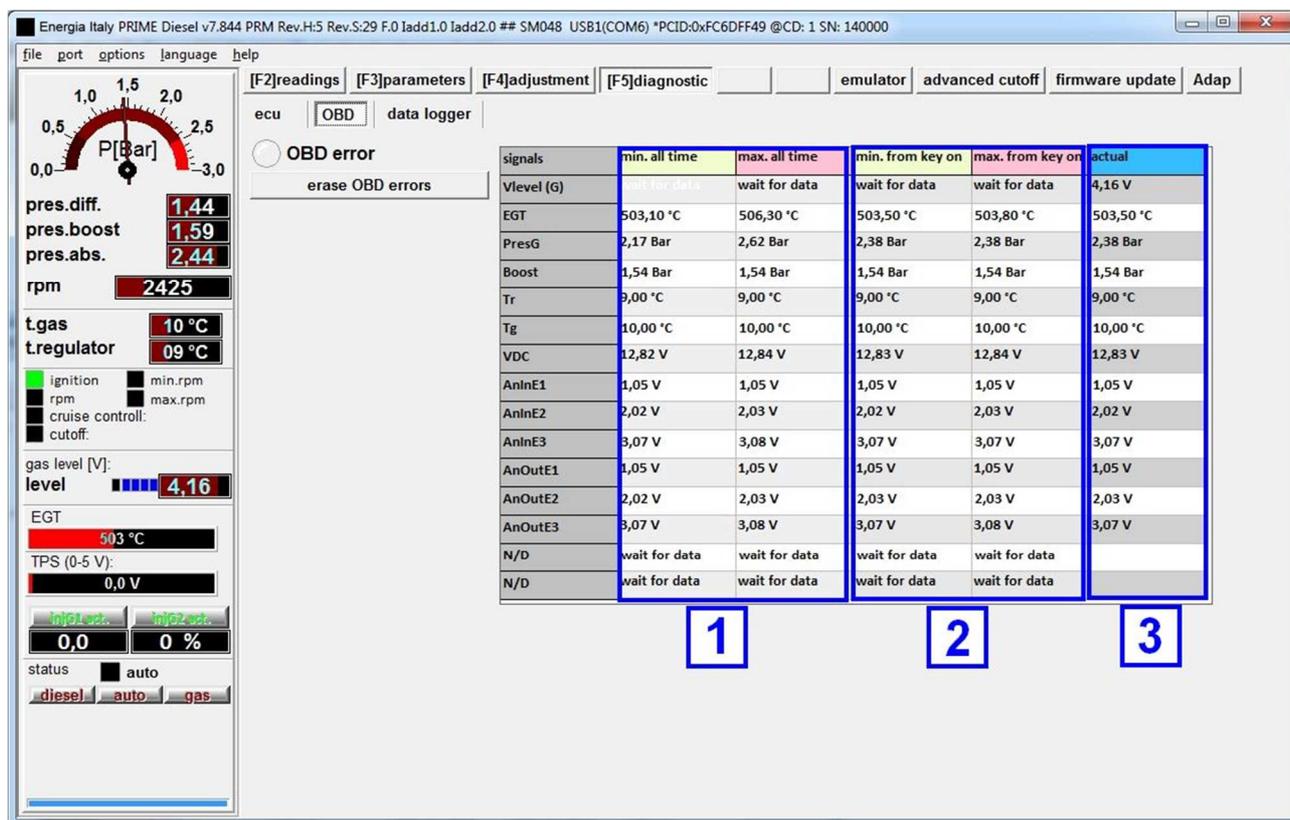
IV. [F5] Diagnostic

ECU



1. Error window. Displays errors history.
 - Return to gas after error. Option of the ECU's reaction to an error. The ECU can either go to automatic mode or go to diesel mode after an error occurs. The reaction will be applied after switching the engine off and on again.
 - Show/erase errors. Displays error and allows to erase them.
2. Emulation diagnostics. Shows values on input and output of every connected emulator, percentage value of emulation and allows to switch them on and off.
3. System's diagnostics. Possible only when engine is turned off. Allows to test every part of the PRIME system.

