

# RELCORD

Integrated Protection  
Coordination & Fault  
Calculation Software

## *RELCORD/32 for Windows - for Windows 95/98 & NT*

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 their 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 with network impedance and connectivity information, contingency analyses can be made to check the effects of changes to 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 operating personnel, technicians and undergraduates who need to understand the how protection is coordinated and how the 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.



## 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 to 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.

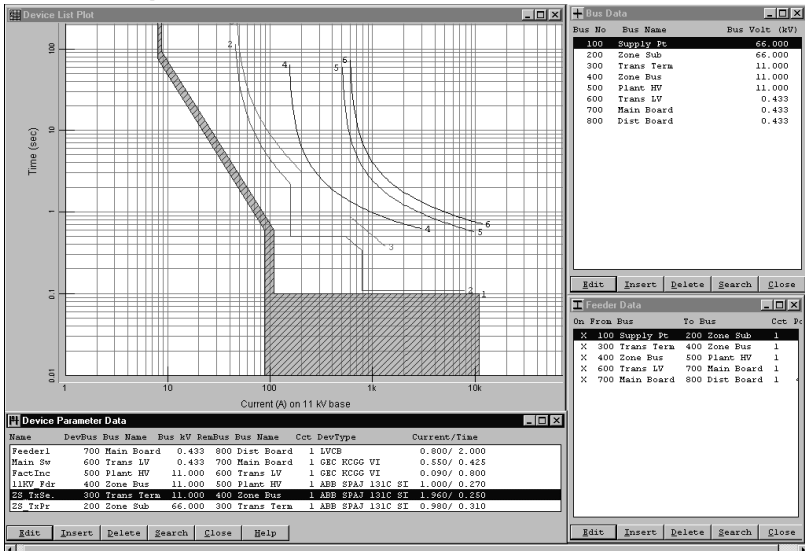
Use RELCORD to:

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

### Features

Standard features include:

- All of the features of the FAULT program - 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 times required.
- Reports operating time for present device settings for any type of fault nominated anywhere on the network.
- Contingency analyses - 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 bus on the network for any nominated fault
- Any protective device can have its settings manually set and made fixed 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 (HP compatible) with voltage base and time & current scales selected by user or, alternatively, automatically selected.
- Colour or monochrome hard copy plots.
- Other report available include:
  - Time & 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.
- Utility program (DEVICEDB) provided as a standard part of the software to allow user to 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 from within RELCORD at any time.
- ASCII files for network data and device data can be completely created and edited within the RELCORD or created in other applications (including DataShare's "ViewBase" program)
- Protection device time-current characteristic representation supported:
  - Curves fitted to data points - by polynomial or cubic spline function automatically fitted to entered data points (including multi-part spline)
  - IEC/BSS formula for Standard Inverse, Very Inverse, Long Time Inverse characteristics
  - ANSI standard curves
  - User defined 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 revised details.
- Plots can include cable damage curves, motor starting curves, etc.
- On-screen plot - cursor coordinates displayed in time & current units
- Optional plot of time margin between curves
- On-line version of the full user guide and reference manual for help system

### Capacity:

Edition	200 node	3,000 node
Bus/node	200	3,000
Sources	50	300
Transformers	150	1,500
Lines	200	3,000
Protection Devices	200	3,000
Coordinated Pairs	200	3,000

### System Requirements

Pentium Computer with Windows 98, NT4, or 2000 with at least minimum recommended RAM for the operating system, SVGA monitor, any printer or plotter supported by Windows .