



VEBKO ONLINE HELP

Introducing “Test View” Window in “Differential” Room, Part 1

Category	tester
Section	AMT Differential Module
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As mentioned previously, one of the windows in "Differential" room is "Test View". This window consists of 7 tabs of "Shot Test", "Check Test", "Search Test", "Stability", "Setting", "Trigger" and "Binary Output". In "Shot Test" tab, you can select fault type and the points for the test and after the test is performed, you can view the results of the evaluation. In this tab, in "Test Point" section "Idiff" and "I bias" currents and in "Fault Type" section the fault type are determined. After specifying the test current, the fault type should be selected from among the standard faults available in "Fault Type" section. These faults include different faults of phase-to-earth, two-phase and three-phase. Before specifying the current and the fault type, you should determine "Supply Direction" in "Setting" section.

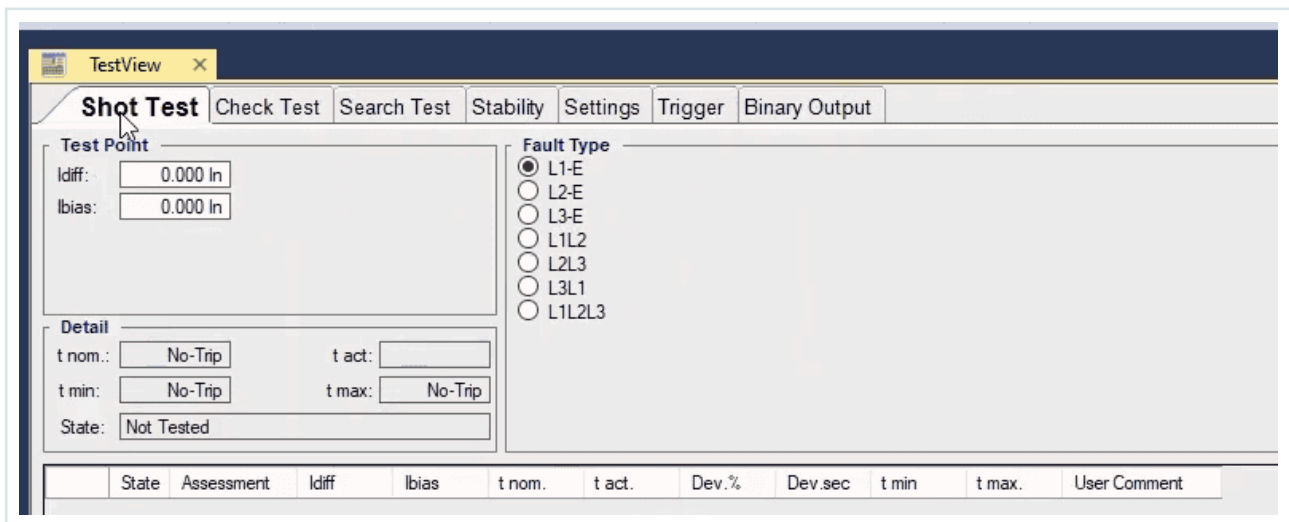


Figure 1



Figure 2

By clicking on "Add", the selected test point is added to the table in this window. By selecting one of the rows and clicking on "Insert" option, the selected row is repeated in the table and by clicking on "Remove" option, the selected point is removed. Also, by selecting "Add to" option, it is possible to copy point or points selected for one of the "Fault Types" to another "Fault Type". By clicking on "Remove All" option, all test points entered in the table will be removed. By clicking on "Sequence" option, "Sequence Test Points to" page opens where it is possible to specify test points with equal steps. In "Step" section and in "Step On" field, by selecting "Angle" it is possible to directly specify the angular steps in terms of angle.



