Z-SCOPE V6.2 *Pro*

EDDY CURRENT INSTRUMENT

Designed for Nondestructive Testing

January 2017 Revised edition EN170110

SUMMARY

1 Introduction

1.1 Package content

1. Z-Scope V62****Pro*** (1)
2. Cable USB-DSub9-M (1)
3. Probe cable (1)
4. Probes (1 or more depending on order)
5. Software WinEC™ for Z-Scope V62.***Pro***

1.2 Operating precautions

- Avoid disconnecting the probe or probe cable because this may cause offset to the measurement and need a recalibration.
- Always connect the instrument to the ground for optimal operation. Ground missing can cause unstable operations and electric shocks.
- Do not allow the instrument to get wet.
- To avoid damage to the instrument, protect it from physical shock when transporting and handling. Be especially careful to avoid physical shock from dropping.
- To move the instrument, disconnect the power cable but keep the probe and probe cable connected, and carry the instrument by the handle.
- Do not apply heavy downward pressure when the handle is positioned as a stand. The handle could be damaged.
- After use, always turn OFF the power

2 Overview

2.1 Product features

- Sinusoidal signal generator: 100 Hz – 500 kHz, 10V peak-to-peak amplitude.
- 2 input measurement channels for measuring the amplitude and phase angle of 2 independent (input frequency range: 3 kHz-500 kHz)
- Operation in USB connected mode with an external computer (Windows XP™, 7, 8, 10™) for configuration, signal visualization and pre-processing.
- Stand-alone operation (without external computer) with opto-coupled I/O and incremental X/Y encode interface on industrial sites.

2.2 Applications

- Eddy current nondestructive testing: detection of flaws, misplacement, part sorting, comparator of parts, etc.
- Nondestructive electrical conductivity measurement
- Noncontact, single-sided thickness measurement
- Noncontact distance measurement
- Sensor or LVDT conditioner
- Signal generator and circuit analyzer

2.3 Synoptic

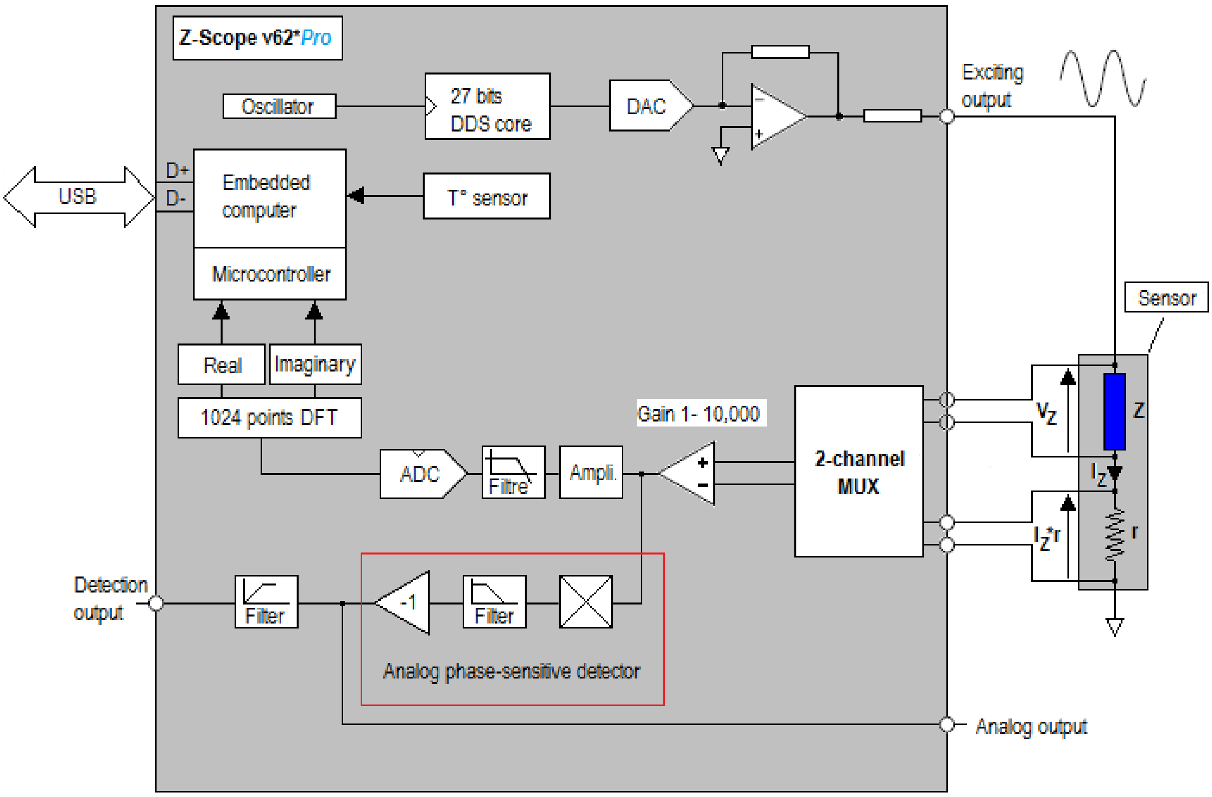


*Fig. 1 - Synoptic of the Z-Scope V62*Pro*

2.4 Names and functions of parts

2.4.1 Connectors

The Z-Scope V62*_Pro_ has the following connectors:

FRONT PANEL

Fig. 2 – Front view of the Z-Scope V62**Pro*

2.4.1.1 Connector « Probes »

This is a Binder 680-7 type connector. It connects the probe cable.

2.4.1.2 Connector « Aux. Inputs »

This is a DSub-25M connector. It provides 1 opto-coupled inputs (and 3 available in option) and an X-Y 24bits-encoder interface available in option.

2.4.1.3 Connector « Aux. Outputs »

This is a DSub-25F connector. It provides 2 opto-coupled outputs and 2 others available in option.

2.4.1.4 LED

The LED on the front panel can display up to 3 colors corresponding to different states of the instrument. For example, in an industrial application consisting of sorting parts, the LED can behave as follows:

- « Off » : the Z-Scope V62**Pro* is starting
- « Yellow » : the Z-Scope V62**Pro* is ready to operate
- « Green » : part acceptable
- « Red » : part rejected

When the Z-Scope V62*Pro is not programmed for a definite application, the LED can only light yellow.

REAR PANEL

Fig. 3 – Rear view of the Z-Scope V62*Pro

2.4.1.5 « USB » connector

Dsub9F. This connector connects a USB-SubD9-male cable linking to a USB port of an external Windows PC.

2.4.1.6 « Power » connector

This connector (DIN 41524 5 pins female, Radiospares ref. 453-432) connects the cable of the external power supply adaptor (Sinpro SPU45E-303).

2.4.1.7 « Mon », « Com », « KB » connectors

Connectors of the embedded computer, reserved for product developer. Not available for normal use.

2.4.1.8 Switch

« ON/OFF » switch, turns “ON” or “OFF” the power.

2.5 Examples of applications

The Z-Scope V62**Pro* is a multi-functions measuring instrument. It can fulfill a large panel of physical measurement and nondestructive testing:

- Eddy current nondestructive testing: detection of flaws, misplacement, part sorting, comparator of parts, etc.
- Electrical conductivity measurement
- Thickness measurement
- Noncontact distance measurement
- Transfer function measurement (Bode diagram characterization)
- Linear Voltage Differential Transformer (LVDT) conditioner

Below are some examples of application of the Z-Scope V62**Pro*

2.5.1 Eddy current nondestructive testing

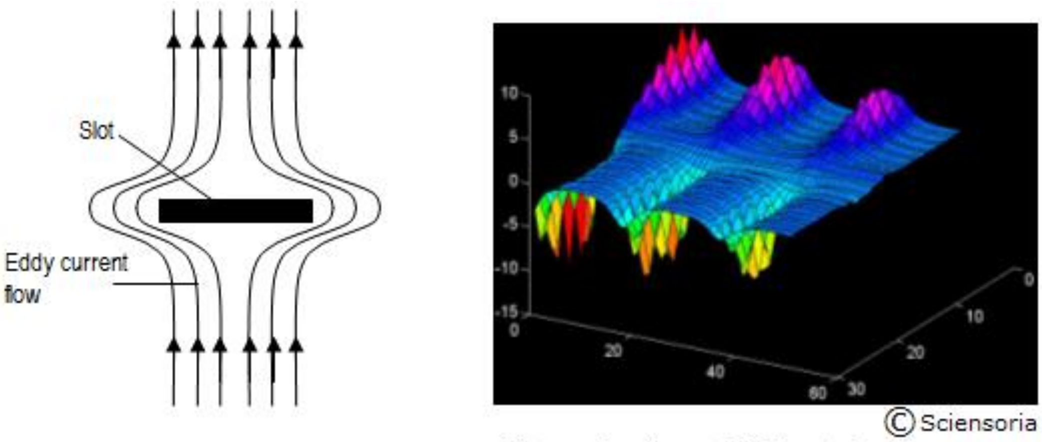
The Z-Scope V62**Pro*™ is well suited for eddy current nondestructive testing.

The working principle of the eddy current nondestructive testing is as follows: a coil **L** carrying an alternative current of frequency ***f*** creates a magnetic field. When this magnetic field reaches a conductivity material near the coil **L**, it induces eddy currents inside the material. The eddy currents generate in their turn a secondary magnetic field, which tends to opposite the initial magnetic field. The global magnetic field $\vec{B}$ around the coil is a sum of the initial magnetic field and the secondary magnetic field. It varies as a function of the properties of the conductive material. The voltage across the coil **L** is linked to the magnetic field $\vec{B}$ as follows:

$$v = \frac{d(\vec{B} \bullet S)}{dt}$$

$\vec{B}$ is the magnetic field passing through the surface S of the coil **L**.

