

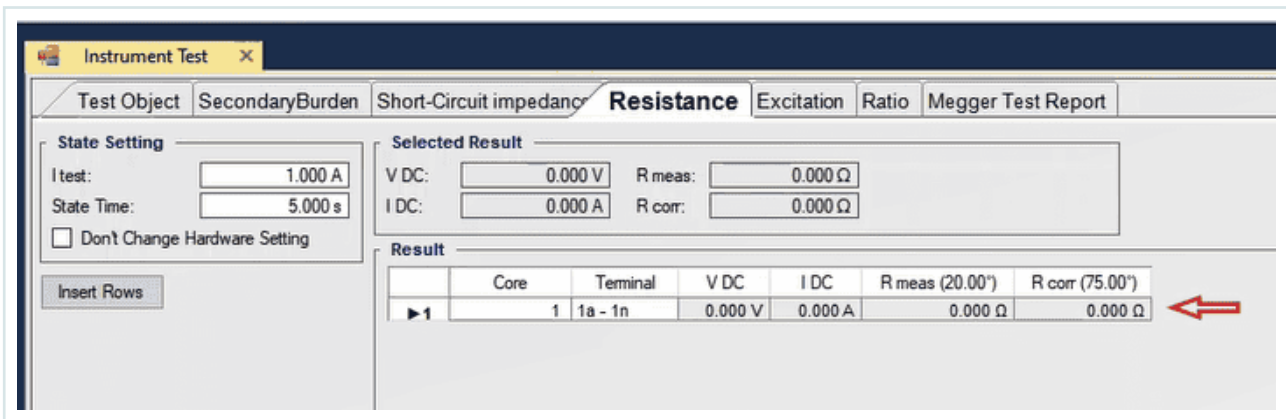


VEBKO ONLINE HELP

Winding Resistance Test

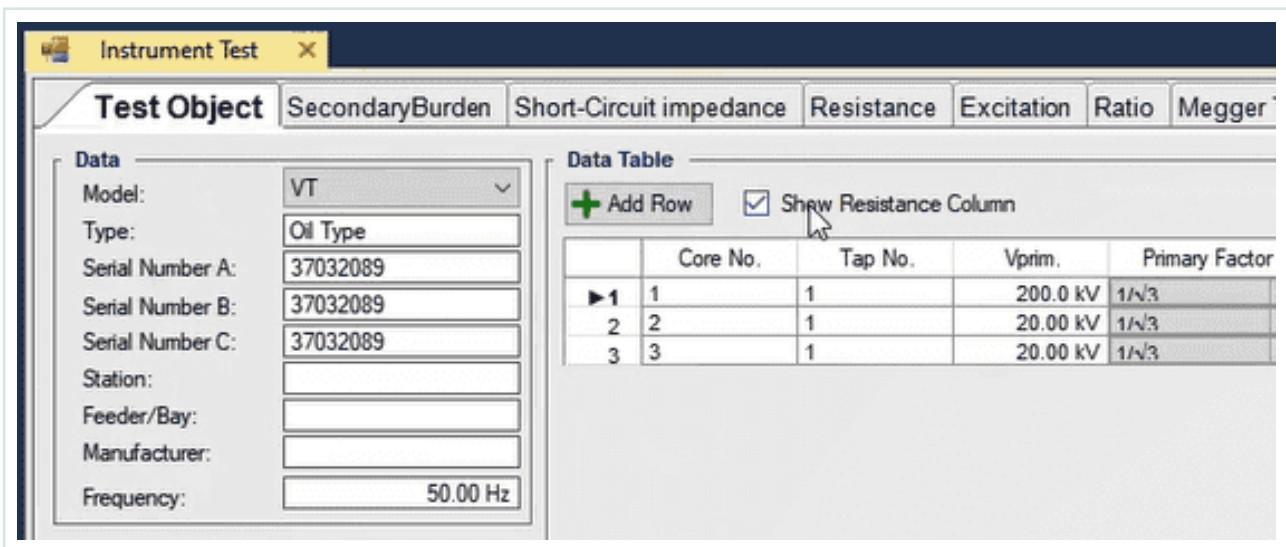
Category	tester
Section	capacitor voltage transformer
Language	English
Generated	2026-10-18

