

Appendix B: Specifications

The 11801C electrical characteristics apply to the following conditions:

- The instrument has had a 20-minute warm-up period.
- The instrument is operating in an environment that meets the limits described in Environmental Specifications in this section.

Table B-1: 11801C Vertical System Specifications

Characteristic	Specification
Input sources	
Mainframe	4 sampling heads, 8 channels
Option 1M, with 4 SM-11 Multi-Channel Units	68 sampling heads, 136 channels
Bandwidth	Dependent on sampling head
Risetime	Dependent on sampling head
Amplifier gain accuracy	$\pm 1\%$ of full-scale range
Vertical resolution	
Trace data	8 bits
Hardware measurements	14 bits
Input sensitivity	2 mV/div to 255 mV/div in 1 mV/div steps
Offset accuracy	± 2 mV
Offset range	± 2 V
Offset resolution	0.25 mV
Measurement level accuracy	± 2 mV
Vertical acquisition resolution	
Single graticule	25 points/div
Dual graticule	25 points/div
Vertical display resolution	
Single graticule	50 pixels/div
Dual graticule	25 pixels/div

Table B-2: 11801C Time Base Specifications

Characteristic	Specification
Internal reference clock	Crystal-controlled oscillator
Sample rate	200 kHz maximum
Record length	User selectable, 512, 1024, 2048, 4096, or 5120 points
Sweep rate resolution	1–2–5 steps or 1 ps/div increments
Record duration	10 ps to 50 ms
Maximum sweep rate	
512-point record	1 ps/div
1024-point record	1 ps/div
2048-point record	2 ps/div
4096-point record	5 ps/div
5120-point record	5 ps/div
Time interval measurement accuracy	$8 \text{ ps} + 0.01\% \times (\text{interval}) + 0.001\% \times (\text{position}), \text{ guaranteed};$ $4 \text{ ps} + 0.004\% \times (\text{interval}) + 0.0004\% \times (\text{position}), \text{ typical, where interval} \geq 1 \text{ ns};$ $2.5 \text{ ps} + 0.0004\% \times (\text{position}),$ typical, where interval = 100 ps; $1 \text{ ps} + 0.0004\% \times (\text{position}),$ typical, where interval $\leq 10 \text{ ps}$
	Notes: 1) For intervals < 100 ps, the above holds for time/div $\leq 20 \text{ ps/div}$ 2) For other intervals not listed above, linearity interpolate the cardinal points

Table B-3: 11801C Input and Output Specifications

Characteristic	Specification
Touch panel	Infrared beam touchable array, 22 rows of 11 columns
Knobs	2 general-purpose knobs, set by user to desired function
Calibrator output step	
Voltage	500 mV open circuit or 250 mV into 50 Ω
Frequency	Approximately 100 kHz (50 kHz if divide-by-two mode selected)
Risetime	Approximately 250 ps into 50 Ω
Internal clock output	
Voltage	Positive pulse from 0 to 2.0 V
Source impedance	50 Ω
Repetition rate	Approximately 100 kHz (50 kHz if divide-by-two mode selected)

Table B-4: 11801C Trigger Specifications

Characteristic	Specification
Jitter	1.1 ps RMS + 4 ppm of position (typical) 2.0 ps RMS + 5 ppm of position max Freq = 2.5 GHz, DC/ $\times 1$, $V_{in} = 200 \text{ mV}_{p-p}$, HF = Off, Enhanced = On May require trigger level adjustment to avoid 250 ps pulse width when triggering on trailing edge
Trigger source	External Direct, Internal Clock, or External Prescaler
Trigger mode	
Auto	Free runs after 20 ms timeout
Normal	Acquisition only after trigger event
Maximum p-p trigger input	
Direct	$1 \text{ V}_{p-p} (\times 1)$ $10 \text{ V}_{p-p} (\times 10)$
Prescaler	2.5 V_{p-p}
Maximum safe trigger input voltage	
Direct	$\pm 1.5 \text{ V} (\times 1)$ $\pm 15 \text{ V}, \leq 5 \text{ V}_{RMS} (\times 10)$
Prescaler	$\pm 2.5 \text{ V}$
External trigger attenuation	$\times 1$ and $\times 10$
Trigger level	-1 V to $+1 \text{ V}$, $\times 1$ attenuation, -10 V to $+10 \text{ V}$, $\times 10$ attenuation
Trigger level resolution	1 mV , $\times 1$ attenuation 10 mV , $\times 10$ attenuation
Trigger accuracy	10% of full scale
Trigger sensitivity	
Direct – DC coupled	$\times 1$: 100 mV , DC to 3 GHz 50 mV , DC to 4 GHz (typical) $\times 10$: 1 V , DC to 3 GHz (Auto, Enhanced Off, Auto holdoff, HF Off) May require trigger level adjustment to avoid 250 ps pulse width when triggering on trailing edge for stable triggering

Table B-4: 11801C Trigger Specifications (Cont.)

