



VEBKO ONLINE HELP

Under Voltage Protection Test in AMR Relay (Simple Test Using Templates)

Category	tester
Section	Testing of relays protection functions
Language	English
Generated	2026-10-18

AMR modular relay of Vebko company supports various protection functions. Explanations of the capabilities and software environment of this relay have already been presented in the video related to differential protection test.

After connecting to the AMR relay at first,

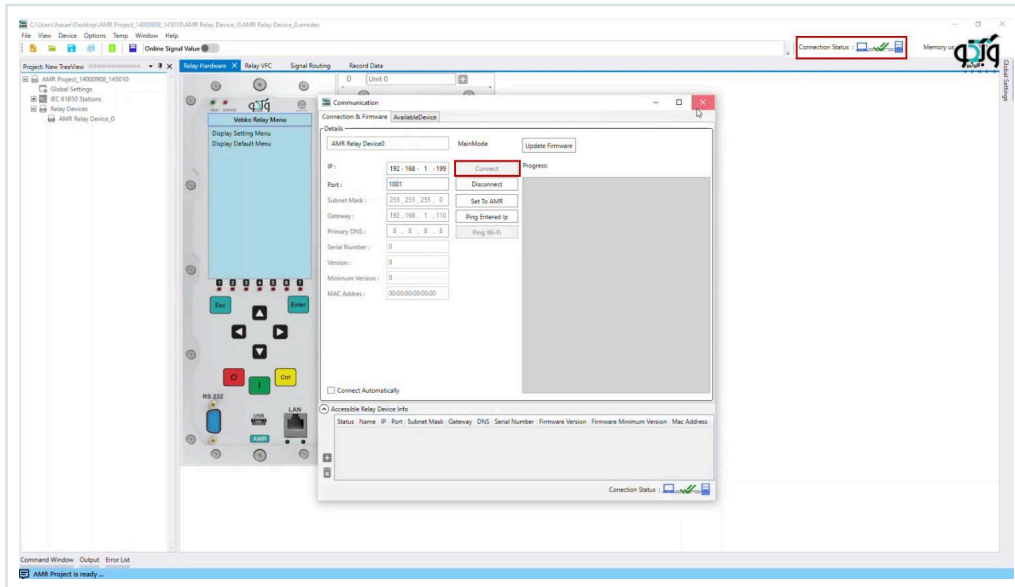


Figure 1

simply load the device's hardware configuration from the Device menu by selecting the Read Hardware from Relay option. The default password is 123456 to receive elements.

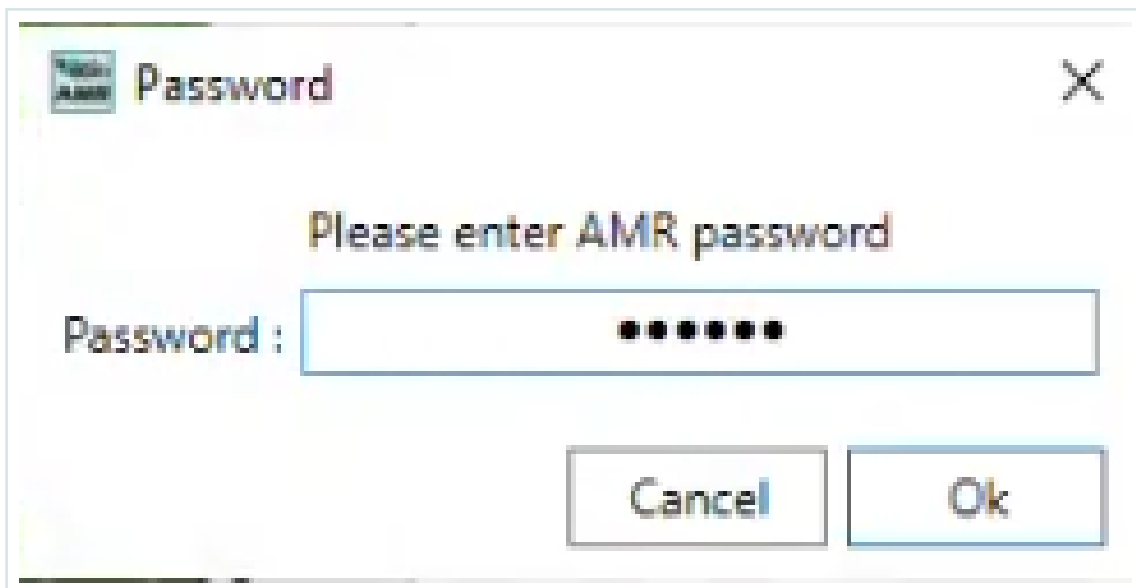


Figure 2



Figure 3

At this point, a message is given to remove the signal, which if confirmed, if the current hardware is not the same as the relay hardware, the current hardware signals used in the VFC section are deleted.

