

TDMS

- protective relays
- energy meters
- transducers
- power quality
- CT-VT-PT
- transformers
- ground grid
- circuit breakers
- batteries
- surge arresters

THE INTEGRATED TESTING SOLUTION

TDMS is a powerful software package providing data management for acceptance and maintenance testing activities. Electrical apparatus data and test results are saved in the **TDMS** database for historical results analysis.

TDMS software organizes test data and results for the majority of electrical apparatus tested with ISA test sets and related software.

TDMS software controls and provides data acquisition from all ISA Test:

- . DRTS 66, DRTS 6, BER 3, DRTS, DRTS 3 and ART 3 - Relay and Energy meters test sets.
- . T1000, T2000 and T3000 - Primary and Secondary injection test sets.
- . CBA 1000 and CBA 2000 - Circuit Breaker analyzers.
- . BTS 100, BTS 200 - Battery load units.

TDMS software is a powerful database.

It allows to create an electrical network with substations, feeders and the majority of electrical apparatus, such as:

- . Relays
- . Instrument transformers
- . Power transformers
- . Circuit Breakers
- . Energy Meters
- . Transducers
- . Power Quality Meters
- . Ground Grids

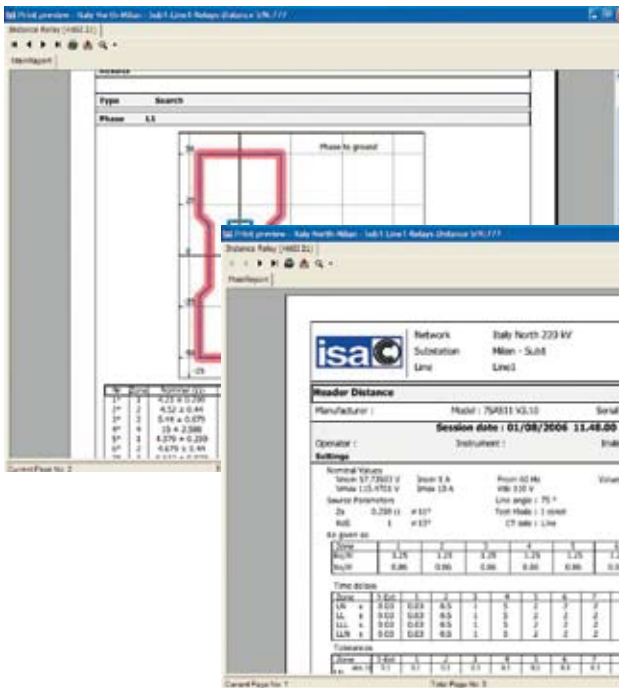
TDMS Test & Data Management Software is the Integrated testing solution to perform any substation apparatus commissioning and maintenance

TDMS Report Editor

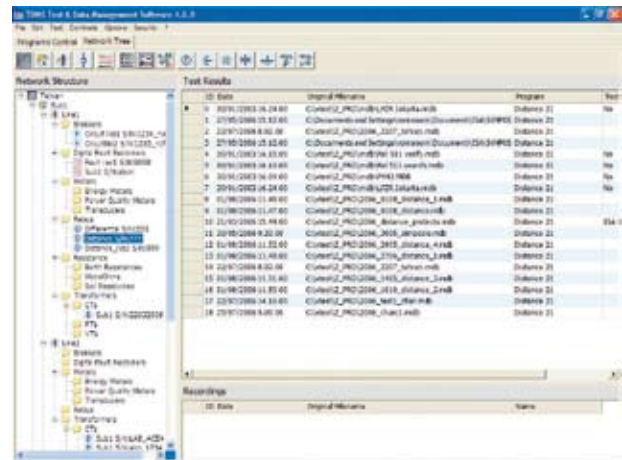
TDMS has a built-in Report Editor that allows to generate professional test report for a single test object, for a group of tested devices or for an entire substation.

It can create customized report or use standard forms.

TDMS Tests report can be exported in MS Office (Word and Excel), PDF or RTF formats.



TDMS Reports



TDMS Data base

TDMS is the control platform to run all ISA test software. Test programs, calibration, firmware, software upgrade and languages are all managed from TDMS.



TDMS Control Platform

TDMS

- protective relays
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TDMS - TESTING PROTECTIVE RELAYS

TDMS is a software package to be used with all the automatic test systems manufactured by ISA

TDMS is a powerful software package for testing:

- . Protective relays in transmission, distribution and power generation;
- . Watt-hour meters;
- . Transducers;
- . Meters;
- . Power quality meters.

