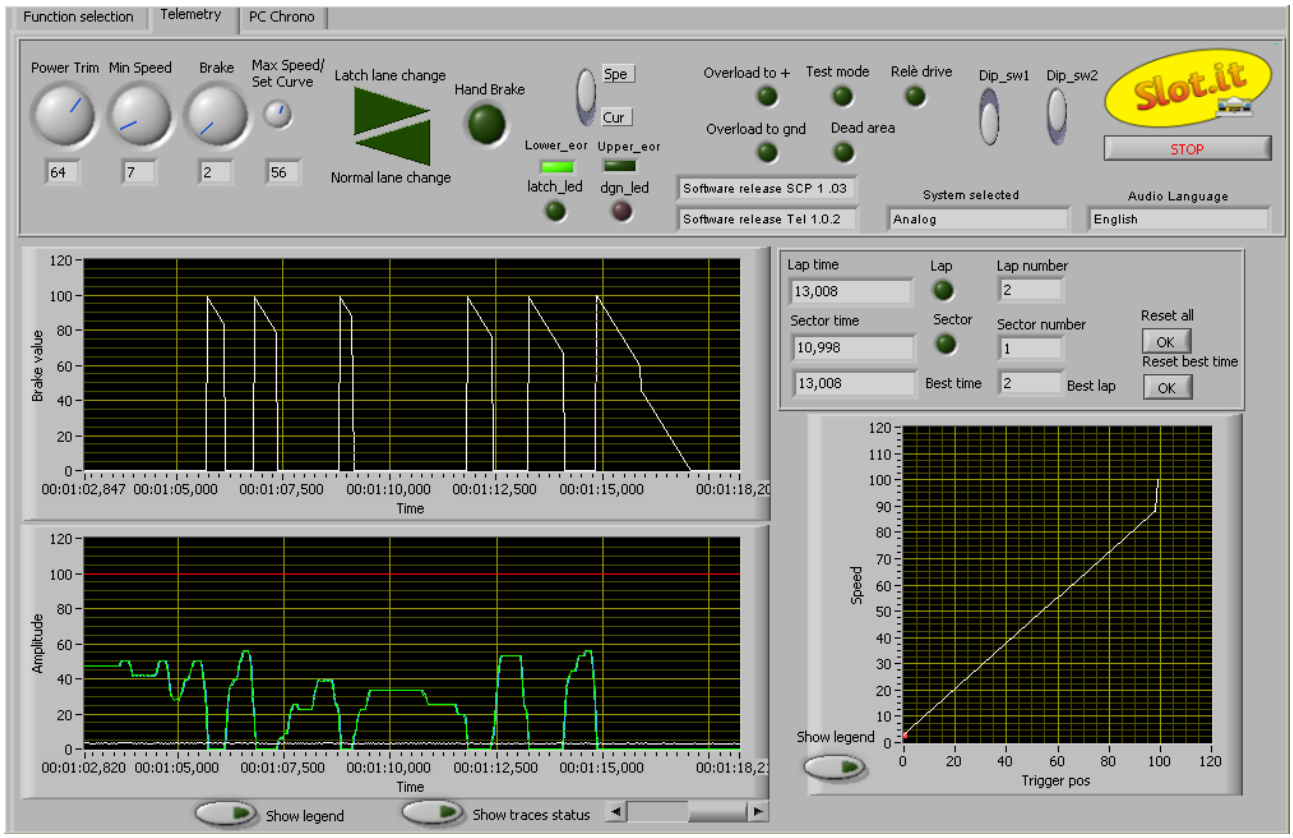
Telemetry Box PC Interface



The software *Telemetry Box PC Interface* is a graphic interface that allows the user to carry out some operations, which can be divided in three groups:

- operations on the *Telemetry Box* connected to the PC (e.g. language *download* or telemetry data download etc.);
- *postprocessing* operations on the data downloaded by the *Telemetry Box* or saved during the *live* telemetry function;
- *live* telemetry operation and/or PC chronometer: both, if in possession of the SCP controller; PC chronometer only, if in possession of another type of controller

In order to be able to use the interface, the following software packages must be downloaded:

- *TelBoxPCIntRunTime*: it must be installed on the PC in order that the PC is able to run the *Telemetry Box PC Interface* application;
- *TelemetryBoxPCInterface*: it is the actual application that must be launched with a double click of the mouse's left key on the representative icon.

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

General Index

1 Installation of TelBoxPCIntRunTime

Once the file *TelBoxPCIntRunTime.zip* has been downloaded, it is necessary to decompress it and to run, with a double click, the file *setup.exe* which can be found in the "*Volume*" directory. The installation of the *runtime* begins. During this phase a series of windows will appear; here they are listed in order of appearance, with their meaning and the operations to be followed for each window:

1. *destination directory*: it asks to specify the directory where to install the *Telemetry Box PC Interface* application and the relative products. We suggest not to change the proposed settings and push *"Next";*
2. *requested license agreement*: 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:* the list of what is going to be installed; push *"Next"*. Now the installation begins, its progress is shown in the following window;
5. *end of installation*: push *"Finish"*. Then the last window appears: push *"Restart"* in order to restart the PC as required.

Once the PC has been restarted, it is possible to move on to the use of *Telemetry 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 *Telemetry Box PC Interface application*

2.1 Driver installation

When connecting the *Telemetry Box* to the PC for the first time, through a generic USB cable (type AB), Windows requires the installation of the driver necessary for the communication between the *Telemetry Box PC Interface* application and the *Telemetry Box* itself. The name of the driver is *TelemetryDriver.inf* and it is in the package containing the *Telemetry Box PC Interface* application. Here are the operations to carry out for each window that appears during the operation:

1. chosen the third option, *"No, not now"*, and push *"Next"*;
2. choose the second option: *"Install from a list or specific location(advanced)"* and push *"Next"*;
3. choose the last option: manual choice of the driver to be installed, then push *"Next"*;
4. by pushing *"Driver Disk"*, choose the driver to be installed (*TelemetryDriver.inf*), then push *"Next"*;
5. push *"Continue"*: the driver installation starts;
6. when the end of installation window appears, push *"Finish"*;
7. now a second installation begins: carry out all the above listed operations again;
8. in order to verify that the installation has been successful, go into the *"Device manager"* of the PC and verify that, with the *Telemetry Box* connected to the PC, the devices shown in figure 1 appear.

