INSTALLATION MANUAL.

REV. 1.1 on 19-05-2016

FOREWORD

Thanks for choosing ZA ELETTRONICA as the electronic manufacturer for your replica.

I'm sure that your choice will be paid back by mutual satisfactions. I have invested a lot of time and resources along with my team on research and development, but your feedback on this product may help me to improve it, since i have the aspiration to make it become the market benchmark.

Therefore i would like, if possible, to receive your suggestions; they will be considered and eventually integrated in future free firmware developments.

Send your suggestions to info@zaelettronica.com including your invoice number.

Thank you for your cooperation and enjoy your manual!

Alessandro Zagni

TABLES OF CONTENTS

CONTENT OF THE SET

What you'll find in the box:

- ✓ 1 MPH board;
- ✓ 1 RPM board;
- ✓ 1 VOICEBOX board;
- ✓ 1 6 ROW board;
- ✓ 2 3 ROW boards;
- ✓ 1 integrated keypad with connector that gets connected to the 6 ROW board
- ✓ 4 8 ways connectors needed for the CAN-BUS line between VOICE BOX, RPM, 6 and 3 ROW boards;
- ✓ 1 10 ways connector needed for the CAN-BUS line between VOICE BOX and MPH board;
- ✓ 1 24 ways connector needed to connect the RPM board to the car cluster;
- ✓ 1 8 ways to connect the RPM board to the car cluster;
- ✓ 1 6 ways connector to connect the VOICE BOX to the COUNTDOWN [2];

ATTENTION:

BEFORE PROCEEDING TO POWER UP THESE ELECTRONICS CAREFULLY READ AND UNDERSTAND THIS MANUAL.

CONTACT QUALIFIED PERSONELL TO PERFORM THIS INSTALLATION! WE DECLINE ANY RESPONSABILITY FOR A NON CORRECT INSTALLATION AND POSSIBLE DAMAGES TO YOUR CAR.

THESE ELECTRONICS, EVEN IF SIMILAR TO OR BETTER OF THE ORIGINAL EQUIPMENT OF YOUR CAR UNDER SOME ASPECTS, ARE INTENDED TO BE USED OUT OF PUBLIC ROADS. WE DECLINE ANY RESPONSABILITY FOR NONCOMPLIANCE WITH THIS RULE.

⚠ **DO NOT CONNECT/DISCONNECT THE CONNECTORS OF THE BOARDS WHEN THE BOARDS ARE POWERED. DANGER OF DAMAGE** ⚠

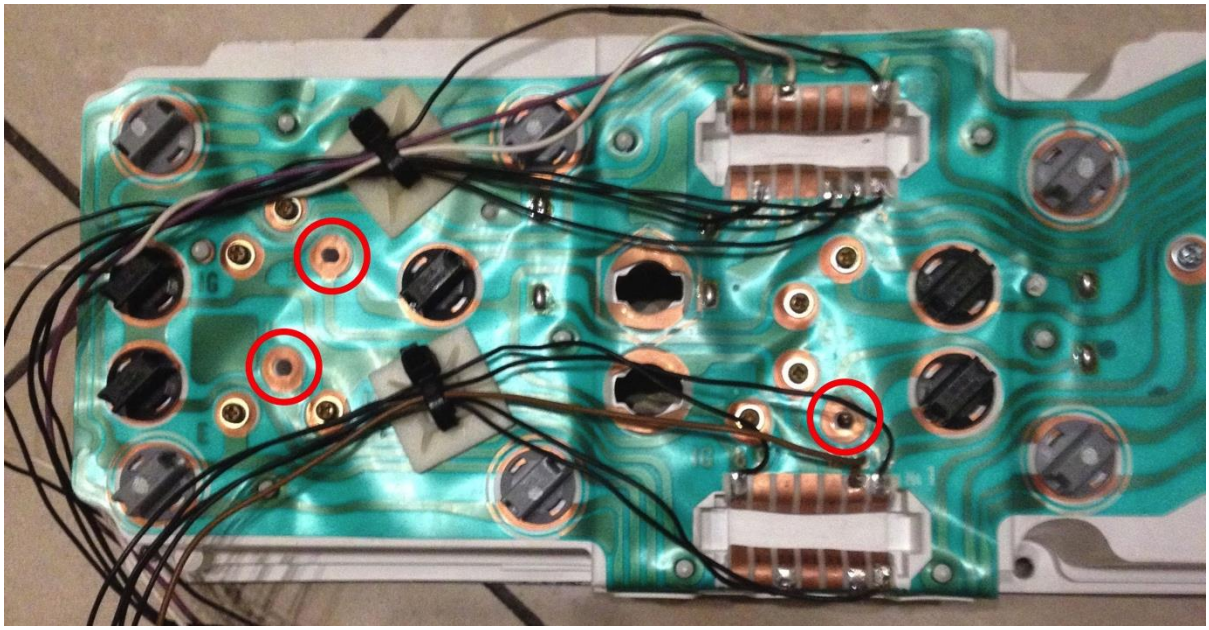
SIGNAL CONNECTIONS

First of all you should make sure that all the gauges in your car are working properly before removing the cluster. If a gauge is broken it is possible that the signal is still passing through; but if the gauge is good and the signal is not passing through you won't get any reading with the new electronics.

Having said that **you have to proceed removing the screws from three of the ohm gauges you're going to use, which are Engine Temperature, Oil pressure and Fuel.**

Tachometer and Speedometer **must** be left in place the way the are. Below a picture of the back of a 1989 original cluster

⚠ATTENTION: You have to remove the screws circled in RED



⚠ATTENTION: IF YOU DO NOT REMOVE THE MENTIONED SCREWS THE READING OF THE SIGNALS WILL BE COMPROMISED AND THE READING NOT CORRECT.

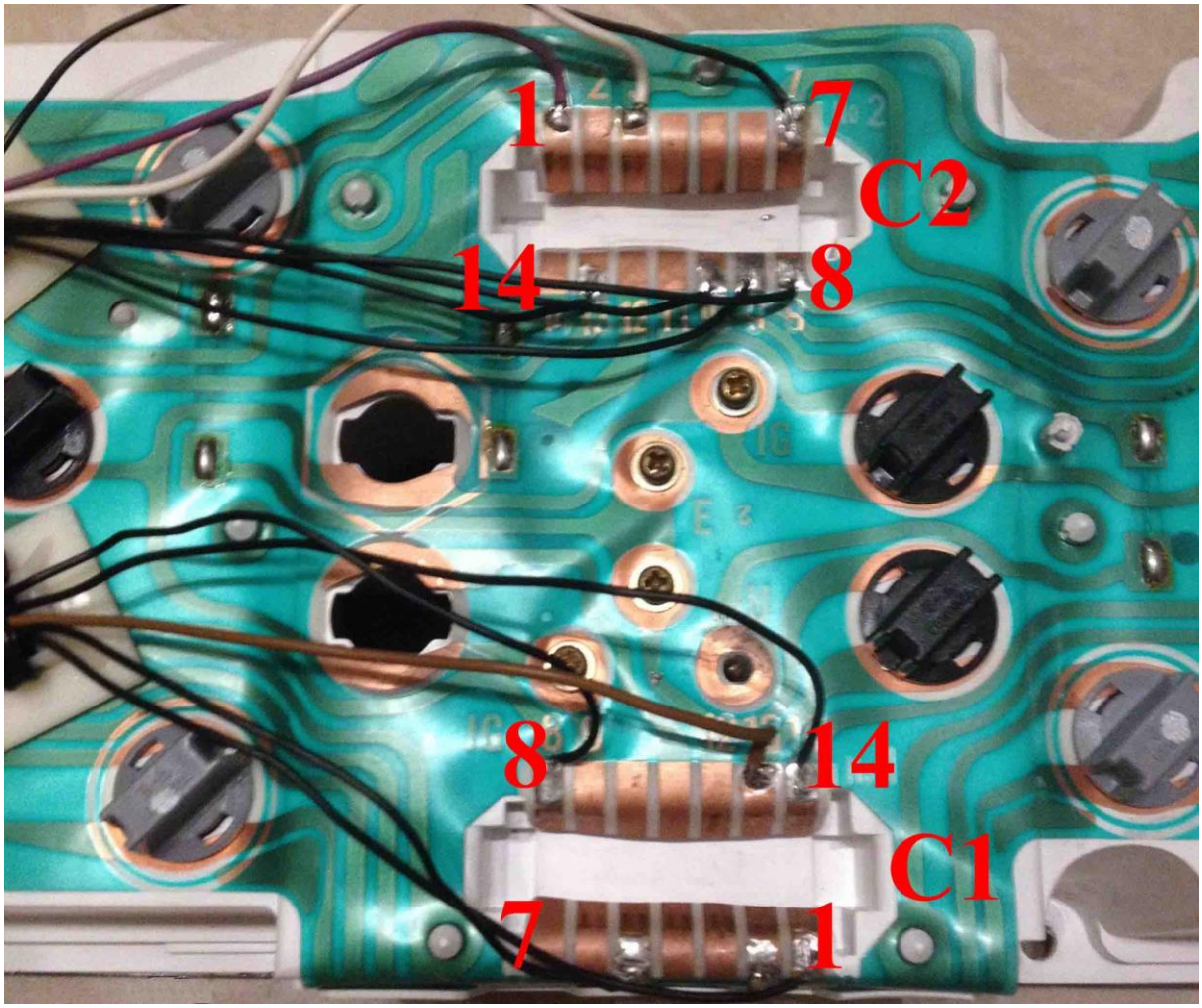
I suggest to use a multi way connector to connect/disconnect cables very easily.

⚠ATTENTION: DO NOT USE TERMINAL STRIPS TO CONNECT THE WIRES! VIBRATIONS CAUSED BY THE CAR MAY GET THE SCREWS LOSE! USE SOME CRIMP-ON OR JUST SOLDER.

The soldering spots you see in the picture were made directly on the top part of the connector area; that requires some skills with the solder iron to avoid damages to the original PCB. If you are unsure of your skills ask an expert to help you.

Difference between the original cluster '82-'86 and later '86:

If for all the cars from 1986 up you just have to remove the screws indicated in the picture above, **in earlier models you have to phisically remove the gauges**; infact there are no screws holding the gauges to the cluster, they're simply held by some metal clips. So you have to remove the gauges by removing the front part of the cluster first, then extract the gauges manually.
Speedometer and tachometer must be left in place.