Winding resistance test is done in "Resistance Test" tab. In this test, by injecting "DC" current into "CVT" secondary and measuring voltage through the "Input" and dividing voltage by current, "DC" resistance or "Rmeas" is calculated. It should be noted that in the software, there is only one row in the test table by default. If the "CVT" has more than one taps or cores, by pressing "Insert Rows" it is possible to add as many rows as necessary and test any of them. To perform this test, the test current and time must be entered in "I test" and "State Time" fields in "State Setting" section, respectively. The current limitation specified for this field is "32" amps but "1" amp of current is usually enough for this test. About rows of the "Result" table, it should be noted that if "Show Resistance Column" option in "Test Object" is checked, three more columns including "Rnom", "Rdev" and "Assessment" are added to the table where "Rnom" and "Rdev" refer to the nominal resistance and the difference between "Rnom" and "Rcorr", respectively. If "Rcorr" is lower than "Rnom", the "Assessment" is "Passed", otherwise it is "Failed".



	Core	Terminal	V DC	I DC	R meas (20.00°)	R corr (75.00°)
► 1	1	1a - 1n	0.000 V	0.000 A	0.000 Ω	0.000 Ω

Figure 1



	Core No.	Tap No.	Vprim	Primary Factor
► 1	1	1	200.0 kV	1/√3
2	2	1	20.00 kV	1/√3
3	3	1	20.00 kV	1/√3

Figure 2

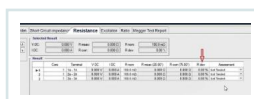


Figure 3

After entering the information, the wiring needs to be done in accordance with the picture. It should be noted that it is possible to magnify the picture by double-clicking on it. In this wiring, first the „la1“ and „lb1“ current output phases are Jumpered and „la2“ and „lb2“ phases are paralleled with the capacitor box. Here, „la2“ is connected after connecting it to the positive end of the capacitor and to the „S1“ CVT and „lb2“ is connected after connecting it to the negative polarity of the capacitor and to the „S2“. The reason for using a capacitor box is to compensate „CVT“ inductance. In this capacitor box, there are three „1000“ microfarad capacitors and the red and black ends of the capacitor box are the positive and negative polarity, respectively.



Figure 4

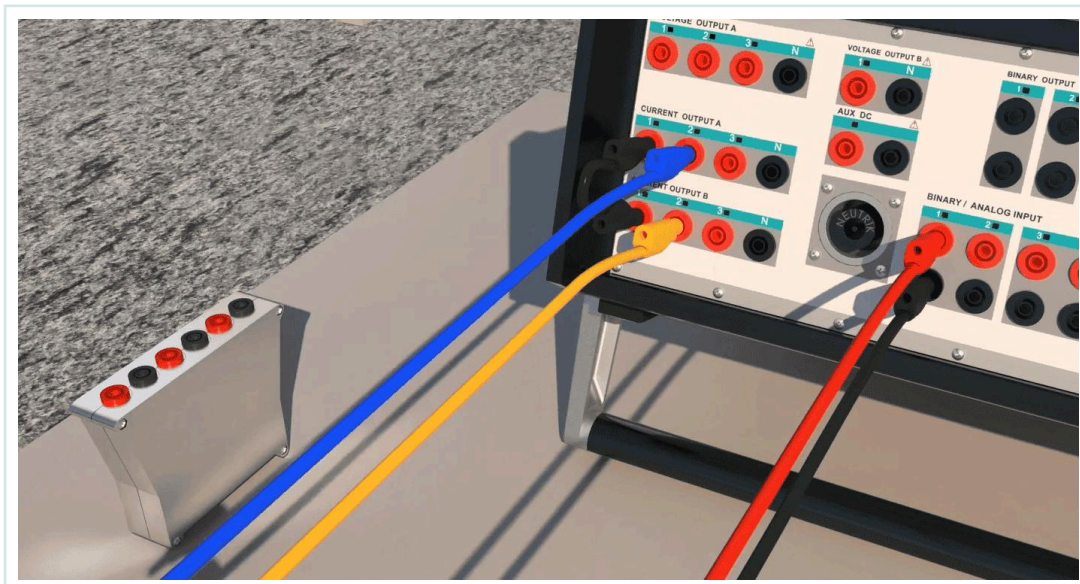


Figure 5

To measure the “DC” voltage, input1 should be connected to the “CVT” and a little further from the current connectors. Then, the source of the current which was paralleled with the capacitor is connected to the “CVT” terminals. It should be noted that to perform the test, it is necessary to right-

