ZENSOL

AUTOMATION INC.

JOB AID

OpenZen - TAP

March 7th, 2013

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					Execute batch test		Advanced graphic report design
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TAP-4 CONFIGURATION

RAW Signals	Envelopes Signals
1: Current	100: Current
2: Accelerometer 1	101: High Frequency Envelope Accelerometer 1
	102: Low Frequency Envelope Accelerometer 1
3: Accelerometer 2	103: High Frequency Envelope Accelerometer 2
	104: Low Frequency Envelope Accelerometer 2
4: Accelerometer 3	105: High Frequency Envelope Accelerometer 3
	106: Low Frequency Envelope Accelerometer 3

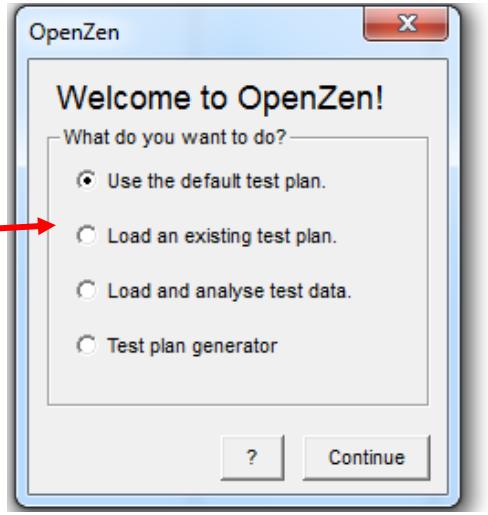
- FILE MANIPULATION -

JOB AID N# 1

LOADING A TEST PLAN (3 methods)

Method 1:

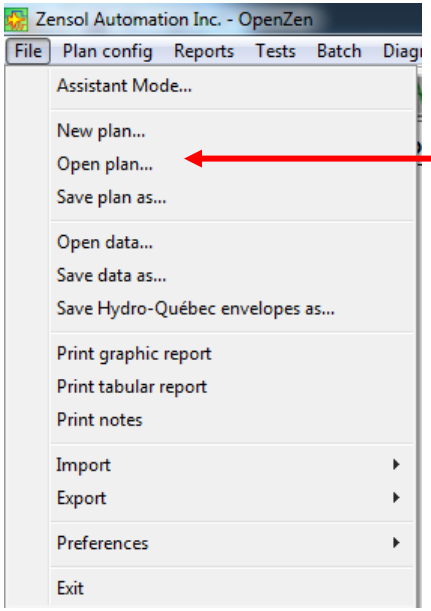
Click on this button and then in the following window choose ‘’Load an existing test plan.’’



Method 2:

Click on this button and choose your test plan.

Method 3:



File--> Open plan

All the files (test plans and test data) are contained in the « example » folder of OpenZen-TAP.

Note: Our test plans always have the same extension: **.wcf**. This extension is automatically added.

- FILE MANIPULATION -

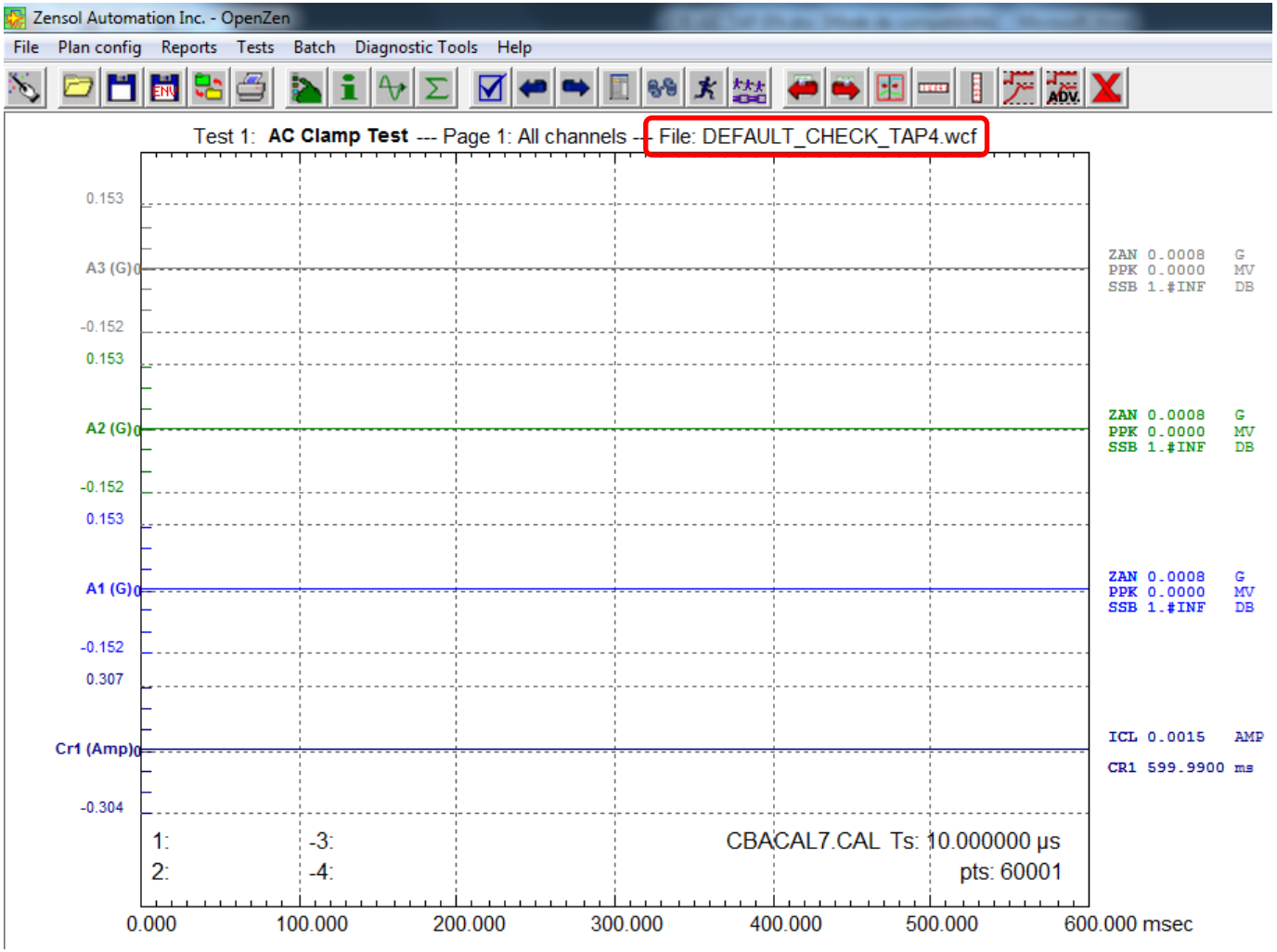
JOB AID N# 2

TEST PLAN (.WCF)

With **OPENZEN-TAP**, the extension of a **TEST PLAN** is **.WCF** (example: zensol.wcf). A test plan is the configuration of a series of tests and is empty of data (as shown in the picture). There is no signal recorded inside. The configuration of a test plan is defined through the green buttons.

The following information is saved in a test plan:

-test configuration
-plan information
-analog inputs
-processing information.



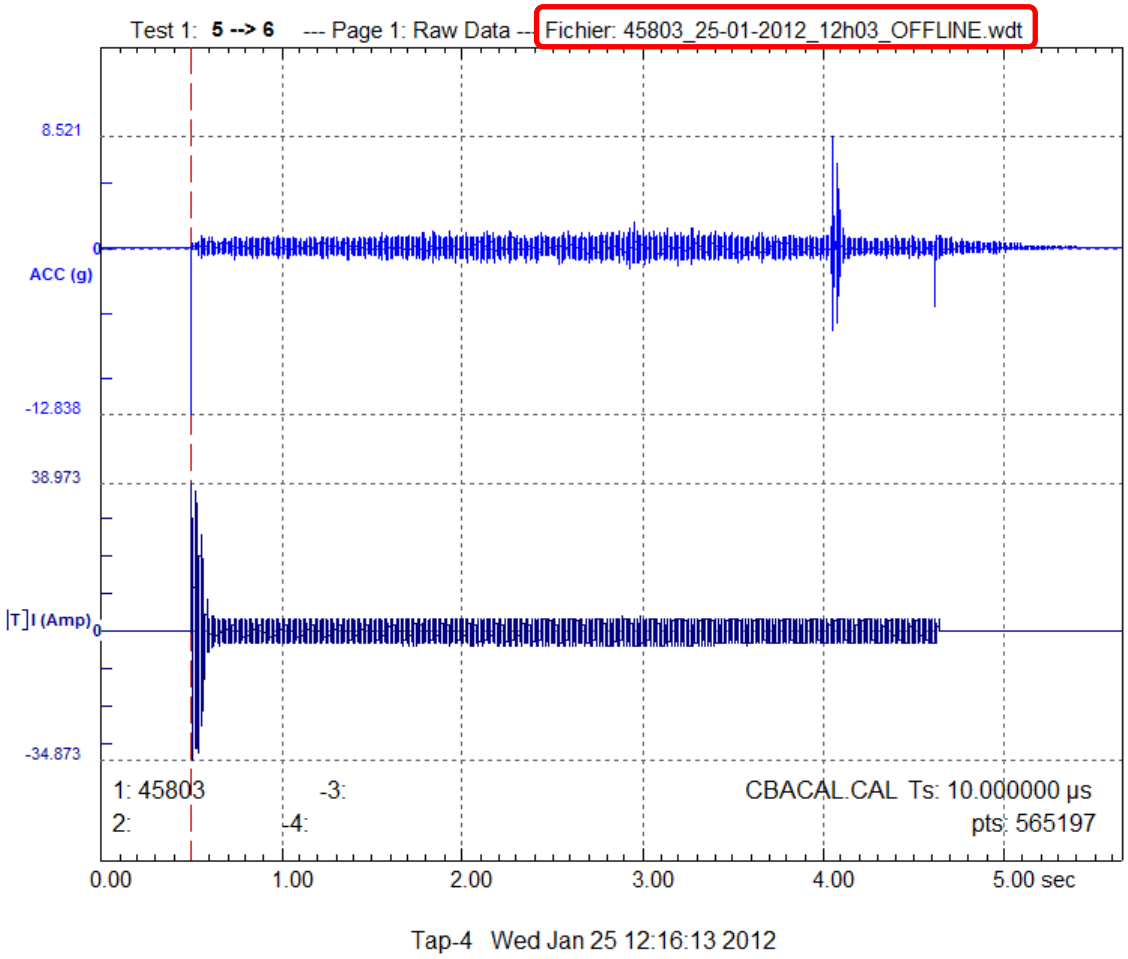
- FILE MANIPULATION -

JOB AID N# 3

DATA FILE/RAW DATA (.WDT)

With **OPENZEN-TAP**, the extension of a **DATA FILE** is **.WDT** (example: zensol.wdt). A data file (or RAW DATA) is the results of tests that have been performed with the TAP-4 with a specific test plan that the user chose.

In the following picture, you can see raw data recorded with the TAP-4:



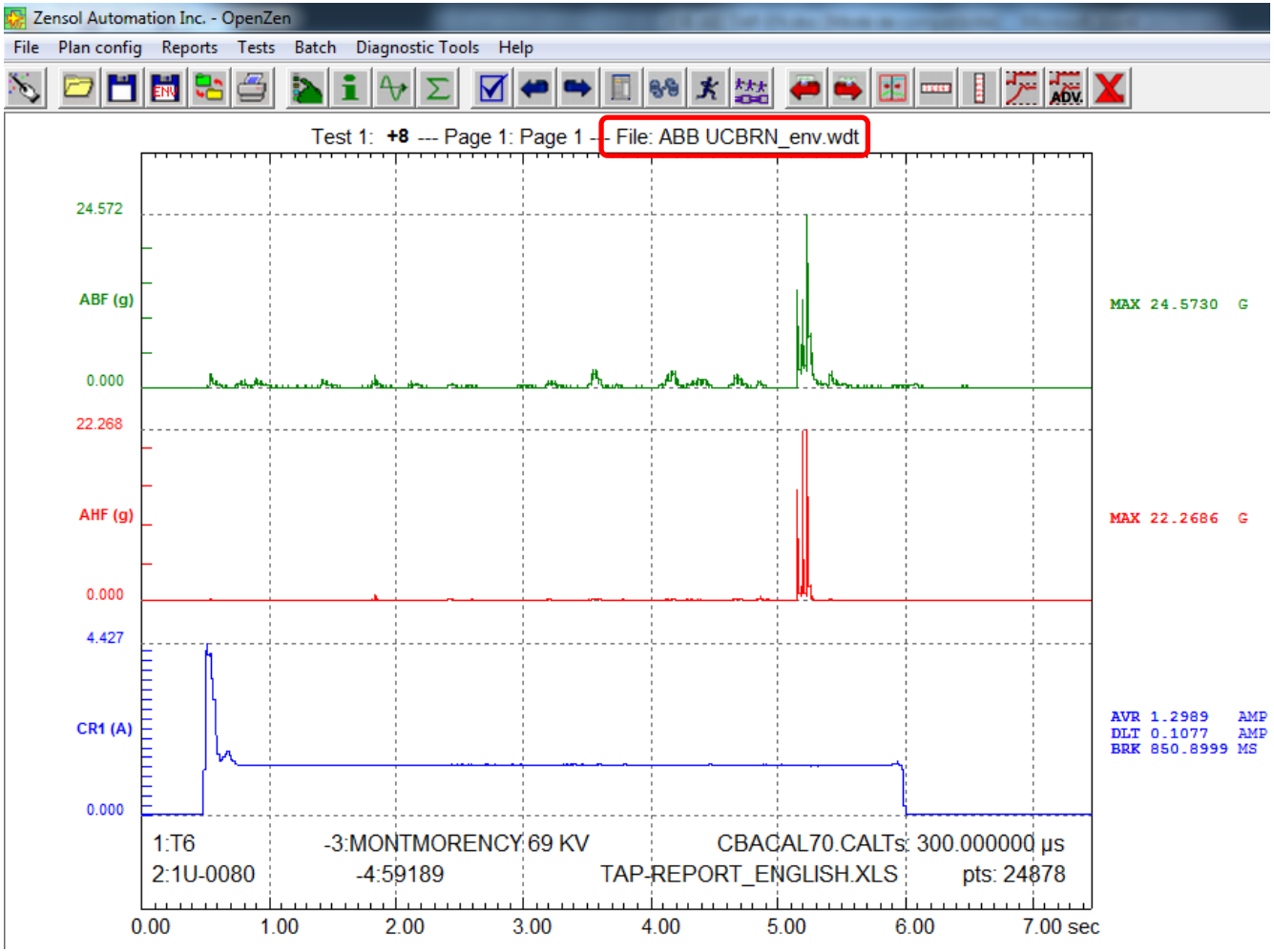
- FILE MANIPULATION -

JOB AID N# 4

ENVELOPE FILE (_ENV.WDT)

With **OPENZEN-TAP**, the extension of a **ENVELOPE FILE** is **_ENV.WDT** (example: zensol_env.wdt). An envelope file is the results of the extraction of the envelopes from the RAW DATA.

