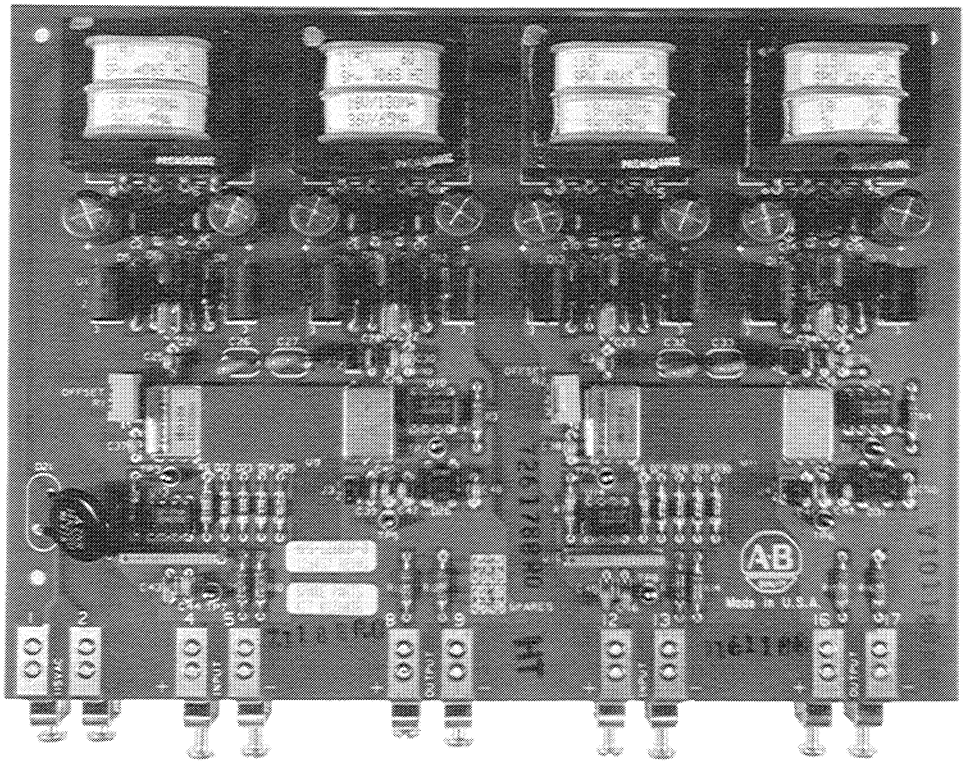
Component Description

Bulletin 1370

Dual Signal Isolator



Function

The Dual Signal Isolator Board consists of two analog isolation amplifier circuits to provide signal isolation between input and output as well as from channel to channel.