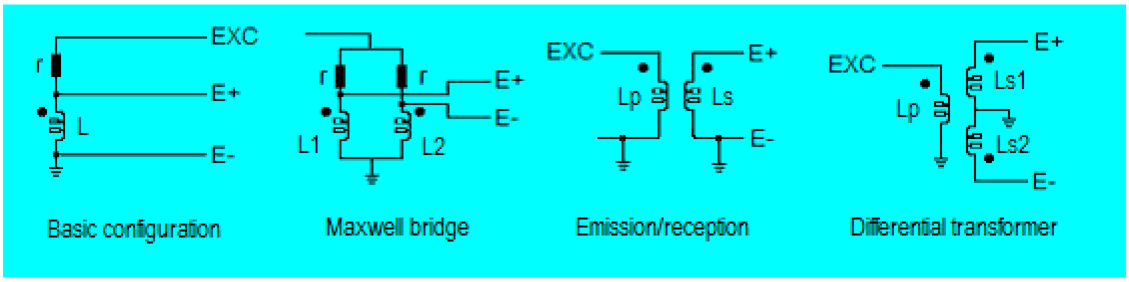
The eddy current flow can be affected by the presence of flaws, voids, cracks, change of electrical conductivity of thickness. Consequently, the magnetic field $\vec{B}$ and the voltage v also vary. By measuring v, ones can determine the state of the inspected material.



Cartography of magnetic field created by eddy current in the vinicity of 3 slots of different depths

Fig. 4 – Distribution of eddy current and magnetic field around 3 parallel slots of different depths

There are different coil arrangements to excite a tested material (target) and measure the secondary field. One can use only 1 coil (basic configuration), 2 coils connected in bridge (the Maxwell bridge), emission/reception coils or transformer differential configuration as shown in the figure below. The Z-Scope V62**Pro*™ can accept all these configurations.



EXC: exciting output of the Z-Scope V62**Pro*™, E+, E-: differential inputs of a channel of the Z-Scope V62**Pro*™

Fig 5. Various coil configurations available with the Z-Scope V62**Pro*™

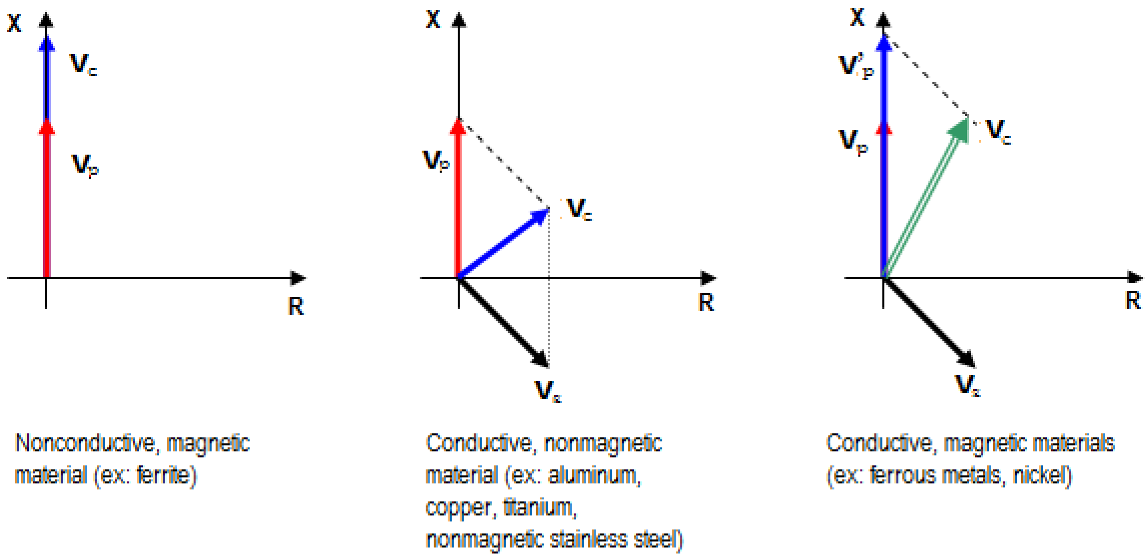


Fig. 6 – Behavior of the voltage across the coil as a function of the target material

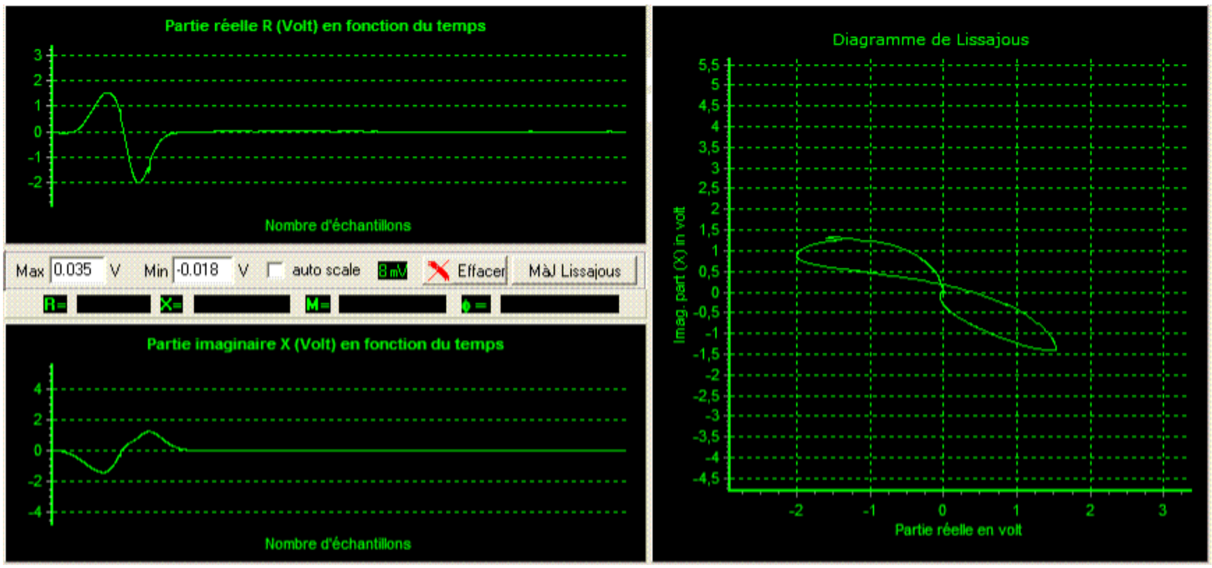


Fig. 7 – Signature of a slot detected by an eddy current sensor. Left: real part (R) and imaginary part (X) of the input signal. Right: Lissajous R-X diagram.

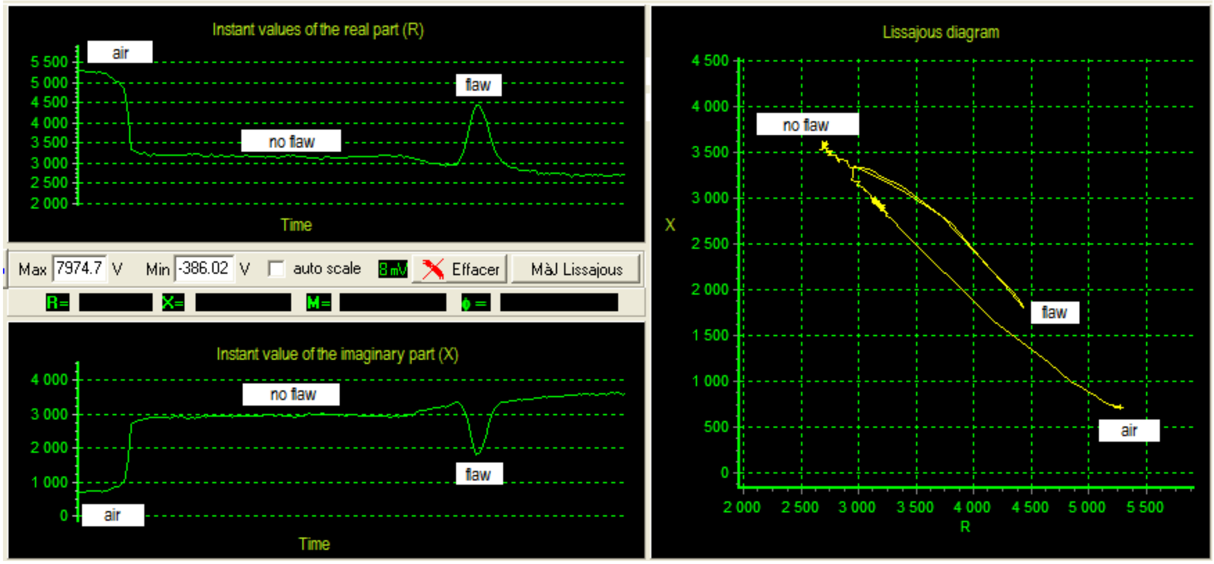


Fig. 8 - Signature of an open slot (0.1 mm width, 0.2 mm depth). One can see the difference between a "lift-off curve" and a "defect curve"

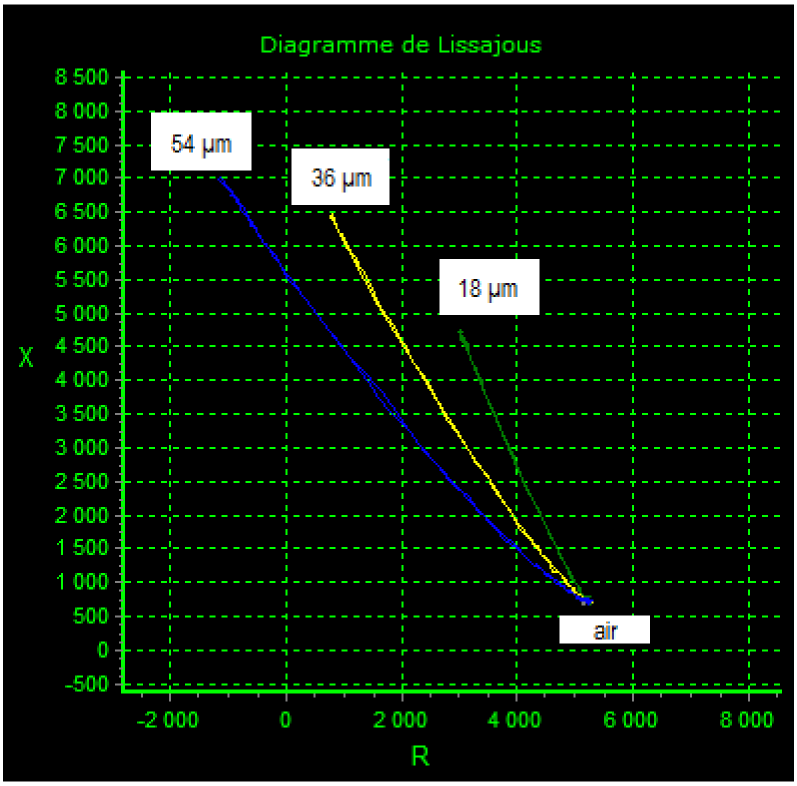


Fig. 9 – Thickness measurement of thin aluminum sheets. The figure shows the 'lift-off curves" of 3 different thickness

