



## X.TEST 3000 SOFTWARE

ADVANCED SOFTWARE PACKAGE FOR TESTING:

- PROTECTIVE RELAYS
- ENERGY METERS
- TRANSDUCERS

### X.TEST 3000 SOFTWARE

**X.TEST 3000** is a software package for use with all the automatic test systems manufactured by ISA (DRTS, DRTS-3, DRTS-6, ART/3, and ART/100. For detailed instrument specifications please refer to the individual product data-sheet).

**X.TEST 3000** is a powerful software package for testing:

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

**X.TEST 3000** runs within Microsoft Windows 3.11, 95, 98, 2000 and NT.

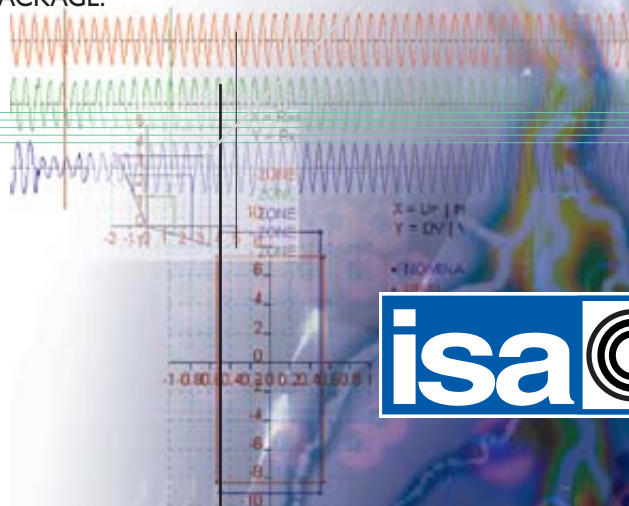
### APPLICATION DESCRIPTION

The **X.TEST 3000** software platform allows the user to select easily and quickly the most appropriate software package for the required application.

**X.TEST 3000** test software uses an open architecture easily expandable with additional software modules at any time.

**X.TEST 3000** consists of 5 main applications:

- . PROTECTION SOFTWARE PACKAGE;
- . ADVANCED GENERATION AND DISTRIBUTION SOFTWARE PACKAGE (X.PRO);
- . ADVANCED TRANSMISSION SOFTWARE PACKAGE (Z.PRO);
- . MEASUREMENT SOFTWARE PACKAGE;
- . PROGRAMMER SOFTWARE PACKAGE.



## THE TABLE BELOW SHOWS THE CONTENTS OF THE FOUR X.TEST 3000 SOFTWARE MODULES AND THEIR APPLICATIONS

### PROTECTION SOFTWARE PACKAGE

X.PRO BASIC	MANUAL AND AUTOMATIC TEST OF ALL POWER GENERATION AND DISTRIBUTION RELAYS
Z.PRO BASIC	MANUAL AND AUTOMATIC TEST OF ALL DISTANCE RELAYS
MAN-R	PLAYING-BACK TRANSIENT SIGNAL AND WAVEFORM GENERATION – COMTRADE FORMAT
UPGRADE	UPGRADES SOFTWARE RESIDENT IN THE TEST SET

### ADVANCED GENERATION & DISTRIBUTION SOFTWARE PACKAGE (PROTECTION SOFTWARE PACKAGE IS ALSO INCLUDED)

X.PRO	AUTOMATIC TEST OF OVER-CURRENT RELAYS
X.PRO	AUTOMATIC TEST OF OVER-VOLTAGE AND UNDER-VOLTAGE RELAYS
X.PRO	AUTOMATIC TEST OF OVER AND UNDER FREQUENCY RELAYS
X.PRO	AUTOMATIC TEST OF FREQUENCY RATE OF CHANGE RELAYS
X.PRO	AUTOMATIC TEST OF DIFFERENTIAL RELAYS
X.PRO	AUTOMATIC TEST OF LINE DIFFERENTIAL RELAYS
X.PRO	AUTOMATIC TEST OF DIRECTIONAL RELAYS
X.PRO	AUTOMATIC TEST OF REVERSE POWER RELAYS
X.PRO	AUTOMATIC TEST OF SYNCHRONIZING DEVICES

