

# 7B22 Isolated, High Level Voltage Output

## Functional Description

The 7B22 is a unity gain single-channel signal conditioning output module that interfaces and filters a  $\pm 10\text{ V}$  input signal and provides an isolated precision output of  $\pm 10\text{ V}$ . The output voltage appears at the 7B Series backplane screw terminal block. Model 7B22 features a nonlinearity of  $\pm 0.02\%$  maximum and an accuracy of  $\pm 0.1\%$  maximum ( $\pm 0.01\%$  typical). Providing  $1500\text{ V rms}$  of galvanic transformer based isolation, output-to-input and power, the 7B22 offers a common mode rejection (CMR) of  $100\text{ dB @ } 50/60\text{ Hz}$  to preserve the integrity of low level signals in noisy environments. The 7B22 is mix-and-match and hot-swappable with other 7B Series modules, so it can be inserted or removed from any socket in the same backplane without disturbing system power. Model 7B22 is rated to operate with a nominal  $+24\text{ V DC}$  supply.

## Inside the 7B22 Series Module

The input and floating isolated voltage output of Model 7B22 are protected up to  $\pm 35\text{ V DC}$ . The input signal from the user's system is buffered and then used to modulate the amplitude of a square wave carrier. The modulated signal is transmitted across the signal transformer and demodulated to retrieve the original input voltage signal. This voltage is then filtered by a two-pole low pass  $400\text{ Hz}$  filter. The nominal  $+24\text{ V DC}$  module supply voltage powers the input side of the 7B22. The oscillator on the input side provides the square wave carrier signal used by the modulator and also drives the power transformer. The signal at the secondary of the transformer is used in the demodulator and is also converted to a DC voltage that powers the circuit on the module's output. The two-pole output filter and subsequent buffer ensures that a low noise, low impedance ( $< 1\ \Omega$ ) signal is available at the isolated output to drive loads down to  $5\text{ k}\ \Omega$ .

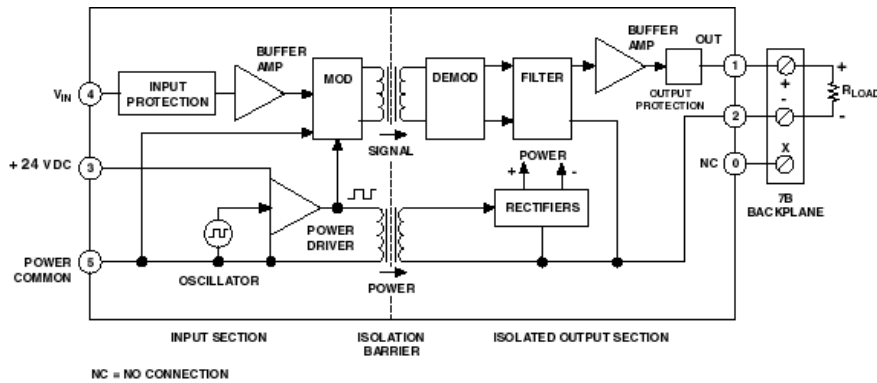


Figure 1. 7B22 Functional Block Diagram

**Input Types**  
 $\pm 10\text{ V}$   
**Output Options**  
 $\pm 10\text{ V}$

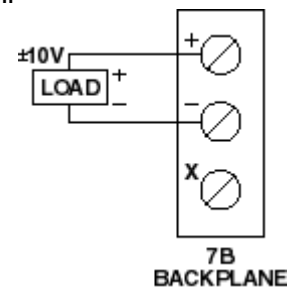


Figure 2. 7B22 Input Field Connections

## 7B22 Models Available

Model	Input Range	Output Range
7B22	-10 V to +10 V	-10 V to +10 V

## 7B22 Specifications

(typical @ +23°C ±5°C and  $V_s = +24$  V dc)

Description	Model 7B22
<b>Output Range (<math>R_L &gt; 5</math> k<math>\Omega</math>)</b>	
Standard Ranges	-10 V to +10 V (-14 V to +14 V, maximum)
Custom Ranges	Not Available*
<b>Input Range</b>	-10 V to +10 V
<b>Accuracy<sup>1</sup></b>	
Initial @ +25°C	±0.01% Span (±0.1% Span, maximum)
Nonlinearity <sup>2</sup>	±0.02% Span, maximum
Span vs. Temperature	±35 ppm/°C
Output Offset vs. Temperature	±0.001% Span/°C
<b>Input Bias Current</b>	+3 nA
<b>Input Resistance</b>	
Power ON	2 M $\Omega$
Power OFF	30 k $\Omega$ , minimum
<b>Output Noise</b>	
5 MHz Bandwidth	7 mV peak
10 Hz to 100 kHz Bandwidth	3 mV rms
0.1 Hz to 10 Hz Bandwidth	6 $\mu$ V peak
<b>Bandwidth, -3 dB</b>	400 Hz
<b>Output Rise Time, 10% to 90% Span</b>	1 ms
<b>Normal Mode Rejection @ 50/60 Hz</b>	60 dB
<b>Common-Mode Voltage (CMV)</b>	
Output-to-Input and Power	1500 V rms continuous
<b>Common Mode Rejection (CMR)</b>	
Output-to-Input and Power @ 50/60 Hz	100 dB
<b>Input Protection</b>	±35 V dc, continuous
<b>Input Transient Protection</b>	ANSI/IEEE C376.90.1-1989 IEEE-STD 472 IEC 255-4, Class II
<b>Output Resistance</b>	< 1 $\Omega$
<b>Power Supply</b>	
Voltage Range, Operating	+19 V dc to +29 V dc
Current	+20 mA, maximum
Sensitivity	±0.0001%/ % of $V_s$
<b>Mechanical Dimensions</b>	1.663" x 2.11" x 0.563" (42.24 mm x 53.6 mm x 14.3 mm)
<b>Weight</b>	60 grams
<b>Environmental</b>	
Temperature Range	
Operating	-40°C to +85°C
Storage	-40°C to +85°C
Relative Humidity, 24 hours	0 to 90% @ +60°C noncondensing
ESD Sensitivity	IEC 801-2, Level 2
RFI Susceptibility	±0.5% Span error @ 400 MHz, 5 Watt, 3 ft

Warm-up time required to meet specifications is approximately 10 minutes.

\* Contact factory for OEM requirements.

<sup>1</sup> Includes the combined effects of repeatability, hysteresis, and nonlinearity.

<sup>2</sup> Nonlinearity is calculated using best-fit straight line method.

Specifications subject to change without notice.