5300A and 5300B measurement system mainframe

The mainframe units provide the system with power, reference frequency, display, counting logic and timing control.

The 5300A has a 6-digit dot matrix display, standard time base, external time base input and BCD output as a standard rear panel output. The 5300B has an 8-digit 7-segment display, standard time base or optional TCXO time base, external time base input and no digital output from the mainframe. See mainframe/plug-on display chart below for number of display digits with a particular mainframe and plug-on combination.

Time base

Standard crystal frequency: 10 MHz.

Stability

- Aging rate: < 3 parts in 10^6/mo.
- Temperature: < ± 5 parts in 10^6, 0° to 50°C.
- Typically: < ± 2 parts in 10^6, 15° to 40°C.
- Line voltage: < ± 1 part in 10^6 for 10% line variation.

Oscillator output: 10 MHz, approximately 1 V rms at rear panel BNC, 100Ω source impedance.

External input: 1 MHz to 10 MHz, 1 V rms into 200Ω.

Opt 001 High stability time base (5300B only)

Frequency: 10 MHz.

Stability

- Aging rate: < ± 1.2 parts in 10^6/year.
- Temperature: < ± 5 parts in 10^6, 0° to 50°C.
- Line voltage: < ± 5 parts in 10^6 for 10% line variation.

Oscillator output: 10 MHz, approximately 1 V rms at rear panel BNC, 100Ω source impedance.

External input: 1 to 10 MHz, 1 V rms into 50Ω.

General

Display: 6-digit, dot matrix (5300A) or 8-digit, 7-segment matrix (5300B), solid state LED display (gallium arsenide phosphide light emitting diodes) including decimal point and annunciator units.

Overflow: LED light indicates when display range is exceeded.

Display storage: holds reading between samples. Sample rate: Sample rate control adjusts the delay from the end of one measurement to the start of a new measurement. Continuously variable from less than 50 msec to greater than 5 seconds. HOLD position: display can be held indefinitely. Reset: Front panel pushbutton switch resets all registers and initiates new measurement. Reset input by contact closure to ground or TTL type low level also available on rear panel connector (5300A only).

Operating temperature: 0° to 50°C.

Power requirements: 115 or 230 volts ± 10%, 48 to 60 Hz, 25 VA maximum (depends on plug-on module). Mainframe power without plug-on nominally 5 watts. Battery operation: with 5310A re-chargeable battery pack (see 5310A specifications).

Weight: net, 1.5 kg (3½ lb). Shipping, 2.5 kg (5½ lb).

Dimensions: (without snap-on module): 89 mm H x 160 mm W x 248 mm D (3½" x 6¼" x 9¾").

Digital output (5300A only)

Digital serial, 4-bit BCD parallel available at rear panel connector.

Code: 4-line 1-2-4-8 BCD, "1" state low, TTL type logic levels.

Decimal point: decimal point code (binary "1111") automatically inserted at correct digit position.

Print command: positive step, TTL output.

Holdoff: contact closure to ground or TTL low level, inhibits start of new measurement cycle.

Connector: 20-pin PC connector. Mating connector Viking 2VH10/1JN or equivalent.

Parallel data output: available from Printer Interface. See 10533A specification.

Note: digital output for 5300B Mainframe is provided by 5312A HP-1B Interface module.

Mainframe/plug-on compatibility

Plug-on | Display Digits with 5300A | Display Digits with 5300B
--- | --- | ---
5301A | 6 | 7
5302A | 6 | 7
5303B | 6 | 8
5304A | 6 | 7
5305B | N/A | 8
5306A (Frequency) | 6 | 7
(ACV, DCV, OHMS) | 5 | 5
5307A | 6 | 6
5308A | N/A | 8

Accessories

Digital Recorder Interface: (for use with 5300A, BCD output) See 10533A Specifications, Page 308 $95

10548A Service support package: Contains an interface card and 4 diagnostic cards for easy troubleshooting of 5300A or 5300B $35

10619A Leather carrying case: Holds 5300A or 5300B, snap-on module and 5310A battery pack plus accessories $65

10681A Rack mount kits
- 10851A Single $40
- 10852A Double $40
- 10853A Single/with plug-between $65
- 10854A Double/with plug-between $65

Ordering instructions

5300A 6 digit mainframe $500
5300B 8 digit mainframe $460
Opt 001: TCXO (5300B only) add $180
5300A/B System (cont.)

- 10 MHz
- Auto ranging
- External gate

5301A 10 MHz frequency counter module

**Input**
- **Range:** 10 Hz to 10 MHz.
- **Sensitivity (min):** 25 mV rms sine wave 50 Hz to 1 MHz, 50 mV rms sine wave 10 Hz to 10 MHz; 150 mV p-p pulse at minimum pulse width, 50 ns. Sensitivity variable to 2.5 V rms.
- **Impedance:** 1 MΩ shunted by less than 30 pF.
- **Overload protection:** 500 V (dc + peak ac). 250 V rms dc to 400 Hz, 10 V rms at 10 MHz.
- **Trigger level:** selectable positive, negative, or zero volts.
- **Frequency measurement**
  - **Range:** 10 Hz to 10 MHz.
  - **Gate times:** manually selected 0.1, 1, or 10 seconds AUTO position selects gate time of 1 second for maximum resolution.
  - **Accuracy:** ±1 count ± time base accuracy.
- **Open/close (totalizing)**
  - **Range:** 10 MHz max count rate.
  - **External gate:** gate signal by contact closure to ground or TTL low.