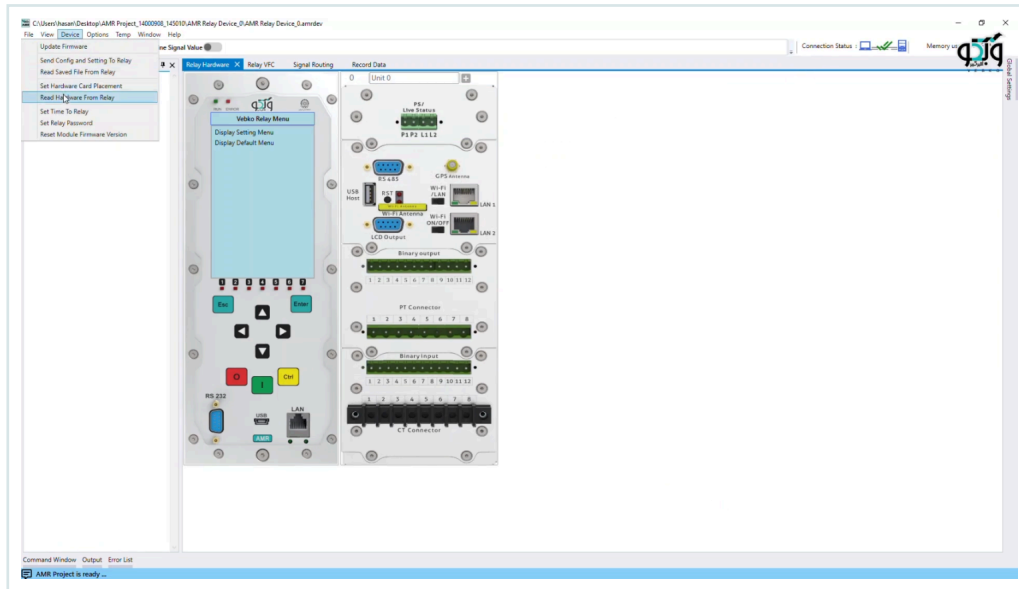


Figure 4

It should be noted that the settings for the conversion ratio of voltage and current transformers are determined in the related card. Here, the current card conversion ratio is 200A to 1A and the voltage card conversion ratio is 63000 to 100V.

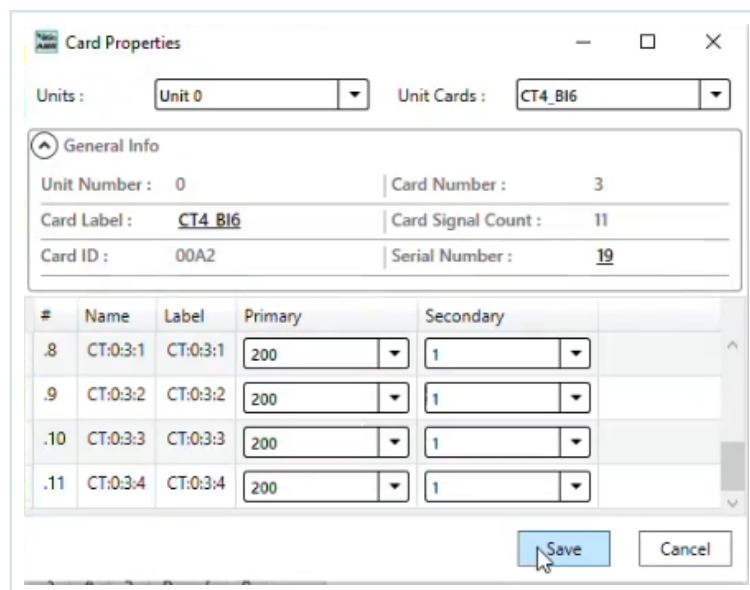


Figure 5

(First, enter the VFC page): As mentioned earlier in AMR software, the config of some of the most

widely used functions, as an example, are placed in the software as samples; and the user can select any of them apply the desired changes and send the new settings to the relay. For this purpose, a set of functions can be seen in the Relay VFC tab and in the Temp Functions section. It should be noted that by selecting each Temp Function, the available blocks in the VFC are removed.

