

# SD-DataViewer

## Rapid guide

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# 1 Introduction

The relays PR122 and PR123 include a new function named “data logger”: in a dedicated memory area are stored the current and voltages signals of the electrical plant. This function will be useful for plant’s analysis and a rapid detection of operational defects. Through SD-TestBus and SD-Pocket software it is possible to transfer the entire content of the data logger forming relay memory to a file; you can manage this file afterwards.

The SD-DataViewer opens this file and represents the current and voltage’s signals as graphics in time and frequency domain. Through the markers, it is also possible to give more precisely measurements in a similar way that oscilloscope does. It permits the harmonic’s spectrum calculation too.

## 2 Operating instructions

### 2.1 Introduction

To install successfully SD-Data Viewer the administrator's privileges are necessary.

If is present another (old) version of SD-DataViewer, it is necessary to uninstall it by the install/uninstall menu of Wwindows 2000/XP (the path is: "Start\ Settings\Control Panel\ Add/Remove Programs" an the select "remove" on the SD-DataViewer icon).

### 2.2 Installation

To start installation extract in a temporary folder the file named "SD-DataViewerNNN.zip" (where NNN gets the version number) and launch the file "setup.exe". You can properly install the program following the instructions.

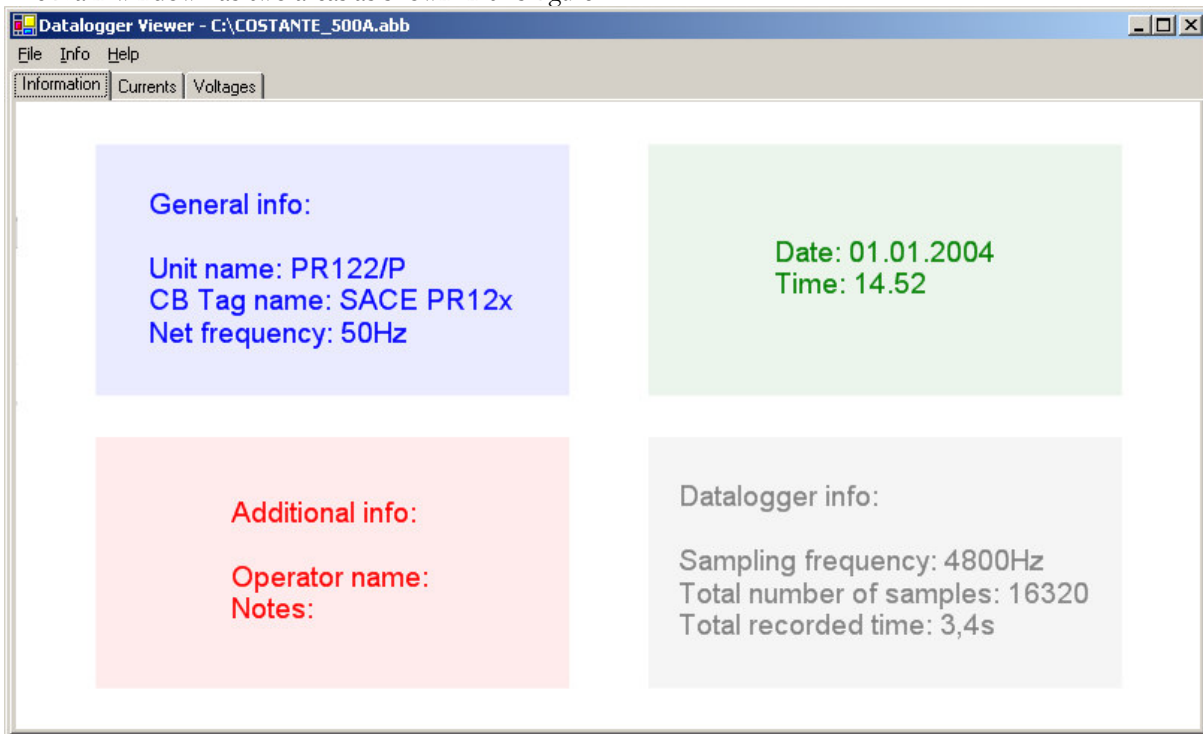
This software uses the .NET Framework v 1.1 from Microsoft (pre installed on Windows XP SP2 systems). If this is not provided by your system, the installation procedure will install the one present on the temporary folder.