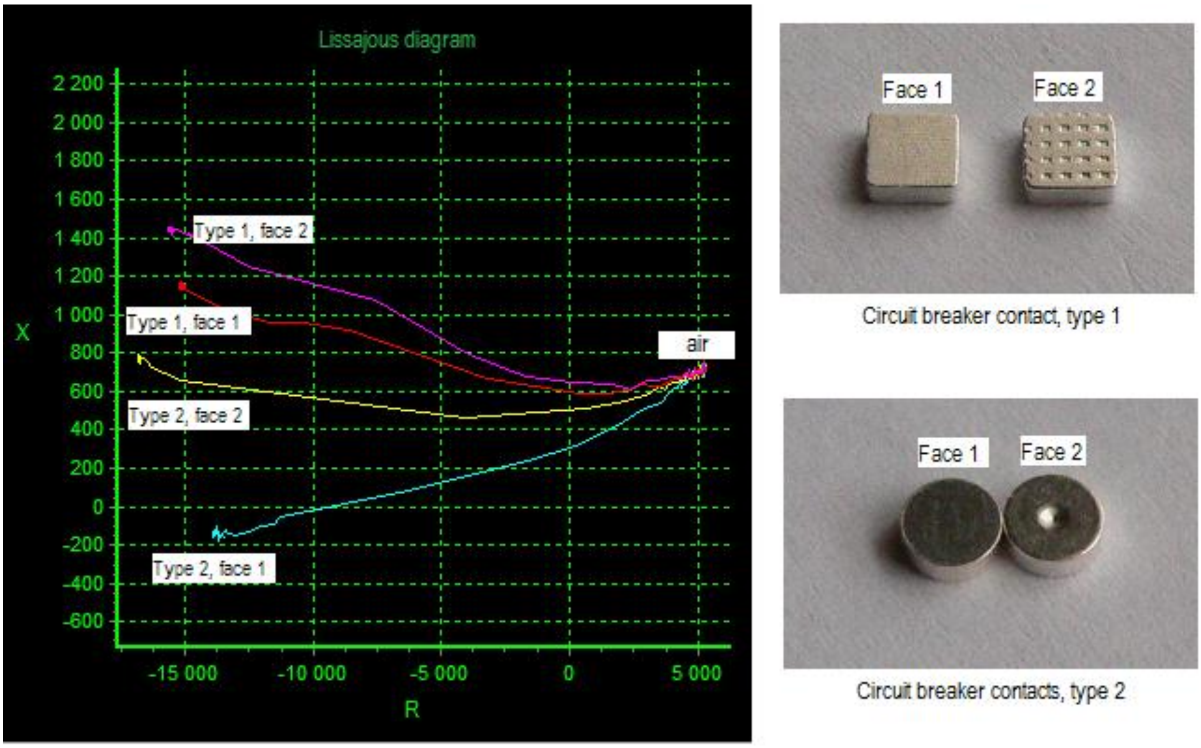


Fig. 10. - Material sorting. The eddy current sensor has to determine the orientation of a circuit breaker contact before welding operation. For a circuit breaker contact, the face 1 is specially processed in order to support electrical arc, while the face 2 is specially processed to be welded to a copper conductor.

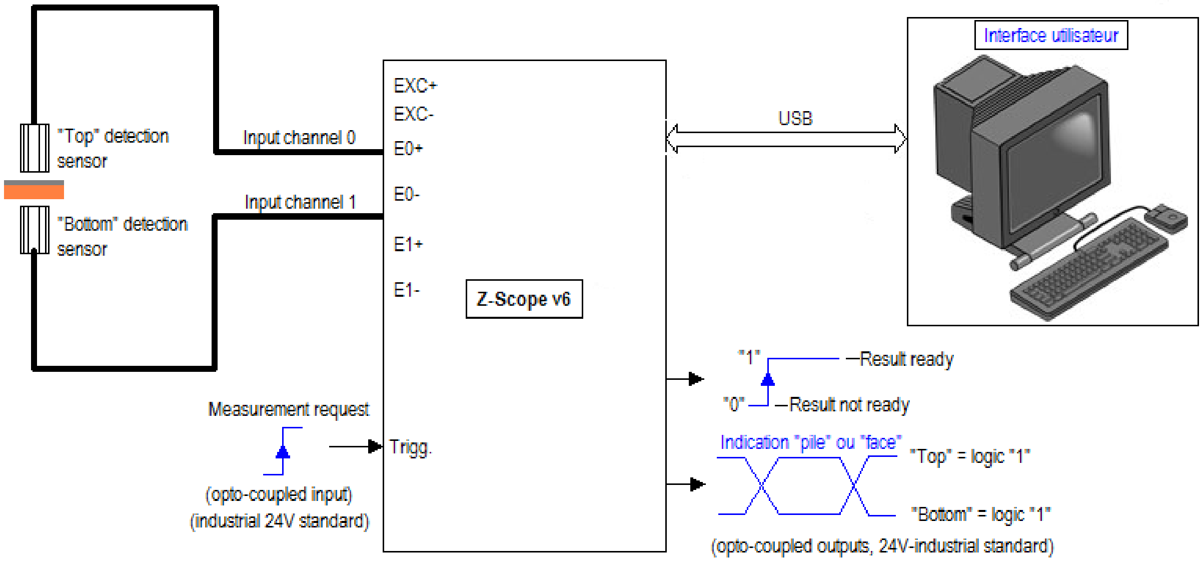


Fig. 11 – Synoptic of a contact orientation detection system using a Z-Scope V62**Pro*™ with *2 input channel utilized. The logic signals are used for interfacing with external PLC.*

2.5.2 Connection with a giant magneto-resistance (GMR) from NVE

The giant magneto-resistance sensors are more and more often utilized in nondestructive testing applications. Their advantage is due to their high sensitivity at low frequency range, unlike sensors based on wound coils.

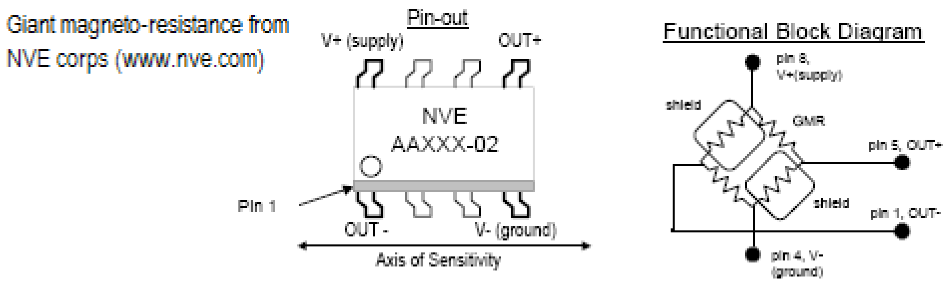


Fig. 12 – A giant magneto-resistance from NVE.

The Z-Scope V62**Pro*™ can provide a complete connection with a GMR to build an eddy current nondestructive testing system.

The sinusoidal exciting output is connected with the exciting coil of the GMR eddy current sensor.

The first differential input (channel 0) is connected to the outputs of the GMR (pins 1 and 5). As the GMR is a bridge of 4 magneto-resistances, the output points need to be measured by a true differential input. One can see here the advantage of the Z-Scope V62**Pro*™.

The second differential input of the Z-Scope V62**Pro*™ is used for measuring the exciting current flowing through the exciting coil L1. This gives a supplementary information about the tested material. One can also measure the voltage across the coil L1. This is also an important information about the tested material (for ex: lift-off and conductivity).

The Z-Scope V62**Pro*™ has also an analog detection output which can be routed out to the "Probe" connector. This output is proportional to the amplitude of the input signal (in this case, the 2nd input channel of the Z-Scope V62**Pro*™ will not be used). The output analog is fed back to a balancing coil which maintains the dc-magnetic field around the GMR at a necessary bias value. The bias value allows the GMR to operate at a linear section of its output characteristic curve.