TDMS runs within Microsoft Windows 98, 2000, XP and Vista.

Relay Application description

The TDMS software platform allows the user to select easily and quickly the most appropriate software package for the required application.

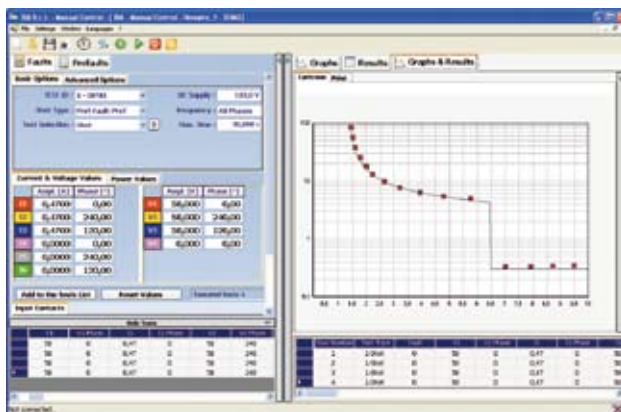
TDMS test software uses an open architecture easily expandable with additional software modules at any time.

IEC61850 Interface - Relay testing with Ethernet -based substation communication protocol.

By means of a dedicated hardware and the TDMS software, ISA DRTS 6 can expand his testing capabilities by handling those IEC61850 messages.

TDMS Package can be used to test any protective relays in:

- Power Generation Plants;
- Distribution network;
- Transmission network;
- Industry.



New manual control virtual front panel.

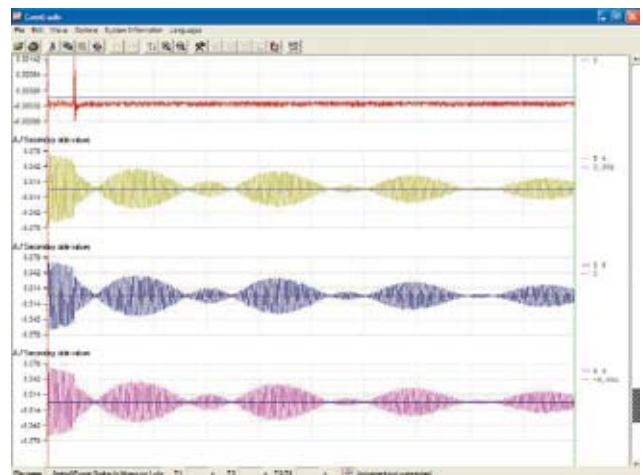
Manual control module has the following main characteristics:

- Intuitive graphical user interface;
- Virtual Front Panel control;
- Graphical Vector control;
- Ramp Test: sequence of tests with ability to ramp any parameter up or down at the same time;
- Threshold test: automatic determination of a threshold (current, voltage, frequency, phase angle);
- Rate of change (gradient) tests of frequency, voltage, current, phase-angle and V dc (Dx/Dt);
- Sequence editor;
- Test of Distance relays with direct import of relay characteristic with RIO Format;

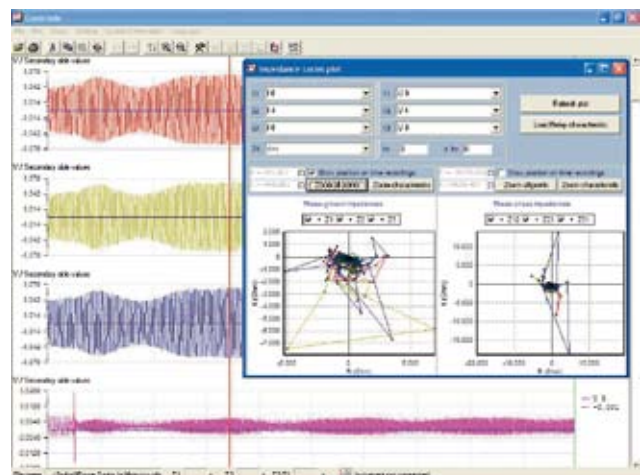
- Test of Distance relays with simulation of all type of faults: single phase, two phase, two phase to ground; three phase;
- Report Manager allows test report customization to user requirements; results are exported in Windows formats.