### 2.3 Start

To start SD-DataViewer select the icon on the programs menu ("Start\Programs\ABB\SD-DataViewer") or double-click the icon on the desktop.

## 3 Main window

The main window has two areas as shown in this figure.



Starting from the top, there is a menu bar and a tab area. Each tab represents a page that contains the graphics of the data from data logger recording by data logger. To select a page move the mouse over the desired tab and click with the left button.

### 3.1 Menu bar

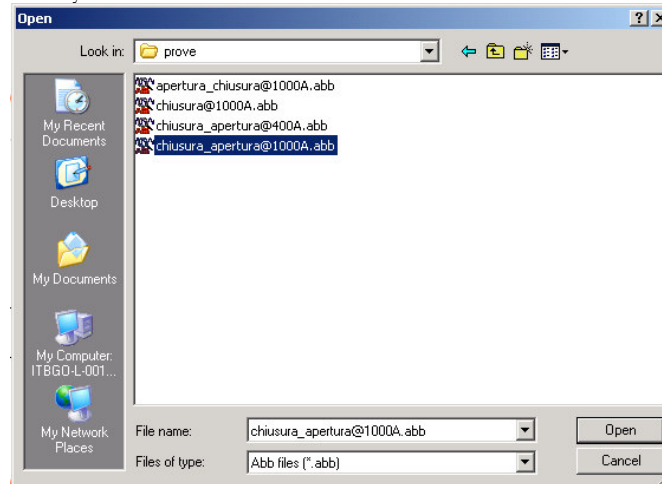
This area shows the commands performed by SD-DataViewer. It change depending on the page selected.

#### 3.1.1 File

This menu contains some commands to manage files. Through SD-TestBus or SD-Pocket programs it is possible to transfer data logger memory from PR122 and PR123 relay to a file; you can open this file and analyze with SD-DataViewer.

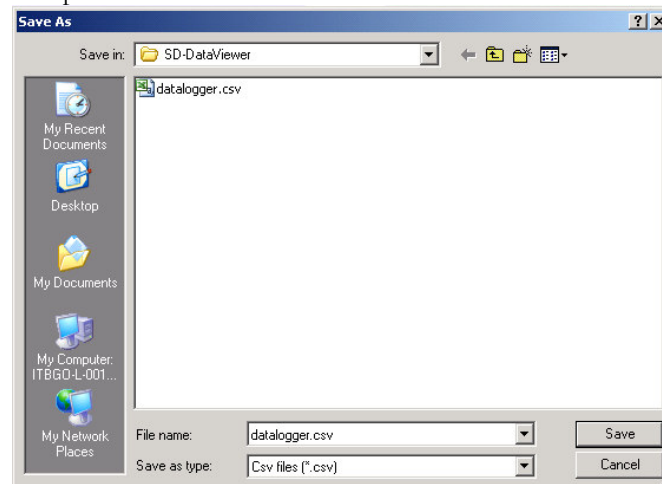
##### 3.1.1.1 Open

This menu item opens and shows a data logger recording. A dialog window will permit to select the name of the file: all of these are generated by SD-TestBus and SD-Pocket and have .abb extension.



##### 3.1.1.2 Save

This menu item permits to save the entire data logger recording on a file in Comma Separated Values (.csv) format. It is possible to open and perform custom analysis with any program that is compatible with this format (Excel). A dialog window will permit to select the file's name to save.

