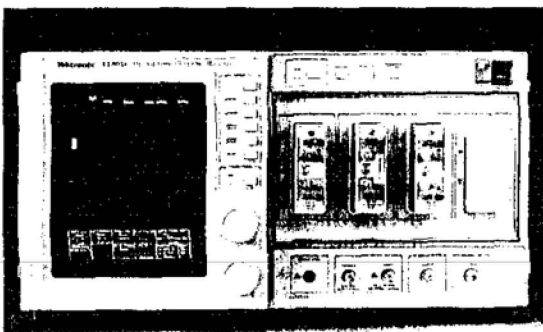


DIGITAL SAMPLING OSCILLOSCOPE

11801C



FEATURES – BENEFITS

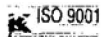
APPLICATIONS

DC To 50 GHz Bandwidth
7 Ps Rise Time
Eight Channels, Expandable to 136
(with SM-11 multi-channel units)
High Resolution and Measurement
Repeatability
10 Femtosecond Sampling Interval
(0.01 ps)
Modular Architecture
Dual Timebase Allows Multiple
Windows
FFT
Predefined Telecom Masks
True Dual-Step Differential TDR
Fully Automatic Jitter and Noise
Measurements
Automatic Statistical
Measurements, Histograms and
Mask Testing
Automatic Pulse Measurements
with Statistics
Comprehensive Waveform
Processing
Complete Programmability for ATE
Applications
Color Display with Color Grading

Semiconductor Test
TDR Characterization
High Speed Digital
Data Communication

For your local Tektronix
representative see the list in
the back of this catalog or
outside the U.S. call:
1-503-627-1916,
inside the U.S. call:
1-800-426-2200.

CE



Tektronix measurement
products are manufactured in
ISO registered facilities.

THE 11801C DIGITAL SAMPLING OSCILLOSCOPE

The 11801C Digital Sampling Oscilloscope
offers the widest range of on-board measure-
ment and waveform processing capabilities of
any multi-Gigahertz scope. With excellent meas-

urement repeatability, exceptional vertical reso-
lution and fast display update rate, the 11801C
is a powerful measurement tool for semiconduc-
tor testing, TDR characterization of circuit
boards, IC packages and cables, and high speed
digital data communications.

DIGITAL SAMPLING OSCILLOSCOPE 11801C

MODULARITY MEETS YOUR NEEDS NOW AND IN THE FUTURE

The modular microprocessor-based architecture of the 11801C not only allows you to select the right configuration for your application, but also allows expandability to meet your future measurement needs. The 11801C accepts up to 4 dual-channel sampling heads and can be expanded through the SM-11 Multi-Channel Units to 136 channels. There are currently nine sampling heads to choose from:

- ▶ SD-14 3 GHz high impedance (100 k Ω /0.475 pF) dual-channel probe sampler
- ▶ SD-20 20 GHz single-channel loop-through head
- ▶ SD-22 12.5 GHz dual-channel low noise head
- ▶ SD-24 20 GHz dual-channel TDR/sampling head
- ▶ SD-26 20 GHz dual-channel sampling head
- ▶ SD-32 50 GHz, single-channel sampling head
- ▶ SD-42 6.4 GHz O/E converter (55 ps optical pulse response FWHM)
- ▶ SD-44 15 GHz O/E converter
- ▶ SD-51 20 GHz trigger head

CHARACTERISTICS

VERTICAL SYSTEMS

Rise Time/Bandwidth – Determined by the sampling head used.*1

Vertical Resolution – 8 bits full screen (78 μ V LSB at 2 mV/div deflection factor).

Amplifier Gain Accuracy – $\pm 1\%$ of all settings.

Deflection Factors – 2 to 255 mV/div in 1 mV/div increments.

Offset Range – ± 2 V.

HORIZONTAL SYSTEM

Main and Window Time Base – 1 ps/div to 5 ms/div, settable in 1-2-5 sequence or in 1 ps increments.

Time Interval Accuracy – 8 ps + 0.01% x (interval) + 0.001% x (position), guaranteed; 4 ps + 0.004% x (interval) + 0.0004% x (position), typical, where interval ≥ 1 ns; 2.5 ps + 0.0004% x (position), typical, where interval = 100 ps; 1 ps + 0.0004% x (position), typical, where intervals < 10 ps.

Notes: 1) For intervals < 100 ps, the above holds for time/div ≤ 20 ps/div.
2) For other intervals not listed above, linearity interpolate the cardinal points.

Record Length – 512, 1024, 2048, 4096 and 5120 samples.

Windows – Any number of window records may be placed on any number of main records, up to a maximum of 8 displayed traces. All window records have the same duration, but may be independently positioned on any main record. Windows may be set to automatically track a moving edge on the main record.

Maximum Sampling Rate – 200 ks/s.

TRIGGER SYSTEM*2

Trigger Bandwidth – Direct 4 GHz typical, Prescaled 12.5 GHz typical.

Trigger Sensitivity – Direct DC to 4 GHz: 50 mV typical.
Prescaled 2 to 10 GHz: 500 mV,
10 to 12.5 GHz: 800 mV typical.

Delay Jitter – 1.1 ps +4 ppm of a position typical. 2.0 ps +5 ppm of position maximum (rms).

Metastability: Raw < 0.005 ppm at 2.488 GHz with 200mV input trigger voltage, typical. Enhanced is theoretically zero.

Internal Clock – 100 kHz (drives TDR, Internal Clock Output and Calibrator).

Trigger Level Range – ± 1.0 V (± 10 V with 10X trigger attenuator activated).

Trigger Input Range – ± 1.5 V (± 1.5 V, 5 V rms maximum with 10X).

