

## Knowledge Is Power<sup>SM</sup>

Apparatus Maintenance and Power Management  
for Energy Delivery

## Product Overview Diagnostic Test Instruments

Doble Engineering Company is the world leader in apparatus maintenance and power management for energy delivery. Our decades of unsurpassed cumulative knowledge and field testing experience have enabled us to develop diagnostic test instruments which accurately assess electrical apparatus condition. Engineered to perform consistently despite rough handling in transport and under adverse conditions, Doble instruments are legendary for reliability in the field.

## APPARATUS DIAGNOSTIC EQUIPMENT

Doble established its world class reputation through the development of our M series instruments. These analytical instruments and test methods measure the quality and condition of electrical insulation. The M series instruments and the “Doble Test” are the industry standard throughout the world.

### M4000 Automated Insulation Analyzer

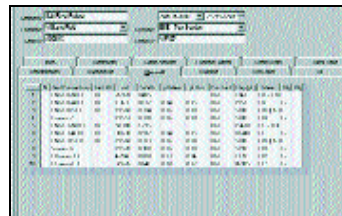
10-kV Portable Automated Insulation Analyzer uses patented, state of the art technology to accurately evaluate the insulation quality of substation high voltage power apparatus even under conditions of high electrostatic and electromagnetic interference.

### Doble Test Assistant (DTA)<sup>®</sup> Software

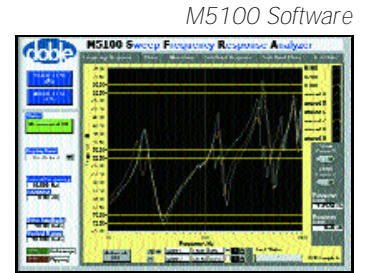
Comprehensive software package to enhance productivity and enable maintenance engineers to make informed decisions on apparatus insulation condition in the field. DTA utilizes a Doble-developed expert system based on decades of analysis of field test results.

### M5100 Sweep Frequency Response Analyzer (SFRA)

Compact, rugged, field-portable system used to detect power transformer mechanical failure or winding movement caused by system events or mechanical stress. The SFRA technique determines whether transformer repair is necessary without costly de-tanking.



DTA Software



M5100 Software



## CIRCUIT BREAKER TEST SYSTEMS

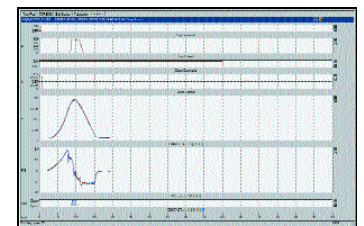
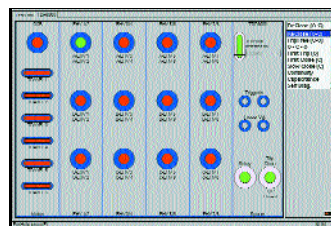
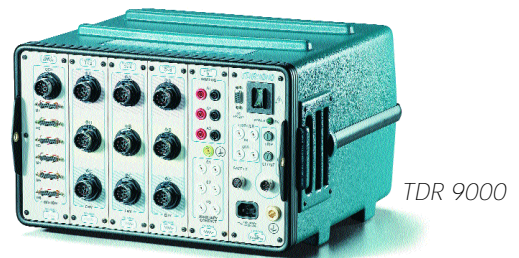
State of the art design allows dynamic testing of circuit breakers with high accuracy, unaffected by electrostatic and electromagnetic interference present in the substation.

### TDR9000 Automated Circuit Breaker Test System

Modular design enables maintenance engineers to configure the TDR9000 to test all classes of circuit breakers. Allows dynamic testing to measure grading capacitors, insertion resistors, mechanism motion and contact timing.

### TRX<sup>™</sup> Software

Automated test software controls TDR9000 and organizes circuit breaker test plans and test types by user-defined regions, locations, and substations. Relational database architecture stores historical test results for trending and maintenance scheduling.



TRX Software



## PROTECTION DIAGNOSTIC INSTRUMENTS

Doble Protection Diagnostic Instruments are compact, rugged and field portable, and are used by test engineers worldwide to diagnose and calibrate electromechanical as well as numerical protection schemes. Designed to provide fully automated steady-state, dynamic and transient testing capability in the field as well as in a laboratory environment.