Comtrade Module: Playing back transient signals and waveform generation

- Playing back transient signal from digital fault recorders and numerical relays;
- Analysis of relay operating time;
- Graphical view and replay of analog and binary signals;
- Impedance locus display;



Comtrade: Playing back transient signals.



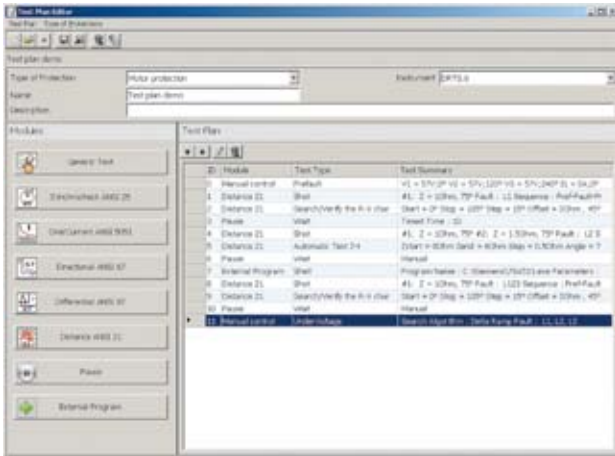
Comtrade: Impedance locus display

- Scaling, cut, copy and paste of the analog signals;
- Supported file format: COMTRADE;
- Test reports for printing or export in Windows .TXT or WMF format.

Test Plan Editor

The “Program Control Tab” now has a new layout:

- Relays Test Plan and Editor; with this new features we give the user the possibility to create and run different test plans for different test applications.



Test Plan Editor is available to create a test plan using predefined macro functions available for any type of relays.

This new feature is particularly useful for testing multifunction relays.

The “Test Plan” can be associated to any relay in TMDs Network Structure and prior execution define relay setting and characteristic.

The “Test Plan”, can be run on a specified relay: the entire test plan can be executed and/or the user can select the macros to execute on that relay according to its needs.

- Finally the “Test Plan” can be printed and saved automatically into the TDMS database.

Automatic Relays Testing in Power Transmission, Generation & Distribution

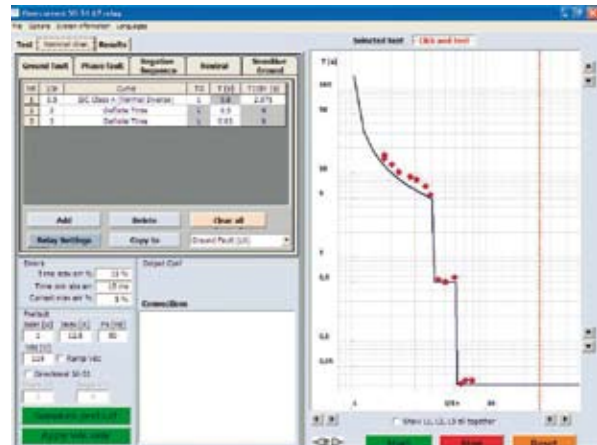
The TDMS - Generation & Distribution Module is a powerful software that allows the user fully automatic testing of the main protective relays in:

- Transmission networks;
- Power Generation Plants;
- Distribution networks;
- Industry.

Main characteristics:

- Extremely easy to use;
- Intuitive graphical user interface;
- Click and test operation;
- Multifunction relay test;

- Graphical definition of the nominal characteristic;
- Automatic test and computing of deviation from the nominal values;
- Report Manager allows test report customization to user requirements; results are exported in Windows formats.



Overcurrent relay module 50-51.

- Graphical definition of the nominal characteristic;
- Automatic test and computing of deviation from the nominal values;
- Report Manager allows test report customization to user requirements; results are exported in Windows formats.

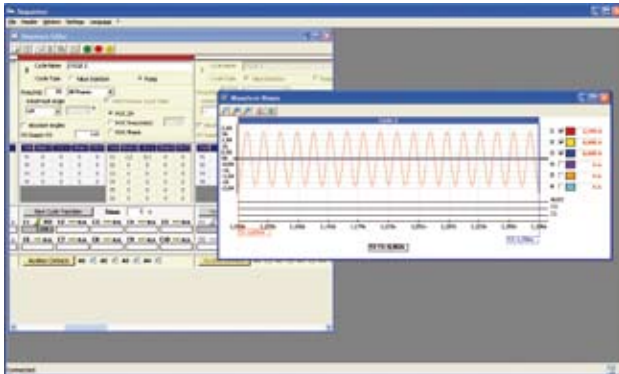
TDMS Software includes the following testing modules:



Differential relay module-87.