CONNECTOR 1 (C1):

1 – RPM (TACHOMETER)
2 – GROUND (GND)
3 – LIGHTS (DIMMER)
4 – SECURITY (VATS LIGHT)
5 – ENGINE TEMP.
6 – NOT USED
7 – NOT USED
8 – OIL PRESS.
9 – INJECTION (IF AVAILABLE)
10 – NOT USED
11 – NOT USED
12 – GROUND (GND)
13 – BELTS (LIGHT)
14 – MPH/KMH (SPEEDOMETER)

CONNECTOR 2 (C2):

1 – HANDBRAKE (LIGHT)
2 – GROUND (GND)
3 – LIGHTS (DIMMER)
4 – NOT USED
5 – NOT USED
6 – NOT USED
7 – LEFT TURN SIGNAL (LIGHT)
8 – HIGH BEAMS (LIGHT)
9 – RIGHT TURN SIGNAL (LIGHT)
10 – FUEL
11 – NOT USED
12 – NOT USED
13 – SERVICE ENGINE SOON (LIGHT)
14 – SHIFT (LIGHT)

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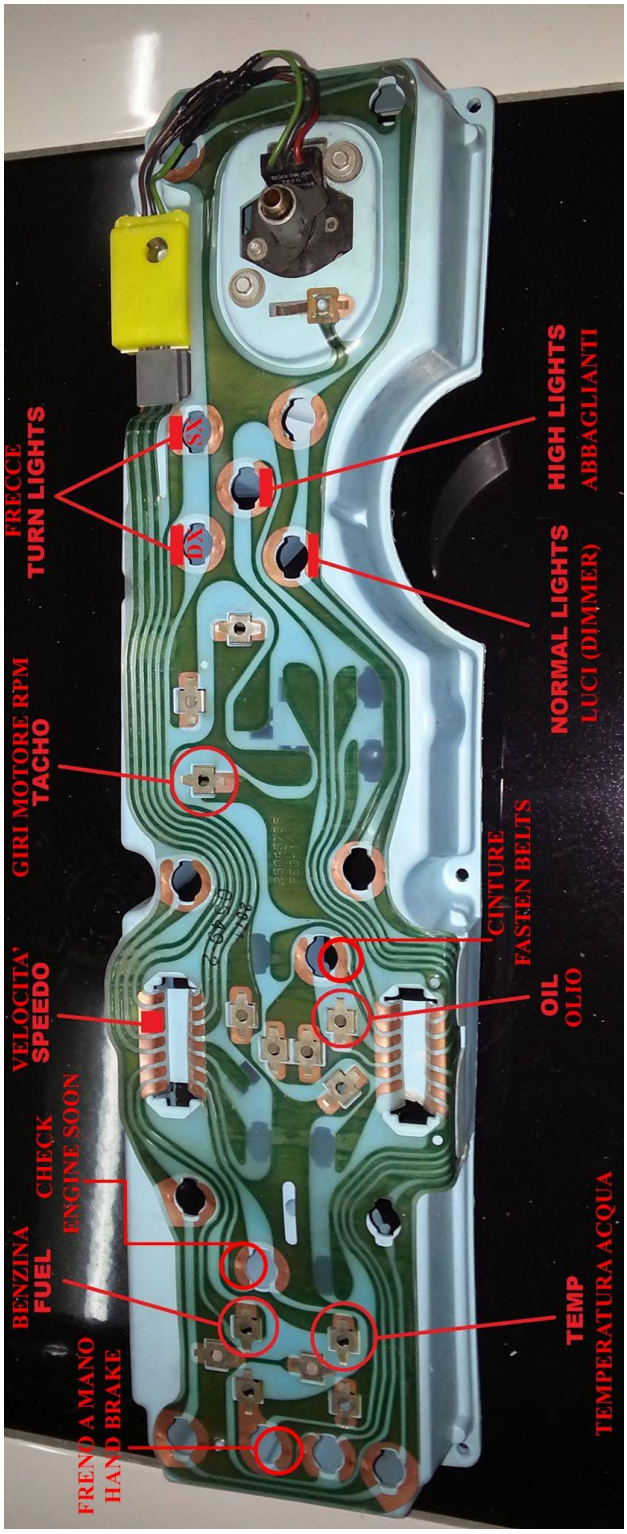
Cluster Pinout from 1982 to 1985 with cruise control

If you don't have a signal transductor on the back of your cluster (yellow little box below) you'll have to use an external one, like the cyberdine 8901. It's very easy to find. Please refer to the cyberdine datasheet to find the speed signal wire (the cyberdine has three wires: +12V, ground (GND) and signal) and connect that to the correct pin (#14) of the new electronics in the 24 ways connector.

⚠ REMOVE ENGINE TEMP, OIL PRESS, FUEL AND VOLT GAUGES FROM THE CLUSTER ⚠



RPM BOARD PINOUT

The pinout below specifies wire by wire their source and their use. Verify more than once you didn't make mistakes in soldering/nomenclature of the single signal wires. **If there are wires that you're not using close the top part with some heat shrink tubing to prevent shorts with the ground of the car.**
Wires are divided by signal types and tied together to prevent mistkes.
You can count the single pins starting from pin 1 on the top right of the connector. Under pin 1 there's pin 2, next to pin 1 there's the 3, under the 3 and next to the 2 there's the 4 and so on.
Below a picture of the connector. To determine the side make sure that the connector clip is facing you; you can find it on one of the longest sides only.

On the same side you will find the AMP word embossed. Both details circled in red in the picture below.

You don't need to know the number of the pins to complete the installation since the cables are selected by color and type.

Rpm board pinout - 24 ways connector:

⚠ **Attention: for the correct operation of the electronics it is very important that all the connections below are made, expecially lights and signals. The mandatory connections are marked with a star *.**
A missing connection may be interpreted as a warning light reporting it in the message center.

Boards connectors.

Below some pictures of the connectors included in the set. To semplify the installation and the finding of the single wires from the 24 ways connector **they've been grouped by types**. In the following pages there will be references to wire groups with IDs.

ID	DESCRIZIONE
A.	3 red wires harness (pin 1, 2, 3) power supply (positive +12 volt);
B.	3 black wires harness (pin 4, 5, 6) power supply (negative, GND);
C.	3 pink wires harness (pin 7, 8, 9) positive common for buttons and bulbs of the PANP;
D.	5 wires harnes colored green, orange, blue, white and purple (pin 10, 11, 12, 13, 14) signals from the car;
E.	4 wires harness colored brown, gray, blue and purple (pin 15, 16, 17, 18) for PANP buttons inputs;
F.	4 wires harness colored orange, green, white and pink (pin 19, 20, 21, 22) for PANP buttons illumination.

Cables numbering

To make the identification of the cable easier we added ID numbers during the production. Besides indicating where to connect the cables (es. Voicebox <-> mph) numbers help this operation to be completed quicker. Here the correspondence between numbers and cables

DESCRIPTION	NUMBERS
VOICEBOX <—> MPH	1
VOICEBOX <-> count down lamps	2
RPM <—> VOICEBOX	3
RPM 24 ways:	4
RPM 8:	5
RPM <—> 6ROWS	6
6ROWS <—> 3ROWS	7
6ROWS <--> KEYBOARD	8
3ROWS <—> 3ROWS	9

RPM 24 ways Power/Inputs/Outputs (WIRE IDs AND COLORS)

Pin	WIRE ID	DESCRIPTION
1,2,3	A	+12 POWER [IN] (BATTERY, RED)
4,5,6	B	Ground (Battery BLACK)
7,8,9	C	+12 [OUT] (common positive for PANP buttons and bulbs, PINK)
10	D	Fuel input (GREEN) * (resistive 10 – 90 ohm to ground)
11	D	Oil Press input (ORANGE) * (resistive 10 – 90 ohm to ground)
12	D	Engine Temp input (BLUE) * (resistive 1300 – 60 ohm to ground)
13	D	RPM input (WHITE) *
14	D	SPEED input (PURPLE) *
15	E	POWER switch input (BROWN) (+12 volt)
16	E	AUTO switch input (GRAY) (+12 volt)
17	E	NORMAL switch input (BLUE) (+12 volt)
18	E	PURSUIT switch input (PURPLE) (+12 volt)
19	F	POWER bulb output (ORANGE) (GND)
20	F	AUTO bulb output (GREEN) (GND)
21	F	NORMAL bulb output (WHITE) (GND)
22	F	PURSUIT bulb output (PINK) (GND)
23,24		RESERVED AND NOT USABLE

RPM 8 ways Inputs LIGHTS (WIRE COLORS)

Pin:	DESCRIPTION
1	Shift (GRAY) (+12 volt renameable)
2	Belts (BROWN) *
3	Service Engine Soon (GREEN) *
4	High Beams (BLUE)
5	Left Turn Signal (PINK)
6	Right Turn Signal (ORANGE)
7	Hand brake (PURPLE) *
8	Light dimming (WHITE) *

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PANP BUTTONS HARNESS – 24 WAYS CONNECTOR RPM BOARD.

The RPM board contains and embedded controller for PANP buttons. It manages the Auto, Normal, Pursuit buttons and the POWER button to turn on and off the electronics **WITH NO NEED OF OTHER BOARDS OR EXTERNAL RELAYS.**

⚠ATTENTION: MAXIMUM ALLOWED LOAD PER BULB IS ... WATT. DO NOT EXCEED THIS VALUE; IF YOU WANT TO USE A HEAVIER LOAD ADD EXTERNAL RELAYS.

On the back of the PANP buttons you will find some letters, to make your connection between the buttons and the wires easier you'll find a little legend below and further in the wiring diagram of this manual.

PANP buttons legend:

NO → NORMALLY OPEN;
NC → NORMALLY CLOSED;
C → COMMON;
LAMP → indicates the two terminals of the bulb.

Following IN ORDER and **step by step** the following instructions you won't have any difficulties. Use a iron solder or a crimp pliers to connect wires.

OUTPUTS 7,8,9 (ID "C") of the 24 ways connector from RPM board (+12 OUT, PINK wire) They get connected to all the commons and to one of the two terminals of each bulb on all the PANP buttons. (see wiring diagram in the next page).

1. Now you have to connect the INPUTS of the buttons to allow the change of driving status AUTO, NORMAL and PURSUIT plus the POWER switching (POWER button).

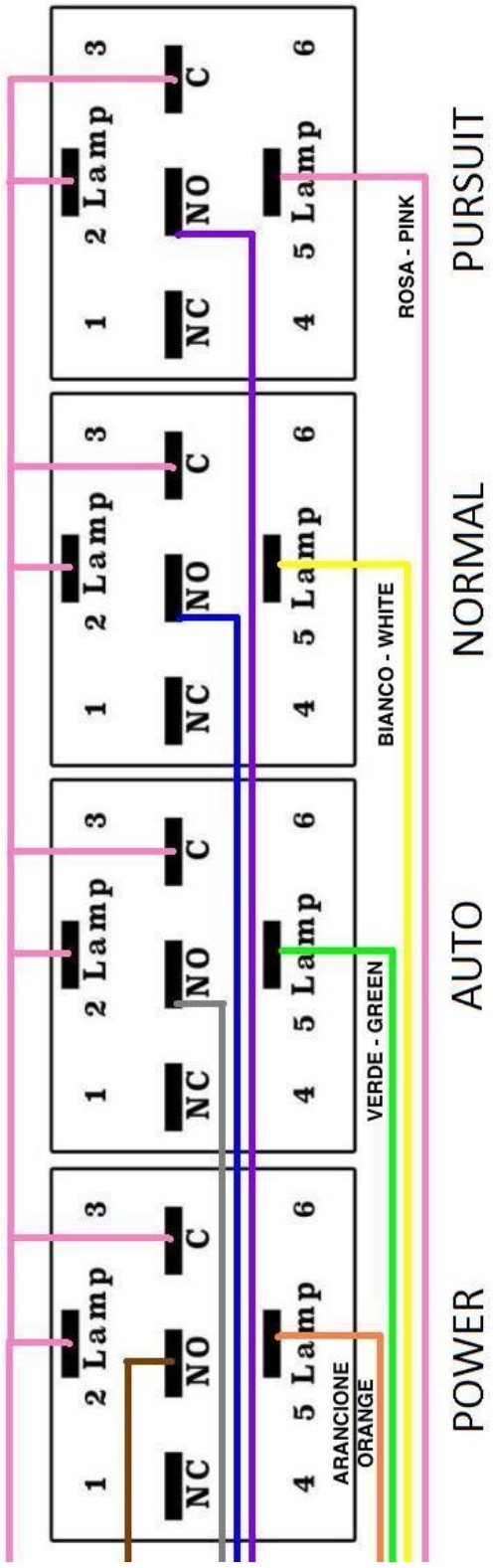
2. Connect the 24 ways connector wires with ID "E" like this:

BROWN WIRE goes on "normally open" (NO on the button) of POWER button
GRAY WIRE goes on "normally open" (NO on the button) of the AUTO button
BLUE WIRE goes on "normally open" (NO on the button) of the NORMAL button
PURPLE WIRE goes on "normally open" (NO on the button) of the PURSUIT button

3. Once completed the previous steps you have to connect the remaining wires (ID"F")for the button lights. Proceed like this:

ORANGE WIRE goes on Lamp of POWER button
GREEN WIRE goes on Lamp of AUTO button
WHITE WIRE goes on Lamp of NORMAL button (in the wiring diagram the yellow color has been used instead of white for printing purposes)
PINK WIRE goes on Lamp of PURSUIT button

⚠ATTENTION: Check your connections several times; a wrong wiring may cause serious damages to the electronics!