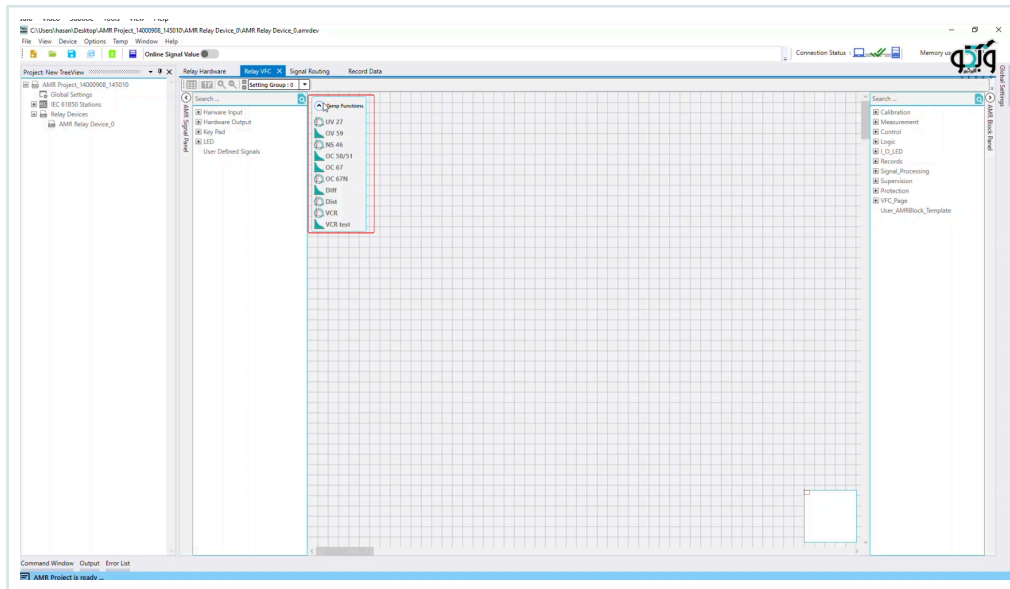


Figure 6

Here the Under Voltage function displayed with the name UV 27 is selected. In the configure of this function, to calculate the line-by-line voltages, first the relay voltage card signals are assigned to the Voltage Quantities block inputs and then assigned to the Undervoltage block. Also, current card signals connected to the current transformers (CT) of the same feeder are assigned to the Undervoltage block for current monitoring. Finally, undervoltage block output signals are assigned to Binary Outputs and relay LEDs by Output and LED blocks. The purpose is to test the Undervoltage function with AND logic, so the sample of line-by-line voltages are used.

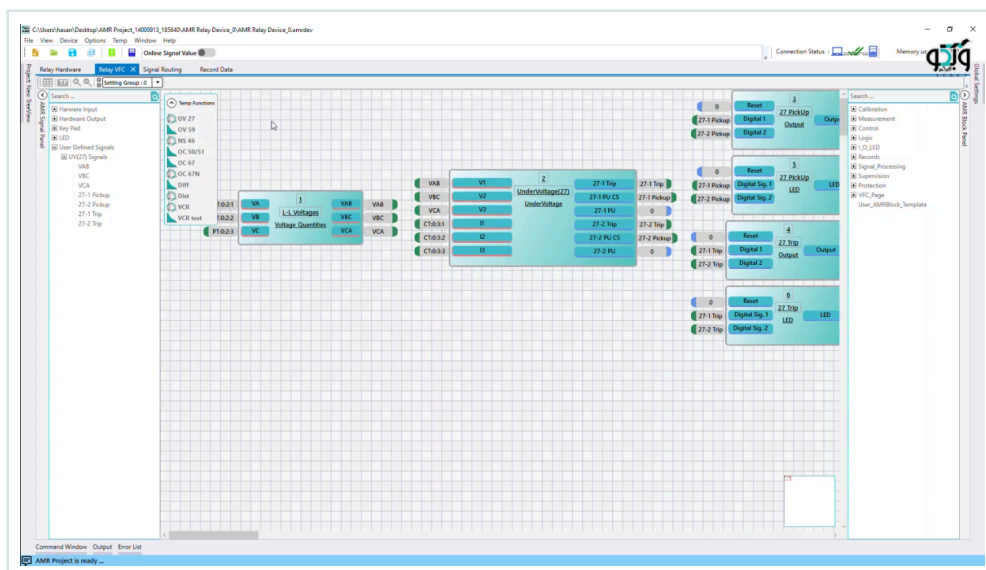
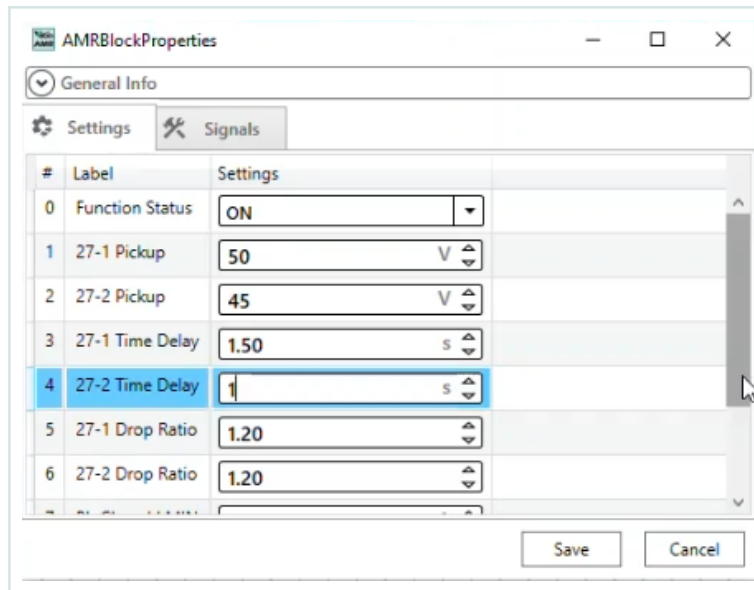


