

NEW 11201 Digitizing Oscilloscope

GPIB
IEEE-488

The 11201 complies with IEEE Standard 488.1-1987, RS-232C, and with Tektronix Standard Codes and Formats.

TYPICAL APPLICATIONS

- Power Supply Testing
- Digital Design and Test
- Communications

BENEFITS

- High Price/Performance Ratio
- High-Resolution Displays
- Automatic Measurements

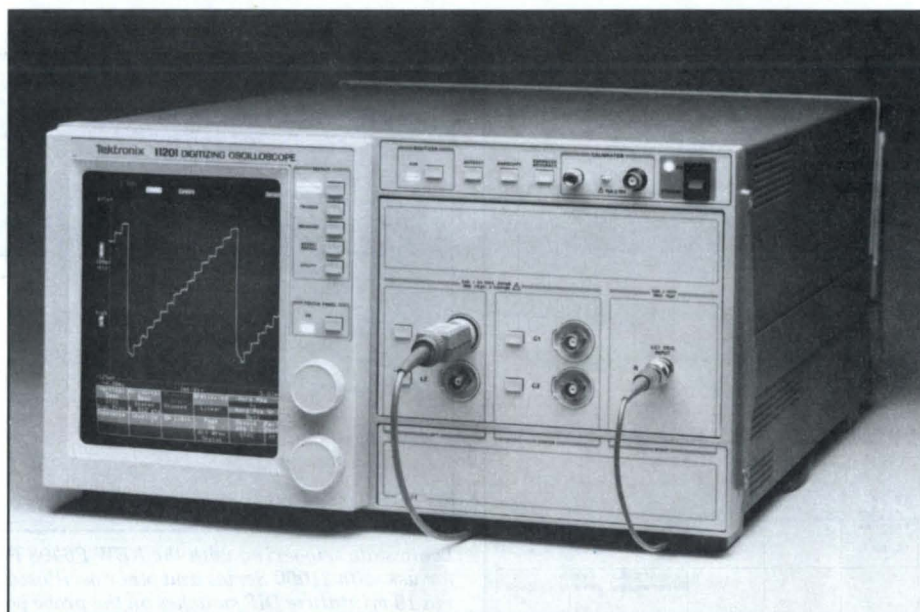
FEATURES

- 400-MHz Bandwidth
- 8 Channel Display, 4 Channel Acquisition
- Switchable Impedance 50 Ω , 1 M Ω
- 10-ps Horizontal Resolution, 9-bit Vertical Resolution
- Waveform Processing and Automatic Pulse parameters
- Multiple 10,240-Point Waveform Records
- Simplified Feature Access
- External Trigger
- Fully Programmable via GPIB and RS-232C

With all the waveform processing power of the best digital storage oscilloscope, the 11201 offers a new level of value in high-performance measurement. Its monolithic design includes state-of-the-art features that make it extremely easy to use in your lab or system.

Choose Your Computer Interface

The 11201 has both IEEE-488 and RS-232C interfaces as standard features for data transfer and instrument control. The RS-232C port lets you control the instrument with a PC, upload or download waveforms from a workstation or mainframe, or run diagnostics over a modem. GPIB and RS-232C menus let you match interface parameters with a controller, modem, or host. If speed is a consideration, the parallel interface provided by the IEEE-488 port should be used. A DMA option can be added to make GPIB data transfers even faster. Whichever bus is chosen, the 11201 responds to a logical set of Tektronix *Standard Codes and Formats* commands that make it easy to write your test procedures.



Accurate, Automatic Measurements

The 11201 performs waveform-processing functions, pulse-parameter analysis, cursor functions, and trigger-to-trigger measurements that cover a full range of measurement needs. A special annotation mode shows where measurements are being made on the trace so users can feel confident that they are on target. Dot cursors can be split between two waveforms to make propagation-delay measurements or to compare voltages. Measurement zones can be set to limit the automatic measurement to a portion of a displayed trace. Users can set proximal, distal, and mesial levels to customize timing measurements. Up to six measurement results can be displayed and continuously updated as the data changes. This lets users make adjustments and see the results quicker than ever before. A direct hard-copy output includes time and date of the measurement for archiving.

CHARACTERISTICS

VERTICAL SYSTEM

Equivalent-Time Bandwidth—

- ≥10 mV: 400 MHz
- 5 to 9.95 mV: 350 MHz
- 2 to 4.98 mV: 250 MHz
- 1 to 1.99 mV: 200 MHz

Vertical Resolution—9 bits (512 levels).

Two built-in four-pole bandwidth-limit filters (100 and 20 MHz) may be activated to reduce unwanted high-frequency noise at 24 dB/octave for each channel.

