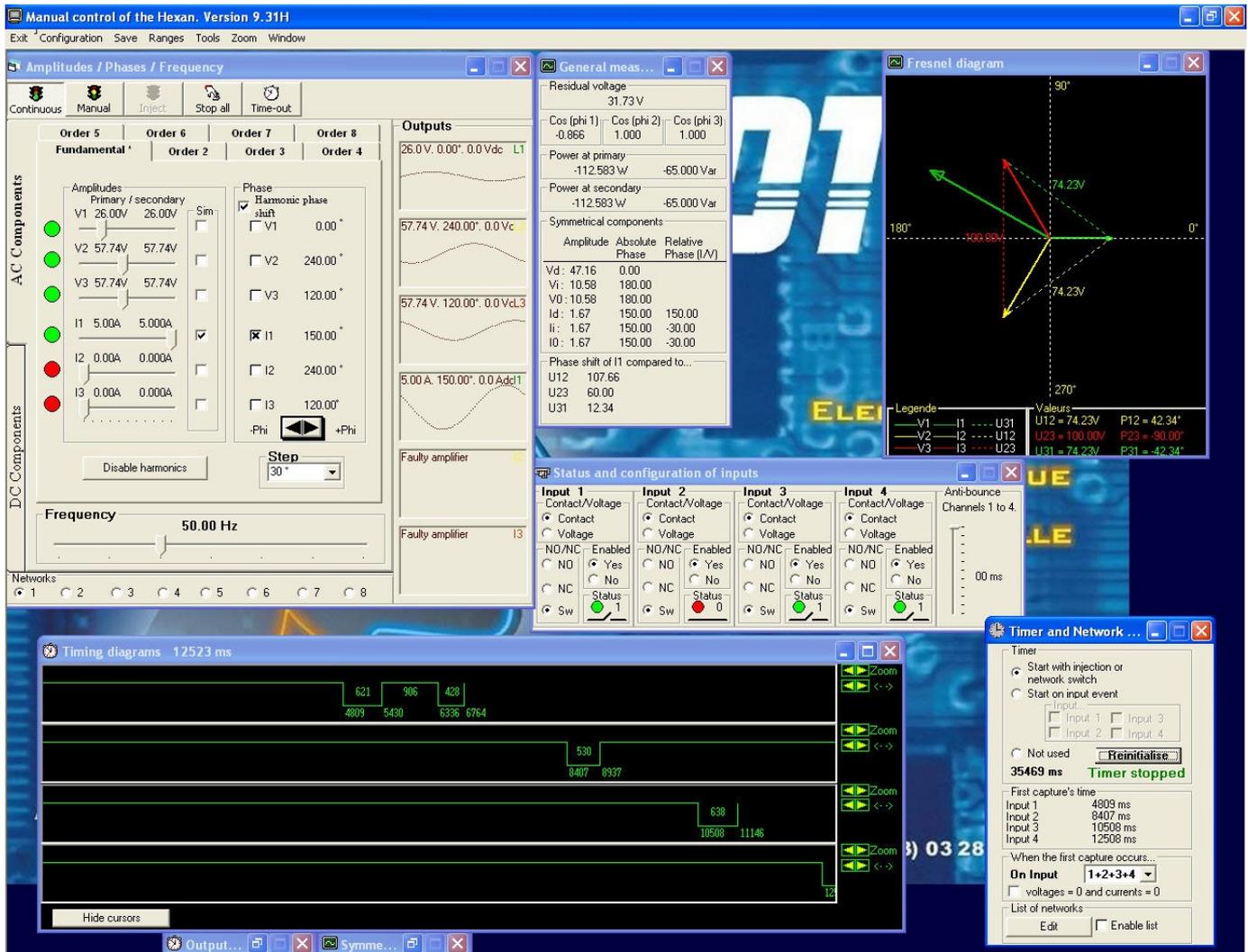


Three-Phase Relay Test Software

by **COTEL**



The **MANUSOFT** software package is supplied free with every **HEXAN** and **POWHEX** and there is no limit to the number of computers into which it can be loaded. As it is extremely easy to use, no computer expertise is required to benefit from all the test set's features and to fully test all commonly encountered relay types, and then produce professional test reports.