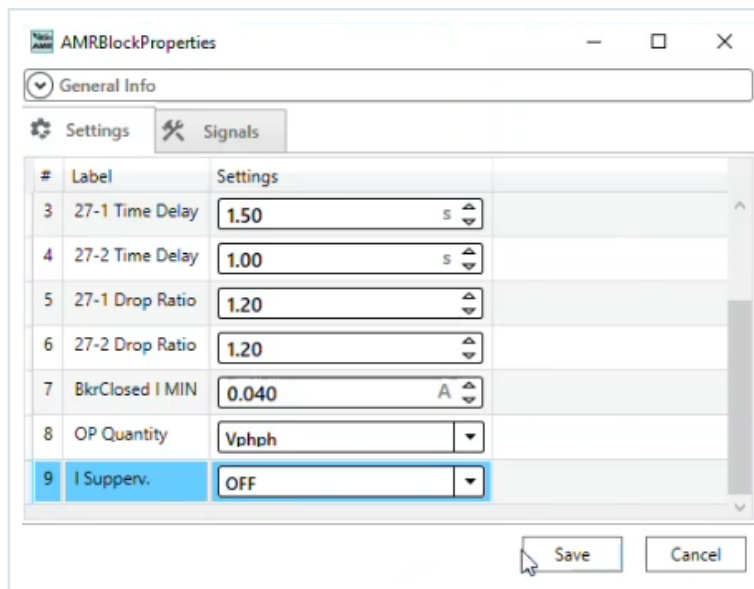
Figure 7

By double-clicking on the Undervoltage block, two stages are defined here. The first stage with a 50V setting and a performance time of 1.5 seconds and a second stage with a 45V setting and a performance time of 1 second. The Drop Ratio value is also 1.2 for both stages by default. Since there is no need for Current Supervision, option I superv. is disabled.



#	Label	Settings
0	Function Status	ON
1	27-1 Pickup	50 V
2	27-2 Pickup	45 V
3	27-1 Time Delay	1.50 s
4	27-2 Time Delay	1.00 s
5	27-1 Drop Ratio	1.20
6	27-2 Drop Ratio	1.20

Figure 8



#	Label	Settings
3	27-1 Time Delay	1.50 s
4	27-2 Time Delay	1.00 s
5	27-1 Drop Ratio	1.20
6	27-2 Drop Ratio	1.20
7	BkrClosed I MIN	0.040 A
8	OP Quantity	Vphph
9	I Superv.	OFF

Figure 9

After this, the pickup signals of both stages are removed from the unit with current monitoring and the necessary signals are added to the normal units without current monitoring. In the final step, these changes are applied to the relay to be prepared for testing.

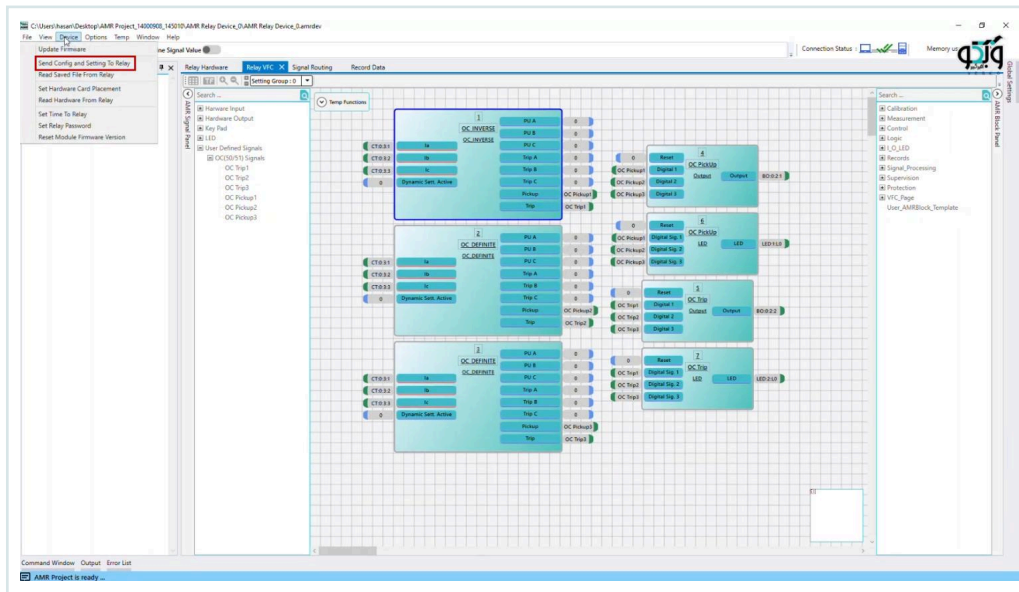


Figure 10

In the next step, by running AMPro software and opening the AMT Under/Over Voltage Test, simply go to the Test Object Parameters section and enter the basic information. Testing this function can also be performed in AMT sequencer room, but in order to make the states and test management more comfortable, this process is performed in the AMT Under/Over Voltage Test.