Both coarse and fine deflection-factor steps are fully calibrated. At 1 mV/div, the high-resolution calibrated dc offset has a setability of 25 μ V and a range of ± 1 V (equivalent to 16 bits), giving an effective screen height of 2000 div.

Number of Channels—Four.

Calibrated Deflection Factors—Coarse steps: 1 mV to 10 V/div in 1-2-5 sequence. Fine steps: Between coarse steps in 1% increments of next more-sensitive coarse step.

Accuracy—

Δ Volts dc accuracy: $\pm(1.4\% + 0.012 \text{ div})$.
DC Balance, 1 to 99.5 mV/div: $\pm(1.0 \text{ mV} + 0.10 \text{ div})$.

Offset Accuracy, 1 to 99.5 mV/div (± 1 V range): $\pm(0.4\% + 0.5 \text{ mV})$.

For absolute dc accuracy of single-point measurements using offset, add the Offset Accuracy and DC Balance terms.

Offset Range—

1 to 99.5 mV/div: ± 1 V; Resolution: 25 μ V.
100 mV to 0.995 V/div: ± 10 V; Resolution: 250 μ V.

1 to 10 V/div: ± 100 V; Resolution: 2.5 mV.

Typical Noise (RMS)—

- 1 to 1.99 mV/div: 0.22 div.
- 2 to 4.98 mV/div: 0.13 div.
- 4 to 9.95 mV/div: 0.07 div.
- 10 mV to 10 V/div: 0.06 div.

Input Impedance—Switchable 1 M Ω in parallel with 15 pF, or 50 Ω $\pm 2.0\%$.

Input Coupling Modes—AC, DC, and off.

Maximum Input Voltage—1 M Ω : 500 V (dc + peak ac). 50 Ω : Input automatically disconnects when the input signal exceeds safe limits. Manual reset.

HORIZONTAL SYSTEM

Time Bases—Two identical built-in time bases. Record Duration—5.12 ns to 1024 s in 1-2-5 sequence.

Time Base Accuracy—100 ps +0.002% of measurement interval.

Record Length—512 points to 10,240 points.

Sampling Rate—20 MS/s maximum.

Main Record Positioning—Position the main record with respect to the trigger point of the main record. Pretrigger: 1 record duration. Post trigger: 1 record duration. Resolution: 1 main record point.

Windows—In addition to the main record, either one or two window records may be acquired and displayed. The window records may be of a different length (duration) and may have a smaller time/div than the main record.

If two window records are used, they have the same duration and time/div settings and can be positioned independently.

Window Record Positioning—The window records are positioned relative to a window trigger point, which may be positioned relative to the main record's trigger point delayed by either time or events.

Main → Window Time Measurement—The time between the MAIN record trigger and the WINDOW trigger can be measured precisely, even if each trigger occurs only once. Repetitive events allow this measurement to be averaged for better resolution and accuracy. Single Trigger Precision: 200 ps. Repetitive Precision: 10 ps, after 100 averages. Accuracy: 250 ps +0.002% of record duration.

TRIGGERING SYSTEM

Range—± Full screen.

Bandwidth—400 MHz maximum.

Coupling and Sensitivity—

Internal DC Coupled: 0.75 div from dc to 50 MHz, increasing to 2 div at 400 MHz.

Noise Reject Coupled: 1.8 div or less from dc to 50 MHz, increasing to 4 div at 400 MHz.

AC Coupled: 0.75 div from 60 Hz to 50 MHz, increasing to 2 div at 400 MHz. Attenuates signals below 50 Hz.

HF Reject Coupled: 1.0 div from dc to 30 kHz.

LF Reject Coupled: 1.0 div from 80 kHz to 50 MHz, increasing to 2 div at 400 MHz.

External Coupling and Sensitivity—DC Coupled: 750 mV. Noise Reject Coupled: 1.8 V from DC to 50 MHz increasing to 40 V at 400 MHz. AC Coupled: 1 V from 60 Hz to 50 MHz, increasing to 40 V at 400 MHz; attenuates signals below 60 Hz. HF Reject Coupled: 1 V from DC to 30 kHz. LF Reject Coupled: 2 V from 80 kHz. To 50 MHz: Triggering signal requirements increase to 2 V at 400 MHz with DC, AC, and LF Reject coupling. For Noise Reject Coupling above 50 MHz, triggering signal requirements increase to 4 V at 400 MHz.

Maximum Input—150 V (dc + peak ac).

Impedance—1 MΩ paralleled by 15 pF.

Holdoff Range—500 ns to 10 s.