In the following picture, you can see envelopes extracted from RAW DATA:



- FILE MANIPULATION -

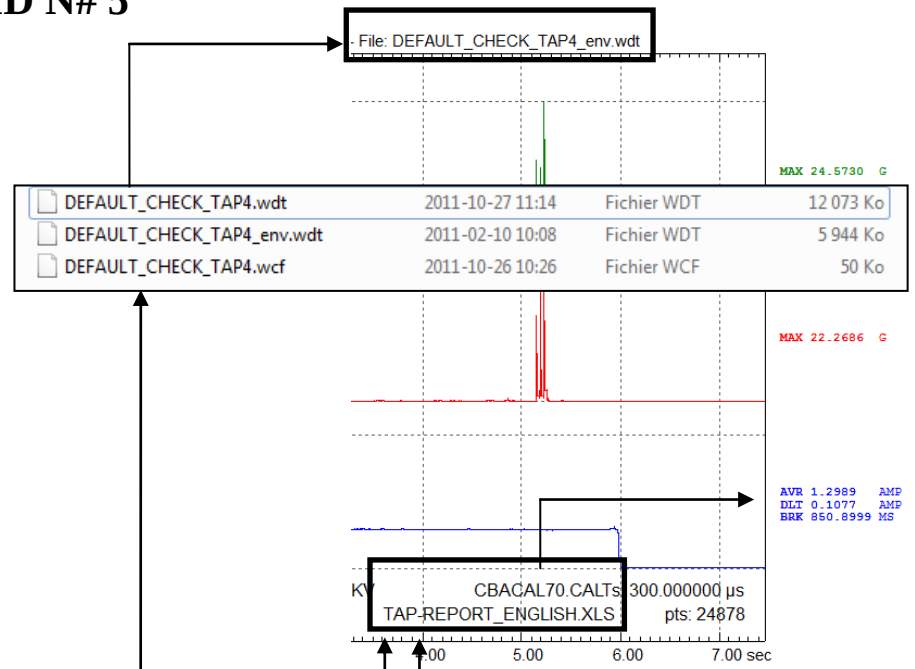
JOB AID N# 5

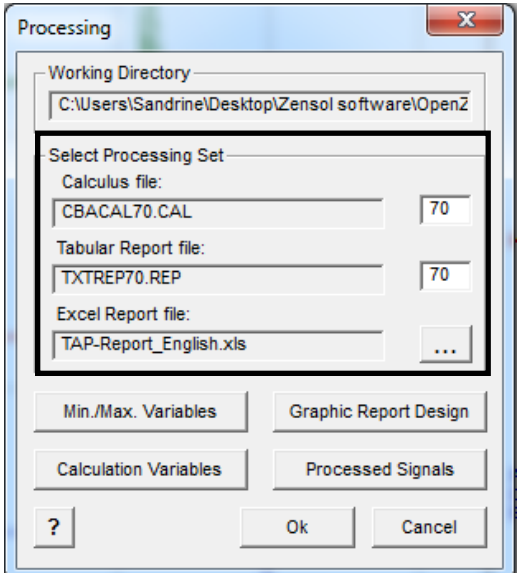
DATA STRUCTURE

TAP 4 - Results

Default Test Pl	@R0		**Compteur**	59189
Exploitation	T6		**# Série**	@R5
Inventaire	1U-0080		**Temp. Huile**	30
Poste	MONTMORENCY			
		CURRENT		
Test Number	**Tap Name**	**Current Average**	**Delta Current**	**Breaking time**
		Currents in Amps		Time in ms
1	+8	1.29892	0.107729	850.899902
2	+9	1.302161	0.368353	6849.600586
3	+10	1.3053	0.332341	6851.299805
4	+11	1.300755	0.103456	1215.399902
5	+12	1.300318	0.11078	858.800293
6	+13	1.300972	0.104677	1219.800293
7	+14	1.29981	0.107118	862.200195
8	+15	1.298278	0.112001	1221.700195
9	+16	1.297902	0.112001	854.899902

Tap-Changer Overview





EXCEL
TAP-Report_English.xls

ENVELOPES
DEFAULT_CHECK_TAP4_env.wdt

RAW DATA
DEFAULT_CHECK_TAP4.wdt

TEST PLAN
DEFAULT_CHECK_TAP4.wcf

CALCULUS
CBACAL70.cal

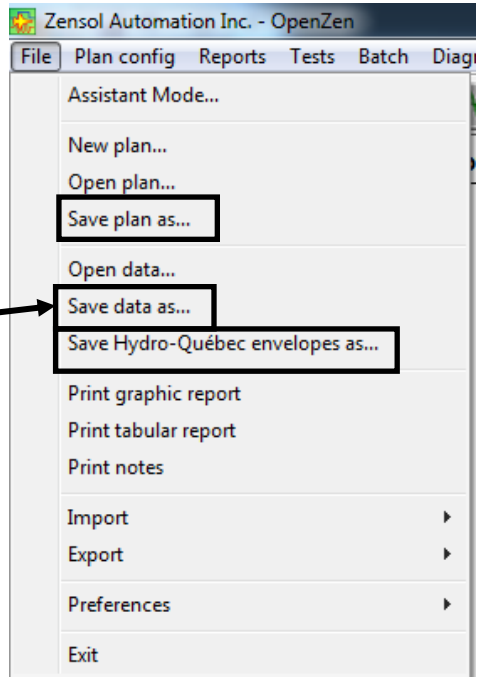
- FILE MANIPULATION -

JOB AID N# 6

SAVING ALL YOUR TESTS

To save all your raw data, click on this icon. 
The extension for raw data is "**.wdt**".

You can also save the data by going through the menu **File**--> **Save data as**...



Note: Save your data after each test (Keep the same filename). This way, you will not lose all your data in case of problem.

To save the envelopes, click on this icon  or go into the menu
The envelopes always have the extension "**_env.wdt**".

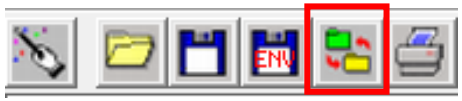
Note: From raw data files, you can also extract the test plan by going into the menu:

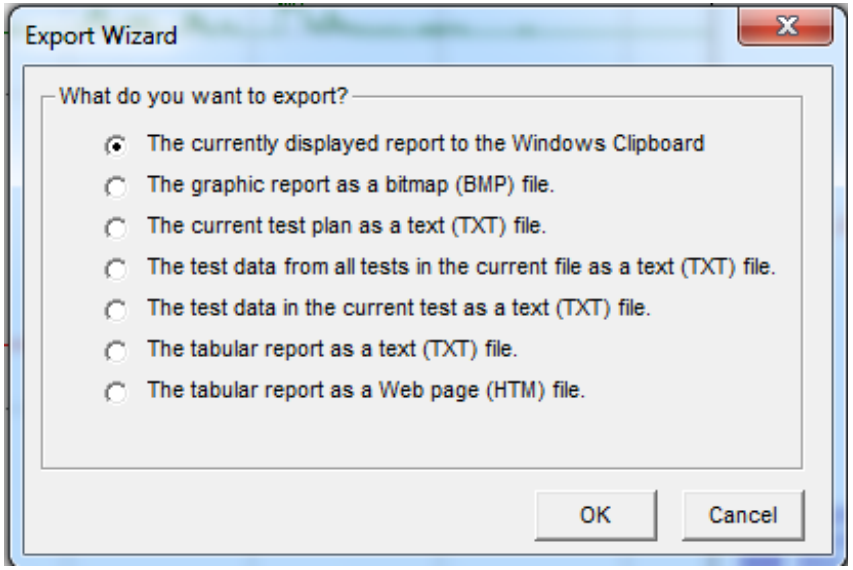
File, then Save plan as…

- FILE MANIPULATION -

JOB AID N# 7

EXPORT



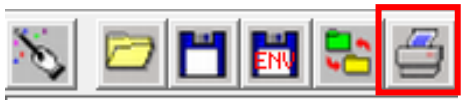


You can do an export of the graphic report, the test data and the tabular report in different type file like BMP, TXT, HTM, XLS.

- FILE MANIPULATION -

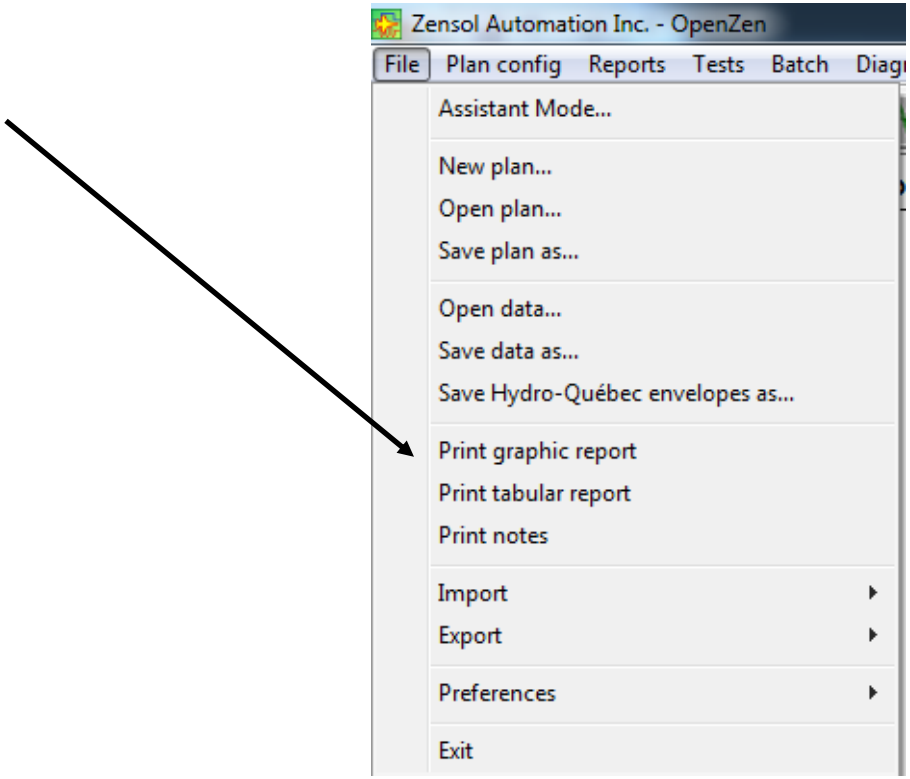
JOB AID N# 8

PRINTING GRAPHICAL



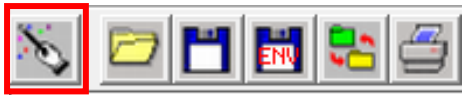
When you want to print anything that is presented on the screen, (a graphical report or a tabular report) you can do it with this icon. 

You can also print at anytime by using the menu:

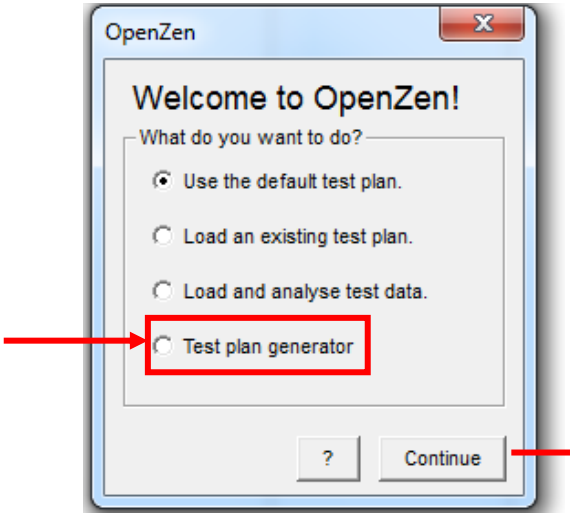


JOB AID N# 9

TEST PLAN GENERATOR

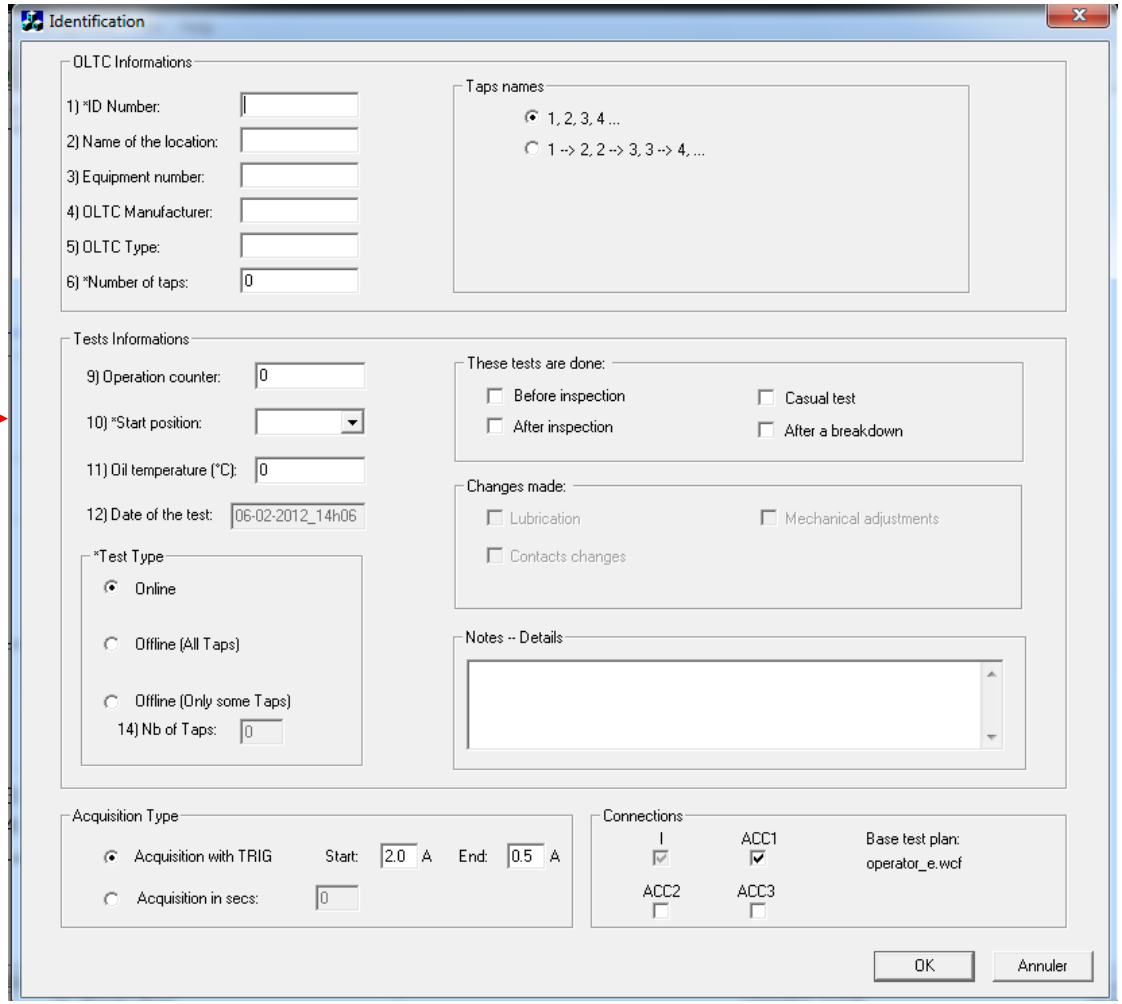


To generate a test plan, click on the **Assistant Mode** button, then select the option **Test plan generator**.



Fill the test plan generator window with all the required information (*) and click OK.

The test plan will be generated automatically depending on the number of taps, if the tests are performed OFFLINE or ONLINE and the start position.

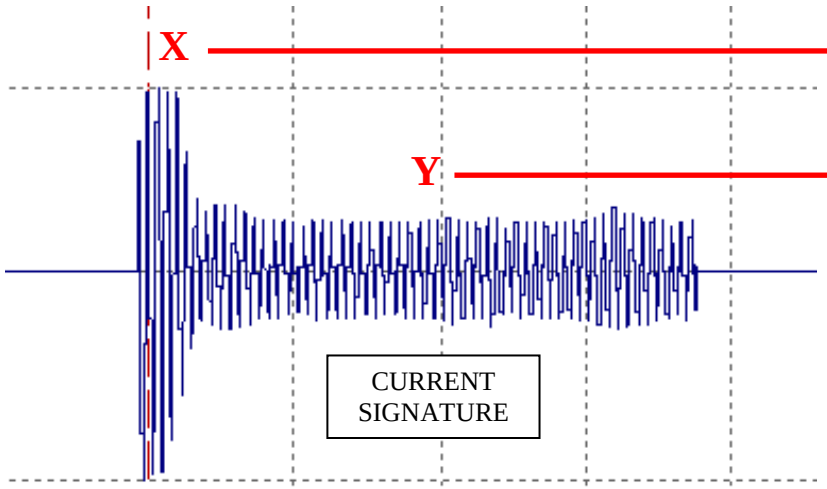


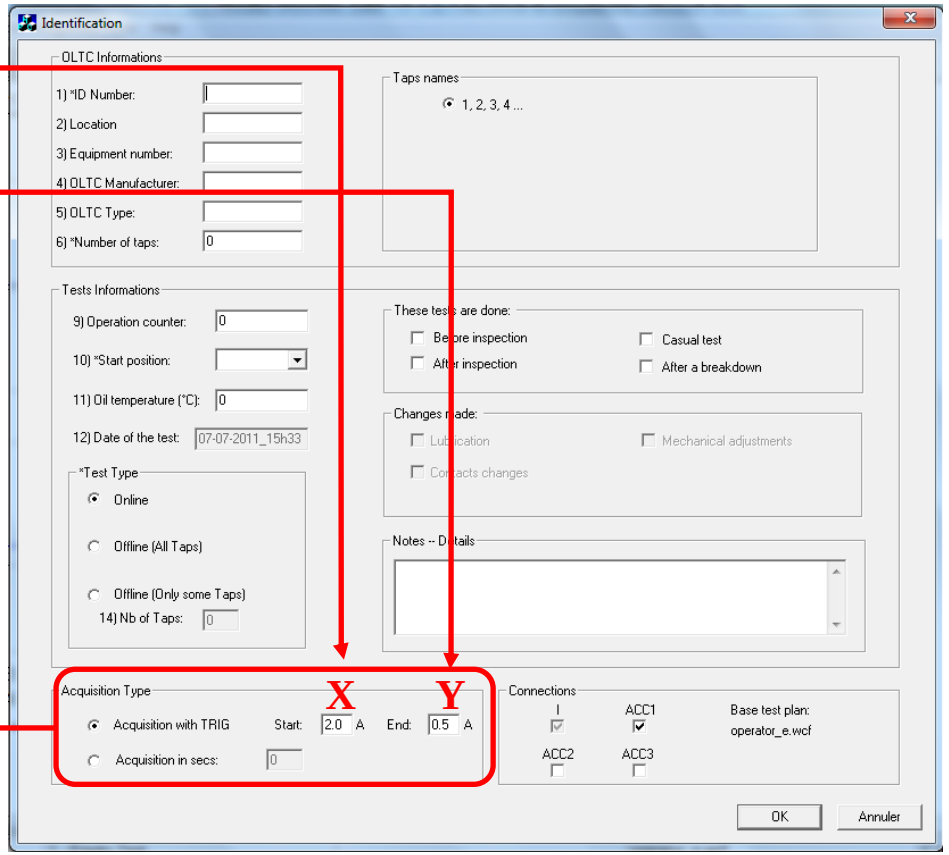
JOB AID N# 10

FIND THE TRIG VALUES

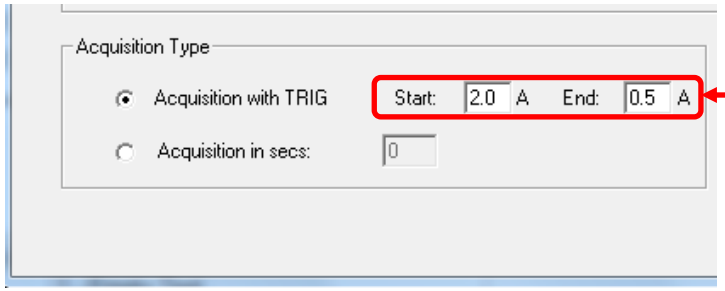
Load the test plan "**DEFAULT_CHECK_OLTC.wcf**" and run the test 1.

While the test 1 is running (10s tests), change a tap position. You should obtain a current signature as follow:





This manipulation is useful to choose the start (**X**) and end (**Y**) TRIG values.
Enter values lower than **X** and **Y** in the test plan generator window.



Click **OK** and begin your tests!

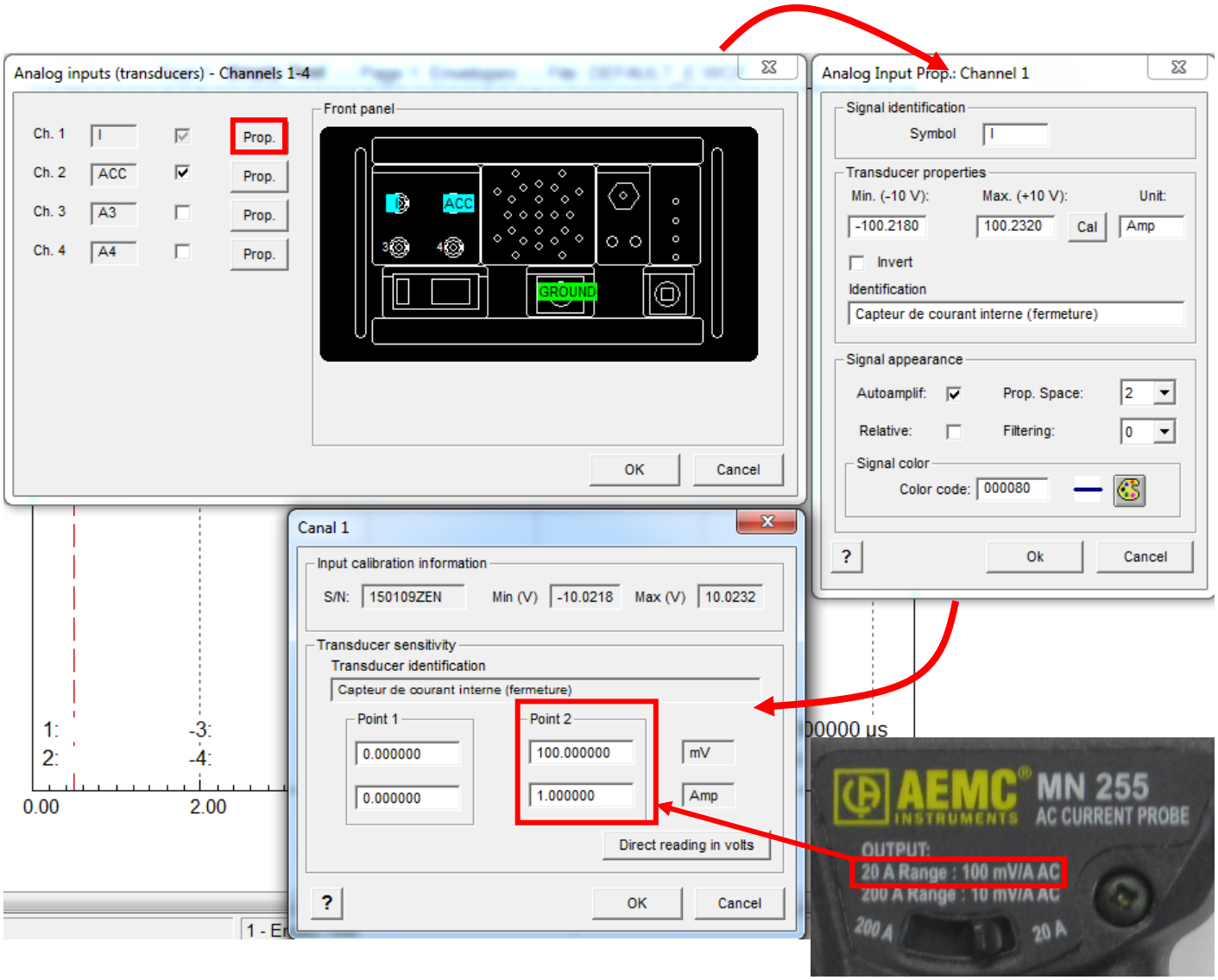
- SETTINGS -

JOB AID N# 11 (1/2)

ANALOG INPUTS

CURRENT

In the **"Properties"** of input #1, click on the «**Cal**» button and then enter the desired values into the textboxes. For the AC/DC current clamp, set on the 20A range and enter 100mV for 1 amp.

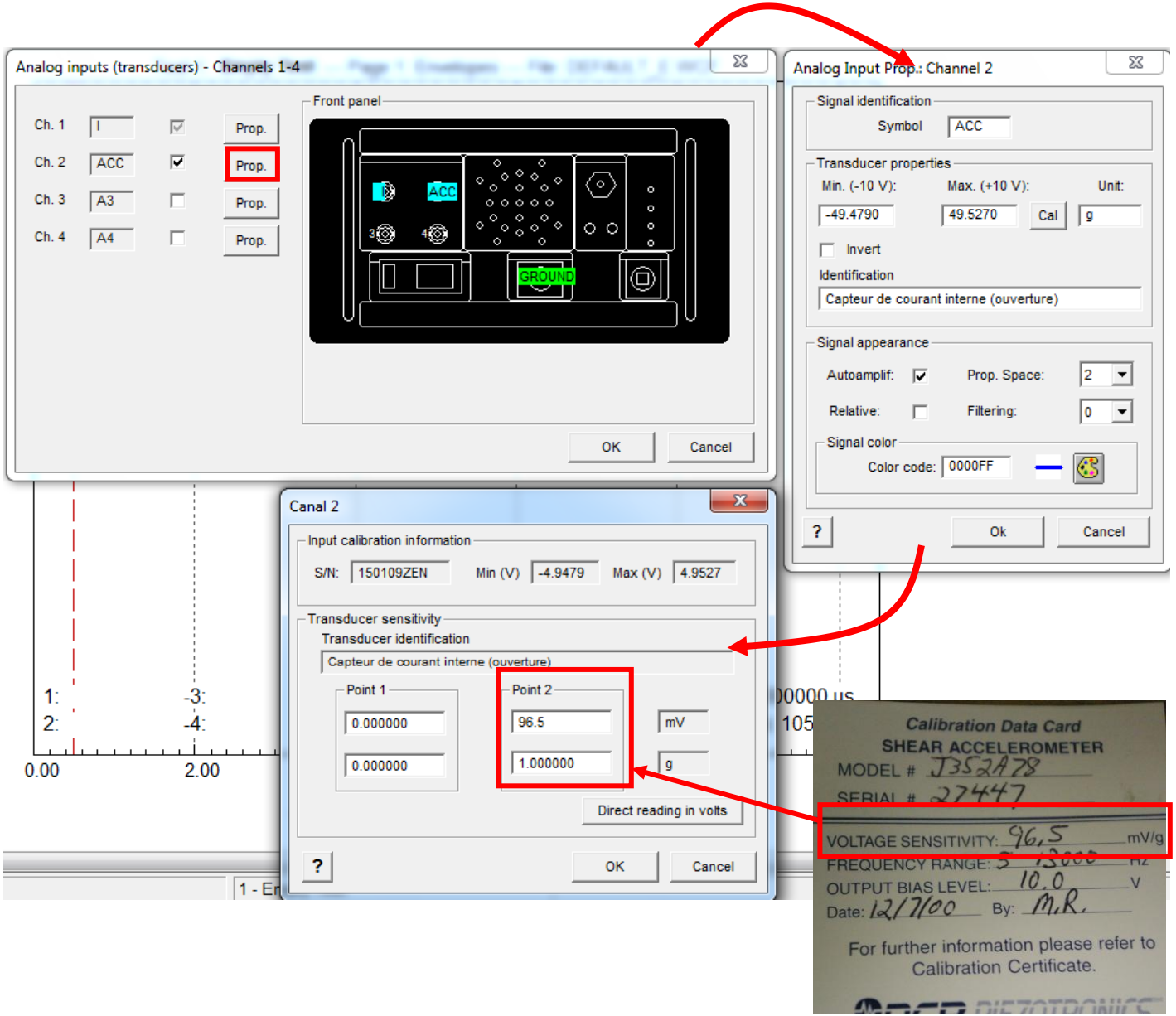


JOB AID N# 11 (2/2)