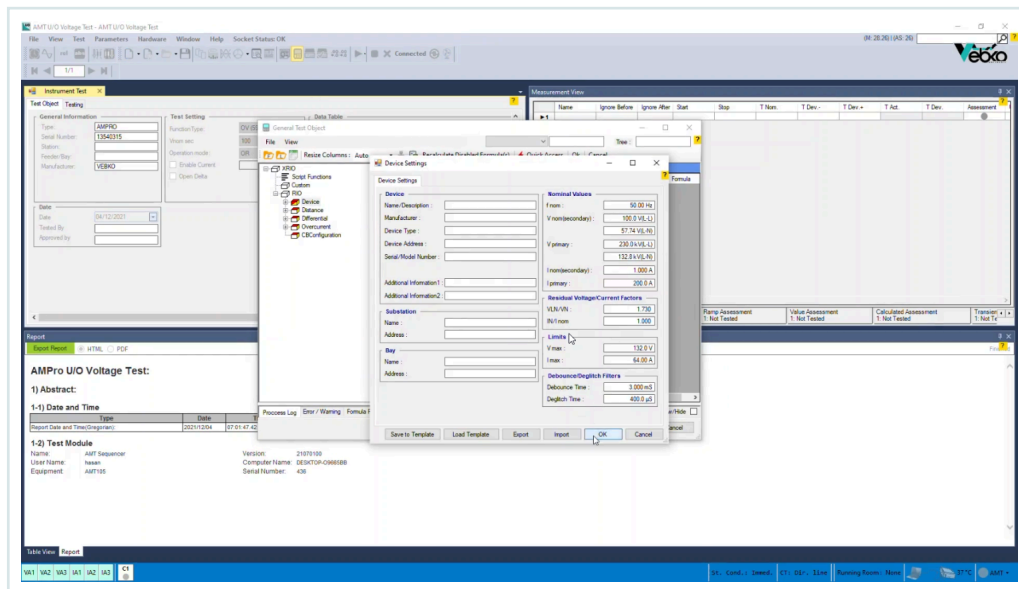


Figure 11

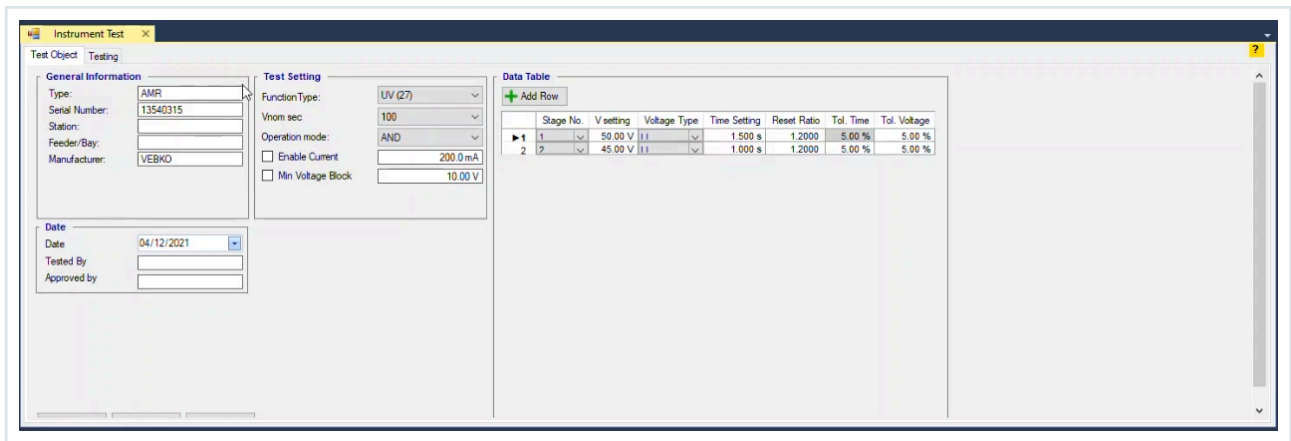
First, the information is entered in the General Information section. This information can include relay type, serial number and other information such as post name and feeder/b number.

In the Test Setting section, the UV (27) option is selected. Here Vnom sec, 100 volts is selected. Also, the performance mode is located on AND logic to reduce the voltage of all three phases of the

specified value to provide the test.