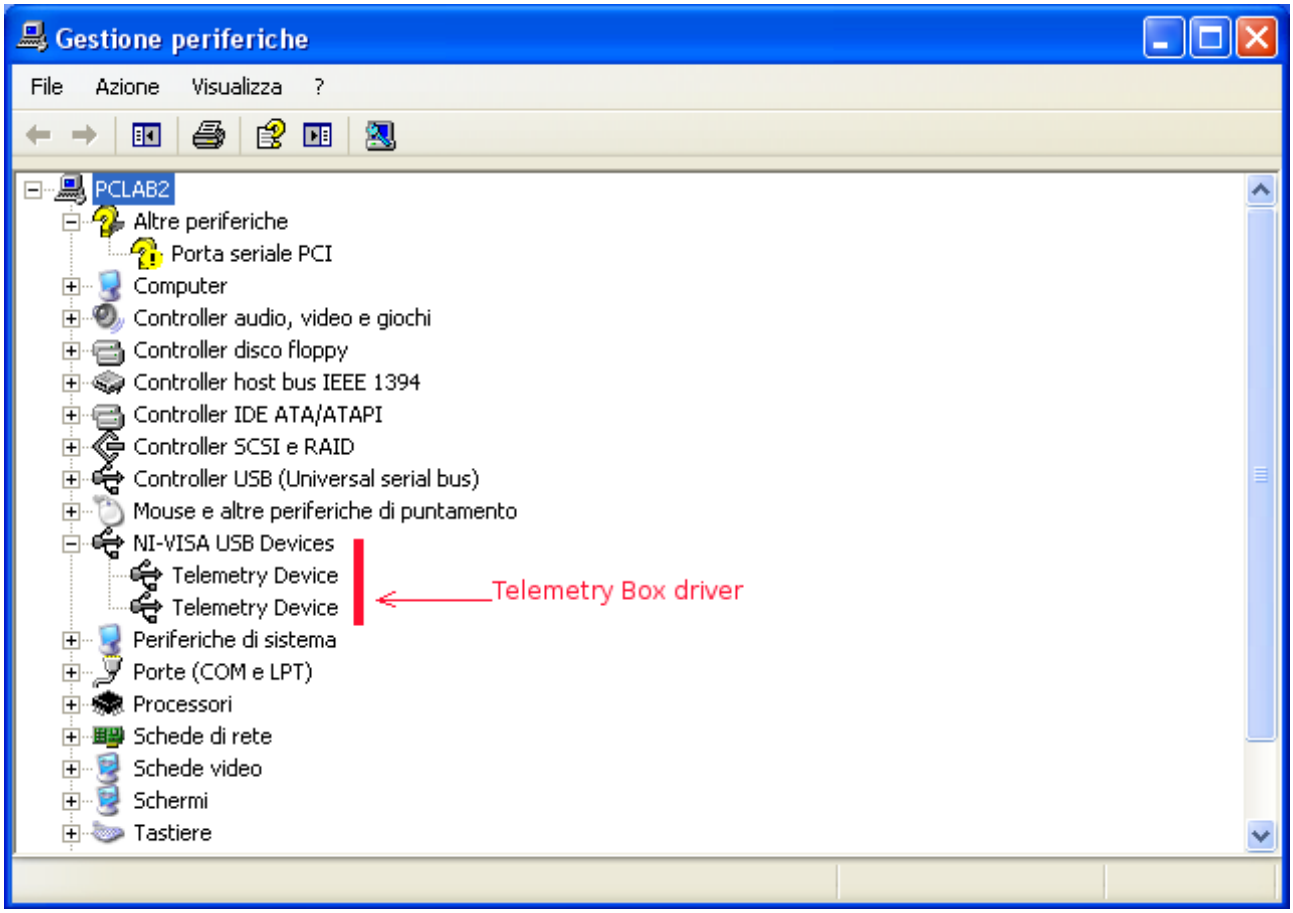


Figure 1: Telemetry box PC Interface driver installation's result check.

2.2 Use of the *Telemetry Box PC Interface* application to communicate with the Telemetry Box

In order to run the application *Telemetry Box PC Interface* you only have to position the mouse's indicator on the icon of the application itself and make a double click with the left key. The *Telemetry Box PC Interface* can present itself in two different ways according that the *Telemetry Box* is connected or not to the PC. If the *Telemetry Box* is not connected to the PC, the application presents itself as shown in figure 2, otherwise as shown in figure 3.