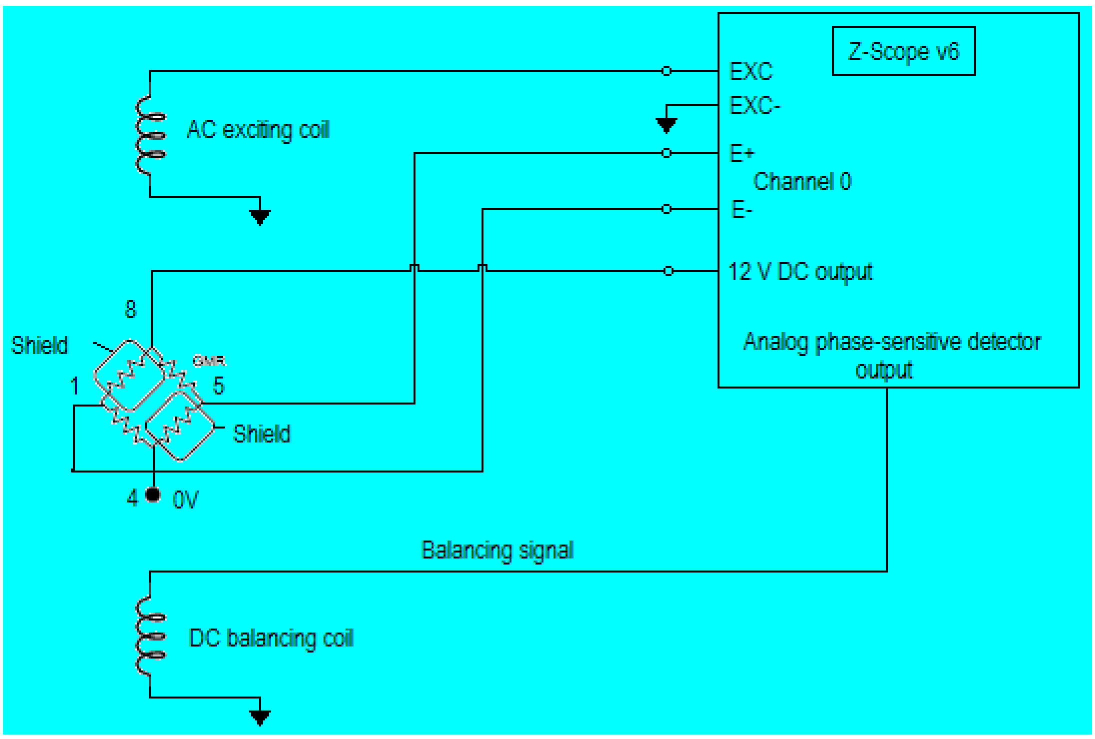


*Fig. 13 – Eddy current GMR nondestructive testing using a Z-Scope V62*Pro™.*

2.5.3 Using strain gages with the Z-Scope V62*Pro™

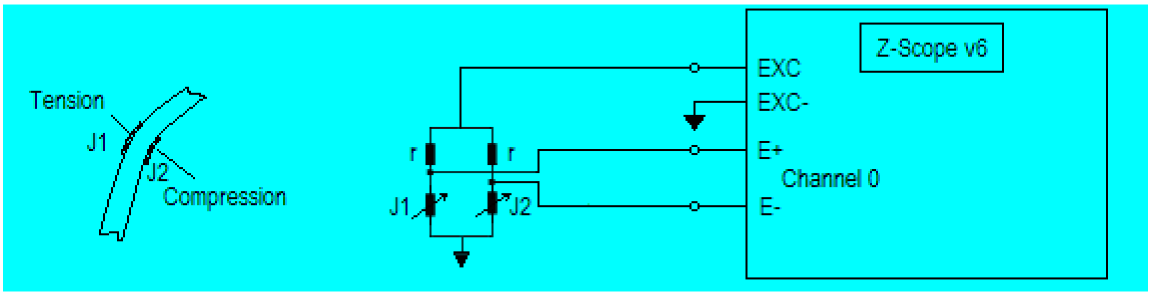


*Fig. 14 – Connecting a strain gage with the Z-Scope V62*Pro™. A second strain gage pair can be connected using the 2nd differential input.*

Strain gages are utilized for measuring mechanical deformations. The Z-Scope V62*Pro™ can be used as signal conditioner for 2 bridges of strain gages. The sinusoidal output of the Z-Scope V62*Pro™ is used as exciting source. The use of the Z-Scope V62*Pro™ has the advantage to eliminate the measurement offset. In effect, many litteratures have shown that AC-excitation of strain gages is much more advantageous than DC-excitation.

2.5.4 Four-points impedance measurement

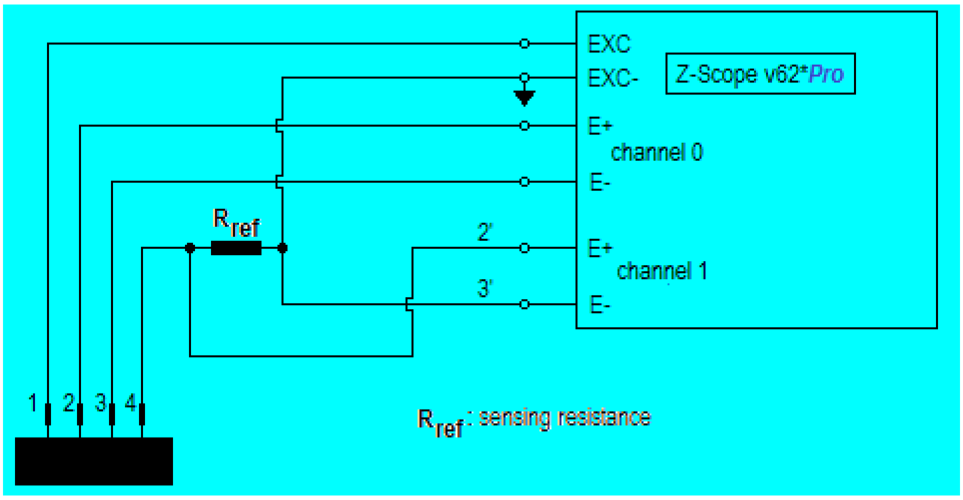


Fig. 15 - Four-points impedance measurement configuration

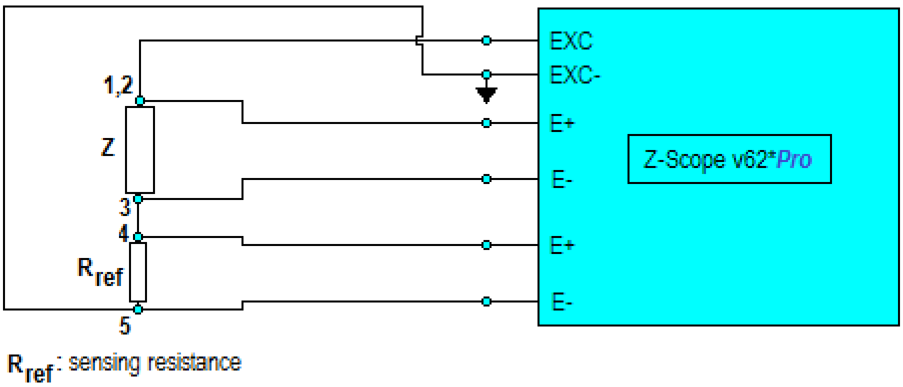


Fig. 16 – Four-points impedance measurement explanation

In this application, the impedance Z is to be measured. To do this, a current is applied using the exciting output EXC+/EXC-. The voltage across the impedance is measured by the 1st channel. The 2nd channel measures the voltage across the sensing resistance Rref. The impedance Z is determined by the following formula: $Z = \frac{V_1}{V_2} R_{ref}$ Z is a complex number: Z= R + jX.

2.5.5 Frequency response analysis

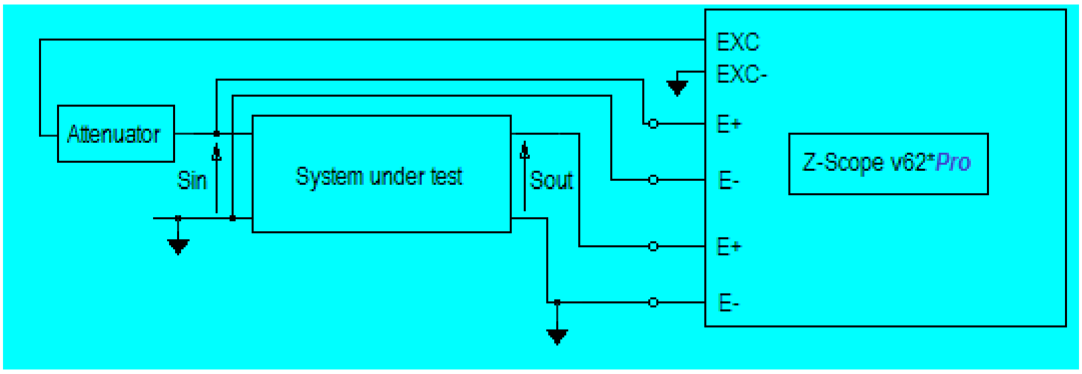


Fig. 17 – Gain phase analysis with the Z-Scope V62*Pro*™

$$G = 20\log_{10}\frac{Sout}{Sin}$$

ϕ= ϕout-ϕin

with G: the gain and ϕ, the phase angle of the system under test

3 Technical description

3.1 Pin-out

3.1.1 Connector « Probes »

Connector type: Binder 680 female, 7 points

1	EXC-
2	EXC+
3	Ch 0-
4	Ch 0+
5	Ch 1-
6	Ch 1+
7	NC

Table 1 – Pin-out of the "Probe" connector

The drawings of the probe cable and the associated connectors are given in the appendix 1.

3.1.2 Connector « Aux. inputs »

Type: DSubD male, 25 points

Vcc 0	13	Vcc 2	9
Out 0	12	Out 2	8
GND 0	25	GND 2	21
Vcc 1	11	Vcc 3	7
Out 1	10	Out 3	6
GND 1	23	GND 3	19
1-5, 14-18		NC	

Table 2 – Pin-out of the "Aux. inputs" connector

3.1.3 Connector « Aux. outputs »

Type: DSub female, 25 points

3.1.4 Connector «USB »

Connector type: DSub female 9 points

Connects a cable USB-SubD9 designed by Sciensoria.

1 : +5V (fil rouge)	2 : D- (fil blanc)	3 : D+ (fil vert)	4 : 0V (fil noir)	5 : blindage
Points 6, 7, 8, 9: not connected				

Table 3 – Pin-out of the "USB" connector

3.1.5 Connector « Power »

Connector type: female DIN 41524 5 pins (reference Radiospares: RS 453-432).

