

# OUTPUT BUFFERS

For the 28000 Signal Conditioning System

## INTRODUCTION

Measurement system requirements sometimes need multiple outputs per signal conditioning channel. These outputs may be routed to control systems, tape backup systems, auxiliary data acquisition systems, scope bays and other destinations. Often, special "T" cables are built to allow the signal conditioning output to be routed to multiple destinations; however, this usually results in the introduction of system ground loops and degradation of the system signal to noise ratio. By buffering each additional output, pitfalls associated with "T" connectors are avoided.

Precision Filters offers a family of output buffer modules to provide one or two additional buffered outputs per channel.

- BUFF-4BNC/15D Quad Output Buffer for 4-channel cards
- BUFF-4CH/(2)15D Dual Output Buffer for 4-channel cards
- BUFF-8CH/(2)HD26D Dual Output Buffer for 8-channel cards

The 4-channel 28000 System signal conditioning cards and some 8-channel cards are fitted with a front panel connector that accepts the output buffer adapter. The adapter plugs on to the front of the signal conditioner card, secured to the card by two captive screws.

The output buffers modules provide switch selectable output ground sense for each channel's outputs. Output ground sense is effective for driving circuits with single-ended inputs.

## SALIENT FEATURES

- Provides fully buffered outputs derived from primary 28000 System signal conditioner outputs
- One or two buffered outputs per channel
- Compatible with 4-channel and 8-channel 28000 cards with front panel DIN connectors
- Selectable output ground sense

## BUFF-4BNC/15D OUTPUT BUFFER

The BUFF-4BNC/15D quad output buffer module illustrated in Figure 1 provides one buffered output per channel on 4 BNC connectors and one 15-pin multi-pin connector. Figure 2 is a block diagram of the BUFF-4BNC/15D adapter.



Figure 1 BUFF-4BNC/15D Output Buffer Modules

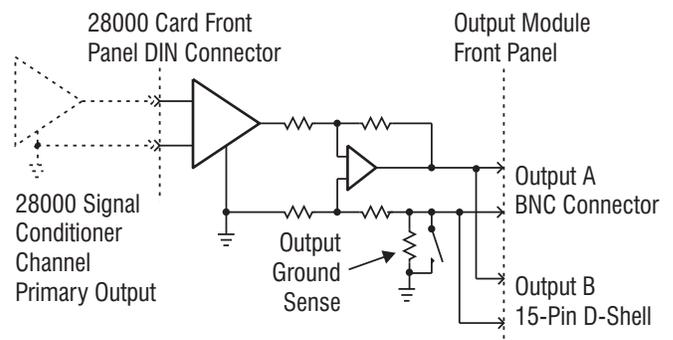


Figure 2 BUFF-4BNC/15D Channel Diagram (1 of 4 Channels)

## BUFF-4CH/(2)15D DUAL OUTPUT BUFFER

The BUFF-4CH/(2)15D dual output buffer for 4-channel cards provides two buffered outputs per channel on 15-position D-type female connectors. Figure 3 illustrates the BUFF-4CH/(2)15D dual output buffer front and rear panels. Figure 4 illustrates the channel block diagram for the dual buffer modules.

## BUFF-8CH/(2)HD26D DUAL OUTPUT BUFFER

The BUFF-8CH/(2)26HD dual output buffer for 8-channel cards provides two buffered outputs per channel on 26-pin high density D-type connectors. Figure 5 illustrates the BUFF-4CH/(2)15D dual output buffer front and rear panels. Figure 4 illustrates the channel block diagram for the dual buffer modules.

