



VEBKO ONLINE HELP

“Offload” Test Part 1

Category	tester
Section	AMT Transducer Module
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1 Imported Content

To test Energy Meters, AMT Transducer & Meter room can be used. On "Start" page, the "AMT Transducer & Meter" room software is opened. This room is comprised of the two main windows of "Test View" and "Transducer Characteristic"; in "Test View" window, it is possible to perform a "Shot Test" for various quantities and compare the results with the meter characteristic.

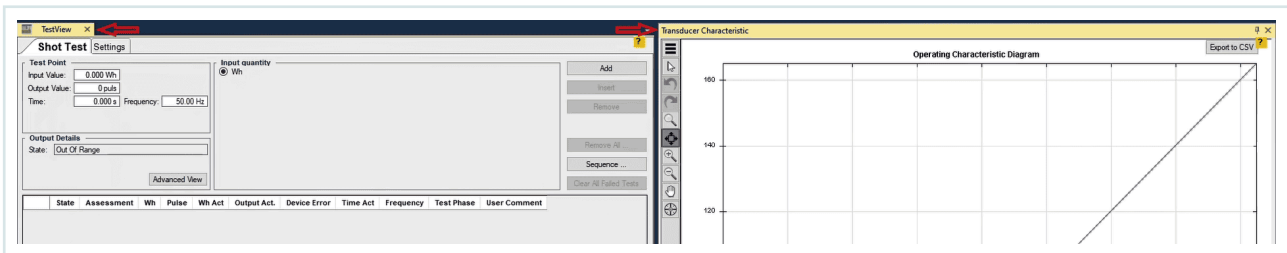


Figure 1

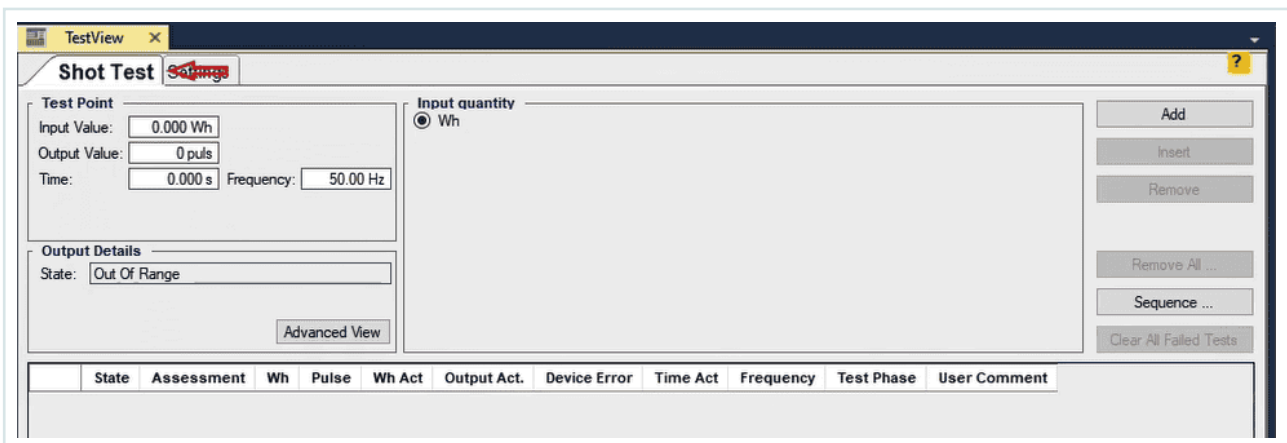


Figure 2

To begin the test, after completing the information in "Device" in "General Test Object" window, double click on "Transducer" option. On "Transducer Properties" page, it is possible to view a set of functions. To test the meter, two functions of "Wh" and "Varh" are used; here, "Wh" is selected. By selecting "Injection" option in "Input" section, it is possible to perform the "Offload" test of the meter by injection from the device. The other option is "Read from Binary" which is used to perform an "On Load" test of the meter. By selecting this option, it is necessary to enter the values into the inputs of the device using the clamps and interface cables.