1,2 : GND	3 : +5V	5 : +15V	4 : -15V	5 : NC

Table 4 – Pin-out of the "Power" connector

⚠ **Very important: the power adaptor must be connected to a power outlet with ground plug!**

3.2 Technical specifications

Frequency range of the exciting output	100 Hz – 500 kHz
Amplitude of the exciting voltage (''Excitation'')	10 V_{p-p} (max value)
Output resistance of the exciting output	190Ω
Frequency range of the inputs	3 kHz – 500 kHz
Maximal amplitude of the inputs	0.2 V_{p-p} max.
Gain setting	1, 2, 5, 10, 20, 50, 100, 200, 500, 1 000, 2,000, 5,000, 10,000
Gain-Bandwidth product	10 MHz
Power supply	5Vdc@1A, +15Vdc@0.2A,-15Vdc@0.2A
Interface USB	2.0, compatible USB 1.1
Dimensions	252x245x90 (Length-width-height)
Operating temperature	0°C to 40°C. Calibrated at 20°C.
Humidity	80% (non-condensing)

Table 5 – Hardware specifications

4 Operation of the Z-Scope v62**Pro*

As described earlier, the Z-Scope v62**Pro* excites a sensor with its exciting output and measures the returned signals from the sensor with its multiplexed 2 input channels. A digital phase sensitive detector determines the real part R and the imaginary part X of each input signal. The amplitude and the phase angle of these signals are then deducted from the real and imaginary parts.

The phase angle of the input signals are determined with respected of the exciting output signal. It is the “absolute phase angle”. The “absolute phase angle” varies as a function of the frequency. This is quite normal because of the presence of filters in the signal path.

On the contrary, the phase difference between the 2 input signals is constant and depends only on the sensor. This allows the Z-Scope v62**Pro* to characterize the phase response of a device under test, or to measure the impedance of an eddy current sensor.

The embedded computer analyzes the real and imaginary parts R and X of the sensor impedance and determines the physical parameters of the material under test like electrical conductivity, thickness, sensor-target distance,… following the programmed application stocked in the flash memory of the computer. This application is built by Sciensoria. Users can build themselves other applications using the Sciensoria’s WinEC™ software and download them to the Z-Scope v62**Pro*.

The measured value will be compared to a threshold to sort good/bad parts. The LED on the front panel changes color as a function of the good/bad signal.

Z-Scope v62**Pro* can receive external commands during its operation. The main configuration parameters are listed below:

1. Start/Stop of measurement
2. Acquisition on channel 0, channel 1 or both (channel 0 then channel 1 alternatively)
3. Frequency of the exciting voltage
4. Frequency increment step during a frequency sweep
5. Number of frequency points during a sweep
6. Waiting period expressed as a number of signal cycles
7. Repetition number of a measurement at one frequency before switching to another frequency

5 Stand-alone mode

In stand-alone mode, the Z-Scope v62**Pro* receives a measurement request, tests the part in order to determine its parameter (for example, electrical conductivity), then compares the result with a threshold value and emits good/bad judgment. No external control is necessary. The application should be already installed in the flash memory of the embedded computer.

The example below shows the typical configuration of a nondestructive conductivity testing of parts on a production line.

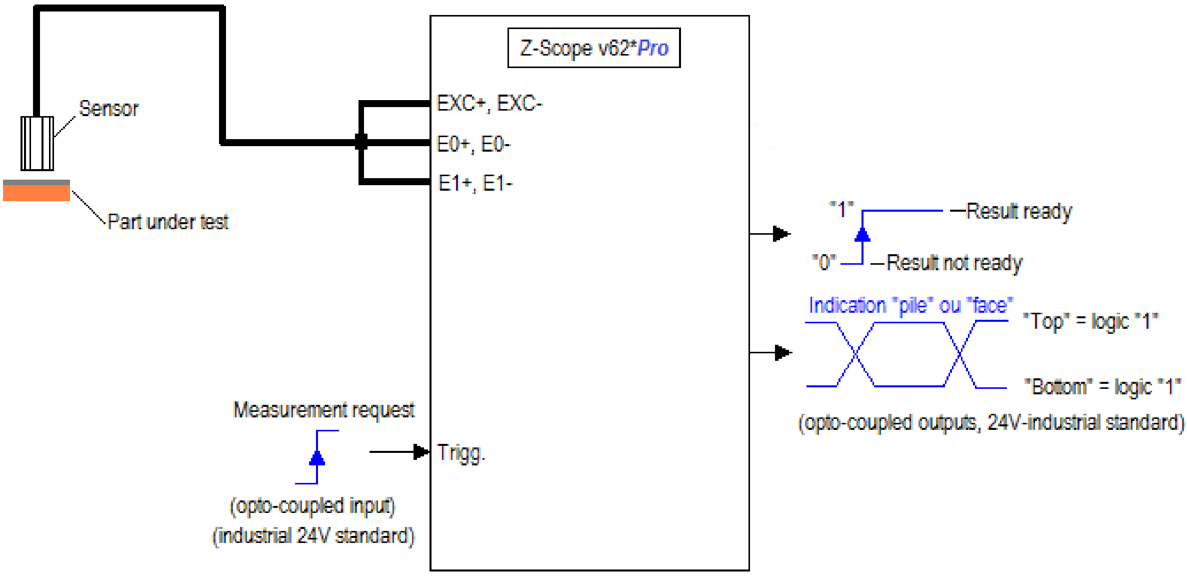


Fig. 18 – Example of connection for a stand-alone operation on production line

6 External control by a Windows™ computer

In external control mode, the Z-Scope v62*Pro is connected to an external computer through a USB port. User uses the Sciensoria's WinEC™ software to visualize, analyze the sensor signal and setup an application. Then, the application is downloaded to the flash memory of the Z-Scope v62*Pro.

The Z-Scope v62*Pro uses a USB interface chip made by the UK firm FTDI. User needs to install the FTDI's USB driver first.

With the USB link, people can also utilize other software like Matlab™ to send command and retrieve data from the Z-Scope v62*Pro. Using Matlab, the user will be able to directly use the Z-Scope v62*Pro with his existing friendly Matlab programs.

The example below shows the typical configuration of a nondestructive conductivity testing of parts on a production line controlled by an external computer.

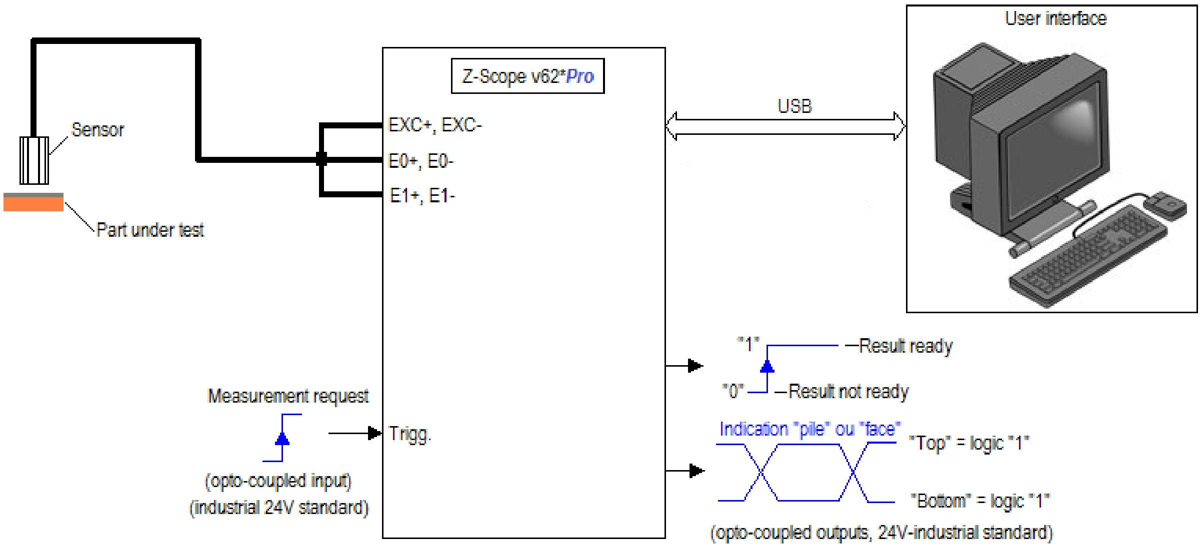


Fig. 19 – Example of connection for an external control by a Windows™ computer

Note: the external control mode does not affect the capacity to run in real-time of the Z-Scope v62*Pro.

6.1 External control commands list

The commands are in ASCII format and can be send from every software capable of handling a COM port, such as Hyper Terminal or Matlab.

The command list is given below:

Note: each command includes 2 numbers separated by a "/" and is terminated by a semi-column ";".

<0/0;> stops the measurement loop (pause mode)

<0/1;> starts the measurement loop

Example: sending 0/1; starts the measurement loop, sending 0/0; stops the measurement loop. The "<" and ">" characters are not to be typed.

<0/5;> multiplexed mode: channel 0 and channel 1 are enabled alternatively

<0/6;> channel 0 only

<0/7;> channel 1 only

Example: sending 0/6; enables the 1st channel (channel 0), sending 0/7; enables the 2nd channel, sending 0/5; enables the multiplexed mode.

<1/xx;> sets the exciting frequency (in Hertz)

Example: sending 1/100000; sets the exciting frequency at 100 kHz

<11/xx;> sets the increment in frequency f_{inc} during a frequency sweep

Example: sending 11/10000; sets the increment in frequency at 10 kHz

<32/xx;> sets the number of frequency points in a sweep

<31/xx;> set the number of waiting time in signal period before switching to another frequency. **xx= 0..511**. After 512: xx= 512+2k with k=1 to 255, xx take no values between 1024 and 1535

<9/xx;> sets the repetition number of a frequency point during a frequency

6.2 Output data format

During the measurement loop, the Z-Scope v62*Pro regularly sends out the raw data through the USB link.