### ADVANCED TRANSMISSION SOFTWARE PACKAGE (PROTECTION SOFTWARE PACKAGE IS ALSO INCLUDED)

Z.PRO	CLICK AND TEST FUNCTIONS
Z.PRO	AUTOMATIC SEARCH AND TEST OF ANY DISTANCE RELAY CHARACTERISTIC CURVE
Z.PRO	GRAPHICAL DISTANCE RELAY CHARACTERISTIC EDITOR AND AUTOMATED TESTING
Z.PRO	AUTOMATIC TEST OF DISTANCE RELAY COMPLEMENTARY FUNCTIONS: POWER SWING, END TO END DEVELOPING FAULT, AUTO RECLOSER, ETC.

### MEASUREMENT SOFTWARE PACKAGE

ENERGY.TEST	AUTOMATIC TEST AND CALIBRATION OF WATT-HOUR METERS
TRNSDUCER.TEST	AUTOMATIC TEST AND CALIBRATION OF POWER, CURRENT, VOLTAGE AND FREQUENCY TRANSDUCERS
METER.TEST	AUTOMATIC TEST AND CALIBRATION OF METERS

### PROGRAMMER SOFTWARE PACKAGE

EDITOR	PROGRAMMING LANGUAGE FOR ALL TEST SETS
Xtest - X.OCX	APPLICATION FOR THE CONTROL OF ALL TEST SETS FROM HIGH LEVEL LANGUAGES

# PROTECTION SOFTWARE PACKAGE

## APPLICATION

The **Protection Software Package** can be used to test any protective relays in:

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

The **Protection Software Package** consists of the following software modules:

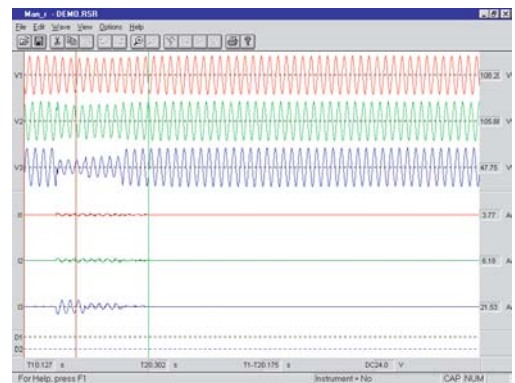
- . Intuitive graphical user interface;
- . Virtual Front Panel control;
- . Graphical Vector control;
- . Ramp Test: sequence of tests with ability to ramp any parameter up or down at the same time;
- . Threshold test: automatic determination of a threshold (current, voltage, frequency, phase angle);
- . Rate of change (gradient) tests of frequency, voltage, current, phase-angle and Vdc ( $\Delta x/\Delta t$ );
- . 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.



**MANUAL CONTROL VIRTUAL FRONT PANEL.**

## MAN-R: 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;
- . 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.



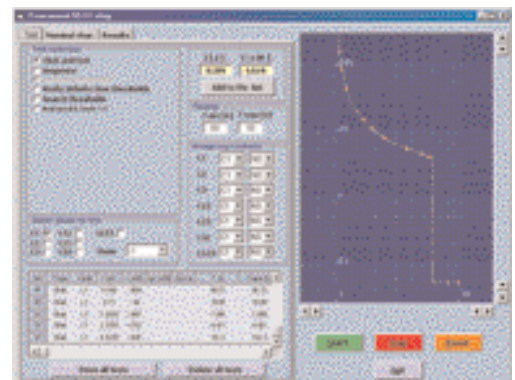
**MAN-R. PLAYING BACK TRANSIENT SIGNALS.**

# ADVANCED GENERATION & DISTRIBUTION SOFTWARE PACKAGE (X-PRO)

## APPLICATION

The **Advanced Generation & Distribution Software Package (X-PRO)** is a powerful software module that allows the user fully automatic testing of the main protective relays in:

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



**X-PRO. OVERCURRENT RELAY MODULE.**

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.

