



VEBKO ONLINE HELP

“Test View” Window

Category	tester
Section	AMT Diff Harmonics Module
Language	English
Generated	2026-10-18

Contents

1. "Shot Test" Tab 2
2. "Check Test" Tab 5
3. "Search Test" Tab 6

As mentioned before, one of the windows of "AMT Diff Harmonic" room is "Test View". This window consists of 6 tabs of "Shot Test", "Check Test", "Search Test", "Setting", "Trigger" and "Binary Output" where in addition to performing "Shot", "Check" and "Search" tests, respectively, some other test settings are managed.

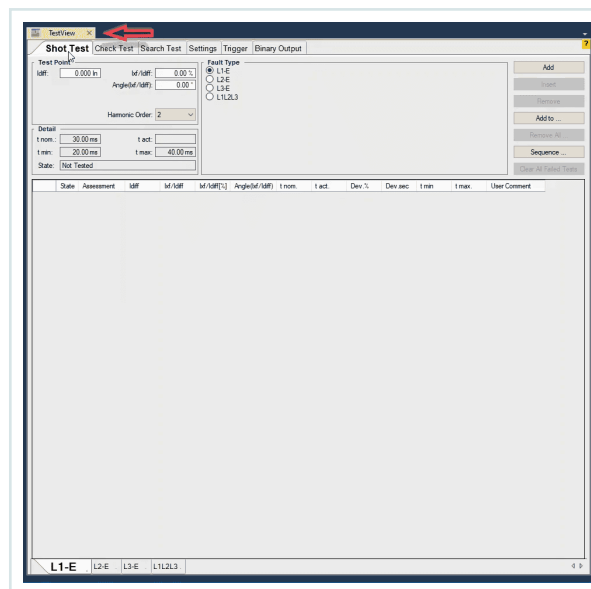


Figure 1

1 "Shot Test" Tab

In this tab, first in "Harmonic Order" field in "Test Point" section, the harmonic level that you wish to test is entered. Meanwhile, you can see that its characteristic curve is displayed in "Harmonic Restraint View" window whose setting are entered in Test Object. Differential current and the proportion of the second harmonic current to the differential current are entered in terms of percentage in "Idiff" and "Ixf/Idiff" fields respectively. In "Angle (Ixf/Idiff)" field, it is possible to specify an angle for the harmonic current. In "Fault Type" section, the fault type is selected from among single-phase to earth and three-phase faults because the transformers are either single-phase or three-phase and only these modes are tested. In "Details" section, the nominal "Trip" time and the maximum and minimum allowed tolerances are displayed. After performing the test, the relay

performance time is displayed in "t act" field. By selecting "Add" option, the information of this "Shot" is added to the "Shot Test" table along with its details. The details include test evaluation, differential and harmonic current, test angle, nominal time, performance time, fault value in terms of percentage and seconds and the minimum and maximum performance time. Also, if you wish to add a comment about any of the test points, you can use "User Comment" cell. Also, at the end of this page, it is possible to select test points table in different "Fault Types".

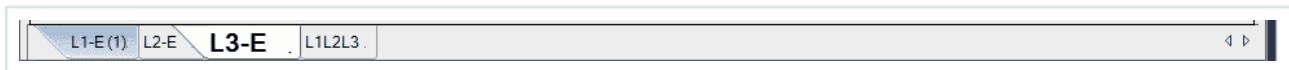


Figure 2

	State	Assessment	Idiff	Ixf/I diff	Ixf/I diff [%]	Angle(Ixf/I diff)	t nom.	t act.	Dev. %	Dev. sec	t min	t max.	User Comment
► 1	+	Passed	0.700 In	0.070	10.00 %	30.00 °	30.00 ms	32.00 ms	6.67 %	2.000 ms	20.00 ms	40.00 ms	

Figure 3

By marking one of the rows and selecting "Insert" option, the marked row is repeated in the table and by selecting "Remove" option, the marked point is removed. By selecting "Add to" option, it is possible to copy the point or points selected from one of the "Fault Types" to another "Fault Type". By selecting "Remove All" option, all of the test points added to the table are removed. By clicking on "Sequence" option, "Sequence Test Points to" page opens where it is possible to create test points with the same steps. By selecting "Angle" in "Step On" field in "Step" section, the angular steps are directly added in terms of degrees.

