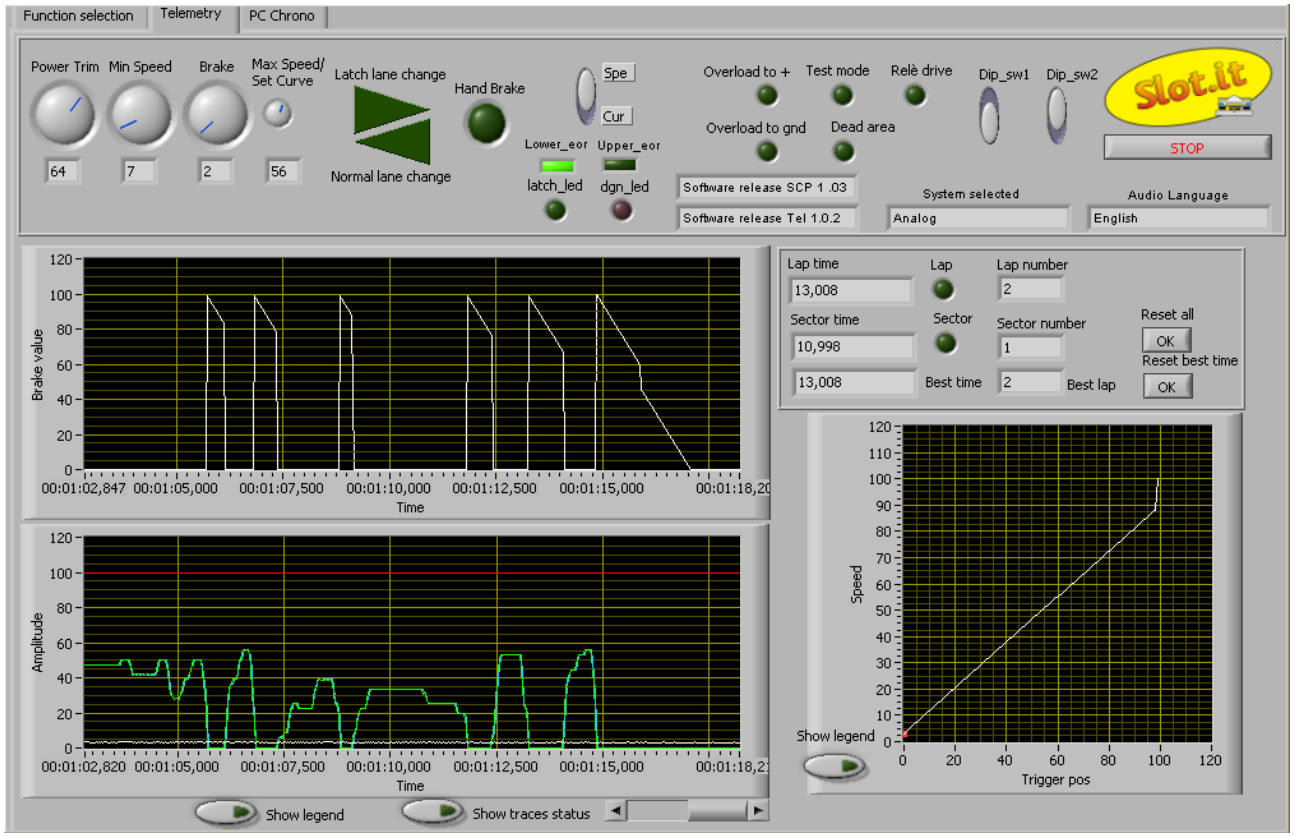
Live Timing Box PC Interface



The *Live Timing Box PC Interface* (also referred to as 'the software' in the manuals) software is a graphic interface allowing the user to carry out three types of operations:

- operations on the *Universal Live Timing Box* (also referred to as ULTB in the manuals) connected to the PC (e.g. language download or telemetry data download etc.);
- *postprocessing* operations on the data downloaded by the *Universal Live Timing Box* or saved during the *live* telemetry function;
- *live* telemetry operation and/or PC chronometer: both, together with a Slot.it SCP controller; or PC chronometer only, *together with any other type* of controller

To use the interface, the following software packages must be downloaded:

- *LTPCRunTime*: the 'runtime kernel' which must be installed once on the PC to run the *Live Timing Box PC Interface* application;
- *LTBoxPCInterface*: the actual user application.

N.B. The current version of *Live Timing Box PC Interface* can be run only on PCs with Windows 7 or XP operating system. Windows Vista is not and will not be supported, even if it might work.

General Index

1 Installation of LTPCRunTime....4
2 Use of the Live Timing Box PC Interface application....5
2.1 Driver installation....5
2.2 Use of the Live Timing Box PC Interface application to communicate with the Universal Live Timing Box....6
2.2.1 Use the application to communicate with the Universal Live Timing Box....8
2.2.1.1 Download Language function....9
2.2.1.2 Download telemetry data function....9
2.2.1.3 Erase stored data function....9
2.2.1.4 Telemetry function....9
2.2.1.5 Postprocessing function....11
2.2.1.6 Live Timing Box Setting....15
2.2.1.7 On-Line Live Timing Box PC Interface manual....18

1 Installation of *LTPCRunTime*

Download *LTPCRunTime.zip*. Decompress it and double click on *setup.exe* which can be found in the "*Volume*" directory. The installation of the *runtime kernel* begins. During this phase a series of windows will appear, as listed listed herein in order of appearance, with their meaning and the operations to be followed for each window:

1. *destination directory*: choose the installation directory for the *Live Timing Box PC Interface* application and the related products. We suggest not to change the proposed settings and push *"Next";*
2. *requested license agreement*: read it and if you agree choose *"I accept the License Agreement"* and push *"Next"*;
3. repeat the operation of step 2);
4. *summary of the software that will be installed:* this is the list of what is going to be installed; push *"Next"*. Now the installation begins, its progress shown in the following window;
5. *end of installation*: push *"Finish"*. When the last window appears push *"Restart"* in order to reboot the PC as required.

Once the PC has been restarted, it is possible to move on to the installation and use of *Live Timing Box PC Interface* application, with a double click of the mouse's left key on the icon of the application itself.

2 Use of the *Live Timing Box PC Interface application*

2.1 Driver installation

When connecting the *Universal Live Timing Box* to the PC for the first time, through a generic USB cable (type AB), Windows requires the installation of the driver needed to communicate between the *Live Timing Box PC Interface* application and the *Universal Live Timing Box* itself. The name of the driver is *LT*Box*Driver.inf* which should be downloaded from the Slot.it site, and placed in a known place (e.g. Desktop). Then do as follows:

1. choose the third option, *"No, not now"*, and click *"Next"*;
2. choose the second option: *"Install from a list or specific location (advanced)"* and click *"Next"*;
3. choose the last option: manual choice of the driver to be installed, then click *"Next"*;
4. by clicking *"Driver Disk"*, choose the driver to be installed (*LT*Box*Driver.inf*), then push *"Next"*;
5. click *"Continue"*: the driver installation starts;
6. click *"Finish"*;
7. to make sure that the installation has been successful, go to the *"Device manager"* of the PC and verify that, with the *Universal Live Timing Box* connected to the PC, the devices shown in figure 1 appear.