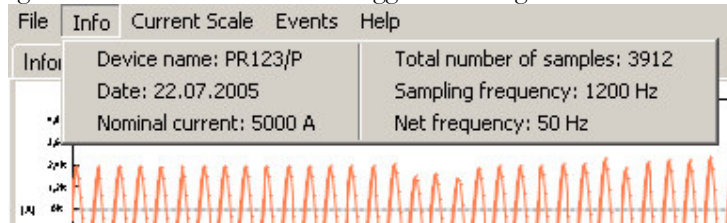


##### 3.1.1.3 Exit

Closes all the windows and comes out of this program.

### 3.1.2 Info

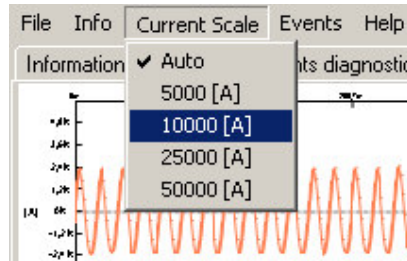
This menu item shows general information about data logger recording.



- **Device name:** give the name and the type of the relay that has generated the data logger file;
- **Date:** local date the data logger recording refers to\*;
- **Nominal current:** the nominal current's value in Ampere RMS;
- **Total number of samples:** total number of samples recorded in the data logger;
- **Sampling frequency:** the value of the sampling frequency;
- **Net frequency:** the nominal frequency the plant works (50 or 60 Hz).

### 3.1.3 Current scale

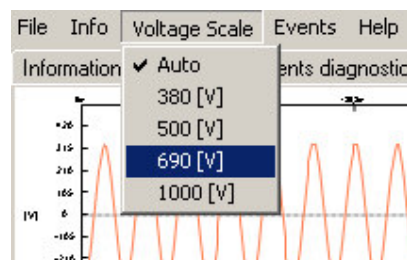
This menu item is shown when the page “Currents” is selected. This menu permits to set the proper scale (Ampere) of the graphics. The predefined scale is 2.1 times the nominal current's RMS value.



By selecting “Auto” it is possible to set the bottom scale value equal to the peak value (absolute value) of the graphic's portion visualized.

### 3.1.4 Voltage scale

This menu item is shown when the page “Voltages” is selected. This menu permits to set the proper scale (Volt) of the graphics.



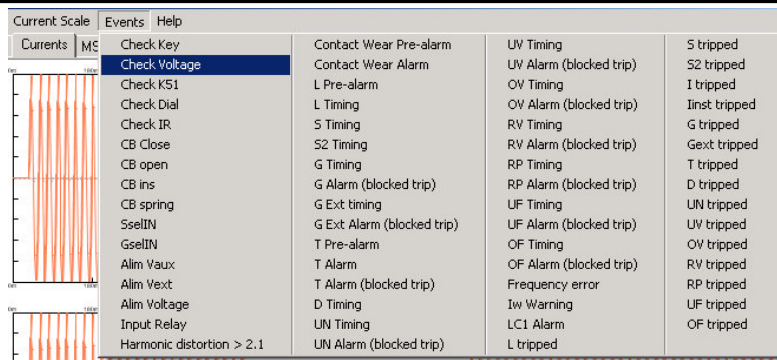
By selecting “Auto” it is possible to set the bottom scale value equal to the peak value (absolute value) of the graphic's portion visualized.

