SIGRA 4
Powerful Analysis of all Protection Fault Records

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Description

lt is of crucial importance after a line fault that the fault be quickly and fully analyzed so that the proper measures can be immediately derived from the evaluation of the cause. As a result, the original line condition can be quickly restored and the downtime reduced to an absolute minimum. lt is possible with SIGRA 4 to display records from digital protection units and fault recorders in various views and measure them, as required, depending an the relevant task.

The product was designed by practical persons who have experience in the evaluation of faults. Accordingly, in addition to the usual time-signal display of the measured variables recorded, it is also designed to display vector diagrams, circle diagrams, bar charts for indicating the harmonics and data tables. From the measured values which have been recorded in the fault records, SIGRA 4 calculates further values, such as: absent quantities in the three-wire system, impedances, outputs, symmetrical components, etc. By means of two measuring cursors, it is possible to evaluate the fault trace simply and conveniently. Standard tools allow to evaluate just one fault record. With SIGRA, however, you can add additional fault records. This does not mean that you open a second fault record in a new window, but you add the signals of another fault record (e.g. from the opposite end of the line) to the current signal pattern by means of Drag & Drop. SIGRA 4 offers the unique possibility to display signals from various fault records in one diagram and fully automatically synchronize these signals to a common time base. In addition to finding out the details of the line fault, the localization of the fault is of special interest. A precise determination of the fault location will save time that can be used for the on-site inspection of the fault. This aspect is also supported by SIGRA 4 – with its "offline fault localization" feature.

SIGRA 4 can be used for all fault records which are available in the COMTRADE file format. The software product is easily and conveniently installed from a CD-ROM, it offers a comprehensive guiding system with demonstration, and an easily readable, practice-oriented manual describes the typical steps involved when using SIGRA.

The functional features and advantages of SIGRA 4 can, however, only be optimally shown on the product itself. For this reason, it is possible to test SIGRA 4 for 30 days with the trial version.

Function overview

- 6 types of diagrams: time signal representation (usual), circle diagram (e.g. for R/X), vector diagram (reading of angles), bar charts (e.g. for visualization of harmonics), table (lists values of several signals at the same instant) and fault locator (shows the location of a fault)
- Calculate additional values such as positive impedances, r.m.s. values, symmetric components, vectors, etc.
- Two measurement cursors, synchronized in each view
- Powerful zoom function
- User-friendly configuration via drag & drop
- Innovative signal configuration in a clearly-structured matrix
- Time-saving user profiles, which can be assigned to individual relay types or series
- Addition of other fault records to the existing fault record
- Synchronization of several fault records to a common time basis
- Easy documentation by copying diagrams to documents of other MS Windows programs
- Offline fault localization

Hardware requirements

- Pentium with 233 MHz processor
- 50 Mbyte of free hard disk space
- CD-ROM Drive
- Pointer device (i.e. mouse)

Software requirements

- MS Windows 2000/XP Professional Edition

Functions

When faults occur in electric power plants, fault recorders, now an integral component of modern numerical protection relays, record analog process variables (usually currents and voltages of the network nodes) and binary information (e.g. protection relay reactions) as a function of time. Those seeking a convenient tool for visualization and analysis of such fault records need look no further than the SIGRA 4 PC program from Siemens.

Different views of a fault record

In addition to the standard time signal representation, SIGRA 4 also supports the display of circle diagrams (e.g. R/X diagrams), vectors, which enable reading of angles, and bar charts (e.g. for visualization of harmonics). To do this, SIGRA uses the values recorded in the fault record to calculate additional values such as positive impedances, r.m.s. values, symmetric components, vectors, etc.

Measurement of a fault record

Two measurement cursors enable fast and convenient measurement of the fault record. The measured values of the cursor positions and their differences are presented in tables. The cursors operate interactively and across all views, whereby all cursor movement is synchronized in each view: In this manner, the cursor line enables simultaneous "intersection" of a fault occurrence in both a time signal characteristic and circle diagram characteristic. And of course a powerful zoom function ensures that you do not lose track of even the tiniest detail. The views of SIGRA 4 can accommodate any number of diagrams and each diagram any number of signals.