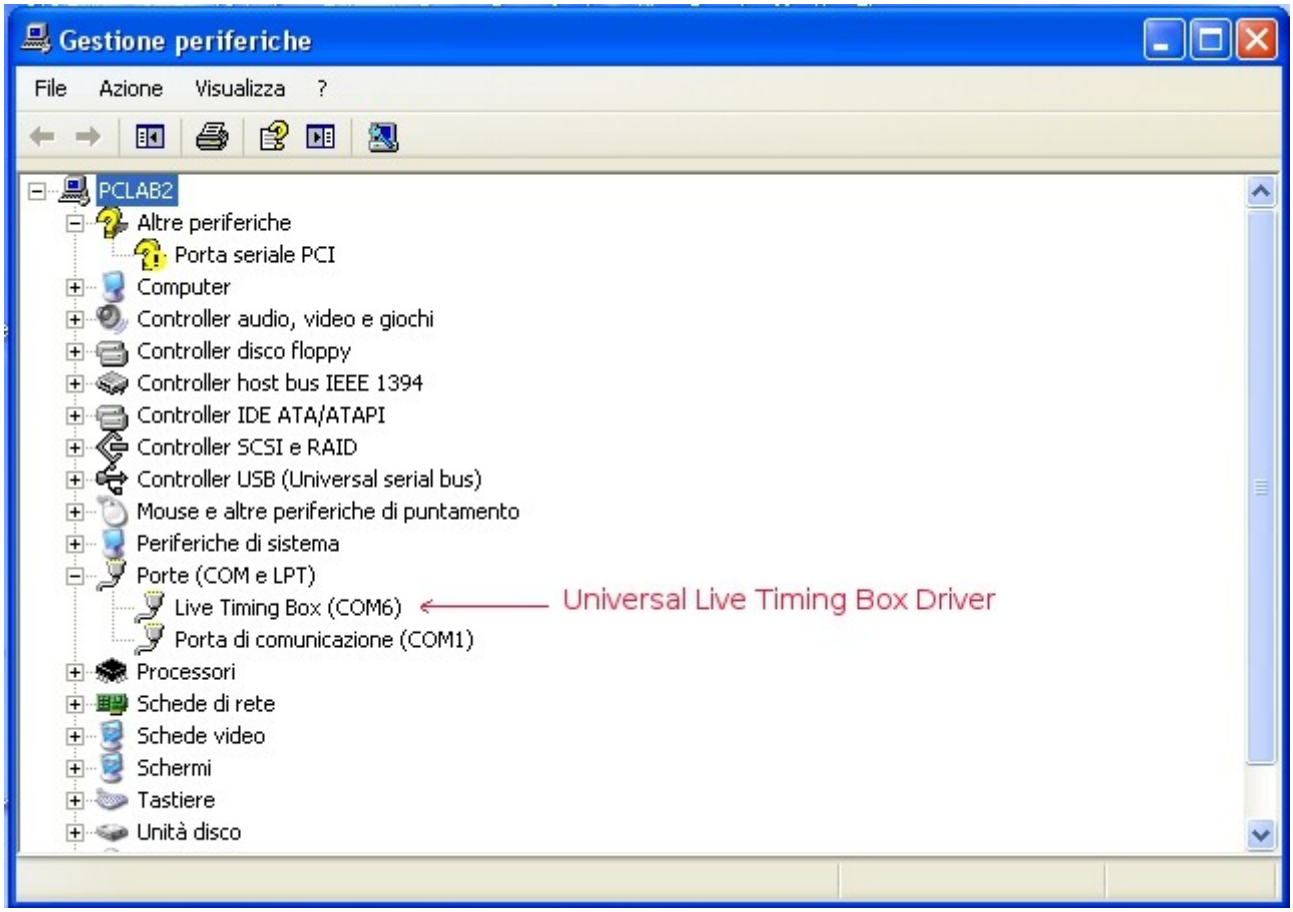


Figure 1: Live Timing Box PC Interface driver installation's result check

2.2 Use of the *Live Timing Box PC Interface* application to communicate with the Universal Live Timing Box

Launche the application *Live Timing Box PC Interface* with a double mouse click - like any other application.

If no *Universal Live Timing Box* (figure 2) is connected, connect the *Universal Live Timing Box* to the PC and push "OK".

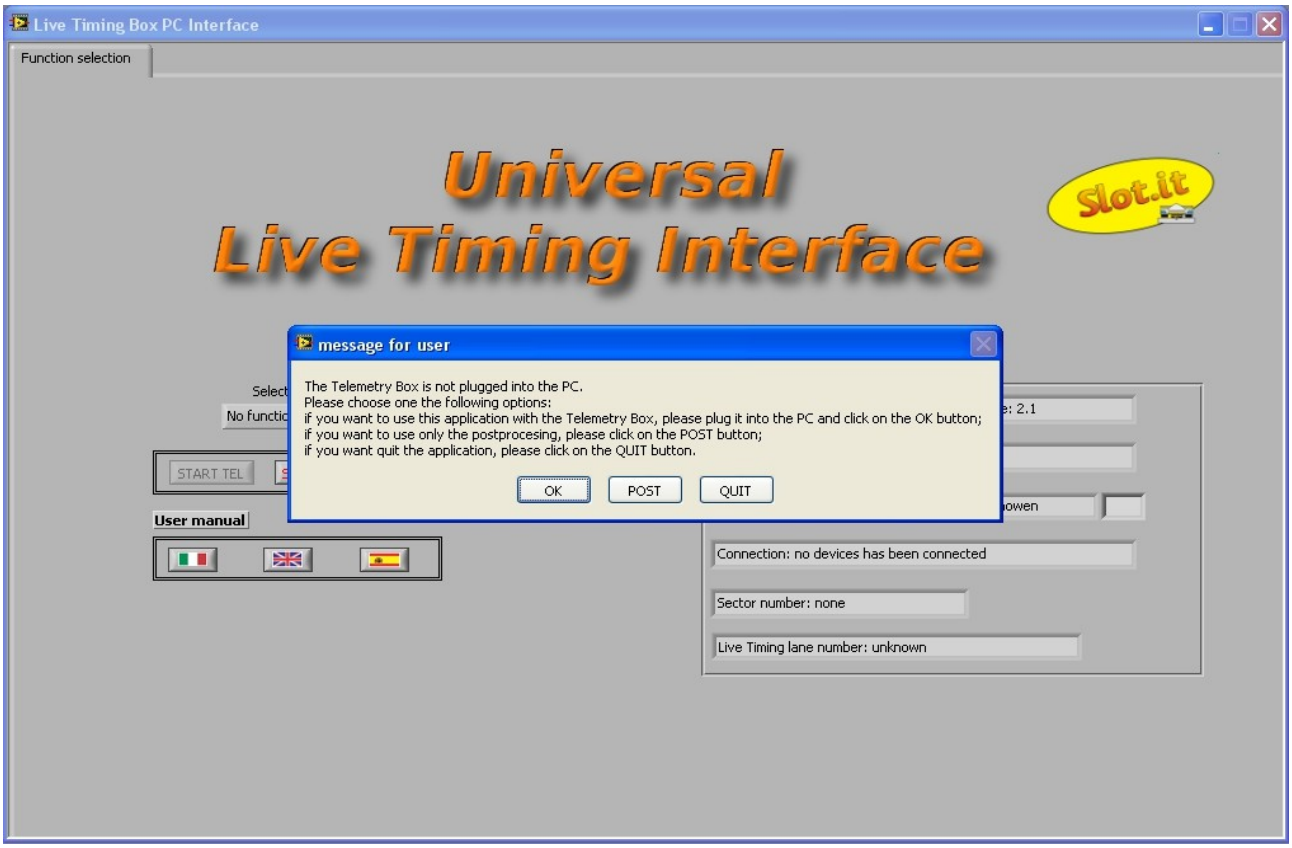


Figure 2: starting windows Live Timing Box PC Interface with no Universal Live Timing Box connection.

