



VEBKO ONLINE HELP

“Distance” Room Settings, Part 1

Category	tester
Section	AMT Distance Module
Language	English
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1 Imported Content

In "Settings" tab it is possible for you to manage settings related to "Shot Test", "Check Test" and "Search Test". In "Fault" section, the method of the test is specified. In addition to the test method, the amount of current or voltage of the test is specified as well. Generally, there are three methods to calculate the test current and voltage and all of these methods are available in the drop-down list in "Test Model". The first method is "Constant test current". After specifying the fault impedance, the test voltage can be easily calculated in a fixed current. Some of the parameters are set in accordance with the option selected in this field about which more be discussed later.

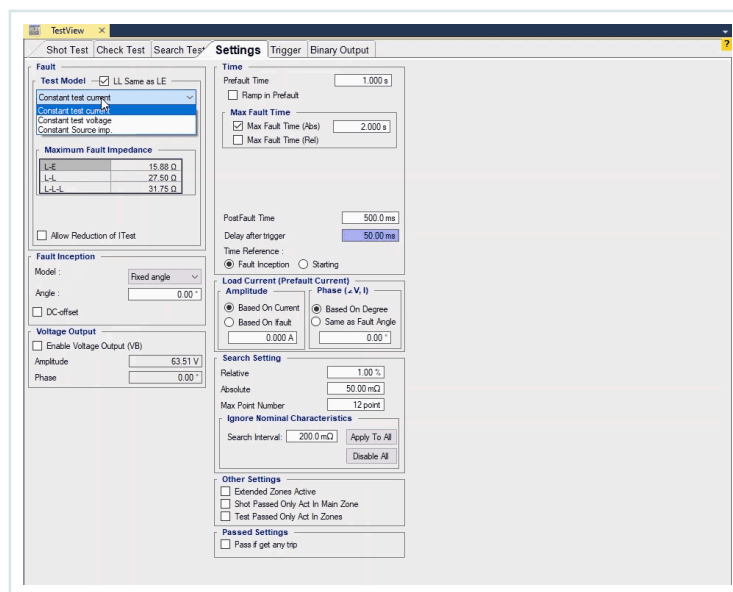


Figure 1

The amount of test current is specified in "I Test" field. As you can see this cell is in Purple which means that its value is dependent on a parameter in "Test Object" and is calculated using the relation defined for it. By right-clicking on this option and selecting "Link to XRio" you can see that the amount of test current is resulted from multiplying the nominal current by 2. You are allowed to change this number to any desired value. By manually changing this value, the cell turns pink (if "XRio" file is loaded) which means that the formula of calculating the test current is disabled. You can also enter the test current value manually by right-clicking on this cell and selecting "Remove Link" option.

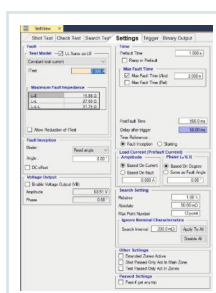


Figure 2

"LL Same as LE" option enables the user to test either of phase to ground and phase to phase fault types with different currents. If this option is checked, all phase to ground and phase to phase fault types are tested with the same current and if this option is unchecked, you can specify a test current for each of fault types. When using the Constant test current test method, in "Maximum Fault Impedance" section, the maximum fault impedance in phase to ground, two-phase and three-phase "Fault Types" is calculated by using these formulae and are displayed.

