DOBLE PROTECTION SOFTWARE

Comprehensive solutions for verifying system protection

DOBLE ENGINEERING COMPANY
YOUR WORLD ENHANCED

Whether you are testing electromechanical relays or state-of-the-art, IEC 61850 designs, Doble has the software you need to verify system protection.

Our office and field software options help you verify any protection and control circuit and simulate system conditions. Options are flexible so you can customize your testing program and adhere to your company’s practices and procedures, while meeting regulatory requirements.

Choose which combinations make sense for your organization.

POWERBASE is the time-tested, industry-proven software for tracking work assignments, settings, test routines and test results from RTS and Protection Suite.
OFFICE-TO-FIELD AUTOMATED EXCHANGES

Doble protection software offers limitless testing capabilities and keeps your records organized. Our office software options provide you with up-to-the-moment information and details, at-hand compliance evidence, and thorough analysis for reports. Standardize processes and enjoy increased control over records with the expansive array of test tools and diagnostic techniques of our field software options.

PROTECTION SUITE offers full spectrum testing with Doble F6 test instruments. Protection Suite files can merge with PowerBase data through the PB FIELD module or be uploaded/downloaded with a Protection Suite server database using PB LITE.
PROTECTION SOFTWARE SOLUTIONS

PROTECTION ASSET & TEST DATABASE
ENOSERV PowerBase

PowerBase is the premier application for administrators to manage and report on protection asset maintenance and engineering records. It helps simplify NERC PRC-005 compliance and trending.

PowerBase is the core piece of your protection testing program: manage your workflows, connect with existing work management systems, automate activities, eliminate manual processes, maintain compliance and optimize efficiency within your organization.

CLIENT/SERVER DATABASE APPLICATION
Numerous workstation computers run PowerBase simultaneously from a single database that operates on a local or Doble-hosted server.

VENDOR-NEUTRAL DATABASE THAT HANDLES ANY POWER SYSTEM ASSET
PowerBase tracks maintenance on relays, CTs/VTs, breakers, transformers, batteries and any other asset. PowerBase features import and export modules for data transfer with other systems and testing tools.

SETTINGS MANAGEMENT WAREHOUSE
PowerBase houses and manages relay settings, allowing you to consolidate settings data from disparate applications, spreadsheets and files.

REPORT ENGINE
PowerBase features a powerful, user-friendly report generator. Reports can be configured to suit your business needs.

COMPLETE PROTECTION ASSET & COMPLIANCE DASHBOARD
Users can easily find information and see a dashboard presenting the whole maintenance picture. This is possible even with many workers and the variety of engineering and testing software products they use.

RELAY DATA CONVERTERS
- ABB
- Alstom
- Areva
- Ametek
- Aspen
- Basler
- Beckwith
- CAPE
- Cooper [Eaton]
- Doble
- GE
- GE Multilin
- GEC
- Schneider
- SEL
- Siemens
RELAY SETTINGS FEATURES
- Customized settings management
- Multiple view/edit/report options
- Listing, archiving, comparisons, range/parameter limiter
- Version-ed files / firmware tracking management
- Association of settings with work orders

TEST MANAGEMENT FEATURES
- FasTypes for linking multiple defined procedures to a single asset type
- RTS import/export data converter
- PB Field module for import/export conversions of Protection Suite data
- Pseudo devices user-defined ancillary asset types used for functional test or inspection data capture
- Merge Utility and PB Live Testing for database-to-database transfers with RTS and PB Field
- Email Module distributes notifications when database updates occur

TEST RESULT FEATURES
- As-Found / As-Left / Pass / Fail
- Aggregate results trending of individual assets or populations
- Report Generator - query database tables using custom statements or defined reports types

WORK MANAGEMENT FEATURES
- Work Assignment Interface that integrates into your corporate work processes
- Auto-triggering / auto-messaging as tasks occur
- Integration with multiple WMS/CMMS platforms (SAP, Maximo, Cascade, etc.)
- Customizable Dashboard
PROTECTION TESTING SOFTWARE

Doble offers a variety of software options for basic through complex testing requirements. Choose the software or combination of software that best fits your protection testing program.

**ENOSERV RTS**

RTS is ideal for testing and capturing data during commissioning and field performance/compliance testing.

RTS is a vendor-neutral software which allows you to connect to a variety of relay test sets in your test equipment inventory.

RTS features powerful automation tools that reduce complexity. It offers an extensive relay test plan library to quickly perform standardized tests. Your teams will save time thanks to the robust communication tools that help automate and simplify testing.

You can also make test plan modifications in one location by quickly editing in the library, which updates hundreds of relay test plans.

RTS can also capture and store important maintenance information for CTs/VTs, DC control circuitry, communication systems and more.

RTS works seamlessly with PowerBase as your complete protection testing program from the field to the office.
Assemble RTS routines of your own design or use any of the hundreds of pre-built routines available from the RTS database.

