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Find the *Tektronix 11A33* at our website: *Click HERE*

NEW GPIB

11A32/11A34

Dc to 350 MHz Bandwidth (11A32 in 11402 Mainframe)

Dual Trace (11A32) or Four Trace (11A34)

1 mV/Div to 10 V/Div Calibrated Deflection Factors in 1% Increments

Switchable 50 Ω or 1 MΩ Input Impedance

High Resolution Calibrated Dc Offset

Fast Overdrive Recovery

The 11A32 and 11A34 amplifier plug-in units are virtually identical to one another except for the number of channels. The 11A32 is a dual-trace unit, and the 11A34 is a four-trace unit. The bandwidth of the 11A32 is slightly higher than that of the 11A34 in each of the four 11000 Series mainframes.

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

Both coarse and fine deflection factors steps are fully calibrated. At 1 mV/div, the high resolution calibrated dc offset has a setability of 25 μV and a range of ±1 V (equivalent to 16 bits), giving an effective screen height of 2000 div and permitting absolute dc measurement accuracies to ±0.4%.

CHARACTERISTICS

Number of Channels — 11A32: Two; 11A34: Four.

Bandwidth — 11A32

Volts/div	11301	11302	11401	11402
>10 mV	300 MHz	350 MHz	350 MHz	400 MHz
5 mV to 9.95 mV	300 MHz	300 MHz	350 MHz	400 MHz
2 mV to 4.98 mV	250 MHz	250 MHz	300 MHz	300 MHz
1 mV to 1.99 mV	200 MHz	200 MHz	200 MHz	250 MHz

Bandwidth — 11A34

Volts/div	11301	11302	11401	11402
>10 mV	250 MHz	250 MHz	300 MHz	300 MHz
5 mV to 9.95 mV	250 MHz	250 MHz	250 MHz	300 MHz
2 mV to 4.98 mV	200 MHz	250 MHz	250 MHz	250 MHz
1 mV to 1.99 mV	200 MHz	200 MHz	200 MHz	200 MHz

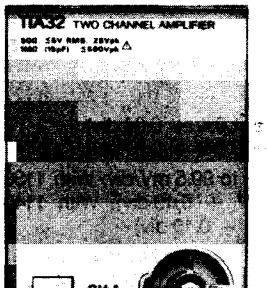
Calibrated Deflection Factors — Coarse steps: 1 mV/div to 10 V/div in 1-2-5 sequence. Fine steps: Between coarse steps in 1% increments of next more-sensitive coarse step.

Accuracy —

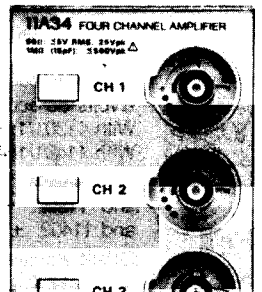
ΔVolts dc accuracy: With 11301/11302: ±(1.0% + 0.04 div). With 11401/11402: ±(0.9% + 0.012 div).

Dc Balance, 1 mV/div to 99.5 mV/div: With 11301 and 11302: ±(1.0 mV + 0.13 div). With 11401 and 11402: ±(1.0 mV + 0.10 div).

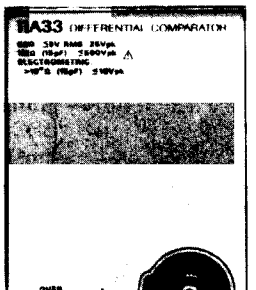
11A32



11A34



11A33



Offset Accuracy, 1 mV/div to 99.5 mV/div (±1 V range): ±(0.2% + 0.5 mV).

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

Offset Range —

1 mV/div to 99.5 mV/div: ±1 V; Resolution: 25 μV.
100 mV/div to 0.995 V/div: ±10 V; Resolution: 250 μV.
1 V/div to 10 V/div: ±100 V; Resolution: 2.5 mV.

Overdrive Recovery —

1 mV/div to 99.5 mV/div: To within ±(0.3% + 0.1 div) within 50 ns from ±2 V step.
100 mV/div to 995 mV/div: To within ±1% within 50 ns from ±20 V step.
1 V/div to 10 V/div: To within ±1% within 50 ns from ±200 V step.

Typical Noise (RMS) —

1 mV/div to 1.99 mV/div: 0.12 div.
2 mV/div to 4.98 mV/div: 0.06 div.
4 mV/div to 9.95 mV/div: 0.025 div.
10 mV/div to 10 V/div: 0.014 div.

Input Impedance — Switchable 1 MΩ in parallel with 15 pF or 50 Ω ±0.5%.

Input Coupling Modes — Ac, dc and off.

Ac Coupling Low Frequency −3 dB Point — 10 Hz or less (1 MΩ input impedance).

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

ORDERING INFORMATION

11A32 Two Channel Vertical Amplifier **$2,025**
Includes: Operator manual supplement.

11A34 Four Channel Vertical Amplifier **$3,525**
Includes: Operator manual supplement.

OPTIONS

Option 22 — Includes two P6134 probes.*[1]

Option 23 — Includes four P6134 probes.*[1]

OPTIONAL ACCESSORY

Service Manual —
(11A32) Order 070-6115-00*[1]
(11A34) Order 070-6116-00*[1]

*[1] *To order, contact your local Tektronix Sales Office.*

11A33

Differential Comparator

Dc to 150 MHz Bandwidth

1 mV/Div to 10 V/Div Calibrated Deflection Factors in 1% Increments

Very High Resolution Calibrated Dc Offset

16000 Division Effective Screen Height

High Common Mode Rejection

Fast Overdrive Recovery From Large Input Signals

Selectable 50 Ω, 1 MΩ, or 1 GΩ Input Impedance

The 11A33 Differential Comparator plug-in is a single channel differential amplifier with high common-mode rejection ratio and fast overdrive recovery from very large signals. As a differential amplifier, common mode input voltage range is ±8 V at 1 mV/div. As a comparator, the built-in comparison voltage (Vc) is used to measure the fine structure of very large signals, such as the settling time of a digital-to-analog converter, with unprecedented accuracy and resolution.

Maximum bandwidth in the 11301, 11302, 11401, and 11402 mainframes is 150 MHz. Two built-in four-pole bandwidth limit filters (100 MHz and 20 MHz) may be activated to reduce unwanted high frequency noise at 24 dB/octave for each channel.

Both coarse and fine deflection factors are fully calibrated. At 1 mV/div, the high resolution comparison voltage has a setability of 25 μV throughout its ±8 V range (equivalent to 19 bits), giving an effective screen height of 16,000 div and permitting absolute dc measurement accuracies of ±0.2%.

CHARACTERISTICS

Number of Channels — One.

Bandwidth — Dc to 150 MHz in 11301, 11302, 11401, and 11402 mainframes.

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

Accuracy — ΔVolts dc accuracy: With 11301/11302: ±(1.4% + 0.04 div). With 11401/11402: ±(1.2% + 0.01 div).

Dc Balance, 1 mV/div to 99.5 mV/div: With 11301 and 11302: ±(0.5 mV + 0.13 div). With 11401 and 11402: ±(0.5 mV + 0.10 div).

Vc Accuracy, 1 mV/div to 99.5 mV/div (8 V range): ±0.15% + 0.6 mV).

Vc Range —
1 mV/div to 99.5 mV/div: ±8 V; Resolution: 25 μV. 100 mV/div to 0.995 V/div: ±80 V; Resolution: 250 μV. 1 V/div to 10 V/div: ±500 V; Resolution: 2.5 mV.

Overdrive Recovery —
1 mV/div to 99.5 mV/div: To within ±0.2% within 30 ns from ±8 V step.

Typical Noise (RMS) —
1 mV/div to 1.99 mV/div: 0.24 div.
2 mV/div to 4.98 mV/div: 0.12 div.
5 mV/div to 9.95 mV/div: 0.05 div.
10 mV/div to 19.9 V/div: 0.025 div.
20 mVdiv to 10 V/div: 0.015 div.

Common Mode Rejection Ratio —
1 mV/div to 99.5 mV/div: 10,000:1 dc to 1 MHz; 1000:1 at 40 MHz.
100 mV/div to 0.995 V/div: 1000:1 dc to 1 MHz; 100:1 at 40 MHz.
1 V/div to 10 V/div: 500:1 dc to 1 MHz; 100:1 at 40 MHz.

Input Impedance — 50 Ω, 1 MΩ in parallel with 15 pF, or 1 GΩ in parallel with 15 pF from 1 mV/div to 99.5 mV/div.

Input Coupling Modes — Ac, dc, and off (each input).

Ac Coupling Low Frequency −3 dB Point — 10 Hz or less (1 MΩ input impedance).

Max Input Voltage — 1 MΩ mode: 1 mV/div to 99.5 mV/div: 40 V (dc + peak ac); 100 mV/div to 0.995 V/div: 400 V (dc + peak ac); 1 V/div to 10 V/div: 500 V (dc + peak ac). (At 1 mV/div to 99.5 mV/div, derate max input voltage at 20 dB/decade above 10 MHz; at 100 mV/div to 10 V/div, derate max input voltage at 20 dB/decade above 1 MHz.) 50 Ω: Input automatically disconnects when the input signal exceeds safe limits. Manual reset.

ORDERING INFORMATION

11A33 Differential Comparator **$3,000**
Includes: Operator manual supplement.

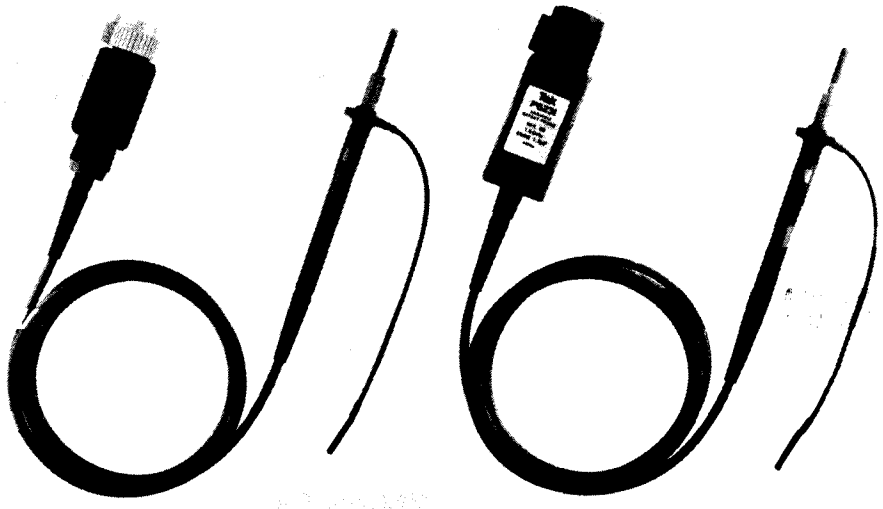
OPTION
Option 24 — Includes a P6135 probe pair.*1

***WARRANTY-PLUS* SERVICE PLANS**
SEE PAGE 496
Contact your local Sales Engineer for prices.
S0 — On-Site Product Installation and Set-Up.
S1 — 1 Year On-Site Service.
S2 — 2 Years On-Site Service.
S3 — 3 Years On-Site Service.

OPTIONAL ACCESSORY

Service Manual — Order 070-6118-00*1

*1 *To order, contact your local Tektronix Sales Office.*



P6134 10X, 10 MΩ Passive Probe

P6135 10X, Matched Pair of 1 MΩ Differential Passive Probes

P6231 10X, 450 Ω Active Probe

Three *NEW* high performance probes round out the capabilities of the 11000 Series oscilloscopes and plug-ins.

The P6134 is a 10X passive probe which is intended primarily for use with the 11A32 and 11A34, with their 1 MΩ input impedances. The P6135 is actually a matched pair of probes clipped together at the scope input end. The P6135 has attenuation adjustments to match the attenuation of the two halves to provide high common mode rejection compatible with the 11A33 Differential Comparator plug-in.

The P6231 is a 1.5 GHz, low-impedance, subminiature, 10X active probe intended primarily for use with high-speed logic circuits. The P6231 provides a "nulling voltage," adjustable via the mainframe controls over a ±5 volt range. This nulling voltage reduces the dc-loading effects of the probe when it is used to measure signals whose mid-voltage is other than zero volts, or in circuits where the termination resistance is returned to other than ground level.

The 50 Ω termination required by the P6231 at the plug-in input is automatically accommodated by the 11000 Series mainframe. When the mainframe senses that a P6231 has been connected to an input connector of an 11A32, 11A33, or 11A34 Amplifier plug-in unit, it automatically switches the plug-in input impedance to 50 Ω. The 11A52 and 11A71 Amplifier plug-ins have fixed 50 Ω input impedances.

Each of the four probes has an "ID" button which, when pressed, will cause any one or more of several actions to be taken by the mainframe—autoset, recall the next in a series of stored setups, invoke the automatic measurement function, or issue an SRQ. These actions are selectable via the mainframe UTILITY major menu.

All of the new 11000 Series probes make use of the new probe interface of the 11000 Series plug-ins. Each of the probes communicates its attenuation ratio to the mainframe. Power for the P6231 active probe comes through that interface, eliminating the need for a special power cable or power source. The bias voltage for the P6231 is applied through that interface. The P6231 also communicates its type and serial number through the serial data communication lines in the interface connector. Sensing of the pressing of the ID buttons on the probes is done through the interface.

All of the probes are compatible with the subminiature accessories shown on page 487, including the KLIPKIT.

All of the other voltage probes described in this catalog which can be compensated to 1 MΩ and 15 pF or to 50 Ω are also compatible with the 11000 Series plug-in units, including the operation of the ID button on probes so equipped. See pages 463–490 for full descriptions of all available Tektronix signal probes and other accessories.

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