



VEBKO ONLINE HELP

"Set Mode and Fault Type" : Part 1

Category	tester
Section	AMT Sequencer Module
Language	English
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Using options in "Set Mode" field in "Set Mode and Fault Type" part, the user can introduce certain parameters to software to test in "Analog Output Channels" table and produce the device voltage and the current corresponding to them. The output values of device can be observed in "Table View" window.

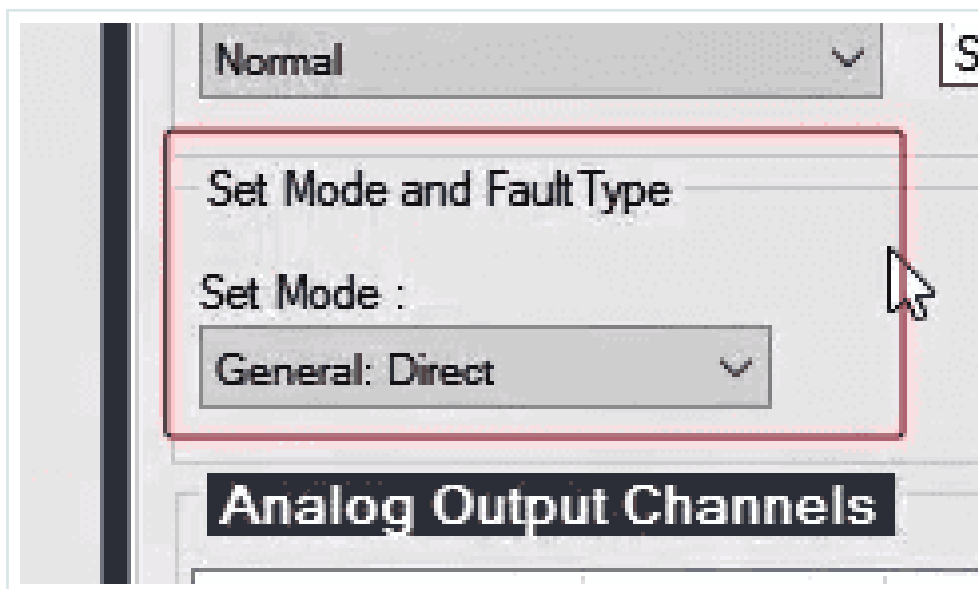


Figure 1

Considering test conditions, the "State Types" of "Continuous Ramp" and "Harmonic" are performed only in "General: Direct" mode. Additionally, considering "Power Swing" test conditions, " State Type :Tracking" is performed in "Distance: Z-I const" mode. Note that since in "Transient Type", the values and type of data are extracted from "Comtrade" file, "Set Mode and Fault Type" part does not exist.