The **Advanced Generation and Distribution Software** includes the following testing modules:

- . **OVERCURRENT MODULE** for automatic testing of OVER-CURRENT relays, including all the standard curves IEC, IEEE and IEC.
- . **VOLTAGE MODULE** for automatic testing of under and over Voltage relays. Definition of the nominal characteristic and its automatic test.
- . **DIFFERENTIAL RELAYS MODULE**, for automatic testing of Differential relays (transformers, generators and bus-bar), with 3 and 6 currents.
- . **LINE DIFFERENTIAL MODULE:** Automatic testing of Line differential relays; End to End testing with GPS (Global Positioning System) synchronization, using two DRTS.
- . **DIRECTIONAL MODULE**, for automatic testing of earth directional relays.
- . **FREQUENCY MODULE**, for automatic testing of over and under frequency relays.
- . **FREQUENCY RATE OF CHANGE MODULE** for automatic testing of frequency rate of change relays.
- . **SYNCHRONIZING MODULE**, for automatic testing of synchronizing devices with 3 or 6 voltages control.
- . **POWER MODULE:** for automatic testing of reverse power relays.
- . **LOSS OF FIELD MODULE** for automatic testing of loss of field relays.
- . **MULTIFUNCTION RELAYS** can be tested easily creating customized test plans.
- . **HARMONIC GENERATOR MODULE** allows the creation of arbitrary harmonic waveform.

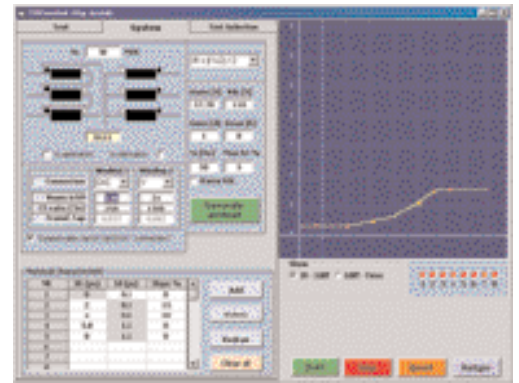
## ADVANCED TRANSMISSION SOFTWARE PACKAGE (Z-PRO)

### APPLICATION

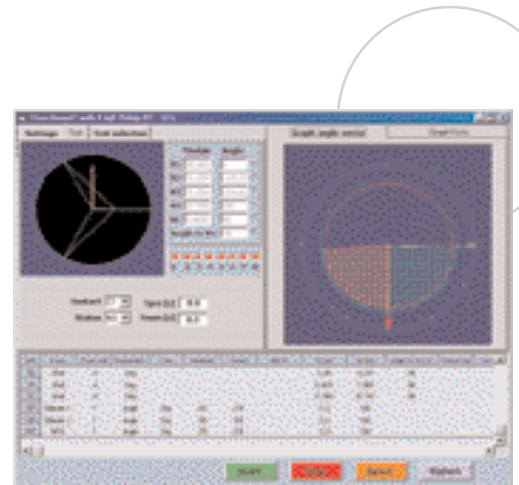
The **Advanced Transmission Software Package (Z-PRO)** is a powerful software module that allows users fully automatic testing of any distance relay regardless of the type or the manufacturer in HV and EHV Transmission networks.

