



VEBKO ONLINE HELP

CB “Timing Test”

Category	tester
Section	Circuit Breaker Module
Language	English
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One of the most important tests performed in CB is "Timing Test". To perform a "Timing Test" it is necessary to specify three main important sections including 1- Supplement method of bobbins, 2- Wiring type of "Binary Outputs" and 3- type of "Binary inputs".

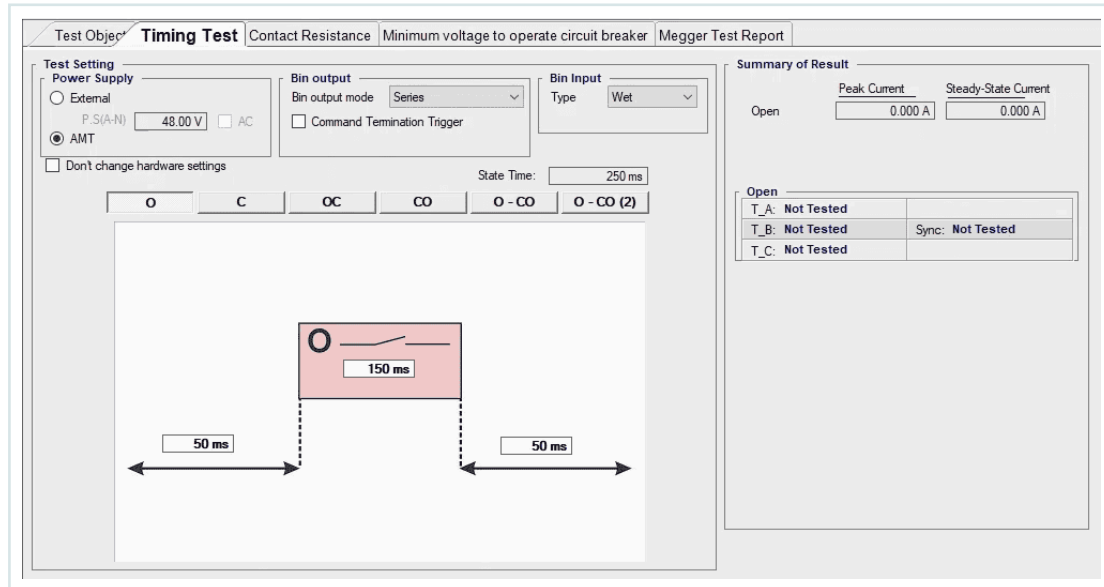


Figure 1

The supplement method of bobbins is specified in "Power Supply" section which is set at "AMT105" by default and its value is taken from "Test Object". To control the voltage applied to "Open" and "Close" bobbins, "Binary Outputs" of the device are used. In "Binary Output" section it is specified that which "Binary Outputs" are to be used to control "Close" and "Open" commands which is set at "Series" by default. In this mode, huge voltages which occur during opening and closing are divided between the two relays which prevents damage to the device. But if one of the "Binary Outputs" is not available, by selecting other options, it is possible to use only two "Binaries". For example, by selecting "Bin1" and "Bin4" you can only use the "Binaries" 1 and 4. In this instruction, "Series" mode is used.

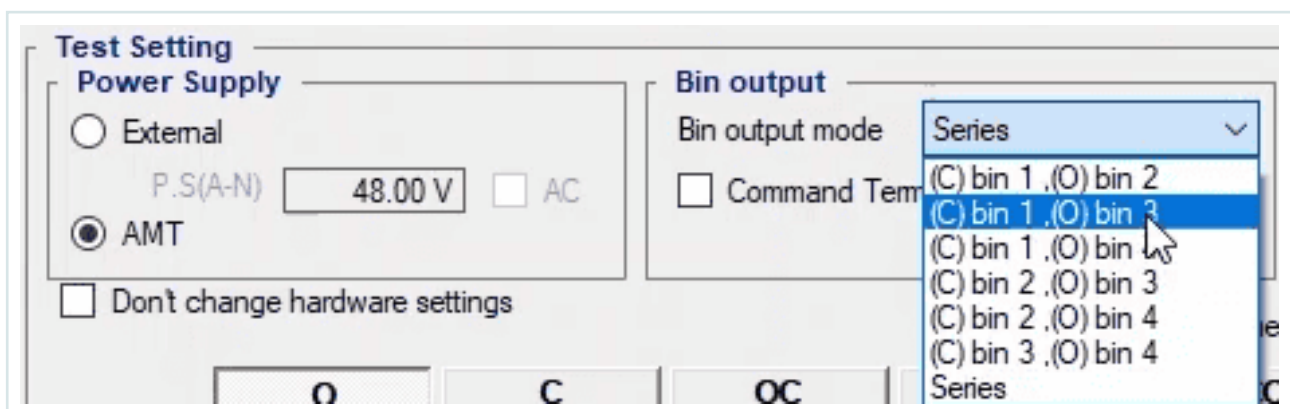


Figure 2

"Binary Input" is used to sense when the CB is closed or open. Since there is noise in substations, "Binary Inputs" are set at "Wet" by default so noise is removed from the "Binary Inputs". But if there is no noise in the test environment you can set the type of "Binary Inputs" at "Dry" and by changing the "Binary" type, the wiring changes as well.