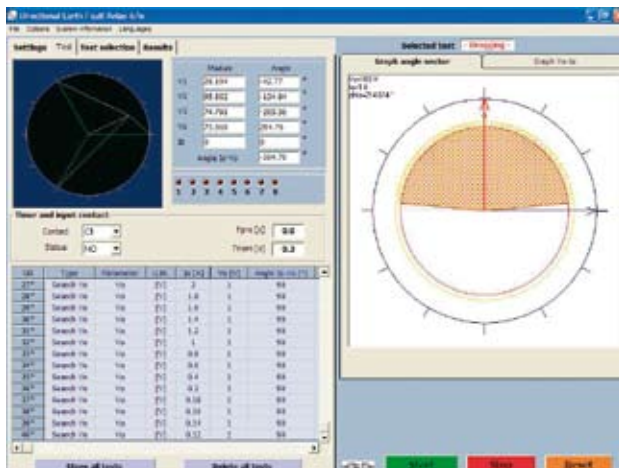
Sequencer

The sequencer module is a software for determining the relays operating time and the logical sequence of the event.



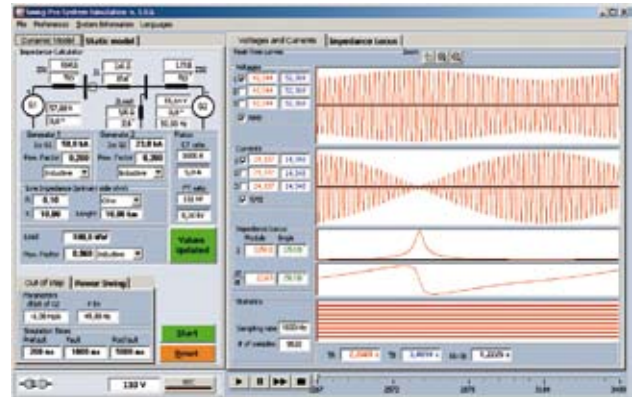
Sequencer

- **OVERCURRENT MODULE 50-51** for automatic testing of OVER-CURRENT relays, including all the standard curves IEC, IEEE and IEC.
- **DIFFERENTIAL RELAYS MODULE-87**, for automatic testing of Differential relays (transformers, generators and bus bar), with 3 and 6 currents.



Directional relay module-67.

- **LINE DIFFERENTIAL MODULE 87-7**: Automatic testing of Line differential relays; End to End testing with GPS (Global Positioning System) synchronization, using two DRTS.
- **DIRECTIONAL MODULE-67**, for automatic testing of earth directional relays.
- **SYNCHRONIZING MODULE-28**, for automatic testing of synchronizing devices with 3 or 6 voltages control.
- **SWING PRO MODULE**: for testing power swing blocking and out of step function.
- **MULTIFUNCTION RELAYS** can be tested easily creating customized test plans.
- **HARMONIC GENERATOR MODULE** allows the creation of arbitrary harmonic waveform.



Swing Pro module.



Harmonic generator.

Distance Relays-21

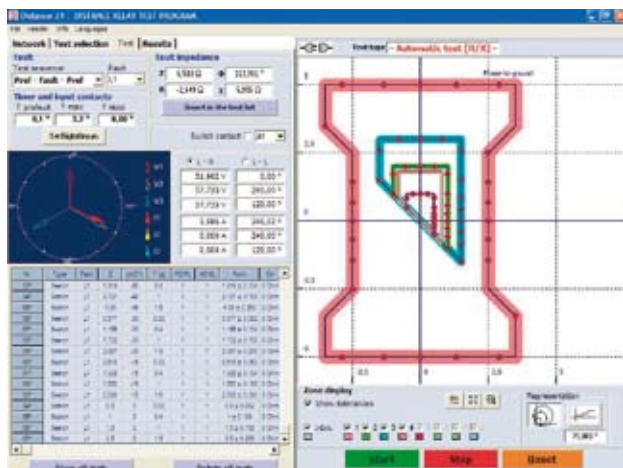
The Distance Relays-21 Module is powerful software that allows users fully automatic testing of any distance relay regardless of the type or the manufacturer in HV and EHV Transmission networks.