OBD

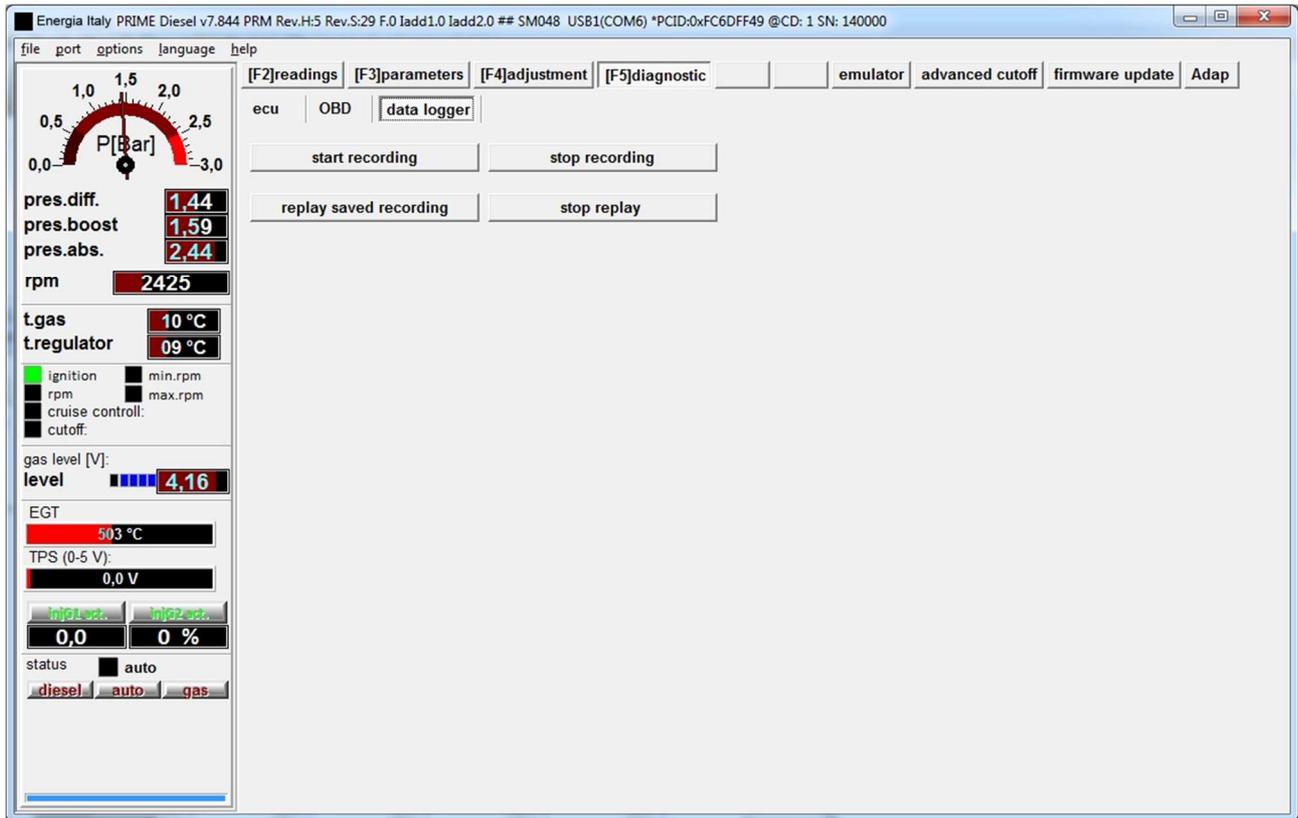


Option available only when ECU is connected to OBD. Allows to see OBD parameters and erase OBD errors. The table displays following values:

1. Max. and min. parameters values from the beginning of installation.
2. Max. and min. parameters values from current engine start.
3. Current parameters.

Note: all parameters reset if ECU is disconnected from battery.