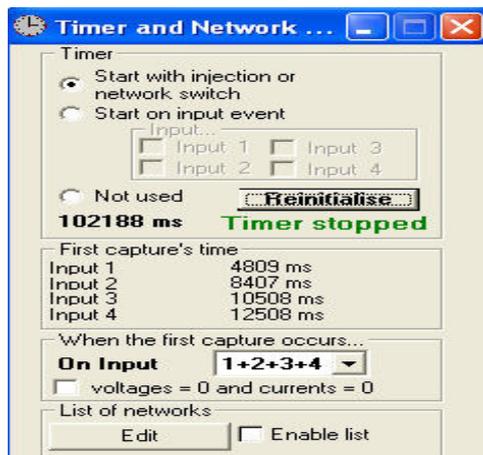
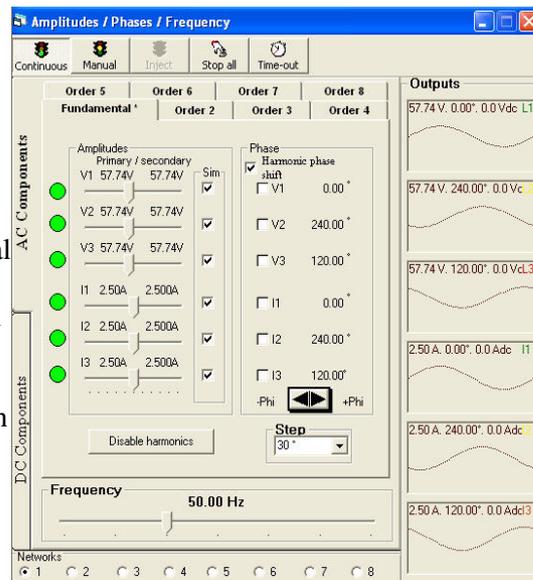
In addition to **MANUSOFT**, there are several other programs which are used for more specific tasks. These include a **State Sequencer** for repetitive testing and for **ROCOF** relays, a **Decoupling** relay package for **G59/2** qualification, and **Synchro-Coupler** and **Distance Relay** packages. There are also programs for finding the complete time/current curve of **Max. Current** relays and testing the **Wattmetric Homopolar** relays used on networks with a compensated neutral. A package for the **Line Fault Detection** relays used on dc railway networks is also available.

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Manusoft Characteristics

Manusoft is used to measure thresholds and response times for all types of relay responses including overcurrent, voltage, frequency, phase and power. All types of triggering events can be simulated and the relay responses timed. The electrical values are set by sliding virtual potentiometers, by fine or coarse key strokes or by keyboard entry. Several tools are incorporated to assist in conducting tests, modifying the display, calculating the symmetrical components and setting two-phase and zero sequence faults. Balanced networks are pre-programmed and there is a four-channel timer with on-screen display and inter-channel timing. Eight states can be defined to be sequenced as needed. The tests are stored as files which can be used to produce test reports, which give a written record of the threshold values, reaction time and any comments inserted by the operator.



Switching from a healthy state to an out-of-limits state (left), displays the response time of the protection device on the screen (below)



The simulated network state values are easily adjusted using the mouse, arrow keys or the keyboard. The generators can be locked together for simultaneous setting of all three phases.

SMARTEST is the easy to use **State-Sequencing** software package developed for programming tests of relays using **COTEL's HEXAN** and **POWHEX** relay test sets. A succession of network states is programmed and then applied in order, with the change from one state to the next triggered by elapsed time, by an input to the timer or by signals on one or more of the test set inputs. The change can be either a "STEP" or a "RAMP", which is used for testing **ROCOF** relays. Such a sequence is recorded as a Base Test, and can be recalled from memory and run as required. Several Base Tests can be grouped into a Sequence and recalled and run as such. Once the test is completed, the settings, results and operator comments can be saved and a full report printed. Thus this software package greatly simplifies the testing of complex, multi-reaction relays and the preparation of the test reports.

OTHER APPLICATIONS

RH7T - Harmonic Generator software package

G59/2 – For **De-Coupling Relay** testing to the G59/2 standard required for PV and Wind Farm connections to the network. This includes over- and under-voltage, over- and under-frequency and zero sequence over-voltage relays.

Prodi – is the package for testing **Distance Relays**, and offers a choice of test sequences adapted to specific relays. If there is a requirement for testing a distance relay not already included in the list, we can add another to the list promptly.

Synchro Coupler – Sets up outputs of V, Frequency and Phase from **HEXAN** for testing **Synchro-Coupler relays** in either manual or automatic mode.

Miti – Produces the curve of opening time against current for the **Maximum Current** function of a relay;

PWh – For testing **Wattmetric Homopolar** relays used on compensated neutral networks. The software sets up outputs of residual voltage and current on the neutral.

DDL – For **Detection of Line Fault** relays. For testing relays used on DC railway networks.

PDMI - For testing **Impedance relays** on **Railway Networks**.

Please contact us if your testing requirement is not covered by any of the packages above.