In order to evaluate the performing of Under Voltage protection, two time tests (Trip time) and Voltage Performance Test (pickup/drop-off) are performed.

Assuming there are two performance stages for Under Voltage protection, regulatory voltage value, voltage type, performance time and more are entered in the Data Table section for both stages of operation.



The screenshot shows the 'Instrument Test' window with three main sections:

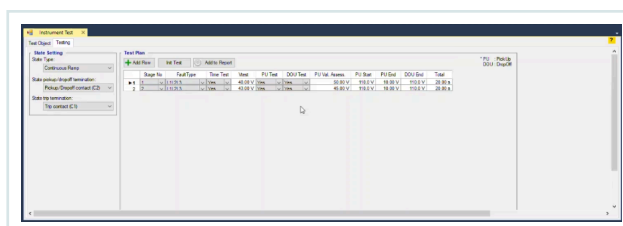
- General Information:** Type: AMR, Serial Number: 13540315, Station: , Feeder/Bay: , Manufacturer: VEBKO.
- Test Setting:** Function Type: UV (27), Vnom sec: 100, Operation mode: AND, Enable Current: 200.0 mA, Min Voltage Block: 10.00 V.
- Data Table:** A table with columns: Stage No., V setting, Voltage Type, Time Setting, Reset Ratio, Tol. Time, Tol. Voltage. It contains two rows of data:

Stage No.	V setting	Voltage Type	Time Setting	Reset Ratio	Tol. Time	Tol. Voltage
1	50.00 V	II	1.500 s	1.2000	5.00 %	5.00 %
2	45.00 V	II	1.000 s	1.2000	5.00 %	5.00 %

Figure 12

After this, in order to be more accurate in testing, continuous ramp option is selected in state setting section, C1 and C2 contacts are considered for detection of trip and pickup/drop-off, respectively. In addition to contact, the relay pickup status can be recorded with LED or even adjusted to instantaneous Under Voltage protection.

By entering the necessary settings in the Test Plan section, schedule the test in a way that both time test and voltage performance testing are performed. In the Fault Type section, by selecting the L1L2L3 option, states are created for the function test based on the Under Voltage of all three phases. By enabling Time Test, the state related to the performance time check is created. Vtest is the voltage value that the performance of the function in each stage is guaranteed. By selecting yes for PU Test and DOU Test elements, it is confirmed to perform pickup drop-off tests. In the PU Val. Assessment section, the evaluation of the pickup value of the function, in the PU Start section, the initial voltage of the pickup process, in the PU end section, the final voltage limit for the pickup test, and in the DOU End section, the final value for the drop-off test is entered. In the Total section, the total duration of the test is entered.



The screenshot shows the 'Test Plan' section of the 'Instrument Test' window. It includes a table for test stages and various checkboxes for test parameters.

Stage No.	Start Time	End Time	V test	PU Test	DOU Test	PU Val. Asses.	PU Start	PU End	DOU End	Total
1	00:00:00	00:00:00	45.00 V	Yes	Yes	Yes	10.00 V	10.00 V	10.00 V	00:00:00
2	00:00:00	00:00:00	45.00 V	Yes	Yes	Yes	10.00 V	10.00 V	10.00 V	00:00:00

Below the table, there are checkboxes for 'Time Test', 'PU Test', 'DOU Test', and 'Total'.

Figure 13

By Clicking on the Init Test option, creating states will be done based on user-imported settings. These states can be seen in the Table View window. This way, the test can be performed to evaluate the necessary items.