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ELECTRONICS POWER UP

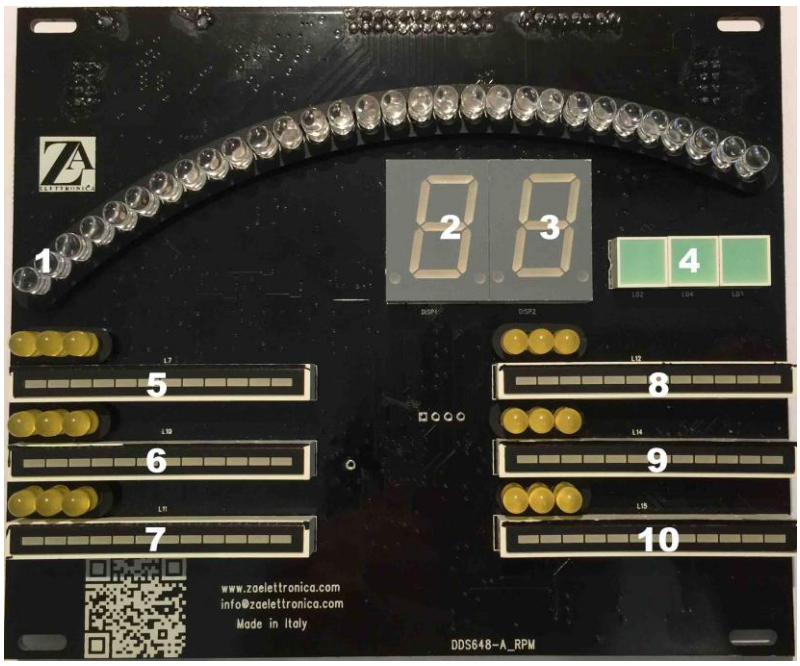
When the electronics are all connected to the power no LED will turn on, they'll be in a standby mode waiting for the signal of the POWER button of the PANP. If the previous instructions have been followed in the right way the electronics will turn on pressing the POWER button.

Pressing the button POWER one more time the electronics will go back in standby, waiting for the POWER signal again.

Therefore pressing the POWER button does not turn the electronics off, it simply puts them in standby.

It is advised to connect the main power feed on the ignition to prevent any chance of levaing the electronics connected for long periods when the car is not used. This to avoid any unwanted battery drain. If left in standby even if the consumption is a few milliampere/hour it is possible to drain the battery in a few days.

Feeding the electronics with the ignition positive you'll make sure that everything is disconnected once the key is removed from the ignition cylinder.



This is the main board, called RPM for easy reference.

On this board we have:

- Power and signal input connectors on the back side;
- Revolutions Per Minute (numbers 1,2,3 in the picture above);
- Coolant temperature (number 9 in the picture);
- Oil pressure (number 10 in the picture);
- PANP input/output;
- Power management circuit for power on/power off mode (no need of external relays);
- USB socket for firmware updates;
- 4 mounting holes.

On this board all the signals from the original cluster are processed by the microprocessor which then process them converting the analogic data into a digital algorithm shown on the electronic displays of these electronics. Let's see the details.

In the red 7-segment displays (numbers 2 and 3 in the picture) the RPMs are shown. Only the thousands and the hunderds are shown. To get the exact value you'll have to multiply the value by 100.
For instance if the display shows 12 the engine is spinning at 12x100 = 1200 RPMs.
There's also an ark (number 1 in the picture) which moves simultanously with the revolutions of the engine.
The reading of the value on this ark is not direct and requires the aluminium overlay that can be ordered on our website: http://www.zaelettronica.com/ZA_elettronica/Overlay.html
Depending on what engine is installed on your car you need to set up the electronics choosing between 3 different options: 4, 6, 8 depending on the number of cylinders of your engine.

In the RPM board there are 6 lighted bars with two colors; each bar has 8 green LEDs and 4 red LEDs. They are numbered from 5 to 10 in the picture above. Number 9 traditionally shows the coolant temperature, number 10 shows the oil pressure.

The values of:

- Coolant temp. (RPM board)
- Oil pres. (RPM board)
- Fuel (MPH e 3 ROW boads)

have all been calibrated from the factory ed shouldn't require any other adjustments. If further adjustments are required check number 29 of this manual.

Also the coolant temperature can be shown (in numeric mode) on the message center of the MPH board;

⚠ ATTENTION: a wrong calibration from the user leads to a wrong reading in the message center

Reaching the first red LED on the bar number 9 (in the picture on page 16), indicates the temperature level for the correct operation of your thermostat, the second red LED shows the activation of the solenoid (where equipped). If you see the whole red LED bar lit that means that the coolant is overheating. Stop your car immediately.

All the values can be seen real time on the message center menue (A MODE) to find out more check pace 19 of this manual.

For the oil pressure instead the red zone is completely normal and indicates no malfunctions at all, the whole bar will be used from the first to the last LED exactly as it happens on the analogic gauge. This value can be seen real time on the message center menu as well.

The three LED arrays (number 4 in the picture) are the backlight for the RPM label on the overlay.

LED bars from number 5 to number 8 have no specific function, they just scroll back and forth like they did in the show. In the future they may be used for other readings, the firmware upgrade is totally free using the USB socket on the board.

The firmware upgrade is an easy and immediate solution for new future function implementations. For this operation check number 41 of this manual.

⚠ ATTENTION: CHECK CAREFULLY THE WIRINGS AND THE ACCURACY OF THE SIGNALS BEFORE CONNECTING THE ELECTRONIC BOARD!

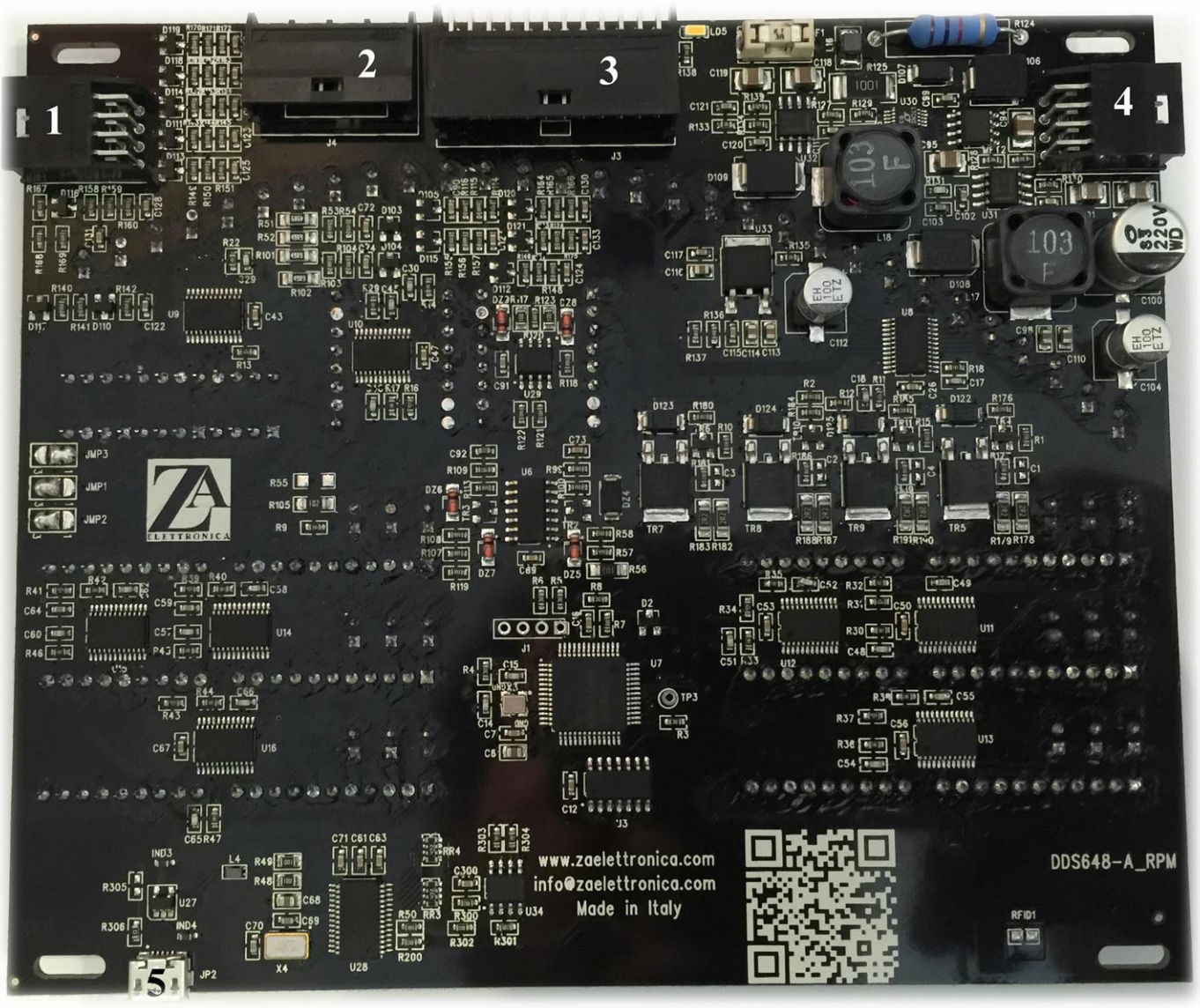
⚠ DANGER OF DAMAGE! ⚠

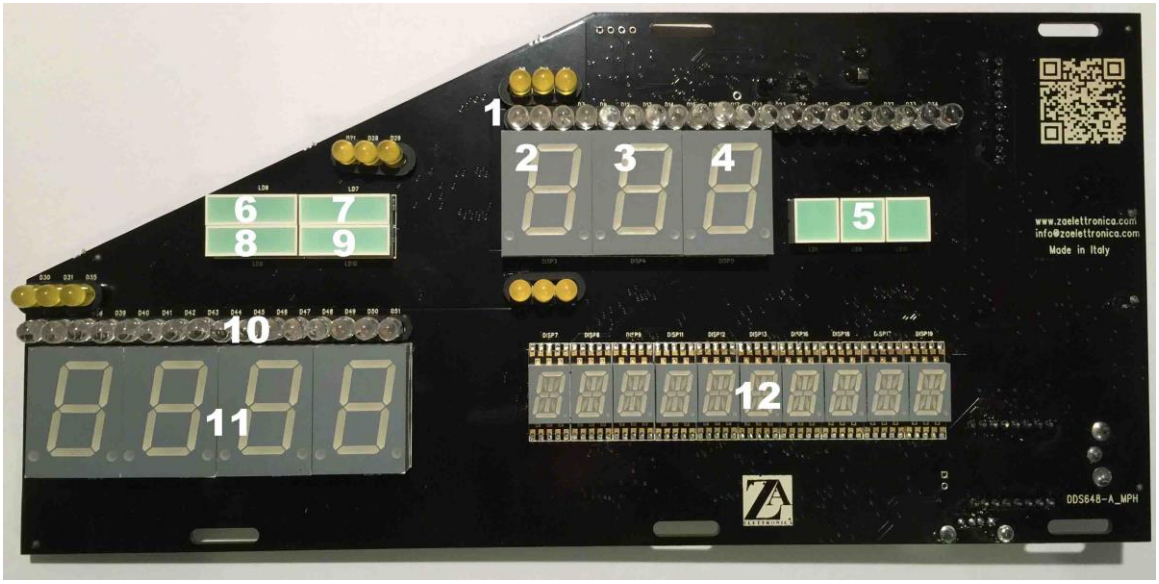
RPM BOARD CONNECTIONS:

On the backside of the RPM there are 4 type MODU 2 connectors, 2 on the sides and 2 in the center.
Watching the board on the backside, as in the photo below, we have (refer to the numbers on the photo):

1. CAN-BUS CONNECTOR that connects the 6 ROWS board
2. CAN-BUS CONNECTOR 8 pole connector for the cars sensors (as from schema on page 11)
3. CAN-BUS CONNECTOR 24 pole connector for the cars sensors (as from schema on page 11)
4. CAN-BUS CONNECTOR that connects to the VOICEBOX board
5. MICRO USB CONNECTOR for firmware update

It is impossible to exchange the connectors and the connection way since they are different one from the other.





The MPH board is maybe more complex under the engineering profile compared to the other boards. It has a microprocessor too that cooperates with the one on the RPM board. Informations are exchanged with a CAN-BUS protocol.