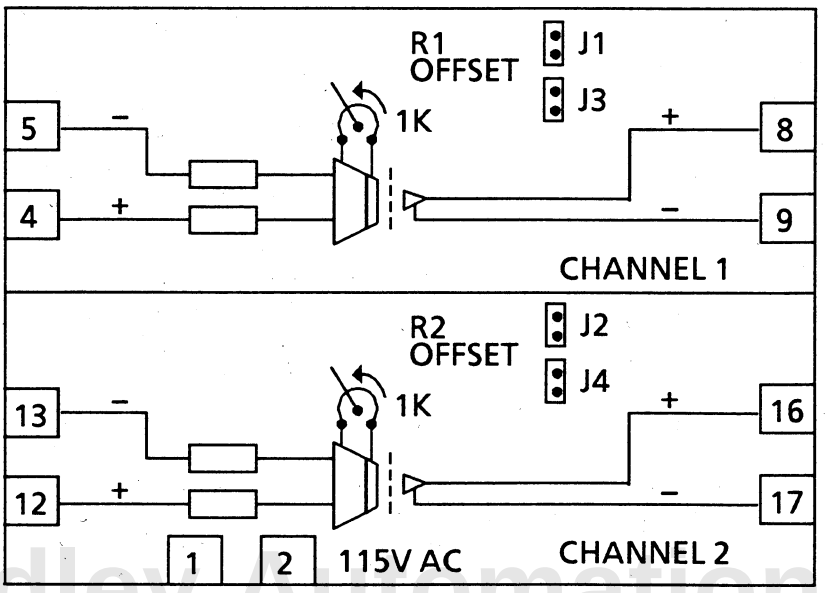


Figure 1. Dual Signal Isolator Block Diagram

Specifications

Maximum ambient operating temperature range	32°F to 130°F (0°C to 55°C)
Storage Temperature	– 40°F to 185°F (– 40°C to 85°C)
Relative Humidity, non-condensing	5% to 95%
Altitude without derating	3300 ft (1000 meters)
Power Requirements	115V AC ± 10%, 47 Hz to 63 Hz RMS current @ 115V, 60 Hz 0.075 Amperes peak inrush @ 115V, 60 Hz 0.6 Amperes
Isolation	Viso = 2500 Volts, 60 Hz, 1 second Viso = 1500 Volts, 60 Hz, 60 seconds Viso = 600 Volts, 60 Hz, continuous
Isolation Mode Rejection Ratio, IMRR **[IMRR = 20*LOG10 (Vout/Viso)]**	100 db minimum, 110 db typical
Input to Output Leakage Current at **2000V AC** **1500V AC** **1000V AC**	 107 µA typical 78 µA typical 49 µA typical
DC Gain, no load **RL = 2000 ohms** **RL = 1000 ohms**	1.01 typical 1.00 typical 0.99 typical
DC Gain Error, RL = 2000 ohms	0.25% typical, 1.20% maximum
Minimum Input Offset Adjustment Range	± 300 mV
Maximum Change in Input Offset Voltage due to ambient swing of 0°C to 60°C	3.0 mV typical
Input Voltage Range	± 10.0 typical, ± 11.5 volts maximum
Input Resistance	104.9K ohms ± 1%
Output Voltage Range, RL = 1000 ohms	± 10.0 typical, ± 11.5 volts maximum
Frequency Response, **Filter 'In'** **Filter 'Out'**	 2.2K Hz 50K Hz

Operation

A typical Functional Block Diagram of the Dual Signal Isolator, including terminal connections is shown in Figure 1. Typical input/output connections are shown in Figure 2.

The Circuit Board consists of two identically functioning isolator circuits (Channel 1 and Channel 2). Each circuit employs its own ± 15V DC Power Supply, with surge protection to 20V DC.

Input signals of up to ± 11.5V DC can be applied directly to terminals 4 and 5 for Channel 1 or terminals 12 and 13 for Channel 2 via a twisted pair cable with one end only of the shield connected. If a higher input voltage is required, it can be scaled down through a voltage divider composed of 1% resistors.

The input signal is encoded by a Voltage Controlled Oscillator, coupled across a capacitive barrier to achieve the signal isolation, decoded with a phase locked loop and filtered at the output buffer stage.

The circuits have a fixed gain of 1. An adjustable Offset permits nulling the output to zero with no input signal applied, to compensate for any amplifier offset. The output bandwidth can be reduced by connecting jumpers J1 and J3 for Channel 1 or J2 and J4 for Channel 2.

Jumper Set-up

Jumper		Bandwidth (Hz)
J1 & J3	OUT	50K
J1 & J3	IN	2.2K
J2 & J4	OUT	50K
J2 & J4	IN	2.2K

