



VEBKO ONLINE HELP

Differential Protection Test in AMR Relay (Simple Test Using Templates)

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

AMR multi-function relay with modular and expandable hardware structure enables the development of various functions. The AMR relay has four regulatory groups and can save Event log, Trip Log and Comtrade. The relay has also successfully passed tests of protection relays in accordance with the IEC-60255 standard.

In order to configure this relay, you can use AMR software. The Relay Hardware software module enables relay hardware configuration and Relay VFC module, allowing logic writing and implementation of various functions from easiest to most complex configurations. Also, using the Signal Routing module, functions can be implemented in the fastest way. After adjusting the settings, it is possible to help the relay test more easier through test devices by receiving the Xrio file as an output containing the functions settings. The AMR software can be downloaded from the website of The Vebko Company (Vebko.org). First, the software connects to the relay using the LAN cable and entering the relay IP in the Communication window.

After connecting to the AMR relay at first, simply load the hardware modules and the default configuration of the device by selecting the Read Hardware from Relay option. The default password is 123456 in order to receive elements. At this point, a message is given to remove the signal, which, if confirmed, the current hardware signals used in the VFC section will be deleted, if the current hardware is not the same as the relay hardware.

It should be noted that the settings for the conversion ratio of voltage and current transformers are determined in the related card. Here, the ratio of the current card conversion is 200A to 1A and the voltage card conversion ratio is 63,000 to 100V.

(First, enter the VFC page): As mentioned earlier in the AMR software, configuring some of the most widely used functions as examples are placed in the software and the user can send new settings to the relay by selecting each of them and applying the desired changes. 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 blocks in the VFC are removed.

Here the differential function displayed with the name Diff is selected. In Config of this function, the signals of the current cards are connected to the differential block input. Finally, differential block output signals are assigned to Binary Outputs and relay LEDs by Output and LED blocks. You can access the settings of this function by double-clicking on the differential block.

After applying the desired changes, using the Ctrl+ E combination keys or by using the File menu and selecting the Export Xrio option, the Xrio file is downloaded from the software as an output containing differential function settings. Next, by running AMPro software and opening the AMT Differential room, simply upload the Xrio file you saved in the software environment in the previous step.

By loading the differential characteristic of the relay, conduct the test based on the periodic testing system of Iran's power transmission network protection systems. Here we select PreFault and

Postfault time 500 milliseconds and Fault time 200 milliseconds.

Firstly, points should be selected within blocking and Tripping areas. The relay performance time during testing must match the time set in the differential relay. At each slope of the curve, test points should be established at least in the characteristic breakpoints and outside of the current tolerance and close to it and on either side of the yield curve. In the lower parts of the characteristic, inactivity and in the upper parts of the characteristic, the moment performance must be recorded. In order to avoid prolonging the test time, fault types L1-E, L2-L3 and L1L2L3 are selected.

In the second step, the Check Test will be performed to calculate the performance and Inactivity on both sides of the characteristic, based on the time of the shots performed. This test is performed in fault types L1-E, L2-L3 and L1L2L3.

In the next step, by using Search Test, we evaluate the real curve of differential protection performance. According to the system, in search test, at least two search lines should be selected on the performance curve for each part of the curve slope, one of these lines is better to be in the characteristic fracture area. This test is performed in fault types L1-E, L2-L3 and L1L2L3.

1 Pickup-Drop Test

As one of the functional tests, you can use pickup drop feature for differential characteristic. The three options Primary Side, -Secondary Side and bias allow pickup drop for differential component on the primary, secondary side as well as bias current, respectively. For this purpose, just add points for different Fault Type and run the test. Here, the drop-off pickup is evaluated for all types on primary and secondary sides.

2 Stability test

Another function test, is available from AMT Differential's Room Stability tab. In this section, considering $I_{diff}=0$, you can specify the bias value as a coefficient against the nominal current to check the trans stability in this case. This test is performed in all fault types. When the test is finished, you can specify the elements in the report and save the output in different formats such as PDF.

[jg1]Differential_protection_test