ANALOG INPUTS

ACCELEROMETERS

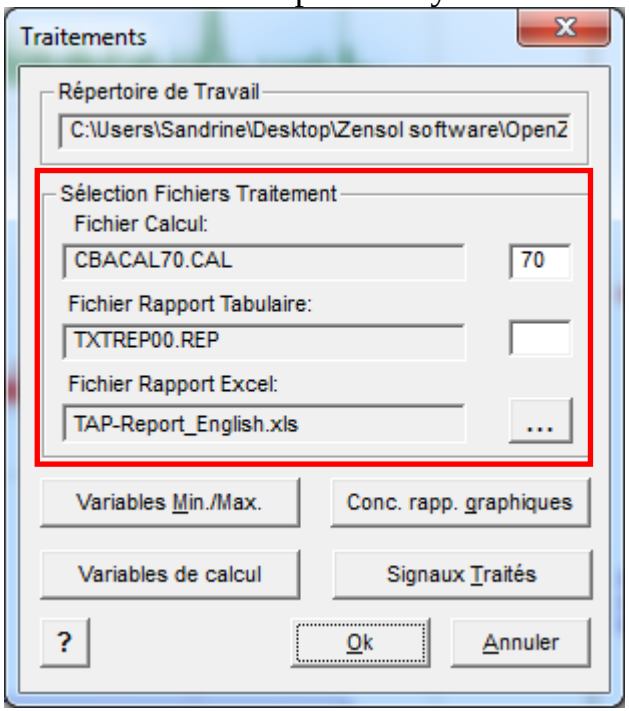
You can change the name of the signal (A1) and the sensitivity of each accelerometer using the calibration card shown below.



JOB AID N# 12

PROCESSING

In the window Processing, you define calculus file and excel report that you want to use.



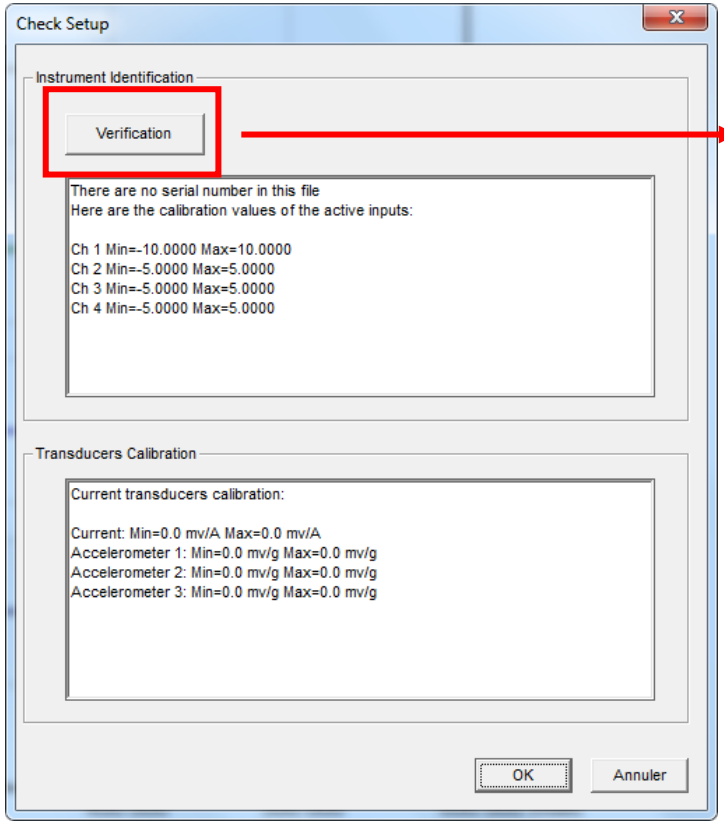
You can also :
-create personalized variables for calculus.
-have access to the Graphic Report Design window.
-activate virtual signals.

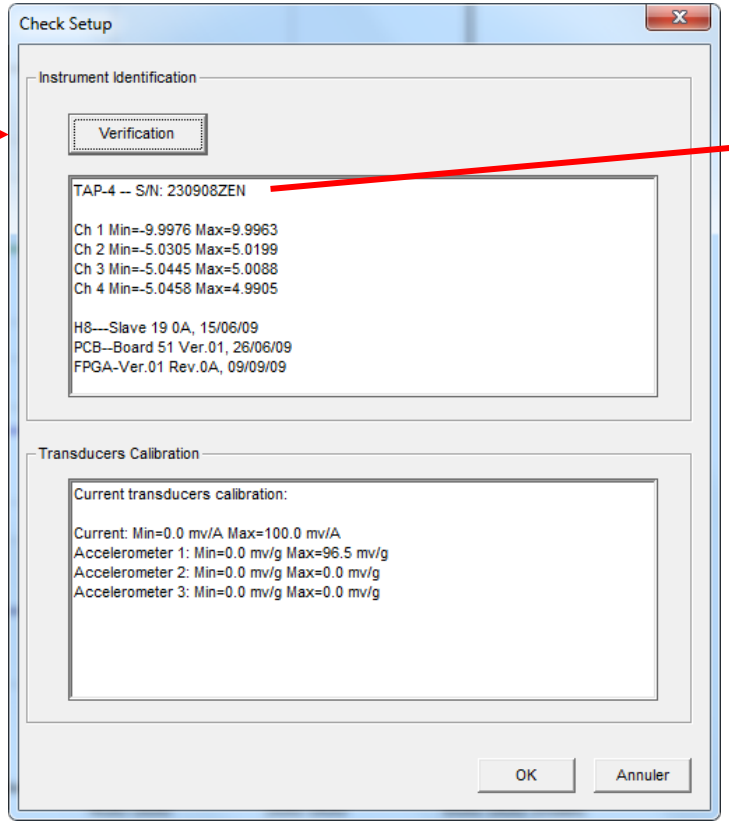
- IN THE FIELD -

JOB AID N# 13

CHECK SETUP

In this Check Setup window, once the “Verification” button is pressed, the software connects to your instrument, reads the calibration data and applies it to your test plan.





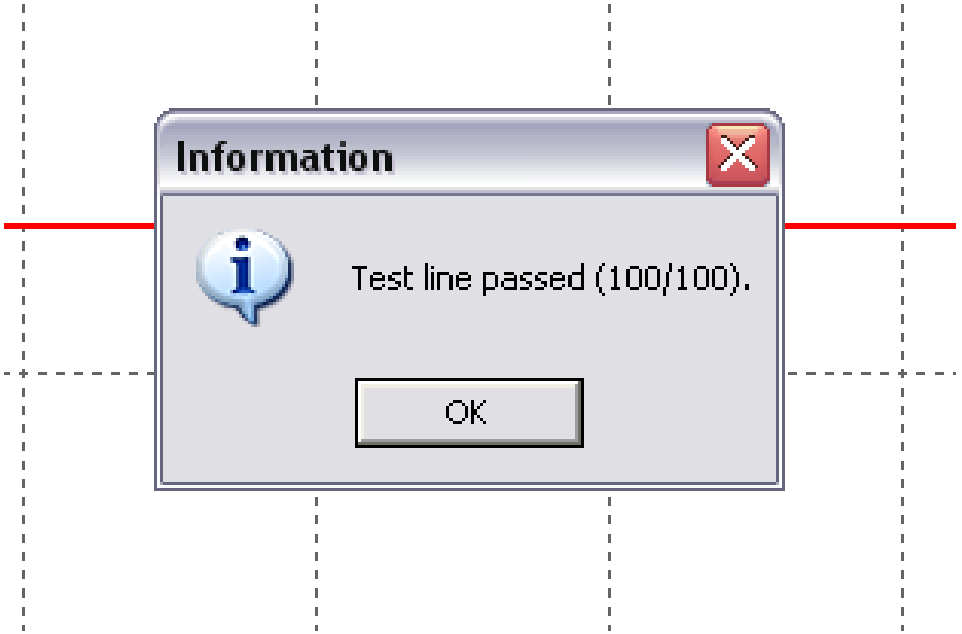
- IN THE FIELD -

JOB AID N# 14

VERIFYING THE COMMUNICATION

To make sure that your ZENSOL unit is properly connected to your computer, please click on the above icon.

It will test the USB link. If everything is good, a message will display the success of the operation.



- IN THE FIELD -

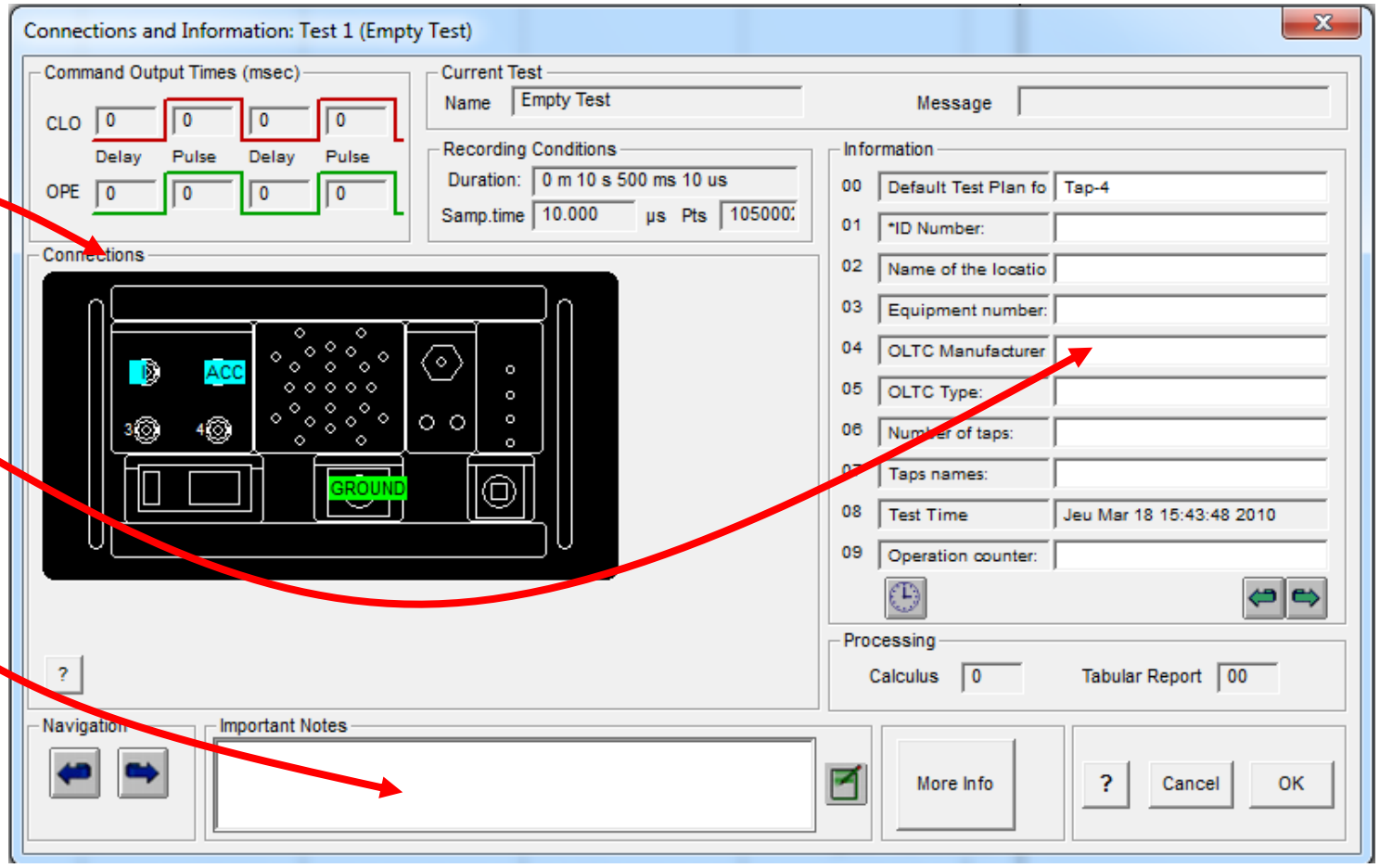
JOB AID N# 15

CONNECTIONS AND INFORMATION

Verify the shown connections

Write relative information to the tests

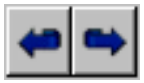
Write important notes about the tests



JOB AID N# 16

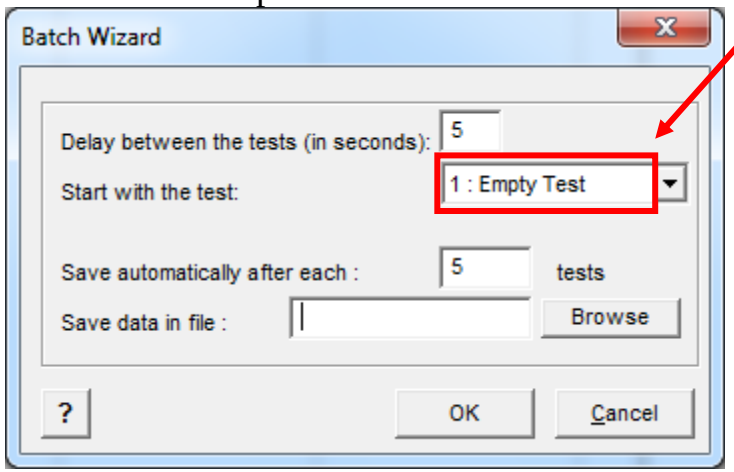
PERFORMING A TEST

- To start the current test, click on this button:  .

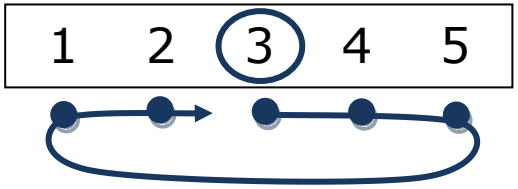
To change tests, click on the **blue arrows**  (not to be confused with the red arrows)

- To launch the tests, you can also use the Quick Batch Test  . It will execute the tests automatically.