**General**
- **Check:** counts internal 10 MHz reference frequency.
- **Operating temperature:** 0°C to 50°C.
- **Power requirements:** including mainframe, nominally 8 watts.
- **Weight:** net, 0.9 kg (2 lb). Shipping, 1.5 kg (3 3/4 lb).
- **Dimensions:** see Mainframe.

5301A 10 MHz Frequency Counter Module $225

10533A Recorder Interface specifications

The 10533A accessory provides an interface between the 5300A measurement system mainframe and a standard parallel-input recorder such as the HP 5055A. The interface module provides conversion from the 5300A serial data output to a standard parallel format.

**Output format:** 10 parallel digits; 6 data, 1 decimal point, 1 overflow, 1 exponent and 1 exponent sign.

**Code:** 4-line 1-2-4-8 BCD; "1" state low TTL levels.

**Decimal point:** floating decimal point automatically inserted at correct digit position. Coded "1111" (**"** on standard HP 5055A print wheels). Internal jumper wire removes decimal point from data format if desired.

**Overflow:** coded "1111" (**"***) printed in first column when 5300A overflow light is on.

**Exponent:** ±0, ±3, ±6 corresponding with 5300A measurement units.

**Print command:** negative step, TTL levels.

**Inhibit input:** +2.0V or higher prevents the 5300A from recycling.

**Power requirements:** 100 mA at 5 volts, provided by 5300A mainframe.

10533A Recorder Interface $225

5302A 50 MHz universal counter module

**Input channels A and B**
- **Range:** Channel A: 10 Hz to 50 MHz, Channel B: 10 Hz to 10 MHz.
- **Sensitivity (min):** 25 mV rms sine wave 50 Hz to 1 MHz, 50 mV rms sine wave 10 Hz to 10 MHz; 150 mV p-p pulse at minimum pulse width, 50 ns. Sensitivity variable to 2.5 V rms.
- **Impedance:** 1 MΩ shunted by less than 30 pF.
- **Overload protection:** 500 V (dc + peak ac). 250 V rms dc to 400 Hz, 10 V rms above 10 MHz.
- **Trigger level:** selectable positive, negative, or zero volts.
- **Slope:** automatically switched to trigger on positive slope for positive pulse and negative slope for negative pulse. Positive slope for sinusoidal inputs.
- **Marker outputs:** rear BNC, TTL level low while gate is open.
- **Frequency**
  - **Range:** channel A: 10 Hz to 50 MHz, prescaled by 10; channel B: 10 Hz to 10 MHz.
  - **Gate times:** manually selected 0.1, 1, or 10 seconds. AUTO position selects gate time of 1 second for maximum resolution.
  - **Accuracy:** ±1 count ± time base accuracy ± trigger error.
- **Time interval**
  - **Range:** 500 nsec to 1000 seconds.
  - **Input:** channels A and B.
  - **Resolution:** 100 ns to 1 ms in decade steps.
  - **Accuracy:** ±1 count ± time base accuracy ± trigger error.
- **Period**
  - **Range:** 10 Hz to 1 MHz.
  - **Input:** channel B.
  - **Resolution:** 100 ns to 1 ms in decade steps.
  - **Accuracy:** ±1 count ± time base accuracy ± trigger error.
- **Period average**
  - **Range:** 10 Hz to 1 MHz.
  - **Input:** channel B.
  - **Periods averaged:** 1 to 10⁴ automatically selected.
  - **Frequency counted:** 10 MHz.
  - **Accuracy:** ±1 count ± time base accuracy ± trigger error.
- **Ratio**
  - **Display:** FA/FB times multiplier (N), N = 10 to 10⁴, selectable in decade steps.
  - **Range:** channel A: 10 Hz to 1 MHz, Channel B: 10 Hz to 10 MHz.
  - **Accuracy:** ±count of FB ± trigger error of FA.
- **Open/close (totalizing)**
  - **Range:** 10 MHz max.
  - **Input:** channel B opening and closing of gate initiated by front panel pushbutton switch.

**General**
- **Check:** counts internal 10 MHz reference frequency.
- **Operating temperature:** 0°C to 50°C.
- **Power requirements:** including mainframe, nominally 10 watts.
- **Weight:** net, 0.9 kg (2 lb). Shipping, 1.5 kg (3 3/4 lb).
- **Dimensions:** see Mainframe.

5302A 50 MHz Universal Counter Module $325