Figure 3

Next you need to select the test type from among "Open—Close—Open Close—..." By selecting any of them, you need to enter the time in the specified box. For example, in "Open" test, you need to enter "three" times in the designed fields; the first "time" is related to before command, the second "time" is related to the Duration which the command is kept on the bobbin and the third time is related to after command. In this example, the bobbin is supplied by the device and "Binary Output" and "Binary Input" are set at "Series" and "Wet" respectively. For "Open" test, the default time values are considered as the time values. Then, you need to set the wiring according to the specified picture. Note that by double-clicking on the picture, it is possible to magnify it. In this wiring, the specified connections must be set, those points that have the same name must be connected to each other, Close and Open bobbins must be connected to the lower end of "Binary Outputs" number 3 and 4 and finally, the connections of "Binary Input" must be set to receive the key contacts. After setting the wiring, open "Signal View" and initiate the test by selecting "Init Test". In "Signal View" window, it is possible to view the voltage and current loaded from the device as well as the CB opening time. "Vc1+" and "Vc2+" indicate the status of the "Close" command control "Binary Outputs" while "Vo1+" and "Vo2+" are indicators of the status of the "Open" command control "Binary Outputs". "L1", "L2" and "L3" indicate the status of the CB contacts:

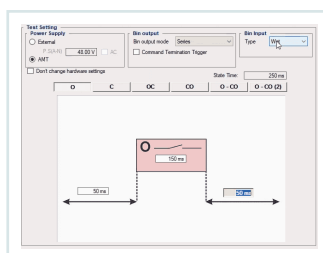


Figure 4



Figure 5

Three colored lines mean that the CB contacts are closed while no lines suggest the opposite. "AUX Open" and "AUX Close" signals are used to determine the origin time for measuring the performance time. As mentioned before, the CB performance is measured since when the voltage of the "Binaries" 7 and 8 exceeds the "Threshold" specified in "Test Object". Moreover, the test results are available in "Summary of Result" section. In this section, the peak current and "Steady State" current and in the "Open" table the opening time of each contact is provided separately. Note that the evaluation of these times is done in accordance with the "Opening Time" and "Opening Sync" specified in "Test Object". If the operating time is somewhere within the range specified in "Test Object" the test "Passes", otherwise it "Fails". For adding the results to the report, you can do so by pressing "Add to Report". Also, if you wish to add some specific parts to the report, or delete and edit the report, you need to use the "Add to Report" cog. By clicking on this cog, you can view the items that can be added to the report. If you do not need each of them, you can unselect by unchecking them. Note that after performing a test the results are not automatically added to the report and it is necessary to add the results to the report by "Add To Report" before "Clearing" the test.