Main characteristics:

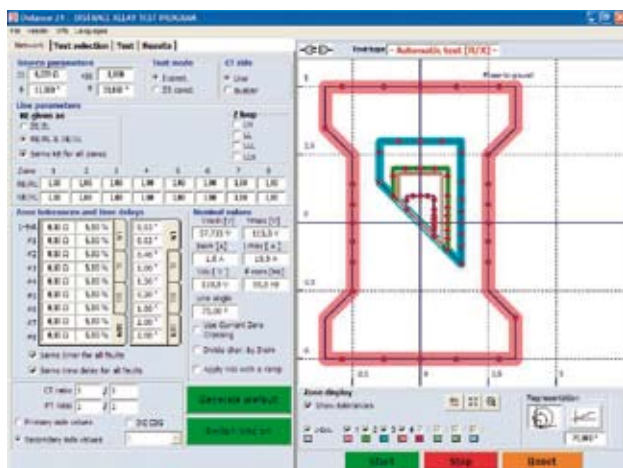
- Graphical user friendly interface;
- Interactive Graphic editor of the nominal characteristic;
- Automatic test and computing of deviation from the nominal values;
- Sequencer Editor for creating test sequences by entering fault impedances or entering currents/voltages and phase-angle quantities;
- Report Manager allows test report customization according to user requirements; results are exported in Windows formats.

Distance Relay-21 has the following testing features:

- . Graphical editor of distance relay characteristic;
- . Simulation of all types of faults: single phase, two phase, two phase to ground; three phase;
- . Click and test directly the R-X diagram of any distance relay nominal characteristic;
- . Automatic test of a given nominal characteristic;
- . Automatic search of an unknown characteristic;
- . End to End test by means of two synchronized ISA test sets;
- . Power Swing Blocking test;
- . Auto-recloser test;
- . Developing fault test;
- . Switch-on-to-fault test;
- . Fuse failure;
- . Direct import of the setting files from main relay manufacturers using RIO file format;



Distance relay-21 test program.



Distance relay-21 test program.

- . Import SET files from our old automatic test programs for distance relays written with X.TEST editor.

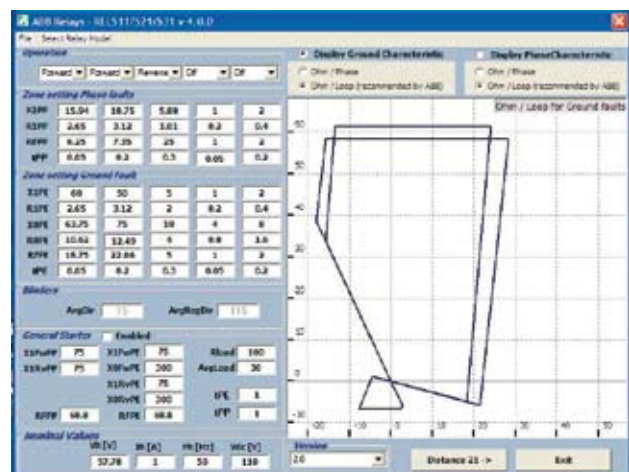
Enhanced features:

Other important features have been included to enhance the automatic test, like:

- . Possibility to set different earth factor for each zone: this feature was already available with other automatic test programs since more and more relays now have this feature.
- . Possibility to set the earth factor as RE/RL and XE/XL
- . Possibility to test the characteristic represented in terms of loop resistance and fault reactance (better known as Arc resistance compensation).

Special distance relay test programs

A large number of special test programs for the main relay manufacturers is included in our Special Distance Relays Test Program Library. Test programs for old electromechanical, solid state and numerical relays from AREVA, ASEA, ABB, ALSTOM, BBC, GE, GEC Alstom, Mitsubishi, SEL, SIEMENS, Toshiba and VAtch are included in the library (Please ask for the detailed list of test programs). These programs ask the relay settings, draw the nominal curve and test it automatically with the Distance Relay-21 program.



Special distance relay module.