In this board we have:

- A mp3 player with a slot for an external memory;
- An RCA connector for audio output;
- Speed indicator (numbers 1, 2, 3, 4 in the picture above);
- Turning signal light, running lights, hi-beam light (numbers 6, 7, 8, 9 in the picture above);
- Fuel level (number 10 in the picture);
- Trip meter (number 11 in the picture);
- INTERACTIVE MESSAGE CENTER (number 12 in the picture);
- 5 mounting holes.

The horizontal bar (number 1 in the picture) lights up progressively when the speed increases or decreases. The three 7 segment red displays (number 2, 3, 4) instead give the speed value in KM/H or MPH depending by the setup configuration in the menu.
These electronics is precisely calibrated by the factory. However it is possible to tune the calibration for custom needs. For this procedure please check page 29 on this manual. These electronics has a maximum speed to 200 (both KM/H and MPH). This is to match the bar number 1 along with the speed. At 100 KM/H or 100 MPH the bar will be exactly in the middle.

The three LED arrays (number 5 in the picture) are the backlight for the MPH label on the overlay.

Green LEDs in the picture numbered 6, 7, 8, 9 are meant for specific uses:

- 6 and 7 are respetively left and right turn signals
- 8 running lights,
- 9 high beams light.

These are automatically interfaced with the message center, we will see it later (C mode – warning)

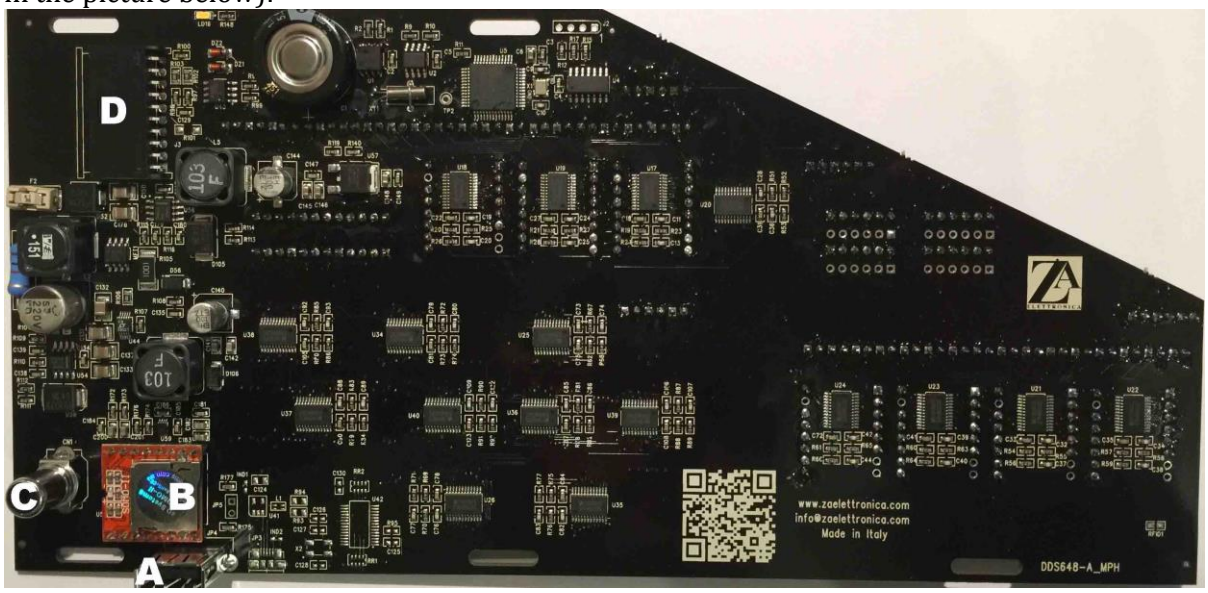
The fuel level (number 10 in the picture) has been calibrated in a way to avoid continuous level changing during the regular operation of the car. The reading is made 100 times per second but the average is spread in 5 minutes. This way the LED indicator doesn't go crazy on every turn like the original gauge.

The block number 11 in the picture composed by four 7 segment red displays shows the trip meter. To reset the meter hold the PURSUIT button of the PANP for 10 seconds

To reset the odometer press and hold the PURSUIT button of the PANP for 10 seconds.

MPH BOARD CONNECTIONS

Looking at the board on the back side like in the picture we will have (referring to the letters in the picture below):

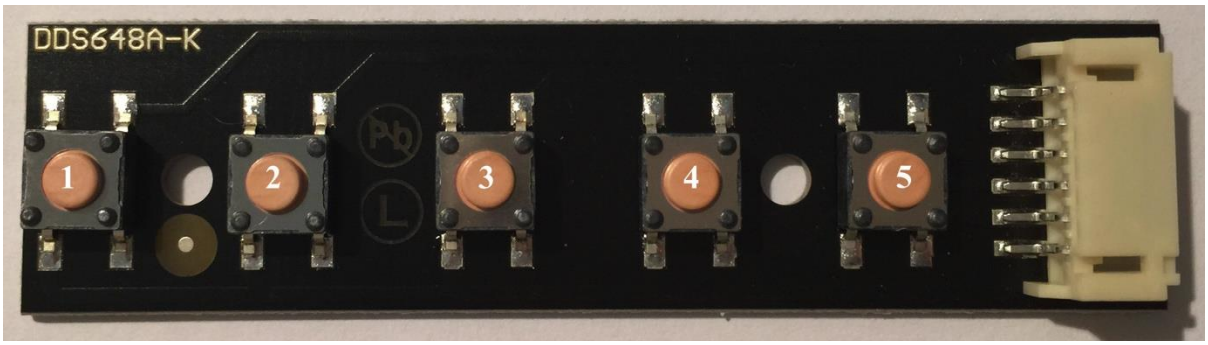


A. a USB socket for a standard flash drive containing the mp3 sounds;
B. SD card slot for the MP3 player
C. RCA connector to connect a standard 4 ohm speaker for the MP3 player reproduction; the voicebox will light up automatically during the sound reproduction.
D. Voice Box connection using the appropriate harness included in the box.

MESSAGE CENTER

This is the part we're proud the most. In the picture the display is number 12 composed by "UK flag" style LEDs; it is embedded in the MPH board, but it is a stand-alone item for its features. At today we have no notice of individual or companies that decided to use such a resource to provide information about the status of the car; ZA ELETTRONICA did. So we can read total ML (or KM), the percentage of available fuel, coolant temperature (°F or °C), oil pressure and even oil change alerts. Since you can't keep looking at all the gauges while driving the display also works as a "warning monitor".

The little keypad in the box (TO CONNECT TO THE 6 ROWS BOARD) has 5 buttons for the following functions (when not used in menu mode shown later).



BUTTON		***FUNCTION***
[1]	***=***	***NOT USED, reserved to go into the menu;***
[2]	***=***	***Cancels repetitive warnings, until next power up of the system;***
[3]	***=***	***Steps back of one message;***
[4]	***=***	***Stops the message. If pressed twice it steps to the next message;***
[5]	***=***	***Switches from Mode A to Mode B/restarts the loop (when interrupted)***

Mode B (show)

Phrases from the show will appear, (selectable with button [5]), with an automatic loop; to block them press button [4].

Every time a button is pressed ([4] forward, [3] backward) the phrases will step up/down of one single step but it won't reactivate the loop

However in case of emergency warning message will appear (mode C).

Mode A (Car Values)

It is the default mode. If you are in another mode it is possible to activate it pressing button [5] displaying the values described below in an automatic loop; to hold the view of a shown value press button [4].

Every time a button is pressed ([4] forward, [3] backward) the phrases will step up/down of one single step but it won't reactivate the loop.

To reactivate the sequence press button [5].

MODE A VALUES:

EGT:

It is shown in °F or °C depending the settings in CAR_SETTINGS.

If the temperature is below 40°C it'll show the message "EGT COLD".

Es.: "EGT 90"

VBATT:

Shown in Volt with one decimal, es. 13.5V.

The calculation considers the presence of the general protection diode. If you power up the electronics without the diode the value will be 0.7V redundant.

Es.: "VBATT 13.5V"

FUEL:
Shown as percentage, 0% - 100%
Es.: "FUEL 100%"

OIL (pressure):
It shows numbers from 3 to 99; if the value is beyond 99 it'll show the message "OIL HIGH P".
It shows the measuring unit after the value to make sure it is pressure.
Es.: "OIL 30 PSI"..

OIL (service):
It indicates the Miles or the KM left before performing an oil change previously set. It is identified with the suffix "SRV" and the value set (which decreases while running on the road)
Es.: "SRV -15000" → means that there are 15.000 Miles or KM left (depending by the unit choosen at the beginning) for the SERVICE. When the SERVICE is PAST DUE, the little minus symbol in front of the number – will disappear, and the Miles or Km (depending by the unit choosen at the beginning) will start to increase after reaching the SERVICE mileage.

Odometer:
It shows the total mileage of the car. Limited to 10 numbers. No decimals present.
Es.: "ML 0.000.000".

Mode C (emergency/warning)

The message appears when the event occurs the unit has been programmed for. If you turn your turning light on for instance in the message center it'll be shown an appropriate message. All the warning messages will disappear as soon as the problem is fixed and doesn't return for a certain number of seconds. Therefore it is normal to have a little delay, for instance, when the turning light gets disengaged.

To avoid the message to appear press button [2].

⚠ ATTENTION: Pressing button [2] to avoid warning messages, the electronics will ignore them till successive power up. ⚠
In case of more warning messages at the same time they will be shown in sequence.
Messages available are:

a. Fuel level below the level set by the user
b. Coolant temperature over the level set by the user
c. Handbrake
d. Shift light ON
e. Fasten belts
f. Service Engine soon
g. High Beam
h. LH turning light
i. RH turning light

And all this happens while you do nothing, these electronics manage priorities automatically.

Some signals have the "programmable polarity" through the menu, and are ignored if the motor is turned off (to avoid the appearance of them, with ZAelettronica's set powered on, but original dashboard turned off) and these are:

- HandBrake
- Service Engine
- Shift

It is possible that the word HANDBRAKE appears for a few seconds after the engine has been shut off. That is perfectly normal. That word will turn off as soon as the engine terminates its revolutions and the display of the tachometer shows 00.

MP3 PLAYER

On the back side of the MPH board there's a MP3 player used by the electronics to play phrases during some events.
All the MP3 files must be stored in a directory called "01" (zero, one in numbers).

Inside that directory each file must have an ID name composed by three numbers in the first three characters, the rest of the name is not important. The extension is ".mp3".

This is the number list:

```
000 = DTMF_0              // The complete DTMF tone set uses numbers from 000 to 014
001 = DTMF_1
002 = DTMF_2
003 = DTMF_3
004 = DTMF_4
005 = DTMF_5
006 = DTMF_6
007 = DTMF_7
008 = DTMF_8
009 = DTMF_9
010 = DTMF_BUSY
011 = DTMF_DIAL
012 = DTMF_POUND
013 = DTMF_RINGBACK
014 = DTMF_STAR

015 = POWERON             // Startup DTMF sequence
016 = MOVIEOFF            // MOVIE power off track
017 = PRESENTAZ           // introduction track (after the startup sequence)
[... space available for future effects]

100 = MESSAGE_SPEED       // Message for speed limit warning
101 = MESSAGE_TEMP        // Message for overheating
102 = MESSAGE_RPM         // Message for over revving
103 = MESSAGE_FUEL        // Message for low fuel level
[... space available for other messages]

110 = SILENCE             // a half of a second silence track (mandatory)
```

Example of file names, only the first three caracters (numbers) are important, the others can be customized:

015_DTMF-poweron.mp3
016_movie_poweroff.mp3
100_message_speed.mp3
101_message_temp.mp3
102_message_rpm.mp3
103_message_fuel.mp3
110_silence.mp3

⚠ ATTENTION: DO NOT CHANGE OR REMOVE THE FIRST THREE CHARACTERS (NUMBERS) OR THE MP3 PLAYER WILL NOT WORK ⚠

ELECTRONICS MENU

ZA Elettronica, decided to eliminate trim-pot tune ups for a matter of practicality and seriousness.
This because:

1. Trim-pots tend to decalibrate and loose efficiency on a long term period;
2. Calibration of those trim-pots once the dash is completely installed gets tricky.