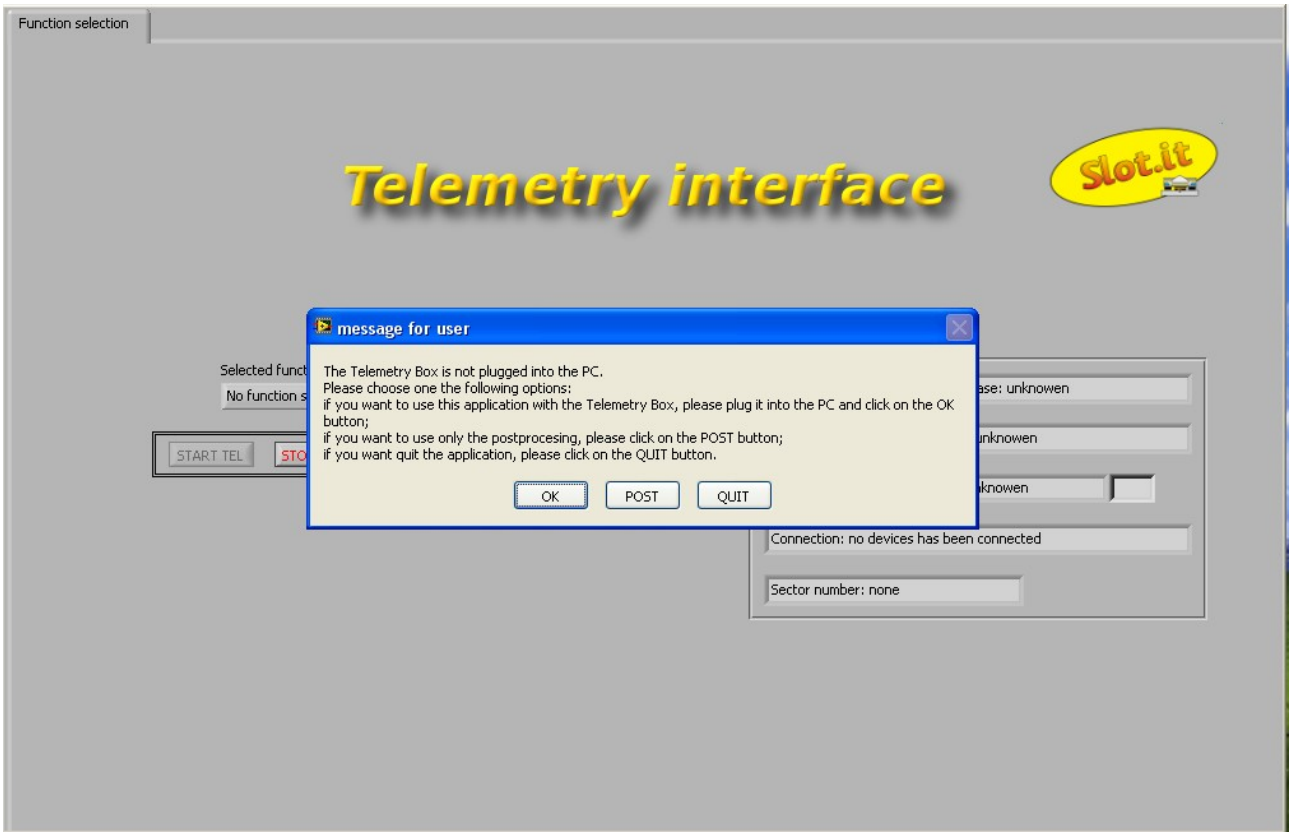


Figure 2: starting windows Telemetry Box PC Interface with disconnected Telemetry Box.

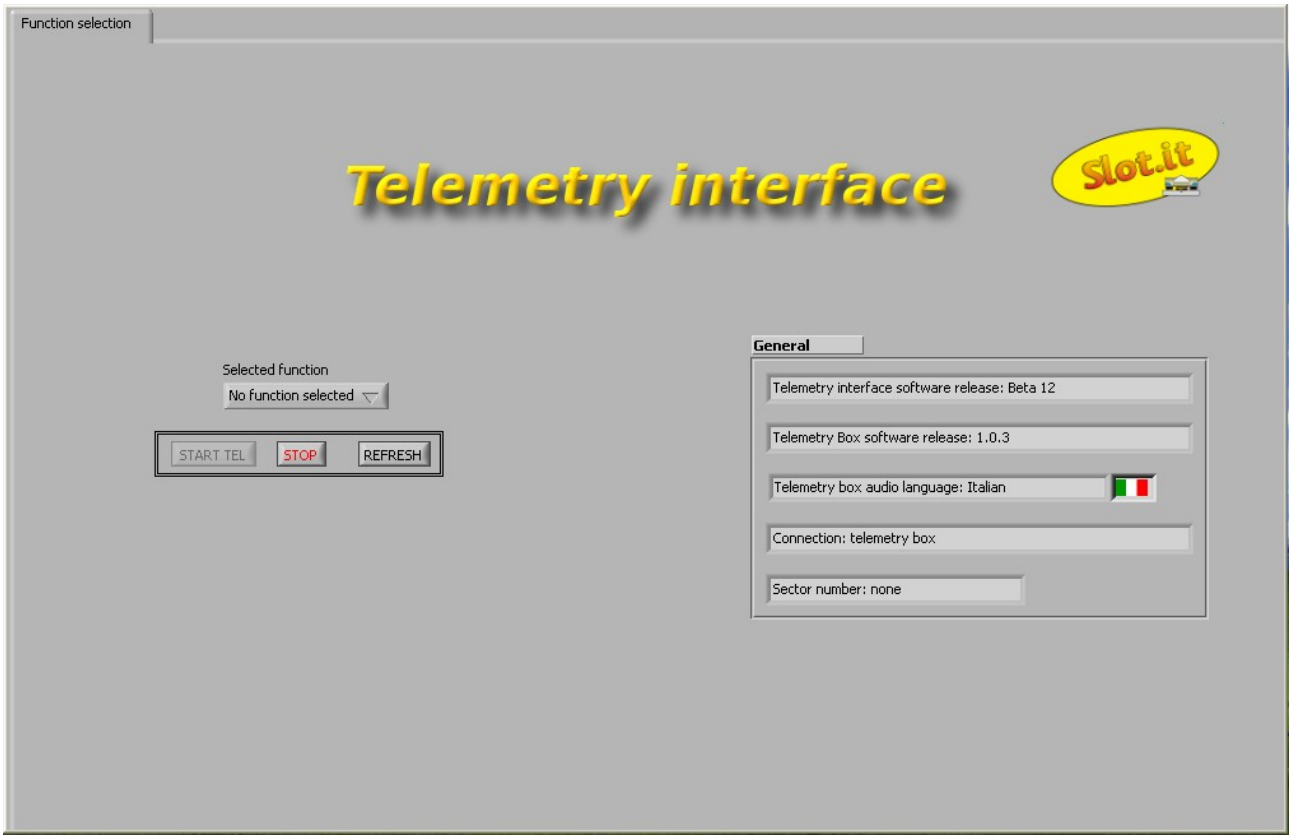


Figure 3: starting windows Telemetry Box PC Interface with connected Telemetry Box.