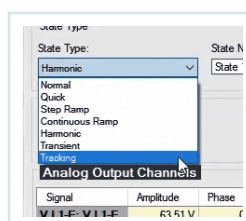


Figure 2

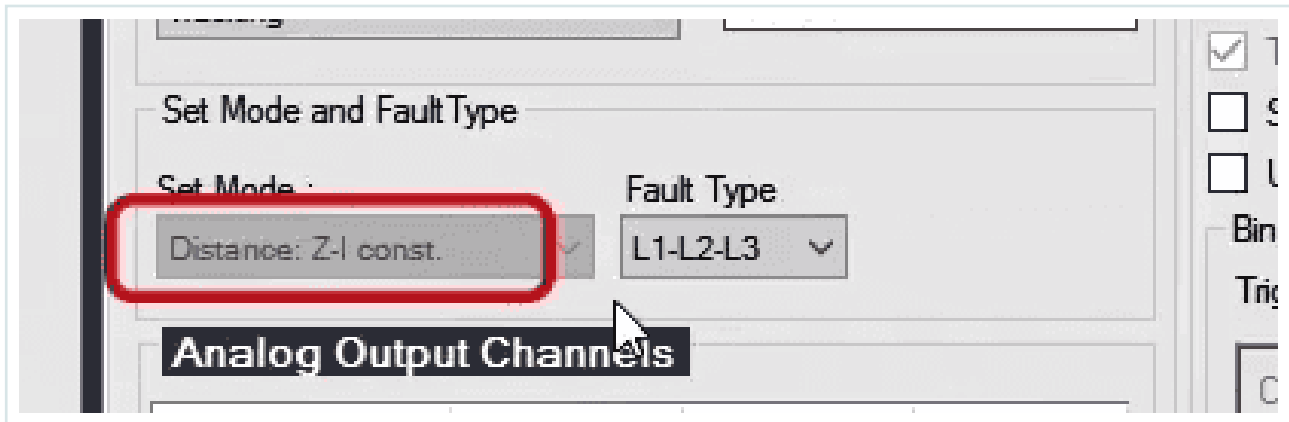


Figure 3

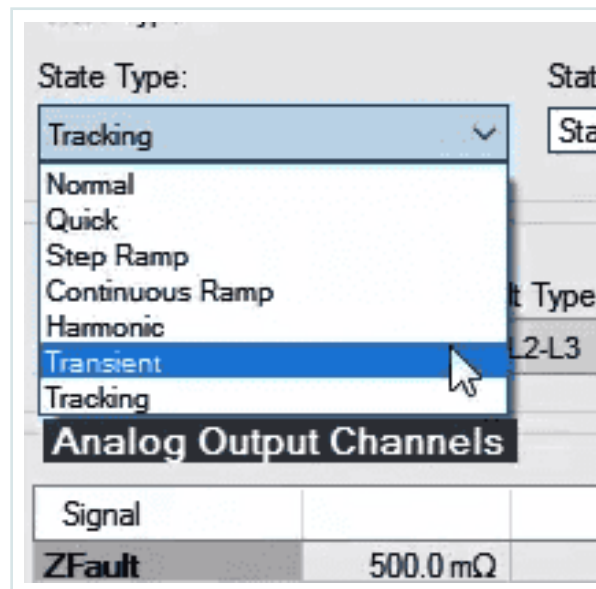


Figure 4

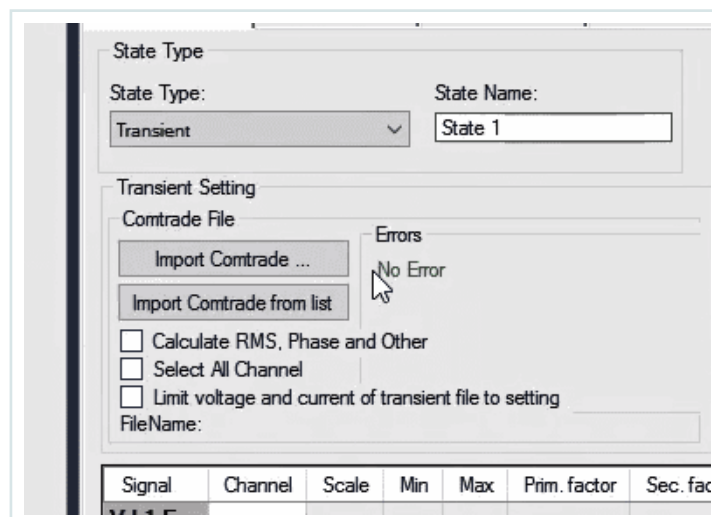
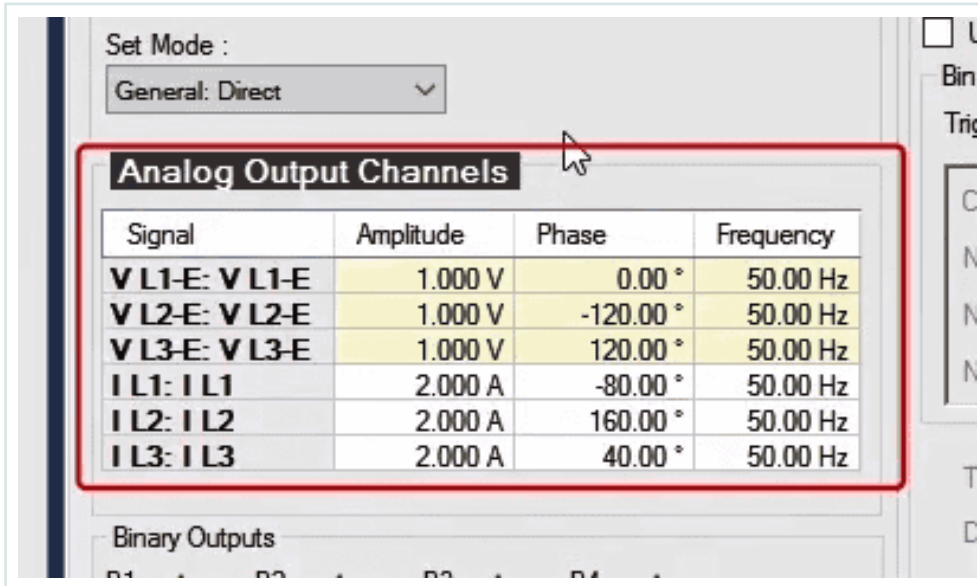