click on one of the rows of the table and select "Apply Test". By doing this, the device settings related to the current and the test time as well as the hardware settings related to "Hardware Configuration" including the outputs and "Binary/Analog Inputs" of the device are automatically adjusted. To analyze the test it is possible to use "Table View", "Detail View" and "Signal View". After opening "Table View" window, two "States" with zero frequency and in accordance with the information entered in "State Setting" section can be seen. The function of the first "State" is to change the "CT" current from transient to steady state while the function of the second "State" is to measure the current and voltage and calculate the resistance. If the user wishes to have access to a more thorough source of information than the "Table View", they can use "Detail View" window.

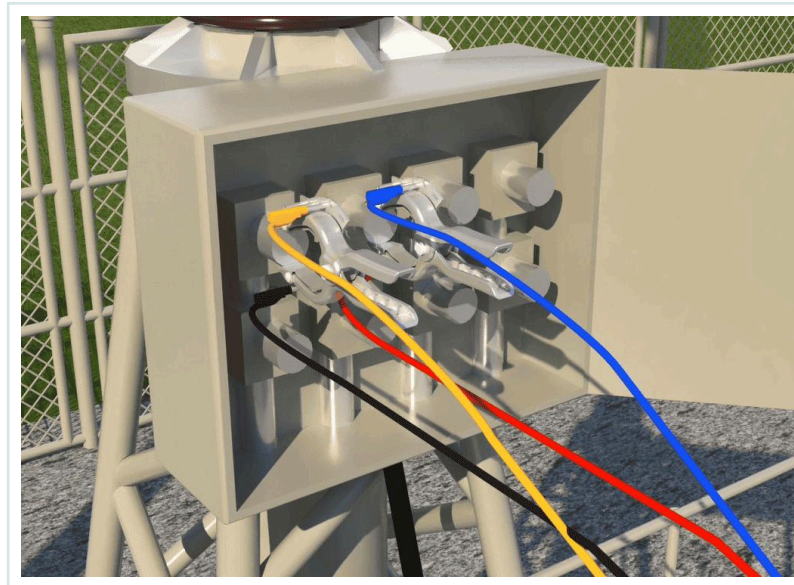


Figure 6

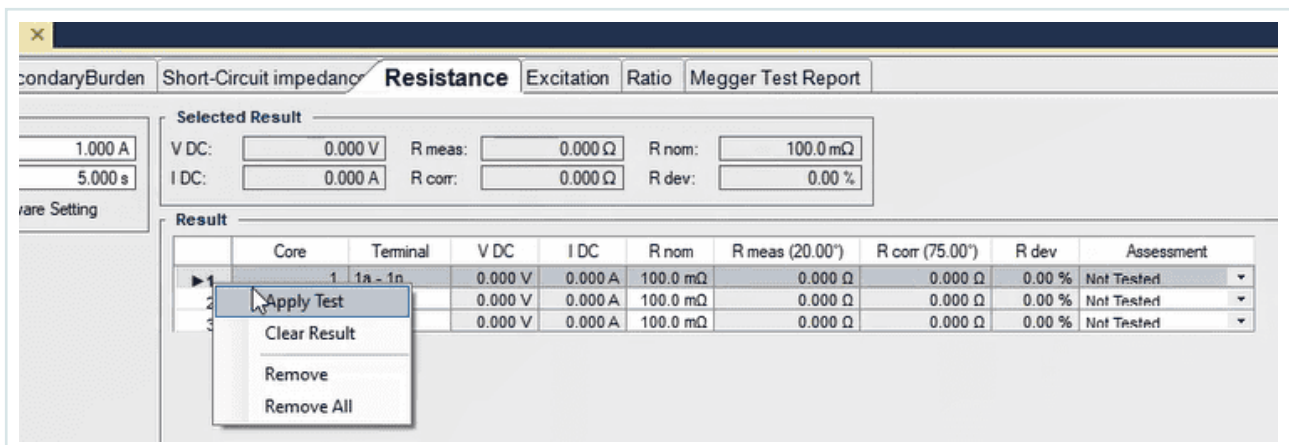


Figure 7

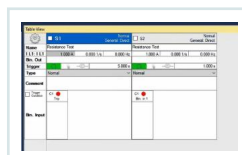


Figure 8

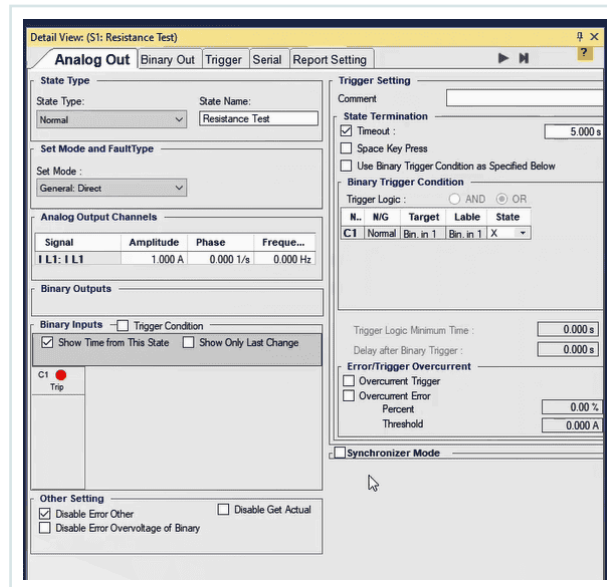


Figure 9

1 Performing the test and analyzing the results

After adjusting the wiring, 1 amp and 5 seconds are entered as the test current and test time, respectively, and by right-clicking on any of the rows and pressing “Apply Test”, the test begins. It should be noted that in “Signal View” section, it is possible to view the actual waveform of the current and the voltage measured by the “Input”. By using “Signal View” and the recorded voltage and current waveforms, it is possible to analyze the test using the “Actual” values and the recorded voltages, Check if the connectors are connected correctly.

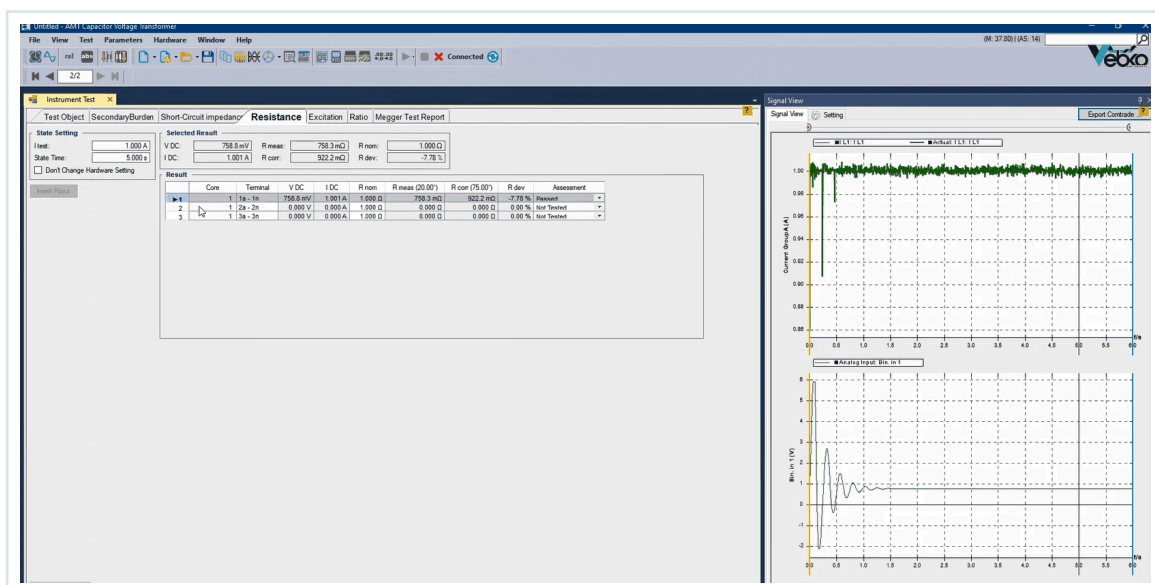
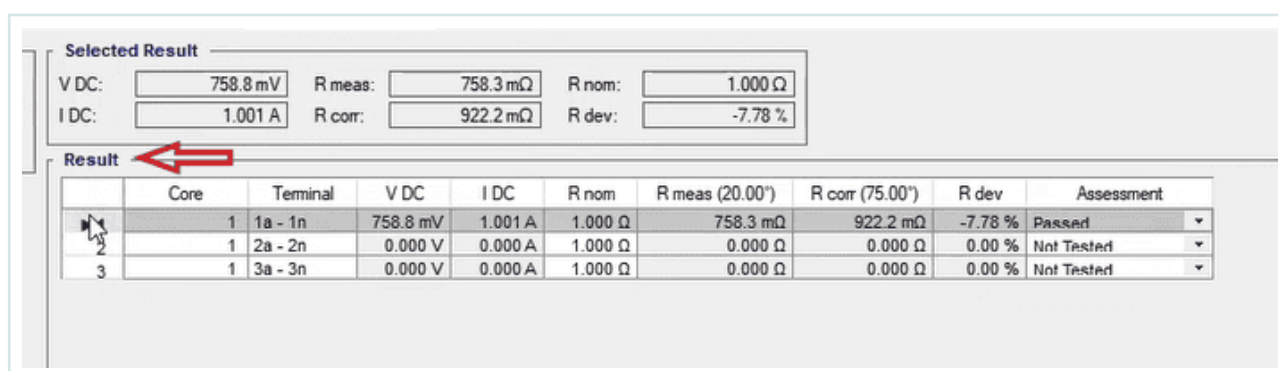