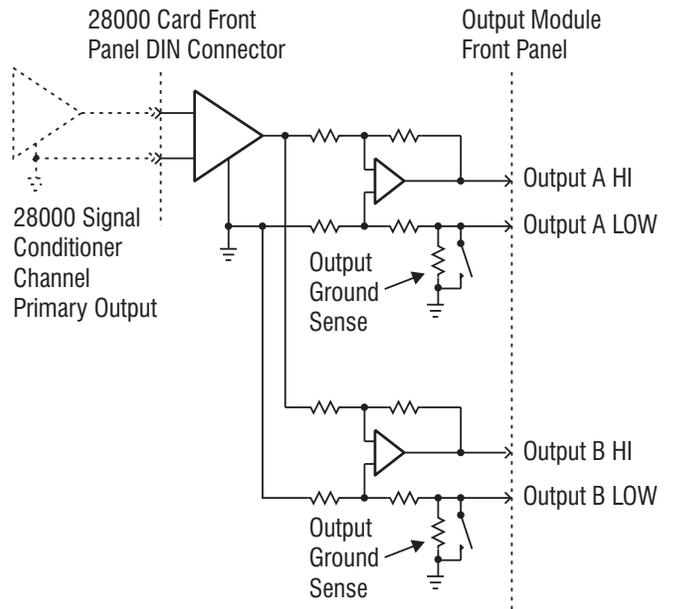


Figure 4 Channel Block Diagram for the BUFF-4CH/(2)15D and the BUFF-8CH/(2)HD26D Dual Buffer Modules

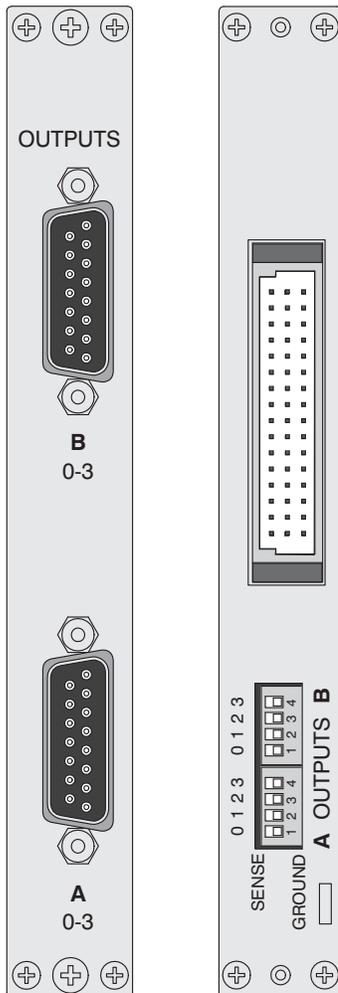


Figure 3 BUFF-4CH/(2)15D Dual Buffer Front and Rear Panels

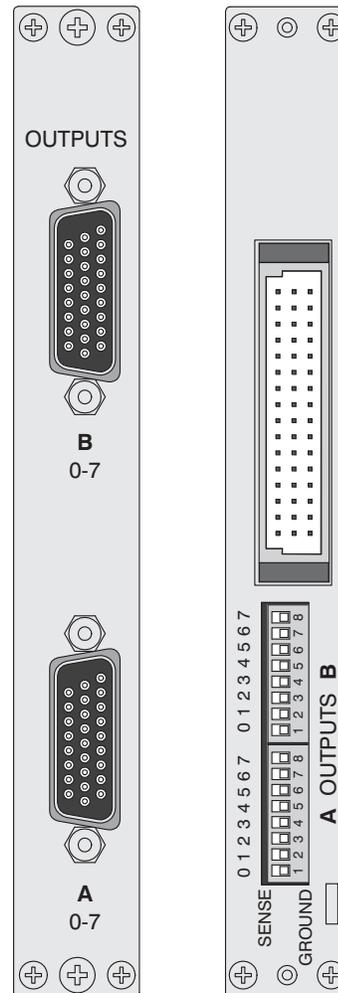


Figure 5 BUFF-8CH/(2)HD26D Dual Buffer Front and Rear Panels

## SPECIFICATIONS

Note: Specifications apply to the output adapter module only. Signal conditioning card specifications must be added to the output adapter specifications to determine overall specs from the signal conditioner channel input to the adapter output.

DC Gain:	$x1 \pm 0.2\%$
DC Gain Stability:	20 ppm/°C
Freq. Response:	$x1 \pm 1\%$ to 127.5 kHz $x1 \pm 2\%$ to 200 kHz
Amplitude Match:	0.1 dB (DC to 200 kHz)
Phase Match:	1.0° (DC to 200 kHz)

### Output Characteristics

Type:	Fully buffered, DC coupled, single ended with selectable output sense.
Interface:	Multi-pin Connectors: High, Sense, Shield (3-wire)
BNC Connectors:	High and Sense (2-wire)
Output Ground Sense:	Output ground sense is effective for driving circuits with grounded single-ended inputs and serves two purposes: to refer the output to the ground at the load and to break ground loops that would otherwise pickup unwanted noise in the cables.