Therefore the choice fell on software based calibration settings.

To do so it is necessary to go into the MENU mode pressing button [1] on the keypad for 3 seconds. A good spot for the keypad normally is under the curved area below the shifter knob, or under the cluster area. Due to its reduced size the installation shouldn't be a problem.

Buttons recalls (number between brackets es. [1]) refer to the keypad.
Menu is in english language.

Browsing the menu:

Programming the electronics is done using the keypad. The menus of these electronics may be easy or FATHER – SON.
A few examples:

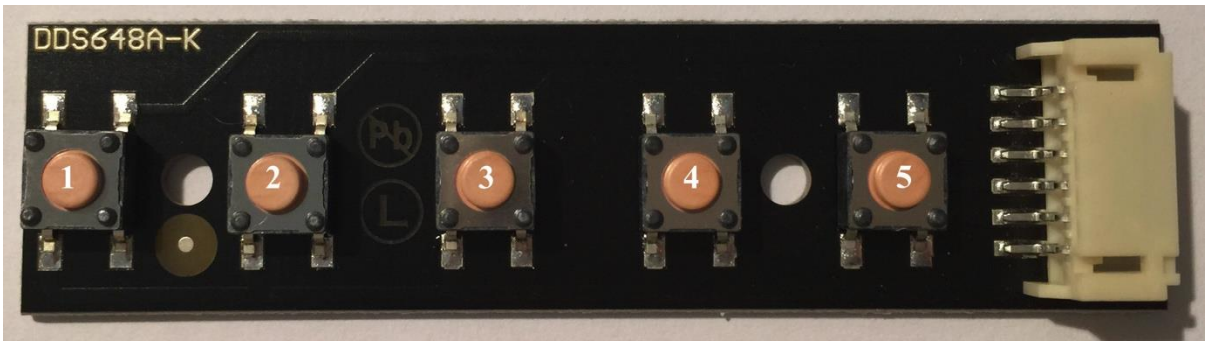
EASY MENU → VALUE adjustable through + or –

FATHER MENU >
SON MENU 1 → VALUE adjustable through + or –

SON MENU 2 → VALUE adjustable through + or –

The electronics set up is performed using the keypad included in the box.
There are 5 buttons available and they have the following functionality (depending on the menu you're into):

BUTTON		***FUNCTION***
[1]	***=***	***menu access***
[2]	***=***	***"+" or UP***
[3]	***=***	***"-" or DOWN***
[4]	***=***	***exit***
[5]	***=***	***NOT USED IN THIS MODE. Reserved for A/B mode.***



- Pressing [1] for 3 seconds the first voice of the menu appears;
- Pressing buttons [2] and [3] you can choose the voice of the menu to adjust;
- When the desired voice is shown, pressing [1] one more time allows adjusting (parameter flashes);
- Buttons [2] and [4] now adjust the parameter;
- To confirm the adjustment press button [1];
- Once done it is possible to regulate another prameter using buttons [2] and [3];
- Button [4] instead returns to the previous menu.
- Press [4] until you're in mode A or B. The RPM board will blink to confirm that the settings have been saved.

If the parameter you are in is a "father menu", indicated by a little arrow on the right side of the voice, presing [1] takes you into a corresponding lower menu level.
Pressing [4] takes you back to the previous level (if pressed once again, being on a main level, it closes the menu).

⚠ATTENTION: Savings happen only when the main menu is closed using button [4] ⚠

INTRODUCTION SETUP

These electronics reproduce an mp3 file at the startup typically associated to the car introduction. Such option can be enabled or disabled by the user.
Pressing button [1] the word PRESEN and the factory setting appear. Press [1] to get into the adjusting mode, the factory setting will flash (press [2] to skip this setting).
Use buttons [2] and [3] to change the options (ON and OFF).
Press [1] to confirm the choice. The voice PRESEN appears again with the option chosen by the user.

POWER ON SETTINGS

There's no unique start-up sequence in the show. Some of the fans prefer to see the whole dash on when they press the POWER button while the voicebox and countdown perform the

sequence; others prefer to have the sequence first and only at the end see the rest of the dash coming on. Any decision would have affected part of the users so I decided to include both the sequences in this menu.

Pressing [2] from the previous selection the voice PON and its factory setting will appear.
Press [1] to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to scroll the options CLASS or FAST
CLASS: Will perform the countdown sequence first and then the rest of the electronics
FAST: the whole dash will come on while voicebox and countdown are performing the sequence.
PRESS [1] to confirm your choice. Voice PON appears again with the option chosen by the user.

POWER OFF SETTINGS

ZA ELETTRONICA electronics has two power off modes:
1. Like in the show from the episode A GOOD KNIGHT'S WORK (default)
2. ON/OFF

Pressing [2] from the previous selection the voice POFF and its factory setting will appear.
Press [1] to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to scroll the options CLASSIC (mode 2) or MOVIE (mode 1).
PRESS [1] to confirm your choice. Voice POFF appears again with the option chosen by the user.

SPEED SETTINGS FOR SWITCHING FROM AUTO-NORMAL TO PURSUIT ON VOICEBOX AND PANP BUTTONS

Pressing [2] from the previous selection the voice PURS and its factory setting will appear.
Press [1] to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to adjust the speed you desire the voicebox (and PANP buttons) automatically switch from NORMAL/AUTO to PURSUIT.
As soon as the speed of the car goes below the chosen value the electronics will automatically switch it back to the previous status.
PRESS [1] to confirm your choice. Voice PURS appears again with the option chosen by the user.

MP3 EVENTS SETTINGS

In this menu it is possible to set up the values that engage the mp3 files. This is the first FATHER-SON menu.
Pressing [2] from the previous selection the MP3 WARNINGS> voice will appear
Press [1] to get in the lower level menu (son menu).
([2] to skip the selection without modifications and to go to the next lower level menu)

In the message center the SPEED voice will appear
This setting is necessary to set the speed limit MP3 warning message.
Press [1] to adjust, factory value will flash.
Use buttons [2] and [3] to choose the desired value.

Press [1] to confirm the choice.
Press [2] to step forward.

In the message center the RPM voice will appear
This setting is necessary to set the rev limit MP3 warning message.
Press [1] to adjust, factory value will flash.
Use buttons [2] and [3] to choose the desired value.
Press [1] to confirm the choice.
Press [2] to step forward.

In the message center the TEMP voice will appear
This setting is necessary to set the temperature limit MP3 warning message.
Press [1] to adjust, factory value will flash.
Use buttons [2] and [3] to choose the desired value.
Press [1] to confirm the choice.
Press [2] to step forward.

In the message center the FUEL voice will appear
This setting is necessary to set the fuel capacity limit MP3 warning message.
Press [1] to adjust, the led bar above the odometer display will show the adjusted value instead of the real fuel reading to show to the user the exact led setopoint.
Use buttons [2] and [3] to choose the desired value.
Press [1] to confirm the choice.
Press [2] to step forward, back to SPEED settings
Press [4] to step out of the son menu. MP3 WARNINGS > will appear again

TIME SETTING

Having pressed [2] from the previous selection, the TIME voice will appear along with the actual time.
Press [1] to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to adjust the time. If held they will make the minutes scroll faster.
Seconds will be set to 00 the moment you close the menu.
Confirm your choice with [1].
Press [1] to confirm your choice. The voice TIME along with the actual time appears again.

LED DIMMING SETTING

Indipensable at night this setting allows the dimming of all the LEDs of all the boards including the voicebox and turns off the countdown lights when you turn your car lights on.
Having pressed [2] from the previous selection, the DIMMER > voice will appear.
Press [1] to access the son menu. ([2] to skip this and step to the next menu) the VALUE voice and the factory value will flash.
Press [1] to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to choose the desired value.
The values go from 1 to 10; 10 represents the MAXIMUM brightness, 1 is the MINIMUM. Below value 3 only the RPM and MPH boards remain lit, all the other boards will turn off so that only the important car information are shown. In this mode the voicebox V-meter will still be active.
Press [1] to confirm.

Press [2] and COUNT DOWN will appear along with the factory settings.
Press [1] and you can choose between two options:

1. ON leaves the countdown lights on even if the dash is dimmed,
2. OFF turns it off.

Use buttons [2] and [3] to choose the desired value.
Press [1] to confirm the choice.
Press [4] to close the son menu. DIMMER voice appears again.

OIL CHANGE SETTINGS

Having pressed [2] from the previous selection, the OIL WARN > voice will appear.
Press [1] to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to choose the desired value.
Press [1] to confirm.
When the SERVICE is past due (km and miles are made over the desired distance) the OIL light on the voicebox will flash; this will happen until the reset procedure is performed (next step).

OIL CHANGE RESET

Press [2], the voice CLEAR will appear
Press [1] to confirm, the option will now blink.
Use [2] and [3] to choose YES or NO.
Choosing YES and confirming with [1] the value is reset to the previous chosen setting.
Press [4] to close the son menu. OIL CHNG voice appears again.

VOICE BOX V-METER CALIBRATING.

If desired it is possible to change the amplitude of the voicebox v-meter (picture 2 page 34). This "father" menu has two "sons" menu to regulate the amplitude of the voice box depending on the separate inputs (MP3 or AUX, this last one normally reserved to the computer or to an external speaker), lets see 2two firsr

Having pressed [2] from the previous selection, the VOICE BOX > voice will appear.
Press [1] to adjust. ([2] to skip this) The voice MP3 VOL and the set value will appear
Use buttons [2] and [3] to regulate the MP3 volume.
Values go from 1 to 20, where 1 is the quietest and 20 in loudest.
Press [1] to confirm.

Press [2] to step forward and the voice MP3 LEV with the value will appear.
Press [1] to adjust. ([2] to skip this)
Use buttons [2] and [3] to regulate the amplitude of the voicebox v-meter move when used for audio warnings.
Values go from 1 to 10, where 1 is the minimum and 10 is the maximum.
Press [1] to confirm.

Press [2] to step forward and the voice AUX LEV with the value will appear.
Press [1] to adjust in the son menu. ([2] to skip this)

Use buttons [2] and [3] to regulate the amplitude of the voicebox v-meter move when used for auxiliary audio source.
Press [1] to confirm. AUX LEV appears again

VOICEBOX MODE

This electronic set has the function to setup the identity of the voicebox choosing from KITT or KARR. The voicebox will act accordingly to the identity choosen (Attention, the bars will change only the movement not the color)

Press [2] to advance in the menu and MODE will show up with a preset value
Press [1] to enter in the submenu to change the value. ([2] to go ahead without changes)
Use buttons [2] and [3] to change the values of the width of th v meter of the voicebox
Press [1] to select the value desidered. MODE will show up with the new value
Press [4] to exit the submenu, VOICEBOX> will show up

MENU ROWS – SCAN SPEED AND 3 ROWS MODE

The scan speed of the bars of the 6 rows and 3 rows board can be set as you like. Only the bars which do not have specific function can be changed. It has been also introduced in the 3 row board green and red, the scan mode as like the other 3 row board, the one with all the red leds.

SCAN SPEED

Since it has been pressed in the previous selection button [2], the ROWS> menu will show up;
Press [1] to enter the submenu ([2] to go ahead without changes), the menu SPEED and the set value will show up.
Press [1] and the predefined value will start blinking (2 to go ahead without changes).
Use button [2] and [3] to change to the desired value.

Below value 12, all the ROWS will remain lighted without any scan, this like it has been seen in some episodes of the series.
You can verify your choice in real time. Press [1] to confirm the value of your choice.

Advises on how the electronic set "thinks"
Speed is a value directly proportional (the low numbers correspond to a low speed). The values are from 11 the lowest to a max of 77.
The meaning of the ten and unit value are the following:

- *The ten value (from 1 to 7) affects the random sequence of the bars*
- *The unit value (from 1 to 7) affects the base speed on which the random sequence acts on*

For example if you select value 71 the random bars act very differently (sometimes very slow, some times very fast). If you select 17 the bars will act pretty fast but randomization will be insignificant (speed will be constant).
Both speeds sum together, so also with 17 the speed will not be very high.