In case of connected *Universal Live Timing Box* (figure 3), some information appears on the right side of the page: this is the first data exchange between the *Live Timing Box PC Interface* application and the *Universal Live Timing Box*. These are:

1. the software version of the *Live Timing Box PC Interface* program;
2. the firmware version of the *Universal Live Timing Box*;
3. the language of lap times playback;
4. the status of the connection of the *Universal Live Timing Box*. In particular:
    - *"no box"*: no *Universal Live Timing Box* is connected to the PC (the situation is the one of figure 2);
    - *"Universal Live Timing box"*: the *Universal Live Timing Box* is connected to the PC and nothing else is connected to the *Universal Live Timing Box* through the white USB cable;
    - *"Universal Live Timing Box + SCP controller"*: the *Universal Live Timing Box* is connected to the PC and to a SCP controller;
    - *"Universal Live Timing Box + Track Interface"*: the Universal Live Timing Box is connected to the PC and to a Track Interface.;
5. the number of track sectors.
6. the number of the lane the ULTB is attached to. An empty (non programmed) value is detected and the user is asked to take action.

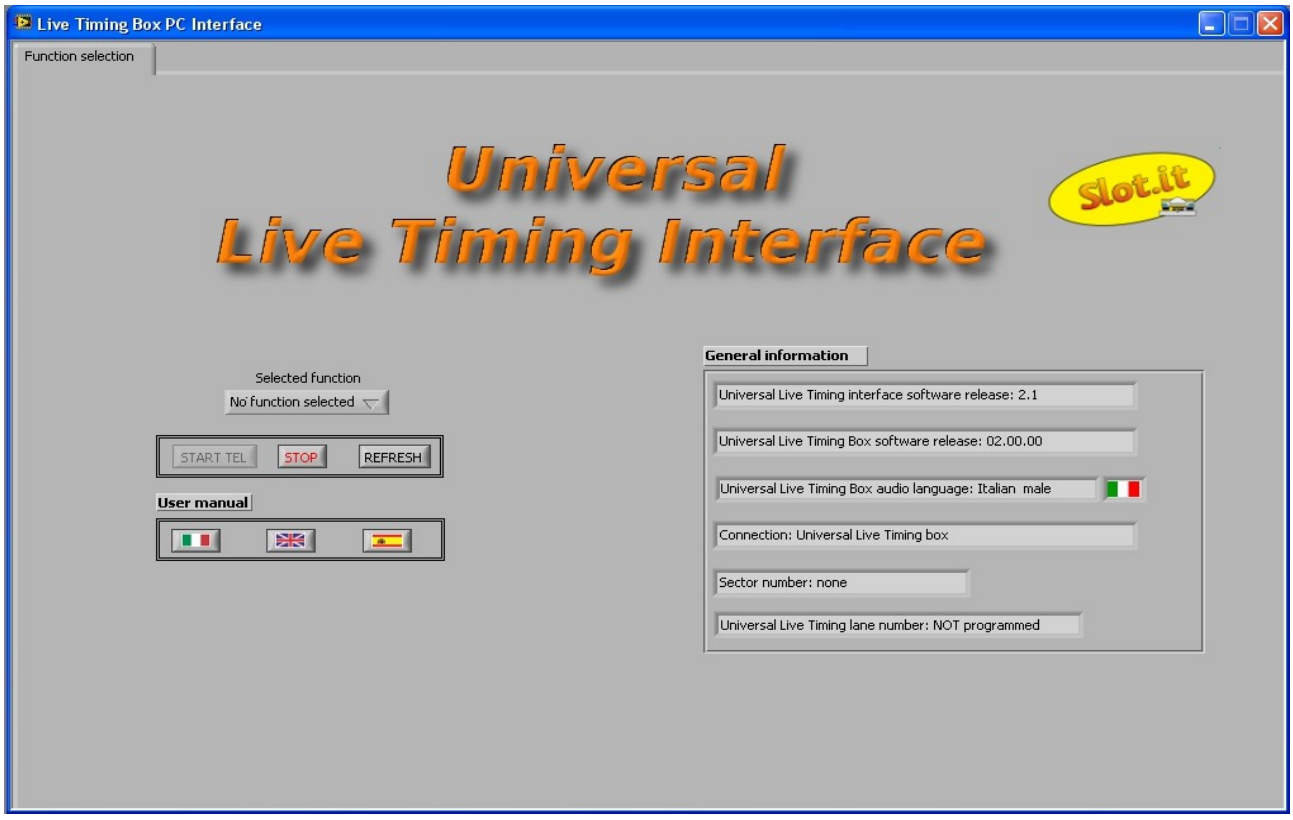


Figure 3: starting windows Live Timing Box PC Interface with one connected Universal Live Timing Box.

On the left side of the same page (figure 3) is a drop-down menu, *"Selected function",* in which all the functions that can be carried out are listed. Under the drop-down menu there are three buttons to open the *Live Timing Box PC Interface* manual (see paragraph 2.2.1.7).

2.2.1 Use the application to communicate with the *Universal Live Timing Box*

If the *Universal Live Timing Box* is connected to the PC, the user can select the operation he wants to perform by the *"Selected function"* drop-down menu (figure. 4):

1. **"Telemetry":** unless a SCP-1 or a Track Interface are connected, this should not be chosen. If you do this by mistake, answer 'NO' to the confirmation menu which pops up next. Otherwise, click 'Yes': if a Track Interface is connected, the 'PC Chronometer' function is automatically selected. If a SCP-1 is connected to the ULTB instead, both the 'Live Telemetry 'and 'PC Chronometer' are available.
2. **"Postprocessing"**: analyse the data saved on the PC during the Telemetry *Live* function or downloaded from the *Universal Live Timing Box* and then saved on the PC. For further details, see paragraph 2.2.1.5 .
3. **"Download language"**: update/change the language of lap time playback. For further details, see paragraph 2.2.1.1 .
4. **"Download telemetry data"**: download and save in a file the data stored on the internal memory of the *Universal Live Timing Box.* For further details, see paragraph 2.2.1.2.
5. **"Erase stored data"**: erase the data stored on the memory of the *Universal Live Timing Box*. For further details, see paragraph 2.2.1.3 .
6. **"Live Timing Box setting":** read and reprogram the internal settings of the device.