TESTING ENERGY METERS TRASDUCERS AND PQ METERS

This package is designed for the automatic test and calibration of:

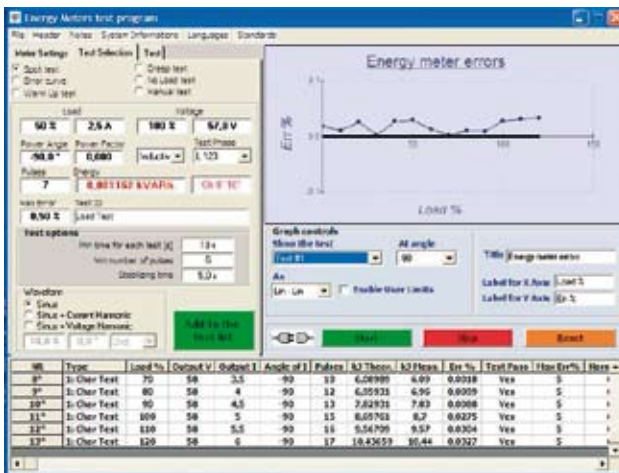
- Energy meters
- Transducers
- Measuring instruments

The Measurement Software Package consists of three test programs:

Energy meters

Allows automatic testing and calibration of energy meters according to the international standard IEC521.

- Test of class 1, 0.5 or 0.2 energy meters;
- Test without or with a standard meter;
- Energy meter accuracy test - Load test;



Energy Meter Test Program control panel.



Energy Meter Test Program manual control.

- Creep test;
- No-Load test;
- Automatic percentage of error computation.

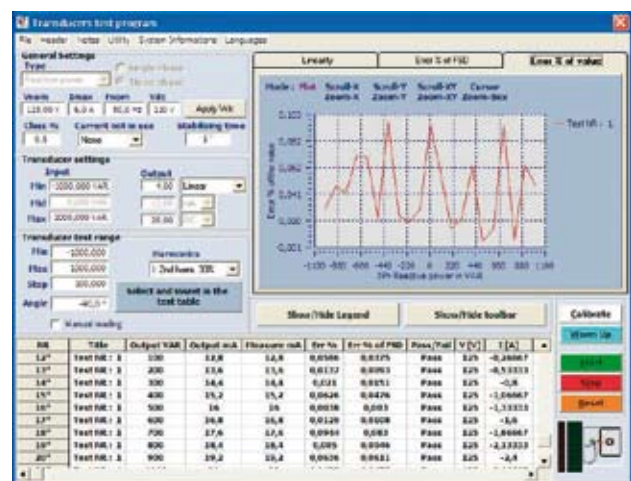
Results

- Results are saved in graphical and tabular form for later use;
- Test reports for printing or export in Windows .TXT or .WMF format.

Transducers

Has been designed for testing measuring transducers:

- Voltage, Current, Frequency and all Power transducers;
- The software automatically computes the errors of transducers.



Transducer Test Program control panel.



Transducer Test Program manual control.

Results

- Results are saved in graphical and tabular form for later use;
- Test reports for printing or export in Windows .TXT or .WMF format.

Power quality meters

It allows automatic testing of power quality meters according to the international standard IEC61000-4-30.

Tested Parameters are:

- change in power frequency;
- changes in supply voltage (dips, swells, rapid voltage changes...);
- presence of flickers;
- voltage and current harmonics/interharmonics;
- voltage unbalance;
- transient voltages;
- and others



Pqmeter. Test Program control panel.

Transcope Software Module

This software module is an option for DRTS66. This option is to be specified at order.

With this option the 10 binary inputs of the DRTS66 can be configured as 10 analog voltage inputs and to act as a:

- Three phase voltage and current (with external clamp or shunts), phase angle, wattmeter, frequency and harmonic meter;
- Oscilloscope;
- Analog Transient recorder;
- Sequence of event recorder.

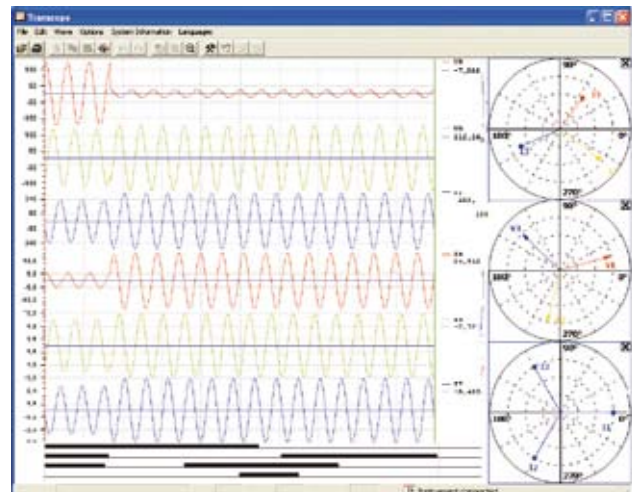
The Transcope functions can be used during any other test function of the DRTS66.

