RelayLabTest

Simulation-based type and acceptance testing software

RelayLabTest – Advanced type and acceptance

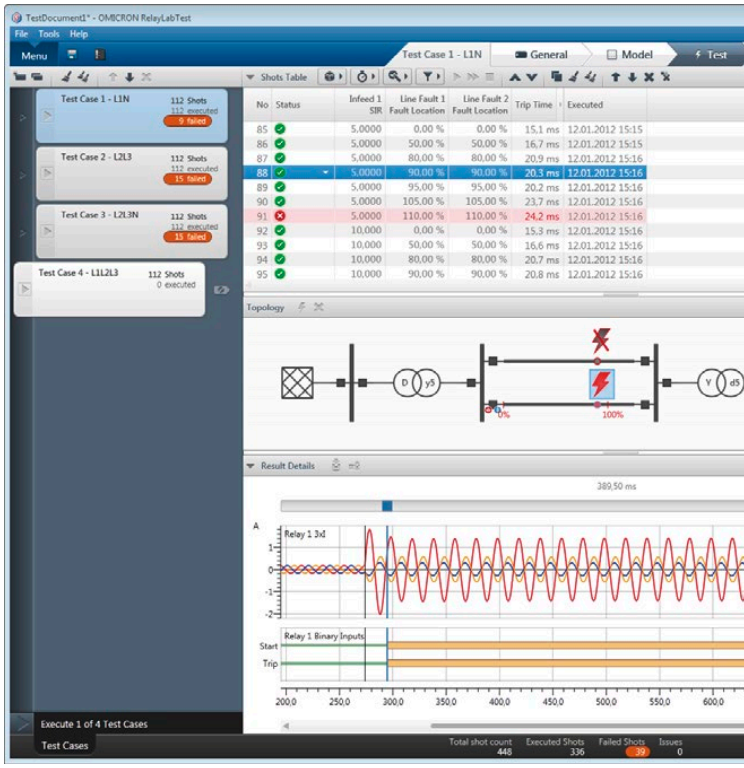
A revolution in type and acceptance testing

RelayLabTest is unique software which enables the user to assess the overall performance of protection devices under realistic operating conditions. It substantially simplifies in-depth type and acceptance testing on the basis of a network simulation. Test signals are directly output on CMC devices and optional amplifiers. The software is particularly easy to use and requires no special simulation or programming skills.

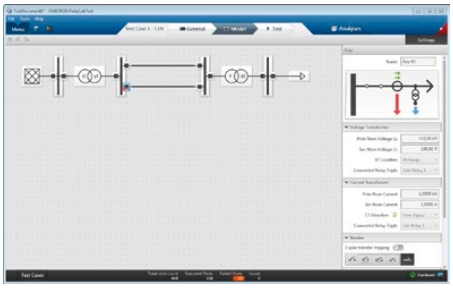
The setting up and execution of comprehensive tests is very convenient as RelayLabTest offers unique modeling and test automation functions. Any network or fault parameter can be varied automatically thus making this ideal for manufacturers' type testing or acceptance testing undertaken within utilities. Large numbers of test shots are created with just a few mouse-clicks.

Extensive test sequences support the simulation of complex fault scenarios such as cross-country and evolving faults. They include multiple fault incidents and also breaker operations in response to the relay commands. This allows the simulation of auto-reclosure cycles and offers the possibility to perform iterative closed-loop tests of one or more protection relays.

In addition to its flexible automation functionality, RelayLabTest provides in-depth analyses of the test results such as SIR diagrams and trip time histograms. Test results and statistical data can then be easily exported to external applications. RelayLabTest perfectly complies with the requirements for simulation tests according to the forthcoming distance protection standard IEC 60255-121.[1]



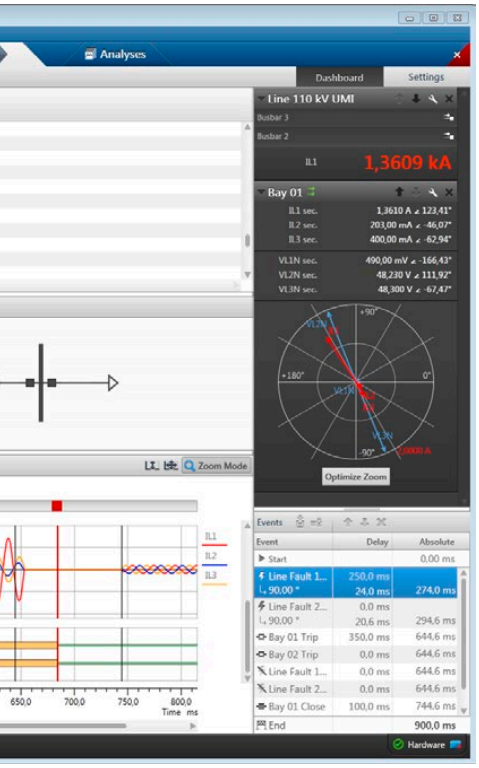
1. Model



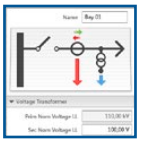
With the flexible grid editor complex power networks can be modeled easily. Elements for lines, busbars, infeeds, loads, two-winding transformers and more, are available.

[1] For all other tests required by IEC 60255-121, OMICRON provides an add-on for the Test Universe software

testing

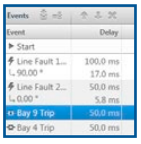


RelayLabTest provides unique features for simulation-based testing:

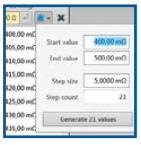


Clearly-structured settings ensure full control of all test parameters. For each element in the network a wide range of options is available.