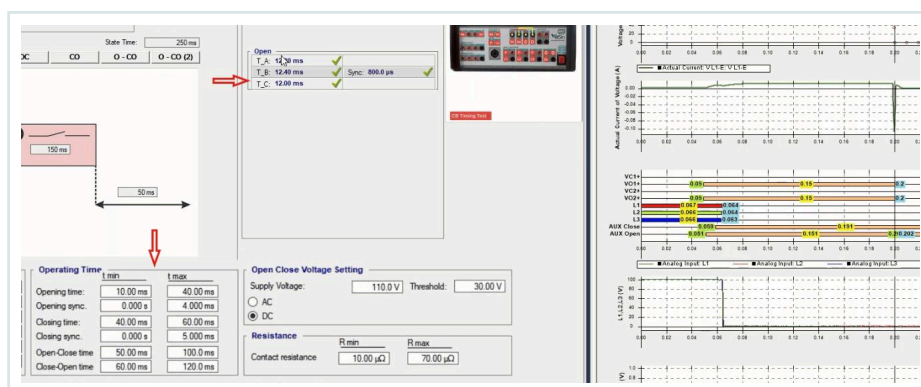


Figure 6

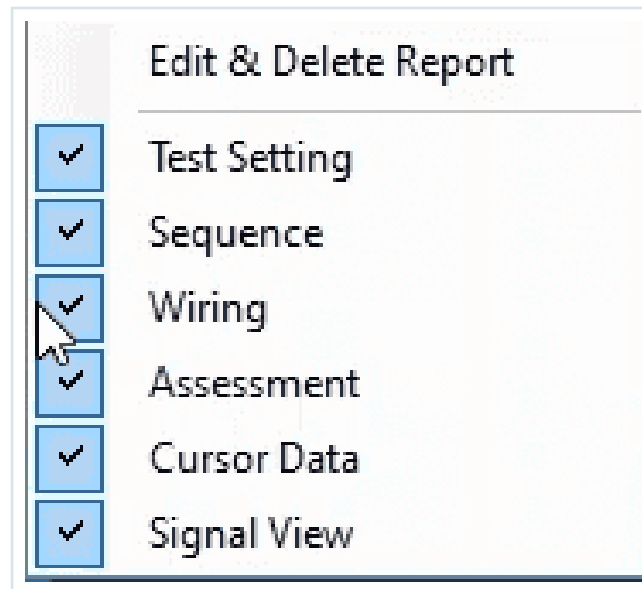


Figure 7

In the following, some points about the test are provided:

The first point is that if you wish to use only one voltage group, first you need to press "Init Test" and then check "Don't Change Hardware Setting" and by going to the "Hardware Configuration", activate your intended voltage phases and deactivate the others in the "Analog Output" tab and perform the test using only the voltages of the intended group. For example, here voltage group "A" is activated and voltage group "B" is deactivated.

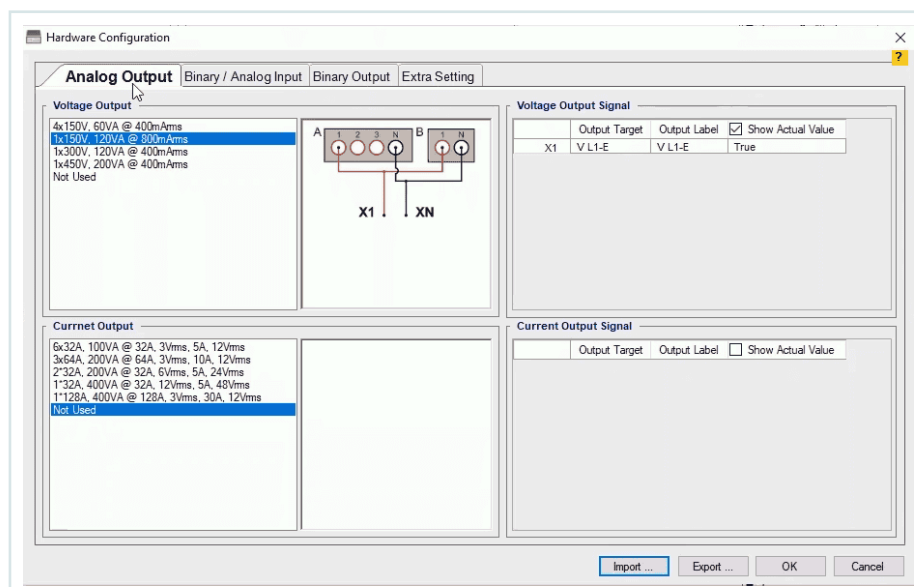


Figure 8

The second point is that when you enter "150" milliseconds as the command time, this means that the command voltage is kept on the bobbin for "150" milliseconds. If you check "Command Termination Trigger" option and enter "10" milliamps as the "Minimum Time", the command is removed from the CB, "10" milliseconds after its operation. To view this item, "Close" test is selected. To initiate the test, "Init" is pressed and test starts. After that, you can see that because of checking this option, unlike the previous case, "10" milliseconds after the CB operation the command is removed.



