

## ADVANCE INFORMATION

## Programmable Gain Amplifier with Multiplexed Inputs

### Features

- 12 Bit Accuracy
- Digital Controlled Gain and Input Channel Selection
- Internal Latches for Channel and Gain Select Bits
- Non-Inverting Amplifier Gains . . . . . +1, +2, +4 and +8
- Gain Error . . . . . 0.01%
- Channel-to-Channel Settling Time max . . . . . 13 $\mu$ S  
typ . . . . . 9 $\mu$ S
- Input Overvoltage Protection continuous . . .  $V_{supply} + 20V$   
transient . . . . . 2000V
- Low Power Dissipation . . . . . 190mW
- Amplifier Offset Adjustment
- Compact 32 Pin DIP
- Compatible with 12 Bit A/D Converters (HI-574A, 674A, etc.) and Sampling A/D Converters (HY-9574, 9674, 9474, etc.)
- Available Temperature Ranges:  
Commercial (-5) . . . . . 0°C to +75°C  
Industrial (-9) . . . . . -40°C to +85°C  
Military (-2) . . . . . -55°C to +125°C

### HY-9595 Features

- 8 Differential Input Channels

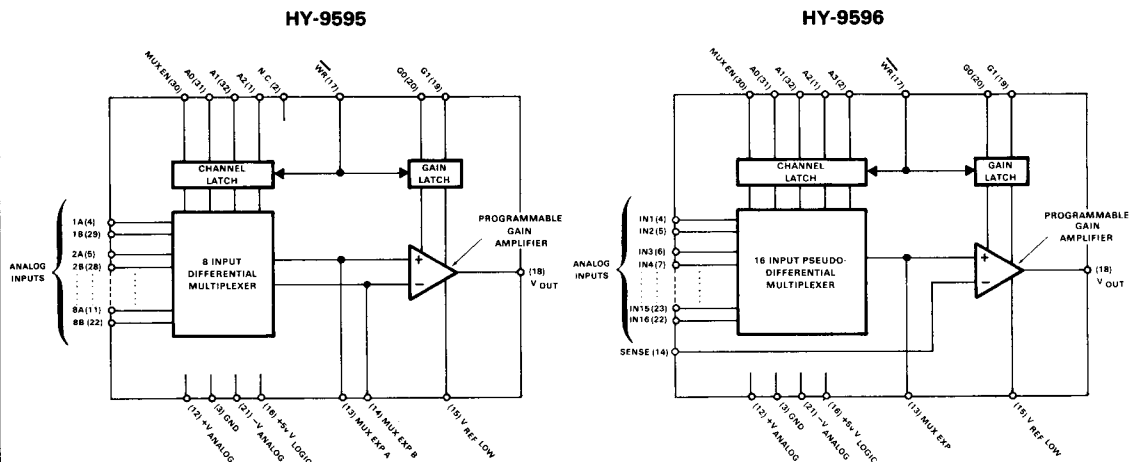
### HY-9596

- 16 Pseudo-Differential/Single Ended Input Channels

### Applications

- Process Control Systems
- Status Monitoring Systems
- Multi-Channel High Reliability Data Acquisition Systems
- Industrial and Scientific Instrumentation
- Military Systems

### Functional Diagram



**Description**

The HY-9595/9596 is a high performance Programmable Gain Amplifier with multiplexed inputs. The amplifier gain and the input channel are selected digitally, and can be controlled through hardware or software. Internal registers latch the digital control bits, eliminating the need for external latches. This part connects multiple analog inputs to data acquisition systems.

The HY-9595 provides eight (8) pairs of multiplexed differential inputs.

The HY-9596 provides sixteen (16) single-ended (pseudo differential) multiplexed inputs.

**Multiplexer Section**

The analog Input Multiplexer includes active input overvoltage protection circuitry, and can withstand a continuous input up to 20 volts greater than either supply. This feature protects the multiplexer against damage when supplies are off, but input signals are present -- essential in systems where the analog inputs originate outside the equipment. Equally important, the HY-9595/9596 can withstand brief input transient spikes of over 4000 volts, which would otherwise require complex external protection.

An overvoltage condition on a deselected input does not cause distortion on the selected input channel.

The Input Multiplexer is guaranteed to break-before-make, so two channels are never shorted together.

Multiplexer Expansion ports are included so external multiplexers can be added, if required.

**Programmable Gain Amplifier Section**

The Programmable Gain Amplifier (PGA) provides non-inverting gains under digital control; the gains are +1, +2, +4 and +8. A different gain can be selected for each input channel. A fully differential amplifier is used in both versions, so the pseudo-differential inputs on the HY-9596 are referenced to the SENSE input, rather than to the supply ground.

The resistor network is laser trimmed to minimize gain errors.

**Input Voltage Ranges**

The HY-9595/9596 accepts the standard  $\pm 10V$  input range. Care must be taken in the system design to avoid overdriving the amplifier, which could result in output signal distortion.

**Temperature Grades**

The HY-9595/9596 will be available initially in Commercial ( $0^{\circ}C$  to  $+75^{\circ}C$ ) and Industrial ( $-40^{\circ}C$  to  $+85^{\circ}C$ ) temperature grades. A grade is also being developed for the military temperature range ( $-55^{\circ}C$  to  $+125^{\circ}C$ ).

**Power Requirements**

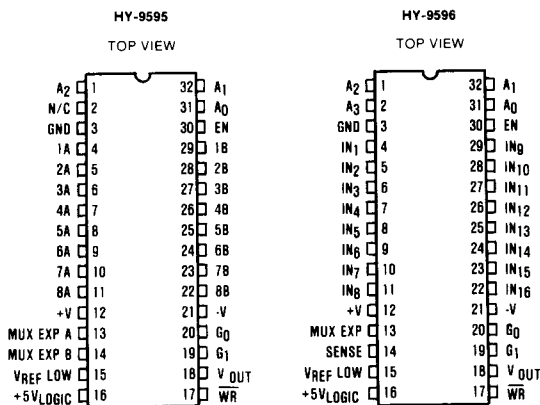
Power requirements are +5V and  $\pm 15V$ , with typical dissipation of 190mW.

**Package**

All models are packaged in a 32-pin DIP with 600 mil row centers. Plastic packages are used for Commercial and Industrial grades. Ceramic hermetic packages will be used for the Military temperature grade.

4  
MULTIPLEXERS

**Pinouts**



**Package**