### 3.1.5 Events

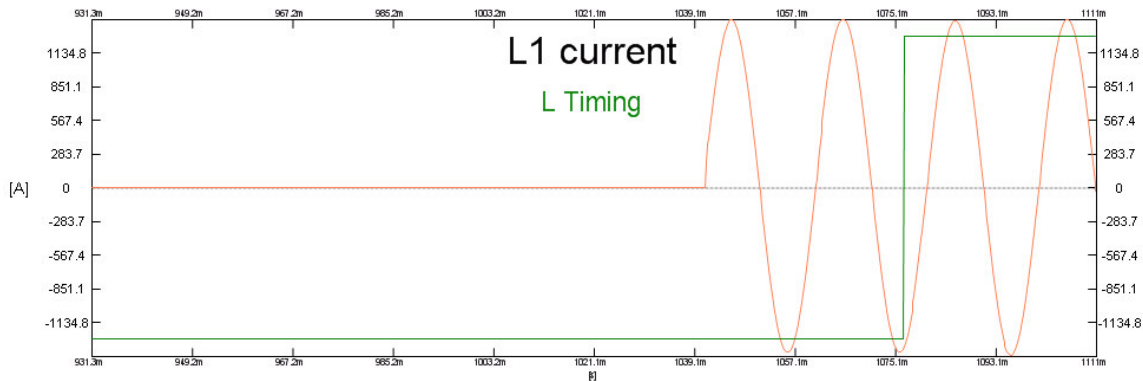
This menu item contains a list of “digital” events, which can be “1 (HIGH)” or “0 (LOW)”.

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\* “local” refers to the relay's time and date.



The selection of one event showed in this menu causes the redraw of the graphics: a green line will be drawn over each graphic. This line represents the event status versus the time and can move from the bottom “0 (LOW)” to the top “1 (HIGH)” or vice versa.



### 3.1.6 Help

It opens this guide.

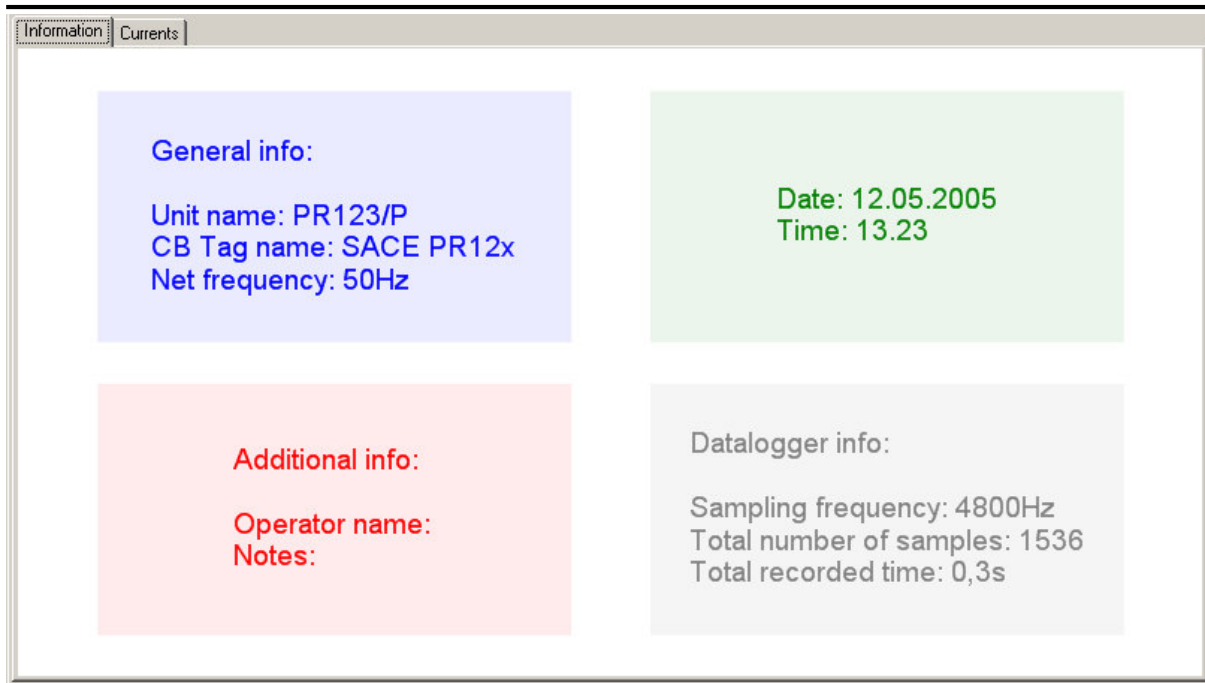
## 3.2 Pages navigation

The SD-DataViewer software shows the graphics of the data recorded on the data logger. Depending on the generated file, it will be shown the pages “Information”, “Currents” and “Voltages”†.