MEASUREMENT SYSTEM

Waveform-Processing Functions

Measurement Set—

Amplitude Measurements

Timing Measurements

Area and Energy

Cursors

Horizontal and Vertical Bars

Measurement-zone Delimiters

CRT AND DISPLAY FEATURES

Standard CRT—9 in. diagonal, monochrome, magnetic deflection. Vertical raster-scan orientation.

Standard Phosphor—GH (P31).

Video Resolution—552 horizontal by 704 vertical displayed pixels.

INPUTS/OUTPUTS

Printers and Plotters—Centronics Interface supports Epson or dot matrix printers.

POWER REQUIREMENTS

Line-Voltage Ranges—90 to 132 V RMS. 180 to 250 V RMS.

Line Frequency—48 to 440 Hz.

Maximum Power Consumption—320 W.

ENVIRONMENTAL AND SAFETY

Temperature—Operating: 0 to +50°C. Non-operating: -40 to +75°C.

Humidity—Operating and Nonoperating: Up to 95% relative humidity, up to +50°C.

Altitude, Vibration, Shock, Bench Handling—Meets MIL-T-28800C, Type III, Class 5.

Electromagnetic Compatibility—Meets MIL-T-28800C; MIL-STD-461B; FCC Part 15, Subpart J, Class B; VDE 0871/6.78 Class B; CE-01 Part 4 with exceptions; CE-03 Part 4, Curve 1; CE-03 Part 4, Curve 4, Navy, NB, BB (with exceptions); CS-01 Part 7; CS-02 Part 4 (with exceptions); CS-06 Part 5; RE-01 Part 4 (with exceptions); RE-02 Part 4; RS-01 Part 4; RS-03 Part 7 (limited to 1 GHz).

Safety—Listed UL 1244; CSA Bulletin 556B, September 1973; Tektronix self-certification to comply with IEC 348 recommendations.

PHYSICAL CHARACTERISTICS

	Cabinet		Rackmount	
	mm	in.	mm	in.
Dimensions				
Width	448	17.6	483	19.0
Height	238	9.4	222	8.8
Depth	599	23.6	550	21.6
Weights ≈	kg	lb	kg	lb
Net	19	41.6	22.0	48.0
Shipping	28.0	62.0	31.4	68.0

ORDERING INFORMATION

11201—400-MHz Programmable Digitizing Oscilloscope.*1

Includes: Introduction manual (070-7274-00); Service manual (070-7279-00); User Reference (070-7275-00); Programmer Reference (070-7276-00); Programmer Quick Reference (070-7277-00); Incoming Inspection Procedure (070-7278-00); Power cord (161-0066-00).

OPTIONS

Option 23—Includes four P6134 probes.*1

Option 1R—Rackmount.*1

Includes: Hardware, tooling, and instructions for converting bench model to rackmount configuration.

Option 2D—Memory Expansion. Expands total waveform memory.*1

Option 4D—DMA Controller. Increases data transfer speed over GPIB.*1

RECOMMENDED SOFTWARE

For more information on utility and application software, see the Test and Measurement Software Section.

INTERNATIONAL POWER PLUG OPTIONS

Option A1—Universal Euro 220 V, 50 Hz.

Option A2—UK 240 V, 50 Hz.

Option A3—Australian 240 V, 50 Hz.

Option A4—North American 250 V, 60 Hz.

Option A5—Switzerland 240 V, 50 Hz.

WARRANTY-PLUS SERVICE PLANS

See Customer Services and Information section.

Q0—On-Site Product Installation and Set-Up.*1

Q1—One year on-site service.*1

OPTIONAL ACCESSORIES

Power-Supply Extended

Diagnostics—Order 067-1264-00. **\$320**

Camera—C-4 Option 10. **\$450**

Cables—

(GPIB) 2 m. Order 012-0991-00. **\$160**

(RS-232C) 10 ft. Order 012-0911-00. **\$100**

(Centronics) 10 ft for hard copy output. Order 012-0555-00. **\$125**

Recommended Probes—See recommended probes in plug-in section, page 277.

Recommended Cart—K217. **\$510**

SOFTWARE SUPPORT

11201-Series/IBM PC Utility—

Order S47P109*1

11201-Series Asyst Driver—

Order S47P304*1

*1 Contact your local sales office.

TECHNICAL ASSISTANCE SERVICES

When you need technical assistance to supplement your own resources, Tektronix can arrange the services of an application engineer skilled in meeting your needs. For more information, see the Total Solution/New Products section, page 35.

TRAINING

Tektronix Instrument Group Customer Training offers operation and application training to help you get full value out of your instrumentation investment. See Customer Training section for information or call 1-800-835-9433 ext. 430. In Oregon, call 1-629-1017 (collect).