**RTS ROUTINES**
- Build your processes into RTS routines
- Link routines to individual assets in your system
- Gain advantages of uniformity of testing, bulk edits, aggregate reporting and simplified records control

**TEST ROUTINE DEVELOPMENT TOOLS**

**Step-by-step test builder**
- Steady-state element tests
- Dynamic-state scheme/logic tests
- End-to-end communications tests

**Forms package**
- Build custom data entry forms
- Manage and preserve instituted forms
- Gather results from 3rd-party software

**BASIC scripting engine with pre-written RTS commands**

**TESTING TOOLS**
- Manual control interface
- State sequencer
- Terminal-terminal line modeler
- COMTRADE playback
- MODBUS module
- File importers

RTS Pro keys are upgraded with drivers that support numerous manufacturers’ test instrument RTS is keyed software (USB dongles / software code keys) with two user levels: Basic (manual only) and Pro (full test set control).
Protection Suite

Protection Suite software is a complete, no-compromise, protection testing solution. Run manual and automated tests for protection-scheme verification, including IEC 61850 sampled values and GOOSE schemes.

With changes in technology, you need a software tool that allows you to test old and new types of devices. Protection Suite is your solution with its time-tested static, dynamic and digital test routines. Quickly create tests with the basic wizard tool and power system models.

Protection Suite offers users the capability to control and manipulate test types, giving users multiple ways of testing and proving a device. Simulate realistic system conditions and power quality issues, such as flicker and harmonic in-rush, using the transient wave generator.

Protection Suite is used with Doble’s F-series test equipment; it also connects with PowerBase to create a comprehensive data-management system for storing, trending, system planning analysis and for reporting to regulatory agencies.

Protection Suite is available in a number of levels. Mix and match the levels that are appropriate for your organization’s testing and reporting requirements.
RECORDS MANAGEMENT

PB Lite
- Network server database for control and reporting of Protection Suite .PSX files
- Nameplate, test plans and results
- Doble F-Series instrument firmware
- Secured records / compliance evidence
- Workflow tracking; download/assign capabilities
- Recommended for small-to-medium sized teams with limited administrative resources
- Available with Protection Suite v.4.4.1 and v.5.0

PB Field (PowerBase)
- Connects Protection Suite software to the PowerBase database system.
- Collates Protection Suite .PSX files into PowerBase relay records for managed office-to-field exchanges
- Non-disruptive: keeps existing Protection Suite macros in place
- Available with Protection Suite v.4.4.1 & v.5.0 with PowerBase v.7.1

TEST CREATION WIZARD

Device parameters and selections for guided creation of tests. Protection Suite offers multiple testing techniques:
- Import settings and characteristic files (xrio, rio, csv, urs, txt)
- Basic Instrument Controls: control panel / battery simulator / waveform recording
- Instrument Calibration with F6 accessories
- Documentation: create data entry/information used in manual operation and data collection
- Steady State / Dynamic State / State Simulation / Transient playback/creation: industry standard test techniques
- Specialized Applications: enables advanced techniques for Harmonic Ramp, Phasor Measurement Unit (PMU) Tests, CT/VT Testing, Rate of Change of Current, Rate of Change of Frequency, Rate of Change of Voltage
- Transducer/Metering: analog and digital device tests
- Protection Suite Tools: scripting, data conversion, settings templates

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- limited steady state test types
+ expanded steady state test types

PowerBase v.7.1
FOR TESTING  
IEC 61850-BASED  
PROTECTION AND  
AUTOMATION SYSTEMS

61850TesT  
Simulate, monitor and test IEDs on your digital substation network with Doble’s 61850TesT Software. Use with Doble’s F6150sv and Protection Suite software to apply sampled values (SV) and generic substation event (GSE) simulations to functionally test, receive status messages and get more data from substation devices. Create fault conditions to verify control scheme coordination to ensure proper design of IED logic. Use 61850TesT to identify and map logical nodes and objects to virtual inputs on the F6150sv. Then use Doble’s Protection Suite testing software to verify correct operation and performance of your IEC 61850-based protection, automation and control schemes.

FEATURES

• Loads multiple IEC 61850 substation configurations or various types of SCL files (ICD, IID, CID, SED, and SCD)
• Discovers the IED’s data model and configuration and generates SCL files
• Built-in Client Simulator browses the IED’s data model and allows read/write actions on their values; displays and updates selected data in watch windows
• Client controls switching devices and simulation and testing modes of IEDs
• GSE support includes GSSE, GOOSE, and Routable Goose
• Scans and captures substation network traffic for GSE and SV messages
• Logs GSE messages and reports from IEDs. Log files can be saved, and a time-aligned display of events facilitates analysis
• PC-based simulation of IEDs for publishing and subscription of GOOSE and R-GOOSE messages manually or automatically using scripts
• Displays live data in various display formats - tabular, annunciator and graphs. Oscillographs of GSE and SV signals are saved and can be viewed and analyzed further with the COMTRADE viewer.