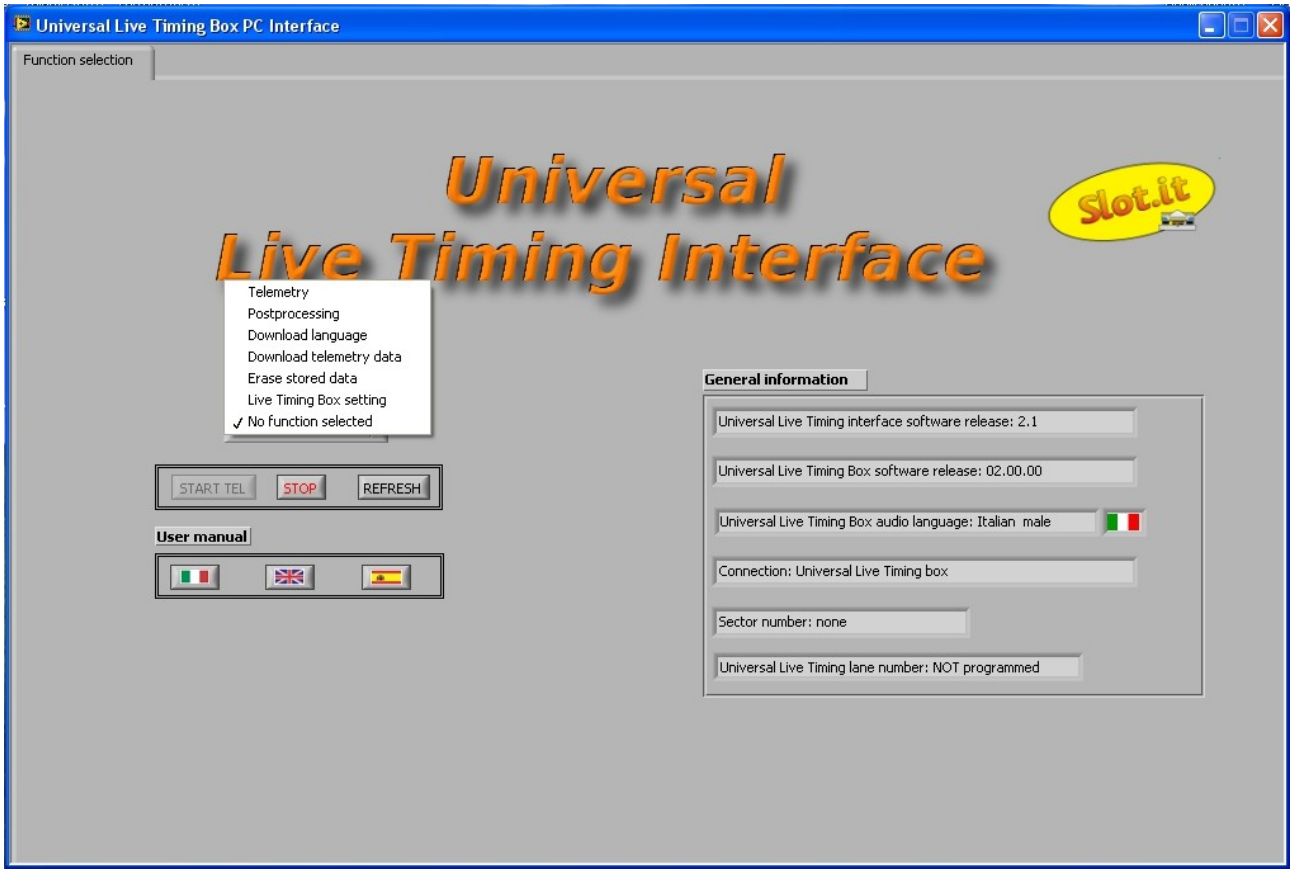


Figure 4: Selected function menu.

2.2.1.1 Download Language function

To change or update the language of lap times playback, select the *"Download Language"* function. This triggers a mwarning message informing the user that the operation causes the erasure of all the data from the internal memory of the *Universal Live Timing Box.* Click:

- *"yes":* user is aked to select the language to be downloaded: for example, *ItalianLanguage.txt*. If the *Universal Live Timing Box* contains a language different from the selected one, writing of memory begins immediately, otherwise the user must confirm overwriting of the previous language. Note that during the *download* phase the *"Audio Off"* red LED of the *Universal Live Timing Box* is on. Once the operation is completed, click OK to return to the initial page, *"Function selection"*;
- *"no":* user ir returned to the initial page, "*Function selection"*.

2.2.1.2 Download telemetry data function

To download the data stored on the internal memory of the *Universal Live Timing Box* to the PC, the user must select *"Download telemetry data"* from the *"Selected function"* drop-down menu, and then select a file name to write the data to. Writing on an existent file requires a user confirmation.

During the *download*, the application creates two files both having the name indicated by the user, but differentiated by the addition, at the end of the name, of "_t" and "_d" (for example, if the name is *Dati.txt*, the created files will be *Dati_t.txt* and *Dati_d.txt*). The file ending with "_t" contains the times of the driver, the other file the possible telemetry data. If there are no telemetry data, the latter file is created anyhow, but it remains empty. At the end of all this, the application asks the user if he wants to move directly on to the *postprocessing* phase: if not, user is returned to function selection. For the entire duration of the download the *"Audio Off"* LED stays on.

2.2.1.3 Erase stored data function

To erase the data stored on the internal memory of the *Universal Live Timing Box* it is necessary to select *"Erase stored data"* from the *"Selected function*" drop-down menu. A warning message message then appears, reminding the user that all data stored in the internal memory of the *Universal Live Timing Box* is going to be erased. Note that only the stored data is going to be erased, not the language. Click "YES" to proceed. If the memory was already empty, a message informs the user, else erasing begins, during which, the *"Power/Mem"* LED of the box flashes red.

2.2.1.4 Telemetry function

This function is only available if a SCP-1 or a Track Interface is connected to the Live Timing Box. When selected, the user is asked to confirm that an SCP-1 is connected. If this is the case, before proceeding, the PC software requires the following actions to be taken out:

- select the number of timing sectors in the track;
- click on the *"START TEL"* button on screen, flashing with yellow light;
- insert the name of the file to save the downloaded data to. File handling is exactly the same as described above in the download telemetry data function.

Full telemetry function is available only if a SCP-1 is connected to the box. If not, that is, if a Track Interface is connected, then only the 'PC Chrono' features are available at this point.

So, if a SCP-1 is streaming data to the box, the "*Telemetry*" page shows the data like in figure 5:

- brake performance
- minimum and maximum speed set by the user and real-time performance of the applied speed in conformity with the chosen anti-spin value
- power curve set by the user on the SCP controller
- real-time status of the knobs and *switches* of the SCP controller
- lap time and lap number
- best lap time and its number
- firmware version of the SCP controller and *Universal Live Timing Box* in use; the type of cartridge connected to the controller; language of the *Universal Live Timing Box*.

