



VEBKO ONLINE HELP

Relay Settings in the "Overcurrent" Room – Part 1

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Section	AMT Overcurrent Module
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1 Imported Content

As mentioned before, to test a relay, the first step is to enter the relay characteristic in the software. To do this, first how to enter the setting for a "Non-directional" relay is going to be explained. Enter "General Test Object" window and after changing the "CT" turns ratio to 500/1 in "Device" block, by double-clicking on "Overcurrent" block, "Overcurrent protection parameters" page opens where you can enter the relay setting. In "Relay behavior" section, the setting related to relay protection, placement of "VT"s as well as wiring of "CT"s are specified. Since here our relay is "Non-directional", "Non-directional" should be selected in this window. Note that the setting related to "VT Connection" and "CT Connection" are only active in "Directional" mode and in "Non-directional" relays, these options are disabled.

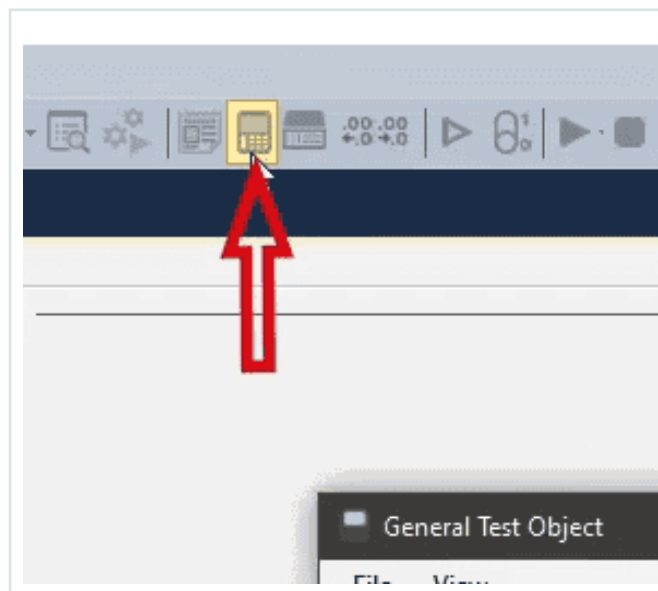


Figure 1

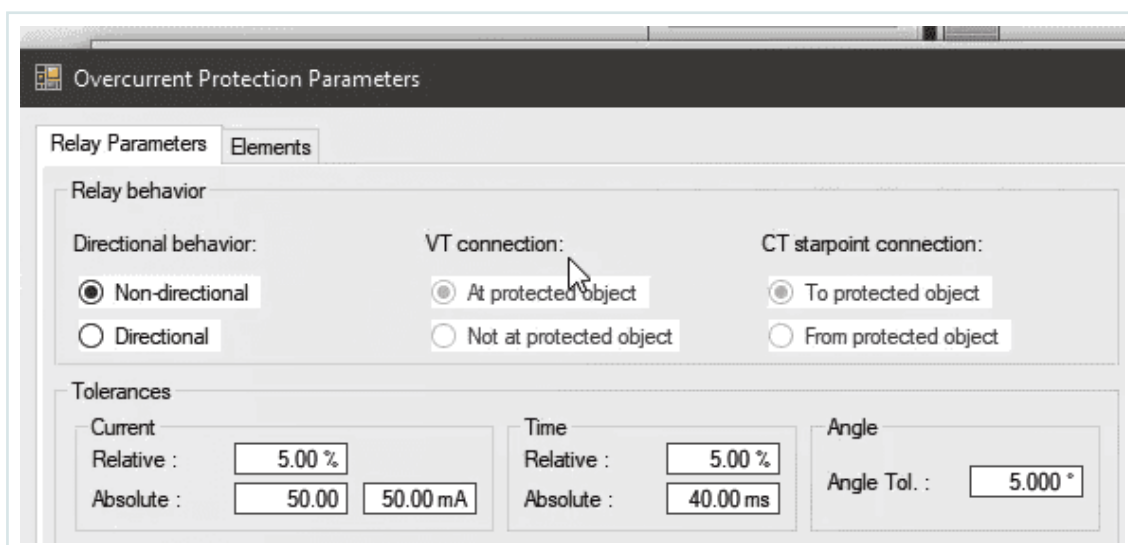


Figure 2

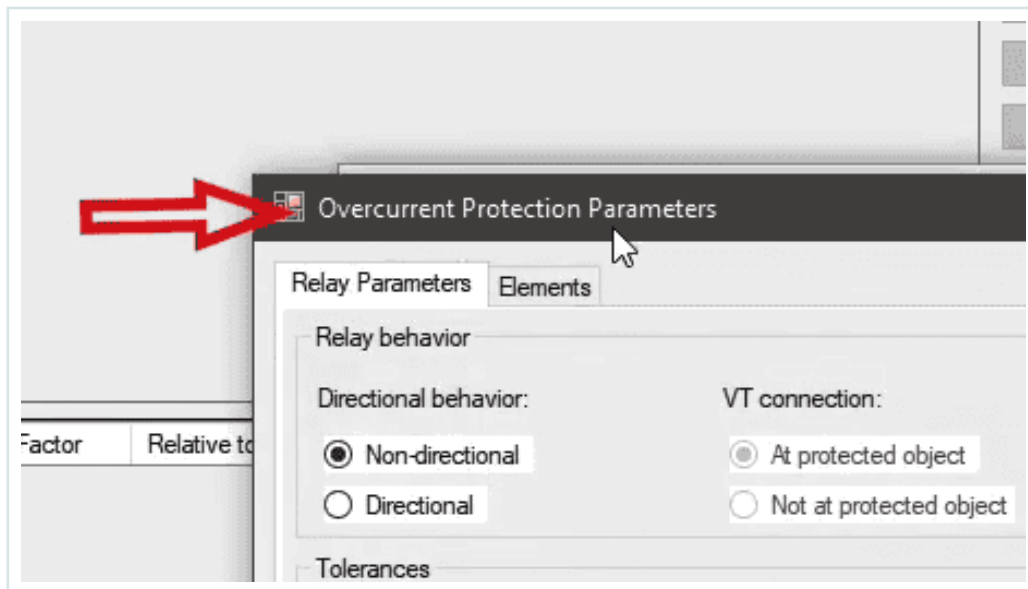


Figure 3

In "Directional" relays, current, time and angular tolerances are set in "Tolerances" section. To set current tolerance, you need to enter your intended tolerance as a percentage of the test current in "Relative" field. You can see that this tolerance is set at 5 percent by default. Also, in "Absolute" section, it is possible to enter this tolerance as a coefficient of "CT" nominal current in this field and view its actual value in the front field. Moreover, it is possible to enter the numerical value of tolerance and view its related coefficient in the previous field. For example, in this field 40 mA is entered as the tolerance. You can see that the coefficient related to this current, changes in the corresponding field. Note that the software picks the maximum tolerance between the two tolerances specified for the characteristic curve. For example, if the test current is set at 1 amp, with a 5 percent tolerance, the current is calculated between 1.05 and 0.95 amp but if a 40 milliamp tolerance is used, the pickup current is calculated between 1.04 and 0.96 amp. The software picks the highest values which is between 1.05 and 0.95 amp. In "Time" section, the time tolerances are specified in percentage and actual forms and the angular tolerance is specified in "Angle" section.

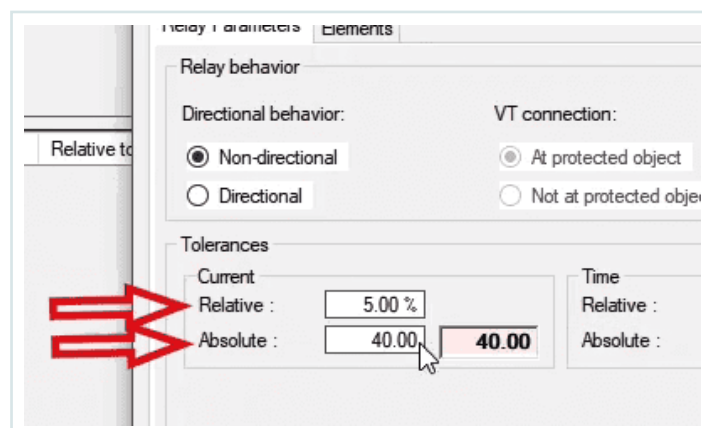


Figure 4

To specify the characteristic curve, you need to enter "Elements" tab. In "Element Name" column, a title for the specified "Stages" is entered. For example, here "Stage1" is selected. In "Tripping Characteristic" column it is possible to specify the type of the characteristic curve which is set at "IEC Definite Time" by default. To change the intended characteristic curve, double-click on "IEC Definite Time" or click on three dots sign from "Characteristic" section to open "Manage / Select Characteristic" window. In "Standard" section, you can view the available characteristic curves in "IEC" standard and by selecting any of these you can view its formula and coefficients in "Characteristic" section. Note that it is necessary to select the same characteristic curve as the one specified for the relay.

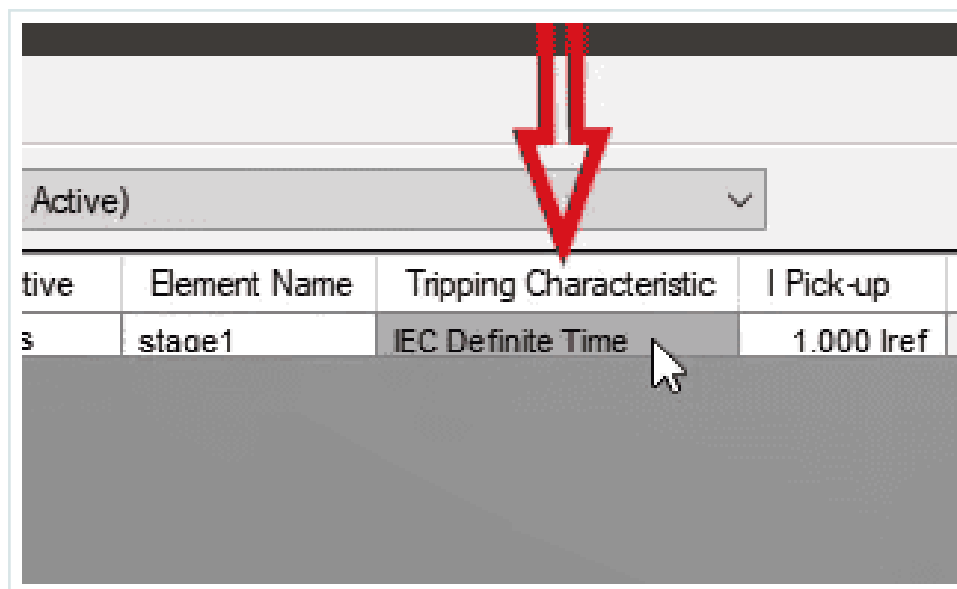


Figure 5

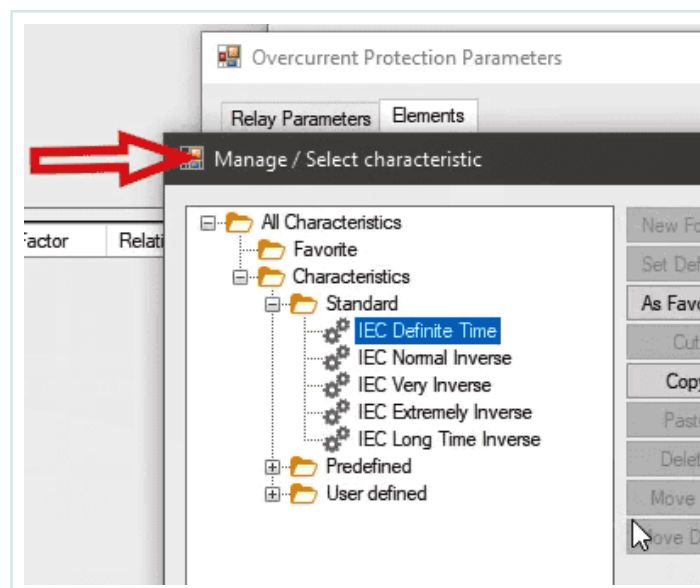


Figure 6

If you cannot find the characteristic curve specified for the relay here or the coefficients of the formulae are different, by entering "Predefined" folder, you can find the relay characteristic curve from "Inverse", "I²T", IAC" and "Reclosers" folders and then select it. Also, if you cannot find the relay formula in any of the folders, in "Custom" folder, by selecting "Custom Formula" it is possible to specify your intended formula according to the coefficients specified in this section as well as the value of "I_{test}/I_{pickup}" and "Time dial" which are indicated by "M" and "Td" respectively. After doing so, you can save and use the formula. Moreover, if the relay characteristic curve is based on the points table, you can add the characteristic curve point by point and view its curve by selecting "Table Example 2" and using the "Grabber" tool available in the software. This window will be fully explained in future videos.

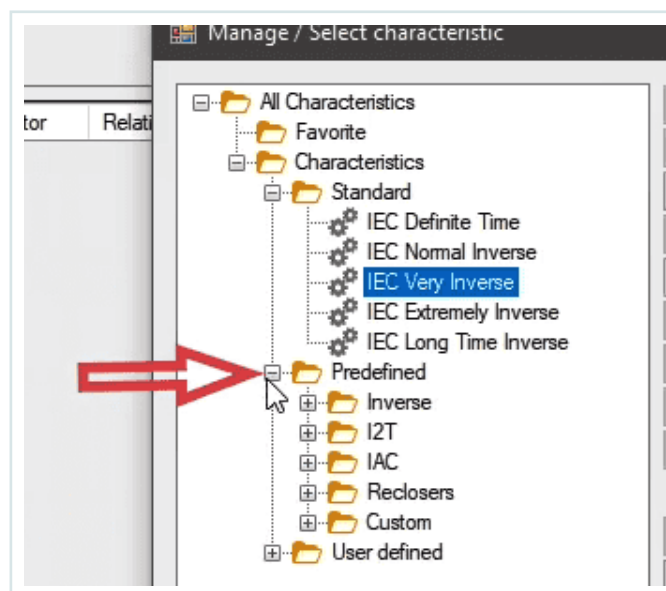


Figure 7

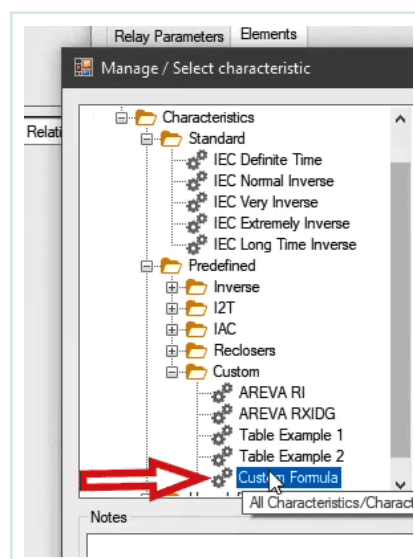
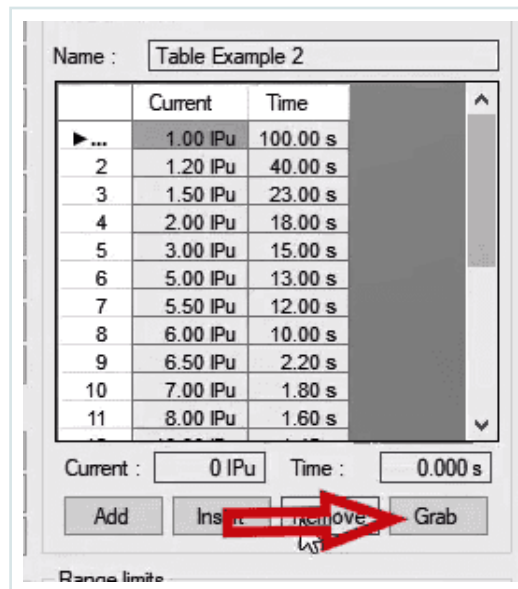


Figure 8



	Current	Time
▶...	1.00 IPu	100.00 s
2	1.20 IPu	40.00 s
3	1.50 IPu	23.00 s
4	2.00 IPu	18.00 s
5	3.00 IPu	15.00 s
6	5.00 IPu	13.00 s
7	5.50 IPu	12.00 s
8	6.00 IPu	10.00 s
9	6.50 IPu	2.20 s
10	7.00 IPu	1.80 s
11	8.00 IPu	1.60 s

Current : 0 IPu Time : 0.000 s

Add Insert Remove Grab

Range limits

Figure 9

If the characteristic curve formula is available in the software, but the used coefficients are not the same as the ones in the relay's manual, you need to select the intended formula and by "Copying" and "Pasting" it in "User defined" section, change its coefficients and use the formula according to the coefficients specified in the relay's manual. To facilitate doing this, "Copy to user defined" option has been made available and you can use it. For example, here the formula related to "Basler I2T-46N" curve is copied and pasted in "User defined" section. Now, by selecting it, you should enter your intended coefficients and by saving the new curve with the selected coefficients, it is saved in the software and can be used.

To continue the process, the "IEC Normal Inverse" curve is selected here. You can see that in "Elements" tab, an "Inverse Normal" "Stage" is entered. Now in "I Pick-up" column, you should set the pickup current of the relay according to a coefficient of "CT" secondary nominal current which, here, is set at 1.1. Also, it is possible to set the pickup current from "I Pick-up" field at the bottom of this tab. After setting the pickup current, its value is displayed in "Absolute" column. In "Time" column, "TMS" or "Time dial" of the relay is entered. This value can also be entered in "Time Index" field at the bottom of this tab and 0.5 is entered here. In "Reset Ratio" column, "Drop Out" coefficient of the relay is entered which is set at 0.95 by default. Also, you can see that in "Direction" column, the type of this curve is set at "Non-Directional".

Um den Vorgang fortzusetzen, wird hier die Kurve „IEC Normal Inverse“ ausgewählt. Sie können sehen, dass auf der Registerkarte „Elemente“ eine „Inverse Normale“ "BühneStufe" eingegeben wird. Sie können sehen, dass auf der Registerkarte „Elemente“ eine BühneStufe („Inverse Normale“) eingegeben wird. Nun sollten Sie in der Spalte „I Pick-up“ den Aufnahmestrom des Relais nach einem

Koeffizienten des Sekundärnennstroms „CT“ einstellen, der hier auf 1.1 eingestellt ist. Außerdem ist es möglich, den Pickup-Strom im Feld „I Pick-up“ unten auf dieser Registerkarte einzustellen. Nach dem Festlegen des Abholstroms wird sein Wert in der Spalte „Absolute“ angezeigt. In der Spalte „Time“ wird „TMS“ oder „Time dial“ des Relais eingegeben. Dieser Wert kann auch im Feld „Time Index“ unten auf dieser Registerkarte eingegeben werden, und hier wird 0.5 eingegeben. In der Spalte „Reset Ratio“ wird der Koeffizient „Drop out“ des Relais eingegeben, der standardmäßig auf 0.95 eingestellt ist. Außerdem können Sie sehen, dass in der Spalte „Direction“ der Typ dieser Kurve auf „Non-Directional“ festgelegt ist.

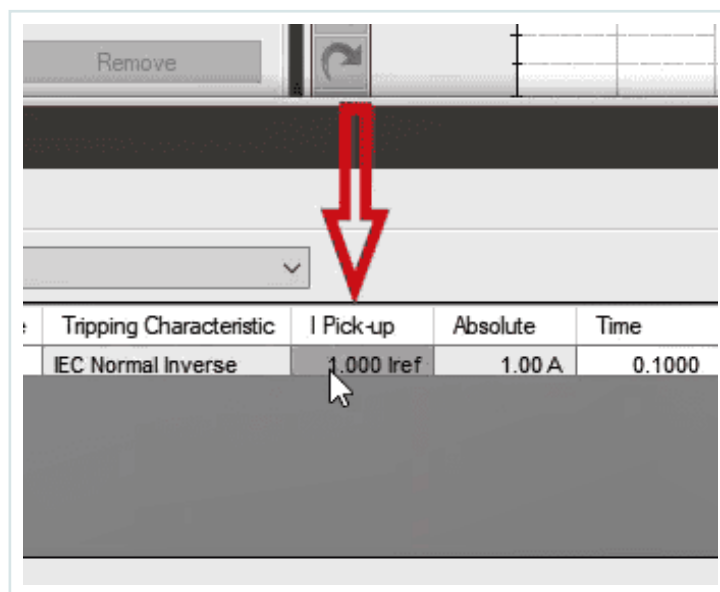


Figure 10

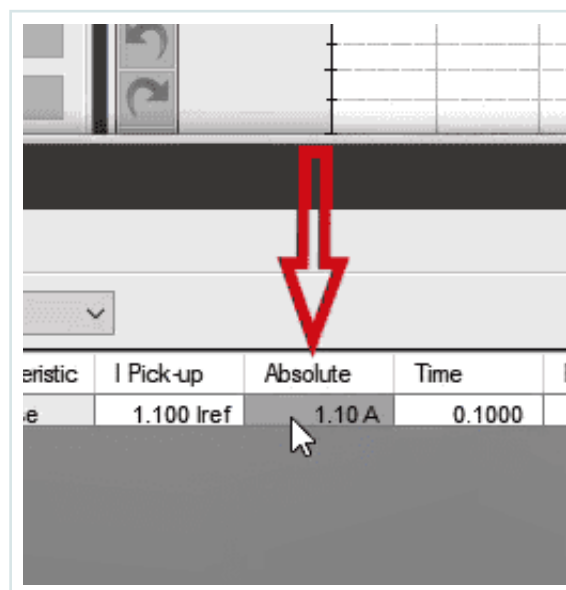
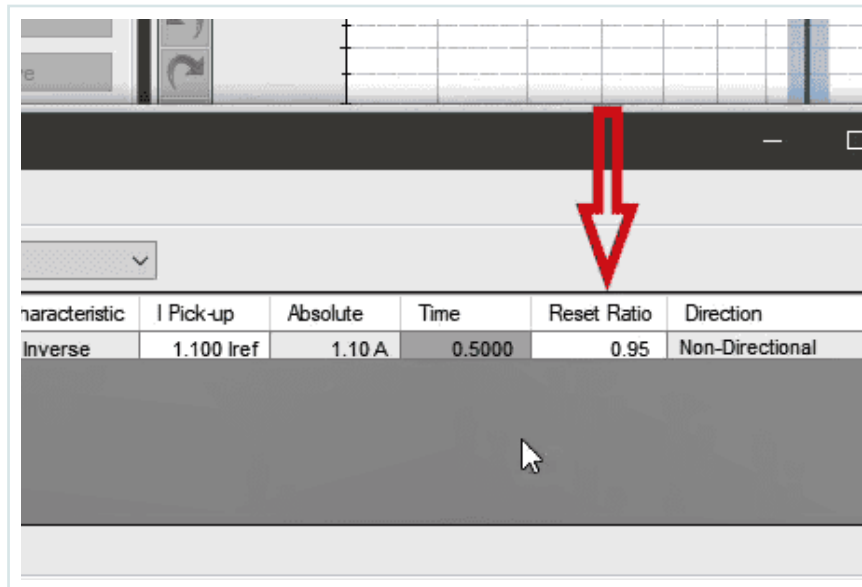


Figure 11



Figure 12



Characteristic	I Pick-up	Absolute	Time	Reset Ratio	Direction
Inverse	1.100 Iref	1.10 A	0.5000	0.95	Non-Directional

Figure 13



I Pick-up	Absolute	Time	Reset Ratio	Direction
1.100 Iref	1.10 A	0.1000	0.95	Non-Directional

Figure 14

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