DATA LOGGER



Option allows to record parameters during drive, save them to a file and replay afterward.

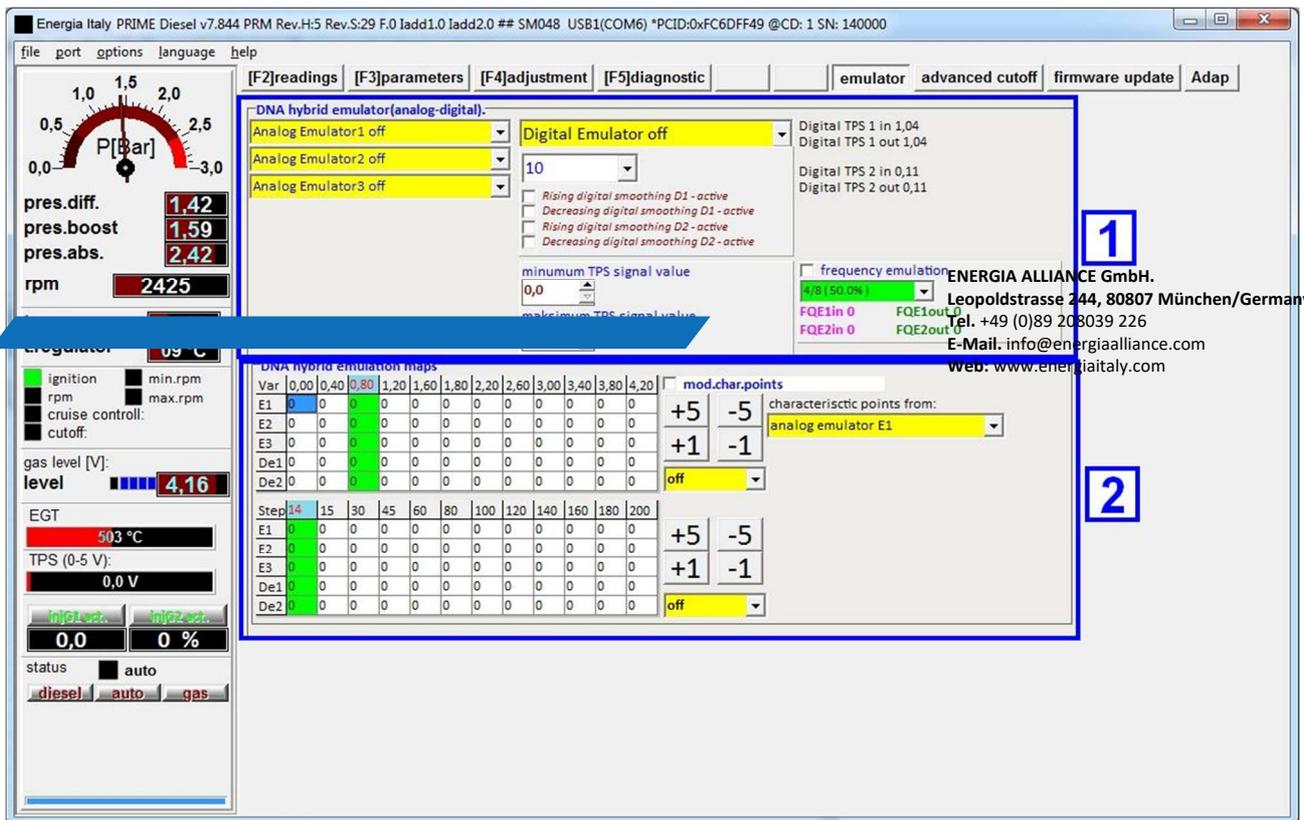
V. Additional adjustment

The screenshot shows the Energia Italy PRIME Diesel software interface. The top bar displays the software version and hardware information. The main interface is divided into several sections:

- Left Panel:** Contains a pressure gauge (P[Bar]) and numerical readouts for pressure (pres.diff: 1.44, pres.boost: 1.59, pres.abs: 2.44), RPM (2425), gas temperature (t.gas: 10 °C), and regulator temperature (t.regulator: 09 °C). It also shows gas level (4.16 V) and EGT (503 °C).
- Top Panel:** Contains navigation buttons for [F2]readings, [F3]parameters, [F4]adjustment, [F5]diagnostic, and other functions like emulatore, advanced cutoff, firmware update, and Adap.
- Table 1 (highlighted):** A large table for adjusting gas dosage based on various sensors. The columns represent different sensor values, and the rows represent different adjustment parameters: [%] T.G. cor., [%] Manifold cor., [%] G.Press cor., [%] Regulator Temp. cor., and [%] Diff.PressR. cor. Each cell contains a numerical value and a dropdown menu (OFF).
- Table 2 (highlighted):** A table for enabling or disabling various error types. The columns represent different error types, and the rows represent the status (checked or unchecked). The errors listed are Tr, Tg, Pres, MAF, EGT, VDC, rpm, and InjG. There is a SAVE button at the bottom.
- Table 3 (highlighted):** A section for setting TPS CUTOFF. It includes a dropdown menu for d/i (OFF), a numerical input for FA (60-normal), and a dropdown menu for SQ. There is also a section for ADVANCED settings with a dropdown menu for d/i (OFF) and a numerical input for 100.
- Table 4 (highlighted):** A section for setting TPS CUTOFF. It includes a numerical input for 50 [ms] and a numerical input for 1.0 [V].

1. Maps with additional adjustment. Allow you to set additional gas dosage according to (from top): gas temperature, manifold pressure, gas pressure, reducer temperature and differential pressure.
2. Enabled errors. You can choose which errors will be detected or ignored by the system.
3. TPS cut off. Select TPS voltage, below which TPS cut off will be active and time in ms, after which it will kick in.
4. Advanced and do not modify – DO NOT MODIFY!

VI. Emulator



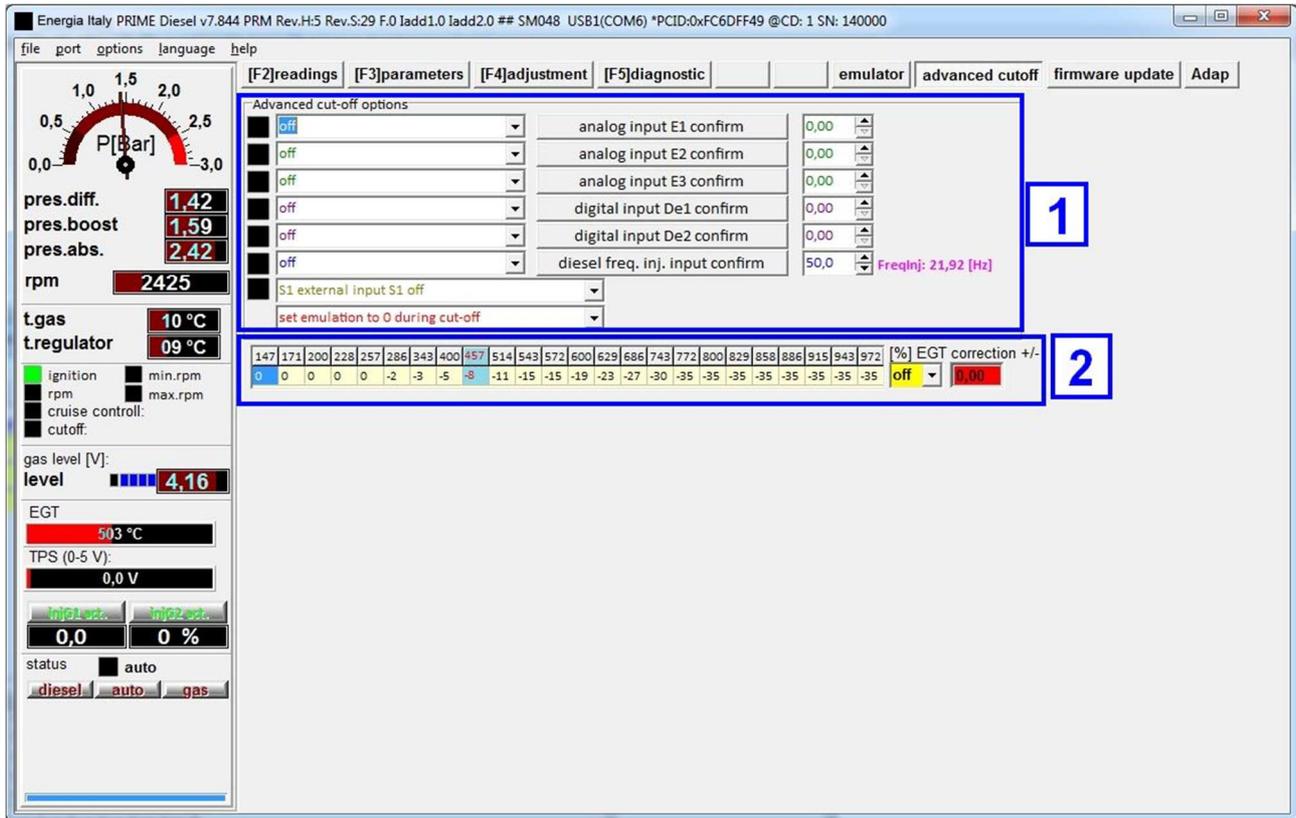
1. DNA hybrid emulator panel.