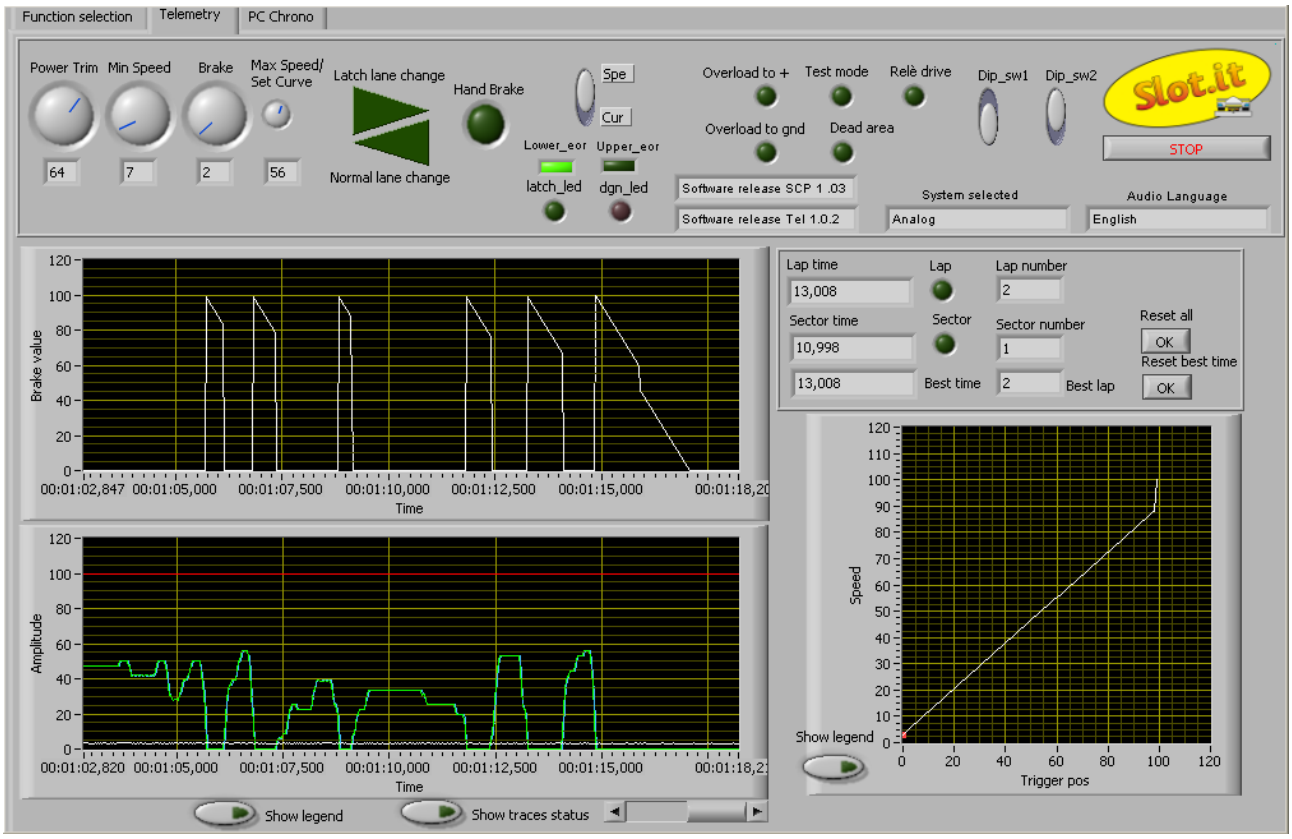


Figure 5: Telemetry page.

The *"PC Chrono*" page shows the data like in figure 6:

- lap time and lap number;
- best lap time and its number;
- list of the last ten laps with relative time.

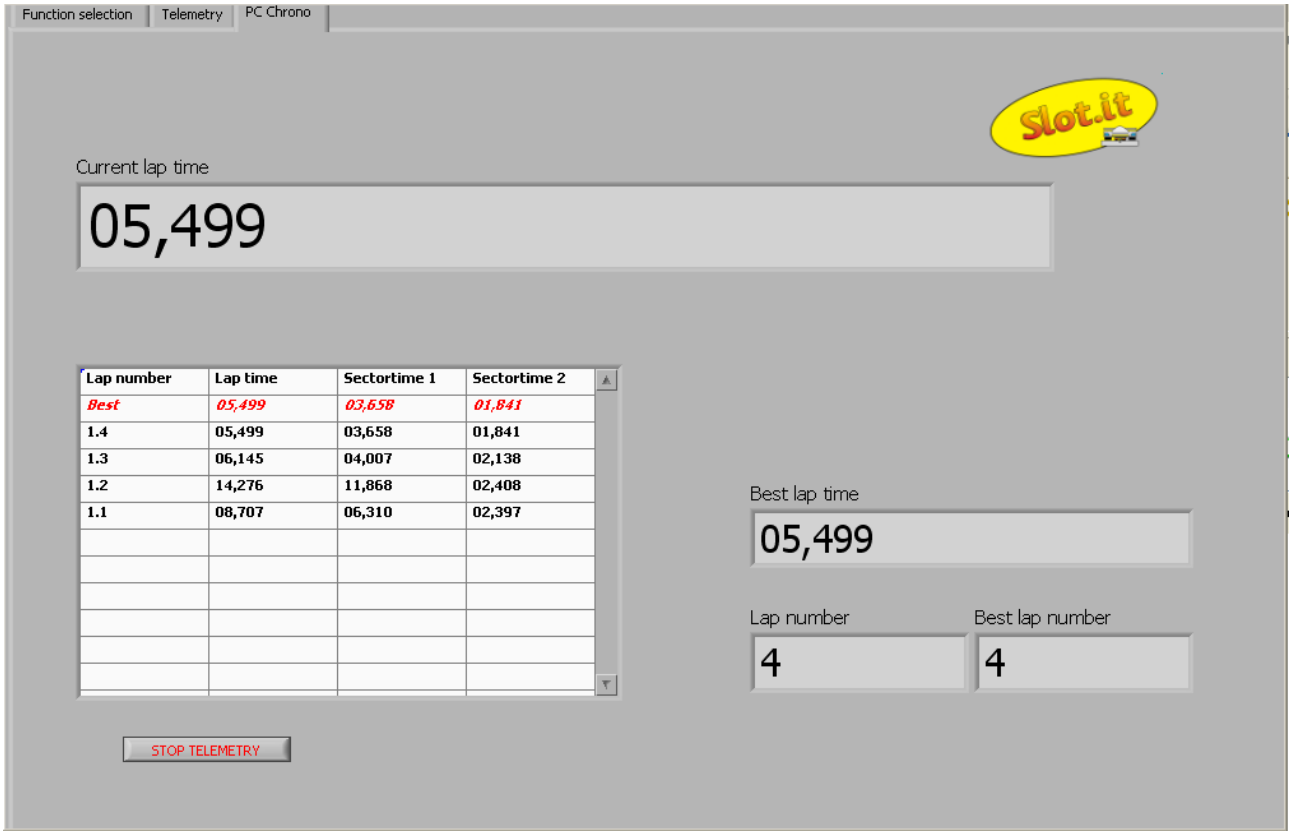


Figure 6: PC Chrono page.