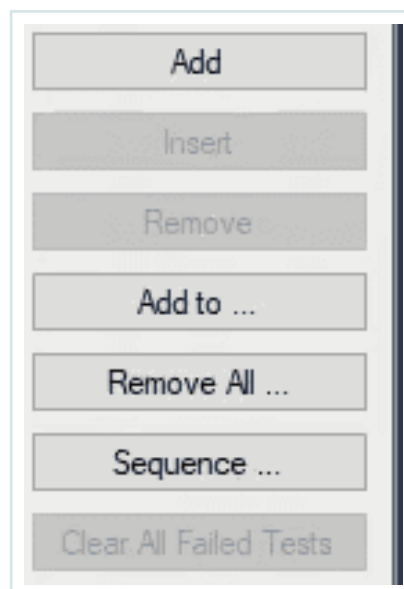


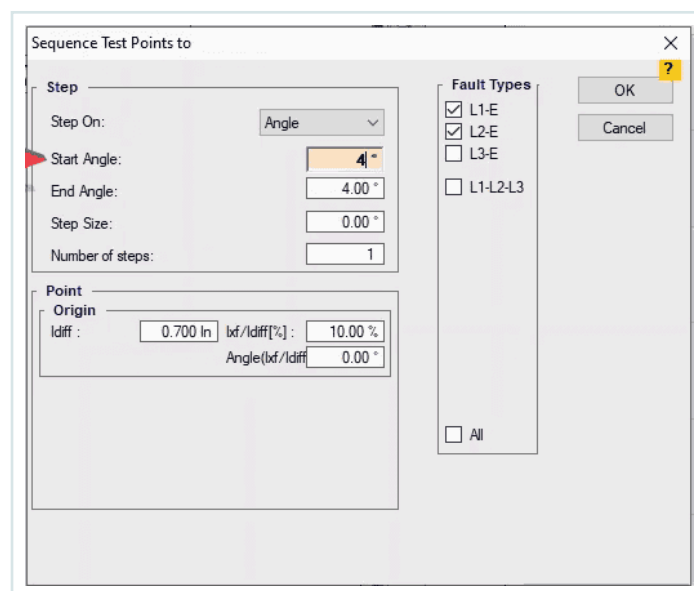
Figure 4

This means that the test points are specified in accordance with the origin point and in "Origin" section 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 0.3 and 2

origin points for Idiff and I bias with 0 angle, by approving this settings you can see that some points are added on the "Harmonic Restraint View". 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.

$$\tan^{-1}(7.044 / 0.6163) = 85^{\circ}$$

Figure 5



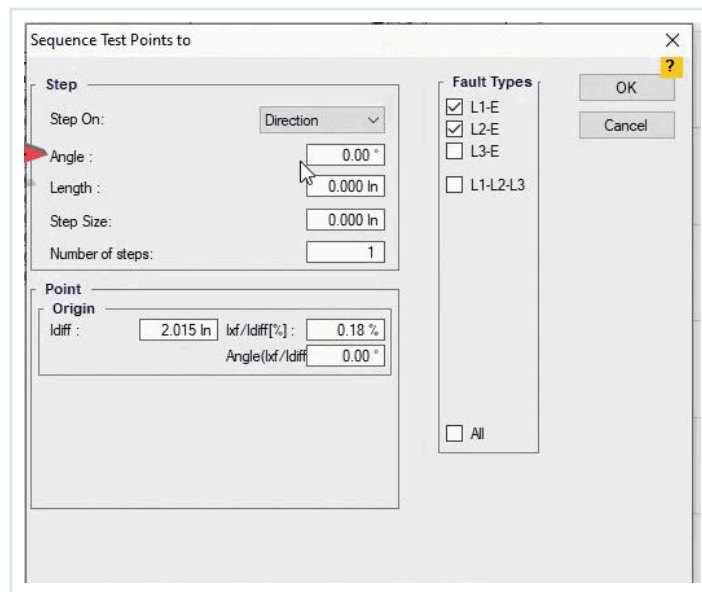
The dialog box "Sequence Test Points to" contains the following fields and options:

- Step**
 - Step On: Angle
 - Start Angle: 41.00 °
 - End Angle: 4.00 °
 - Step Size: 0.00 °
 - Number of steps: 1
- Point**
 - Origin
 - Idiff: 0.700 In
 - Idiff[%]: 10.00 %
 - Angle(Idiff): 0.00 °
- Fault Types**
 - ☒ L1-E
 - ☒ L2-E
 - ☐ L3-E
 - ☐ L1-L2-L3
 - ☐ All
- Buttons: OK, Cancel, ?

Figure 6

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 "2" and the step is "0.1" times the nominal current and the origin point current and the second harmonic are "0", 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". After removing all of the points by using "Remove All" option and adding three new "Shots" to the table, the test runs and the relay performance is analyzed. If the performed test has "Failed" points, by selecting "Clear All Failed Tests" option, the results of these points are "Cleared" from the table and you can test the point again by right-clicking on its row and

selecting "Apply Test".



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

- Step Section:**
 - Step On: Direction (dropdown menu)
 - Angle: 0.00 °
 - Length: 0.000 In
 - Step Size: 0.000 In
 - Number of steps: 1
- Point Section:**
 - Origin
 - Idiff: 2.015 In
 - Ixf/Idiff[%]: 0.18 %
 - Angle(Ixf/Idiff): 0.00 °
- Fault Types Section:**
 - ☒ L1-E
 - ☒ L2-E
 - ☐ L3-E
 - ☐ L1-L2-L3
 - ☐ All
- Buttons:** OK, Cancel, and a help icon (?)

Figure 7

2 "Check Test" Tab

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 "Harmonic Restraint View", 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", "Ixf/Idiff", "Angle (Ixf/Idiff)" and "Angle" fields, 1In, 17 percent, 0 degree and 0 degree are entered as origin differential current, the proportion of the "nth" harmonic current to the differential current, the angle of the "nth" harmonic current and the angle of the "Check Line" respectively. Also, 5In is entered as the length of the check line in the cell of the "Length" section. In "Harmonic Order" field, the harmonic level is selected so that its curve is displayed. 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" line table.

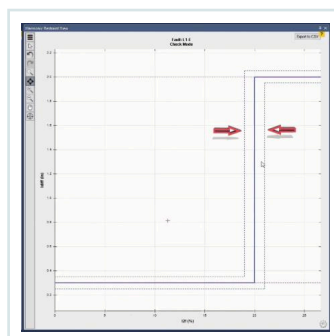


Figure 8

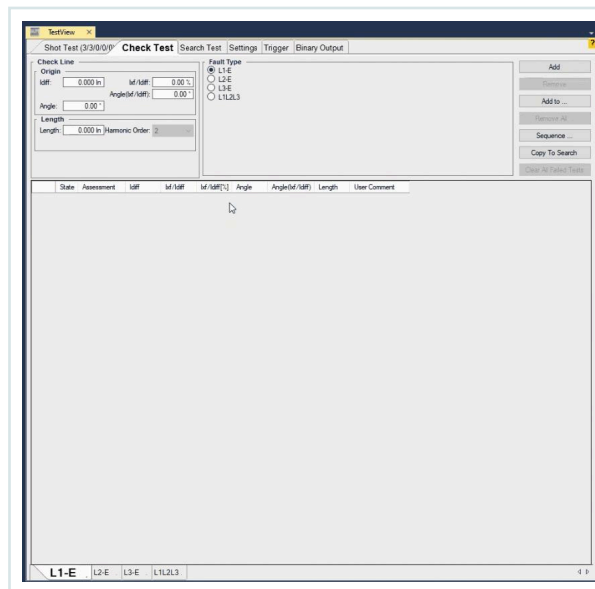


Figure 9

Another method for drawing the "Check Line" is to hold down left-click and "Ctrl" key on "Harmonic Restraint View" 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.