Operational features

The main aim of the developers of SIGRA 4, who were assisted by ergonomic and design experts, was to produce a system that was simple, intuitive and user-friendly:

- The colours of all the lines have been defined so that they are clear and easily distinguishable. However, the colour, as well as the line style, the scale and other surface features, can be adjusted to suit individual requirements.
- Pop-up menus for each situation offer customized functionality – thus eliminating the need to browse through numerous menu levels (total operational efficiency).

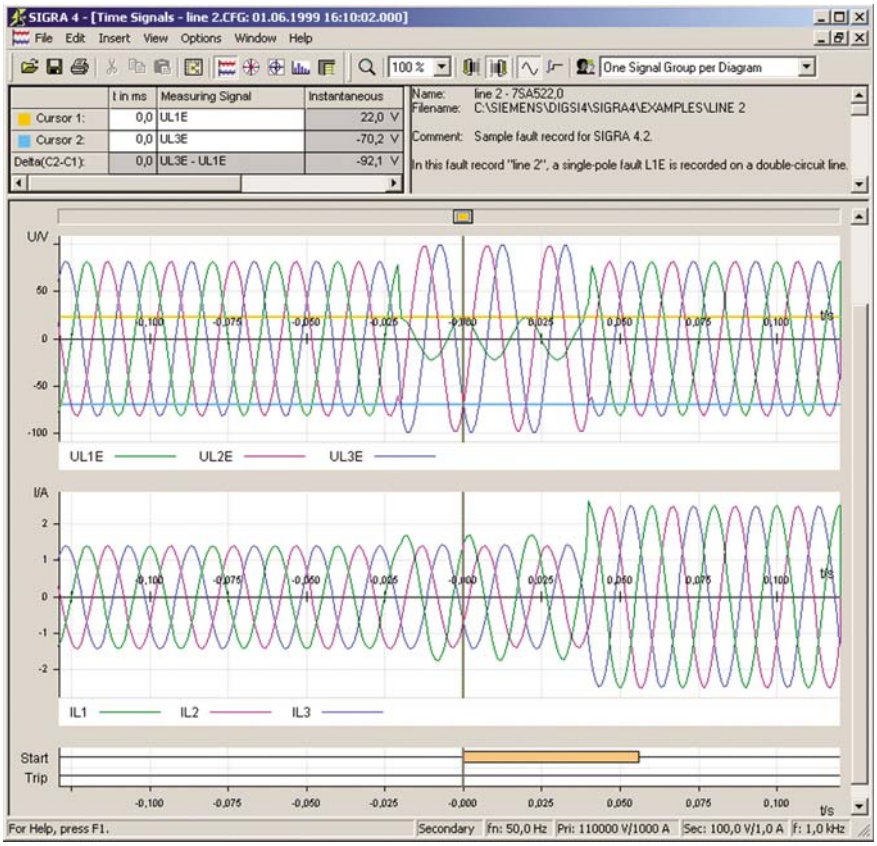

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Fig. 3/9 Typical time signal representation