The buttons that can be found in the *"Telemetry*" page (figure 5):

- *Reset all*: erase the data displayed in the following fields: *Lap time, Lap number, Sector time, Sector number, Best time and Best lap*;
- *Reset best time:* erase the best time recorded until that moment and the corresponding lap number;
- STOP TELEMETRY: clicking this button stops the live telemetry function and gives the user the possibility to access directly the *postprocessing* function, on the data that was previously saved on file. See paragraph 2.2.1.5 for an explanation of postprocessing.

2.2.1.5 Postprocessing function

The *"Postprocessing"* is an analysis of the saved data, as shown in figure 7 . The screen is divided in two sections, DRIVER1 and DRIVER2, as it possible to load the data of two different drivers or of two different runs of the same driver in order to compare them. It is necessary to select the file to be analysed, using the *Browse "Path_file1"* and/or *"Path_file2"* button. Among the available files it is necessary to choose the one ending with "_t.txt". Once the selection has been done, the relative times are reported in the table to the side. The worst time is highlighted in red, the best time in green. Moreover, if telemetry data are present, too, the *Live Timing Box PC Interface* application enables a second page, *"Postprocessing 2"* (figure 8), in which the telemetry data can be visualized, by selecting the desired lap number.

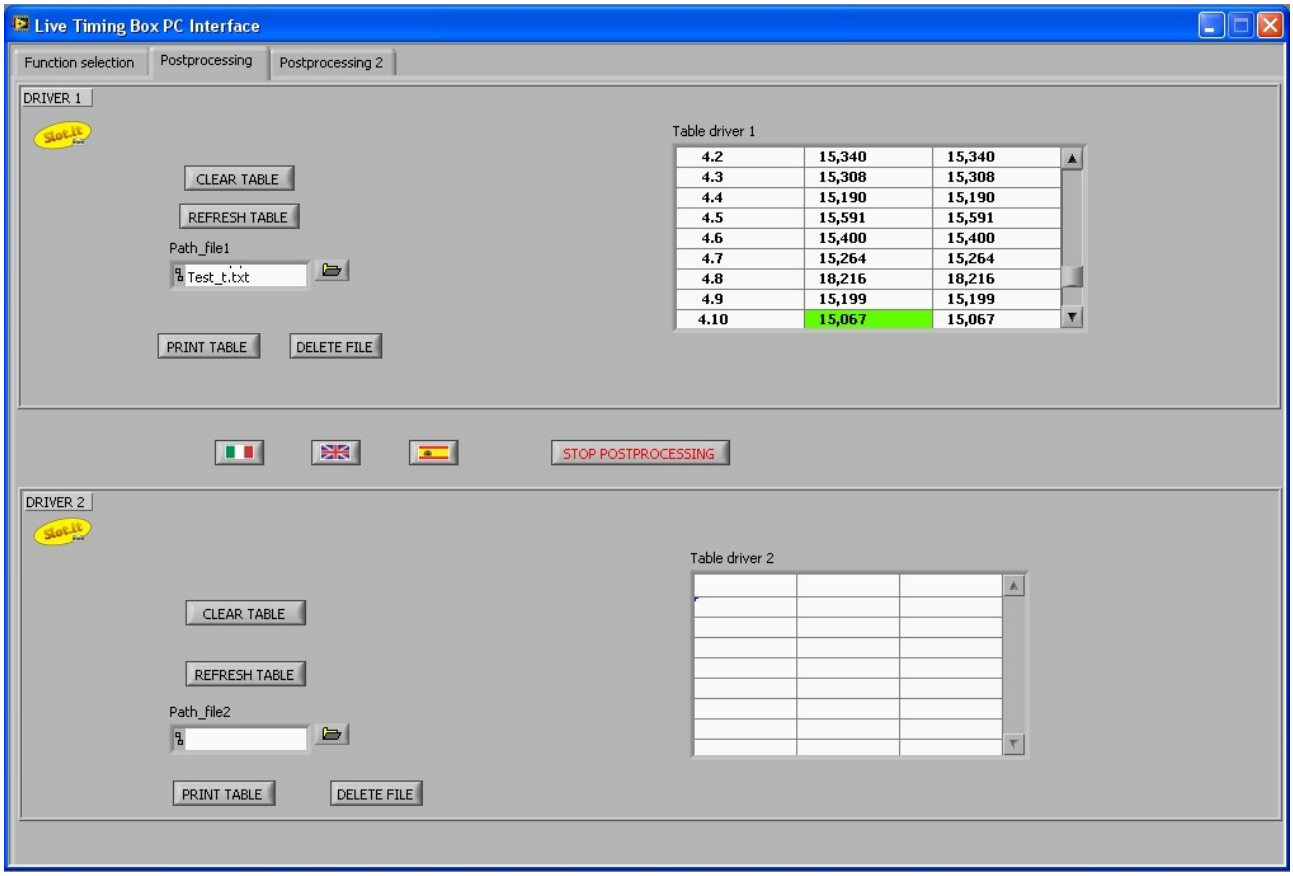


Figure 7: postprocessing page.

With reference to the "*Postprocessing"* page (figure 7), here is the meaning of each button:

- *CLEAR TABLE*: erase the just loaded table and file;
- *REFRESH TABLE*: updates the loaded table;
- *PRINT TABLE*: click this button to open a new window that allows to set the font, the colour, the size, and the number of copies to be printed;
- *DELETE FILE*: erase the loaded file permanently;
- *STOP POSTPROCESSING*: stop*"Postprocessing"and* returns to the starting page.

It is also possible to sort the data reported by one of the column of the table by clicking on the table's heading.