Characteristic	Specification
Direct AC coupled	<p>×1: 100 mV, 30 kHz to 3 GHz 50 mV, 30 KHz to 4 GHz (typical)</p> <p>×10: 1 V, 30 kHz to 3 GHz (Auto, Enhanced Off, Auto holdoff, HF Off) May require trigger level adjustment to avoid 250 ps pulse width when triggering on trailing edge for stable triggering</p>
Prescaler – AC coupled	800 mV peak-peak from 2 GHz to 3 GHz < 1V, 10 GHz to 12.5 GHz (typical)
Metastability	0 ppm (typical) (tested with 250 K trigger events) at 2.5 GHz, 100 mV _{p-p} trigger, Enhanced = On
Main and window position	Minimum 25 ns pre-trigger required (48 ns, Option 1M)
Initial window delay	25 ns to 50 ms in steps of 1% of main record size (48 ns, Option 1M)
Strobe skew adjustment	±1.5 ns

Table B-5: 11801C Display Specifications

Characteristic	Specification
CRT	8½ inch diagonal, color, magnetic deflection. Vertical raster orientation. Nominal screen size: 6.087 inches vertical by 4.496 inches horizontal
Character display	
Character height	0.10 in (upper case)
Character cell	16 pixel vertical by 10 pixel horizontal

Table B-6: 11801C AC Line Power Specifications

Characteristic	Specification
Voltage ranges	90 to 132 V _{RMS} or 180 to 250 V _{RMS} Voltage ranges apply to trace distortion, which reduces peak line voltage 5% Installation Category II
Frequency	48 Hz to 440 Hz
Power	320 W
Current	4.6 A _{RMS} at 50 Hz, 90 V line with 5% clipping
Fuse	6 A, 250 V normal blow

Table B-7: 11801C Environmental Specifications

Characteristic	Specification
Temperature	Meets MIL–T–28800E, Type III, Class 5
Operating	0° C to 50° C
Non-operating	–40° C to 75° C
Humidity	Up to 95% relative humidity, at up to 50° C
Altitude	Meets MIL–T–28800E, Type III, Class 5
Operating	Up to 4.5 km (15,000 ft)
Non-operating	Up to 15 km (50,000 ft)
Vibration	Operating, sampling heads not installed: meets MIL–T–28800E, Type III, Class 5 (section 4.5.5.3.1)
Shock	Non-operating, sampling heads not installed: meets MIL–T–28800E, Type III, Class 5 (section 4.5.5.4.1)
Bench handling	Operating: meets MIL–T–28800E, Type III, Class 5 (section 4.5.5.4.3)
Packaged product vibration and bounce	Packaged product, sampling heads not installed: meets NSTA Proj. 1A
Drop of packaged product	Packaged product, sampling heads not installed: meets NSTA Proj. 1A
Electrostatic immunity	No disruption or degradation of performance: up to 10 kV. No damage to instrument: up to 20 kV

Table B-8: 11801C Certifications and Compliances

Characteristic	Specification
Approvals	<p>UL3111-1 – Standard for electrical measuring and test equipment</p> <p>CAN/CSA C22.2 No. 1010-1 – Safety requirements for electrical equipment for measurement, control and laboratory use</p>
Installation Category Descriptions	<p>Terminals on this product may have different installation category designations. The installation categories are:</p> <p>CAT III Distribution-level mains (usually permanently connected). Equipment at this level is typically in a fixed industrial location.</p> <p>CAT II Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected.</p> <p>CAT I Secondary (signal level) or battery operated circuits of electronic equipment.</p>
Conditions of Approval	<p>Safety Certifications/Compliances are made for the following conditions:</p> <p>Altitude (maximum operation): 2000 meters</p>
IEC Characteristics	<p>Equipment type:</p> <p>Test and Measuring</p> <p>Pollution Degree 2, rated for indoor use</p> <p>Safety Class 1, grounded product (IEC1010-1)</p>