3 ROWS MODE

Press [2] and 3ROWS menu will show up with its preset value.
Press [1] to change value.
Use buttons [2] and [3] to select STD mode (with standard mode the bars will show the remaing fuel and istantaneous fuel consumption) or SHOW mode (with show mode will act as the other 3 row boards with a random scheme).
Press [1] to confirm the choice. 3ROWS will show up
Press [4] to exit submenu and ROWS will show up.

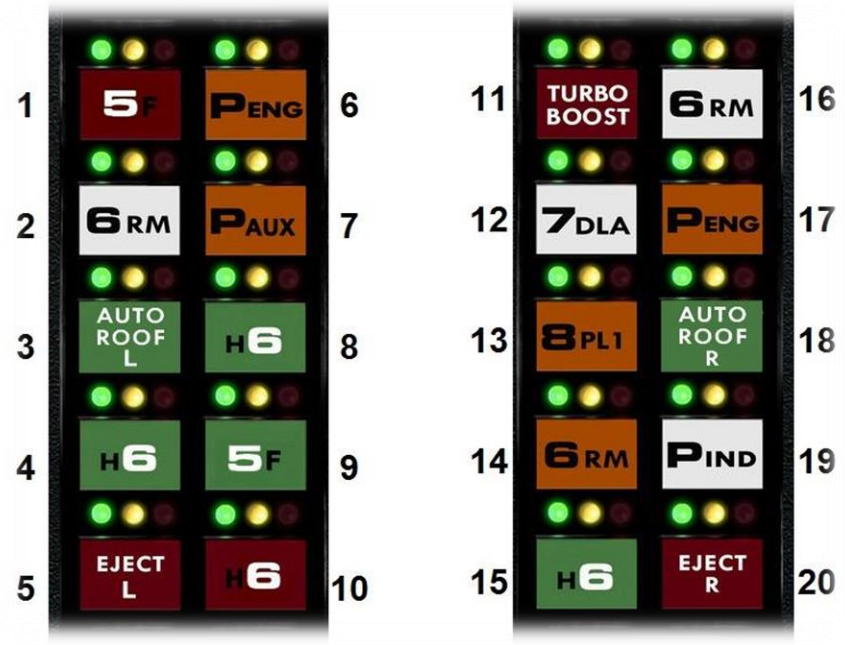
SWITCHPOD MENU

This menu is used to select the function desired for each switchpod button (relè, Mp3, both, none).

After pressing button [2] from the previous selection, SWPOD> will show up
Press [1] to enter the submenu (Press [2] to go ahead to the next submenu without changes)
SW01 will show up (it refers to button 1 on the top left of the left switchpod SW20 will be the last button in the bottom right of the right switchpod - **look the picture below** -)
Press [1] to change value and the predefined value will flash. Use buttons [2] and [3] to change values which are:

- Only Mp3
- Only Relè
- Relè + mp3
- None (reproduces a random dmtf tone)

Repeat the operation for each button. You can also use the firmware updater program (recommended) to select the function of each switchpod button. With the firmware updater program you can also decide how the relè works. For this function please refer to the specific users manual.



VIRTUAL TRIM-POTS:

ZA ELETTRONICA performs a factory adjustment, **we discourage any modifications.**

SPEEDOMETER.

Having pressed [2] from the previous selection, the TRIMMERS > voice will appear.
Press [1] to access the son menu. ([2] to skip this and step to the next menu).
The SPEED voice and the factory value will appear.
Press [1] again to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to choose the desired value. Compared to the factory settings a positive adjustment will show the symbol "+" while a negative adjustment will show the symbol "-".

FUEL

Having pressed [2] from the previous selection, the FUEL voice will appear.
Press [1] to access the son menu. ([2] to skip this and step to the next menu).
The SPEED voice and the factory value will appear.
Press [1] again to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to choose the desired value. Compared to the factory settings a positive adjustment will show the symbol "+" while a negative adjustment will show the symbol "-".

OIL

Having pressed [2] from the previous selection, the OIL voice will appear.
Press [1] to access the son menu. ([2] to skip this and step to the next menu).
The SPEED voice and the factory value will appear.
Press [1] again to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to choose the desired value. Compared to the factory settings a positive adjustment will show the symbol "+" while a negative adjustment will show the symbol "-".

COOLANT

Having pressed [2] from the previous selection, the EGT voice will appear.
Press [1] to access the son menu. ([2] to skip this and step to the next menu).
The SPEED voice and the factory value will appear.
Press [1] again to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to choose the desired value. Compared to the factory settings a positive adjustment will show the symbol "+" while a negative adjustment will show the symbol "-".

BATTERY VOLTMETER

Having pressed [2] from the previous selection, the VBATT voice will appear.
Press [1] to access the son menu. ([2] to skip this and step to the next menu).
The SPEED voice and the factory value will appear.
Press [1] again to adjust. ([2] to skip this) The factory setting will flash.
Use buttons [2] and [3] to choose the desired value. Compared to the factory settings a positive adjustment will show the symbol "+" while a negative adjustment will show the symbol "-".

Press [4] to go back to the father menu, the TRIMMERS > voice will appear again.

CAR SETUP:

In this menu it is possible to set up the general info of the car, like the number of cylinders and the units of measurements. Here we have a father menu and three sons.
Having pressed [2] from the previous selection the voice CAR SETUP > will appear.
Press [1] to access the son menus.

UNITS OF MEASUREMENTS SETTINGS

Having pressed [1] from the previous selection the voice SPEED with the factory value will appear.
Press [1] to adjust. ([2] to skip this), the factory value will flash.
Use [1] and [2] to select the desired options (kmh or mph)
Press [1] to confirm. The voice SPEED will appear again.

USE OF CYBERDYNE 8901

ZAelettronica uses the same original parameter of the car to calculate the run distance, hence 4.000 ppm (pulses per mile). Some vehicles earlier than 1985 do not have any digital transductors, they simply have a steel cable coming straight from the transmission that goes directly in the cluster. Those users are forced to use a sending unit called CYBERDYNE 8901 (http://www.summitracing.com/int/parts/cyb-8901/overview/). This unit is calibrated on 8.000 ppm. With this menu the electronics set on 8.000 ppm adapting to the new signal.

Having pressed [2] from the previous selection, the SENSOR voice and the factory value will appear.
Press [1] to adjust. ([2] to skip this) The factory value will flash.
Use buttons [2] and [3] to select STD or CYB.
STD is the setting to use normally WITHOUT che Cyberdyne unit.
CYB is the setting to use with the Cyberdyne.
Press [1] to confirm. The word SENSOR will appear again.

ENGINE SETTINGS

Having pressed [2] from the previous selection the voice CYLIND with the factory value will appear.
Press [1] to adjust. ([2] to skip this), the factory value will flash.
Use [1] and [2] to select the desired options 4, 6, 8.
Press [1] to confirm. The voice CYLIND will appear again.

COOLANT SETTINGS

Having pressed [2] from the previous selection the voice TEMP with the factory value will appear.
Press [1] to adjust. ([2] to skip this), the factory value will flash.
Use [1] and [2] to select the desired options °C or °F,
Press [1] to confirm. The voice TEMP will appear again.

DISPLAY SETTINGS

In some episodes of the show we can see that the numbers 6 and 9 on the display are missing the top (or bottom) segment.
With this menu you can decide whether you want to show those numbers with or without that segment.
Having pressed [2] from the previous selection the voice DISPLAY with the factory value will appear.
Press [1] to adjust. ([2] to skip this), the factory value will flash.
Use [1] and [2] to select the desired option, 6 and 9 with or without the segment.
Press [1] to confirm. The voice DISPLAY will appear again.

GREEN LED SETTINGS

The 4 green bars in the MPH board can be left on or off. With this setting you can decide if you want them on or off upon the event they have been programmed for.

Having pressed [2] from the previous selection the voice GREEN LED with the factory value will appear.
Press [1] to adjust. ([2] to skip this), the factory value will flash.
Use [1] and [2] to select the desired option 1 or 0.
If value 1 is selected the bars will be always ON and on the event (es. turning signal) they will turn OFF.
If value 0 is selected the bars will be always OFF and on the event (es. turning signal) they will turn ON.
Press [1] to confirm. The voice GREEN LED will appear again.

CLUSTER LIGHTS SETTINGS

Despite all the cars have the same cluster it may be necessary to invert the logic of some signals. Said logic can be managed with this menu. The standard values are already set from the factory. We discourage any modifications.

SHIFT LIGHT SETTINGS

Having pressed [2] from the previous selection the voice S_SHIFT with the factory value will appear.
Press [1] to adjust. ([2] to skip this), the factory value will flash.
Use [1] and [2] to select the desired options HI or LO.
Press [1] to confirm. The voice S_SHIFT will appear again.

SERVICE ENGINE SOON SETTINGS

Having pressed [2] from the previous selection the voice S_ENG with the factory value will appear.
Press [1] to adjust. ([2] to skip this), the factory value will flash.
Use [1] and [2] to select the desired options HI or LO.
Press [1] to confirm. The voice S_ENG will appear again.

HANDBRAKE SETTINGS

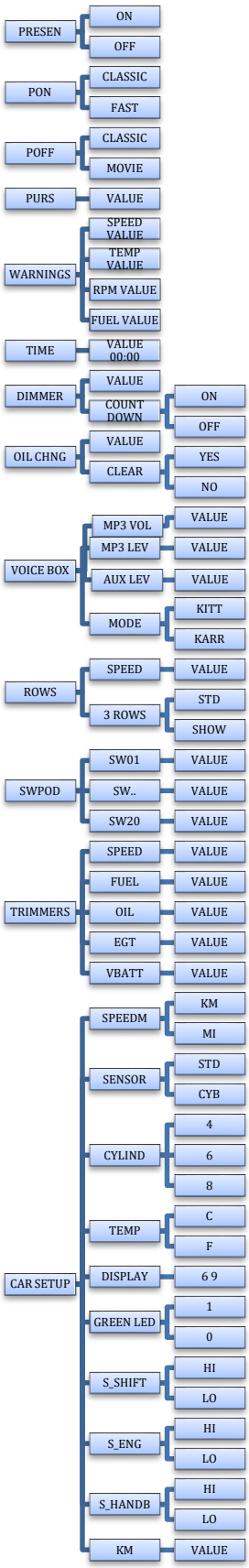
Having pressed [2] from the previous selection the voice S_HANDBB with the factory value will appear.
Press [1] to adjust. ([2] to skip this), the factory value will flash.
Use [1] and [2] to select the desired options HI or LO.
Press [1] to confirm. The voice S_HANDBB will appear again.

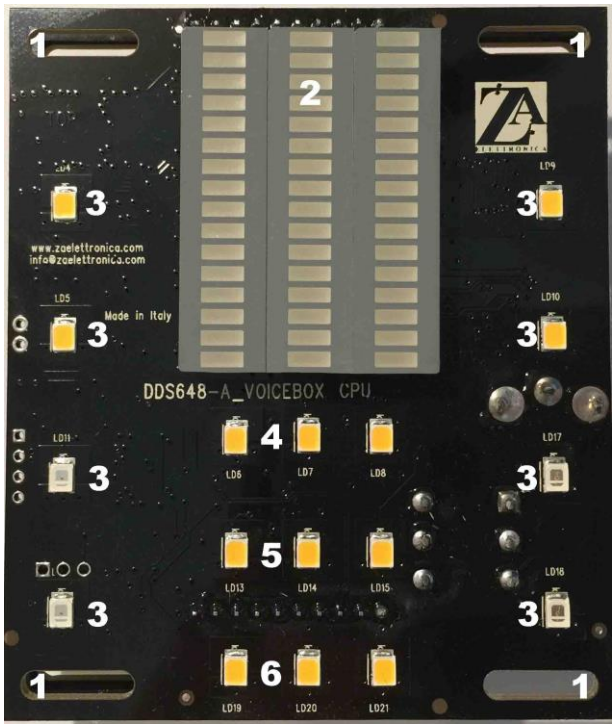
SETTING TOTAL KM OR MI

These electronics really count the distance that your car runs.
We found extremely usefull to show the real miles of your car.
We advise to write down the miles from your cluster before the installation of the dash.
Before doing that make sure if it is calculated in MILES or KILOMETERS.
If the car shows Miles and you want to use Kilometers (or vice versa) it is advised to set the unit of measurement in the same unit of the car. Then change the value that your car is showing on the cluster and in the end change again the unit of measurement matching your preferred criteria.