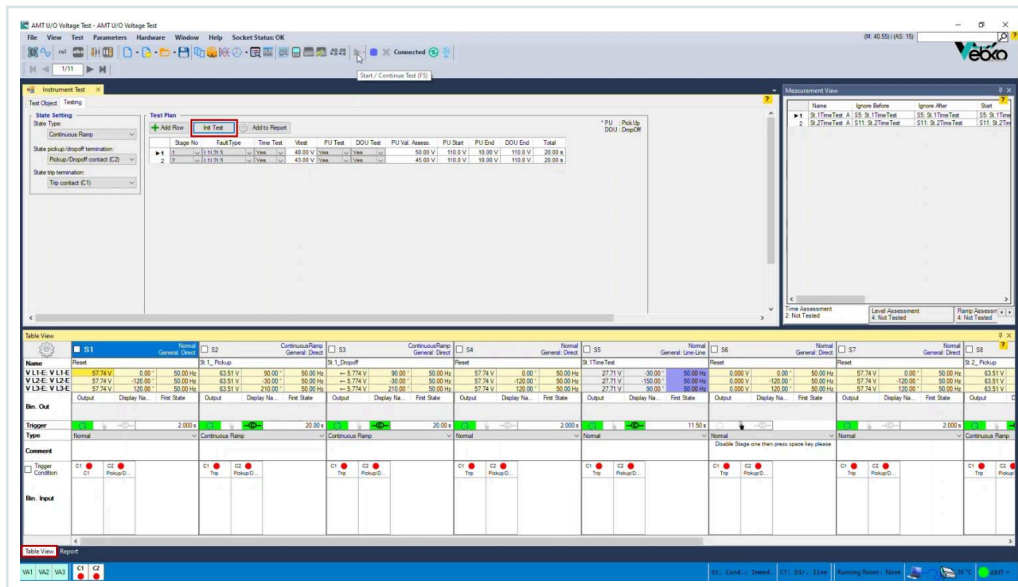


Figure 14

In the Measurement View section, in Assessment ramp tab you can see the assessment of the pickup drop-off and in the Time Assessment tab, you can see the performance time assessments of each stage can be seen.

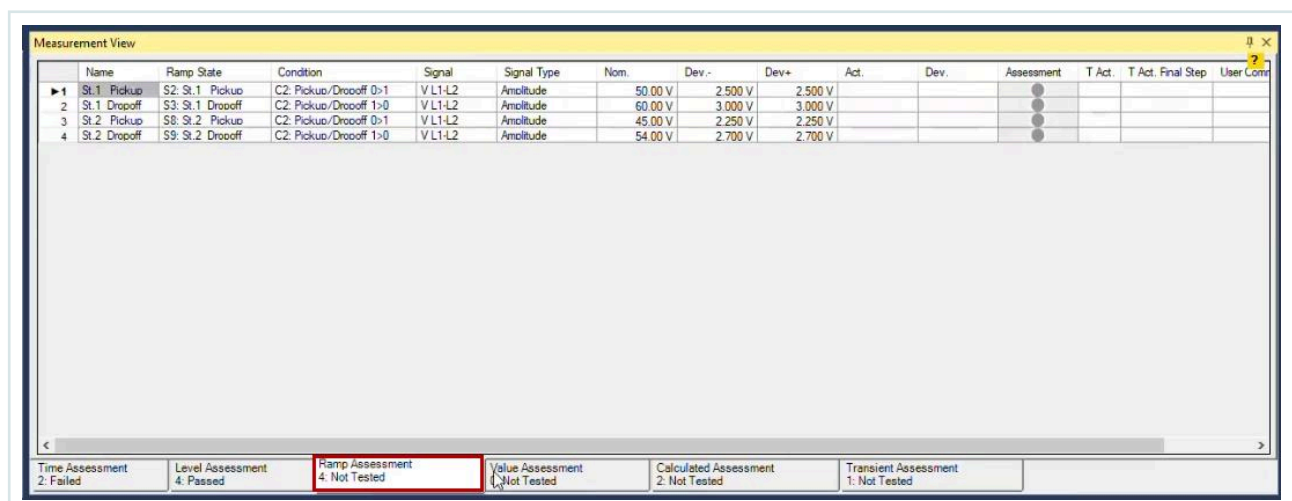


Figure 15



Figure 16

Keep in mind that when the test reaches the second stage assessment section, a message appears to the user to disable the first stage in order to provide non-interference conditions. This can be done by removing elements related to the first stage from the blocks associated with pickup and trip. Another solution is to equalize the setting of two stages. For this purpose, once again refer to AMR software and set the first stage settings equal to the second stage settings.

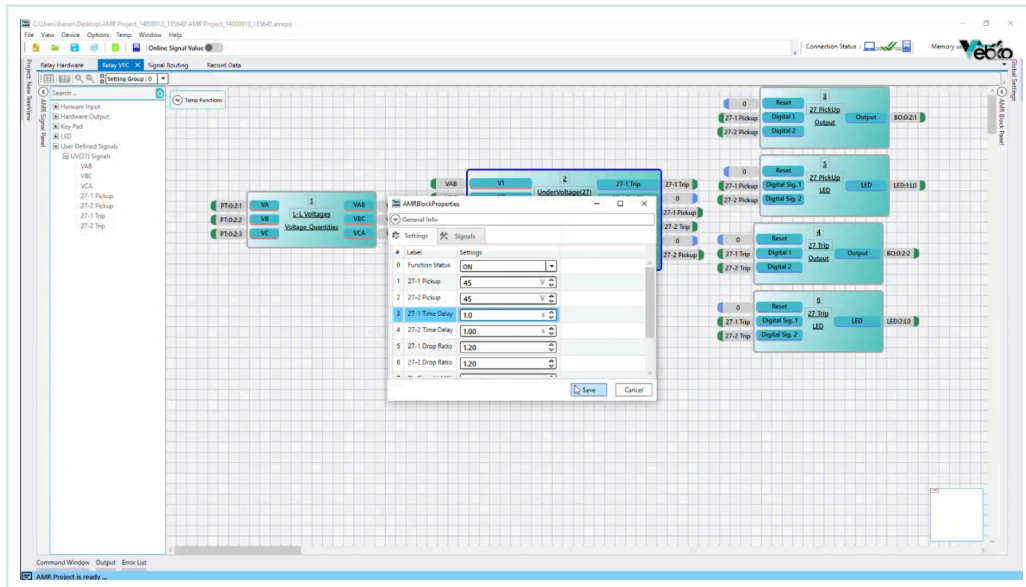


Figure 17

the settings are then to be sent to the relay.

