

27708A OCTAL PROGRAMMABLE AC/DC AMPLIFIERS

For the 28000 Signal Conditioning System



28000 SIGNAL CONDITIONING SYSTEM

- Graphical User Interface (GUI) and Ethernet network interface for system control
- Intelligent gain and system scaling algorithms
- Test input and output monitor busses
- Go/no-go test with diagnostics
- Rigorous factory acceptance test for maintenance
- Field swappable AC or DC power supplies
- Built-in temperature and power supply monitoring with alarms
- Backward compatible with 27000 signal conditioning modules such as the 27708A card

28000 SIGNAL CONDITIONING SYSTEM

The Precision 28000 signal conditioning system provides all the flexibility you need to manage your test measurements.

The Precision 28000 makes it easy to manage a test with hundreds of channels and a mix of transducers. choose charge, IEPE w/TEDS, voltage (filter amplifier), strain, thermocouple, RTD, potentiometer, current, frequency, or other transducers. The system is backward compatible with 27000 signal conditioning modules such as the 27608A card.

The built-in test hardware and software (optional) provide quick go/no-go performance checks which can be run before each test, and rigorous factory acceptance tests to assure you that the 28000 meets your most stringent requirements for critical applications. It won't be long before these tests earn a permanent place in your maintenance routine. And since they are traceable to NIST, they eliminate the need for off-site calibration.

In every phase of your tests—record keeping, installation, design, set-up, operation, maintenance and upgrading—the Precision 28000 offers ways to help you save time and money over the life of the system.

27708A FEATURES

- Distributed gain: x1/16 to x4096 in x0.01 steps
- 100 kHz full power bandwidth; 300 kHz small signal bandwidth
- Hi-Z, Hi-CMRR differential input
- Programmable AC/DC input coupling
- Constant current source for piezo-electric transducers
- Automatic DC offset adjust
- Single-ended output with ground reference
- Overload detection

27708A INTRODUCTION

Designed for the Precision 28000 Signal Conditioning Systems, the Precision 27708A octal programmable amplifier card allows for up to 128 channels in one 16-slot chassis or 64 channels in a single 8-slot chassis. Systems beyond 128 channels may be accommodated by multiple mainframes controlled from a single controller. Modular construction provides easy expansion.

The 27708A provides gain of x1/16 to x4096 with 0.05% resolution. A balanced differential input results in outstanding rejection of common-mode interference. Low noise (<-156 dBV/ $\sqrt{\text{Hz}}$) and low drift ($5 \mu\text{V}/^\circ\text{C}$) insure data integrity will be maintained. Output overload detectors alert the user to possible non-linearities caused by internal amplifier overloads. Optional features include a programmable AC/DC coupling and a constant current source for piezoelectric transducers. Test and monitor busses allow the 27708A to integrate seamlessly with the 28000 Test Subsystem for built-in performance verification.

27708A INPUT CHARACTERISTICS

Type: Balanced differential input
Impedance: 1.58 M Ω // 100 pF per side
Level: ± 10 Vpk linear; ± 50 Vpk w/o damage
Level vs. Freq.: ± 10 Vpk for $f < 100$ kHz
 ± 10 Vpk (100 kHz/ f) for $f \geq 100$ kHz
CMRR: 90 dB min, DC to 440 Hz
at input gain > 16
Bias Current: < 1 nA typical
Noise: 20 nV/ $\sqrt{\text{Hz}}$ at 100 Hz RTI, typ
15 nV/ $\sqrt{\text{Hz}}$ at 1 kHz RTI, typ
Offset Drift: ± 5 $\mu\text{V}/^\circ\text{C}$, RTI at max gain, typ

Option 6: Programmable AC/DC coupling
Impedance: 3.16 M Ω & 0.033 μF //100 pF
per side,
AC coupled (1.526 Hz).
1.58 M Ω //100 pF per side,
DC coupled

Option 9: Programmable Constant Current
Source 2.2 mA constant current
source with 24 V compliance voltage
to power remote IEPE transducers.

Test Input (Std): A switch at the input of each channel
allows for injection of a test signal.

27708A AMPLIFIER CHARACTERISTICS

Programmable Gain: x1/16 to x4096 in x0.01 steps
DC Accuracy: $\pm 0.1\%$ dB
DC Stability: ± 40 PPM/ $^\circ\text{C}$
DC Linearity: $\pm 0.02\%$ of F_s relative to best straight
line at any setting
Freq. Response: ± 0.1 dB to 100 kHz
Full Power BW: 100 kHz
Small Signal BW: 300 kHz (-3 dB)

Gain Control Modes

Two gain control modes are supported by the available
Graphical User Interface for the 27708A.

Standard Mode: Enter the input and output gain. Gain
may be entered either in linear steps
or in logarithmic steps.

Computed: Enter transducer sensitivity (Volts per
Measurement Unit), full-scale input
(measurement units) and full-scale out-
put (Volts). Gain is automatically com-
puted.

27708A OUTPUT CHARACTERISTICS

Type: DC-coupled, single-ended with ground
reference
Z: 50 Ω // 100 pF
Max Output: ± 10 Vpk, ± 10 mApk
Drift: ± 5 $\mu\text{V}/^\circ\text{C}$ RTI + 50 $\mu\text{V}/^\circ\text{C}$ RTO
Noise: 6 μVrms RTI + 50 μVrms RTO,
0.1 Hz to 100 kHz.
Overload Detector
Threshold: ± 10 Vpk

27708A GENERAL CHARACTERISTICS

27708A Card Size: 5.68 x 13.15 x 0.75 inches
14.43 x 33.40 x 1.91 cm
Card Weight: 1.87 lbs net, 3.3 lbs shipping
(0.85 kg net, 1.5 kg shipping)
Temperature: 0 $^\circ\text{C}$ to 40 $^\circ\text{C}$ (operating)
-20 $^\circ\text{C}$ to 70 $^\circ\text{C}$ (storage)

ORDERING INFORMATION

Octal Amplifier Module and Options

Up to 16 amplifier modules may be supported per 27000 mainframe.

27708A-1-AMP-?

Options: 6, 9

28000-BP-1-27K

One blank front panel is required for
each 27000 card installed in a 28000
frame.