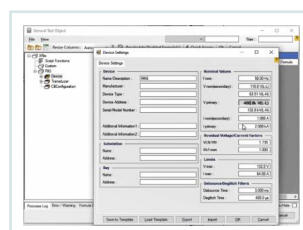


Figure 3

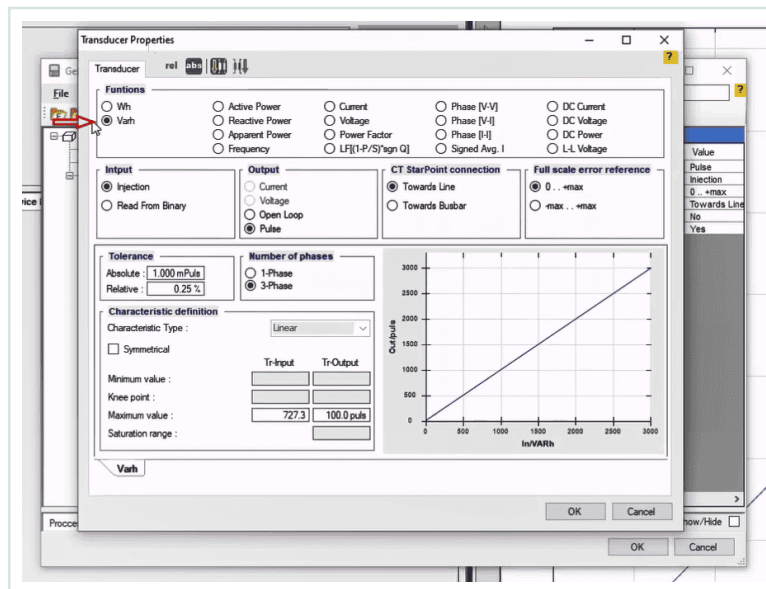


Figure 4

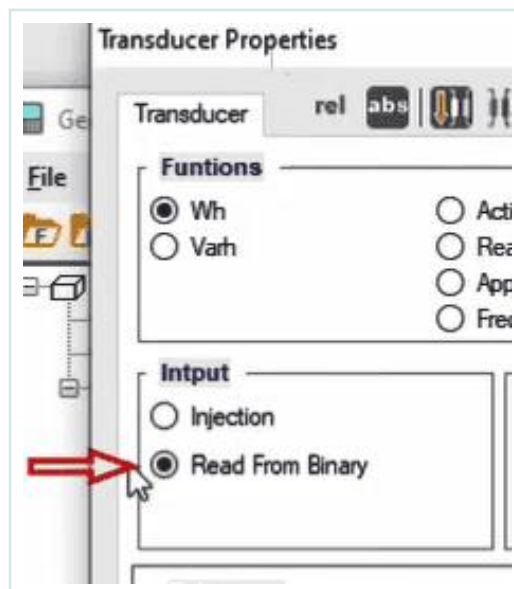


Figure 5

In "Output" section, it is possible to specify the type of the output received from the meter. To test transducers and their corresponding outputs, by selecting "Current" or "Voltage" options, it is possible to take the output current and voltage values to the inputs 9 and 10 for measurement. To test the meter, if only the output values are being displayed on the screen, "Open Loop" option can be used. Here, "Pulse" option is used so that using the light sensor which comes with the device, the number of the output pulses of the meter is recorded.



Figure 6

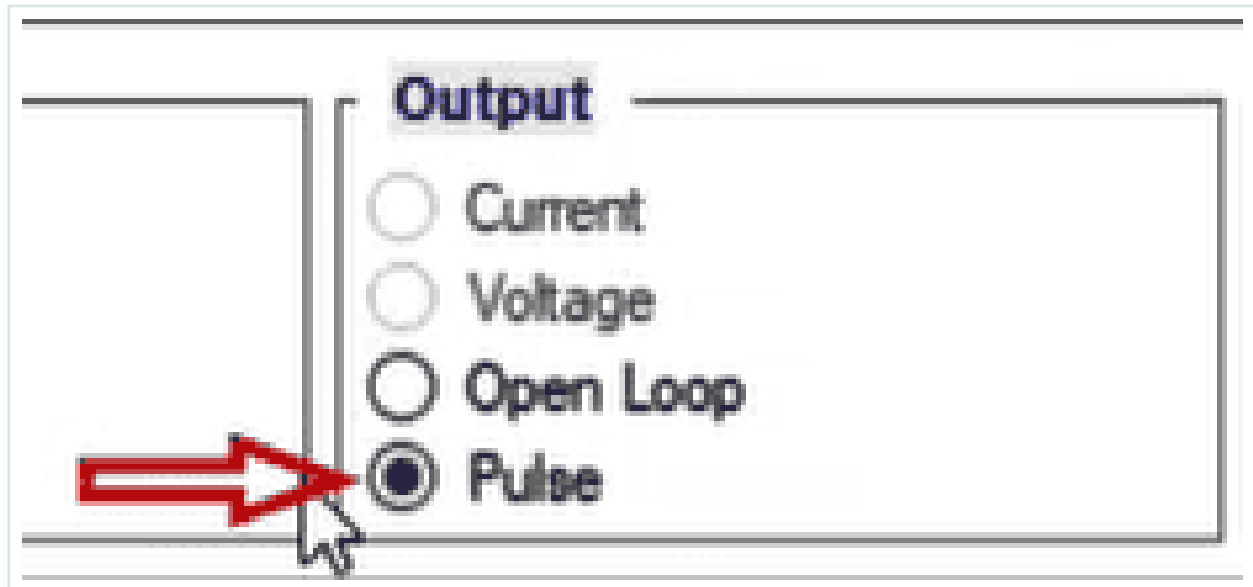


Figure 7

In „CT Star point Connection“ section, the connection related to the current transformers are specified. Usually and since the active power flows from the busbar toward the line, "Toward Line" option is selected. Selecting "Toward Line" is in accordance with the injection of the active power from the device to the equipment. If "Toward Busbar" is selected, 180 degrees are added to the angle of the current.

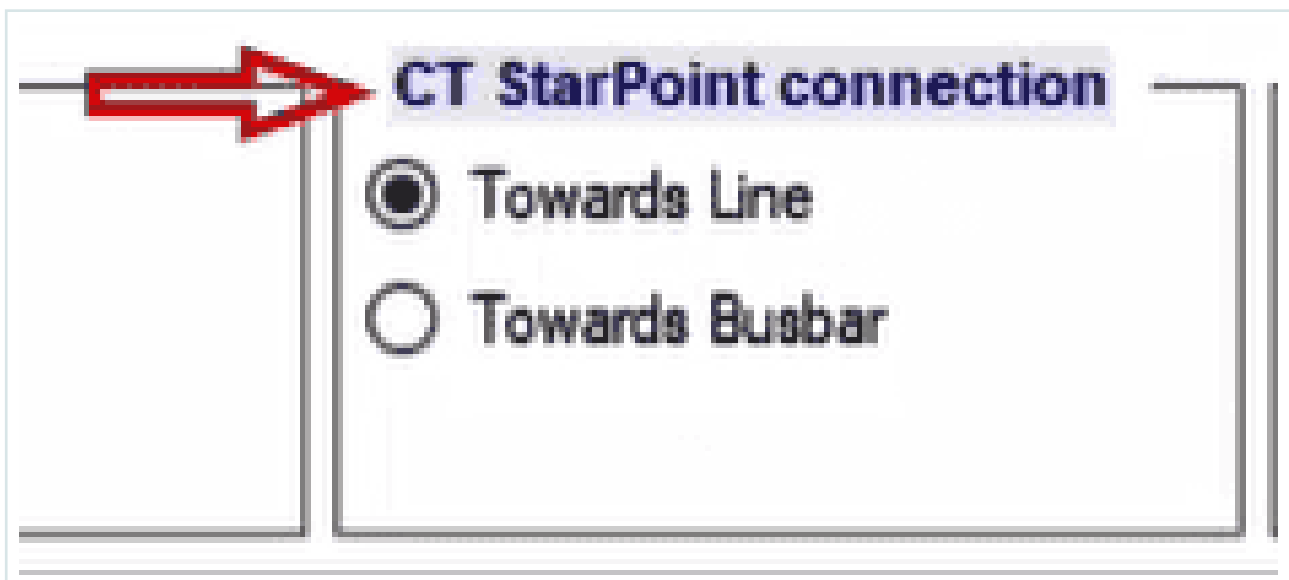


Figure 8

In "Full Scale Error Reference" section it is possible to specify the error recording reference which can be selected from a range of zero to the maximum or negative to the positive maximum. If the

characteristic is asymmetrical the range is from zero to the maximum while if the characteristic is symmetrical, it is possible to select both options for error measurement. As for error measurement, suppose that for a transducer with a characteristic with the maximum input of 1 amp and output of 33 milliamperes, for a 0/5 amp current, the output of the transducer equals 16 milliamperes. In such a case, the error percentage is calculated as follows.