Figure 3

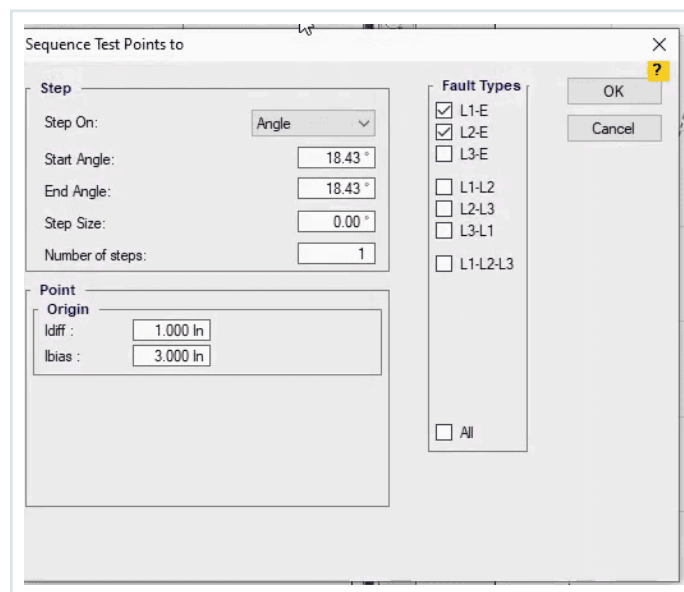


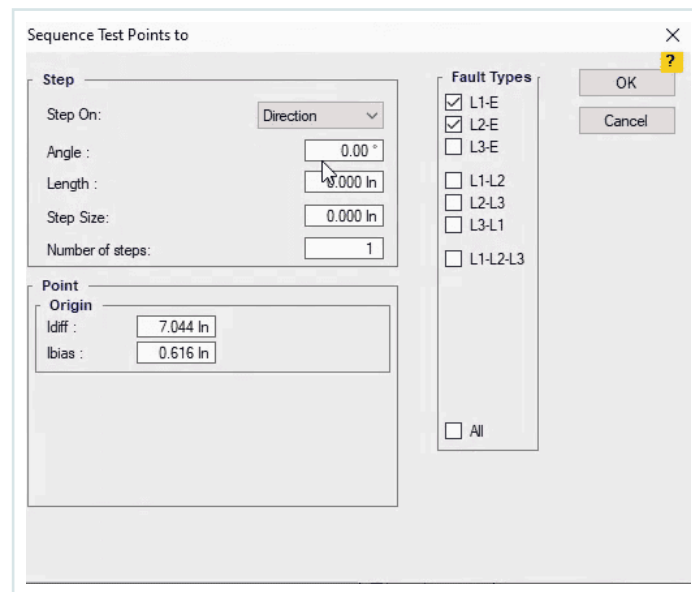
Figure 4

This means that the test points are specified in accordance with the origin point and in "Origin" section, they are determined in a way that the required angles are resulted in proportion with the horizon. For example, if the start and end angles are "45" and "90" degrees respectively with "5" degrees steps and origin point for Idiff and I bias equal 5 times In, by approving this settings you can see that some points are added on the "Differential Characteristic". For example, the last point is selected; by doing the mentioned calculation, in the picture you can see that the resulted angle is "85" and not "90" degrees which is because the "Origin" point is considered as one of the points and the last point of this "Sequence" is removed.



Figure 5

But by selecting "Direction", an angle is specified in "Angle" field and in this angle from the "Origin" point, with the length entered in "Length" field and with the steps specified in "Step Size", some points are shot on the characteristic curve. Note that the length and steps of the points are based on nominal current. For example, if the angle is "45" degrees and the length is "5" and the step is "0.5" times the nominal current and the origin point is "0" amp, by approving this settings you can see that some points are added to the characteristic curve at the angle of 45 degrees with the origin of "0" volt and "0" amp.



The dialog box "Sequence Test Points to" contains the following fields and options:

- Step**
 - Step On:
 - Angle:
 - Length:
 - Step Size:
 - Number of steps:
- Point**
 - Origin
 - Idiff:
 - Ibias:
- Fault Types**
 - ☒ L1-E
 - ☒ L2-E
 - ☐ L3-E
 - ☐ L1-L2
 - ☐ L2-L3
 - ☐ L3-L1
 - ☐ L1-L2-L3
 - ☐ All
- Buttons: ,