### *F6000 Family of Power System Simulators*

Automated, state of the art three phase testing and evaluation of numerical and electromechanical protection and protection schemes. Provides high power capability in a single, lightweight (44 lb/20 kg) package.

### *F2250 Family of Power System Simulators*

Versatile, high power manual or fully automated protection testing. Units can be used individually for simple single phase testing or combined for sophisticated three phase protection schemes.

### *ProTesT™/ F6 Test Automation Software System*

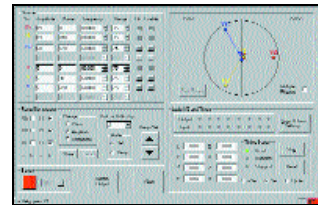
Enables fully automated control of Doble test instruments for simplified, accurate testing of protection schemes. Eliminates manual errors to improve productivity. Relational database architecture stores protection settings, test methods and test history.



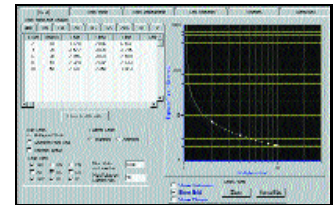
F6150



F2253



ProTesT Software



F6 Test Software

## ON-LINE DIAGNOSTICS

Doble is the world leader in the application of expert systems for on-line diagnostics of electrical apparatus based on decades of field testing experience.

### *Intelligent Diagnostic Devices (IDD)™*

A family of small stand-alone devices installed on specific apparatus which continuously monitors the apparatus condition using an expert diagnostic system. Provides operators and maintenance engineers with an early warning of the need for preventive maintenance or corrective actions.

### *Doble Moisture in Oil Sensor (DOMINO)*

Continuously measures moisture content and temperature of electrical insulating liquids such as transformer oils. Provides results in parts per million (ppm) with accuracy consistent with traditional laboratory titration methods.

DOMINO



IDD

# KNOWLEDGE IS POWER

With so much change affecting our industry – deregulation, increased competition, growing oversight by government and the media – you need to have up-to-the-minute, detailed and comprehensive information about the hard-working assets that make up your system. You're committed to success in these new times. But to meet your goals, you need to know more. Know it sooner. And know it for certain.

It takes equipment that's "Doble tested" to give you this level of confidence.

For the past 80 years, we've earned a reputation for unsurpassed products, services, conferences and solutions that help you consistently achieve demanding goals for both minimized risk and maximum performance of your electric power delivery systems.

*Only Doble can bring it all together...*



### Industry-leading diagnostics

Doble is the world leader in diagnostic test instruments for evaluating the condition of electric power assets. Engineered to perform consistently despite rough handling in transport and under adverse conditions, Doble instruments are legendary for reliability in the field.



### World-class laboratory services

At Doble Engineering, we are committed to advancing the knowledge of material sciences. We have laboratory services for material sciences and high voltage testing, staffed by industry-acclaimed scientists and apparatus engineers.



### Doble Engineered Strategies–D.E.S.™

Our newest service, D.E.S.™, was created to meet the needs of our clients in today's demanding environment, with a focus on comprehensive risk management solutions. D.E.S. works with you to resolve specific operational and maintenance issues facing owners of electric power apparatus.



### Premiere conferences and events

Doble's Client Conferences in North America, Europe, Latin America and Asia-Pacific, are the industry's premiere events on apparatus maintenance and asset management. These annual conferences are the venues for exchanging the latest industry information, and for advancing the reliable and cost-effective delivery of electric power. In addition, Doble offers regional seminars worldwide throughout the year, on topics of importance to the industry.



### A wealth of information

Clients tell us that their relationships with Doble Client Service Engineers are one of the most valuable aspects of working with Doble. Our engineers work in close partnership with our clients, to analyze test data and handle service issues, providing a wealth of knowledge and expertise. Doble has been collecting critical apparatus and analysis data for decades. We are the source for the industry's information, and are constantly improving the delivery of this resource to our clients. With our new Doble Online Center, registered clients can interact with Doble's extensive, industry-wide KnowledgeBase and services.



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