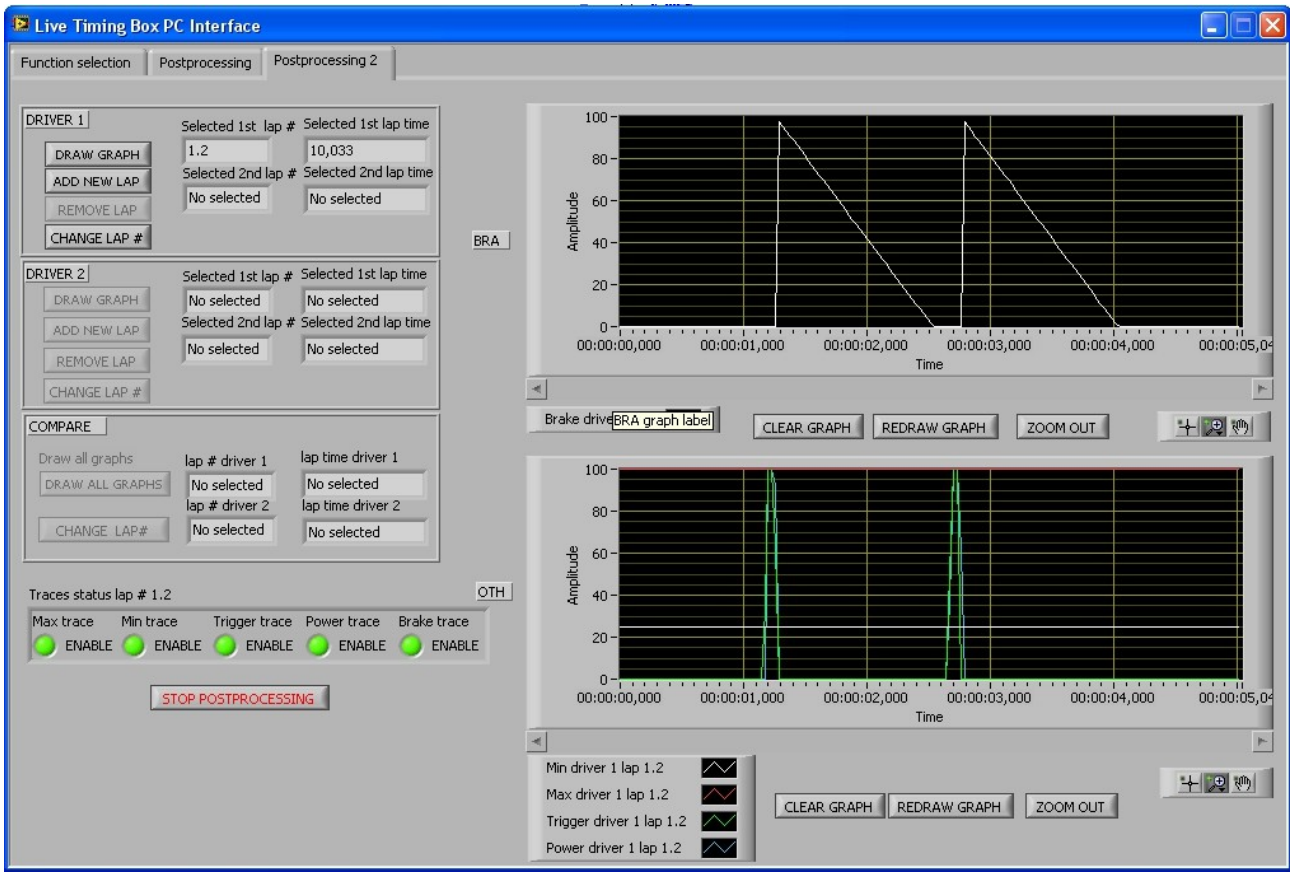


Figure 8: postprocessing 2.

As shown in figure 8, the buttons can be divided in three groups: DRIVER 1, DRIVER 2 and COMPARE. These are not enabled at the same time, but only as follows:

- those belonging to the first group, DRIVER 1, are enabled only if the user loads the data in the DRIVER 1 section of the "*Postprocessing*" page, using the *browse "Path_file1"* button;
- those belonging to the second group, DRIVER 2, are enabled only if the user loads the data in the DRIVER 2 section of the "*Postprocessing*" page, using the *browse "Path_file2"* button;
- those belonging to the third group, COMPARE, are enabled only if the user loads the data in both DRIVER 1 and DRIVER 2 sections of the "*Postprocessing*" page. This is the case of the comparison of, for example, the data of two different drivers;

In the "*Postprocessing2*" page (figure 8), the following data can be seen:

- brake performance ("BRA" graph);
- minimum and maximum speed set by the user and real-time performance of the applied speed in conformity with the chosen anti-spin value ("OTH" graph);

The buttons of the "*Postprocessing2*" page have the following meaning:

- *DRAW GRAPH:* this function draws the above data as found the selected lap. In particular, the brake value is displayed in the "BRA" graph, the other values in the "OTH" graph. If no lap number has been selected, a message informs the user that, in order to continue, it is necessary to specify the lap number to be visualized. The selected lap number is also displayed in the "*Selected 1st lap #*" field;

- *ADD NEW LAP:* click to select a further lap, so that it is possible to compare the data of the two selected laps. The number of the additional selected lap can be seen in the "*Selected 2nd lap #*" field. To go on to visualize the data, push the "DRAW GRAPH" button again;
- *REMOVE LAP:* click to select the lap number to be removed, among the already selected ones;
- *CHANGE LAP #:* click to indicate the lap number to be visualized and, in case that two laps have already been selected, it allows to change the last selected one;
- *DRAW ALL GRAPHS:* click to visualize the data concerning the selected lap for both drivers at the same time;
- *CHANGE LAP# (COMPARE group*): click to indicate the number of laps, one for each driver, that one wishes to compare. In particular, clicking the button, a new window appears where it is necessary do the following:
    - select the number of the driver one wishes to select the lap of;
    - indicate the lap number;
    - select the number of the second driver one wishes to select the lap of (optional, since it is possible to change the lap number of one driver only);
    - indicate lap number;
    - click “OK”;
- *TRACES STATUS:* click to choose which data will be kept displayed on the two graphs: if the green light is on, the corresponding data is displayed, otherwise it is hidden;
- CLEAR GRAPH: click to erase the values just visualized. Note: by clicking the button, the above standing graph is cleared, but the values are not erased from the memory: they can be visualized again by pushing "REDRAW GRAPH";
- *REDRAW GRAPH:* click to draw the above standing graph again;
- *ZOOM:* click to zoom in on the above standing graph;
- *STOP POSTPROCESSING:* returns the *Live Timing Box PC Interface* application to the starting page, *"Function selection" (*figure 3).

2.2.1.6 Live Timing Box Setting

This function enables the writing of the internal EEPROM with custom values.