$$\frac{1}{.033} * .016 = 480\text{mA}$$

Figure 9

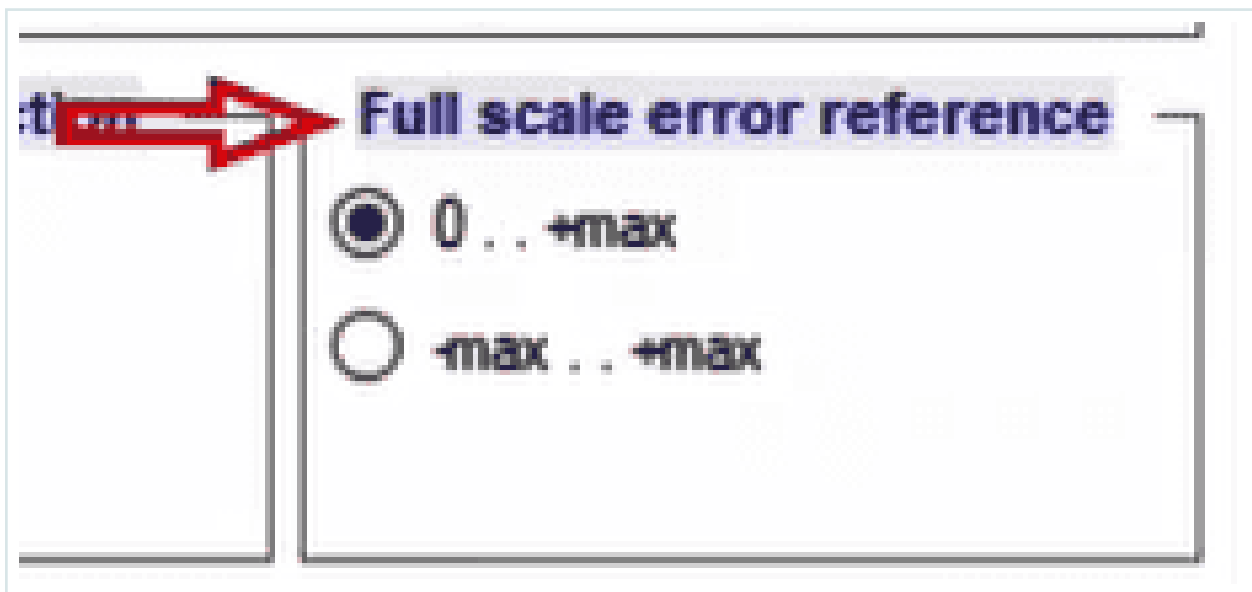


Figure 10

This means that ideally, for a 480 milliamperes input, the output equals 16 milliamperes. Therefore, the absolute error value equals 20 milliamperes and the error percentage equals -4 percent:

$$480 - 500 = -20\text{mA}$$

$$\frac{480 - 500}{500} * 100 = -4\%$$

Figure 11

Also, the "Full-Scale" error value of the transducer equals -2 percent.

$$\frac{0.480 - 0.500}{1} = -2\%$$

Figure 12

This method is used for cases where "Full Scale Error Reference" is set at "0...+max". If the characteristic is "Symmetrical", the error calculation method should be selected from among "0...+max" and "-max...+max". For the previous example, if the characteristic was symmetrical and "-max...+max" was selected, the following relation is used for "Full Scale Error" calculation.

$$\frac{0.480 - 0.500}{2 * 1} = -1\%$$

Figure 13

In "Tolerance" section, it is possible to enter the error value as an absolute or a relative value; the default values are 1 milli pulse and 0/25 percent. Finally, a comparison is made between these two values and the larger value is selected as the allowed error value. In "Number of phases" section, it is possible to specify whether the meter is single-phase or three-phase.

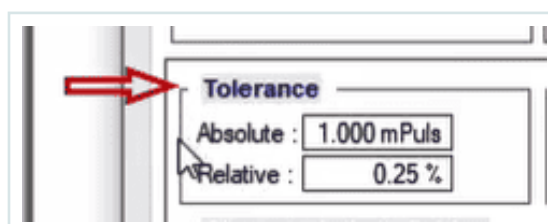


Figure 14

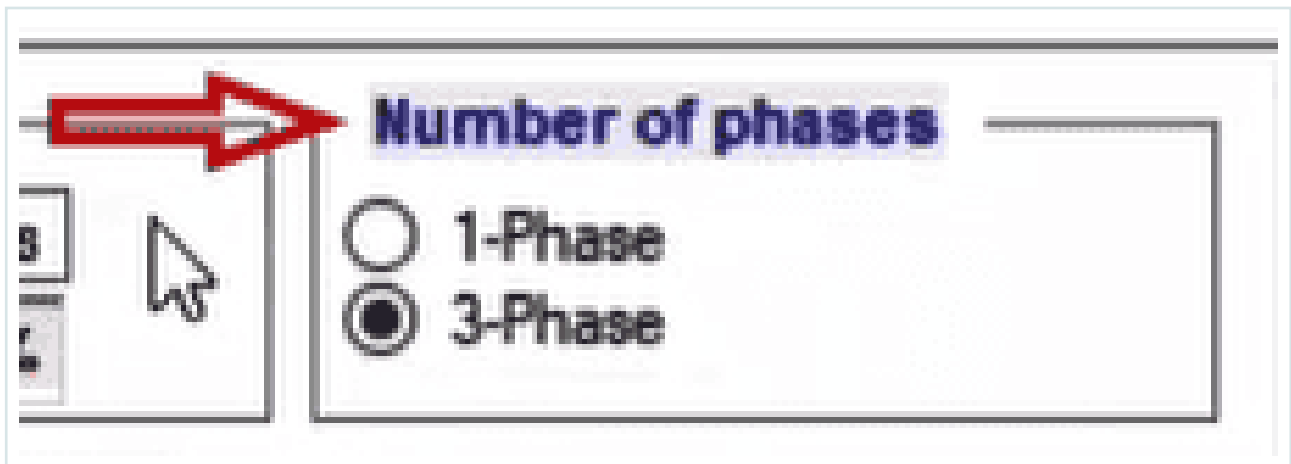


Figure 15

The test characteristic is specified in "Characteristic Definition" section. Since the meter characteristic is linear, "Linear" option is selected as the "Characteristic Type" and it is uneditable.