Figure 10

After the test is finished, by selecting the row in "Result" section, the test results can easily be viewed. The results include "VDC", "IDC", "Rnom", "Rcorr" and "Rdev" which refer to the measured voltage, the injected current, the resistance measured in the current temperature, the resistance measured in the reference temperature and the difference between "Rcorr" and "Rnom" in terms of percent, respectively. In "Correction Factor" field, the temperature correction factor is calculated in accordance with the current ambient temperature, the reference temperature and the material of the winding. The information of this temperature is entered in "Temperature Correction" field in "Test Object" and the "Rcorr" is obtained by multiplying "Rmeas" by the "Correction Factor".



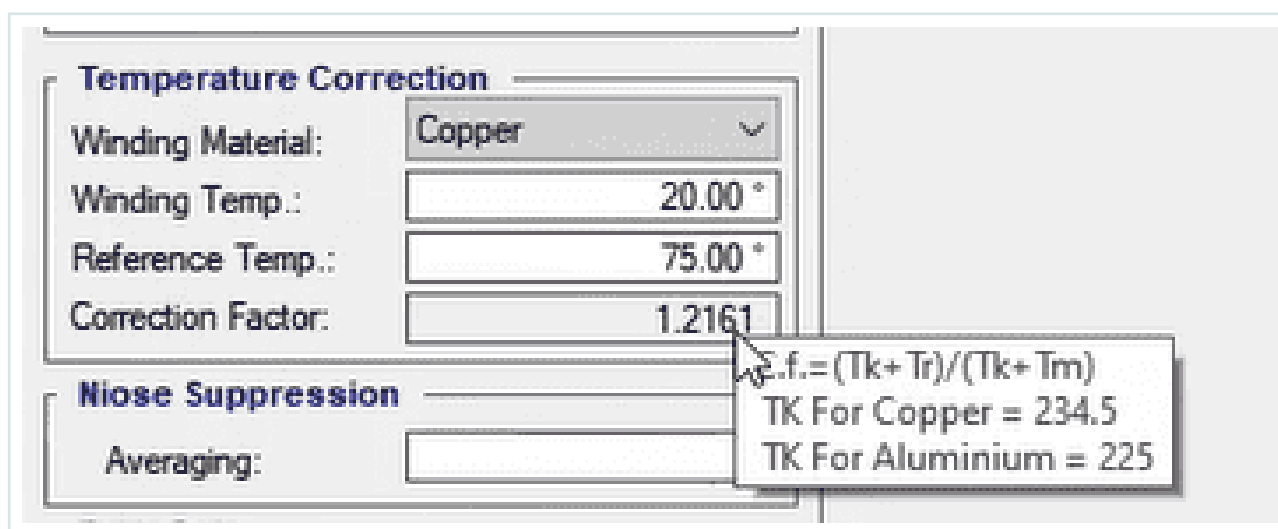
Selected Result

V DC: 758.8 mV R meas: 758.3 mΩ R nom: 1.000 Ω
 I DC: 1.001 A R corr: 922.2 mΩ R dev: -7.78 %