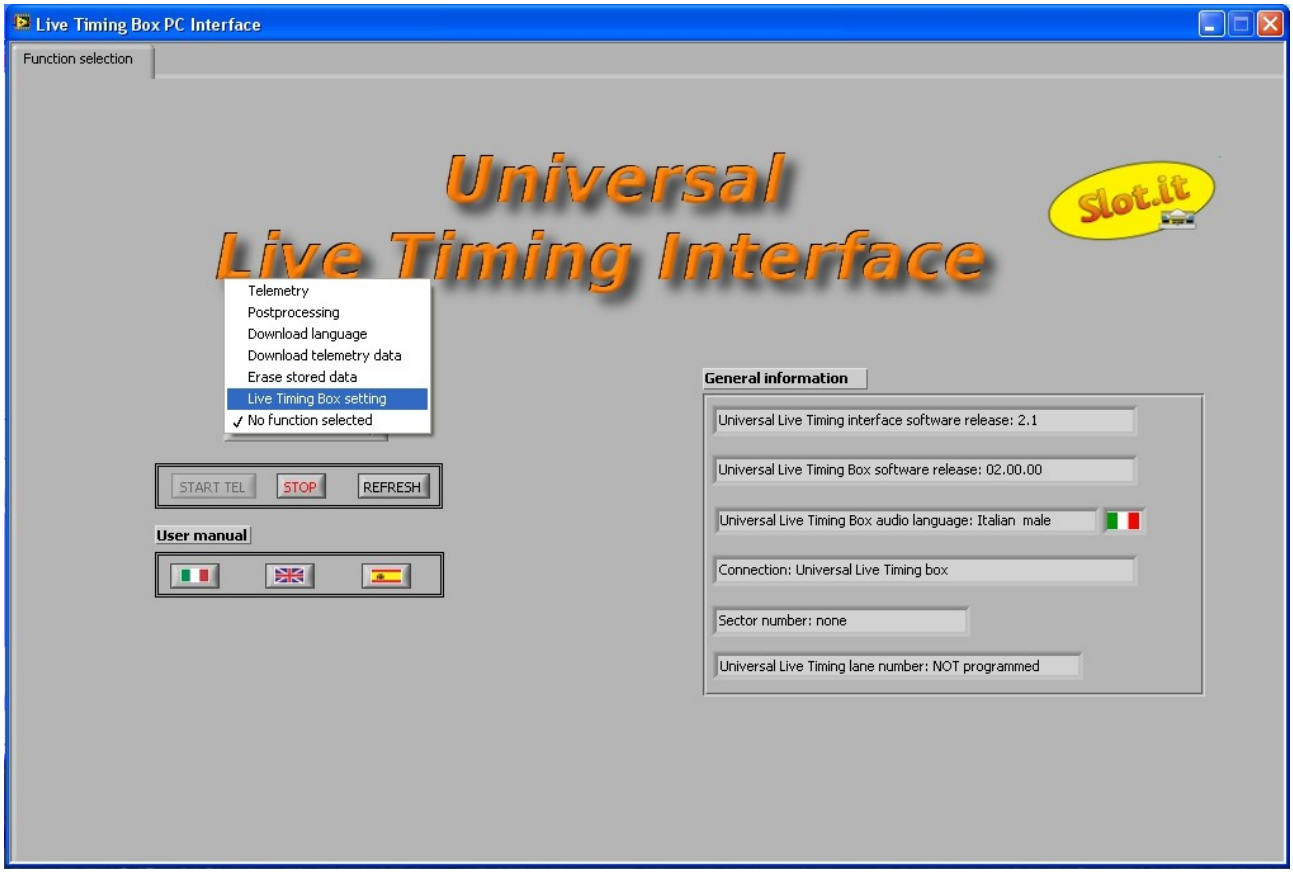


Figure 9:

If the box is connected and the Live Timing Box Setting is chosen, the following page appears on screen.

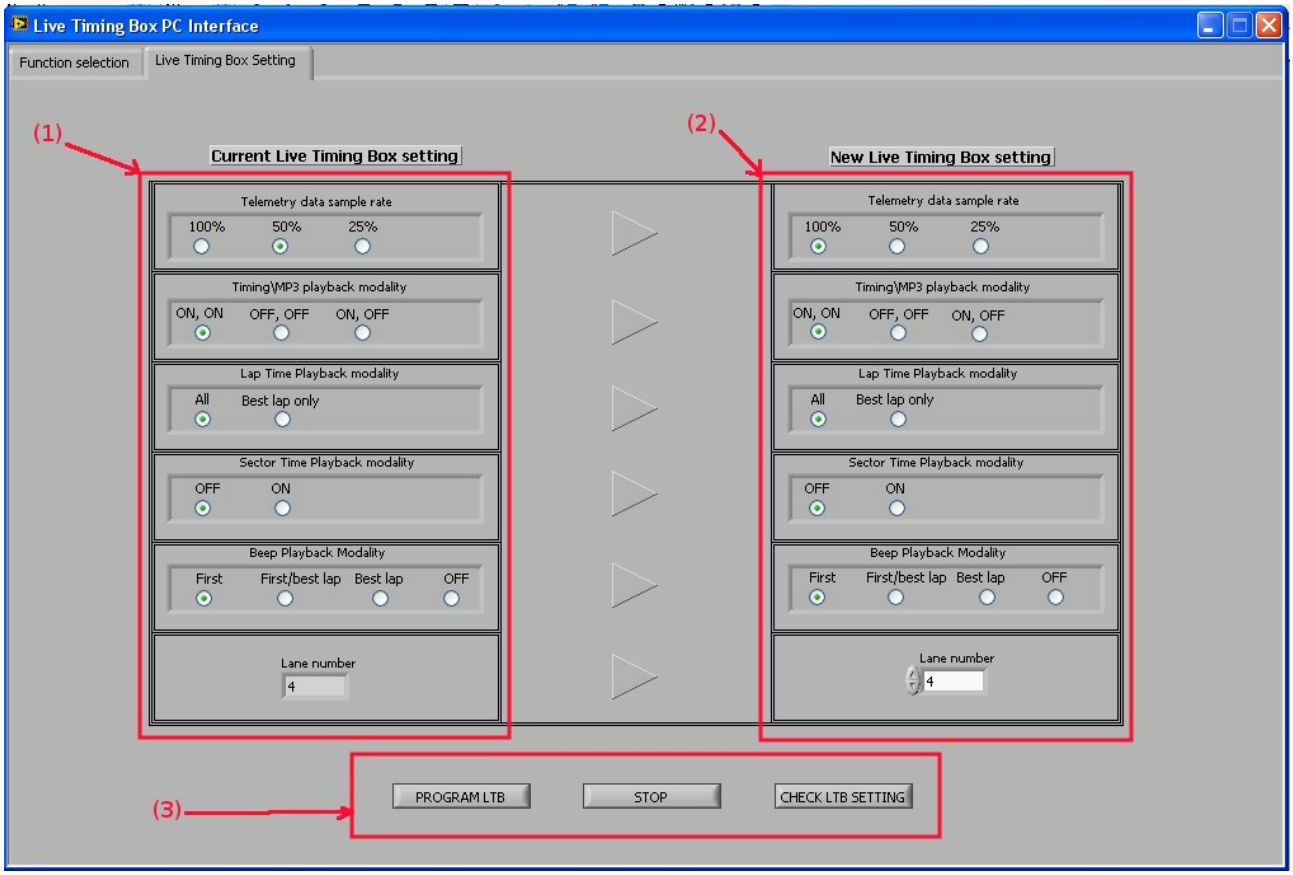


Figure 10:

The screen is split in three sections:

1. **Current Live Timing Box settings (1)**: readout of the *current* state of the ULTB
2. **New Live Timing Box setting (2)**: a description of the selected settings, as they will be written in EEPROM
3. Three push buttons:
    1. Program LTB: click to WRITE permanently in EEPROM the values shown in the “New Live Timing Box setting” as described above.
    2. Check LTB Setting: click to READ the current setting. Values in 'Current Live Timing Box settings' screen area will be updated after read.
    3. Stop: return to main selection menu (confirmation asked - click Cancel to stay in this function)

The following parameters can be programmed in the ULTB EEPROM (Refer to Universal Live Timing Box manual (ver.2.0 or greater), chapter 7, for an explanation of the meaning of each parameter).

1. sample rate for telemetry data
2. MP3 playback volume mode
3. sector time playback mode
4. 'Beep' playback mode
5. Number of the lane associated with the ULTB

2.2.1.7 On-Line Live Timing Box PC Interface manual

Click on the national flags in the 'User manual' screen area in the main window to access the online manuals.

Figure 11: