

# Relcord

**Integrated Protection  
Coordination & Fault Calculation  
Software**

***Relcord32 - For Windows XP / Vista & 7.0***

The ultimate productivity improvement tool for protection designers and managers coordinating over-current and ground fault protection devices. It is widely used by electricity utilities, consultants, the mining industry and other industries with internal electricity networks, universities and other training institutions.

## ***Productivity Gains***

***RELCORD/32 for windows*** saves more than 90% of the laborious, repetitive and time consuming work of costly, highly-skilled protection personnel is completed in minutes! And with ***RELCORD*** much of this work can even be carried out by less skilled and experienced staff, allowing senior people to concentrate on tasks more deserving of the attention.

## ***Suggests Protection Settings***

***RELCORD/32 for windows*** can analyse the settings needed to achieve discrimination times nominated by the user ! ... and displays time-current characteristic curves on screen and can print or plot curves, setting details, etc.

## ***Contingency Analysis***

Protection designers can be much more thorough using ***RELCORD*** than has been previously possible. With the complete integration of protection details within a network impedance and connectivity information can be made to check the effects of

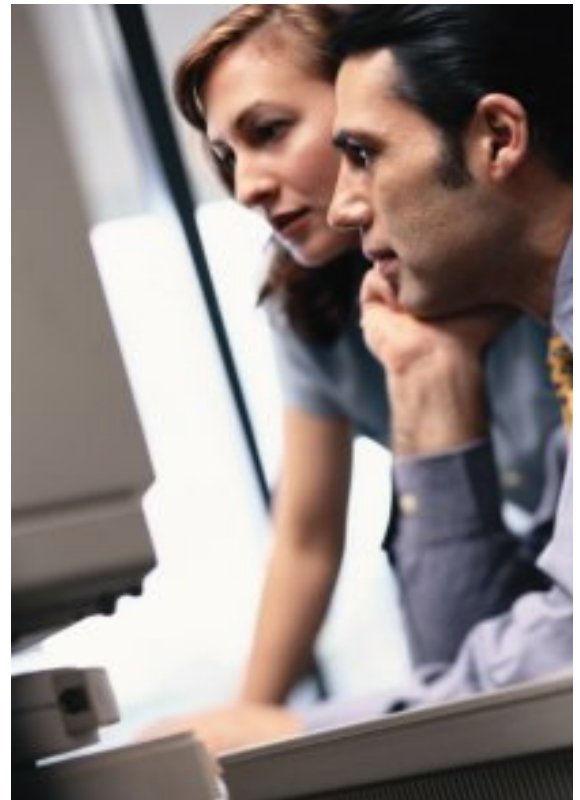
changes in the network configuration on proposed – or actual – protection device settings. For example, if fault levels are changed, transformers are paralleled, a feeder is switched off, etc. This includes multiple contingencies ... but all still completed within a few minutes – a fraction of the time required by conventional methods!

## ***Operating Time Checks***

Once settings have been determined (either by ***RELCORD***, or manually), thorough testing of the proposed settings can quickly and easily be carried out. The user can nominate any type of fault (symmetrical or asymmetrical), with or without a fault/ground impedance, anywhere on the network, under any operating condition of the network, and see a report of operating times, if any, for any protection device modelled in the system.

## ***Ideal Training Tool***

***RELCORD/32 for windows*** is ideal for training protection and operation personnel, technicians and undergraduates who need to understand how protection is coordinated and how the combination of the type and location of a fault and network operating conditions – may affect discrimination times and the overall coordination of the system.



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## Product Specification

### Application

**RELCORD** includes all the features of the **Fault** program enabling it to calculate symmetrical & asymmetrical fault currents and their distribution in the network due to short-circuits involving

- Line to earth
- Line-to-line, or line-to-line with earth,
- Balanced 3-phase – with or without earth
- And determine resulting network voltages.

In addition **RELCORD** can coordinate the settings of over-current and earth-fault protection devices, such as relays, fuses, reclosers, etc. and print or plot time-current curves of the protection devices.