Main characteristics:

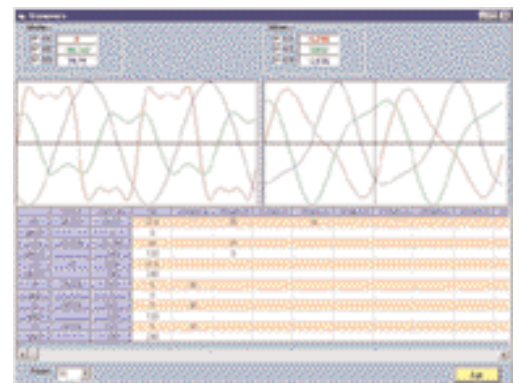
- . Graphical user friendly interface;
- . Interactive Graphic editor of the nominal characteristic;
- . Automatic test and computing of deviation from the nominal values;



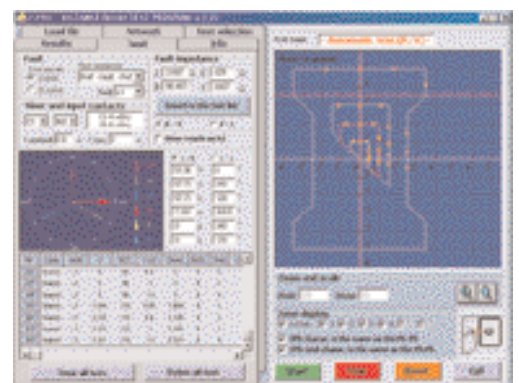
**X-PRO. DIFFERENTIAL RELAY MODULE.**



**X.PRO. DIRECTIONAL RELAY MODULE.**

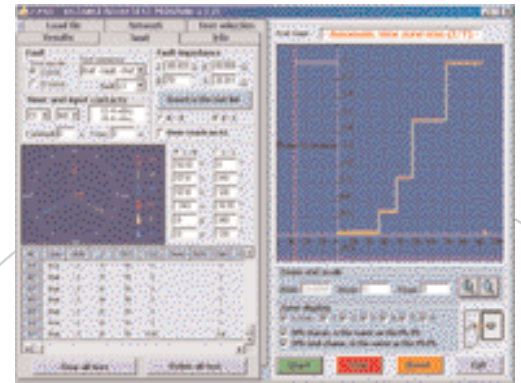


**HARMONIC GENERATOR.**



**Z.PRO. DISTANCE RELAY MODULE.**

- . 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.



**Z.PRO. DISTANCE RELAY MODULE.**

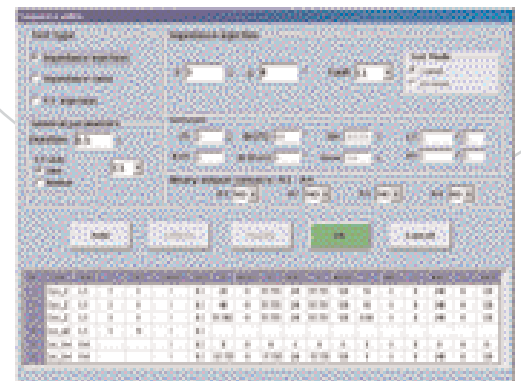
**Z-PRO** has the following testing features:

- . 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;
- . 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 (Siemens 7SA5xx wise).
- . Possibility to test the characteristic represented in terms of loop resistance and fault reactance (better known as Arc resistance compensation).



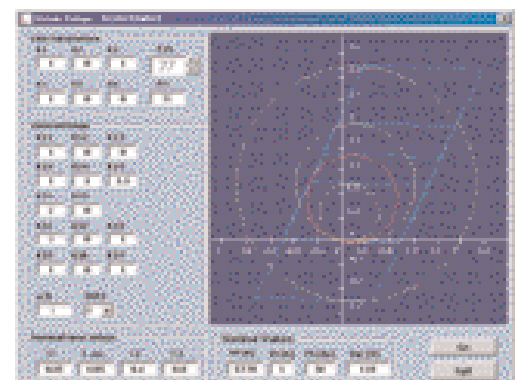
**Z.PRO. SEQUENCER.**

**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 ASEA, ABB, ALSTOM, BBC, GE, GEC Alsthom, SEL, SIEMENS and Toshiba 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 Z.PRO program.