A window will open: choose in this list the first test to begin with:



All the other tests will then be done one after the other. For example if you select to start at test #3, the following tests will be 4, 5, 1 and 2.

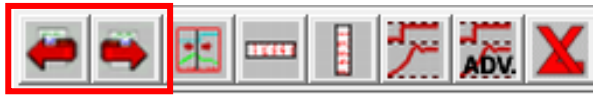


Note: You can also launch the quick batch from the main menu through: **Batch → QuickBatch**

- ANALYSIS -

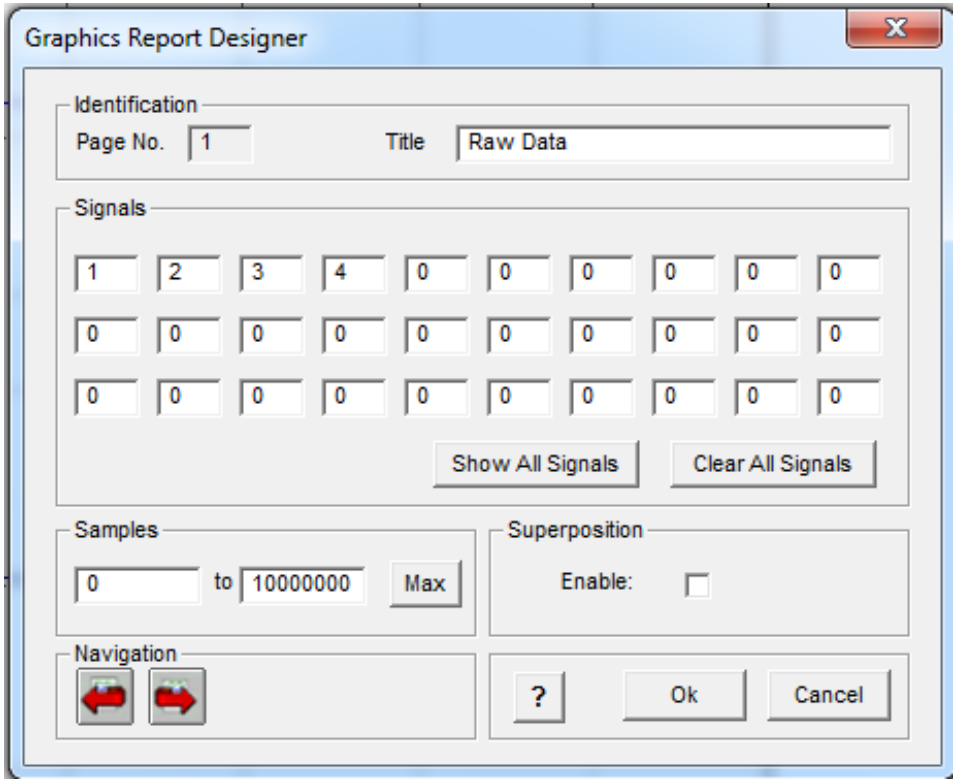
JOB AID N# 17

GRAPHIC NAVIGATION TOOLS



 You can browse your results on 10 different graphical pages. The **red** arrows let you navigate through all these pages.

They can be configured using this button:  . It means that you can show any channels you want on your page.

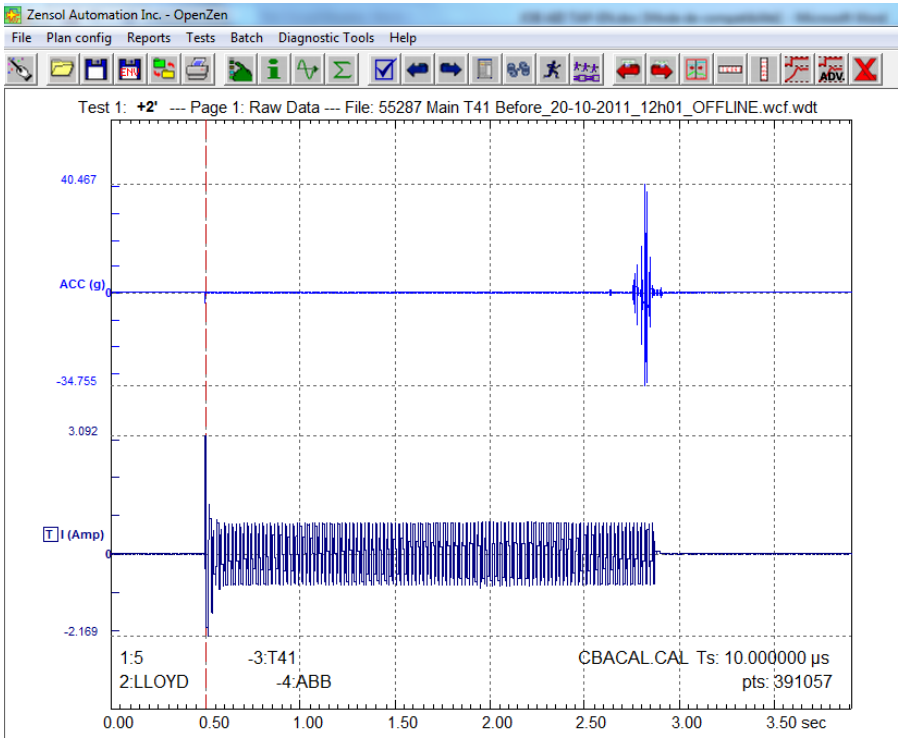


- ANALYSIS -

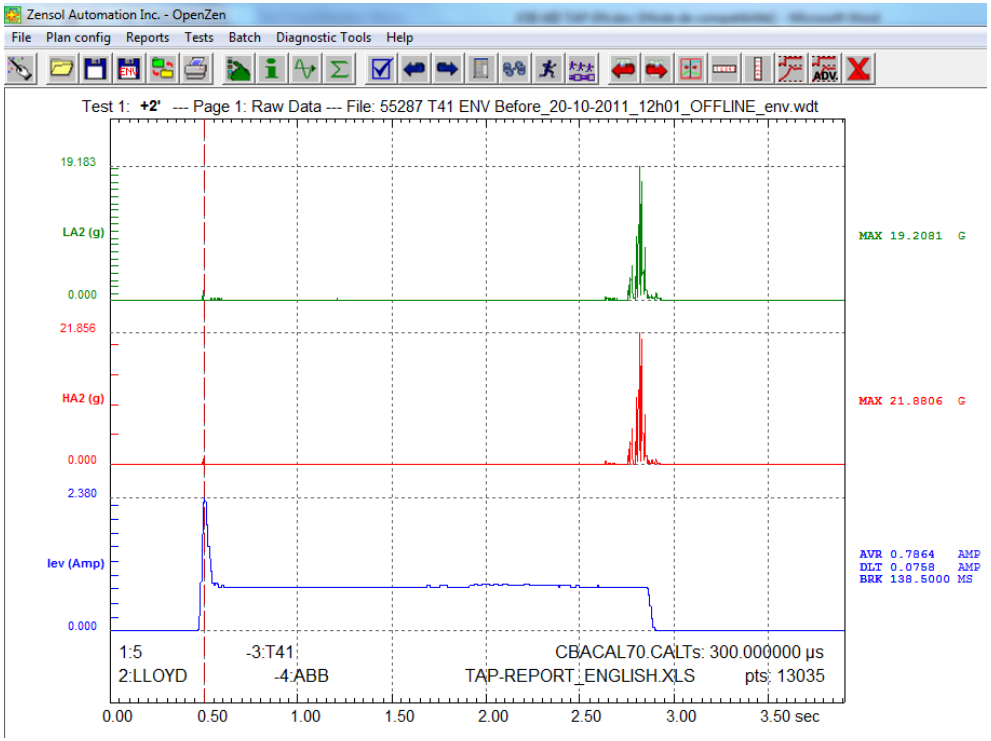
JOB AID N# 18

RAW DATA VS ENVELOPES

RAW DATA



ENVELOPES



RAW DATA Signals:

1: Current input
2: Accelerometer 1 input

3: Accelerometer 2 input

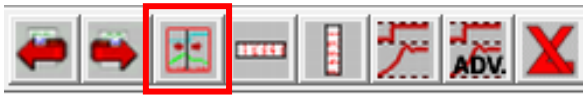
3: Accelerometer 2 input

ENVELOPES Signals:

100: Current envelope
101: High Frequency Accelerometer 1 envelope
102: Low Frequency Accelerometer 1 envelope
103: High Frequency Accelerometer 2 envelope
104: Low Frequency Accelerometer 2 envelope
105: High Frequency Accelerometer 3 envelope
106: Low Frequency Accelerometer 3 envelope

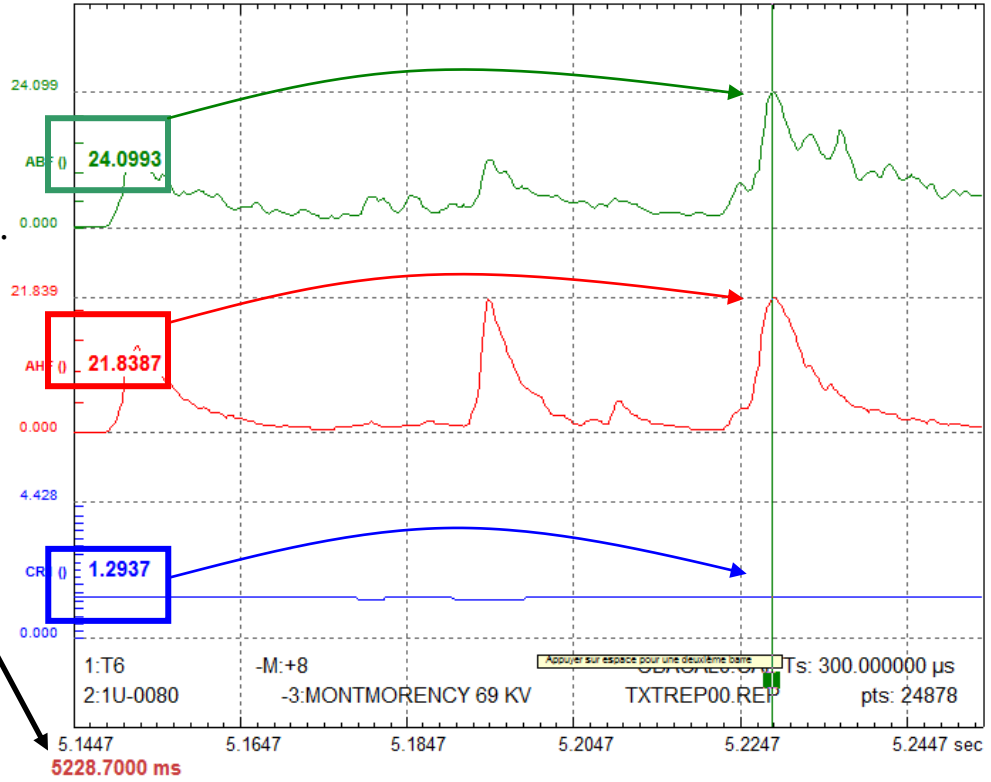
JOB AID N# 19 (1/2)

VERTICAL CURSOR (EXAMINE) TOOL



The tool indicates the value of the Y axis at the intersection between the green bar and each curves.

The bar also indicates the value of the X axis (time) at the position of the green bar.

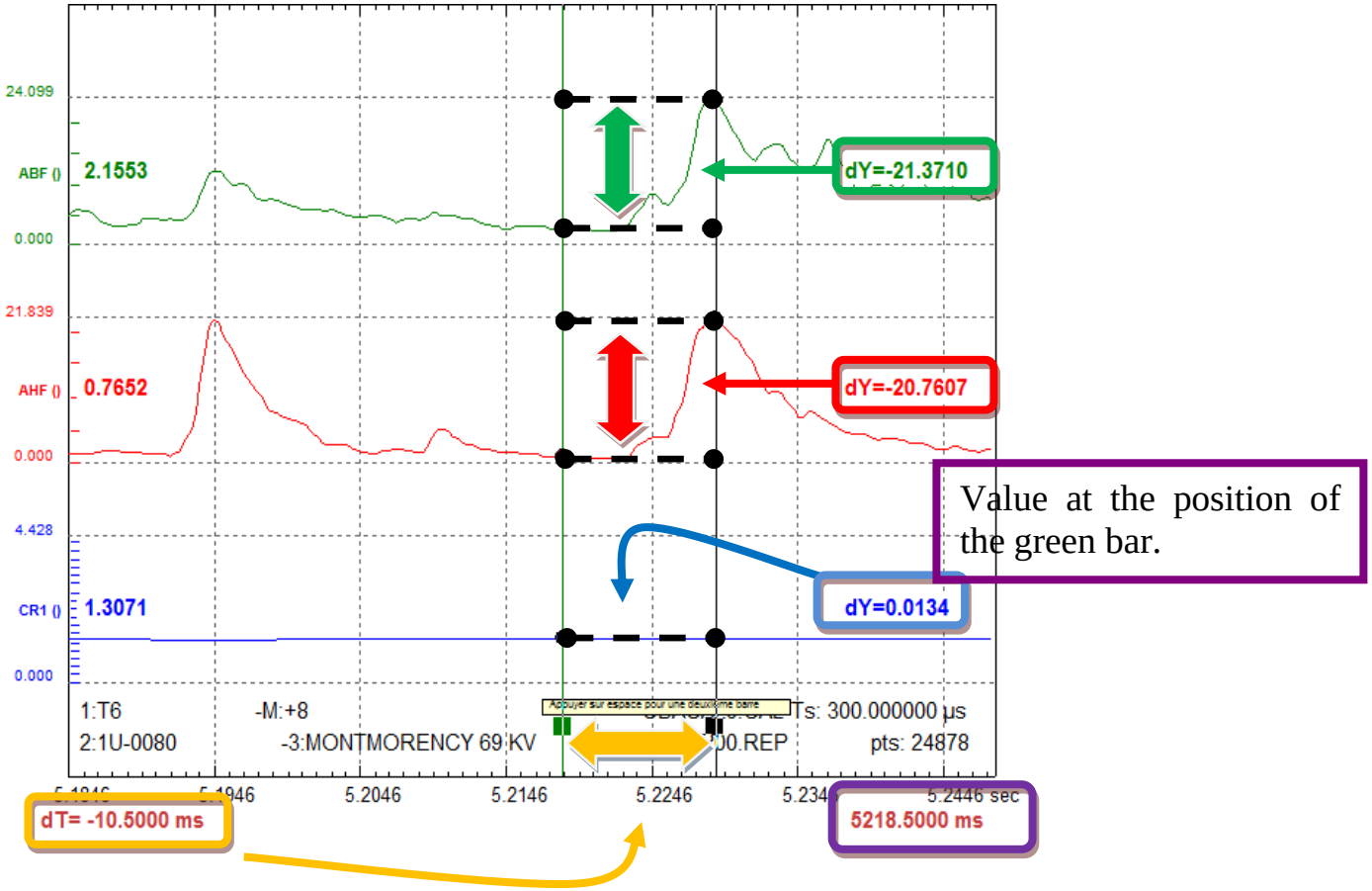


- ANALYSIS -

JOB AID N# 19 (2/2)

VERTICAL CURSOR (EXAMINE) TOOL

If you click the spacebar on your keyboard, you will have a second vertical cursor.