BENEFITS

• Provides a well-organized approach in selecting and defining GSE messages and signals for use in testing and visualizing
• Easy-to-use interface for viewing messages and their datasets
• Plan your testing scenarios in a laboratory or offline and use the saved configuration files in the field for efficient testing and commissioning
• Easy modifications in the field can be made for troubleshooting
• Provides better awareness and confidence in the test and test results
• Provides complete functionality with enhanced visualization required for efficient and secure testing IEC 61850-based protection and control schemes
61850TesT: A CLOSER LOOK

CLIENT/SERVER AND SIMULATION
Browse the data model of IEDs and select data items. The Client simulator allows you to read current values and you can write or change the values of certain items. Create watch lists of selected items for automatic updating of display values. Control and set IED modes for simulation and behavior, such as test-blocked. Control circuit breakers based on their control model such as select-before-operate and verify the interlocking and synch-check logic. The Server simulator allows you simulate multiple IEDs to automatically publish GOOSE messages. Change the values of selected items manually or semi-automatically with a table of selected items with their prescribed values for quick simulation. Scripts allow simulation of more complex testing scenarios including simulation of IEDs to simultaneously subscribe and publish GOOSE messages conditionally based on implemented logic.

CONFIGURATION OF F6150SV FOR GSE TESTING
Select signals from the Substation section for GSE subscription and simulation. Map these signals to the F6150sv virtual inputs and outputs for easy testing of your IEC 61850 design.

ANNUNCIATOR PANEL AND TABULAR VIEWS OF LIVE DATA
The annunciator panel and signal table provide a clear, real-time visualization of monitored signals and analog data using custom widget-based displays. Identical signals from real IEDs and signals from the test set and other simulators can also be viewed simultaneously.

GRAPHICAL VIEW OF EVENTS AND WAVEFORMS
Use the graphical oscilloscope to view SV and GSE signals, and client/server report data. Triggers based on GOOSE and specified SV thresholds or value changes initiate automatic recording and saving in COMTRADE file format. The saved file can be reviewed for more detailed analysis using the COMTRADE Viewer, including phasor views and derived data tables.
Doble’s F-Series power system simulators are the industry’s trusted diagnostic device for protection testing. Testing requirements can vary from team to team and company to company. That’s why Doble’s F-series power system simulators are customizable. Choose what functions you need in order to perform testing of protection devices and schemes. You can maximize your testing capabilities with accessories for communication, amplification, calibration and more. From manual testing through to high burden testing, choose the options and accessories that make sense for your budget and business requirements.

*The F6150sv is UCA/IEC 61850 certified Level A by DNV-GL for:
- IEC 61850 Server (GOOSE Publisher/Subscriber), Editions 1 and 2
- IEC 61850 Sampled Values 9-2LE Publisher, Edition 1

**PROTECTION HARDWARE**

**F6150sv**
Power System Simulator

**F6350e**
External Amplifier

**F6052**
Universal Time Synchronizer

**DUC**
Doble Universal Controller

**F6080**
Field Calibration Unit
PROTECTION TRAINING
We offer a wide range of protection training courses that will help prepare you for a modern grid, power plant and industrial facility. Classes are geared towards engineers, technicians, supervisors and managers who are involved with protection assets. Choose which courses are right for you and your team.
Learn more at events.doble.com/protection

PROTECTION SUITE RELATED COURSES
• Protective Relaying Application & Testing
• Generator Protection Application & Testing
• Essentials of Protection - Beginners Course for Technicians
• Basic Hands-on Application & Testing Electro-Mechanical and Microprocessor Relays
• Intermediate Hands-on Application & Testing Electro-Mechanical and Microprocessor Relays
• Advanced Hands-on Application & Testing Electro-Mechanical and Microprocessor Relays

61850 TEST TRAINING
• IEC 61850 Application & Testing

RTS COURSES
• RTS Essentials Training
• RTS Developer Training
• RTS Advanced Developer Training

PROTECTION THEORY COURSES
• Basics of Protection for Industrials
• Basics of Protection for Utilities
• Substation Maintenance
• Schematic Electrical Print Reading
• Fault Calculation and Symmetrical Components
• Harmonics Simplified

PROTECTION SERVICES
Access consultation and application support from a team of experienced protection engineers. Our protection experts have extensive practical experience throughout the industry, from the field to administration at both large and small utilities, as well as at relay OEMs. Contact a member of the Doble team to find out more about how we can assist you throughout your transmission, distribution and generation applications.

PROTECTION EVENTS
Doble offers a variety of protection-related training courses and seminars throughout the year. The annual Doble Protection Seminar features PowerBase, RTS, Protection Suite and 61850 TesT training and user group meetings, along with technical presentations on protection topics and an Industry Expo. Other options include the Australasian Protection Testing Users Group (APTUG) Meeting, protection training courses, web-based training, and on-site training tailored to your team.
OPTIMIZE OPERATIONS WITH DOBLE’S RANGE OF DIAGNOSTIC SOLUTIONS

ON-LINE MONITORING

OFF-LINE TESTING & ASSESSMENT

IN-SERVICE TESTING & ASSESSMENT

PROTECTION TESTING

CONSULTING & TESTING SERVICES

ENTERPRISE ASSET MANAGEMENT