- Analog emulator 1,2,3, digital emulator – on/off. Allows to switch each emulator on/off. Do not modify the value “10” under the digital emulator.
- Digital smoothing. Select this option to make digital emulation smoother. Select desired channel (D1 – digital emulator 1 or D2 – digital emulator 2) and type of signal – increasing or decreasing.
- Minimum & maximum TPS signal value. Applies only to digital TPS. Select range of output (emulated) TPS signal value. This option is used to prevent errors from OBD when output signals are too high/low.
- **Frequency emulation. Select this option when emulating a digital frequency signal (e.g. from a digital frequency air flow meter).**

2. DNA hybrid emulation maps.

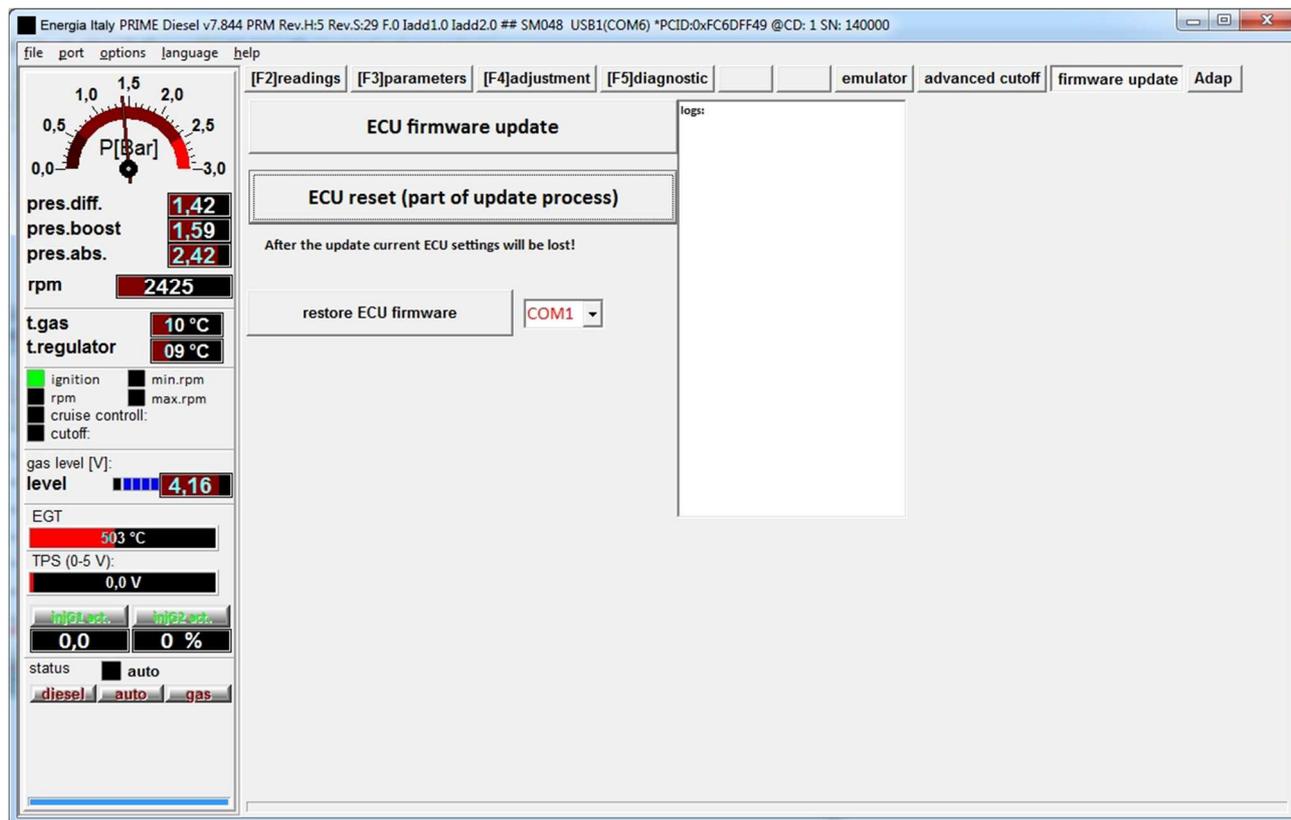
- Top map. This map allows to set emulation according to emulated signal's value. The upper bar represents the signal's voltage. You can change the range by clicking **mod. char. points** (un-click to save). Set individual emulation strength (in percentage) for active analog emulator (E1, E2, E3) and/or digital emulator (De1, De2) by selecting a single field or area and clicking +/- 1 and +/- 5 buttons. Use the on/off button to activate / deactivate map.
- Bottom map. This map allows to set emulation according to map value. The upper bar represents the map values. Set individual emulation strength (in percentage) for active analog emulator (E1, E2, E3) and/or digital emulator (De1, De2) by selecting a single field or area and clicking +/- 1 and +/- 5 buttons. Use the on/off button to activate / deactivate map.

VII. Advanced cut-off



1. Advanced cut-off options. This option allows to set cut-off from every signal connected to the ECU (analog or digital). When cut-off is active the gas supply is immediately stopped. Select the signal and signal's level at which the cut-off should occur. The best results are with the diesel frequency injector signal. You can also choose to stop emulation during cut-off (set emulation to 0 during cut-off).
2. Additional map according to EGT temperature. You can set additional correction from EGT temperature. In case the EGT gets too high, you can use this map to decrease gas dosage at higher EGT values.