In case of disconnected *Telemetry Box* (figure 2), the user can carry out one of the following operations, as summarized by the message on the monitor:

- connect the *Telemetry Box* to the PC by means of a USB cable for printer (type AB) and push "OK". This means that the situation is now the one described in figure 3: use of the *Telemetry Box PC Interface* application to communicate with the *Telemetry Box* (see paragraph 2.2.1);
- push "POST" in order to go to the *Postprocessing* phase;
- push "QUIT" in order to stop the running of the *Telemetry Box PC Interface* application.

In case of connected *Telemetry Box* (figure 3), it can be observed that on the right side of the page there is a series of data, the result of a first data exchange between the *Telemetry Box PC Interface* application and the *Telemetry Box*. These are:

1. the software version of the *Telemetry Box PC Interface* application which is being run;
2. the software version of the *Telemetry Box* connected to the PC;
3. the language of lap times playback in the driver's earphones on the internal memory of the *Telemetry Box*;
4. the status of the connection of the *Telemetry Box*. In particular, next to the writing "*Connection*" one of the following sentences can appear:
    - *"no box"*: no *Telemetry Box* is connected to the PC (the situation is the one of figure 2);
    - *"telemetry box"*: the *Telemetry Box* is connected to the PC by means of a USB cable for printer (type AB) and nothing else is connected to the *Telemetry Box* by means of the white USB cable;
    - *"telemetry box + SCP controller"*: the *Telemetry Box* is connected to the PC and to a SCP controller;
    - *"telemetry box + Track Interface"*: the Telemetry Box is connected to the PC and to a Track Interface.;
5. the number of sectors indicated by the user for carrying out the *live* Telemetry.

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, but the enabled ones are only the ones that can be carried out on the basis of what the *Telemetry Box* is connected to in this moment. For example: if the *Telemetry Box* is connected to the PC only, the *"telemetry"* function is not enabled since it requires that the *Telemetry Box* is connected to a SCP controller, too.

2.2.1 Use the application to communicate with the Telemetry Box

In case that the *Telemetry Box* is connected to the PC only, the user can decide the operation he wants to carry out among the enabled ones, by means of the *"Selected function"* drop-down menu (figure. 4). In particular, in this configuration, one of the following functions can be selected:

1. **"Postprocessing"**: it allows to analyse the data saved on the PC during the Telemetry *Live* function or downloaded from the *Telemetry Box* and then saved on the PC. For further details, see paragraph 2.2.1.5.
2. **"Download language"**: it allows to update/change the language of lap time playback. For further details, see paragraph 2.2.1.1.

3. **"Download telemetry data"**: it allows to download and save in a file the data stored on the internal memory of the *Telemetry Box*. For further details, see paragraph 2.2.1.2.
4. **"Erase stored data"**: it allows to erase the data stored on the memory of the *Telemetry Box*. For further details, see paragraph 2.2.1.3.

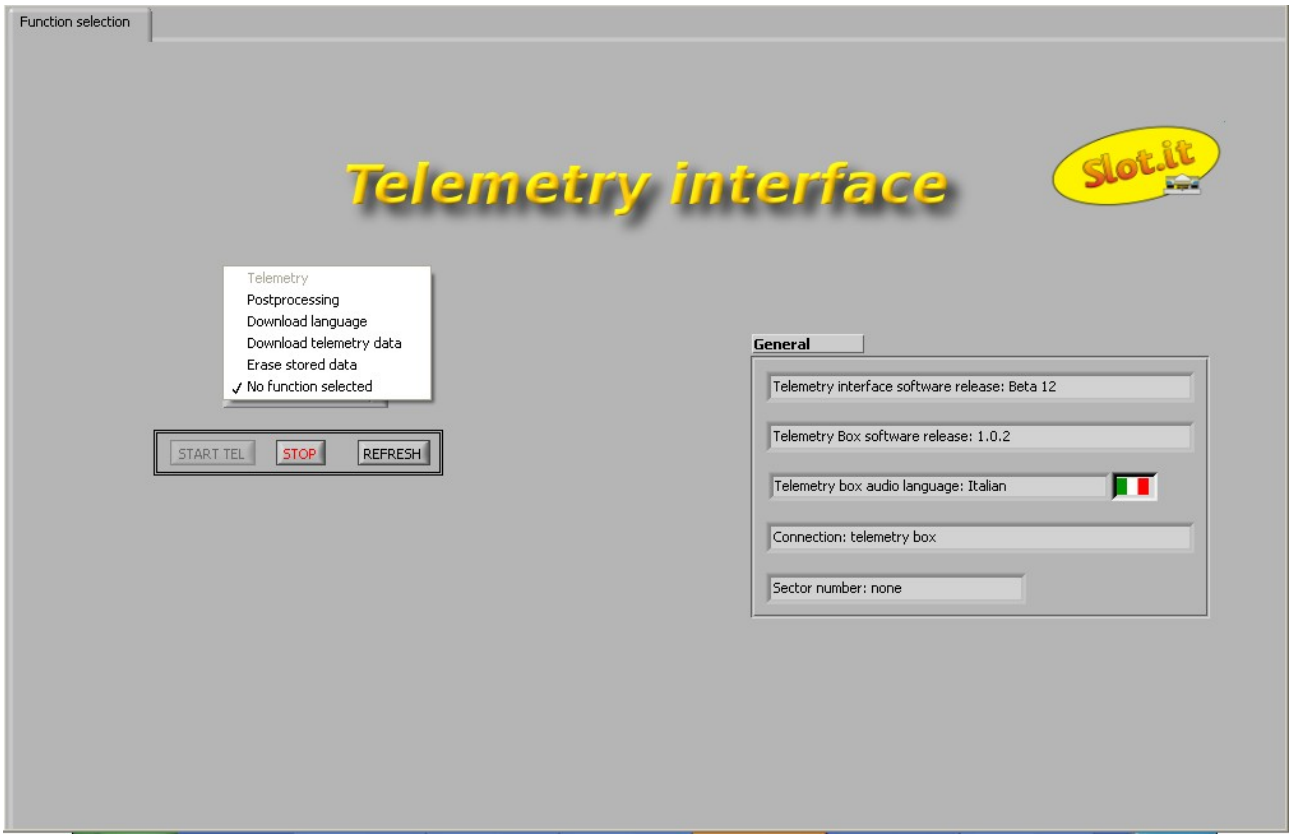


Figure 4: Selected function menu

In case that the *Telemetry Box* is connected at the same time to the PC and to a SCP controller or to a *Track Interface*, the following functions from the "*Selected function*" menu are enabled:

1. **"Telemetry":** it allows to enter the "*Live* Telemetry" function and/or the "PC chronometer" function, according to what the *Telemetry Box* is connected to, by means of the white USB cable. In particular:
   1.1. ***Telemetry Box* connected to the PC and to the *Track Interface*:** it is possible to enter the "*PC chronometer*" function only. This is valid for firmware versions of the *Telemetry Box* from 1.0.3. For the previous versions, the enabled functions are the same that are enabled in the situation of *Telemetry Box* connected to the PC only;

   1.2. ***Telemetry Box* connected to the PC and to the SCP controller:** it is possible to enter both the "*live* Telemetry" and the "PC chronometer" functions;

2. **"Postprocessing":** it allows to analyse the data saved on the PC during the *live* Telemetry function or downloaded from the *Telemetry Box* and then saved on the PC. For further details, see paragraph 2.2.1.5.

2.2.1.1 Download Language function

In order to change or update the language of lap times playback it is necessary to select the *"Download Language"* function. This involves the appearance of a message signalling to the user that the operation causes the erasure of all the data from the internal memory of the *Telemetry Box.* Pushing:

- *"yes":* a window appears in which to select the language one wishes to download: for example, *ItalianLanguage.txt*. In case that the *Telemetry Box* contains a language different from the selected one, the setting of the memory begins immediately, otherwise a message appears asking to the user if he wishes to overwrite it. If not, one returns to the *"Function Selection"* page, alternatively the *download* phase begins, during which the *"Audio Off"* red LED of the *Telemetry Box* is on. The end of the operation is signalled by the application with a message in which it is necessary to push "OK". Once the operation is completed, the application returns to the initial page, *"Function selection"*;
- *"no":* one returns to the initial page, "*Function selection"*.

Returning to the initial page, *"Function selection",* a message reminds the user that, in order to move on to other operations, it is necessary to select one of them from the *"Selected function"* drop-down menu.

2.2.1.2 Download telemetry data function

In order to download the data stored on the internal memory of the *Telemetry Box,* the user must select *"Download telemetry data"* from the *"Selected function"* drop-down menu. Once this function has been selected, a window appears asking to specify the name of the file in which to save the data. According to the inserted name, the following situations can arise:

- ***already existing file having the same name:*** a message appears asking the user if he wants to overwrite the file. If he does not, he is asked to insert a new name, otherwise the *download* phase begins;
- ***non-existent file*****:** the download phase begins immediately.

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. In case that the two files are already present, the application asks permission to overwrite them: if the permission is given, the *download* phase begins, otherwise the user is asked if he wants to create a new file, in order to save the data, or if he prefers to annul the *download* operation. If he decides to annul the operation, the application returns to the initial page, *"Function selection"*, otherwise the *download* phase begins. At the end of this, the application asks the user if he wants to move directly on to the *postprocessing* phase. If yes, the relative pages appear (see figure 7 and 8), otherwise the initial page *"Function selection"* reappears, where a message reminds the user that in order to move on to other operations, it is necessary to select one of them from the *"Selected function"* drop-down menu.

Note that for the entire duration of the download the *"Audio Off"* LED throws a steady red light.

2.2.1.3 Erase stored data function

In order to erase the data stored on the internal memory of the *Telemetry Box* it is necessary to select *"Erase stored data"* from the *"Selected function*" drop-down menu. Once this function has been selected, a message appears reminding the user that the data stored on the internal memory of the *Telemetry Box* are going to be erased. Note that only the stored data are going to be erased, the language is not. Pushing "YES" the two following situations can arise:

- *the internal memory of the Telemetry Box is empty*: this signalled by a proper message. Pushing "OK", one returns to the initial page, *"Function selection"*;
- *the internal memory of the Telemetry Box is not empty*: the erasure begins. During the operation the *"Power/Mem"* LED of the *Telemetry Box* flashes with red light. At the end of the operation, signalled by the application with a message, one returns to the initial window, *"Function selection"*.

Returning to the initial page, "*Function selection*", a message reminds the user that, in order to move on to other operations, it is necessary to select one of them from the "*Selected function*" drop-down menu.

2.2.1.4 Telemetry function

In case that the user selects the *"Telemetry"* function, he is asked by the *Telemetry Box PC Interface* application to carry out the following operations before the function can begin:

- insert the number of sectors the track is made up of;
- push the *"START TEL"* button, that is flashing with yellow light;
- insert the name of the file in which the data have to be saved, with also the file extension .txt. The application creates two different files with this name, 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*). In the former the driver's times are saved, in the latter the telemetry data, in case that a SCP controller is being used. In case that the two files are already present, the application asks permission to overwrite them: if the permission is given, the telemetry phase begins, otherwise the user is asked to indicate a new name in order to save the data.

Now the *"Telemetry"* function is being carried out. According to the device the *Telemetry Box* is connected to, the following situations can arise:

- ***Telemetry Box connected to the PC and to the Track Interface:*** a single page appears: *"Telemetry"*. Note: the use of the *"Telemetry"* function with *Telemetry Box* connected to the PC and to the *Track Interface* is only possible from the firmware version 1.0.3 of the *Telemetry Box;*
- ***Telemetry Box connected to the PC and to the SCP controller:*** (in this case the SCP controller is connected to the *Track Interface*): two pages appear: "*Telemetry"* and *"PC chrono"*.