Result

	Core	Terminal	V DC	I DC	R nom	R meas (20.00°)	R corr (75.00°)	R dev	Assessment
1	1a - 1n		758.8 mV	1.001 A	1.000 Ω	758.3 mΩ	922.2 mΩ	-7.78 %	Passed
2	1 2a - 2n		0.000 V	0.000 A	1.000 Ω	0.000 Ω	0.000 Ω	0.00 %	Not Tested
3	1 3a - 3n		0.000 V	0.000 A	1.000 Ω	0.000 Ω	0.000 Ω	0.00 %	Not Tested

Figure 11



Temperature Correction

Winding Material: Copper
 Winding Temp.: 20.00 °
 Reference Temp.: 75.00 °
 Correction Factor: 1.2161

Noise Suppression

Averaging:

$C.f. = (T_k + T_r) / (T_k + T_m)$
 TK For Copper = 234.5
 TK For Aluminium = 225

Figure 12

In the end, after performing the test, if "Rcorr" is lower than "Rnom", the result of the assessment is "Passed" in "Assessment", otherwise it is "Failed". After the assessment, it is necessary to add the results to the report which in equipment test is done by pressing "Add to Report".

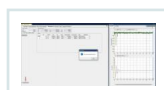


Figure 13

Also, if you wish to add specific parts of the test to the report or edit or delete the report, “Add to Report” cog. By clicking on this cog, the elements that can be added to the report are indicated by checked checkboxes and before pressing “Add to Report” the user can uncheck any of them that they do not wish to be added to the report. It should be noted that after every test the test results are not added to the report automatically and after every test, it is necessary to add the results of the performed test to the report by pressing “Add to Report” before clearing the test.

If you wish to use a different wiring for current injection, you need to have pressed “Apply Test” at least once. Then, check “Don’t change Hardware Setting” and select their intended wiring in “Hardware Configuration” and press “Apply Test” one more time. To select a different “Input”, it should be noted that the selected “Binary Input Target” must be similar to the default “Binary Input Target”. For this, it is suggested to right-click on “Input1” row and cut the information and “Paste” it in the intended row. To change the current wiring, it is important to set the “Output Target” of the selected wiring at “IL1”.