**Z.PRO. SPECIAL DISTANCE RELAY MODULE.**

# MEASUREMENT SOFTWARE PACKAGE

## APPLICATION

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

- .Watt-hour meters
- .Transducers
- . Measuring instruments

The Measurement Software Package consists of three test programs:

## ENERGY.TEST

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;
- . 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.

## TRANSDUCER.TEST

Has been designed for testing measuring transducers:

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

## RESULTS

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

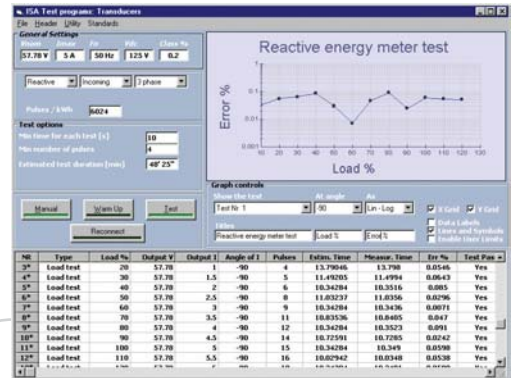
## METER TEST

Is designed for testing measuring instruments. It permits checking of all meters that are normally installed in a substation. In particular, the following meters can be tested:

- Volt meter;
- Current meter;
- Frequency meter;
- Power factor meter;
- Watt meter;
- VAR meter.

## RESULTS

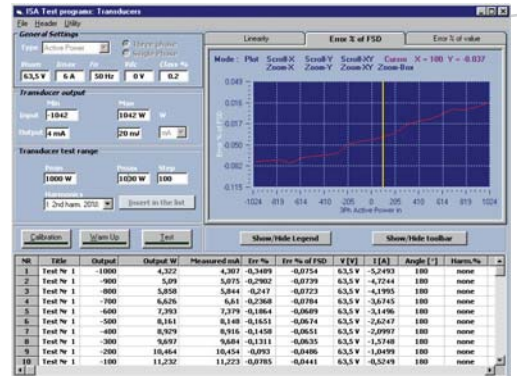
- . Results are saved in graphical and tabular form for later use;
- . Test reports for printing or export in Windows .TXT or .WMF format.



ENERGY METER TEST PROGRAM CONTROL PANEL.



ENERGY METER TEST PROGRAM MANUAL CONTROL.



TRANSDUCER TEST PROGRAM CONTROL PANEL.



TRANSDUCER TEST PROGRAM MANUAL CONTROL.

# PROGRAMMER SOFTWARE PACKAGE

## APPLICATION:

Our customers have two choices for editing test programs for our range of test sets: EDITOR or XTEST\_X.

## EDITOR

Is a very user-friendly programming language for editing test programs.

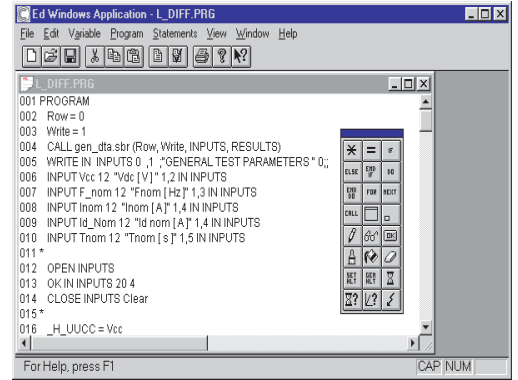
This unique software allows the editing of test programs for all type of protective relays, energy meters and transducers. Using EDITOR it is possible to create test programs or to modify existing test programs developed by ISA.

EDITOR is menu driven and uses as few as 24 instructions, no specific programming skill is required.

## 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.



EDITOR OF TEST PROGRAMS.



E-XTEST3000-10.01

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