### 3.2.1 Info

This page shows general information about data logger recording.

† The “Voltages” page is shown only if voltage module of the relay generating the data logger file has installed.



The screenshot shows the 'Information' tab in the SD-DataViewer application. It contains four distinct colored boxes with the following text:

- General info:** Unit name: PR123/P, CB Tag name: SACE PR12x, Net frequency: 50Hz
- Date:** 12.05.2005, **Time:** 13.23
- Additional info:** Operator name: Notes:
- Datalogger info:** Sampling frequency: 4800Hz, Total number of samples: 1536, Total recorded time: 0,3s

Starting from the upper left, there are some information about the relay, the circuit breaker name and the nominal frequency of the plant. Moving on the upper right, there are the “local” time and date of the data logger recording.

**Note:** “local” refers to the relay time and date.

On the bottom, starting from left, there are some optional information about the operator name and notes. On the right there are the sampling frequency, the total number of samples and the total recorded time.

### 3.2.2 Currents

This page shows the amplitude versus the time of the currents recorded in the data logger. Depending on the installed circuit breaker this page can contain the L1, L2 and L3 currents. The Ne current is shown if provided by the circuit breaker or by any **external** sensor.

### 3.2.3 Voltages<sup>‡</sup>

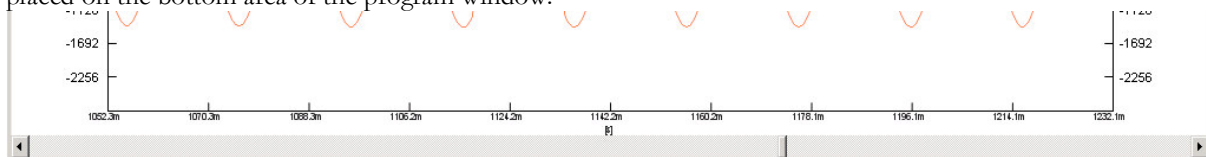
This page shows the voltage’s amplitude versus time.

### 3.2.4 Zoom

At first the pages “Currents” and “Voltages” have a default zoom value: the entire data logger recording is showed. To increase or decrease the zoom factor press the keys “Page↑” or “Page↓”. It is also possible to use the wheel of the mouse if the hardware provides it.

### 3.2.5 Scroll bar

If the zoom factor is different from the default value, it is possible to scroll the graphics by moving the scroll bar placed on the bottom area of the program window.

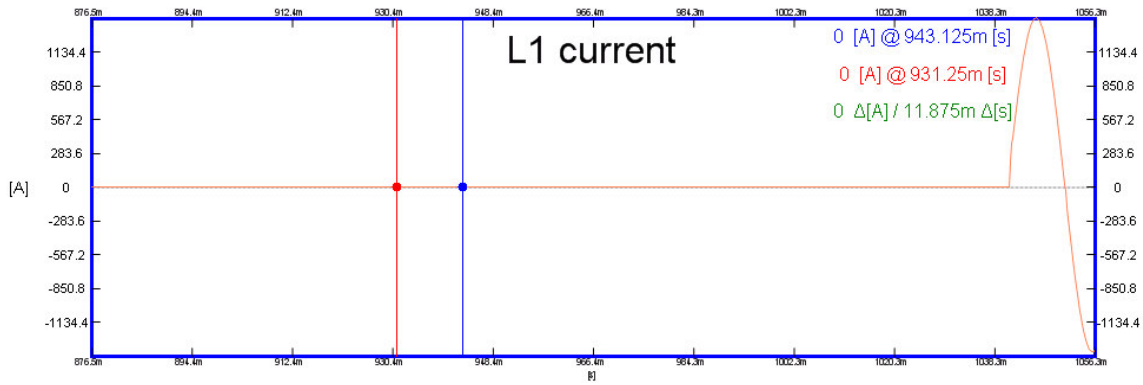


<sup>‡</sup> The “Voltages” page is shown only if voltage module of the relay generating the data logger file has installed.