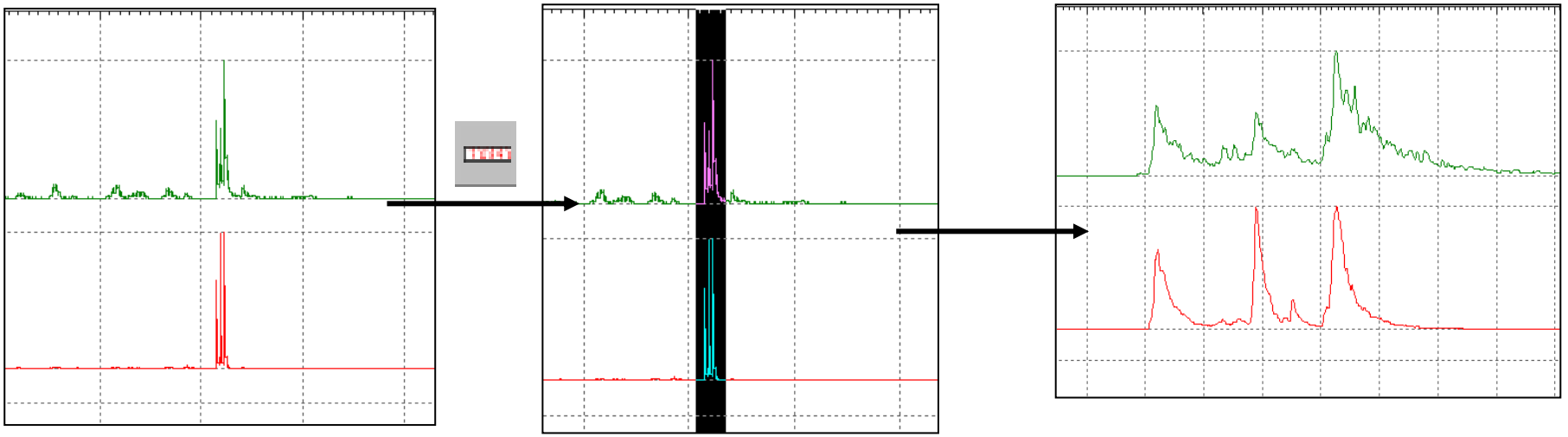


- ANALYSIS -

JOB AID N# 20

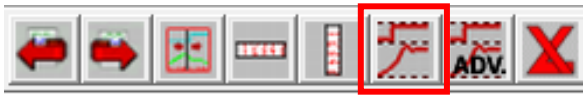
SCALE EXPANSION TOOL

The scaling buttons serve to **analyze** a signal. Correctly used, they can help you better interpret your results.



JOB AID N# 21

GRAPHIC REPORT DESIGN

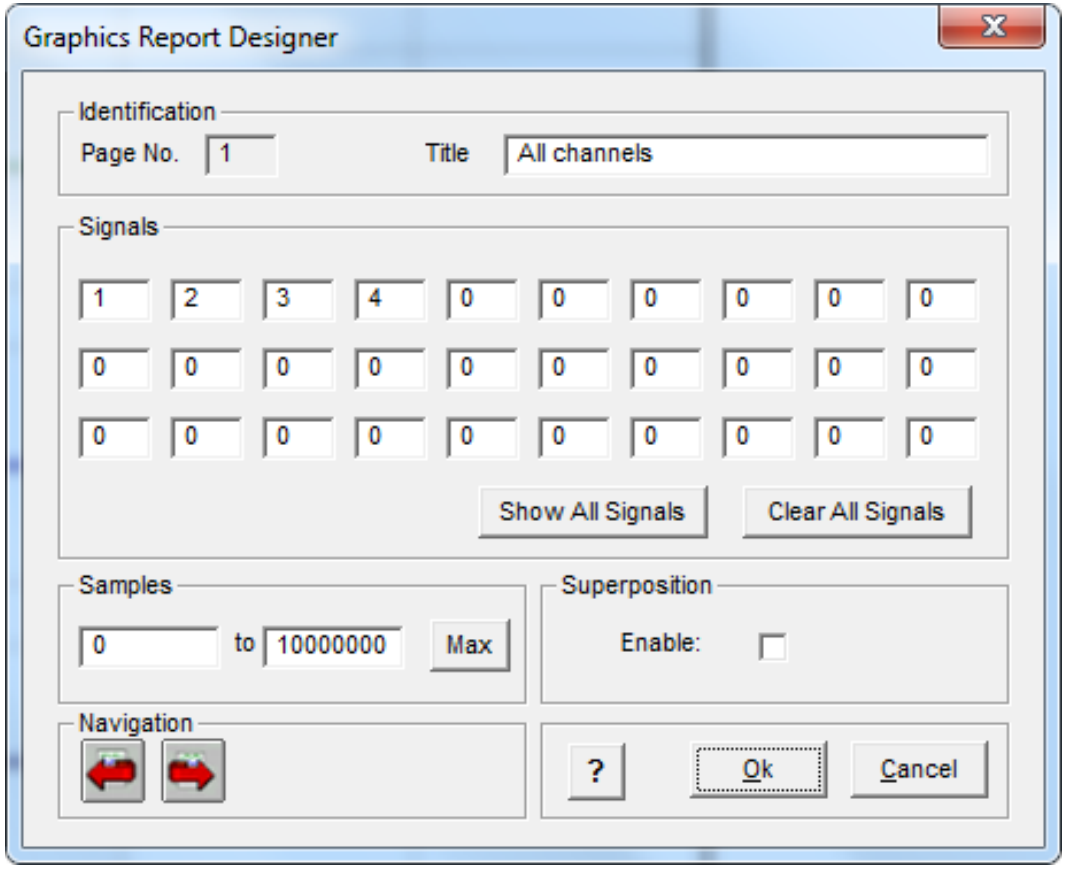


Available signals:

1 – Current clamp
2 – Accelerometer 1
3 – Accelerometer 2
4 – Accelerometer 3

100 – Current Envelope
101 – HF Accelerometer 1 Envelope
102 – BF Accelerometer 1 Envelope
103 – HF Accelerometer 2 Envelope
104 – BF Accelerometer 2 Envelope
105 – HF Accelerometer 3 Envelope
106 – BF Accelerometer 3 Envelope

61 – Digital output (Step up)
62 – Digital output (Step down)

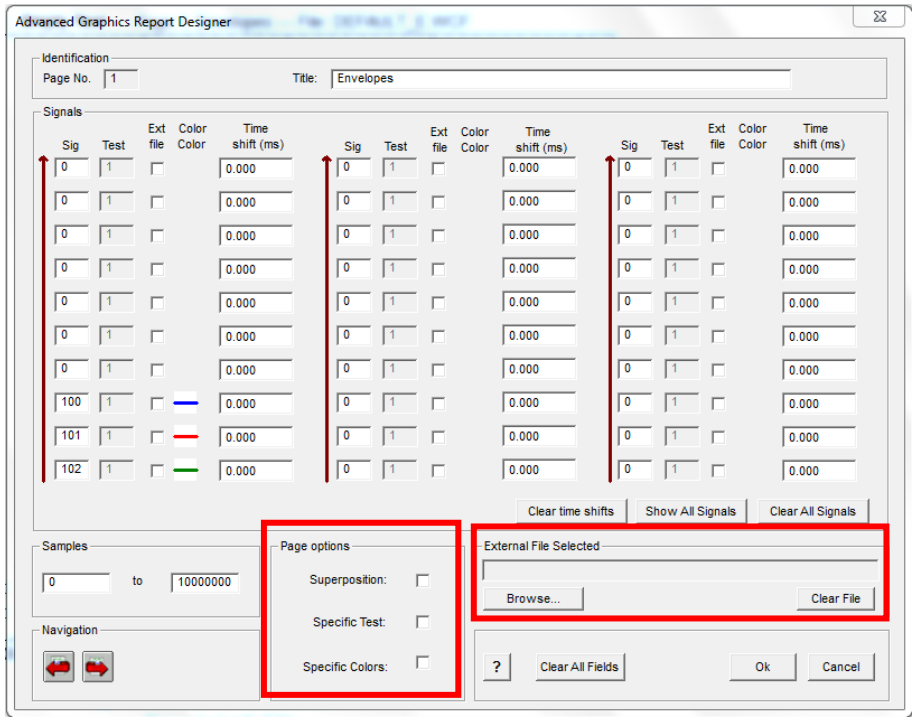


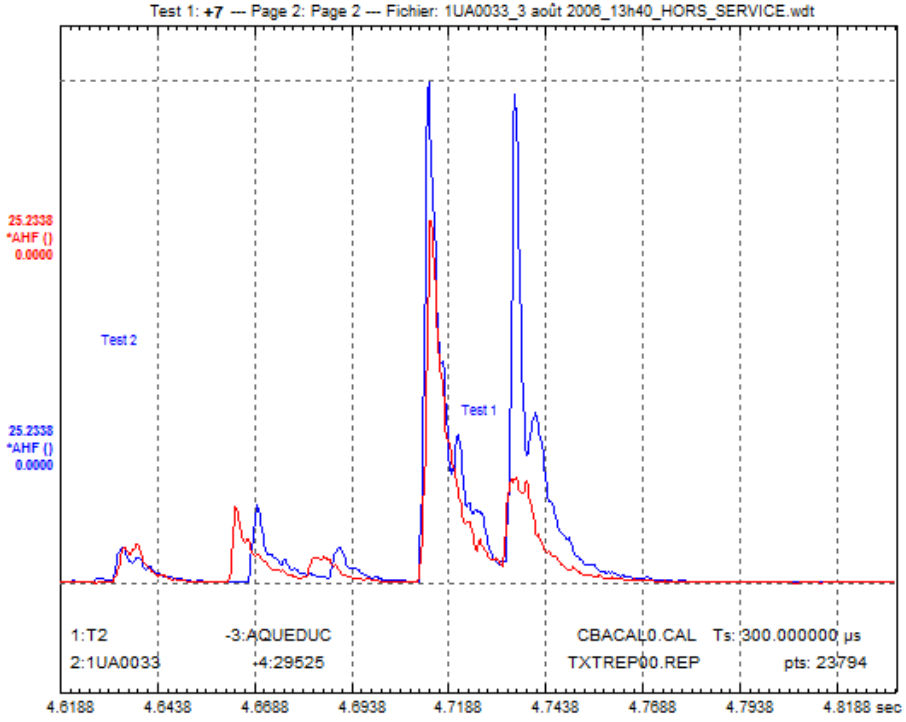
JOB AID N# 22

ADVANCED GRAPHIC REPORT DESIGN

With this window, you can do superposition between signals. These signals are taken from tests that can come either from an external file, or from another test. Select the external file you want and compare the tests that will make your analysis relevant.

You can do a superposition, choose the color of the signals and select the tests that you want to compare.



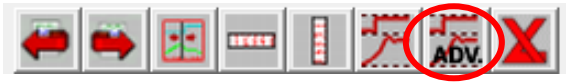


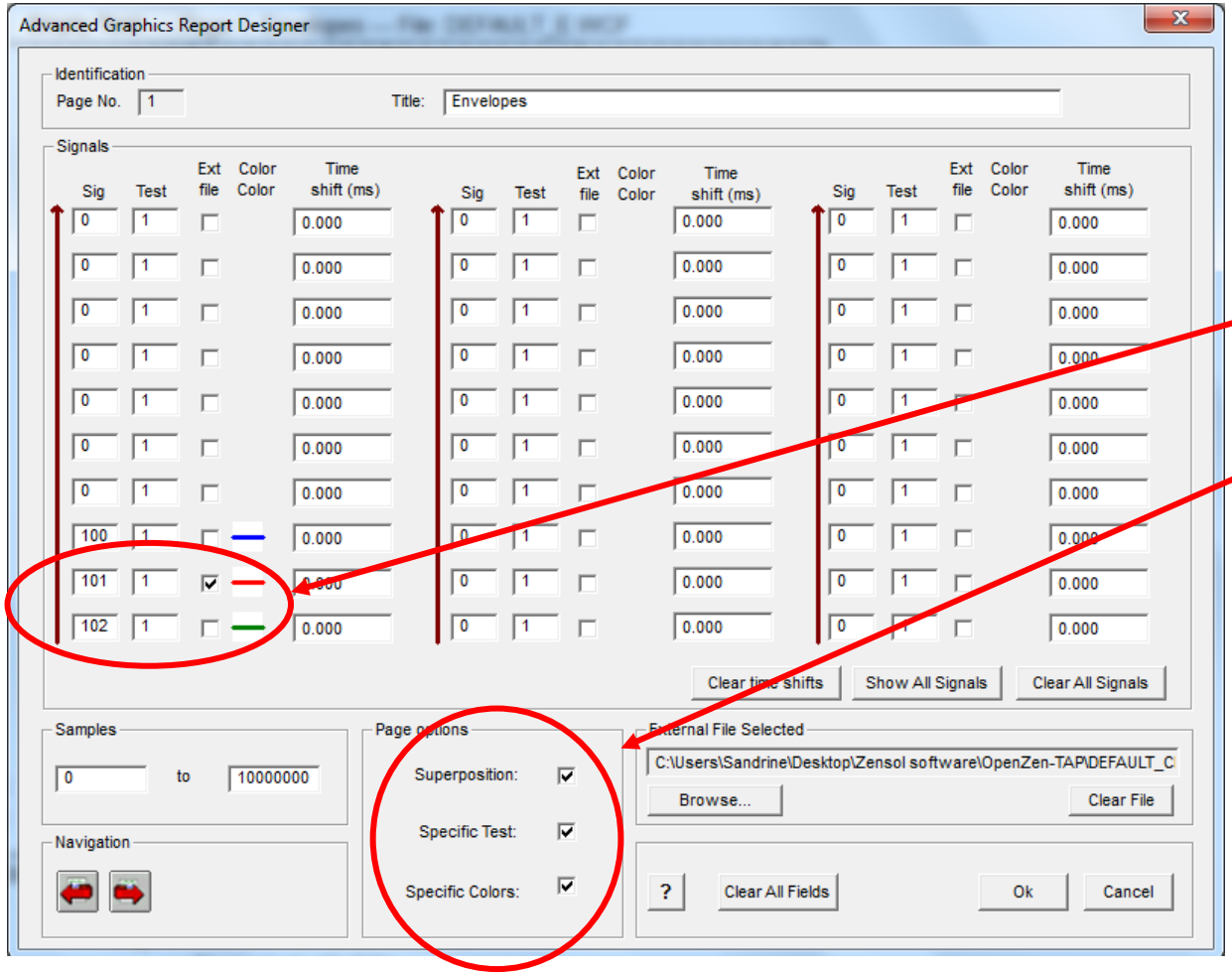
Here is an example of superposition between two tests where we changed the color signals.

