

## USES:

- Production Testing of LCR Components
- Frequency Response, Component & Sensor Characterization
- Component Screening
- Material Testing
- Quality Assurance Testing
- Measuring Dielectric Constant Using Standard Test Cell

## FEATURES:

- Frequency Range 10 Hz to 2 MHz
- 0.05% Basic Measurement Accuracy
- 7 Digit Measurement Resolution
- Programmable Test Voltage and Current
- Auto Ranging
- Test Setup and Measurement Data Storage
- Four-Terminal Kelvin Connections
- Standard USB Host Port, RS-232, Handler, Parallel Printer Interfaces
- Optional IEEE-488
- Graphical and Tabular Display of Swept Frequency, Voltage and Current Measurements
- Sequence Testing of Up To 6 Individual Tests
- Load Correction
- Binning (15)
- Built-in Auto Calibration Routine

# 7600 Plus Precision LCR Meter

The 7600 Plus LCR Meter performs precision impedance measurements over a frequency range of 10 Hz to 2 MHz. The instrument can measure 14 different impedance parameters with 0.05% accuracy, meeting today's requirements for component and material testing. The ease of use and user-friendly menu programming makes the 7600 Plus ideal for applications in product development, incoming inspections, or production line testing.

**14 Different Impedance Parameters:** Measure and display any two parameters simultaneously to achieve coverage and flexibility not previously available.

**Automatic Test Sequencing:** Run up to six different tests in sequence with a single push of the start button. Each test can have different conditions and limits.

**Swept Measurements:** Fast and accurate swept parameter measurements, graphical or tabular, for verification of component and material response to changes in AC test frequency, AC test voltage, or AC test current without the need for complex programming or an external controller.

**Program and Data Storage:** Test setups can be stored and recalled from either internal memory or from standard USB memory stick. The front panel can be locked out with password protection to ensure procedures are run the same way every time. Measured data can be stored on a USB memory stick in CSV format and then transferred to PC for data reduction and analysis.

**Load Correction:** Substantially improves instrument accuracy by performing measurements on a known standard and applying correction to subsequent measurements. Ideal for repetitive testing of identical devices at like test conditions.

**Automatic Calibration Procedure:** The 7600 Plus can be calibrated without returning the unit to the factory using the NIST traceable QuadTech Calibration Kit, reducing downtime and calibration costs.

**Easy to Use:** Large LCD graphics display and user friendly menu driven interface allows the 7600 Plus to be put on line fast, providing useful measurements by operators with little or no training.



## 7600 Plus

**Measured Parameters:** Any two of 14 parameters measured and displayed simultaneously, user selectable

Parameter	Measurement Range	Basic Measurement Accuracy*		
		Fast	Medium	Slow
Cs, Cp	00000.01 fF to 9.999999 F	±0.5%	±0.25%	±0.05%
Ls, Lp	0000.001 nH to 99.99999 H	±0.5%	±0.25%	±0.05%
D	.0000001 to 99.99999	±0.005	±0.0025	±0.0005
Q	.0000001 to 999999.9	±0.005	±0.0025	±0.0005
Z , Rs, Rp, ESR, Xs	000.0001 mΩ to 99.99999 MΩ	±0.5%	±0.25%	±0.05%
Y , Gp, Bp	00000.01 μS to 9.999999 MS	±0.5%	±0.25%	±0.05%
Phase Angle	-180.0000° to +179.9999°	±1.8°	±0.9°	±0.18°

\*At optimum test signal levels, frequencies, DUT values and without calibration uncertainty.

Capacitance (Cs/Cp), Inductance (Ls/Lp), Resistance (Rs/Rp), Dissipation (D) and Quality (Q) Factors, Impedance Z, Admittance Y, Phase Angle (θ), Equivalent Series Resistance (ESR), Conductance (Gp), Reactance (Xs), Susceptance (Bp)

Note: s = series, p = parallel, ESR equivalent to Rs

<b>Test Frequency:</b>	Range: 10 Hz to 2 MHz, continuous Resolution: 0.1 Hz from 10 Hz to 10 kHz, 5 digits > 10kHz Accuracy: ±(0.01% + 0.10Hz)
<b>Measurement Speed:</b>	Fast: 120 meas/sec Medium: 16 meas/sec - 8 meas/sec below 150kHz Slow: 2 meas/sec - 1 meas/sec below 150kHz
<b>Ranging:</b>	Automatic, Range Hold or user selectable
<b>Trigger:</b>	Internal (automatic), External (RS-232, IEEE-488.2 or Handler interfaces) and Manual
<b>AC Test Signal:</b>	Voltage: 20 mV to 5.0 V (open circuit) up to 500kHz in 5 mV steps 20 mV to 1.0 V (open circuit) 500kHz-1MHz in 5 mV steps 20 mV to 0.5 V (open circuit) >1MHz in 5 mV steps  Current: 250 μA to 100 mA (short circuit) in 50 μA steps Max. Compliance 3V < 500kHz.
<b>Source Impedance:</b>	25Ω, 400Ω, 6.4kΩ, or 100kΩ, range dependent
<b>DC Bias Voltage:</b>	Internal: 2.0 V External: 0 to +/-200V
<b>Display:</b>	LCD Graphics with back light and adjustable contrast
<b>Result Formats:</b>	Engineering or scientific notation % Deviation from nominal of primary parameter Deviation from nominal of primary parameter Pass/Fail Binning summary No Display for maximum throughput

<b>Sweep Result:</b>	Primary parameter vs. frequency, voltage or current Graphical or Tabular Format Up to 200 measurement points per sweep
<b>Sequencing Result:</b>	Displays up to 6 sequential test results, primary and/or secondary
<b>AutoAcc:</b>	Automatic calculation and display of overall instrument accuracy for selected settings, test conditions, and device under test
<b>Interfaces:</b>	Standard: USB Host Port, RS-232, Handler, Printer Port Optional: IEEE-488.2
<b>Charged Capacitor Protection:</b>	$\sqrt{8/C}$ for $V_{max} \leq 250 V$ ; $\sqrt{2/C}$ for $V_{max} \leq 1000V$ C = Capacitance in farads of the device under test
<b>Measurement Delay:</b>	Programmable from 0 - 1000 ms in 1 ms steps
<b>Averaging:</b>	Programmable from 1 - 1000 Median value mode
<b>Data Storage:</b>	USB Host Port USB1.1 Compliant, ASCII format
<b>Program Storage:</b>	Memory internal USB Host Port ASCII format
<b>Calibration:</b>	Recommended Calibration Interval 1 year Complete NIST Traceable Calibration using QuadTech 7000-09 Cal Kit Built-in automatic calibration procedure
<b>Usage &amp; Cal Data:</b>	Displays last calibration date, standard values used in calibration and # of hours operation
<b>Self-Test Routine:</b>	Verifies critical instrument operation at power-up or when selected from menu
<b>Contact Check:</b>	Time to detect, 2ms
<b>Test Terminals:</b>	Front panel, four terminal (BNC) guarded
<b>Mechanical:</b>	Bench mount with tilt bail Dimensions: (w x h x d): 16 x 6 x 14in (410 x 150 x 360mm) Weight: 17 lbs (8kg) net, 23 lbs (10.5kg) shipping
<b>Environmental:</b>	Meets MIL-T-28800E, Type 3, Class 5, Style E & F Operating: 0°C to + 50°C Humidity: <75% for 11°C to 30°C Operating Storage: - 10°C to + 60°C
<b>Power:</b>	• 90 - 250Vac • 47/63Hz • 100W max
<b>Safety:</b>	IEC61010-1: 2001 CAT 1, Pollution Degree 2
<b>EMC:</b>	89/336/EEC, 92/31/EEC, 93/68/EEC

## Ordering Information

### 7600 Plus Precision LCR Meter

#### Includes:

151053 Instruction Manual  
700700 Power Cord  
P/N N/A Calibration Certificate Traceable to NIST  
FLASH -118 512MB Memory Stick

#### Optional Accessories:

7000-00 Rack Mount Kit  
7000-01 BNC Cable Set, 1 meter  
7000-02 BNC Cable Set, 2 meters  
7000-03 Kelvin Clip Leads  
7000-04 Alligator Clip Leads  
7000-05 Chip Component Tweezers

7000-06 Axial/Radial Lead Component Test Fixture  
7000-07 Chip Component Test Fixture  
7000-09 Calibration Kit  
7000-22 IEEE Interface Option  
630250 RS232 to USB Adapter