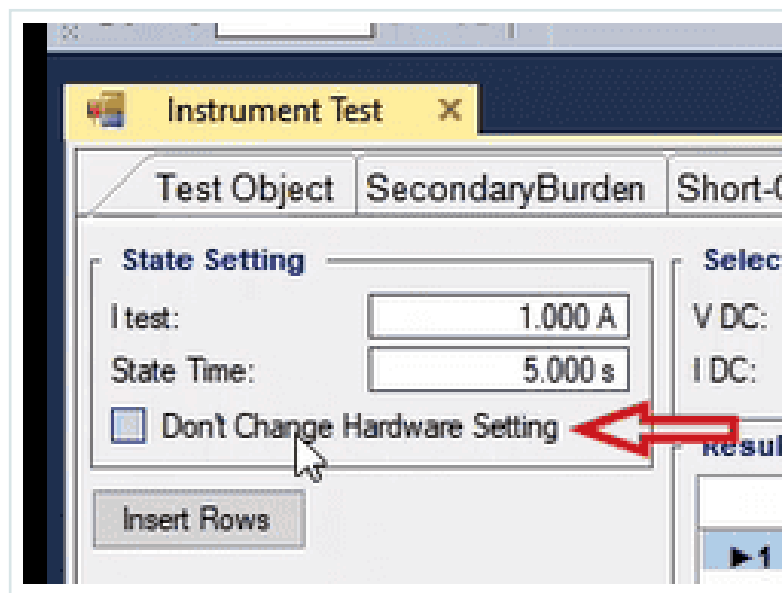


Figure 14

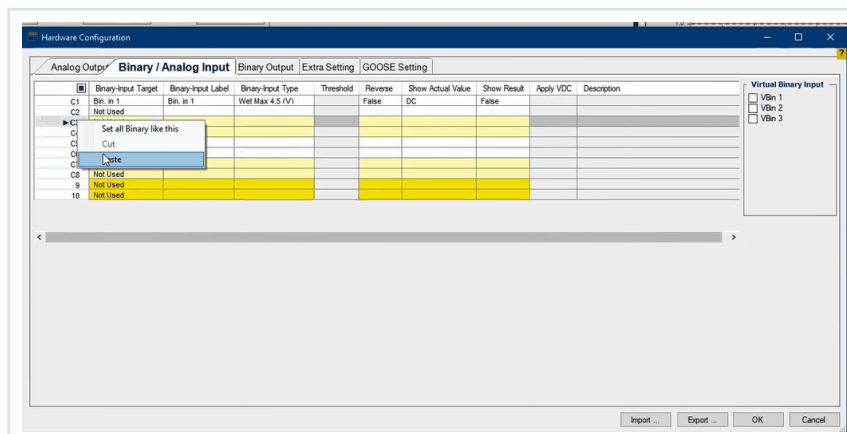


Figure 15

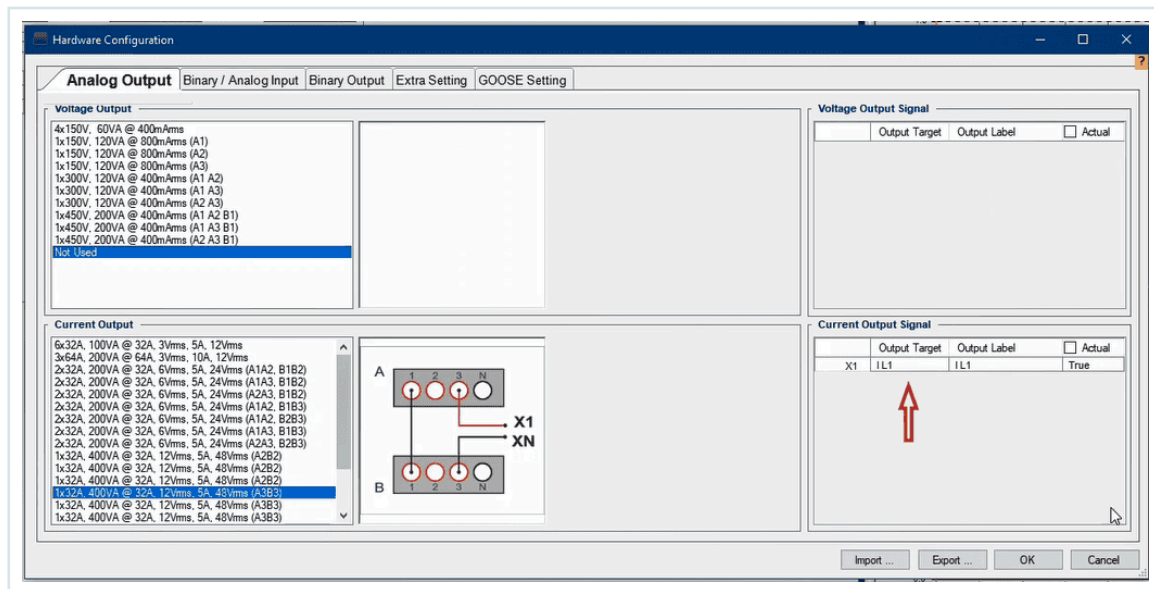


Figure 16

There are two more notable points; the first one is that „Error Other“ indicates that either there is a problem with the wirings or the resistance is too high that the device is not able to provide the „Burden“ needed for current injection. Therefore, in cases of facing this error, the user needs to examine the „Actual“ value of the current from „Signal View“. If the current is injected from the device („Actual Current“) but its difference with the specified current is high, the wiring resistance is too high and if the „Actual Current“ is zero, it means that the current injection path is open. In cases where the resistance is too high, it is necessary to decrease the current and when the „Actual Current“ equals zero, the connection of the connectors needs to be checked. The second point is that if the measured voltage has a too high tolerance or equals zero, this means that the connectors are not connected correctly.