The sense pin should be grounded for driving differential loads. An externally accessible rocker switch selects the per-channel sense termination.

#### Impedance:

Hi Output:	10 $\Omega$ // 100 pF
Low Output (Sense Input):	1000 $\Omega$ // 100 pF or ground selectable per-channel via an externally accessible rocker switch.

Max Out:  $\pm 10$  Vpk,  $\pm 5$  mA pk with short circuit protection

Max Out vs. Frequency:  $\pm 10$  Vpk \* (200 kHz/f) for  $f \geq 200$  kHz

Noise: 50  $\mu$ Vrms, 3 Hz to 200 kHz.

DC Offset: 5 mV

DC Offset Stability: 20  $\mu$ V/°C

## Mating Connectors

**CONN-OUT-15D** 15-Pin mating output connector, with crimp pins and strain relief backshell for BUFF-4BNC/15D and BUFF-4CH/(2)15D. PF pn A6862G2.

**CONN-OUT-15D-SC** 15-Pin mating output connector, with solder cup pins and strain relief backshell for BUFF-4BNC/15D and BUFF-4CH/(2)15D. PF pn A6862G4.

**CONN-OUT-26D-MTL** 26-pin mating output connector with crimp machined pins and metal backshell with large hole for BUFF-8CH/(2)HD26D. PF pn A9405G1.

**CONN-OUT-26D-SC-MTL** 26-pin mating connector with solder cup machined pins and metal backshell with large hole for BUFF-8CH/(2)HD26D. PF pn A9405G4.

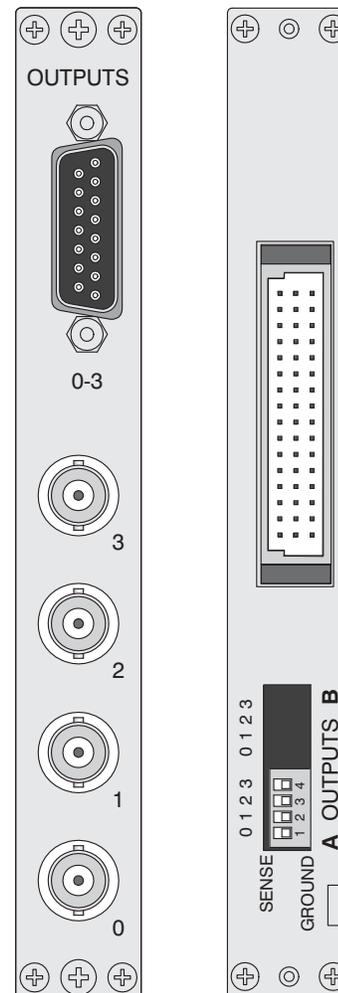


Figure 6 BUFF-4BNC/15D Front and Rear Panels

## General Characteristics

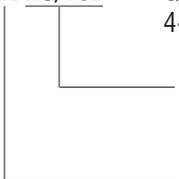
---

Buffer Module Size: 0.78" x 3.20" x 6.15" WDH (typical)  
Buffer Weight: 0.5 lb. net  
Temperature: 0 °C to 40 °C (operating)  
                  -20 °C to 70 °C (storage)

## OUTPUT BUFFER ORDERING GUIDE

---

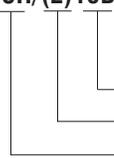
**BUFF-4BNC/15D** Quad Output Buffer for  
4-channel cards



Output Buffer with a Single Output on  
4 BNC connectors and one  
15-pin multi-pin connector

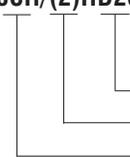
4 Channels

**BUFF-4CH/(2)15D** Dual Output Buffer for  
4-channel cards



15-Pin D Connectors  
Dual Output Buffer  
4 Channels

**BUFF-8CH/(2)HD26D** Dual Output Buffer for  
8-channel cards



High Density 26-Pin D Connectors  
Dual Output Buffer  
8 Channels