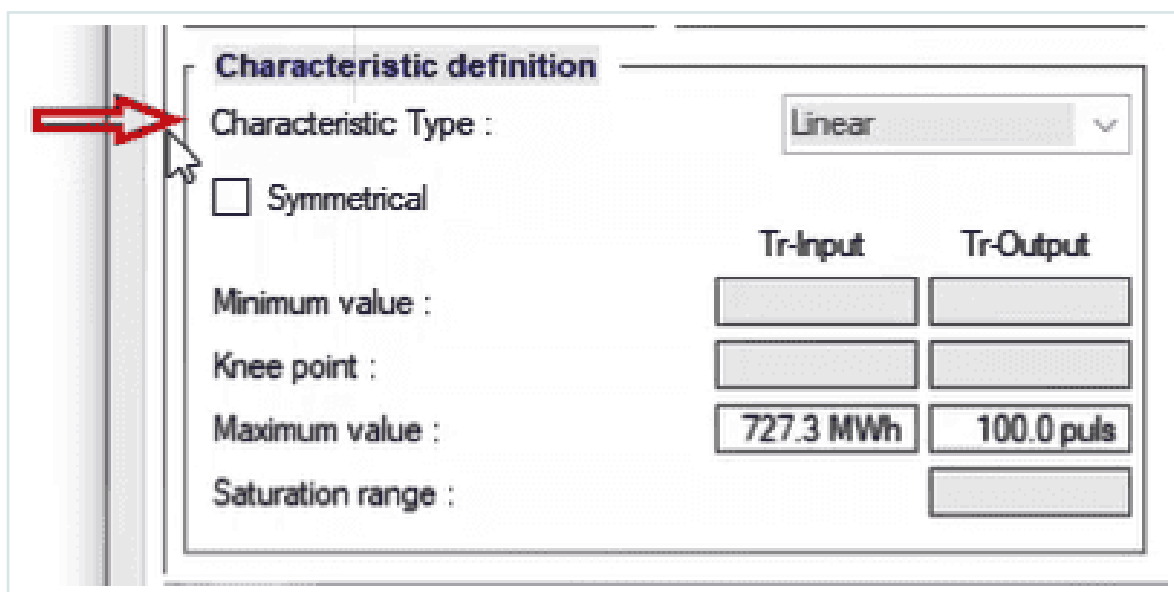
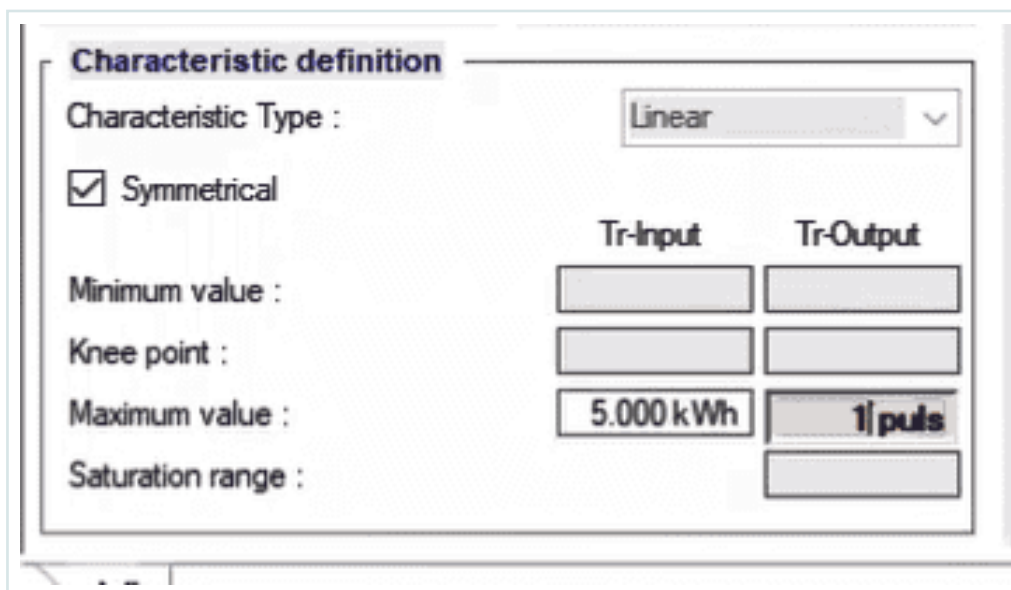


Figure 16

To specify the energy "Import" and "Export" values, it is possible to check the "Symmetrical" option so that there is a Symmetrical characteristic in both sides available. The "Minimum Value", "Knee Point" and "Saturation range" fields are disabled for meter test but in "Maximum Value" section, it is possible to enter the amount of power and the number of pulses received in exchange for that amount of power. Usually, the meter factor or "c/r" is entered in this section. For example, the factor for a edmi mk6e meter equals 5000 Wh per pulse.