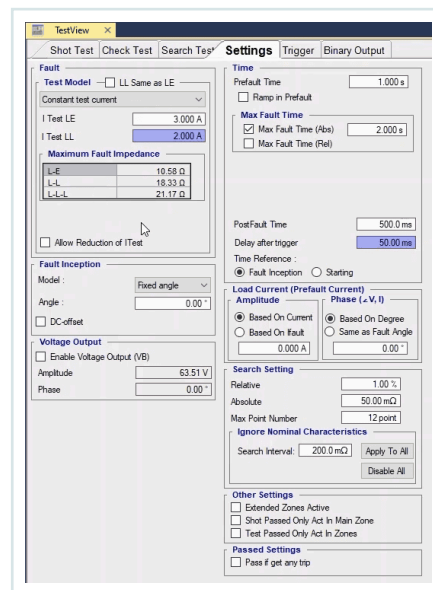


Figure 3

If in constant current, the test voltage is more than the nominal value of the relay a prompt saying "Out Of Range" is displayed which means that the selected point is out of the allowed range. By checking "Allow Reduction of I Test" option, the software considers the voltage as the nominal value to calculate the intended impedance current and voltage and decreases the current value so that the shot point is placed in the injection range of the device. By checking "Allow Reduction of I Test" option, "V Max (L-L)" field is displayed which is the same as the nominal line voltage. You can see that this cell is in Purple which means its value is related to another parameter. By right-clicking on this field and selecting "Go to Linked Value", you can see that this field is linked to "V nom" parameter and by changing this parameter the value of this field changes accordingly. Also, by right-clicking on this cell and selecting "Remove Link" option, you can enter this value manually. For example, in "Shot Test" tab, a point with a "30" ohm impedance is added to the points table. This point is located in the "Out Of Range" area and by opening "Vector View" window, the voltage and current values for this impedance are displayed. By checking "Allow Reduction of I Test" option, you can see that the voltage value changes to nominal voltage and the current value is reduced so that this point is placed in the injection range of the device. Note that when you are testing a wide range of the zone, the injected current must be bigger than the minimum "Pick up" current of the relay. If the relay uses the voltage dependent on the inception current, make sure that the test voltage is always smaller than the "Pick

up" voltage set for the relay.

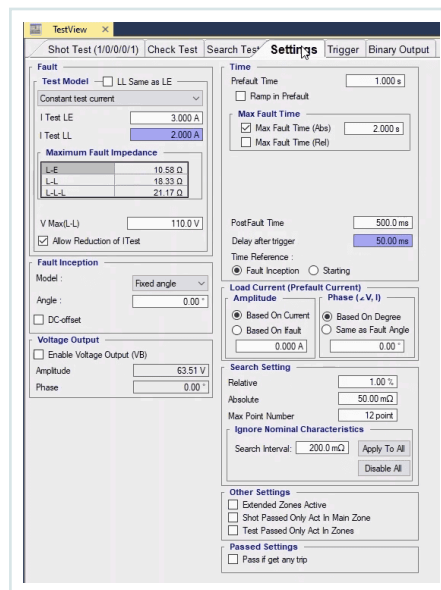


Figure 4

The second method is "Constant test voltage". By specifying the fault impedance value and keeping the voltage fixed, the test current can easily be calculated. Some of the parameters are set in accordance with the option selected in this section about which more is going to be said. The test voltage value is specified in "V Test" field and the value entered in this section is considered to be fixed throughout the test. When you are using the Constant test voltage test method, in "Minimum Fault Impedance" section, the minimum fault impedance in phase to ground, two-phase and three-phase "Fault Types" is calculated using these formulae and displayed.

Single phase Fault	Two Phase Fault	Three Phase Fault
$Z_{Lmin} = \frac{V_{test}}{\sqrt{3} \cdot 1 + K_L \cdot I_{max}}$	$Z_{Lmin} = \frac{V_{test}}{2 \cdot I_{max}}$	$Z_{Lmin} = \frac{V_{test}}{\sqrt{3} \cdot I_{max}}$

Figure 5

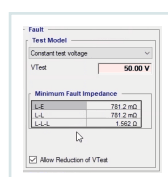


Figure 6

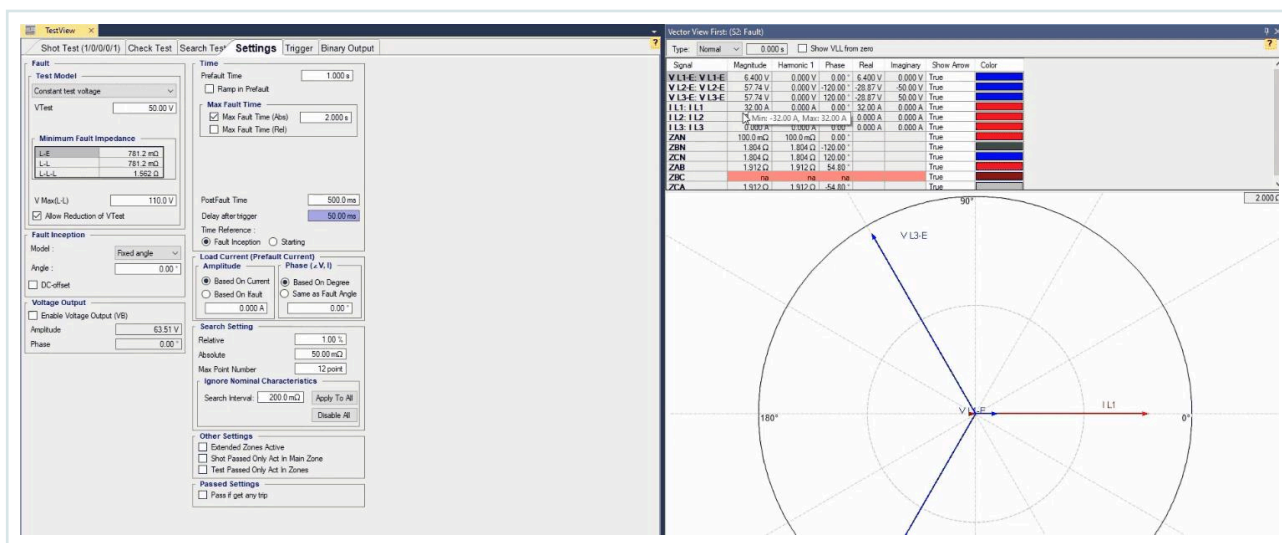


Figure 7

The third method is “Constant Source Impedance”. In this method, it is possible to specify the fault impedance source so that the test current value is calculated by using a constant impedance. You can use various modes available in “Mode” drop-down list to determine the fault Source type. By clicking on this field a list opens where you can select your impedance model and enter the value of the required parameters in “Source Type” table in accordance with the selected model.