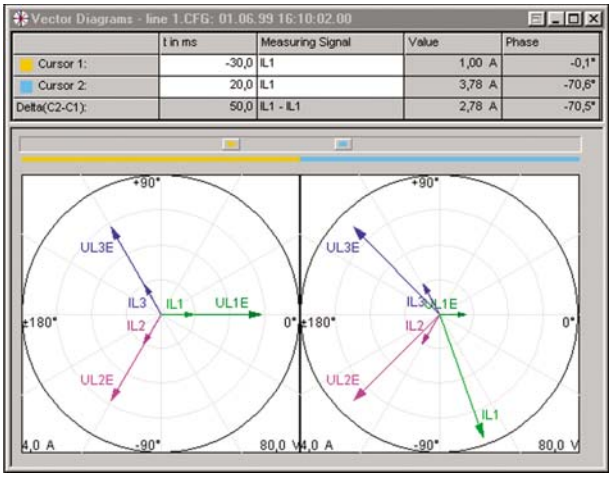

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Fig. 3/10
Vector diagrams

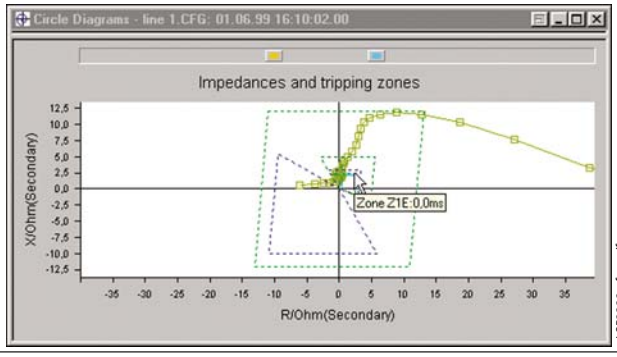

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Fig. 3/11
Circle diagram

Functions

- Configuration of the individual diagrams is simple and intuitive: object-oriented, measured variables can be simply dragged and dropped from one diagram to another (also diagrams of different types).
- "Snap-to-grid" and "snap-to-object" movement of the cursor lines for easy and accurate placement.
- Redundancy: Most user tasks can be achieved via up to five different operational methods, thus ensuring quick and easy familiarization with the analysis software.
- Utilization of the available screen space is automatically optimized by an intelligent function that, like the "synchronous mouse cursors", has since been patented.

But even experts are impressed when it comes to speed and the repetition of frequent operational steps:

- For example, it is possible to store whole views, complete with settings (zoom, size), in so-called user profiles and to assign them to individual relay types or series. Then simply select from the toolbar and you can display each fault record quickly and easily as required. No need to waste time scrolling, zooming or resizing and moving windows.
- Additional fault records, e.g. from the other end of a line, can be added to existing records.
- A special function allows several fault records to be synchronized on a mutual time basis, thus considerably improving the quality of fault analysis.
- Fault localization with data from one line end the fault record data (current and voltage measurement) values are imported from the numerical protection unit into SIGRA 4. The fault localisator in SIGRA 4 is then started by the user and the result represented in % or in km of the line length, depending on the parameters assigned.
- Fault localization with data from both line ends. The algorithm of the implemented fault location does not need a zero-phase sequence system. Thus, measuring errors due to earth impedance or interference with the zero current of the parallel line are ruled out. Errors with contact resistance on lines with infeed from both ends are also correctly recorded.
  The above influences are eliminated due to the import of fault record data from both line ends into SIGRA. For this purpose, the imported data are synchronized in SIGRA and the calculation of the fault location is then started. Consequently, fault localization is independent from the zero-phase sequence system and the line infeed conditions and produces precise results to allow as fast an inspection of the fault location as possible.
- So-called marks, which users can insert at various instants as required, enable suitable commentary of the fault record. Each individual diagram can be copied to a document of another MS Windows program via the "clipboard": documenting fault records really could not be easier.