The "*Telemetry*" page shows the following data (see 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;
- regulation 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 *Telemetry Box* in use; the type of cartridge connected to the controller; language of the *Telemetry Box*.

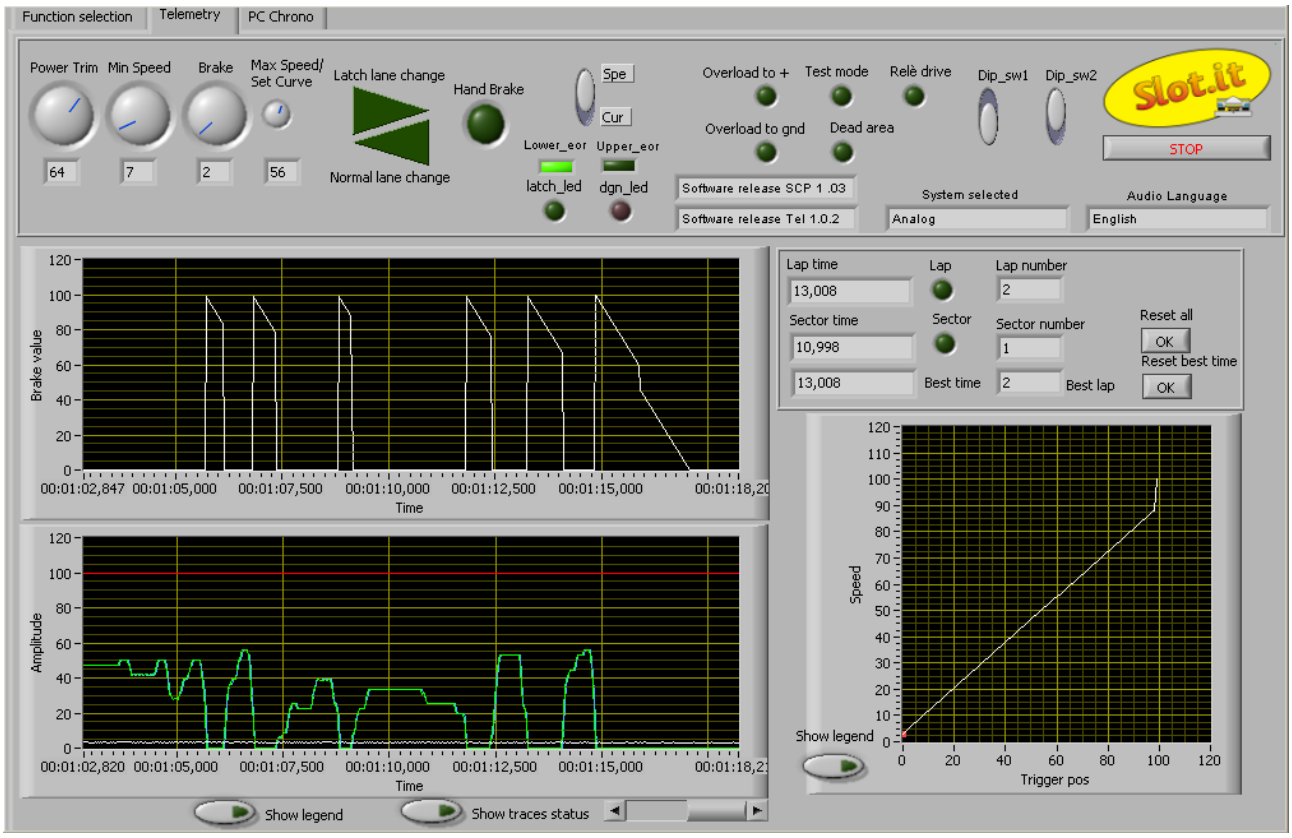


Figure 5: Telemetry page.

The *"PC chrono*" page shows the following data (see figure 6):
- lap time and lap number;
- best lap time and its number;
- list of the last ten laps with relative time.