Measurement features:

- Current and voltage: RMS values.
- Phase angles between inputs.
- Frequency.
- Active, reactive and apparent power.
- Energy.

- Harmonic content. Measurements of the Total Harmonic Distortion, and of the distortion of all harmonic components up to the 40th.

- Oscilloscope feature: it is possible to select the trace to be viewed, and to view it on the local display of the DRTS66. The oscilloscope can be triggered on any trace.
- Recording feature: it is possible to use the test set as an analog transient recorder and as a digital sequence of event recorder.
- Extended triggering capability: positive and negative trigger thresholds and ROC thresholds on any of the voltage or current inputs, and also on any of the computed parameters.



Programmer Software Package

XTEST_ X ISA

Provides an OCX application (ActiveX) that allows controlling any Automatic Relay Test Set with high level languages, such as Visual Basic, Visual C++ or any other software that supports the ActiveX technology.

This is particularly useful for integrating the test set control into existing software, that includes the control of other instruments, such as meters, converters and so on.

TDMS

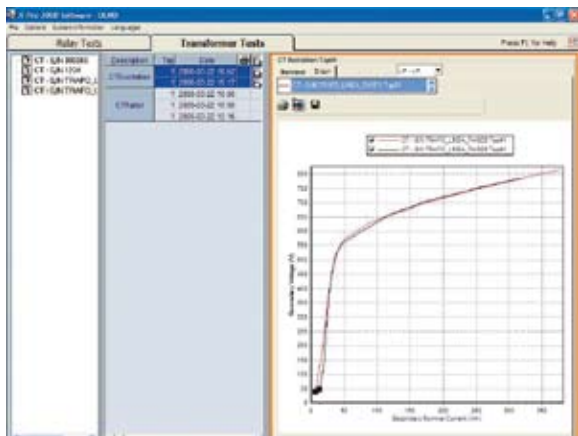
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TESTING CT-VT-PT TRANSFORMERS

TDMS CT-VT-PT Transformer and Ground Grid software module is a powerful application that provides connectivity with the instruments of the t/XX family: T1000 for relays testing, T2000 for transformer testing and the powerful sub-station & maintenance test set T3000.

The main test application are defined as:

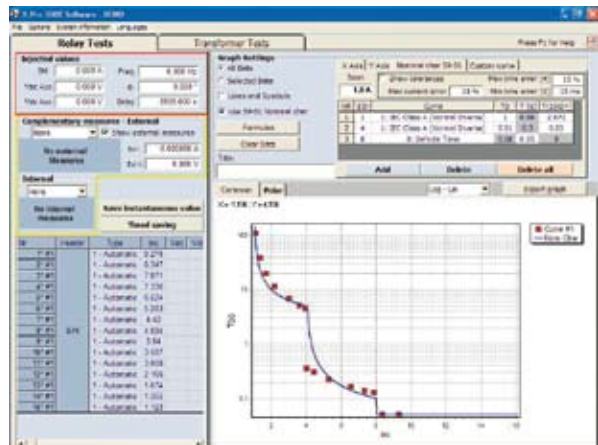
- Relay Test Application
- Transformer Test Application
- Line Impedance Measurement
- Ground Grid Resistance and soil resistivity



TDMS - CT Saturation Curve Test Result

The software performs various tasks, such as:

- Download stored measures, performed on the field, and saved in the local memory of the instrument;
- Open and save results in a Access Database (.MDB) format;



TDMS - Relay Test Result

For T1000 and T3000 in relay test application mode:

- Real time display of the measures made by the instrument;
- Possibility to draw the characteristic of the relay under test.
- Perform calculation on the results.
- Display and print Cartesian or Polar graphs of all combination of measures.

For T2000 and T3000 in transformer test application mode:

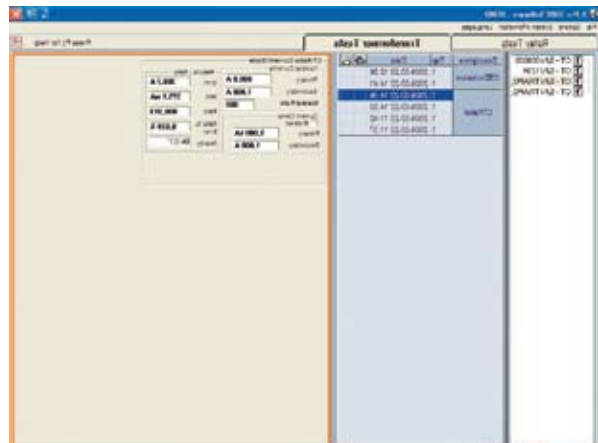
- Display and print transformer results.
- Compare different CT excitation curves on the same graph.