The data format is as follows:

… @@R0X0R1X1iCRC@@R0X0R1X1iCRC@@R0X0R1X1iCRC@@R0X0R1X1iCRC …

with

@@R0X0R1X1iCRC is a data frame

@@: data frame header

R0: the real part of the channel 0 signal (1^{st} channel), coded on 16 bits, in the MSB first order

X0: the imaginary part of the channel 0 signal (1^{st} channel), coded on 16 bits, in the MSB first order

R1: the real part of the channel 1 signal (2^{nd} channel), coded on 16 bits, in the MSB first order

X1: the imaginary part of the channel 1 signal (2^{nd} channel), coded on 16 bits, in the MSB first order

i: the frequency index, coded on 8 bits. The current frequency is computed as below:

$$f_i = f_0 + i*f_{inc}$$

f_0 is set by the command 1/xx; and f_{inc} is set by the command 11/xx;

CRC: the checksum coded on 8 bits. The checksum is computed by adding all the previously sent bytes in the frame except the header.

Example of decoding a frame:

For the following received frame @@$byte_1byte_2byte_3byte_4byte_5byte_6byte_7byte_8byte_9byte_{10}$, one can reconstruct the data as follows:

R0 = $byte_1*256 + byte_2$

X0 = $byte_3*256 + byte_4$

R1 = $byte_5*256 + byte_6$

X0 = $byte_7*256 + byte_8$

i= $byte_9$

CRC= $byte_{10}$

If the CRC is equal to

$$(byte_1 + byte_2 + byte_3 + byte_4 + byte_5 + byte_6 + byte_7 + byte_8 + byte_9 + byte_{10}) \text{ AND } 255$$

the received data are correct.

6.3 Making a custom software with the Z-Scope v62**Pro*

With the commands of the Z-Scope v62**Pro* in ASCII format and the given data transfer protocol, one can easily create its own software to control the Z-Scope v62**Pro*. The available software tools as Matlab™, Labview™, C, C++ ou Delphi™ can access to the USB port using the DLL D2XX.dll from FTDI (downloadable on the FTDI Web site www.ftdichip.com).

6.4 External control tool provided by Sciensoria: the WinEC™ software

The WinEC™ software is a powerful tool. It allows user to setup the Z-Scope v62**Pro*, make data acquisition, visualization, analysis, sensor calibration and real-time measurement.

The received data can be visualized in time series form or x-y (Lissajous) form. Target signatures can be isolated and saved to disk, and loaded later for sensor calibration.

WinEC™ can import a calibration file for perform parameter measurement. So, each calibration file is an application.

See the appendix to learn out how WinEC™ works.

Below, a screen copy of WinEC™

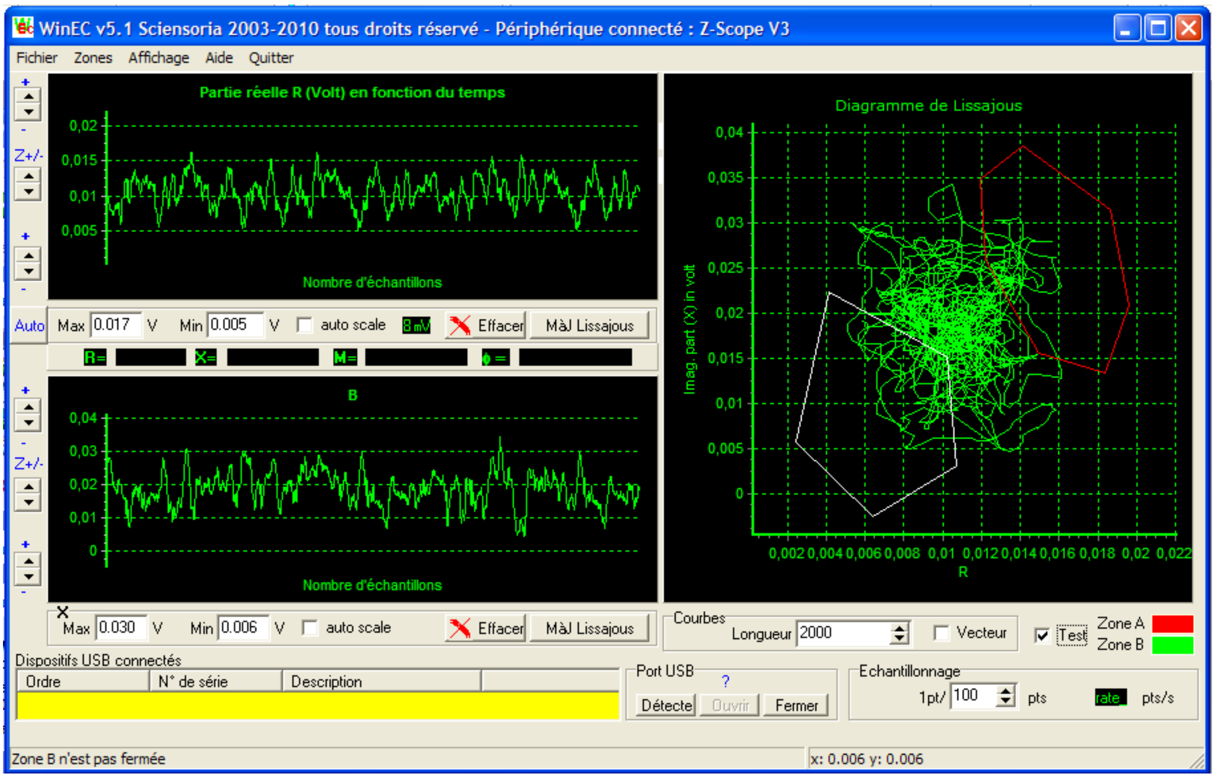


Fig. 20 – A screen copy of WinEC™

6.5 Procedure to setup a custom application using WinEc™

Example: setup a new application, "*Measurement of the electrical conductivity of aluminum parts*".

1. Preparations:
    a. Connect the probe to the Z-Scope v62**Pro*.
    b. Connect the Z-Scope v62**Pro* to a Windows PC by the USB cable.
    c. Turn on both the Z-Scope v62**Pro* and the PC.
    d. Launch WinEC™ on the PC.
    e. Initialize the USB link and start data acquisition.
    f. Place the probe far from any metallic materials and make an "air" calibration with the "Reference" button of the WinEC™ software. Then check the "on target" and verify if the measurement point is very close to the point (0, 1) on the chart.
    g. Choose aluminum standards with different electrical conductivity values.
2. Calibration:
    a. Place the probe on the 1st aluminum standard. During an acquisition, press F3 to acquire a set of data. The default length of the data set is 200 points. Label the data curve with the conductivity value of the standard (see WinEC™ user's manual[1]). Save the data to a learning file (*.dxt)
    b. Place the probe on the 2nd aluminum standard and process in the same way as above. Continue to do so until the last aluminum standard.
    c. Open the "Sensor calibration" of WinEC™. Import learning data from files previously saved. Click on the "Compute" button to build the application. Save the result into a file.
3. Download to the Z-Scope v62**Pro*
    a. Load an application file using the menu File->Open an application of WinEC™
    b. Download the application to the flash memory of the Z-Scope v62**Pro*
    c. Turn the Z-Scope v62**Pro* off and on again. The new application is now running.

[1] The WinEC™ user's manual is only available to registered customers

7 Maintenance and service

Warning: Do not attempt to modify, disassemble or repair the instrument as fire, electric shock or injury could result

Note

- If damage is suspected, check "Symptom list" section before contacting your dealer or Sciensoria representative.
- In the following cases, immediately stop using the instrument, unplug the power cord and contact your dealer or Sciensoria representative.
  - When an excessive heat occurs
  - When the nature of the damage is clearly evident
  - When measurement is impossible
  - After long-term storage in adverse conditions such as high temperature or humidity
  - After being subject to severe shock during transport
  - After severe exposure to water, oil, or dust

7.1 Symptom list

Symptom	Check item, or cause	Remedy
The LED does not turn on (yellow) when the power is on	Is the power cord unplugged? Is it properly connected?	Confirm that the power cord is properly connected
The instrument is not seen in Windows	Is the USB cable properly connected?	Reconnect the USB cable
The instrument does not respond	Are data scrolling when acquisition is started? Is the probe properly connected?	Reconnect the probe
The instrument does not respond correctly	Is the probe properly connected?	Reconnect the probe Reload the original default configuration. Make a check-up with the samples delivered in the package

7.2 Reset procedure

- Turn off the instrument, then turn in on again
- Reconnect the USB link
- Reinstall the WinEC™ package
- Launch WinEC™. Reload the default configuration file.