Figure 17



Characteristic definition

Characteristic Type : Linear

☒ Symmetrical

Minimum value :

Knee point :

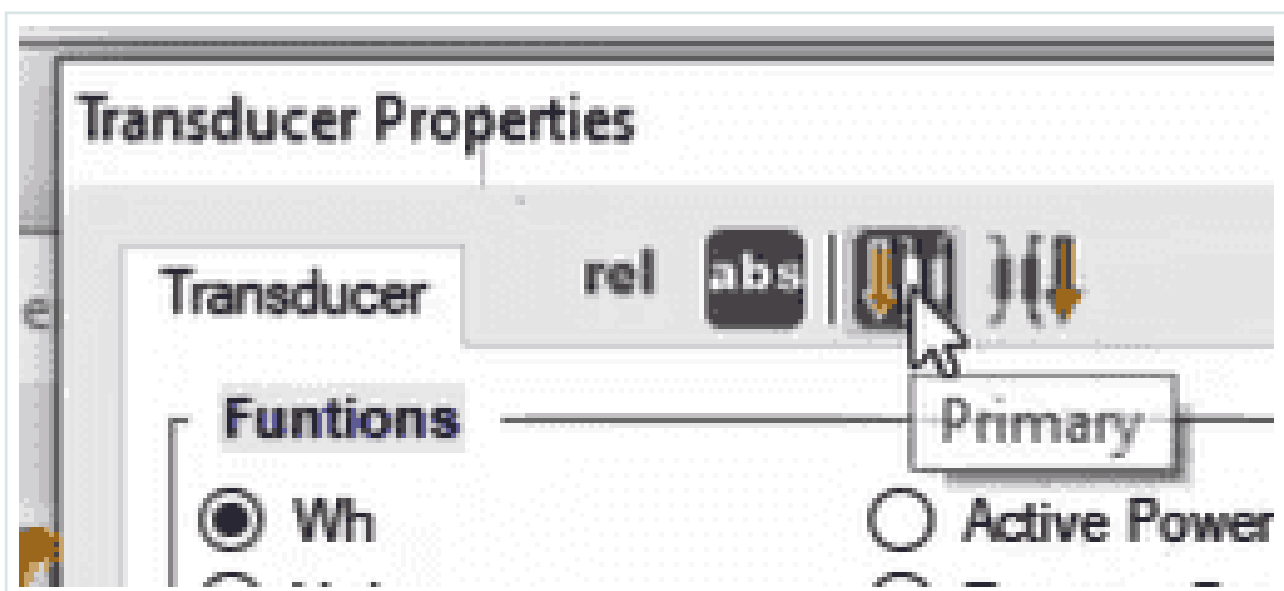
Maximum value : 5.000 kWh

Saturation range :

Tr-Input	Tr-Output
	
	
5.000 kWh	1/puls
	

Figure 18

Note that by using "Primary" and "Secondary" options at the top of the screen, it is possible to enter the values as primary or secondary in accordance with the meter type which needs to be done considering the CT and PT conversion ratios.



Transducer Properties

Transducer rel abs Primary Secondary

Functions

☒ Wh ☐ Active Power

Figure 19

"Relative" and "Absolute" options are used for displaying the absolute or relative amount of the values. After entering the values, "Ok" is selected to continue with the test.

After completing the information in "Transducer Properties" section, the "Hardware Configuration"

settings need to be examined. By opening this window, you can see that the current and voltage outputs are set by default.

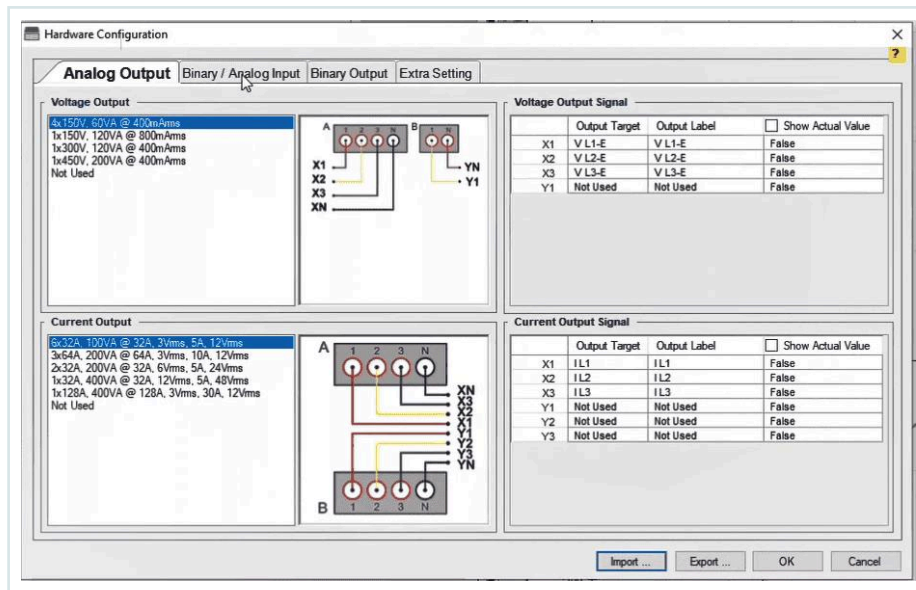


Figure 20

In "Binary/Analog Input" tab, you see that the Binary number 8 is selected to record the pulses of the meter by default. However, it is possible for the user to use any other binary if necessary. By clicking on "Ok", the applied changes are saved.

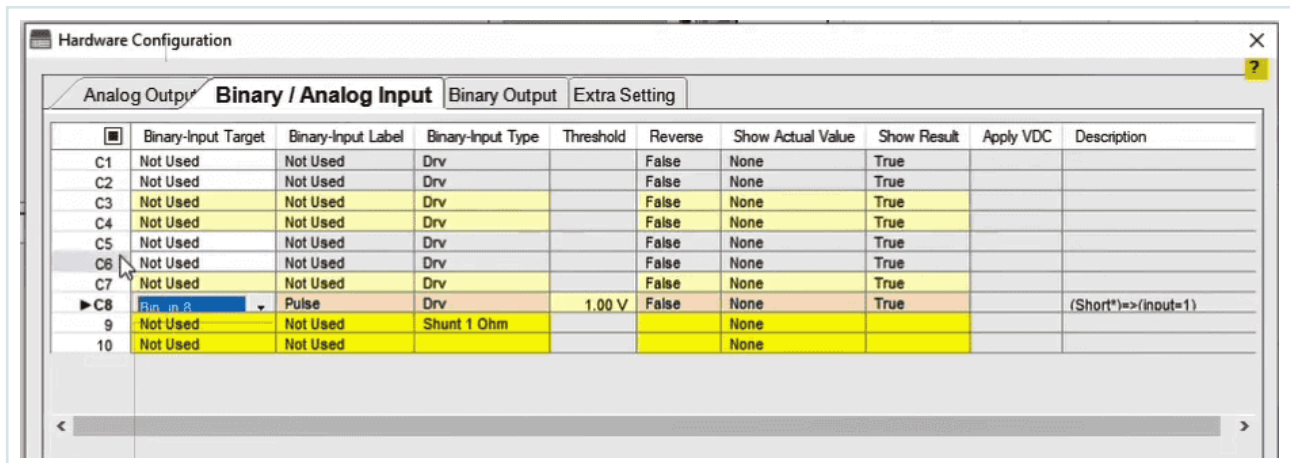


Figure 21

To perform a test, a point on the characteristic must be selected which can be done using two methods:

1- Entering the values in the fields of "Test Point" section which means entering the related parameters including Wh value, number of pulses, test performance time and frequency. Then, by selecting "Add", this point is added to the test table.

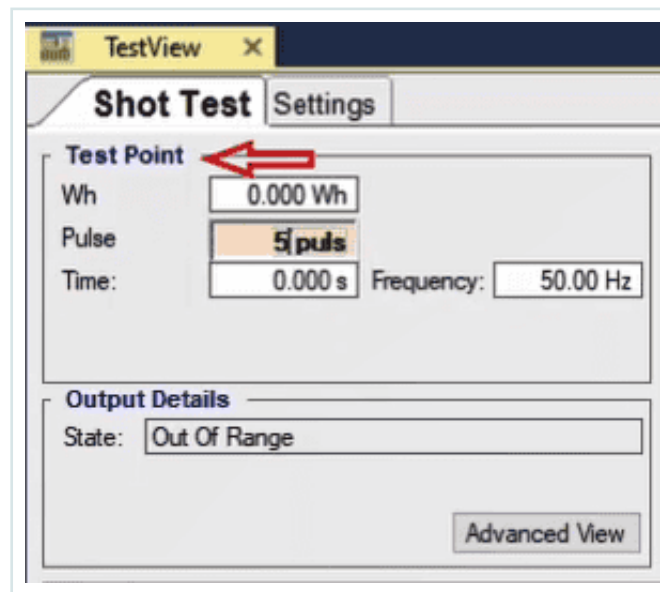


Figure 22

2- Holding down the "CTRL" key and then clicking on the meter characteristic curve.

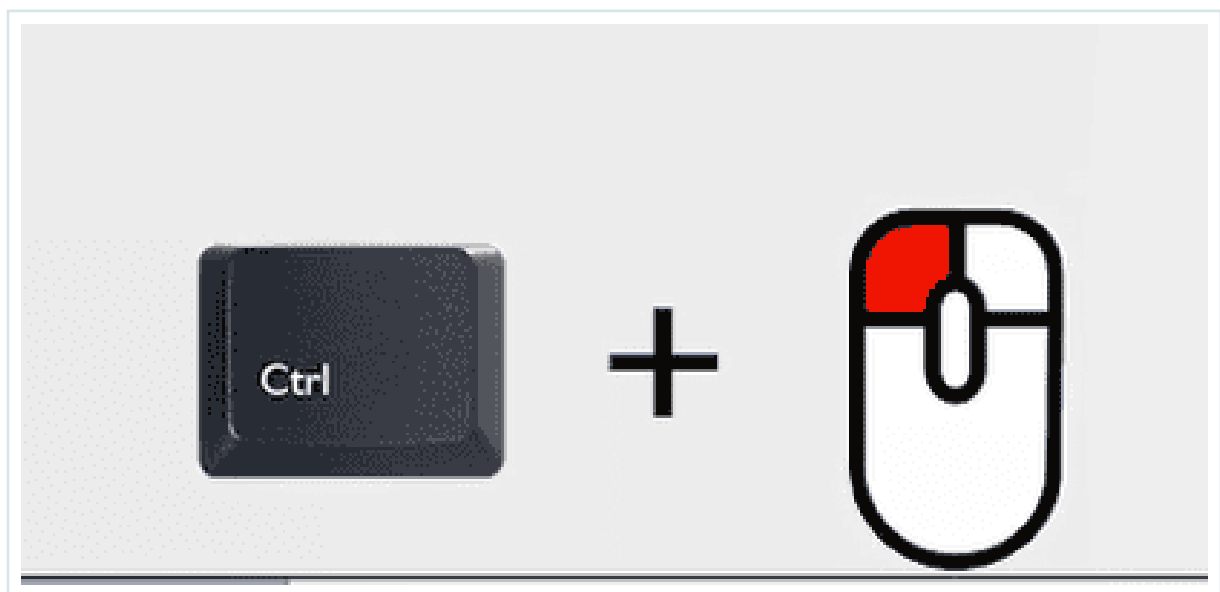


Figure 23

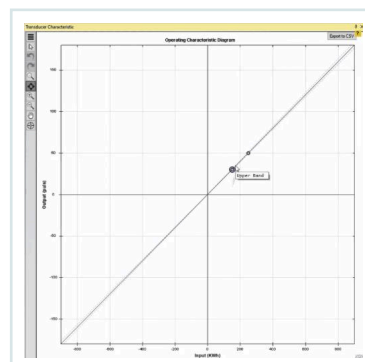


Figure 24

On "Test View" page, by clicking on "Advanced View", a page opens where it is possible to enter the voltage, current and their angle as well as the