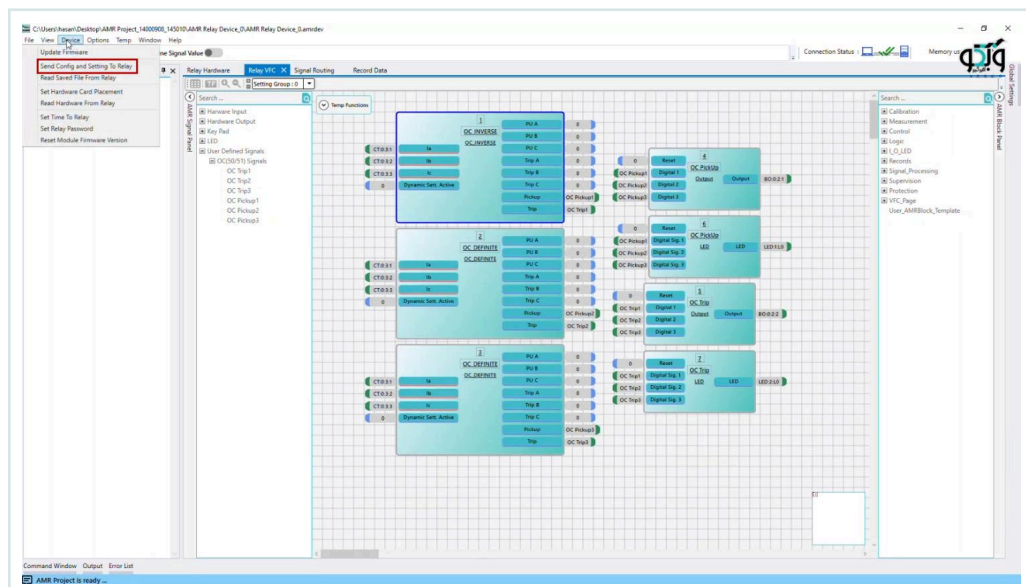


Figure 18

In the end, the results are added to the report by clicking on the Add to Report option. These results are visible in the Report window.

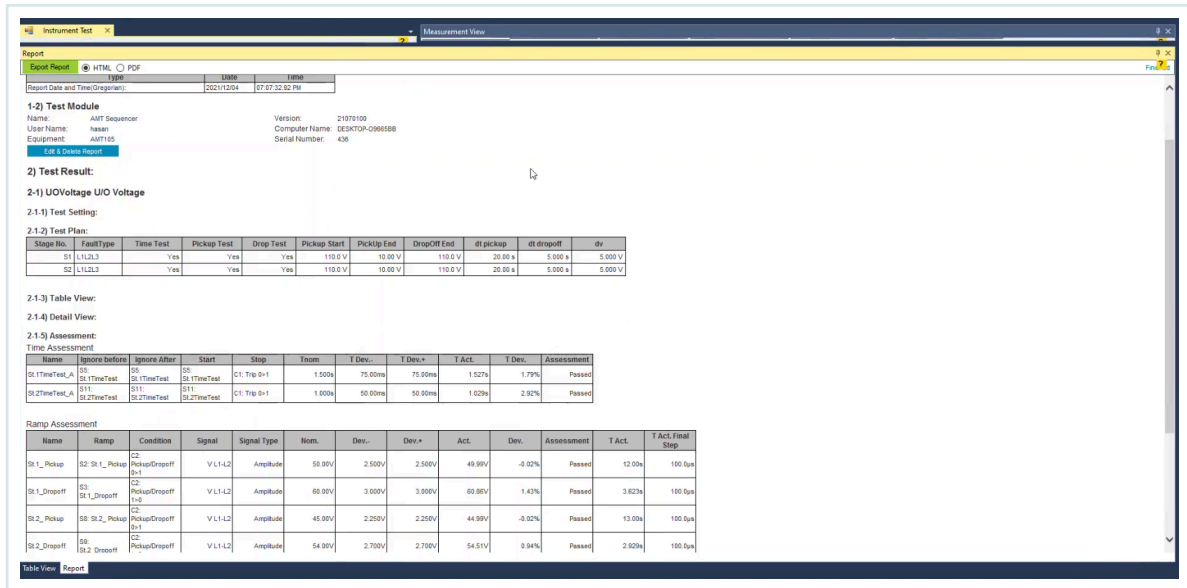


Figure 19

[jg1]Voltage_reduction_protection_test_in_AMR_relay