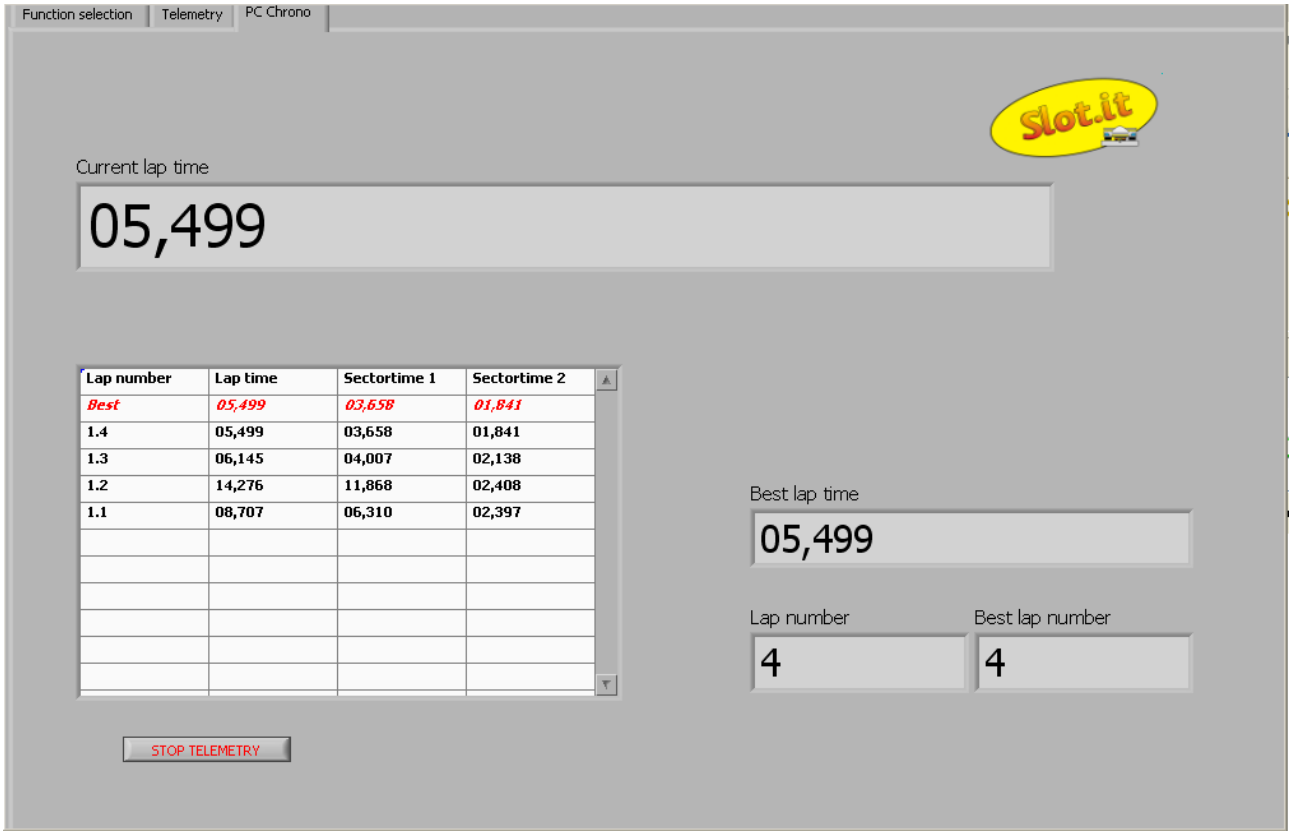


Figure 6: PC Chrono page.

Here is a brief description of the function of the various buttons that can be found in the *"Telemetry"* page (figure 5):

- *Reset all*: it erases the data displayed in the following fields: *Lap time, Lap number, Sector time, Sector number, Best time and Best lap*;
- *Reset best time:* it erases the best time recorded until that moment and the corresponding lap number;
- STOP TELEMETRY: by pushing this button, the user is asked if he wants to move on directly to the *postprocessing* function. If yes, the *postprocessing* phase begins (for its description, see paragraph 2.2.1.1), otherwise the *Telemetry Box PC Interface* application returns to the starting page (figure 3) *"Function selection"*, where a message reminds the user that, in order to move on to other operations, it is necessary to select one of them from the *"Selected function"* drop-down menu.

2.2.1.5 Postprocessing function

By selecting the *"Postprocessing"* function, the page shown in figure 7 appears. It is divided in two sections, DRIVER1 and DRIVER2. It is possible to load the data of two different drivers or of two different runs of the same driver in order to compare them. In order to continue, 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 *Telemetry Box PC Interface* application enables a second page, *"Postprocessing 2"* (figure 8), in which the telemetry data can be visualized, by selecting the intended lap number.

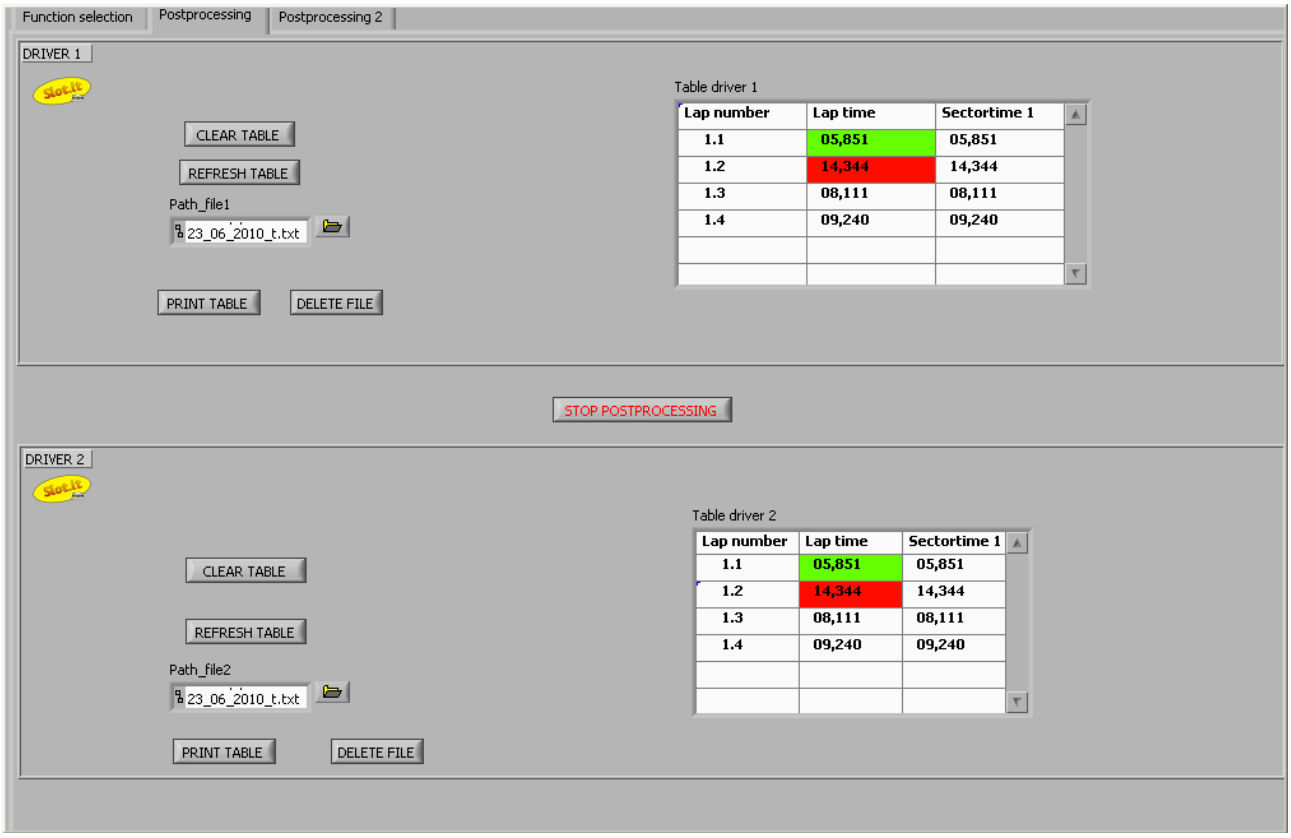


Figure 7: postprocessing page.