Figure 5

The "Set Mode" filed can be put on different modes in the "State Types" of "Step Ramp", "Quick", and "Normal"; in this film we refer to "General" modes. "Analog Output Channels" table in "General" modes has "Signal", "Amplitude", "Phase", and "Frequency" columns.



Signal	Amplitude	Phase	Frequency
V L1-E: V L1-E	1.000 V	0.00 °	50.00 Hz
V L2-E: V L2-E	1.000 V	-120.00 °	50.00 Hz
V L3-E: V L3-E	1.000 V	120.00 °	50.00 Hz
I L1: I L1	2.000 A	-80.00 °	50.00 Hz
I L2: I L2	2.000 A	160.00 °	50.00 Hz
I L3: I L3	2.000 A	40.00 °	50.00 Hz

Figure 6

1 "General: Direct" Mode:

In this mode, values of voltage signals and the output current of the device are directly determined by adjusting the phase values of voltage signals and the values of current signal lines in "Analog Output Channels" table. In this mode, the frequency value can be determined in "Analog Output Channels" table, but in other modes, the frequency value is obtained from "Test Object". As it can be observed, values of "Analog Output Channels" table have been directly entered in "Table View" window.

2 "General: Line-Line " Mode:

In this mode, the output signals values of the device are determined by adjusting the line to line values of voltage and current signals, as well as the value of zero sequence voltage in "Analog Output Channels" table. As it can be observed, the current values in "Analog Output Channels" table have been directly entered into "Table View" window. By changing the zero sequence voltage to 5V, the voltage value of each phase changes to 6 V in the first phase and 4.583 V in other phases based on the defined relations.