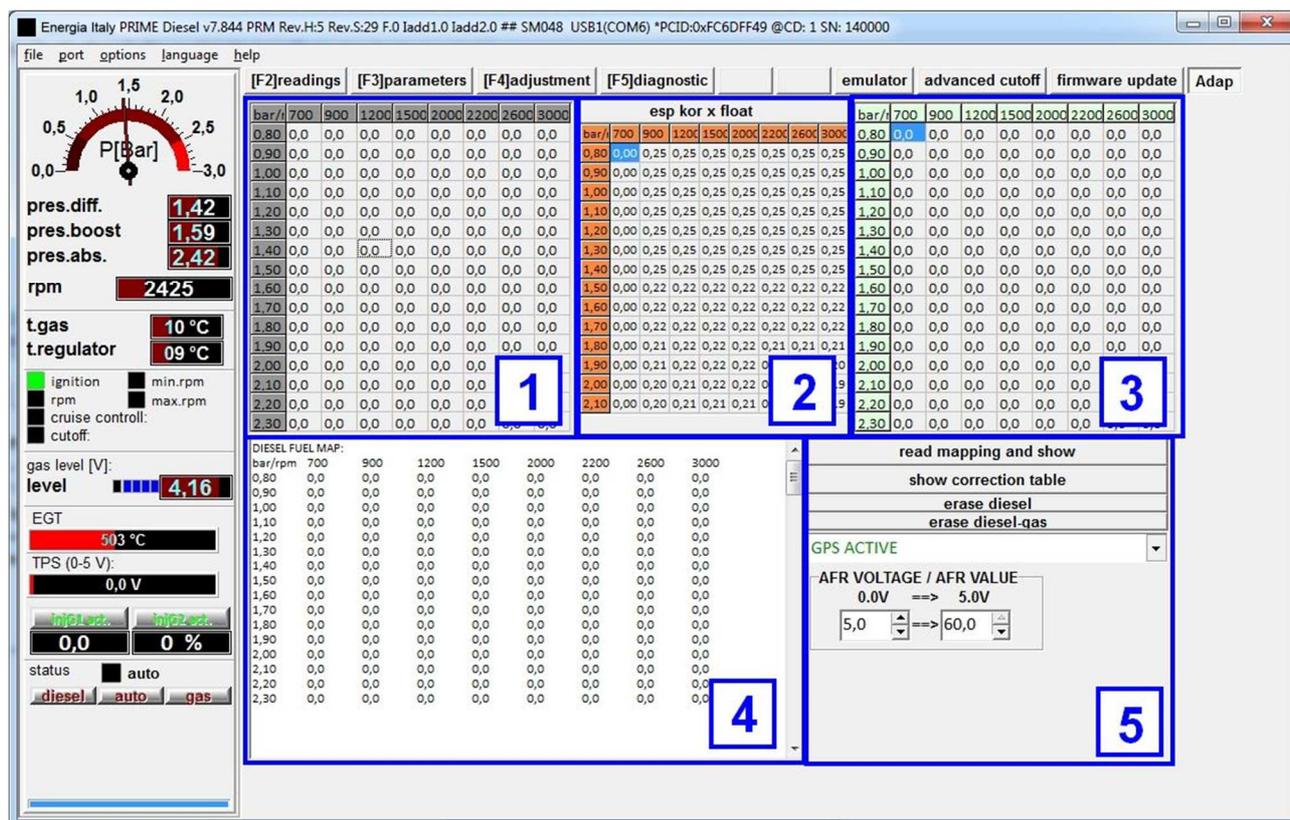
VIII. Firmware update



This option is used in case there is a new version of firmware released which needs to be uploaded in an already installed ECU. You can perform the update without removing the ECU from the vehicle – through the USB interface.

Note: When performing an update make sure to use original USB interface!

IX. Adaptation



Option compatible only with additional telemetry ECU (GPS module) and/or with an external AFR probe.

In case of installing an AFR probe and connecting it to the ECU, the AFR values will be automatically gathered by the ECU and displayed on maps. In case of installing a GPS module, the maps will display fuel rates.

1. Diesel only map. Represents AFR values / fuel rates during driving on diesel only.
2. Coefficients map. Do not modify.
3. Diesel-gas map. Represents AFR values / fuel rates during driving on diesel-gas.

The maps are helpful to see if gas dosage and emulation have been set properly. The AFR values on map 1 should be similar to corresponding areas on map 3. In case of fuel rates, you should see decrease of fuel consumption on map 3.

4. In this field you can copy the maps' values to a text file for offline analysis.
5. Settings buttons.
 - Read mapping and show. Displays AFR values gathered by the system during drive.
 - Show correction table. Displays correction table.
 - Erase diesel. Clears data gathered during diesel drive.

- Erase diesel-gas. Clears data gathered during diesel-gas drive.
- GPS Active / AFR active. Select weather GPS module or AFR probe option is active. Use GPS option for rough settings and AFR option for fine settings.
- AFR voltage. Set the range of AFR probe signal.