Having pressed [2] from the previous selection KM or MI (depending of the unit of measurement set previously) with the factory value (000.000) will appear.
Press [1] to adjust. ([2] to skip this), the factory value will flash.
Use [2] and [3] to modify the value. Holding the button will fast forward.
Press [1] to confirm. The voice KM or MI will appear again with the new set value.

Press [4] to go back to the father menu, the CAR SETUP > voice will appear again.





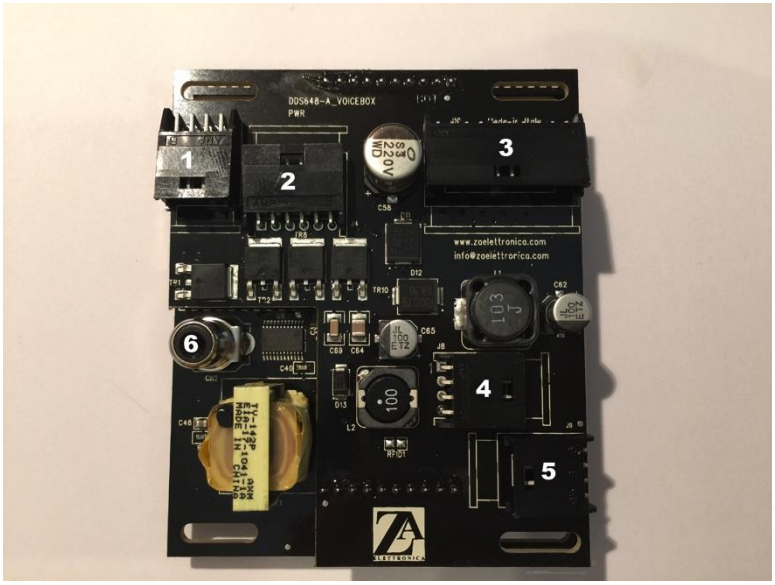
The ZA Elettronica Voicebox has been designed to be used with the plastic bezel made by KRW Enterpises. That cover may be purchased, other than the manufacturer website, on www.zaelettronica.com
The voicebox is made by two boards in a sandwich structure, one called CPU which performs the data elaboration, the other one called PWR where the power management takes place and all the CAN-BUS signals arrive.
In this board you'll find:

- 4 installation holes (in the picture above, number 1);
- 3 LED arrays for voice simulation with 16 segments (in the picture above, number 2);
- SMD LED for AIR, OIL, S1, S2, P1, P2, P4 backlight (in the picture above, number 3);
- SMD LED for Auto Cruise backlight (in the picture above, number 4);
- SMD LED for Normal Cruise backlight (in the picture above, number 5);
- SMD LED for Pursuit backlight (in the picture above, number 6);
- 6 CONNECTORS on the back side

VOICEBOX CONNECTIONS ON THE BOARD

Looking at the board on the back side, like in the picture on the side, you'll have (refer to the numbers in the picture):

1. CAN-BUS CONNECTOR to connect to the RPM board with the 8 pin cable included in the box;
2. CAN-BUS CONNECTOR to connect to the COUNT DOWN with the 6 pin cable included in the box;
3. CAN-BUS CONNECTOR to connect to the MPH board with the 10 pin cable included in the box;
4. CAN-BUS CONNECTOR to connect to the ZA ELETTRONICA Left Hand switchpod board with the cable that comes in the Switchpod Kit;
5. CAN-BUS CONNECTOR to connect to the ZA ELETTRONICA Right Hand switchpod board with the cable that comes in the Switchpod Kit;
6. RCA audio INPUT for the V-METER (voice) to connect to an external audio source (Computer, external MP3 player or other)

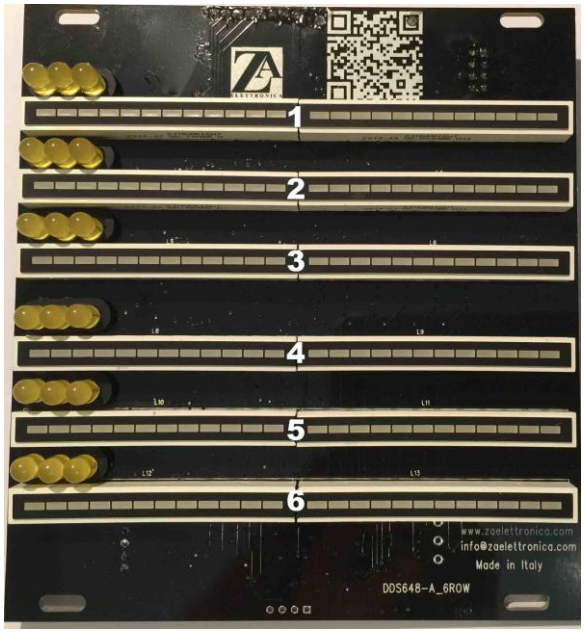


COUNTDOWN - VOICE BOX CONNECTIONS

With the harness included it is possible to drive the lights of the voicebox.

COLOR CABLE	DESCRIPTION
PINK	+12 VOLT (common for all)
ORANGE	GND (GROUND) LAMP 1 (POWER)
GREEN	GND (GROUND) LAMP 2 (MIN RPM)
WHITE	GND (GROUND) LAMP 3 (FUEL ON)
BLUE	GND (GROUND) LAMP 4 (IGNITORS)

6 ROW BOARD



The 6 row board is limited, for the moment, to play the light games like in the show. In the future that could be used to implement new functions, with an easy and free firmware upgrade.

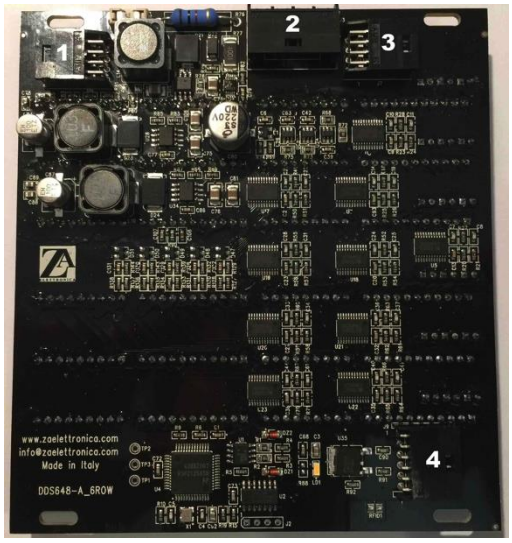
In this board you'll find:

- LED arrays for light patterns
- 4 CONNECTORS on the back side.

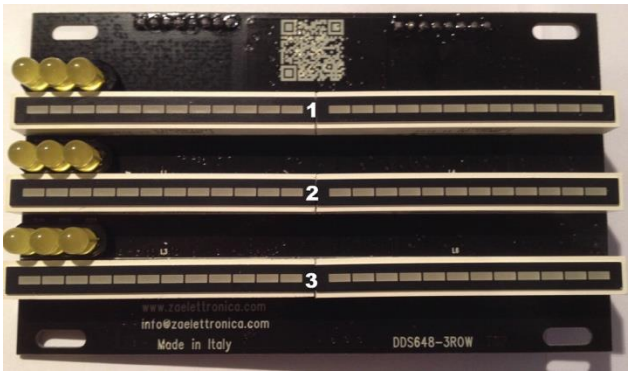
6 ROW BOARD CONNECTIONS

Looking at the board on the back side, like in the picture on the side, you'll have (refer to the numbers in the picture):

1. CAN-BUS CONNECTOR for future developments with ZA ELETTRONICA products;
2. CAN-BUS CONNECTOR to connect to the 3 ROW board with the cable included in the box;
3. CAN-BUS CONNECTOR to connect to the RPM board with the cable included in the box;
4. CAN-BUS CONNECTOR to connect ZA ELETTRONICA integrated Keypad.



3 ROW BOARD



There are two different kind of boards, one has all red led arrays, the other on has red and green led arrays. Normally the board with all red/green led is placed right next to the PANP buttons. The one with red led is placed right next to the previous one instead.

For an easier identification of the board with the red/green led we decided not to use the output connector (see picture)

The 3 ROW red/green board for the first time is not limited to the well known light games but it makes the functions FUEL GALLONS, MI GALLONS and RANGE ESTIMATE reality.

FUEL GALLONS, (in the picture the array pair numbered 1) simply a mirrored data of the fuel quantity in the car already shown on the red bar on the MPH board (see picture at page 19, number 10)

MI GALLONS (in the picture the array pair numbered 2) simulates the immediate fuel consumption of the car. A brute acceleration will make the indicator move rapidly, a smooth one will make it move gradually.

RANGE ESTIMATE (in the picture the array pair numbered 3) is based on the quantity of fuel left in the tank to estimate an available autonomy distance.

⚠ ATTENTION: REAL DATAS MAY BE LARGELY DIFFERENT BASED ON THE DRIVE STYLE, TO THE WEATHER CONDITIONS AND THE MODEL OF THE CAR. ⚠

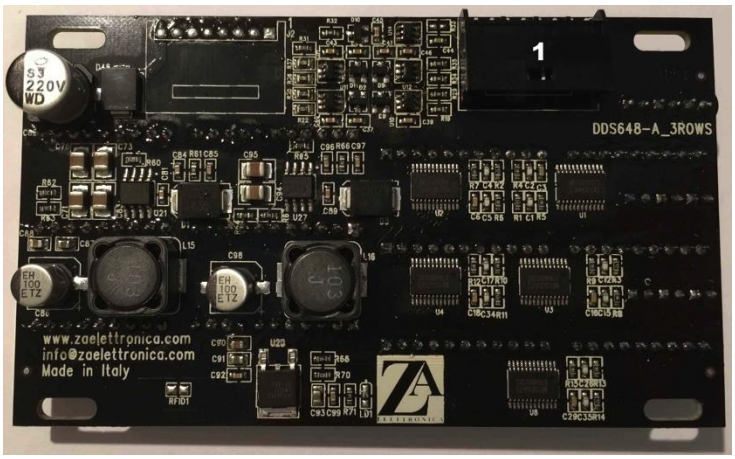
3 ROW BOARD CONNECTIONS

Looking at the board on the back side, like in the picture on the side, you'll have (refer to the numbers in the picture):

1. CAN-BUS CONNECTOR to connect to the 6 ROW board with the cable included in the box;
2. CAN-BUS CONNECTOR to connect to the 3 ROW board with the cable included in the box;

Looking at the board on the back side, like in the picture on the side, you'll have (refer to the numbers in the picture):

1. CAN-BUS CONNECTOR to connect to the 3 ROW board with the cable included in the box;



DIODE BASED BOARD PROTECTION

To avoid damages to the boards caused by polarity inversion (swiching + with -) the kit comes with an extra board to install prior the power supply. Even if every single board is equipped with a fixable fuse it is advised to install this board on the main power inlet along with a 3A fuse.

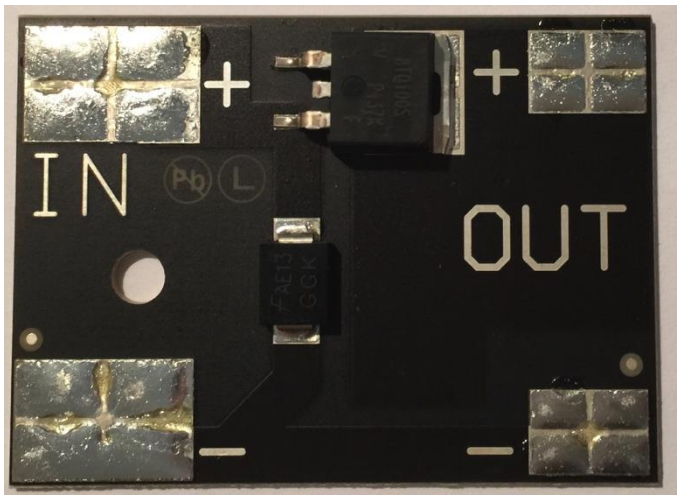
As you clearly see in the picture, the installation needs to be done with a soldering iron, making sure to solder the wires in the right way paying attention to:

INLET wires

OUTLET wires.

