F2250

OPTIONS

The F2250 Power System Simulator Family is flexible and expandable. These internal options can be easily installed in the field.

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F2810 **Fault Rotate** Changes preset voltage and current phasors to simulate A-N, B-N, C-N, and A-B, B-C, C-A faults without changing interconnecting leads.

F2820 **Δ Value / Δ Time** Simulates rate-of-change in frequency, at least significant digit Hertz per second rates for determining frequency relay response to actual power system excursions. Also simulates rate-of-change of voltage/current/phase angle with least significant digit per cycle for realistic pickup and dropout tests using AutoSensE™. Used with the F2010 Mini-controller.

F2825 **Multiple Sources** Extends F2010 Minicontroller operation for simultaneous cycle-by-cycle control of up to 3 voltage or 3 current sources for simulating three-phase and phase-to-phase faults and power swings. May also be used manually with front panel controls for multiple source operation.

F2865 **Translent Waveform Generator** Replays COMTRADE format digital fault recorder and relay records, and EMTP or ATP power system simulations. Stores 256K 16-bit samples of transient waveform per channel. Replaces the standard sine waveform generator board and requires TRANS2 Transient Simulation Software.

- Stores transient data until the instrument is powered down, allowing one relay test plan to include steady state, dynamic-state, and transient simulation tests without reloading data
- Measures relay operating time by starting the multi-mode Timer in each simulation at any sample number in a transient record

F2875 **Battery Simulator** An internal, high starting current 60 watt continuous rating dc supply for powering protection relays and auxiliaries. Select 48, 125 or 250 Vdc (±10%) manually or use the POWER macro in ProTesT™. The F2875 is protected against short circuit. 50/60Hz ripple is less than 0.2% of reading. Switching noise is less than 5% of reading, peak to peak up to 30 kHz. Output sockets, controls, range and status LED are located on the side panel, protected by a sliding door.

F2885 **Satellite Synchronizing Interface** Synchronizes remotely located Power System Simulators using GPS or satellite receivers. One interface is required for each system. The interface uses standard IRIG B and 1 Hz timing signals for synchronized end-to-end tests on unit protection schemes.

- Uses standard satellite receiver outputs.
- Synchronizes F2000's to one pulse per second (1pps) of GPS satellite. Worst case phase angle accuracy is ± 50 µs / ≤ one degree, between remote test sites under manual control or automation.
- Reads time code from IRIG B signal and starts test at user defined testtime-of-day ± 5 ms.
- Use with SSIMULTM for dynamic state simulation or TRANS2 for transient simulations.
- Includes "50/60 Hz Synch" and "Start" input for user developed synchronizing schemes.

F2895

GPS Satellite Synchronizing Interface with Receiver and Antenna Includes F2885 as described above with an integrated GPS Receiver / Antenna, and 100' (30 meter) cable. The F2895 provides a complete solution to satellite synchronizing. One set required for each system.

F2910

ProTesT™ Software System Starter Kit Provides communication between Simulators and PCs equipped with the ProTesT software system.

F2920

Precision Autosynchronizer Automatically tests automatic synchronizing relays; displays circuit breaker advance time in ms / cycles. Older oscilloscope or chart recorder test methods require subjective interpretation of waveforms leading to loss of repeatability and accuracy. The F2820 □ Value / □ Time option is required to verify response to rate of change in slip frequency using F2010 mini controller.

SIMULATOR AUTOMATION OPTION:

ProTesT Software System A menu-driven interactive software system for automated Steadystate relay calibration tests and database management. Functions include; create and edit relay test plans for any type of relay, run tests automatically, log time and date stamped results, plot characteristics, overlay plots for analysis, and generate test reports. ProTesT is organized by IEEE relay functions and supplied as ProTesTPLANs™, which are licensed for company wide use. ProTesTPLANs includes test macros for testing all relay elements by specifying test parameters in standard engineering units of voltage, current amplitude, phase angle, and frequency. ProTesT™ includes sample relay test plans. Each Simulator requires a F2910 ProTesT Starter Kit, personal computer with appropriately configured memory and graphics capability, and an RS-232 interface. ProTesT includes SSIMUL, a program for automated dynamic-state scheme testing and test result database management.

F2253 is the only product offered by Doble in F2250 series.

F2251 and F2252 are no longer a part of Doble product line.

For more information, contact fserieshelp@doble.com

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