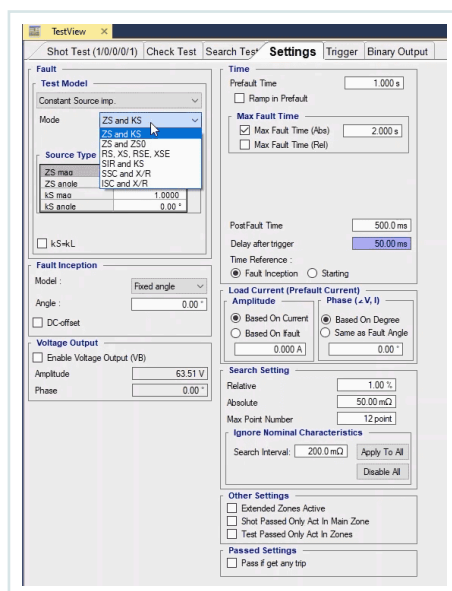
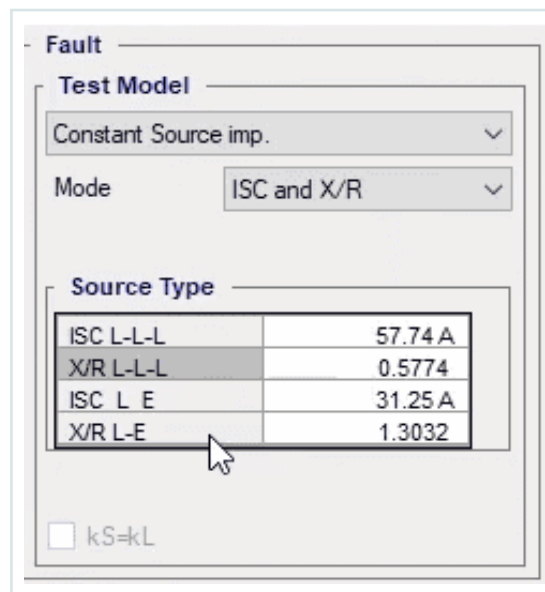


Figure 8

In “Zs and KS”, “ZS1 and ZS0”, “RS, Xs, RSE, XSE” and “SIR and KS” modes, magnitude and angle of the source impedance and the grounding factor of the impedance, magnitude and angle of the source impedance in zero and positive sequence, real and imaginary sections of the source impedance as

well as the relation of mentioned real and imaginary parameters, and magnitude and angle value of real and imaginary sections of the source impedance are entered respectively. In fact, in this section, "SIR" is "ZS/ZL". In "Ssc and X/R" and "Isc and X/R" modes, the short circuit apparent power for three-phase and phase to ground mode and the "X/R" parameter relation in single-phase mode, and the short circuit current for three-phase and phase to ground and the "X/R" parameter relation in single phase mode are entered in "Source Type" table respectively.



Source Type	
ISC L-L-L	57.74 A
X/R L-L-L	0.5774
ISC L-E	31.25 A
X/R L-E	1.3032

☐ kS=kL

Figure 9

If "KS=KL" option is checked, in the models mentioned in "Mode" field numbers 1, 2, 3, and 4 only the first two parameters are adjustable and the other two parameters are disabled. This option is disabled in modes 5 and 6. By setting the parameters of any of the selected models, the software calculates the current or voltage value for the test which can be viewed in "Vector View" window.

In "Fault Inception" section, the fault inception angle can be determined in three ways. To better understand this, open "Signal View" window. If "Fixed Angle" is selected from "Model" slide field, you can enter the desired fault inception angle value in "Angle" field and view the angle changes in "Signal View". By entering this angle, current and voltage phases shift at the same amount. By selecting "Maximum Offset" option, the software picks the maximum "DC Offset" value in the fault inception moment for the current waveform. The maximum positive "DC Offset" value occurs when the fault inception angle is equal to the impedance angle ± 90 degrees. By selecting "Zero offset" option, a zero "DC offset" is applied to the current output. By checking "DC offset" option, in "Fixed Angle" it is possible to specify a "DC offset" value for the current output in the fault inception moment in any desired angle.