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

- *CLEAR TABLE*: it erases the just loaded table and file;
- *REFRESH TABLE*: it updates the loaded table;
- *PRINT TABLE*: pushing this button a new window appears that allows to set the font, the colour, the size, and the number of copies to be printed;
- *DELETE FILE*: it erases the loaded file permanently;
- *STOP POSTPROCESSING*: it provokes the stop of the *"Postprocessing"* function; the *Telemetry Box PC Interface* application returns to the starting page, *"Function selection"* (figure 3), where a message reminds the user that, in order to move on to other operations, it is necessary to select one of them from the *"Selected function"* drop-down menu.

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

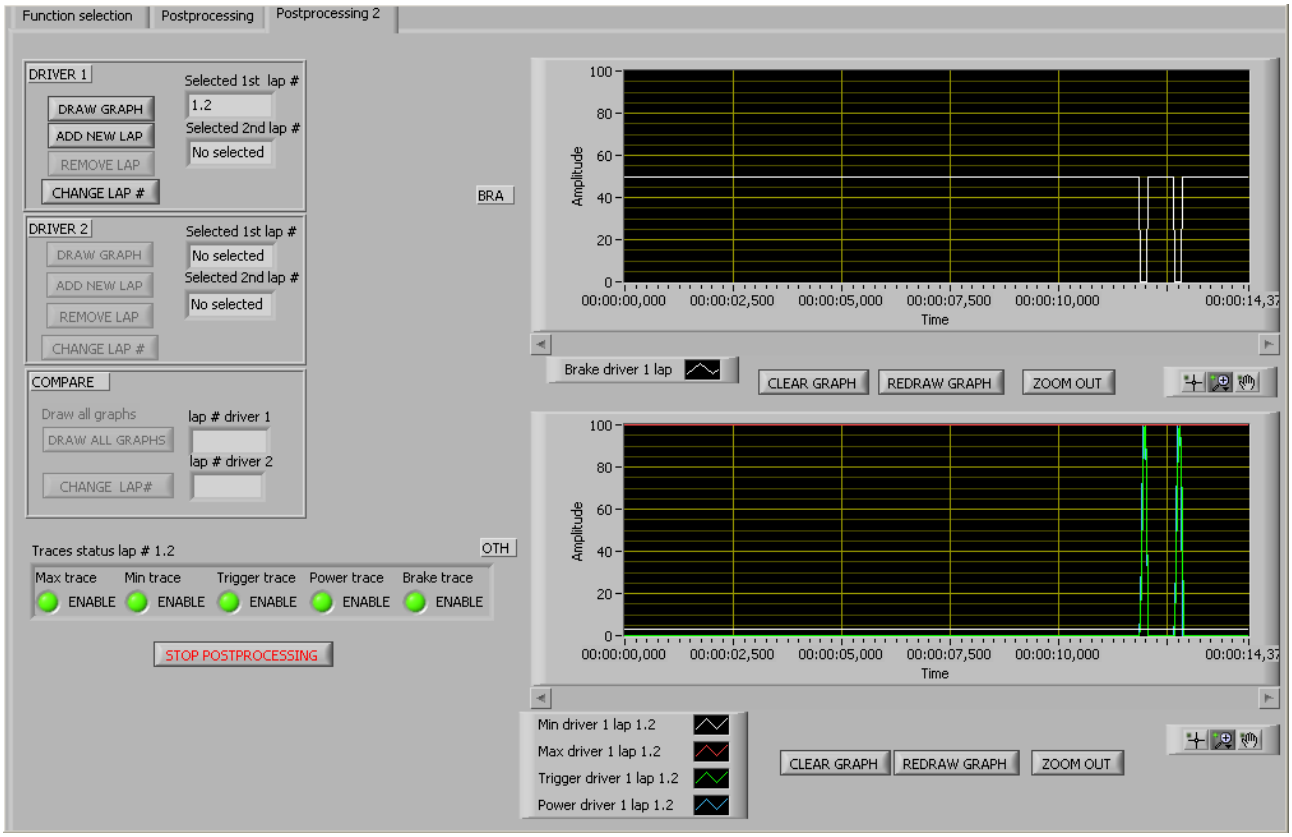


Figure 8: postprocessing 2.

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, that is, 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, that is, 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;
- minimum and maximum speed set by the user and real-time performance of the applied speed in conformity with the chosen anti-spin value;

Here is a description of each button of the "*Postprocessing2*" page:

- *DRAW GRAPH:* it allows to see the above listed data concerning 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:* it allows to select a further lap, so that it is possible to compare the data concerning the two selected laps. The number of the additional selected lap can be seen in the "*Selected 2nd lap #*" field. In order to go on to visualize the data, push the "DRAW GRAPH" button again;
- *REMOVE LAP:* it allows to select the lap number to be removed, among the already selected ones;
- *CHANGE LAP #:* it allows 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:* it allows to visualize the data concerning the selected lap for both drivers at the same time;
- *CHANGE LAP# (COMPARE group*): it allows to indicate the number of laps, one for each driver, that one wishes to compare. In particular, pushing the button, a new window appears where it is necessary to act as follows:
    - 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;
    - push “OK”;
- *TRACES STATUS:* it allows to choose which data will be kept displayed on the two graphs: if the green light is on, the datum is displayed, otherwise it is hidden;
- CLEAR GRAPH: it allows to erase the values one has just visualized. Note: by pushing 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:* it allows to draw the above standing graph again;
- *ZOOM:* it allows to zoom in on the above standing graph;
- *STOP POSTPROCESSING:* the *Telemetry Box PC Interface* application returns to the starting page, *"Function selection" (*figure 3), where a message reminds the user that, in order to move on to other operations, it is necessary to select one of them from the "*Selected function*" drop-down menu.