The INLET wires are the ones coming from the battery of the car to the inside of the dash (the ones that require the fuse mentioned above), while the OUTLET wires are the ones feeding the electronics included in this kit.

The board also has a hole for an easy installation to the dash.



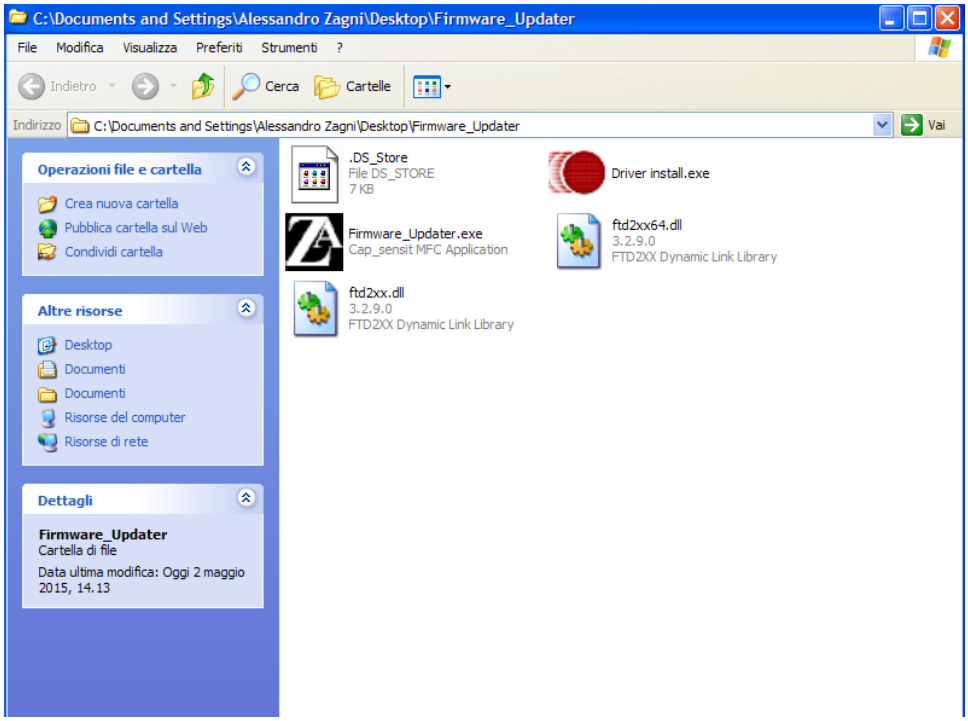
USB FIRMWARE UPGRADE

Ideas come alive from needs. These electronics came alive for my needs. It is totally expandable. In the future it may be possible to have firmware upgrades to achieve new functions or to fix bugs and errors that could occur.

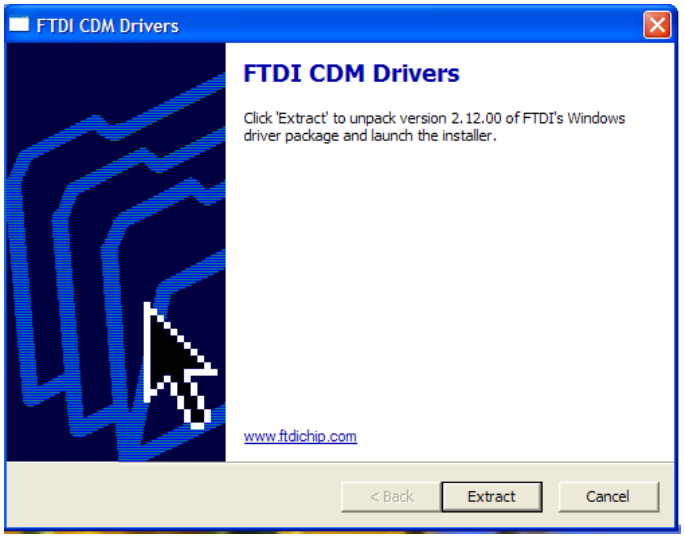
All that is free.

INSTALL FIRMWARE UPDATER ON PC

Fo to the link → http://www.zaelettronica.com/Download/Firmware_Updater.zip
Extract file, then copy in to your desktop

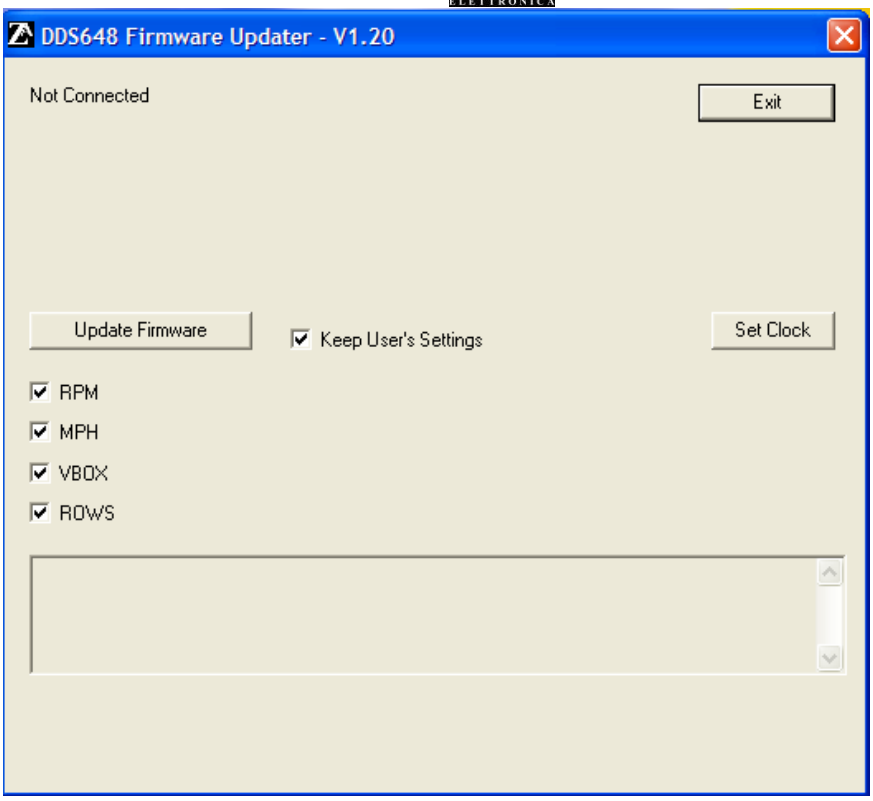


Run the installation file and install drivers, follow the signs.



After this procedure, launch the firmware updater.exe.

Once you open the program, connect the micro USB cable to the RPM board.



Wait the message: USB CONNECTED.

To upgrade the card, press UPDATE FIRMWARE.
This opens a folder where you have to choose the files to upload. For convenience, the folder opens in the same folder, FIRMWARE UPDATER, that you have on your desktop.
We suggest to save the updates in the same folder.

Once you choose the file, you'll notice that next to the text with RPM, MPH, VBOX and ROWS bars, appear that will move from red to green to indicate the progress of the procedure. Electronics, however, will be lit in sequence some LED confirming that the boards you are updating.

When finished updating the firmware in the box below you will see "VERY WELL DONE." You can now disconnect the USB cable to resume normal operation of the boards.

CLOCK SET function: it is used to set the time of your computer even in electronics.

PERSONALIZED PHRASES

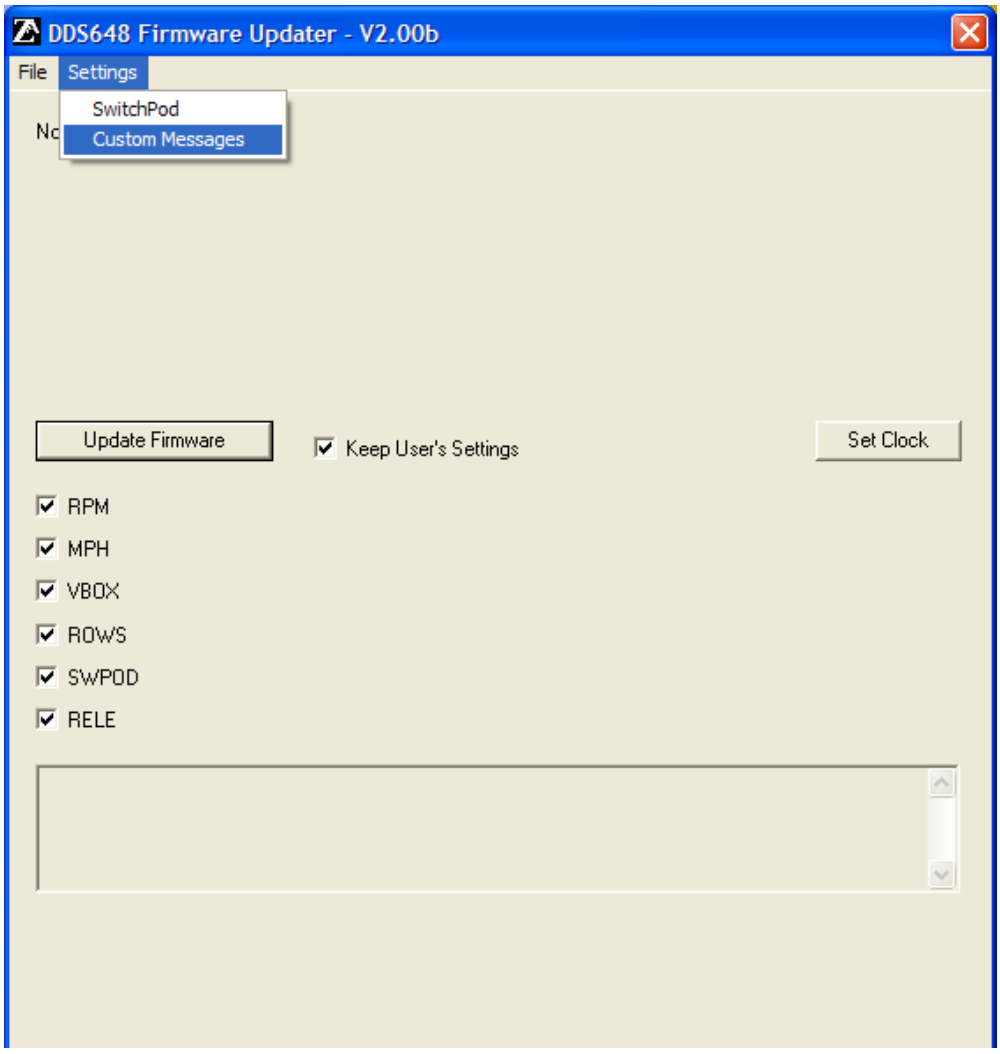
Because the Shift signal (refer to schema at page 12 of this manual) is not used by all cars, we have made it renameable as you like and shown in the message center.

USE ALWAYS A SIGNAL ACTIVATED BY A + 12Volts

It has been also introduced the function to have 5 personalized phrases (these phrases will show up as first in mode CAR VALUE – B)

To program these 5 phrases it is necessary to connect the electronic set to the computer with the usb cable and wait till the program reconizes the set. (you should have already installed the drivers as shown in the previous section).

1. Executed "Firmware updater"
2. Click on the "Settings" button
3. Click "Custom Messages"



At this point a window will open where you can write your 5 custom phrases that will appear in the message center when in mode "Car Value B" (see page 21 of this manual)
Also in this window you can write the custom phrases instead of the SHIFT message.

Once written with your custom phrases, press “OK” button to update the boards with your personlized settings. A success message will appear once done.

The system by default finds the boards settings so for example you have previously selected a word in “Message 1” at the next connection of the set to the pc, this will show up. To disable the phrases you can leave the message box blank.
It is not possible to leave the SHIFT box blank. If nothing is written the system will automatically show SHIFT again.