7.3 Contact support service

Sciensoria sarl 35170 BRUZ France

E-mail: support@sciensoria.fr Phone: 33 6 89 33 95 59 Fax: 33 2 99 57 18 78

8 Appendix 1 – Information about the probe cable and connectors

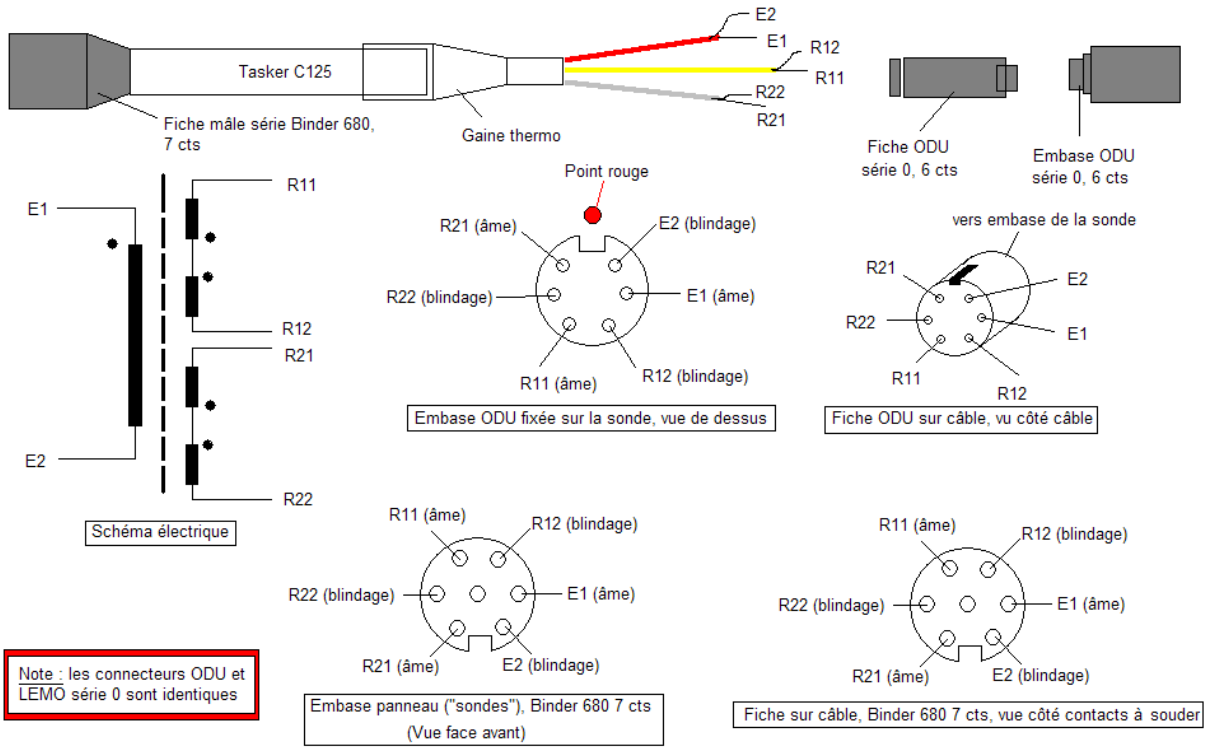


Fig. A1 – Schematic diagram of the probe cable, probe connection and pin-out

9 Appendix 2 - The WinEC™ software

The WinEC™ software is a powerful tool to use with Sciensoria products. It allows user to setup the Z-Scope v62**Pro*, make data acquisition, visualization, analysis, sensor calibration and real-time measurement.

The received data can be visualized in time series form or x-y (Lissajous) form. Target signatures can be isolated and saved to disk, and loaded later for sensor calibration.

WinEC™ can import a calibration file for perform parameter measurement. So, each calibration file is an application.

9.1 Step 1: Launch WinEC™

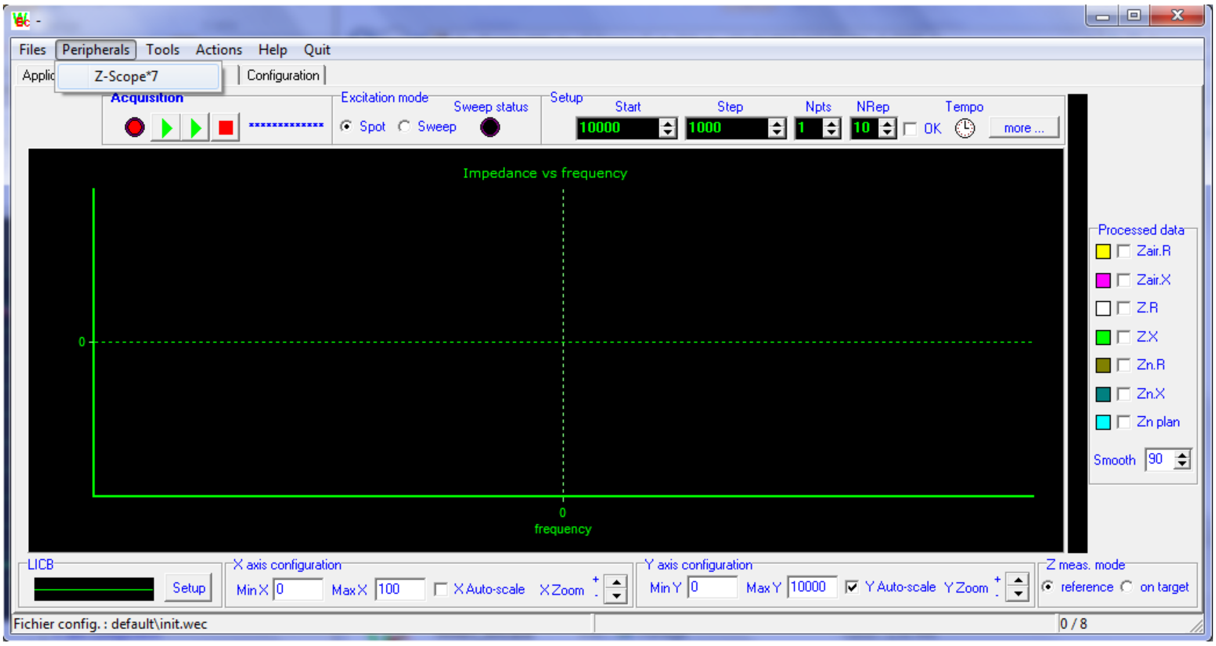


Fig. A2.1 – WinEC™ window at the start

9.2 Step 2: load a configuration file (application)

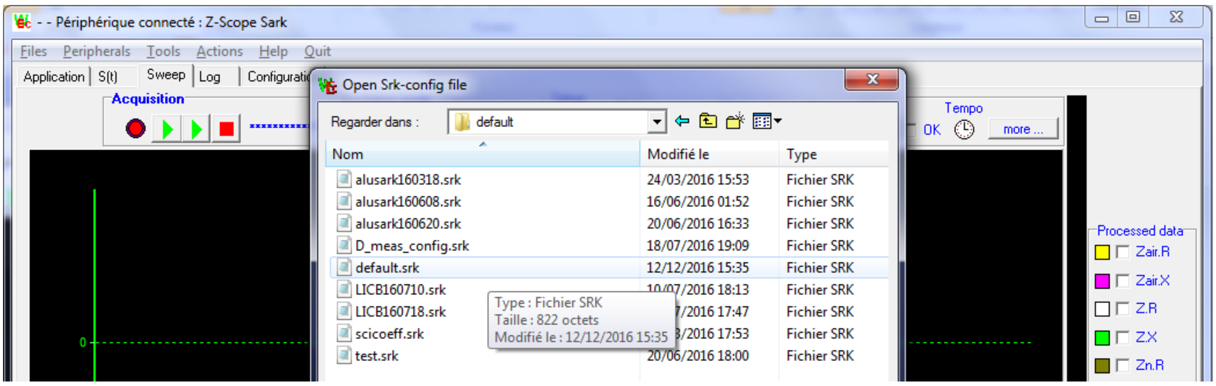
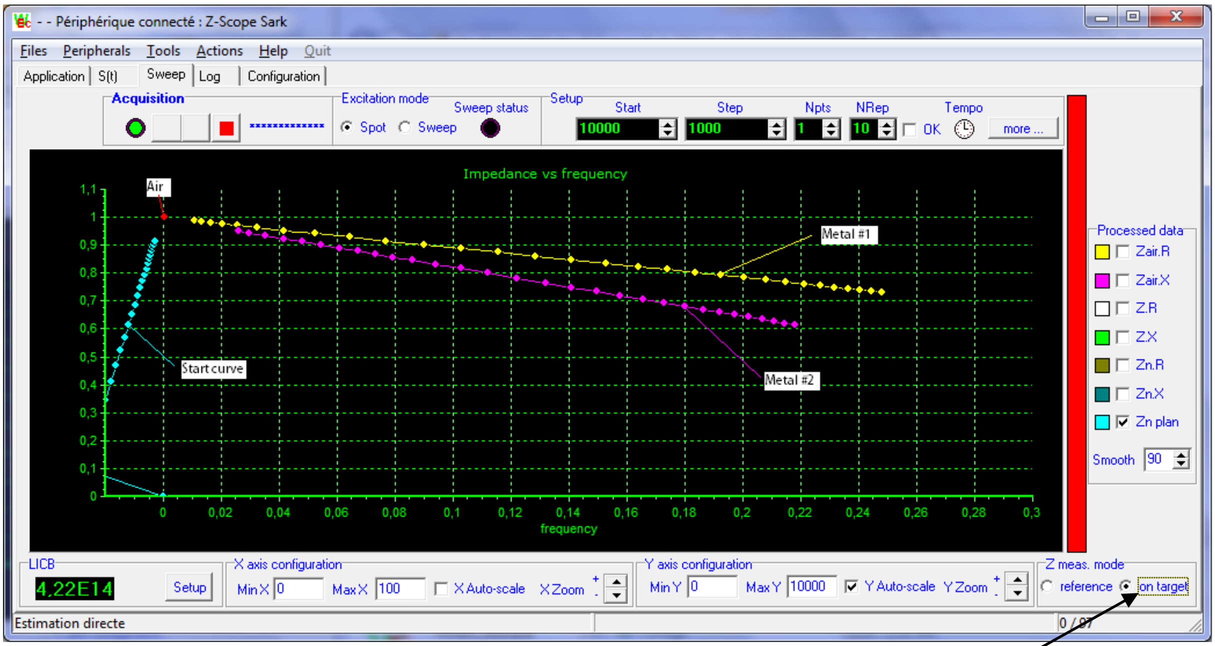