Trigger Holdoff – 5 μ s to 2.5 s.

MEASUREMENT SYSTEM

Waveform Processing Functions – Add, subtract, multiply, divide, absolute, average, differentiate, envelope, exponent, integrate, natural log, log, signum, square root, smoothing and filter.

Measurement Set – Max, min, mid, p-p, mean, rms, amplitude, extinction ratio, overshoot, undershoot, noise*3, rise, fall, spectral magnitude, spectral frequency, THD, SNR, frequency, period, prop delay, cross, width, phase, duty cycle, jitter*3, area +, area -, and energy. Measurements are constantly updated; mean and standard deviation available on all measurements.

Measurement Parameters – (Proximal, mesial, distal and start/stop levels): May be set to absolute levels.

Cursors – Paired or split dots, vertical bars, and horizontal bars.

TDR SYSTEM (SD-24 ONLY)

Combined TDR/Acquisition Reflected Rise Time – 35 ps or less.

TDR Step Amplitude – Adjustable to ± 250 mV (polarity of either step may be inverted).

Time Coincidence Between TDR Steps – Adjustable to less than 1 ps.

Source Resistance – 50 ± 0.5 Ω .

Typical Aberrations (at ± 250 mV Amplitude) –

10 ns to 20 ps before step: $\pm 3\%$ or less;
less than 300 ps after step: +10%, -5% or less;
300 ps to 5 ns after step: $\pm 3\%$ or less; elsewhere: $\pm 1\%$ or less.

DIGITAL SAMPLING OSCILLOSCOPE

11801C

CRT AND DISPLAY FEATURES

CRT – 9 in. diagonal, magnetic deflection, vertical raster scan orientation. Color.

Colors – Eight-color default color set included; or, colors are user-selectable from palette of 262,144 colors.

Video Resolution – 552 horizontal by 704 vertical displayed pixels.

^{*1} Vertical system specifications of 11801C with SD-14 non-applicable. See 11800 Series Sampling Head specifications.

^{*2} 11801C has external trigger only; requires 23 ns pretrigger or DL-11 Delay Lines to view trigger point (45.5 ns with Option 1M).

^{*3} Available only in statistical measurement mode.

POWER REQUIREMENTS

Line-Voltage Ranges – 90 to 132 V rms, 180 to 250 V rms.

Line Frequency – 48 to 440 Hz.

Maximum Power Consumption – 214 W.

ENVIRONMENTAL AND SAFETY

Temperature – Operating: 0°C to +50°C; nonoperating: –40°C to +75°C.

Humidity – Operating and nonoperating: up to 95% relative humidity, up to 50°C. Per Mil-T-28800E, Type III, Class 5.

Altitude, Vibration, Shock nonoperating, Bench Handling – Meets MIL-T-28800E, Type III, Class 5.

Electromagnetic Compatibility (with sampling heads or optional blank panels installed in all sampling head compartments) – Meets the requirements of: MIL-STD-461B; FCC Part 15, sub-part J, Class A; VDE 0871/6.78 Class B.

Safety – Listed UL 1244, CSA Bulletin 556B September 1973.

PHYSICAL CHARACTERISTICS

Dimensions	Cabinet		Rackmount	
	mm	in.	mm	in.
11801C				
Width	448	17.6	483	19.0
Height	238	9.4	222	8.8
Depth	599	23.6	550	21.6
SM-11				
Width	448	17.6	483	19.0
Height	238	9.4	222	8.8
Depth	558	22.0	550	21.6
Weights				
	kg	lb.	kg	lb.
11801C				
Net	22.3	49.0	23.2	51.0
Shipping	25.9	57.0	26.8	59.0
SM-11				
Net	20.0	44.0	20.9	46.0
Shipping	23.6	52.0	24.5	54.0

ORDERING INFORMATION

For price information: Outside the U.S. contact your local Tektronix representative, inside the U.S. see the price list in the back of this catalog.

11801C

Digital Sampling Oscilloscope.

Includes: User Manual (070-9971-00); Programmer Manual (070-9970-00);

Service Manual (070-9972-00);

12-in. SMA-SMA cable,

2 ea. 8-1/2-in. SMA-SMA cable,

1 wrist strap.

Opt. 1M – Multi-Channel Conversion: Modifies 11801C to permit operation with up to four SM-11 Multi-Channel Units.

Opt. 1R – Rackmount.

Includes: Hardware, tooling and instructions for converting bench model to rackmount configuration. Available with 11801C.

DL-11

Delay Line.

Includes: Delay Line Instruction Sheet – Order 070-7051-01.

INTERNATIONAL POWER PLUGS

Opt. A1-A5 – Available.

See page 619 for description.

ADDITIONAL ACCESSORIES

Calibration Step Generator – USA (067-1338-00); Europe (067-1338-01); UK (067-1338-02); Australia (067-1338-03); Switzerland (067-1338-05); Japan (067-1338-06).

Sampling Head Extender Cable, 1 meter – Order 012-1220-00.

Sampling Head Extender Cable, 2 meter – Order 012-1221-00.

DL-11 Service Manual – Order 070-7050-01.

Blank Panel for Empty Sampling Head Compartments – Order 200-3395-00.

ECL Terminator – Order 015-0558-00.

SMA Accessory Kit – Order 020-1693-00.

RECOMMENDED PROBES

P6150 – 9 GHz Passive Probe.

P6249/1103 – 4 GHz Active FET Probe and Power Source.

For your local Tektronix representative see the list in the back of this catalog or outside the U.S. call: 1-503-627-1916, inside the U.S. call: 1-800-426-2200.

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