If for any reason you wish to use the group B voltage output in "Distance" test, you can do so by checking "Enable Voltage Output (VB)" in "Voltage Output" section and entering the intended voltage and angle values. You can view the waveform related to this voltage output in "Signal View" window.

[jg1]Distance_room_settings_Part1

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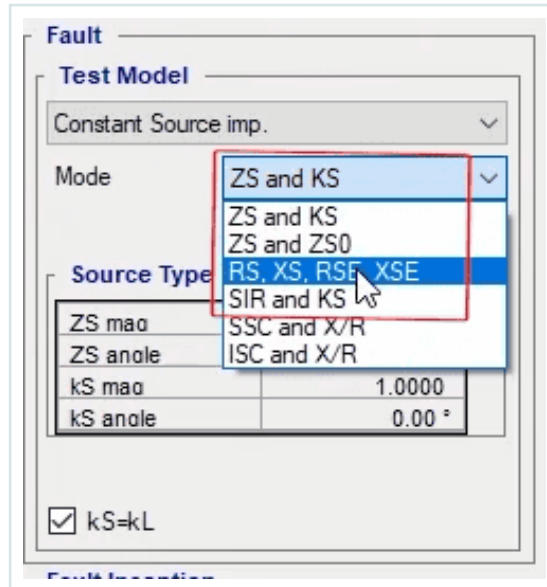


Figure 10

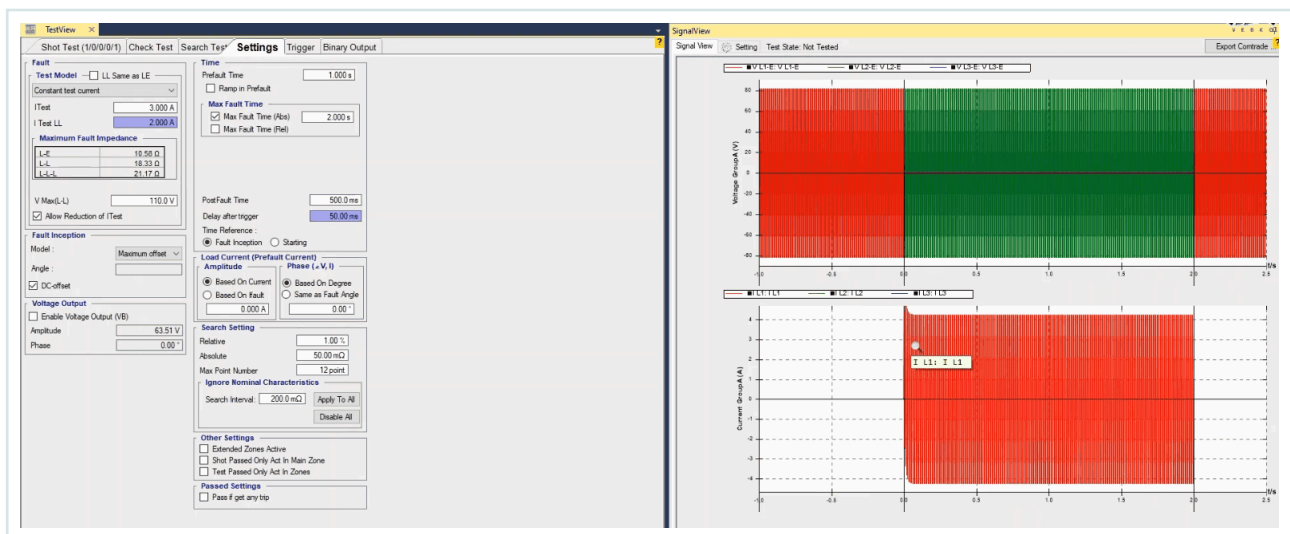


Figure 11

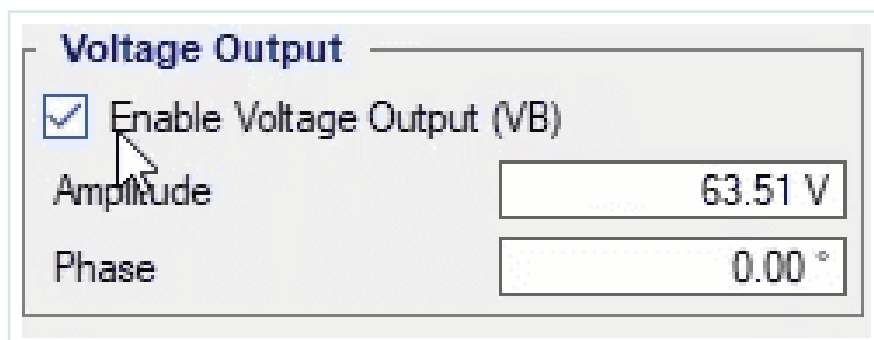




Figure 12