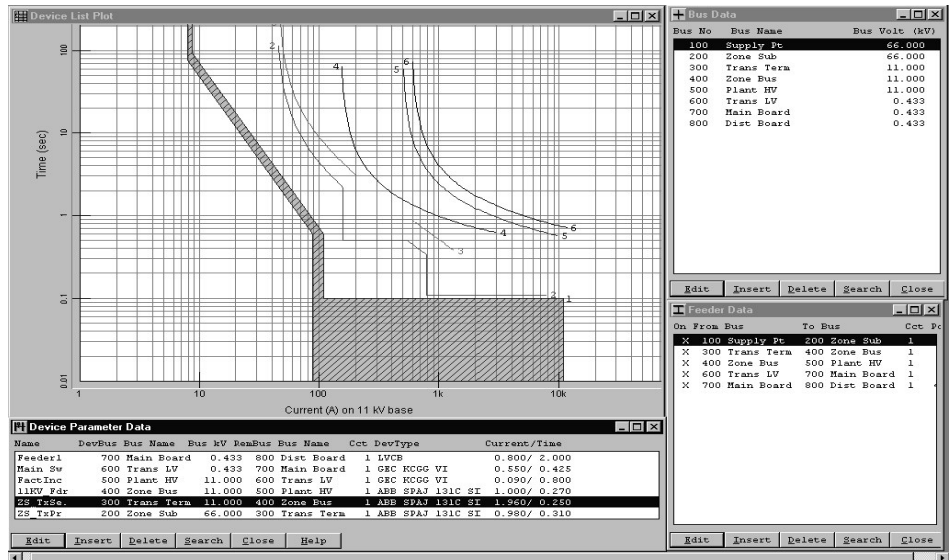
Use **RELCORD** to:

- design protection systems
- determine settings and ratings of devices for coordination
- review protection settings after faults

### Features

Standard features include:

- All the features of Fault/32 – see separate product specification
- Calculates time and current settings for inverse-time characteristic over-current and ground fault devices, including instantaneous, definite-time and directional overcurrent relays.
- Time settings determined to coordinate protection devices to meet user specified discrimination time required.
- Reports operating time for present device settings for any type of fault nominated anywhere on the network.
- Contingency analysis – checks the effect of changes to operating condition of the network – eg. Changed fault levels, circuits out of service or circuits paralleled, etc.
- Can be used to simulate actual faults to analyse protection coordination.
- Handles radial and fully meshed networks.
- Supports coordination of reclosers and fuses with “fuse saving” protection philosophy for recloser fast trips.
- Assists in the setting of Distance/Impedance relays by reporting the impedance (in polar form) seen at any bud on the network for any nominated fault
- Any protective device can have its settings manually set and made fixed
- On-screen plot – cursor coordinates displayed in time and current units
- Optional plot of time and current units



so that the program cannot alter its settings but the program will attempt to coordinate other devices around these fixed settings

- Plots of protection device time-current characteristics to screen, printer or plotter with voltage base and time & current scales selected by user or, alternatively, automatically selected.
- Colour or monochrome hard copy plots.
- Other reports available include:
  - Time and current settings
  - Instantaneous settings
  - In-field setting calibration data.
- Database of protection device characteristics accessed by the program.
- Extensive library of protection device characteristics with most commonly used devices and including many templates.
- Add new device characteristics to the library, edit existing models and to manage the contents of protection device databases.
- Multiple device databases supported with a command line parameter to determine which database is loaded when the program starts. User can change databases at any time.
- Optional plot of time margin between curves

- ASCII files for network data and device data can be completely created and maintained in **RELCORD** or created in other applications (including Power Consultants “ViewBase” program)
- Protection device time-current characteristics representation supported:
  - Curves fitted to data points – by *polynomial* or *cubic spline* function automatically fitted to enter data points (including *multi-part spline*)
  - IEC/BSS formula for *Standard Inverse*, *Very Inverse*, *Long Time Inverse* characteristics
  - ANSI standard curves
  - User defines formula
  - Low Voltage Circuit Breakers
- Accurate representation of non-linear region of electro-mechanical relays at low current multiples/low time lever settings
- On-screen “hot graphs” – click on a graph data point and device data dialogue is displayed allowing settings to be edited – even device type changed and graph is re plotted to revise details
- Plots can include cable damage curves, motor starting curves, etc.
- On-line version of the full user guide and reference manual for help system.

### System Requirements

- IBM compatible computer with Windows XP / Vista or 7.0
- At least the minimum memory required by the operating system
- Approximately 16mb Hard disk space
- Printer or plotter (Colour preferred)

Edition / Capacity	200 Node	3000 Node
Nodes / Buses	200	3000
Sources	50	600
Transformers	150	1500
Lines/Feeders	200	3000
Protection Devices	200	3000
Coordination Pairs	200	3000
Larger systems sizes may be available, by arrangement		

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