It is possible to move the bar by dragging the cursor with the mouse or by pressing the keys “Alt” plus “←” or “Alt” plus “→”.

### 3.2.6 Markers

Each graphic on the page has two markers that show the amplitude versus the time starting from the origin. First of all select with the mouse the graphic of interest: move the mouse over the area and do a single click with the left mouse button. A blue rectangle shows the graphic’s selection. Now it is possible to activate the markers by pressing the keys “F1” and/or “F2”.



To move **blue** marker press the arrow keys “←” and “→” for a precision placement or the combination of “Shift” plus “←” (or “Shift” + “→”) for rapid movement. In the same way it is possible to move **red** marker with the arrow keys “↑”, “↓”, “Shift” + “↑” or “Shift” + “↓”.

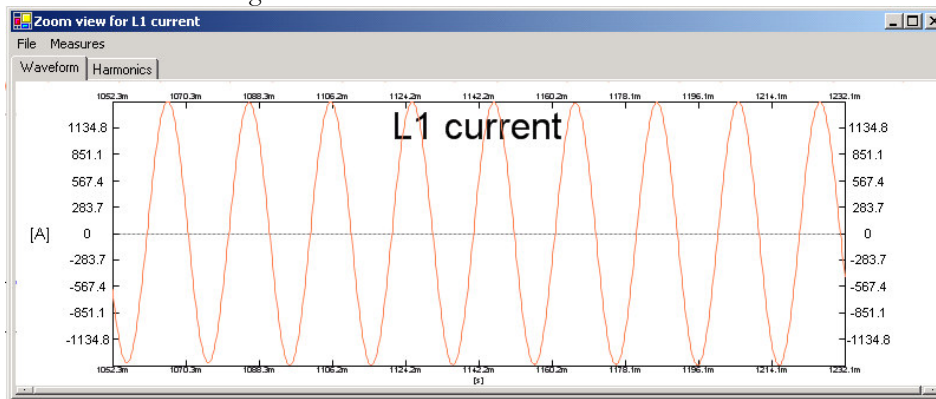
It is also possible to move the markers with the mouse: simply drag the marker with the pointer by pressing the left mouse button.

In the upper right area of the graphic are reported the amplitude and time displacement of the **blue** and **red** markers and, reported in **green**, the difference.

To turn off the markers press once the keys “F1” and/or “F2”.

## 4 Graphic details

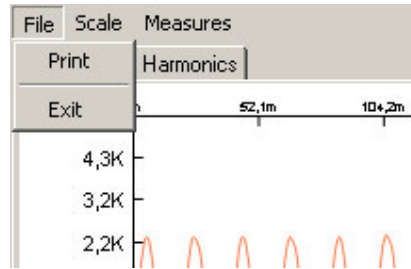
With this function it is possible to have a single signal graphic on a dedicated window. To activate this view double clicks the mouse over the signal of interest.



### 4.1 Menu bar

The menu bar contains two items: “File” and “Measures”.

### 4.1.1 File



#### 4.1.1.1 Print

By selecting this item it is possible to send to a printer the current view: it will be opened a dialog window with the active printer and the current printing option shown.

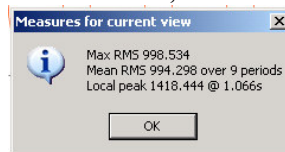
#### 4.1.1.2 Exit

Closes the window.

### 4.1.2 Measures

This menu item performs some calculations depending on the signal selected.

On the page “Waveform” it calculates the maximum RMS, the mean RMS and the local peak<sup>§</sup>.



On the “Harmonics” page it calculates the frequency of the main harmonic and the “Total Harmonic Distortion”<sup>\*\*</sup>.