Fig. A2.2 – Loading a configuration file

9.3 Step 3: start measurements and capture signatures



"on target" option

Fig. A2.3 – Captured target signatures

a. Remove all conductive material from the area around the probe

b. Check the option "on target" (see below). The instrument will start to make data acquisition

c. Place the probe on a target, press F3 to capture a target signature

9.4 Save signatures to files

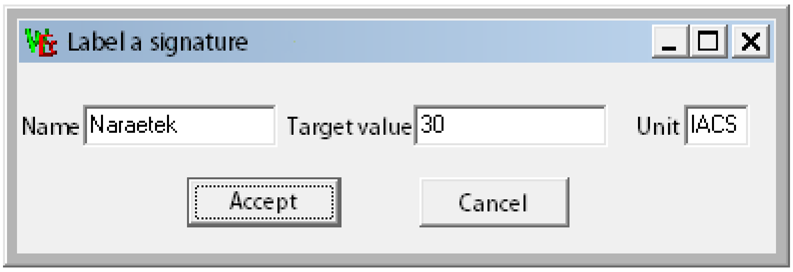


Fig. A2.4 - Label signatures

a. Right-click on the signatures and label them

b. Save the signatures to file

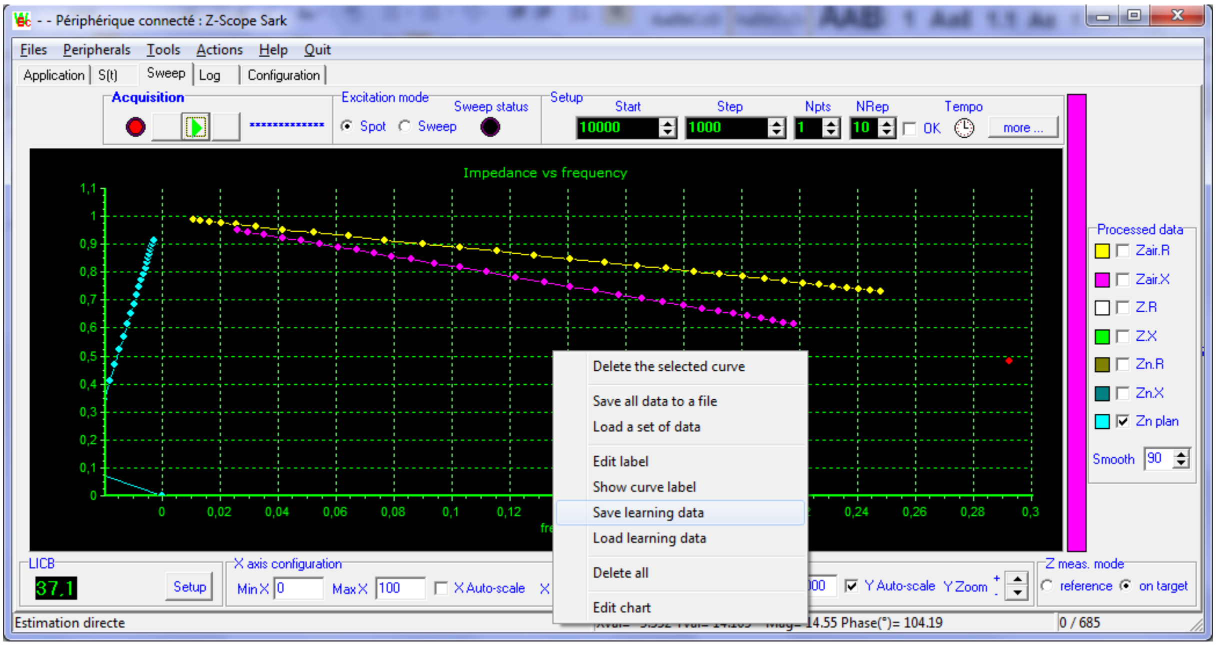


Fig. A2.5 – Save signatures to files

9.5 Calibrate sensor

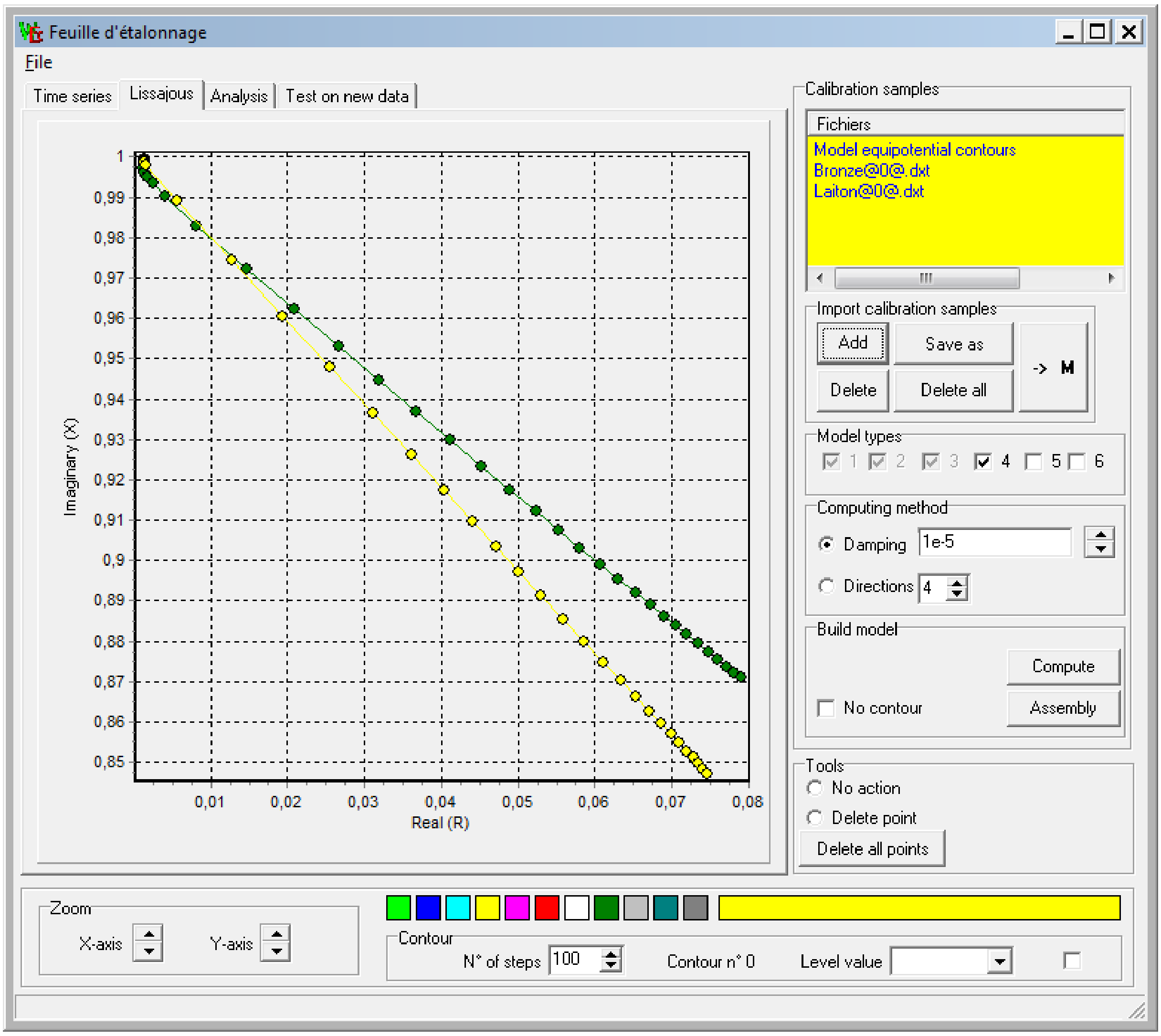


Fig. A2.6 – Import signatures and calibrate the sensor.

One the “compute” button is pressed, the application will be created.

9.6 Make real-time measurement

Load the new application file using the button “Parameters” on the 1st tab of WinEC™. Real-time measurement will start, and the result will be displayed on the chart in the 1st tab, as shown below.

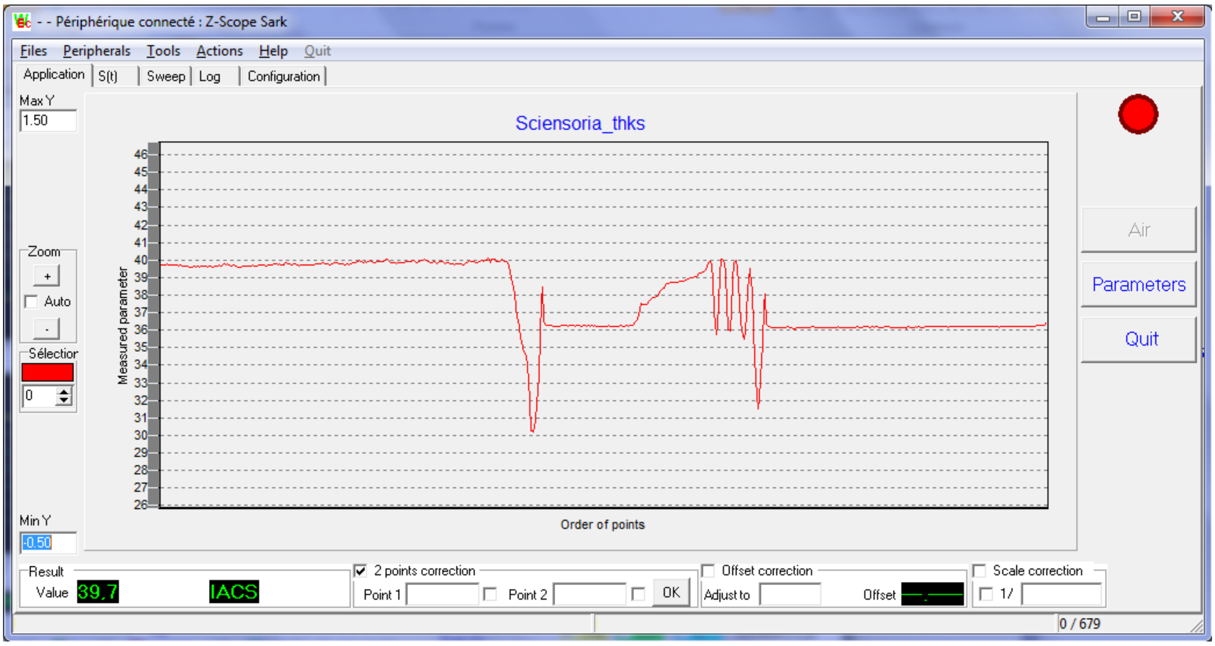


Fig. A2.7 – Real-time measurement with WinEC™

9.7 Download the new application to the connected instrument

Depending the model of the connected instrument, there are several methods to download the new application to its flash memory. A simple method is to copy the application file in its flash memory using Windows Explorer.

A threshold value can be added to the application configuration file in order to make the instrument sort the targets as good or bad parts.

When the instrument restarts, whether in connected or stand-alone mode, it will make measurements and sort the checked parts following the newly loaded application.