

TEKTRONIX

ADA400A

The Tektronix ADA400A is a high-gain, differential preamplifier designed to extend the sensitivity and common-mode rejection capabilities of compatible Tektronix oscilloscopes. It provides differential measurements from high-impedance sources and features selectable gain settings from 0.1X to 100X, customizable bandwidth limiting, and exceptionally high common-mode rejection, making it ideal for low-amplitude measurements in noisy environments.

SPECIFICATIONS

General

Interfaces	TekProbe BNC (output interface), 2 x Standard BNC (input interfaces)
Display	LED status indicators for Gain, Bandwidth, and Input Coupling

Physical

Power Supply	Powered directly from the host oscilloscope via TekProbe BNC interface, or via external 1103 TekProbe Power Supply
Operating Temperature	0 to 50 °C
Dimensions (W×H×D)	32 mm × 76 mm × 135 mm mm
Weight	0.36 kg

Signal & Amplification Performance

Bandwidth	DC to 1 MHz
Selectable Gain Settings	0.1X, 1X, 10X, 100X
Gain Accuracy	±2% (at DC)

Common-Mode Rejection Ratio (CMRR)

CMRR at 60 Hz (100X Gain)	≥ 100,000:1 (100 dB)
CMRR at 60 Hz (10X Gain)	≥ 100,000:1 (100 dB)
CMRR at 60 Hz (1X Gain)	≥ 10,000:1 (80 dB)
CMRR at 60 Hz (0.1X Gain)	≥ 10,000:1 (80 dB)

Input Characteristics

Input Configuration	Differential (A - B)
Input Resistance (100X and 10X Gain)	1 M Ω or >10 ¹² Ω (selectable)
Input Resistance (1X and 0.1X Gain)	1 M Ω (fixed)
Input Coupling Modes	AC, GND, DC (independently selectable for Channel A and Channel B)
Maximum Differential Input Voltage (100X Gain)	± 10 mV
Maximum Differential Input Voltage (10X Gain)	± 100 mV
Maximum Differential Input Voltage (1X Gain)	± 1 V
Maximum Differential Input Voltage (0.1X Gain)	± 10 V
Maximum Common-Mode Input Voltage (100X and 10X Gain)	± 10 V
Maximum Common-Mode Input Voltage (1X and 0.1X Gain)	± 40 V
Maximum Non-Destruct Input Voltage	± 40 V (DC + peak AC)
DC Offset Adjust Range (100X Gain)	± 10 mV (referred to input)
DC Offset Adjust Range (10X Gain)	± 100 mV (referred to input)
DC Offset Adjust Range (1X Gain)	± 1 V (referred to input)
DC Offset Adjust Range (0.1X Gain)	± 10 V (referred to input)
DC Offset Adjustment Controls	Multi-turn screwdriver-adjustable coarse and fine potentiometers on the side panel
Input Capacitance (100X and 10X Gain)	125 pF
Input Capacitance (1X and 0.1X Gain)	10 pF
Input Bias Current (100X and 10X Gain)	≤ 9 nA
Input Offset Current (100X and 10X Gain)	≤ 4 nA

Bandwidth Limiting & Filtering

Low-Pass Filter Settings	100 Hz, 3 kHz, 100 kHz, FULL (1 MHz)
Low-Pass Filter Roll-off Rate	20 dB/decade (single-pole)

Output Characteristics

Output Impedance	50 Ω
Maximum Output Voltage Swing	± 1.0 V (into 1 M Ω load)

Connectivity & Host Interface

Input Connectors	2 x BNC (Female), labeled ACTIVE (+) and REFERENCE (-)
Output Connector	TekProbe BNC (Male)
Host Oscilloscope Compatibility	Tektronix TDS, CSA, or DPO series oscilloscopes with TekProbe BNC interface; can also connect to other instruments via Tektronix 1103 Power Supply
Control Interface Type	Local push-button interface (on preamplifier) or remote software control via compatible host oscilloscope

Environmental & Safety

Storage Temperature Range	-55 °C to +75 °C
Operating Humidity Range	Up to 90% RH (non-condensing)

Physical & Mechanical

Cable Length	1.5 m
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Environmental

Maximum Operating Altitude	2000 m
Maximum Storage Altitude	15240 m

Power Supply

Power Consumption (+15 V)	90 mA max
Power Consumption (+5 V)	10 mA max

Performance

CMRR at DC to 10 kHz (100X Gain)	100,000:1 (100 dB)
CMRR at DC to 10 kHz (10X Gain)	10,000:1 (80 dB)
CMRR at DC to 10 kHz (1X Gain)	1,000:1 (60 dB)
CMRR at DC to 10 kHz (0.1X Gain)	100:1 (40 dB)
Noise Referred to Input (100X Gain, Full Bandwidth)	$\leq 30 \mu\text{V RMS}$
Noise Referred to Input (100X Gain, 100 Hz LPF)	$\leq 3 \mu\text{V RMS}$
Noise Referred to Input (10X Gain, Full Bandwidth)	$\leq 90 \mu\text{V RMS}$
Noise Referred to Input (10X Gain, 100 Hz LPF)	$\leq 15 \mu\text{V RMS}$
Noise Referred to Input (1X Gain, Full Bandwidth)	$\leq 900 \mu\text{V RMS}$
Noise Referred to Input (1X Gain, 100 Hz LPF)	$\leq 150 \mu\text{V RMS}$
Noise Referred to Input (0.1X Gain, Full Bandwidth)	$\leq 9.0 \text{ mV RMS}$
Noise Referred to Input (0.1X Gain, 100 Hz LPF)	$\leq 1.5 \text{ mV RMS}$
Input Offset Drift (100X and 10X Gain)	$\leq 5 \mu\text{V}/^\circ\text{C}$
Input Offset Drift (1X and 0.1X Gain)	$\leq 50 \mu\text{V}/^\circ\text{C}$
Gain Temperature Coefficient	$\leq 0.03\% / ^\circ\text{C}$
Common-Mode Overvoltage Recovery Time	$< 50 \mu\text{s}$ (to recover from 40 V surge at 100X gain)

Compliance

Safety Standards Compliance	UL3111-1, CSA1010.1, EN61010-1
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TECHNOLOGY

Active Differential Preamplifier

APPLICATIONS

Low-voltage signal measurement, power supply testing, medical electronics design, and transducer signal amplification

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