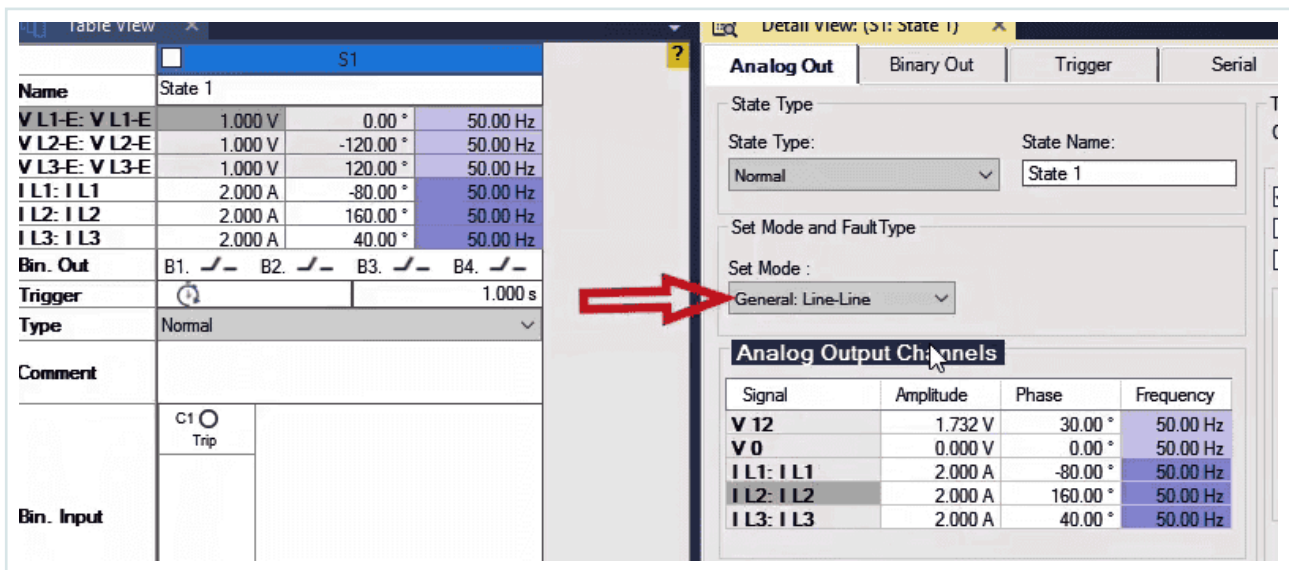


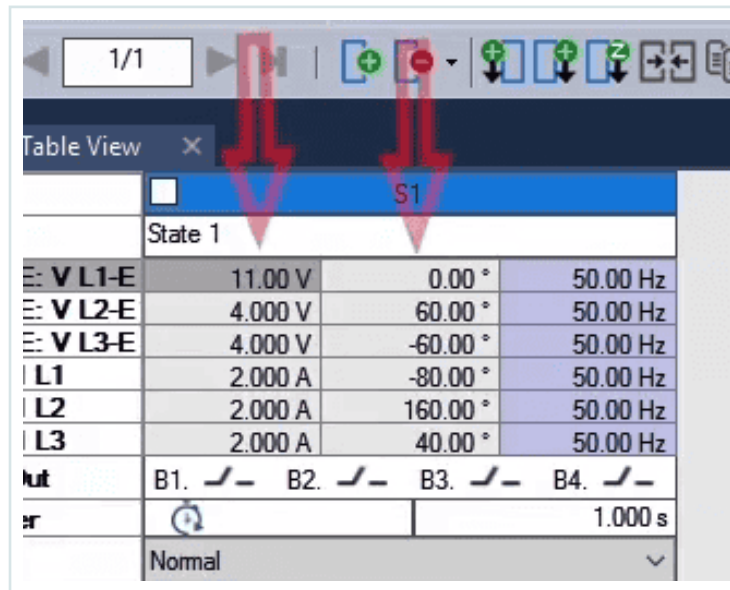
Figure 7

3 "General: Symmetrical Components" Mode

In this mode, by adjusting the value of voltage and positive, negative, and zero sequence current in "Analog Output Channels" table, the values of device voltage and current signals corresponding to them are determined. In order to observe these changes, the negative sequence value changes to 5. According to mathematical relations, the value of the first phase and the other two phases was calculated to be 11 V and 4 V, respectively. In addition, by changing the negative sequence current to 2 Amperes, the output values of current changes to 2.391, 3.973, and 1.581 Amperes, respectively.

Analog Output Channels			
Signal	Amplitude	Phase	Frequency
V 1	1.000 V	0.00 °	50.00 Hz
V 2	5.000 V	0.00 °	50.00 Hz
V 0	5.000 V	0.00 °	50.00 Hz
I 1	2.000 A	-80.00 °	50.00 Hz
I 2	0.000 A	26.57 °	50.00 Hz
I 2 / I 1	0.0000	106.57 °	50.00 Hz
I 0	0.000 A	-75.96 °	50.00 Hz

Figure 8



State 1			
E: V L1-E	11.00 V	0.00 °	50.00 Hz
E: V L2-E	4.000 V	60.00 °	50.00 Hz
E: V L3-E	4.000 V	-60.00 °	50.00 Hz
I: L1	2.000 A	-80.00 °	50.00 Hz
I: L2	2.000 A	160.00 °	50.00 Hz
I: L3	2.000 A	40.00 °	50.00 Hz
Out	B1. ☒	B2. ☒	B3. ☒ B4. ☒
Time			1.000 s
Mode	Normal		

Figure 9

$$a = e^{j\frac{2\pi}{3}} \rightarrow \begin{bmatrix} V_a \\ V_b \\ V_c \end{bmatrix} = \begin{bmatrix} V_0 \\ V_0 \\ V_0 \end{bmatrix} + \begin{bmatrix} V_1 \\ a^2 V_1 \\ a V_1 \end{bmatrix} + \begin{bmatrix} V_2 \\ a V_2 \\ a^2 V_2 \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & a^2 & a \\ 1 & a & a^2 \end{bmatrix} \begin{bmatrix} V_0 \\ V_1 \\ V_2 \end{bmatrix} = AV_{012}$$

$$\begin{bmatrix} V_0 \\ V_1 \\ V_2 \end{bmatrix} = A^{-1}V_{abc} \rightarrow A^{-1} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & a & a^2 \\ 1 & a^2 & a \end{bmatrix}$$

Figure 10

4 "General: Powers": Mode

In this mode, the values of device voltage and output current signals are determined by adjusting the phase value of voltage signals, apparent power, active power, and reactive power in "Analog Output Channels" table. The fourth to sixth rows of apparent power are related to each phase and the seventh row is the apparent row of three phases whose magnitude is determined in "Amplitude" column and their angle is determined in "Phase" column. Moreover, the eights to tenth rows are related to the active and reactive power of each phase, and the eleventh row is related to the active and reactive power of three phases. The active power value is determined in "Amplitude" column and reactive power value is determined in "Phase" column.