The TDMS software control also the instrument to:

- Upgrade the firmware of the instrument.
- Save or load the calibration values.

For T1000 and T3000 in Relay test application mode:

- Control the choice of internal or external complementary measures;
- Save or load of instrument settings.



TDMS - CT Test Result

TDMS

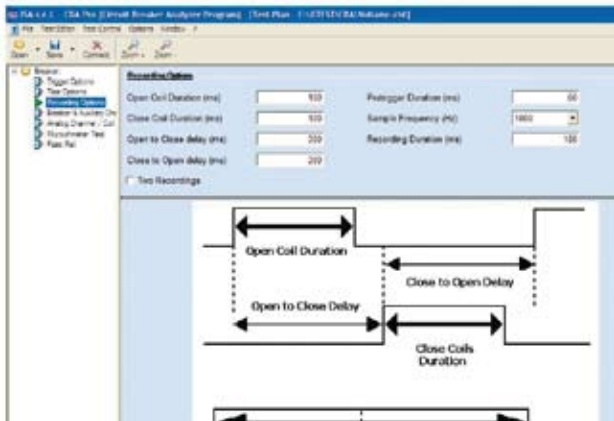
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TESTING CIRCUIT BREAKERS

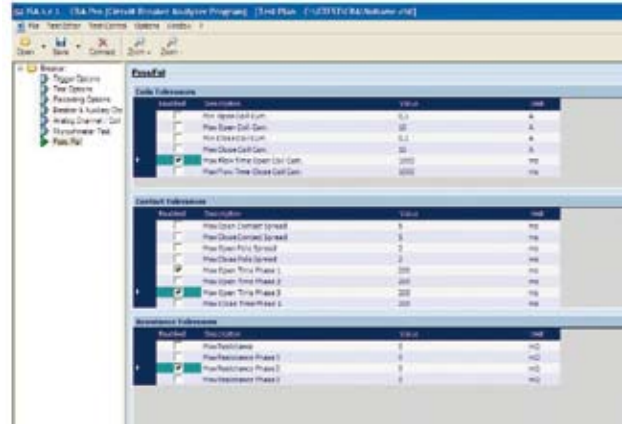
TDMS - Circuit Breaker software module is a powerful application that provides connectivity with CBA 1000/CBA 2000 test set for circuit breaker analysis.

The software performs various tasks, such as:

- Full control of the Circuit Breaker analyzer CBA 1000/CBA 2000.
- Download pre-defined test plans to the CBA 1000/CBA 2000 test set.
- Download test plans defined with CBA 1000/CBA 2000 to TDMS.
- Download test results (timing test, coil current, transducers and microhmeter measures) stored on CBA 1000/CBA 2000 local memory.

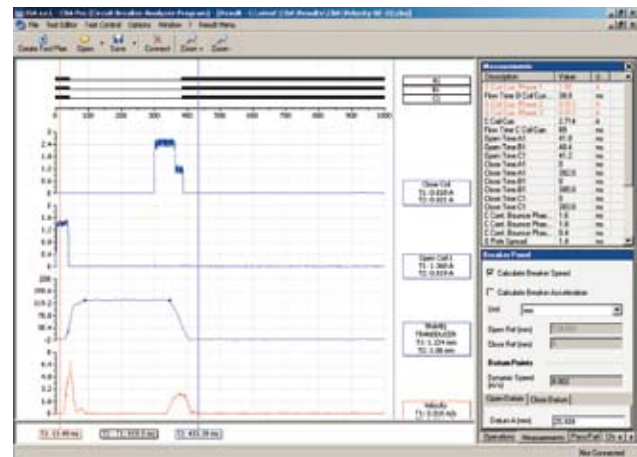


TDMS - Circuit Breaker Testing Parameters



TDMS - Circuit Breaker Testing Parameters

- Display channels waveforms.
- Calculation on data received from CBA 1000/CBA 2000.
- Compare different curves on the same graph.
- Enhanced measurement features for motion, speed and acceleration analysis.
- Test plans and test results can be viewed, edited, saved and printed.
- Test results can be exported in Word, Excel, RTF format and PDF.
- Save or Upload the calibration values.



TDMS - Circuit Breaker Test Result



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