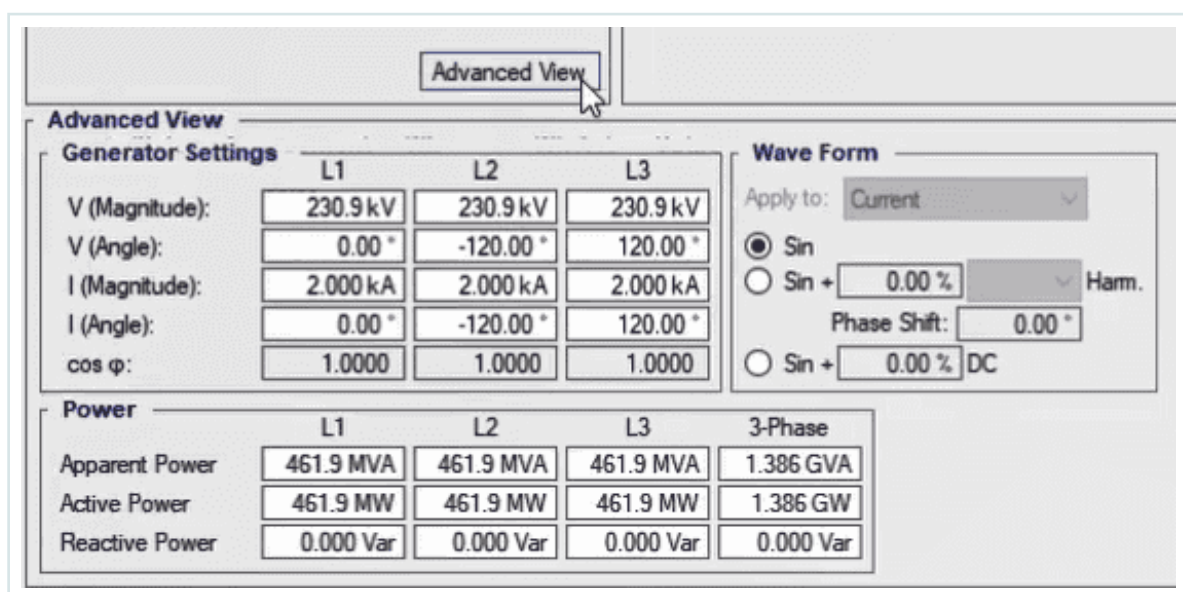
After adding the intended points, the test can be started and after the time specified in accordance with the pulses and Wh elapsed, the results are displayed.

In performing this test, some points must be considered:

- 1- If a test point is specified in Wh mode, zero is entered as the value for reactive power by default and to change this, first the current angle needs to be changed from "Angle" field.
- 2- The time entered in "Time" field by the user changes in accordance with the characteristic curve of the meter. This change is in a way that the number of pulses changes to integer.
- 3- Being "Out of Range" for the points in this test depends on the required time for performing the test. Since the maximum injection time of the device is 4000 seconds, if a test point needs more time for the test, that point becomes "Out of Range"; to change the state of this point, more voltage or current can be entered in "Advanced View" section.
- 4- If a too large value is entered in "Wh" field, this value is recorded as "na" and by selecting "Add", this point becomes "Out of Range".

[jg1]Offload_TEST

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The screenshot shows the 'Advanced View' interface with the following sections:

- Advanced View** (Title)
- Generator Settings**

	L1	L2	L3
V (Magnitude):	230.9 kV	230.9 kV	230.9 kV
V (Angle):	0.00 °	-120.00 °	120.00 °
I (Magnitude):	2.000 kA	2.000 kA	2.000 kA
I (Angle):	0.00 °	-120.00 °	120.00 °
cos φ:	1.0000	1.0000	1.0000
- Wave Form**

Apply to: Current

☒ Sin ☐ Sin + 0.00 % Harm.

Phase Shift: 0.00 °

☐ Sin + 0.00 % DC
- Power**

	L1	L2	L3	3-Phase
Apparent Power	461.9 MVA	461.9 MVA	461.9 MVA	1.386 GVA
Active Power	461.9 MW	461.9 MW	461.9 MW	1.386 GW
Reactive Power	0.000 Var	0.000 Var	0.000 Var	0.000 Var

Figure 25

Wave Form 

Apply to: Current

☒ Sin

☐ Sin + 0.00 % Ham.

Phase Shift: 0.00 °

☐ Sin + 0.00 % DC

Figure 26

Power	L1	L2	L3	3-Phase
Apparent Power	461.9 MVA	461.9 MVA	230.9 kVA	924.0 MVA
Active Power	461.9 MW	461.9 MW	230.9 kW	924.0M W
Reactive Power	0.000 Var	0.000 Var	0.000 Var	0.000 Var



Figure 27

Advanced View

Generator Settings	L1	L2	L3
V (Magnitude):	63.51 V	63.51 V	63.51 V
V (Angle):	0.00 °	-120.00 °	120.00 °
I (Magnitude):	1.000 A	1.000 A	1.000 A
I (Angle):	0.00 °	-120.00 °	120.00 °
cos φ:	1.0000	1.0000	1.0000

Wave Form

Apply to: Current

☒ Sin

☐ Sin + 0.00 % Ham.

Phase Shift: 0.00 °

☐ Sin + 0.00 % DC

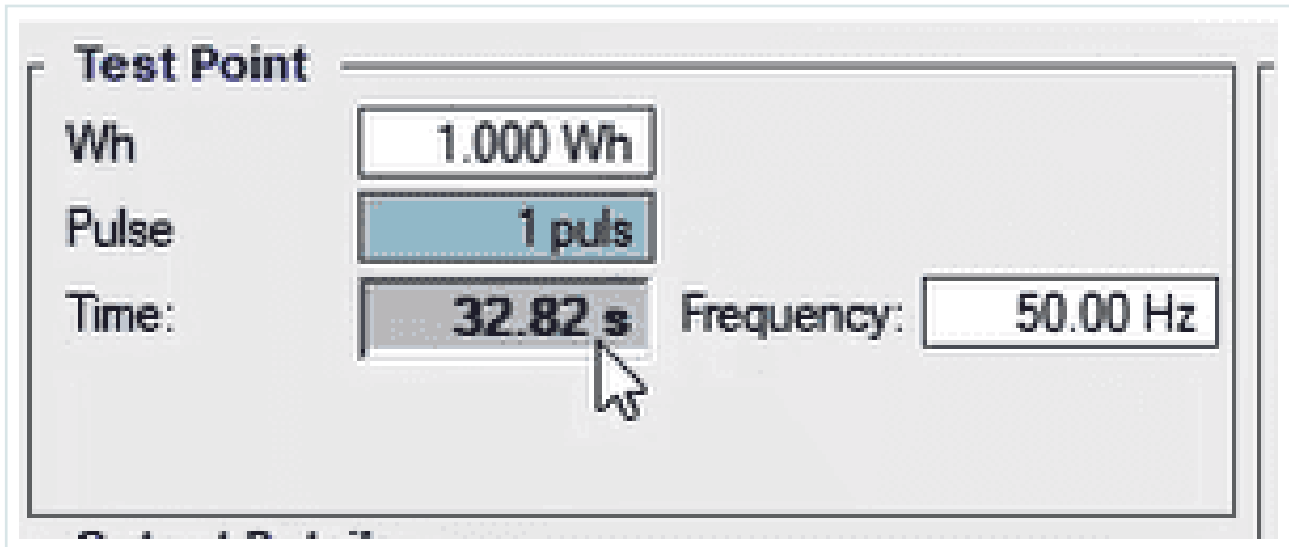
Max Power for better Assessment: 7.200 kVA

