



# GPS-3200 Series

## Precision Benchtop LCR Meters



### Any Frequency, Not Just The Usual Five.

A bench bridge that measures two parts of the complex impedance in every cycle, in any of twenty pairings, on six and a half digits at  $\pm 0.05\%$  basic accuracy. Five models share the instrument and differ only in how far up they go: 100 kHz, 200 kHz, 300 kHz, 500 kHz or 1 MHz.

The frequency is not a list of fixed points. It is continuously adjustable from 10 Hz in steps of 1 mHz, so a part is measured at the frequency it will work at rather than the nearest one the instrument happens to offer. Ten of those points can be swept automatically, with a limit set at each.

The drive is set as a voltage from 10 mV to 2 V or as a current from 100  $\mu$ A to 20 mA, and automatic level control holds it there against the load. Source impedance is selectable at 30  $\Omega$  or 100  $\Omega$ , which is what lets an inductor reading be compared against a figure taken elsewhere. Bias runs to  $\pm 2$  V and  $\pm 20$  mA internally, or  $\pm 60$  V from an external supply.

For production, the comparator sorts into nine bins with an out-of-bin and an auxiliary bin, counts to 999999, and drives a handler through its own interface. LAN, GPIB, RS232 and USB are all fitted for the host side, and setups, readings and screens save to internal memory or a USB stick.

#### KEY FEATURES

- 10 Hz to 1 MHz, continuous in 1 mHz steps
- $\pm 0.05\%$  basic on six and a half digits
- Level control · 30  $\Omega$  or 100  $\Omega$  source
- Bias  $\pm 2$  V and  $\pm 20$  mA ·  $\pm 60$  V external
- Nine-bin comparator with counting
- LAN, GPIB, RS232, USB and Handler

#### IDEAL FOR

- Component development and characterisation
- Goods-in and incoming inspection
- Production sorting and binning
- Dielectric and magnetic material work
- Automated test systems

## MEASUREMENT RANGES

| Range                                                             | Accuracy                   | Resolution | Notes                                                          |
|-------------------------------------------------------------------|----------------------------|------------|----------------------------------------------------------------|
| Measurement display range · six and a half digits                 |                            |            |                                                                |
| Capacitance 0.001000 pF to 99.9999 F                              | ±0.05% basic               | —          | Series or parallel · Cp and Cs                                 |
| Inductance 0.001000 nH to 99.9999 kH                              | ±0.05% basic               | —          | Series or parallel · Lp and Ls                                 |
| Resistance, reactance and impedance 0.001000 mΩ to 999.999 MΩ     | ±0.05% basic               | —          | Rp, Rs, Xs and  Z                                              |
| Conductance, susceptance and admittance 0.001000 μS to 999.999 kS | ±0.05% basic               | —          | G, B and  Y                                                    |
| Test signal and bias                                              |                            |            |                                                                |
| Frequency 10 Hz to 1 MHz, model dependent                         | ±0.01%                     | 1 mHz      | Continuously adjustable                                        |
| Voltage 10 mVrms to 2 Vrms                                        | ±(5% + 5 mV)               | 1 mV       | Held to ±(2% + 2 mV) from 10 mV to 1 V under level control     |
| Current 100 μArms to 20 mArms                                     | ±(5% + 50 μA)              | 10 μA      | Held to ±(2% + 20 μA) from 100 μA to 10 mA under level control |
| Internal bias -2 V to +2 V                                        | ±(2% + 5 mV)               | 1 mV       | Internal current bias -20 mA to +20 mA                         |
| External bias -60 V to +60 V                                      | Set by the external supply | —          | Applied at the rear bias input                                 |

±0.05% is the best case and applies on the slow or medium measurement rate, between 30 Hz and 10 kHz, for impedances from 10 Ω to 100 kΩ, at a drive between 0.5 V and 1.5 V. Accuracy is stated with at least 30 minutes warming, open and short circuit correction run, bias off and ranging left automatic.

## WHAT'S IN THE BOX



- GPS-3200 series meter
- Four-terminal Kelvin test cable
- Lead-type Kelvin test fixture, GPS-3203, 3205 and 3210
- Gold-plated short circuit bar
- Three-core power cord
- Instruction manual and warranty certificate

**AVAILABLE SEPARATELY** · GPIB, RS232 and USB leads, 2 m and 4 m test cables, an SMD component fixture, an LCR test pen with a four-wire surface mount fixture, and a Kelvin fixture. GPIB itself is fitted as standard on every model except the GPS-3201, where it is an option.

## GENERAL SPECIFICATIONS

| Code     | Item                                                                               | Part Number |
|----------|------------------------------------------------------------------------------------|-------------|
| GPS-3201 | Precision benchtop LCR meter, 10 Hz to 100 kHz · GPIB optional                     | 503201      |
| GPS-3202 | Precision benchtop LCR meter, 10 Hz to 200 kHz                                     | 503202      |
| GPS-3203 | Precision benchtop LCR meter, 10 Hz to 300 kHz · lead-type Kelvin fixture supplied | 503203      |
| GPS-3205 | Precision benchtop LCR meter, 10 Hz to 500 kHz · lead-type Kelvin fixture supplied | 503205      |
| GPS-3210 | Precision benchtop LCR meter, 10 Hz to 1 MHz · lead-type Kelvin fixture supplied   | 503210      |

## MEASURES

Twenty parameter pairings · main from Cp, Cs, Lp, Ls, Rs, |Z|, |Y| and G · second from D, Q, G, B, Rp, Rs, Xs and phase angle in degrees or radians

## RANGING

Nine impedance ranges, 30 Ω, 100 Ω, 300 Ω, 1 kΩ, 3 kΩ, 10 kΩ, 30 kΩ, 100 kΩ and 300 kΩ · automatic or held

## CORRECTION

Open, short and load · open and short interpolated across 49 fixed frequency points, or taken at a chosen point · cable length 0, 1, 2 or 4 m · self-calibration

## LIST SWEEP

Ten points swept on frequency, level or bias · sequential or stepping · upper and lower limit at each point

## DISPLAY

7 in TFT, 800 × 480 · English interface · 32 backlight steps · dual parameter reading

## POWER AND SIZE

220 V AC ±10%, 45 to 55 Hz, 110 V optional · under 20 W · 330 × 285 × 136 mm · 3.6 kg

## BASIC ACCURACY

±0.05% · six and a half digit resolution

## MEASUREMENT RATE

Slow 1.25, medium 10 and fast 50 readings per second · custom from 0.5 to 200 · fast is 20 readings per second on the GPS-3201

## SORTING

Nine bins with an out-of-bin and an auxiliary bin · tolerance or sequential limits · counting to 999999 · deviation as an absolute value or a percentage

## TRIGGER

Internal, manual, external or bus · delay 0 to 10 s in 1 ms steps

## INTERFACES AND STORAGE

LAN, RS232, GPIB, USB device, USB host and Handler · ten setups internally and ten on USB · readings as CSV and screens as image files

## ENVIRONMENT

Operating 0 °C to 40 °C · humidity 15% to 85% · altitude to 2000 m · 30 minutes warming, up to 16 hours continuous