### 4.2 Pages navigation

On this windows it is made possible to select two main pages: “Waveform” and “Harmonics”.

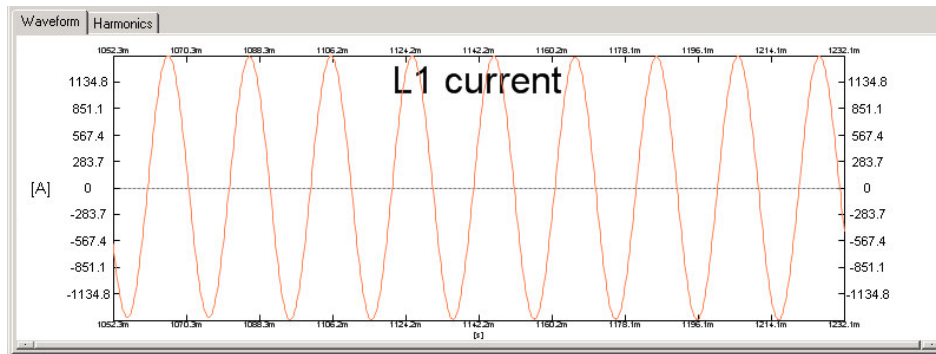


<sup>§</sup> “local” peak means the greater absolute value showed into the current view. Changing the zoom factor or scrolling the view may vary the value of the “local” peak. In the same way the maximum RMS and mean RMS depends on the graphic’s portion showed.

<sup>\*\*</sup> The frequency of main harmonics is that one corresponding to harmonics having the highest absolute value. This frequency may vary from the electrical plant’s nominal frequency.

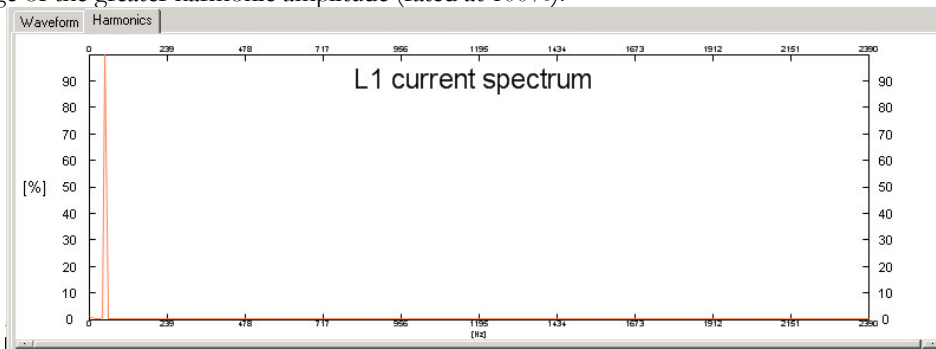
### 4.2.1 Waveform

This page shows the waveform of the selected signal versus the time. With the proper keys (3.2.4) it is possible to increase the zoom factor. To scroll the view and to use markers see instructions at 3.2.5 and 3.2.6.



### 4.2.2 Harmonics

In this page is shown the signal's spectrum calculated via the DFT algorithm. The amplitude module is expressed as percentage of the greater harmonic amplitude (rated at 100%).



**Note:** the spectrum is performed as the DFT over (at maximum) 10 periods of the harmonic at nominal frequency (ex. at 50Hz the spectrum calculus is performed with a signal segment of 200ms). If the signal showed has a “silence”, the corresponding spectrum may be void.

## 5 FAQ

“The signal representation is heavily disturbed”

**Noise and plant harmonics at frequencies above 50 or 60 Hz may affect signal's representation. It is important to choose the proper sampling frequency. Higher sampling frequency may help to reduce disturbance.**

“What kind of signals are represented by data logger viewer? I can't see voltage signals”

**The data logger viewer is able to view current signals for L1, L2, L3 and Ne phases.**

**If a voltage module is installed on the relay, it is also possible to view voltage signals.**

**Note:** on bipolar relay configuration, the Ne channel is not viewed.