The dashboard displays current, voltage, and power values from different locations. This information can be used to analyze load flows and fault currents.



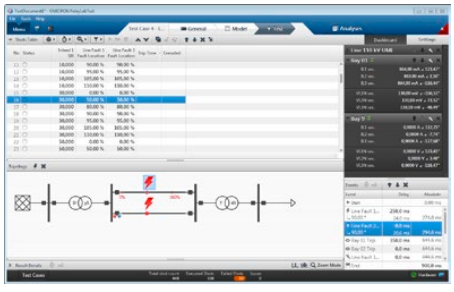
The test sequence may consist of multiple events like fault incidents and breaker operations. This allows to simulate the most complex of fault scenarios.



With automatic variation multiple parameters such as infeed parameters, fault types, and fault inception angles can be altered easily.

Test plans combine different network configurations and fault scenarios. Multiple test cases can be executed and analyzed simultaneously.

2. Test



RelayLabTest supports testing with extensive sequences and a large number of test shots. This allows the simulation of realistic operating conditions for comprehensive tests.

3. Evaluation

Automated assessment functions facilitate the quick evaluation of individual test shots and the overall test results. Failed shots can be found instantly and re-injected without delay.

4. Analysis

Easy-to-apply statistical analyses provide detailed insights on the test results. Two kinds of general graphical representations with many customization options are available.

RelayLabTest

RelayLabTest: Type and acceptance testing software

Applications

Relay manufacturers

- Type tests according to IEC 60255-121
- Simulation-based scheme tests
- Investigation of relay algorithm behavior

Utilities

- Thorough acceptance tests
- Investigation of relay algorithm behavior
- Reproduction of real-world scenarios
- Regression tests for updated firmware

Functional range

Transient simulation

- Pre-fault load conditions
- Capacitances of infeeds and lines
- Dynamic behavior of capacitor voltage transformers
- Saturation effects of current transformers
- DC offsets
- Current changes due to switch-off at the remote end

Event simulation

- Multiple 1-phase, 2-phase or 3-phase faults with, or without, ground contact
- Complex fault scenarios including evolving and cross-country faults
- Relay-controlled breaker operations (3-phase, 1-phase)
- Sophisticated auto-reclosure cycles

Statistical analysis

- XY charts for trip times and arbitrary infeed, load and fault parameters (for example, SIR diagram)
- Trip time histograms (“relay fingerprint”)
- Multiple test cases in one combined analysis

Supported test devices

- CMC 356, CMC 353, CMC 256plus, CMC 256 (with any NET hardware option), CMC 850
- CMS 356, CMA 156, CMS 156, CMA 56, third-party amplifiers

Related support offered by OMICRON

Training

- Testing with the RelayLabTest software
- Setting up of tests according to IEC 60255-121

Consulting

- Support from OMICRON experts
- Type tests for manufacturers according to IEC 60255-121
- Acceptance tests for utilities according to customer specifications

For more information on training and technical consulting please visit:
www.omicronenergy.com

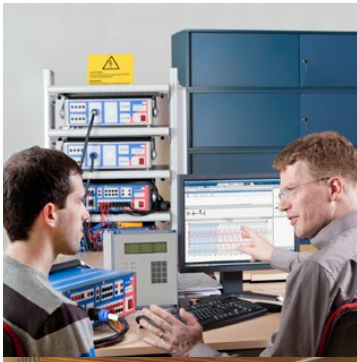
Key features

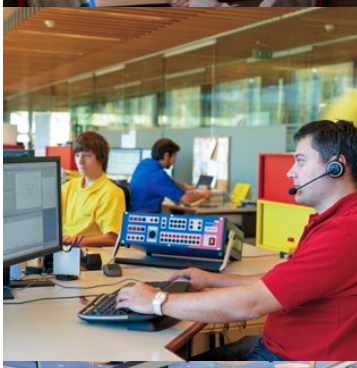
- Type and acceptance testing of relays under realistic operating conditions
- Quick and flexible modeling of complex power networks
- Automatic parameter variation for the quick set up of comprehensive tests
- User-definable test sequences to simulate complex fault scenarios
- Simulation of breaker operations for iterative closed-loop testing
- Easy-to-apply statistical analyses for an in-depth view on test results
- Current and voltage output on CMC test sets and additional amplifiers
- IEC 61850 support for testing with GOOSE messages and Sampled Values
- Simulation tests of protection devices according to IEC 60255-121

Additional benefits

OMICRON provides

- Worldwide high quality technical support
- Platforms for an international knowledge exchange
- Training courses designed for electric power system technicians and engineers





Ordering information

VESM6005	RelayLabTest

OMICRON is an international company serving the electrical power industry with innovative testing and diagnostic solutions. The application of OMICRON products allows users to assess the condition of the primary and secondary equipment on their systems with complete confidence. Services offered in the area of consulting, commissioning, testing, diagnosis and training make the product range complete.

Customers in more than 140 countries rely on the company's ability to supply leading-edge technology of excellent quality. Service centers on all continents provide a broad base of knowledge and extraordinary customer support. All of this together with our strong network of sales partners is what has made our company a market leader in the electrical power industry.

The following publications provide further information on the solutions described in this brochure:

Product catalog (secondary equipment)

CMC 356 brochure

CMC 353 brochure

CMC 256plus brochure

For more information, additional literature, and detailed contact information of our worldwide offices please visit our website.

www.omicronenergy.com