	L1	L2	L3	3-Phase
Apparent Power	63.51 VA	63.51 VA	63.51 VA	190.5 VA
Active Power	63.51 W	63.51 W	63.51 W	190.5 W
Reactive Power	0.000 Var	0.000 Var	0.000 Var	0.000 Var

Figure 28

Generator Settings	
V (Magnitude):	63.51 V
V (Angle):	0.00 °
I (Magnitude):	1.000 A
I (Angle):	30.00 °
cos φ:	0.8660

Figure 29



Test Point

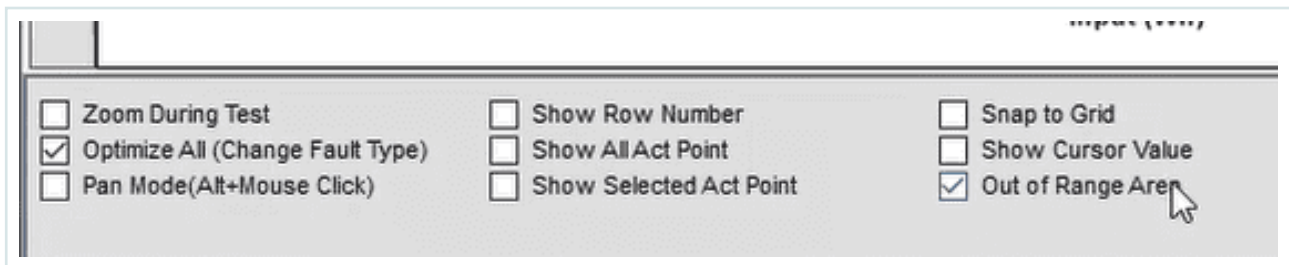
Wh: 1.000 Wh

Pulse: 1 puls

Time: 32.82 s

Frequency: 50.00 Hz

Figure 30

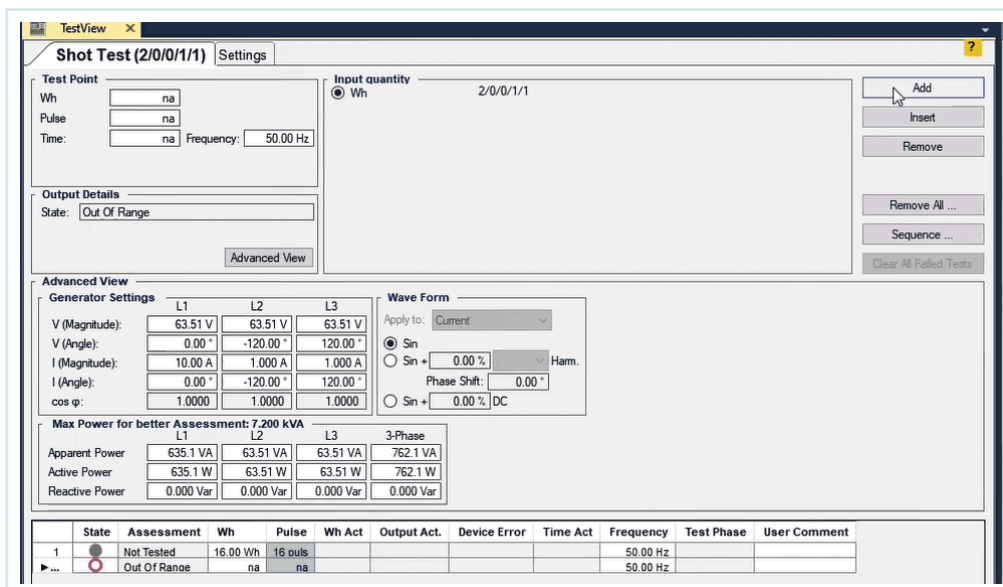


☐ Zoom During Test
☒ Optimize All (Change Fault Type)
☐ Pan Mode(Alt+Mouse Click)

☐ Show Row Number
☐ Show All Act Point
☐ Show Selected Act Point

☐ Snap to Grid
☐ Show Cursor Value
☒ Out of Range Area

Figure 31



TestView x

Shot Test (2/0/0/1/1) Settings

Test Point

Wh: na
Pulse: na
Time: na Frequency: 50.00 Hz

Input quantity: 2/0/0/1/1

Output Details

State: Out Of Range

Advanced View

Generator Settings

	L1	L2	L3
V (Magnitude):	63.51 V	63.51 V	63.51 V
V (Angle):	0.00 °	-120.00 °	120.00 °
I (Magnitude):	10.00 A	1.000 A	1.000 A
I (Angle):	0.00 °	-120.00 °	120.00 °
cos φ:	1.0000	1.0000	1.0000

Wave Form

Apply to: Current

☒ Sin
☐ Sin + 0.00 %
☐ Sin + 0.00 % DC

Phase Shift: 0.00 °

Max Power for better Assessment: 7.200 kVA

	L1	L2	L3	3-Phase
Apparent Power	635.1 VA	63.51 VA	63.51 VA	762.1 VA
Active Power	635.1 W	63.51 W	63.51 W	762.1 W
Reactive Power	0.000 Var	0.000 Var	0.000 Var	0.000 Var

	State	Assessment	Wh	Pulse	Wh Act	Output Act.	Device Error	Time Act	Frequency	Test Phase	User Comment
1	Not Tested	16.00 Wh	16 puls						50.00 Hz		
...	Out Of Range	na	na						50.00 Hz		

Figure 32