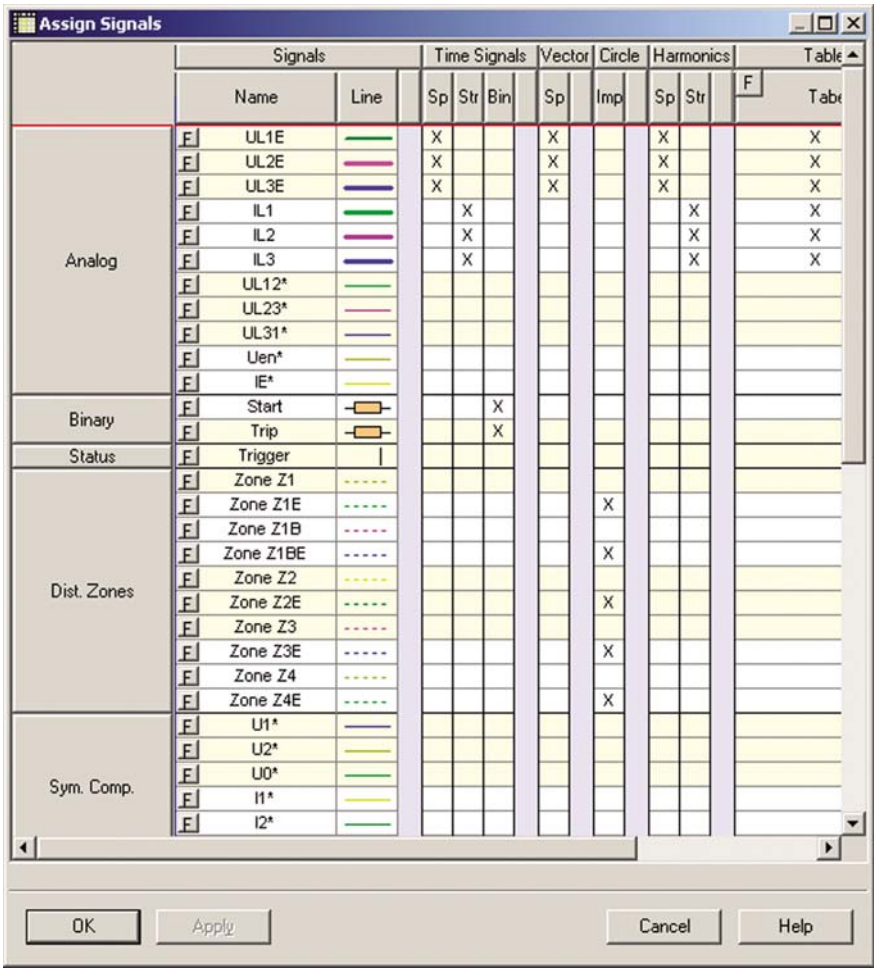

Fig. 3/12 Concise matrix for assigning signals to diagrams

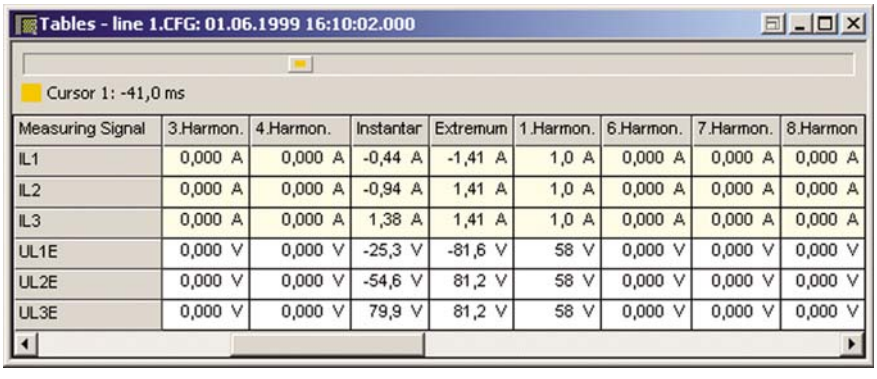

Fig. 3/13 Table with values at a definite time

Scope of delivery

The software product is quick and easy to install from a CD-ROM. It has a comprehensive "help" system. An user-friendly and practical manual offers easy step-by-step instructions on how to use SIGRA.

Selection and ordering data

Description	Order No.
SIGRA 4	
Software for graphical visualization, analysis and evaluation of fault records and measurement records Running under MS Windows 2000 / XP Professional Edition Incl. templates, online manual Incl. service (upgrade, update, hotline, newsletter) Operating languages: German, English, French, Spanish, Italian, Chinese, Russian, Turkish (selectable) incl. multimedia tutorial on separate CD	
SIGRA 4 applicable with or without DIGSI for Comtrade records; also applicable for devices of other manufacturers License for 10 computers, on CD-ROM (authorization by serial number)	
SIGRA 4 for DIGSI With licence for 10 PCs on CD-ROM (authorisation by serial number)	*7XS5410-0AA00*
SIGRA 4 Scientific Software for graphic visualisation, analysis and evaluation of fault and measurement records Online manual	*7XS5416-1AA00*
Stand Alone version Installation without DIGSI on DIGSI 4 CD-ROM (authorisation by serial number) only for scientific institutions (universities, laboratories)	*7XS5416-0AA00*
Trial SIGRA 4 Trial version Corresponds to the Stand-Alone-Version (for test limited to 30 days), on CD-ROM	*7XS5411-1AA00*
Trial -> Stand Alone SIGRA 4 Like the Stand-Alone-Version For customers who want to release a Trial-Version fully valid, on CD-ROM	*7XS5416-2AA00*