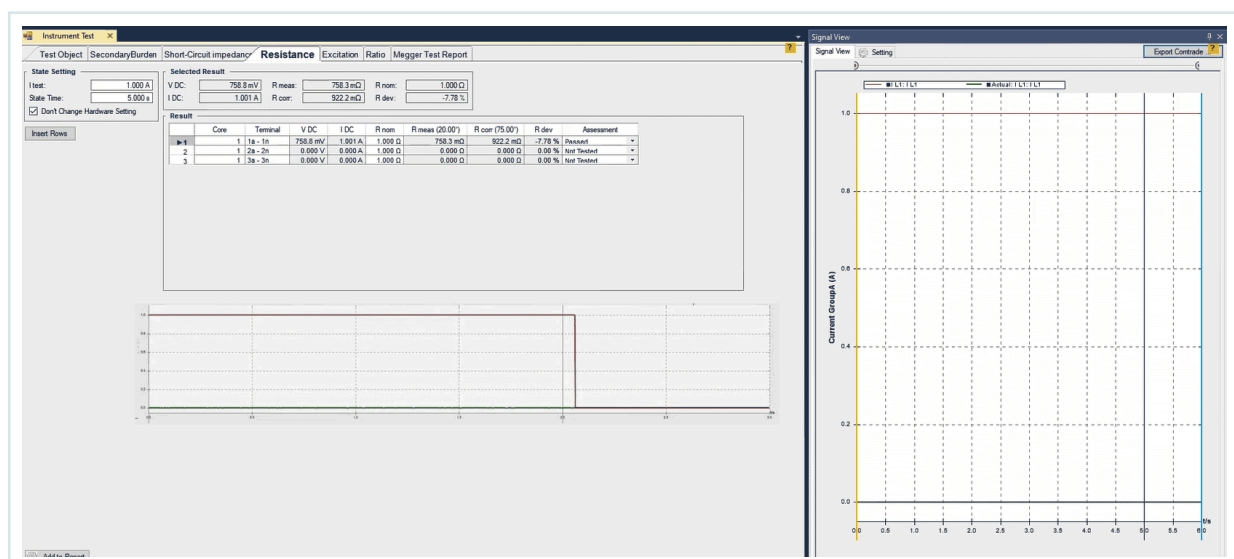


Figure 17

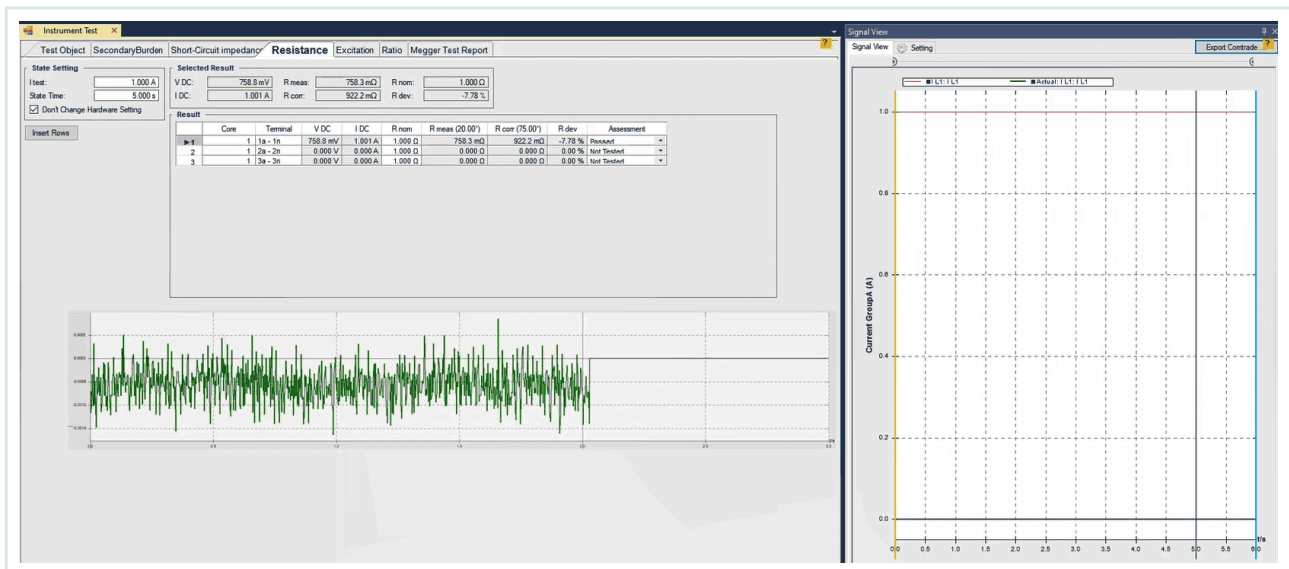


Figure 18

[jg1]Winding_resistance_test