Bin output

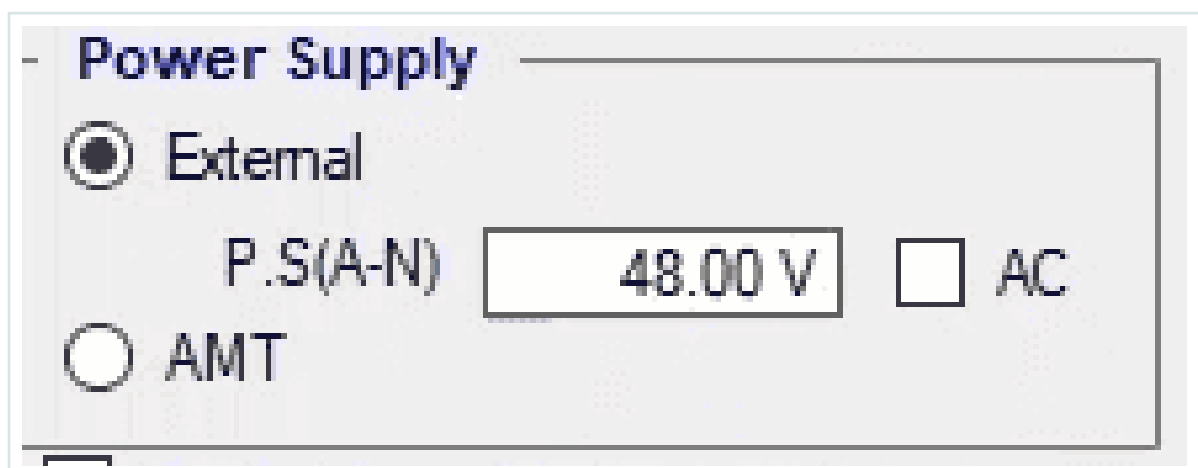
Bin output mode Series

☒ Command Termination Trigger

Minimum Time 10 ms

Figure 9

The third point is that if the current needed to exciting the bobbin is more than "2.5" amps, it is necessary to use an external source. In this case, check the "External" option and set the new wiring and start the test after pressing "Init Test". If you are using an external source to provide the voltage of the bobbins, to better protect the bobbins, put a glass relay with the "Binary Outputs" in series so that if something unexpected happened to the "Binary Outputs" which made them no longer able to disconnect the voltage applied to the bobbins, the CB is not damaged and in this way you can have more control on connecting and disconnecting the supply applied to them. In using a glass relay, since the voltage of the binaries number 7 and 8 is used as the time origin, delay of the glass relay has no effect on the test result and this delay is deleted by the software.



Power Supply

☒ External

P.S(A-N) 48.00 V ☐ AC

☐ AMT

Figure 10

Also, when testing the CB time test, it is necessary to know the current loaded by the CB. A "100" milliohm resistance is considered for this and when the current flow, a voltage is measured by the "Binary Input" 10 and by dividing the voltage by the resistance, "Coil Current" is calculated by the software and displayed in "Coil Current" section in "Signal View".

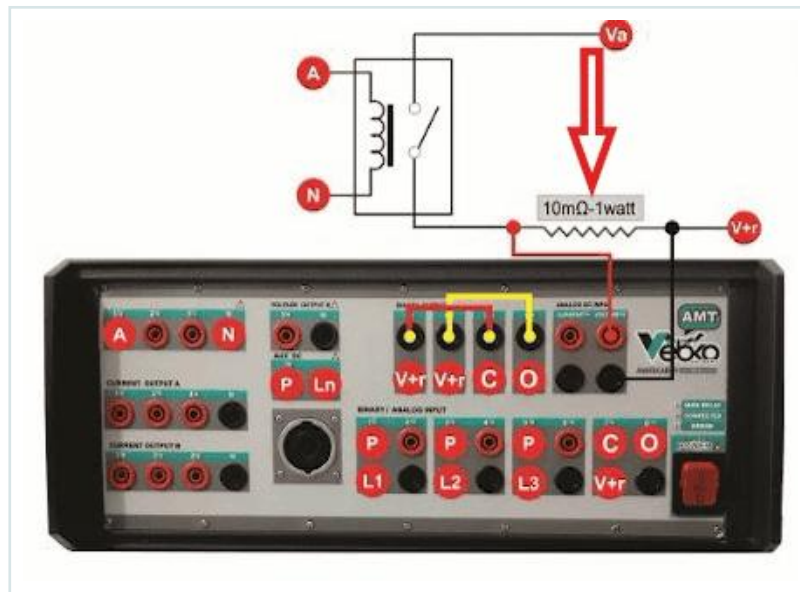


Figure 11

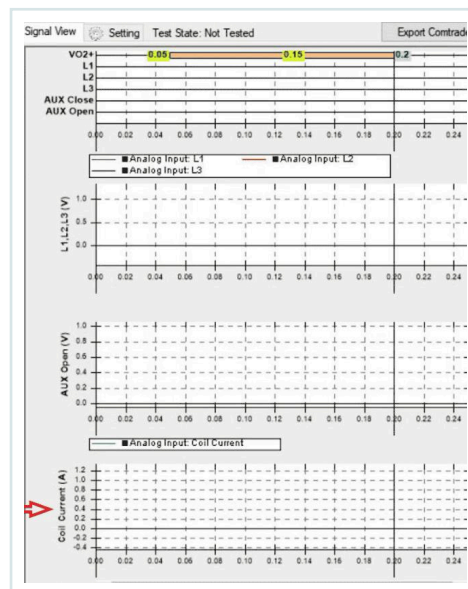


Figure 12

The third point is that "Error Other" while performing a test means that there is an issue with the connections or the high current loaded by the bobbins in a way that the device is unable to provide needed current. Therefore, in case of encountering this error, check the "Actual Current" value in

"Signal View". If the "Actual Current" reaches "2.5" amps and then the test is stopped, it means that the device is not capable of injecting that current and an external source should be used. If the time recorded in the table is "-1ks", this means that the CB has been "Open" before performing the test or it has been closed for the "Close" test of the CB. In this case, other than the wiring, you need to check whether the CB is closed or open.

[jg1]CB_Timing_Test