

F2250



TOGETHER WE POWER THE WORLD

FAMILY OF POWER SYSTEM SIMULATORS

F2250 Simulators perform integrity and application tests on complete protection schemes and individual relays. Run Steady-State, Dynamic-State, and optional Transient Simulation tests with the F2250. The evolutionary design of the F2250 Simulator is based on the in-service experience of over five thousand F2000 instruments and dramatically improves protection maintenance productivity.

The F2250 Simulator Family and ProTes™ software are revolutionary solutions which improve productivity of all protection maintenance. ProTes calculates load and fault phasor values, and directly controls the simulation. The F2250 Simulator reproduces the phasor and logic signals and verifies protection scheme response. Scheme diagnostics are more effective than steady-state calibration tests because they evaluate the integrated response of the complete protection scheme to actual power system disturbance conditions, verifying performance under in-service conditions.

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

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

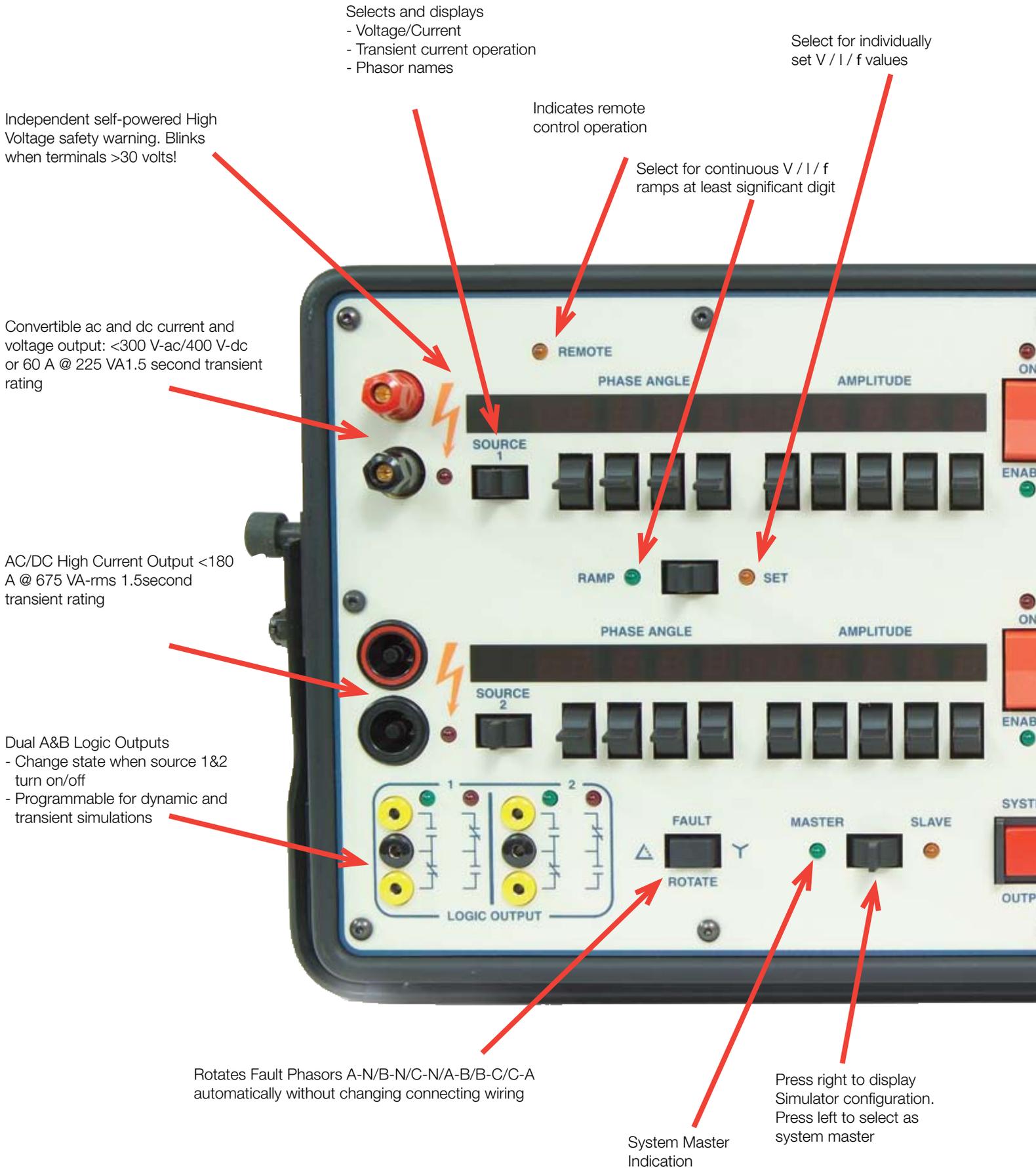
F2250 Features:

F2250 Scheme Diagnostics:

- Dynamic State Simulations: ProTes™ Power System Model
- Transient Simulation: Replay, Relay, DFR, EMPT records
- GPS Satellite Synchronized for end-to-end simulations
- Modular Current Power: 150, 300, or 450 VA; field plug-in modules
- Convertible operation: One voltage and one current or two currents; ac or dc
- Two Logic Outputs: Simulate circuit-breaker, carrier, and scheme logic
- Two Logic/Signal Inputs: Sense dry contact or voltage for timing. Logic signals trigger changes in test conditions
- Multi Mode Timer: Internal/External Start and Stop operations
- Intuitive front panel for easy manual testing.



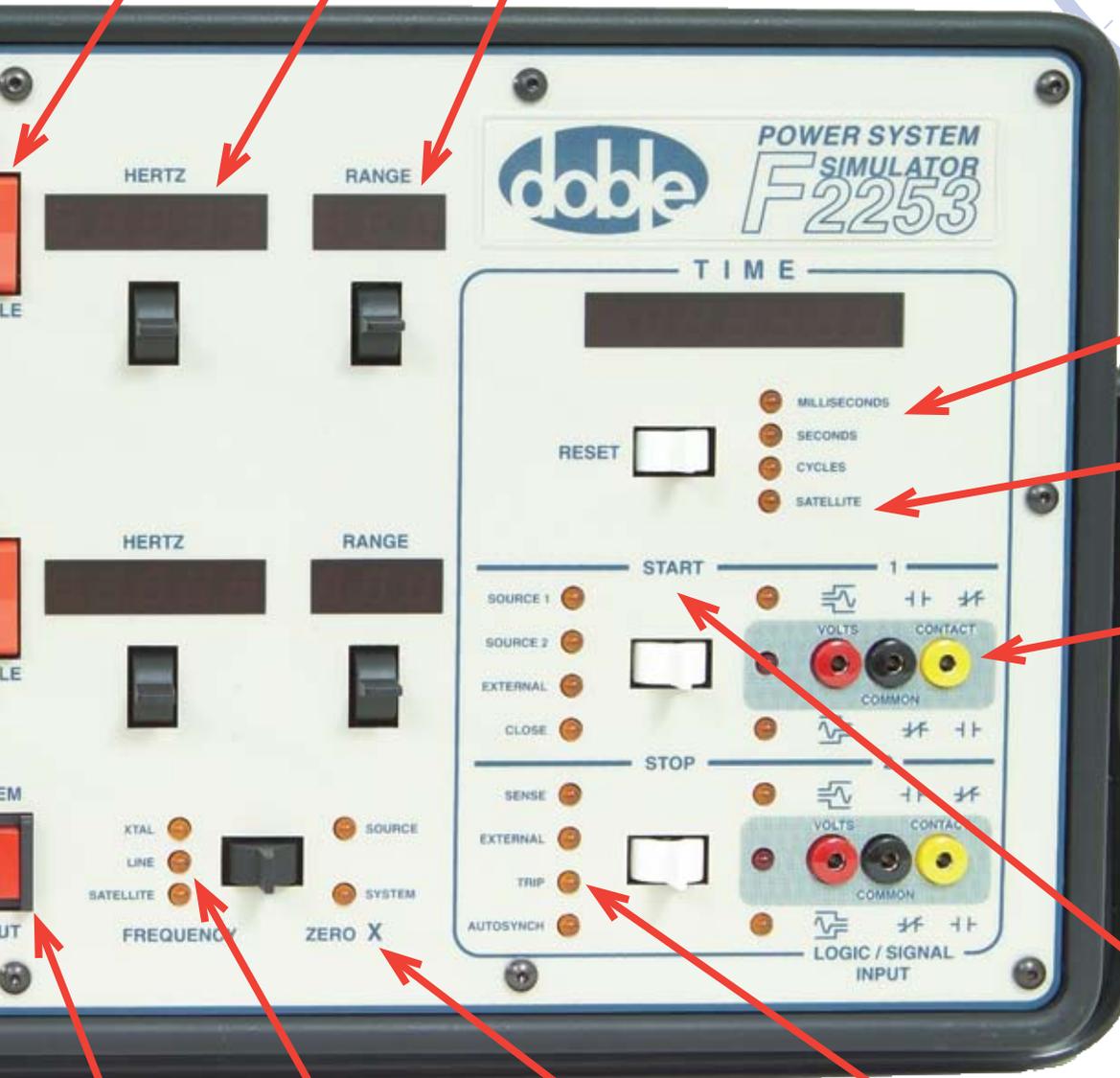
Intuitive Front Panel for Easy Manual Testing



Selects and displays dc- or ac- base frequency of 50/60 Hz incrementally up to the 20th harmonic. Using F2010 Minicontroller up to 10 KHz
 Programmable 0.1 Hz to 10 kHz

Individual Source On/Off or Enable

Autorange or select a range



Autoranging from tens of microseconds to thousands of seconds or cycles

Displays GPS Satellite time

Isolated Inputs
 - High Power 30 V/100 mA Source for sensing dry contacts
 - High Z Voltage Sense 1 V to 300 V ac/dc

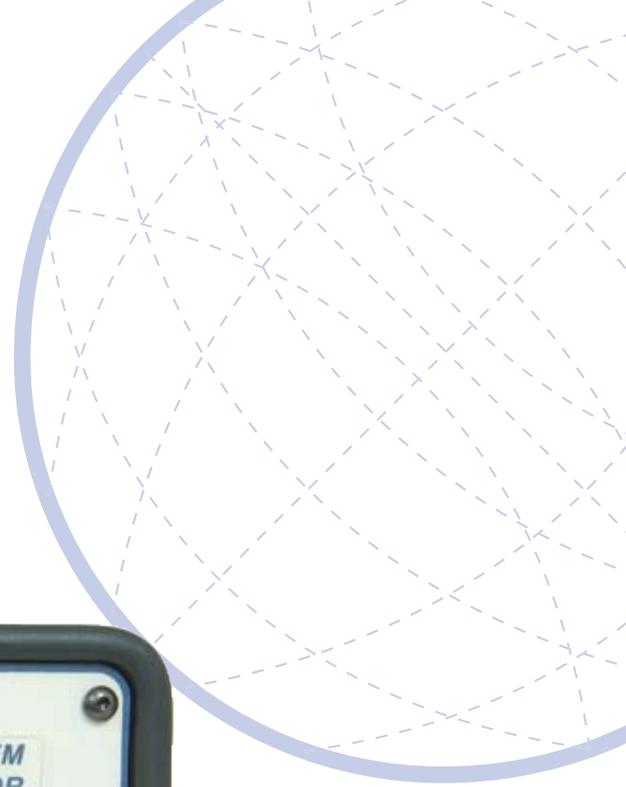
- Start timing from internal transition or external signals
 - Initiate circuit breaker close simulation

- Stop timing from external signals or Autosynchronizer
 - Sense pickup/dropout
 - Initiate circuit breaker trip simulation

Internal XTAL reference
 Phase lock to power line
 Phase lock to GPS Satellite

Zero X Turns on and changes values at Source 0° System 0°

Synchronously controls Enabled Sources and Logic Outputs



Overview of F2250 Technical Specifications

All models of the F2250 Simulator Family members have two sources each, providing ac current or voltage sine waves or dc operation switch selectable.

- Voltage sources provide up to 300 V ac / 400 V dc at 150 VA continuously; their ac transient power rating is 195 VA. The voltage source has one voltage amplifier module.
- Current modules operate up to 30 A ac / 20 A dc at 150 VA continuously; their transient rating is 60 A ac and dc at 225 VA.
- The Model Numbers of the Simulator Family members are F2251, F2252, and F2253. The last digit indicates the number of Active Source™ current amplifier modules. Adding current amplifier modules increases source VA and current ratings. F2252 and F2253 front-panel selection provides one voltage and one current source, or two current sources. Start with F2251, add plug-in amplifier modules in the field anytime.
- The F2251 has one 150 VA voltage source and one current source. The current source has one 150 VA current amplifier module.
- The F2252 has one 150 VA voltage source and two 150 VA current amplifier modules. Front-panel selection provides:
 - One 150 VA voltage and one 300 VA current, or
 - Two 150 VA currents.
- The F2253 has one voltage source and three 150 VA current amplifier modules. Front-panel selection provides:
 - One 150 VA voltage and one 450 VA current, or
 - One 150 VA current and one 300 VA current



All Simulator Family members have an integrated, six digit, multi-mode Timer, two Logic/Signal Inputs, and two independent Logic Outputs. The Timer provides event sensing and timing in cycles, seconds, or milliseconds. The Timer starts, stops, or senses from internally initiated events and external signals. The Logic/Signal Inputs drive the multi-mode Timer; turn sources on or off and initiate state changes in amplitude, phase, and frequency for control of dynamic state tests. The Logic Outputs simulate power-system events like carrier receive and circuit breaker 52a/52b operation.

Multi-Mode Timer:

Accuracy: $\pm 0.0005\%$ of reading, \pm one least significant digit, ± 50 micro-seconds.

Resolution: 10 micro-seconds (1 least significant digit).

Ranges: 0 - 9999.99 milliseconds
0 - 9999.99 seconds
0 - 9999.99 cycles

Logic/Signal Inputs: Two sets of galvanically isolated Logic/Signal Inputs, each set has a voltage sensing terminal for ac or dc voltage, a shared common terminal, and a dry contact sensing terminal.

Logic Outputs: Two sets of galvanically isolated Logic Outputs, each set has a normally open (Form A) terminal, shared common terminal, and a normally closed (Form B) terminal.

All interconnecting cables, connectors and accessories for application are supplied in a rugged cable bag for field use

For more information, contact fserieshelp@doble.com