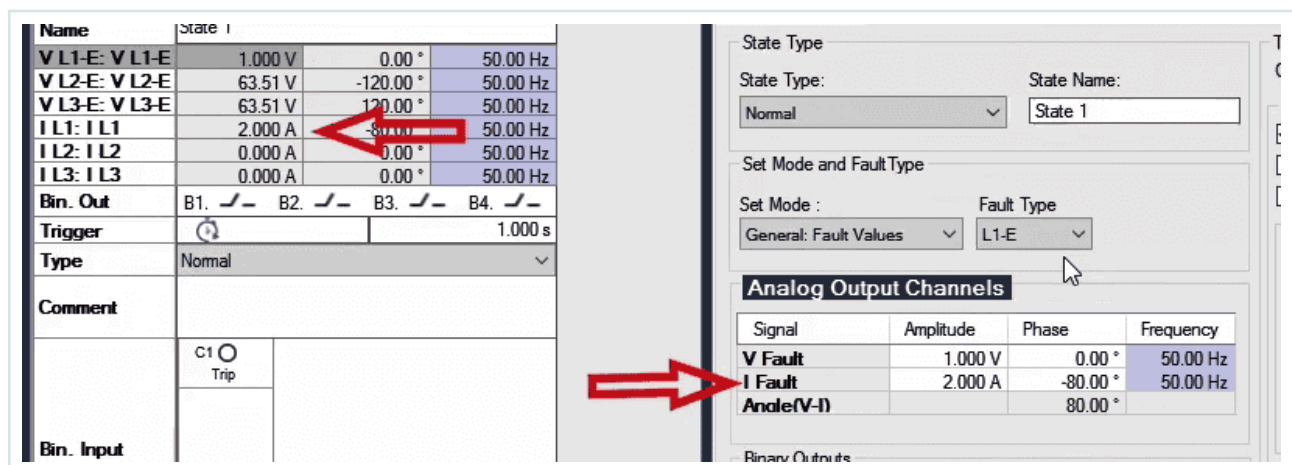


Figure 11

As it can be observed, the voltage values in "Analog Output Channels" table are directly entered into "Table View" window and by changing the value of apparent power of three phases to 50 volt-ampere (VA) in "Analog Output Channels" table, the current values in the output change to 1.515 A in the first phase and 4.167 A in the other two phases.

5 "General: Fault Values" Mode:

In this mode, first the fault type is selected from the slider bar of "Fault Type" field, then in "Analog Output Channels" table, the value of fault voltage, fault current, and their angle are entered and the values of device voltage signals and output current corresponding to them can be seen in "Table View" window. As single phase to ground fault is selected here, the values of device voltage and output current in that phase are considered to be equal to the value of fault voltage and current in "Analog Output Channels" table.



Name	State 1
V L1-E: V L1-E	1.000 V 0.00 ° 50.00 Hz
V L2-E: V L2-E	63.51 V -120.00 ° 50.00 Hz
V L3-E: V L3-E	63.51 V 120.00 ° 50.00 Hz
I L1: I L1	2.000 A -80.00 ° 50.00 Hz
I L2: I L2	0.000 A 0.00 ° 50.00 Hz
I L3: I L3	0.000 A 0.00 ° 50.00 Hz
Bin. Out	B1. ☒ B2. ☒ B3. ☒ B4. ☒
Trigger	1.000 s
Type	Normal
Comment	
Bin. Input	C1 ☐ Trip

State Type

State Type: Normal State Name: State 1

Set Mode and Fault Type

Set Mode : General: Fault Values Fault Type: L1-E

Analog Output Channels

Signal	Amplitude	Phase	Frequency
V Fault	1.000 V	0.00 °	50.00 Hz
I Fault	2.000 A	-80.00 °	50.00 Hz
Angle(V-I)		80.00 °	

Binary Outputs

Figure 12

[jg1]Set_Mode_and_Fault_Type_Part1