- ANALYSIS -

JOB AID N# 23

ADVANCED SIGNAL SUPERPOSITION 1





Select the signals you want to superimpose, in which test it is located, which one comes from the external file.

Then, check “superposition” and the “specific test” box at the bottom of the dialog and “specific colors” if you want to change the color.

- ANALYSIS -

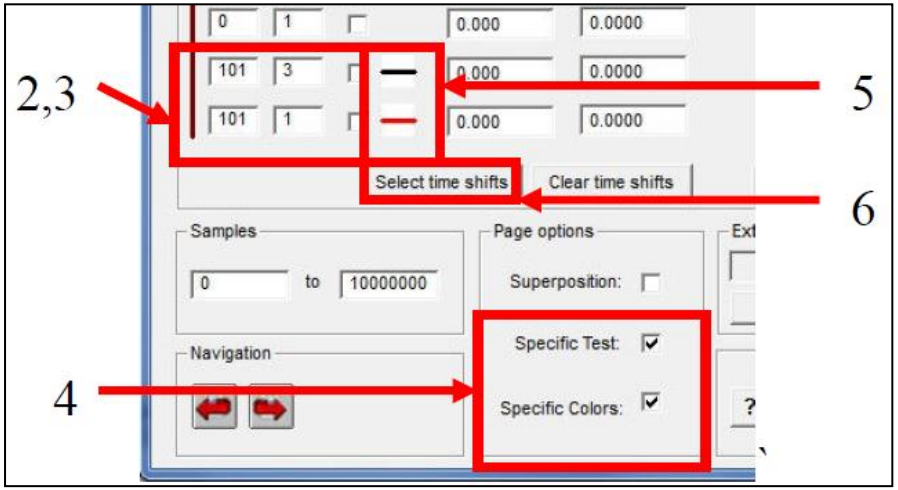
JOB AID N# 24 (1/2)

ADVANCED SIGNAL SUPERPOSITION 2

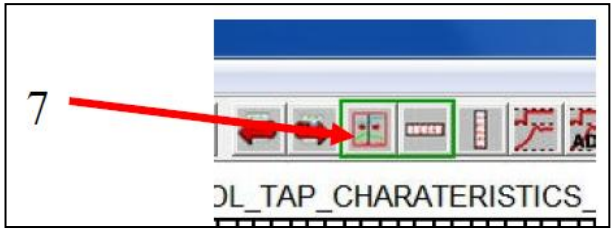
This example uses two signals. Up to twenty signals may be compared using this tool.

1. Click the Advanced Report Designer button: 

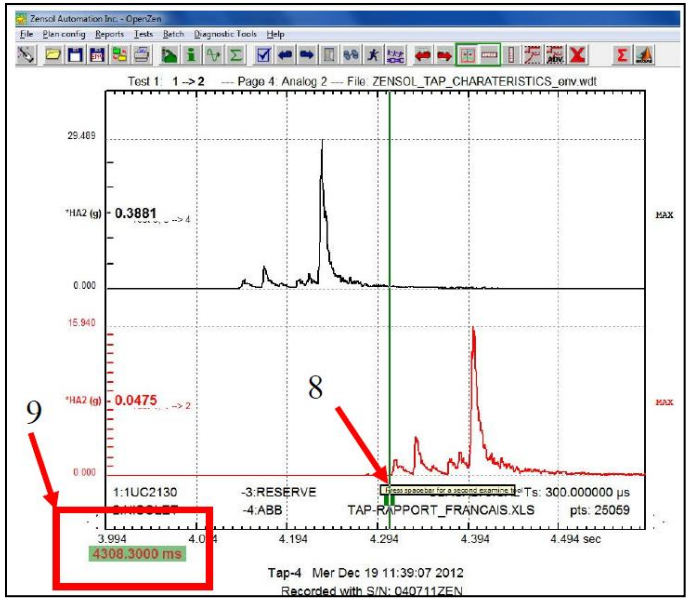
2. Enter the signals you want to compare (example 101).
3. Select the tests you want to compare (example 1 and 3).
4. Select the specific test and specific color options.
5. Change the color of the second signal – click the colored line and select a contrasting color.
6. Click Select Time Shifts.



7. You are allowed to use the buttons highlighted in green (Examine and Scale) in the button bar to zoom in and select the time references.



8. Zoom in to the area of interest and use the Examine tool to select the first time reference.
9. You will note that the time indication at the bottom left corner of the display is highlighted in green. Click on it to open the time shift notepad window.

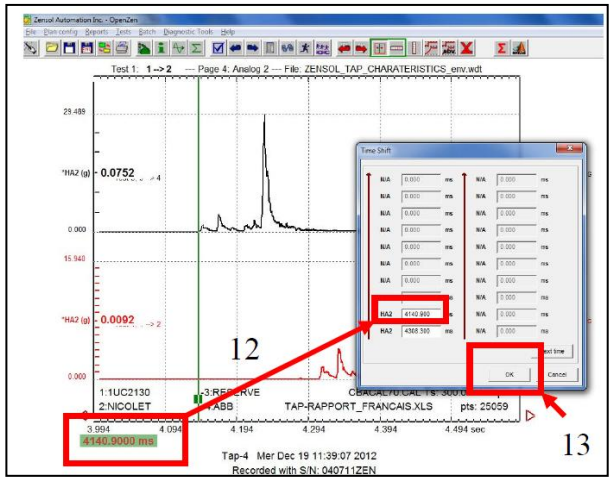


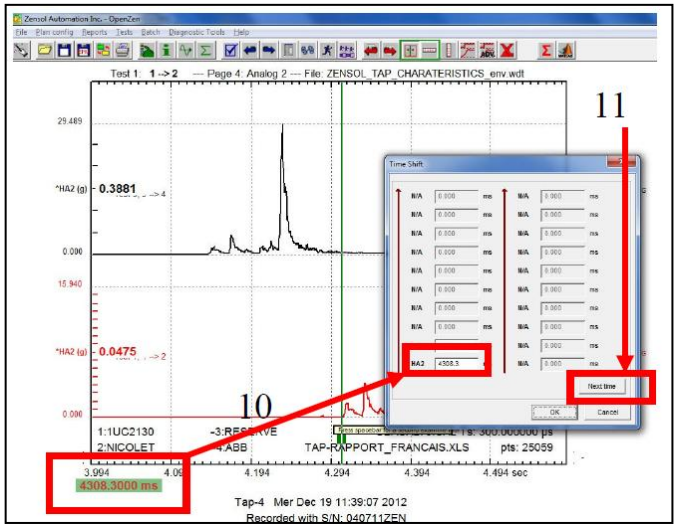
JOB AID N# 24 (2/2)

ADVANCED SIGNAL SUPERPOSITION 2

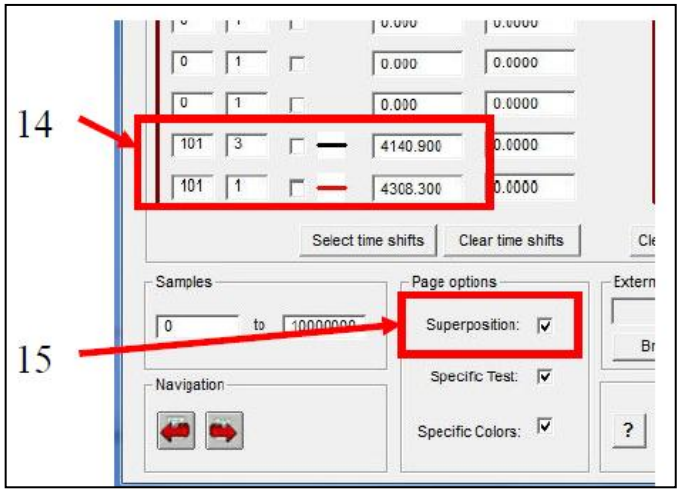
10. Enter the time shown in the box corresponding to the signal.
11. Click the Next Time button (not the OK button yet).

12. Repeat this for the second signal to compare. This may be done as many times as necessary to compare all the desired signals. Be sure to click the Next Time button between each time reference selection.
13. Click OK once you have selected all the time references.

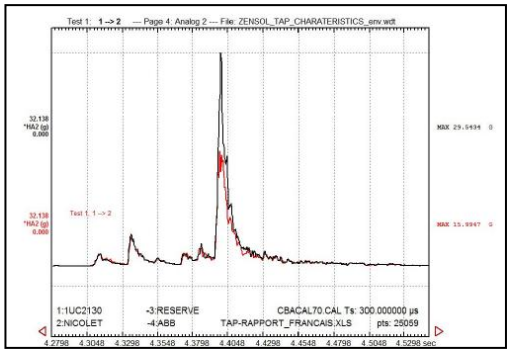




14. The Advanced Graphic Report window will reappear so you can review the settings.
15. Select the Superposition option.
16. Click OK to apply the settings.



The signals are now superimposed and aligned in time.



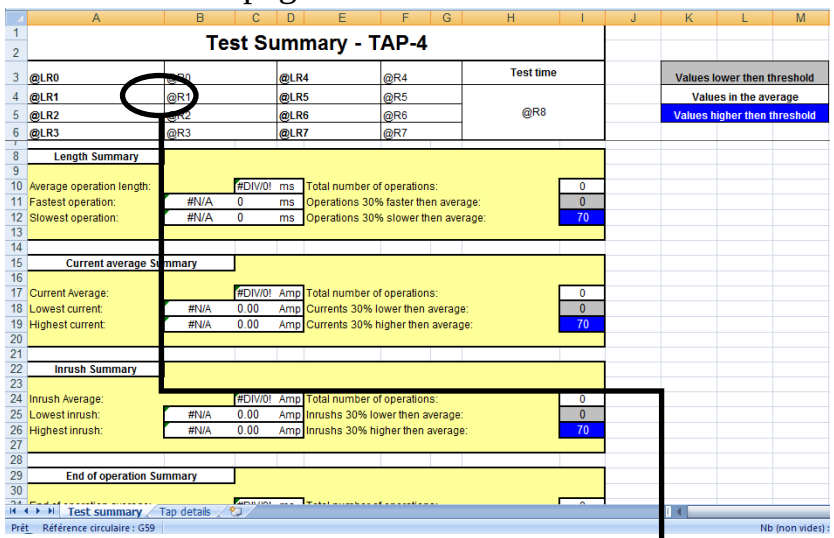
JOB AID N# 25

EXCEL EXPORT EXAMPLE

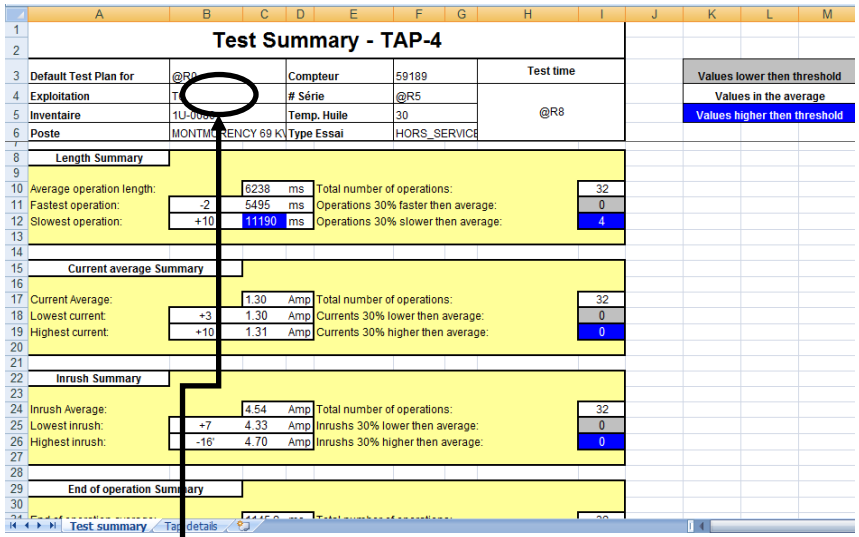
1. Load the file "ABB UCBRN_env.wdt" that is located in the folder \examples\ of OpenZen-TAP**.**
2. Export the results to Excel by going into **Processing**  and choose the excel file "**TAP-Report_English.xls**".
3. The Excel file specified in the processing window is automatically filled with results.