Figure 6

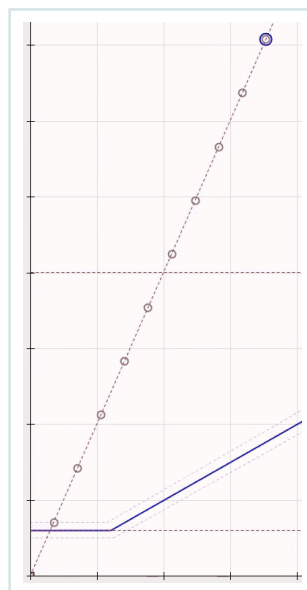
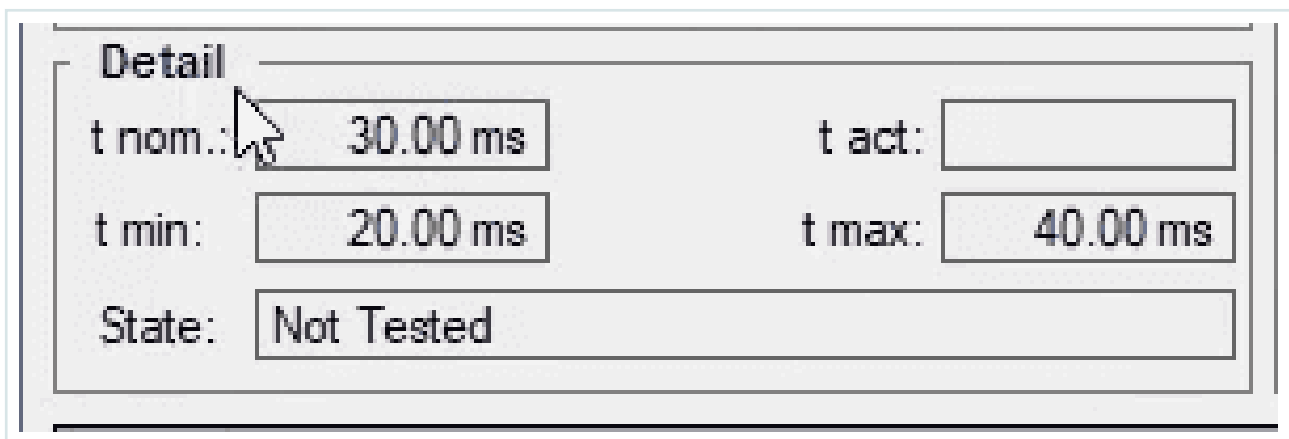


Figure 7

If the performed test has "Failed" points, by selecting "Clear All Failed Tests" option, it is possible to clear all these points from the table of this section. In "Detail" section, the information related to "Trip" nominal time, the allowed operation time range, actual time and test point evaluation are entered in "t nom", "t min" and "t max" fields, "t act" and "Stage" fields respectively. The test points are entered with detail in the table at the bottom of the page. The details include test evaluation, test current, nominal time, operation time, fault value in terms of percent and seconds and the minimum and maximum operation time. Also, if you wish to add a comment about any of the test points, you can use the "User Comment" cell. At the end of this page, it is possible to select test points table from different "Fault Types".



Detail

t nom.: 30.00 ms

t min: 20.00 ms

t max: 40.00 ms

t act:

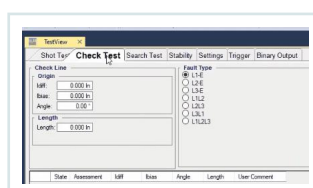
State: Not Tested

Figure 8

	State	Assessment	Idiff	Ibias	t nom.	t act	Dev. %	Dev. sec	t min	t max.	User Comment
1		Not Tested	0.000 In	0.000 In	No-Trip				No-Trip	No-Trip	

Figure 9

After performing the "Shot Test", "Check Test" and "Search Test" are performed. In "Check Test" the upper and lower tolerances of the relay, which are displayed as dotted lines in "Differential Characteristic", are tested and evaluated. To perform the "Check Test", first it is necessary to draw some lines named "Check Line" in different parts of the vector. To draw this line, first from "Origin" section in "Check Line" section, the start point of this line is specified. In "Idiff", "I bias", and "Angle" fields, 2In, 3In and -30 degrees are entered as origin differential current, origin bias current and the angle of the check line respectively. Also, 1In is entered as the length of the check line in the cell of the "Length" section. Note that the drawn "Check Lines" must have at least one intersection with one of the characteristic curve tolerance lines. Then click on "Add" option to add the "Check Line" to the "Check Test" test lines table.



Check Test

Idiff: 0.000 In

Ibias: 0.000 In

Angle: 0.00

Length: 0.000 In

Fault Type:

- ☐ L1
- ☐ L2
- ☐ L3
- ☐ L1,2
- ☐ L1,3
- ☐ L2,3
- ☐ L1,2,3

State: Assessment: Idiff: Ibias: Angle: Length: User Comment:

Figure 10

Another method for drawing the "Check Line" is to hold down left-click and "Ctrl" key on "Differential Characteristic" window and then move the cursor in the desired direction on the characteristic curve. You can see that the information of the drawn "Check Line" is displayed in "Check Test" lines table. After drawing the "Check Line", the software evaluates the crossing place of "Check Line" and tolerance lines as "Shot" test in accordance with the performance of the relay. Here, after performing the test, the relay does not perform in lower tolerance and performs a trip in the upper tolerance so the result of the test is "Pass". Other parts of this section such as "Fault Type" and "Remove All" and "Sequence" etc. options are the same at those of "Shot Test" section which have been explained in previous videos. The only additional option in this section is "Copy to Search". By marking any of the test lines and selecting this option, it is possible to copy the selected line in "Search Test" and by selecting "Add" option in "Search Test", add this line to the "Search Test" test lines table.

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