3 "Search Test" Tab

After performing "Shot Test" and "Check Test" in "AMT Diff. Harmonics" room, it is necessary to perform "Search Test". The purpose of this test is to find the characteristic curve line. To perform a "Search Test", first some lines named "Search Line" should be drawn in different parts of the vector. The method for drawing these lines is the same as the one explained for "Check Line". To draw this line, first the start point of this line is specified in "Search Line" section, "Origin" section. For example, in "Idiff", "Idf/Idiff", "Angle (Idf/Idiff)" and "Angle" fields, 1In, 17 percent, 0 degree and 0 degree are entered as origin differential current, the proportion of the "nth" harmonic current to the differential current, the angle of the "nth" harmonic current and the angle of the "Search Line" respectively. Also,

6In is entered as the length of the check line in the cell of the "Length" section. In "Harmonic Order" field, the harmonic level is selected so that its curve is displayed. Then click on "Add" option to add the "Search Line" to the "Search Test" test lines table. After drawing the "Search Line", the software tests the intersection location of the "Search Line" and tolerance lines as "Shot" and evaluates them based on the relay performance. Upon running the test, by testing some points on the search line the software starts interpolating the characteristic curve and determines its exact location.

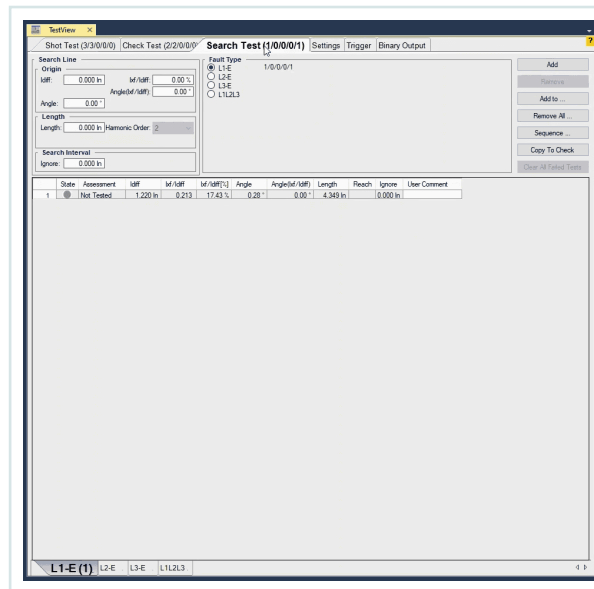


Figure 10

"Ignore" field in "Search Interval" section is used when you want the intended "Search" line to ignore the specified characteristic curve. By entering a number in this section, some points are added on the "Search" line with this number as the distance between them. For example, by specifying "2In" in this field, you can see that some points are added on the "Search Line" with "2In" distance from each other. By clicking on "Add" option, this "Search Line" is added to the "Search Test" lines table. If the test runs, the points added on the "Search Test" are tested one after the other until the exact location of the relay characteristic curve is determined. This option is used when there is no characteristic to test or the characteristic that you have seems wrong.

If you wish to do the same for all of the tested lines, you can use "Setting" tab in "Ignore Nominal Characteristic" section. To do this, by entering the value in "Search Interval" and selecting "Apply to All" option, you can apply this setting to all test lines and find the relay characteristic.

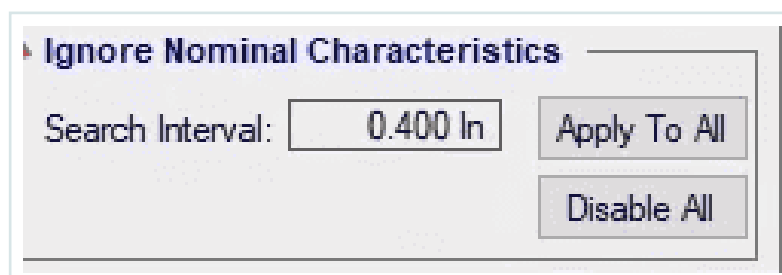


Figure 11

[jg1]Test_View_window_ AMT_Diff_Harmonic