FICHIER EXCEL VIDE

1st page



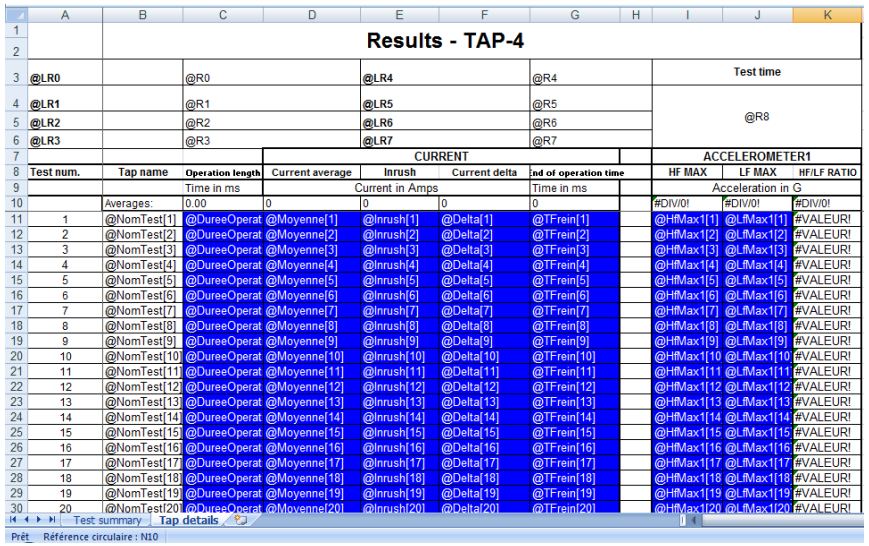
FICHIER DE DONNÉES EXPORTÉ



Exemple: "**@R1**" sera remplacé par "**T6**"

FICHIER EXCEL VIDE

2nde page



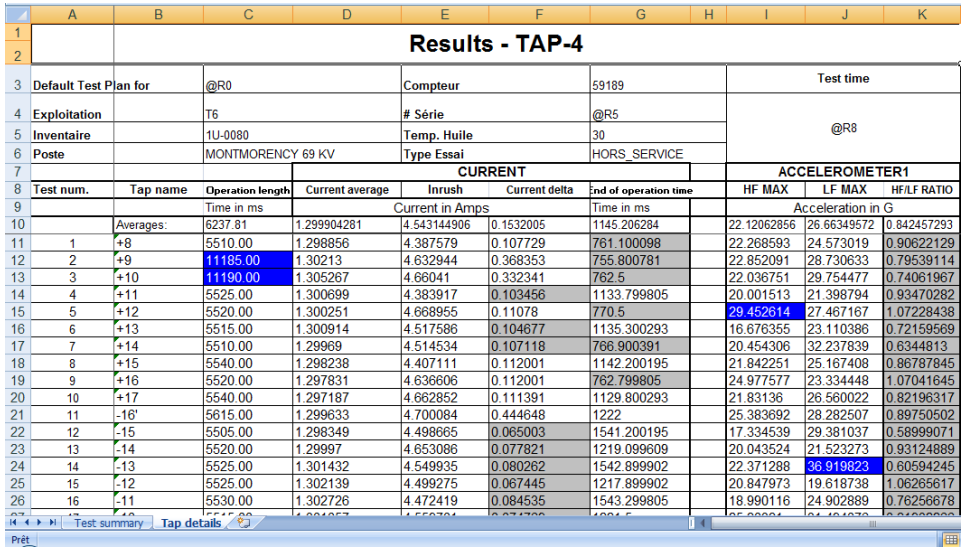
Results - TAP-4

@LR0		@R0		@LR4		@R4		Test time		
@LR1		@R1		@LR5		@R5		@R8		
@LR2		@R2		@LR6		@R6				
@LR3		@R3		@LR7		@R7				
			CURRENT				ACCELEROMETER1			
Test num.	Tap name	Operation length	Current average	Inrush	Current delta	End of operation time	HF MAX	LF MAX	HF/LF RATIO	
		Time in ms	Current in Amps			Time in ms	Acceleration in G			
	Averages:	0.00	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	
1	@NomTest[1]	@DureeOperat	@Moyenne[1]	@Inrush[1]	@Delta[1]	@TFrein[1]	@HfMax1[1]	@LfMax1[1]	#VALEUR!	
2	@NomTest[2]	@DureeOperat	@Moyenne[2]	@Inrush[2]	@Delta[2]	@TFrein[2]	@HfMax1[2]	@LfMax1[2]	#VALEUR!	
3	@NomTest[3]	@DureeOperat	@Moyenne[3]	@Inrush[3]	@Delta[3]	@TFrein[3]	@HfMax1[3]	@LfMax1[3]	#VALEUR!	
4	@NomTest[4]	@DureeOperat	@Moyenne[4]	@Inrush[4]	@Delta[4]	@TFrein[4]	@HfMax1[4]	@LfMax1[4]	#VALEUR!	
5	@NomTest[5]	@DureeOperat	@Moyenne[5]	@Inrush[5]	@Delta[5]	@TFrein[5]	@HfMax1[5]	@LfMax1[5]	#VALEUR!	
6	@NomTest[6]	@DureeOperat	@Moyenne[6]	@Inrush[6]	@Delta[6]	@TFrein[6]	@HfMax1[6]	@LfMax1[6]	#VALEUR!	
7	@NomTest[7]	@DureeOperat	@Moyenne[7]	@Inrush[7]	@Delta[7]	@TFrein[7]	@HfMax1[7]	@LfMax1[7]	#VALEUR!	
8	@NomTest[8]	@DureeOperat	@Moyenne[8]	@Inrush[8]	@Delta[8]	@TFrein[8]	@HfMax1[8]	@LfMax1[8]	#VALEUR!	
9	@NomTest[9]	@DureeOperat	@Moyenne[9]	@Inrush[9]	@Delta[9]	@TFrein[9]	@HfMax1[9]	@LfMax1[9]	#VALEUR!	
10	@NomTest[10]	@DureeOperat	@Moyenne[10]	@Inrush[10]	@Delta[10]	@TFrein[10]	@HfMax1[10]	@LfMax1[10]	#VALEUR!	
11	@NomTest[11]	@DureeOperat	@Moyenne[11]	@Inrush[11]	@Delta[11]	@TFrein[11]	@HfMax1[11]	@LfMax1[11]	#VALEUR!	
12	@NomTest[12]	@DureeOperat	@Moyenne[12]	@Inrush[12]	@Delta[12]	@TFrein[12]	@HfMax1[12]	@LfMax1[12]	#VALEUR!	
13	@NomTest[13]	@DureeOperat	@Moyenne[13]	@Inrush[13]	@Delta[13]	@TFrein[13]	@HfMax1[13]	@LfMax1[13]	#VALEUR!	
14	@NomTest[14]	@DureeOperat	@Moyenne[14]	@Inrush[14]	@Delta[14]	@TFrein[14]	@HfMax1[14]	@LfMax1[14]	#VALEUR!	
15	@NomTest[15]	@DureeOperat	@Moyenne[15]	@Inrush[15]	@Delta[15]	@TFrein[15]	@HfMax1[15]	@LfMax1[15]	#VALEUR!	
16	@NomTest[16]	@DureeOperat	@Moyenne[16]	@Inrush[16]	@Delta[16]	@TFrein[16]	@HfMax1[16]	@LfMax1[16]	#VALEUR!	
17	@NomTest[17]	@DureeOperat	@Moyenne[17]	@Inrush[17]	@Delta[17]	@TFrein[17]	@HfMax1[17]	@LfMax1[17]	#VALEUR!	
18	@NomTest[18]	@DureeOperat	@Moyenne[18]	@Inrush[18]	@Delta[18]	@TFrein[18]	@HfMax1[18]	@LfMax1[18]	#VALEUR!	
19	@NomTest[19]	@DureeOperat	@Moyenne[19]	@Inrush[19]	@Delta[19]	@TFrein[19]	@HfMax1[19]	@LfMax1[19]	#VALEUR!	
20	@NomTest[20]	@DureeOperat	@Moyenne[20]	@Inrush[20]	@Delta[20]	@TFrein[20]	@HfMax1[20]	@LfMax1[20]	#VALEUR!	

Test summary | Tap details

Prêt | Référence circulaire : N10

FICHIER DE DONNÉES EXPORTÉ



Results - TAP-4

Default Test Plan for		@R0		Compteur		59189	Test time		
Exploitation		T6		# Série		@R5	@R8		
Inventaire		1U-0080		Temp. Huile		30			
Poste		MONTMORENCY 69 KV		Type Essai		HORS_SERVICE			
			CURRENT				ACCELEROMETER1		
Test num.	Tap name	Operation length	Current average	Inrush	Current delta	End of operation time	HF MAX	LF MAX	HF/LF RATIO
		Time in ms	Current in Amps			Time in ms	Acceleration in G		
	Averages:	6237.81	1.299904281	4.543144906	0.1532005	1145.206284	22.12062856	26.66349572	0.842457293
1	+8	5510.00	1.298856	4.387579	0.107729	761.100098	22.268593	24.573019	0.90622129
2	+9	11185.00	1.30213	4.632944	0.368353	755.800781	22.852091	28.730633	0.79539114
3	+10	11190.00	1.305267	4.66041	0.332341	762.5	22.036751	29.754477	0.74061967
4	+11	5525.00	1.300699	4.383917	0.103456	1133.799805	20.001513	21.398794	0.93470282
5	+12	5520.00	1.300251	4.668955	0.11078	770.5	29.452614	27.467167	1.07228438
6	+13	5515.00	1.300914	4.517586	0.104677	1135.300293	16.676355	23.110386	0.72159569
7	+14	5510.00	1.29969	4.514534	0.107118	766.900391	20.454306	32.237839	0.6344813
8	+15	5540.00	1.298238	4.407111	0.112001	1142.200195	21.842251	25.167408	0.86787845
9	+16	5520.00	1.297831	4.636606	0.112001	762.799805	24.977577	23.334448	1.07041645
10	+17	5540.00	1.297187	4.662852	0.111391	1129.800293	21.83136	26.560022	0.82196317
11	-16'	5615.00	1.299633	4.700084	0.444648	1222	25.383692	28.282507	0.89750502
12	-15	5505.00	1.298349	4.498665	0.065003	1541.200195	17.334539	29.381037	0.58999071
13	-14	5520.00	1.29997	4.653086	0.077821	1219.099609	20.043524	21.523273	0.93124889
14	-13	5525.00	1.301432	4.549935	0.080262	1542.899902	22.371288	36.919823	0.60594245
15	-12	5525.00	1.302139	4.499275	0.067445	1217.899902	20.847973	19.618738	1.06265617
16	-11	5530.00	1.302726	4.472419	0.084535	1543.299805	18.990116	24.902889	0.76256678

Test summary | Tap details

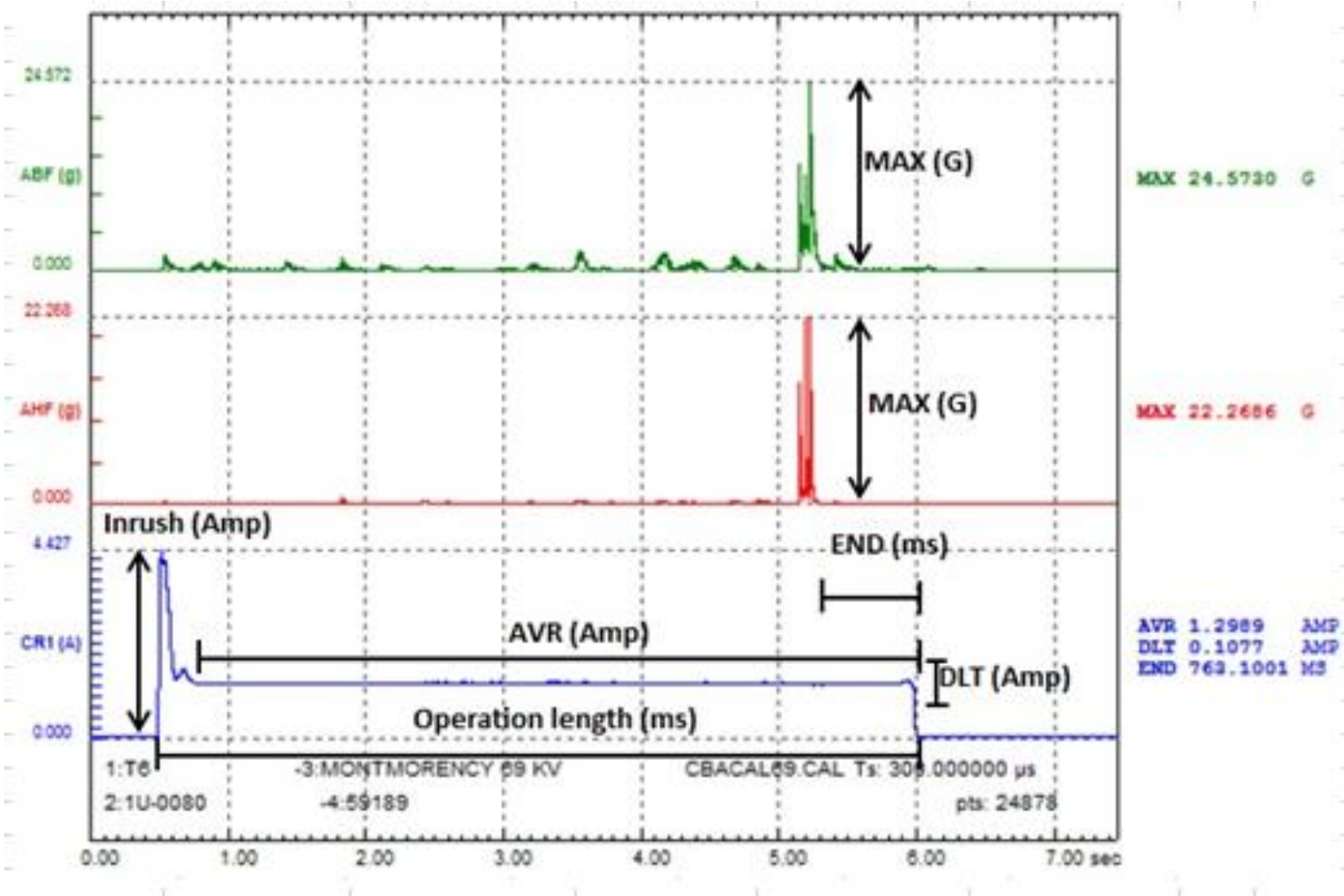
Prêt

Note: If you need a customized Excel model, contact us and we will be glad to help you.

- ANALYSIS -

JOB AID N# 26

CALCULATION EXPLANATIONS



JOB AID N# 27

COMMON ABBREVIATIONS

Here are the most common abbreviations encountered in the OpenZen software with the standard calculation files cbacal7.cal and cbacal70.

Abbréviation	Définition
ZAN	Signal average
PPK	Peak-to-peak value
RMS	Signals RMS value (in volts)
SSB	Noise of the signal (in dB)
ENV	Envelope of a signal
MAX	Maximum value of the signal
AVR	Average motor current between inrush and breaking
DLT	Delta between inrush and breaking
BRK	Time gap between the end of tap changing and the end of the motor current