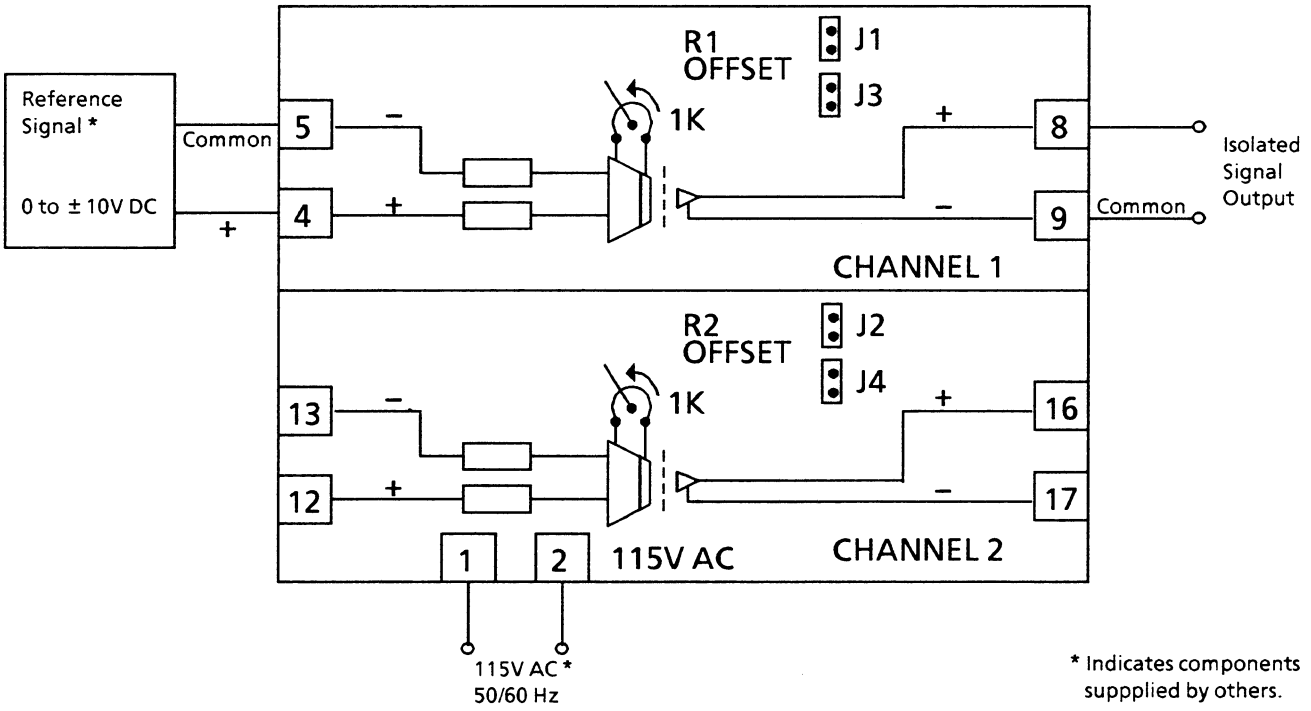


Figure 2. Typical Input/Output Connections

Installation

WARNING: To avoid an electrical shock hazard, remove all Board Power prior to performing the following procedure.

1. Ensure that all power to the Drive has been removed.
2. Slide board into appropriate slot of card rack enclosure.
3. Secure board by means of the captive screw-type terminals located on the front edge of the board.

Adjustment

1. Connect a DC voltmeter, set to the 1 volt range, across the output of the Signal Isolator PCB (terminals 8 and 9).
2. Remove wires at input of the Signal Isolator PCB (terminals 4 and 5). Install jumper across terminals 4 and 5.
3. Apply power.
4. While monitoring the voltmeter, adjust the **Offset** pot (R1 for Channel 1, R2 for Channel 2) on the Signal Isolator PCB until the voltmeter indicates 0.0 volts.
5. Remove power. Remove jumper at input of Signal Isolator PCB and reconnect wires that were disconnected in step 2.
6. Remove voltmeter.

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With offices in major cities worldwide.

WORLD HEADQUARTERS
1201 South Second Street
Milwaukee, WI 53204 USA
Tel: (414) 382-2000
Telex: 43 11 016
FAX: (414) 382-2400

EUROPE/INDIA/MIDDLE EAST/ AFRICA HEADQUARTERS
Allen-Bradley
International Limited
Chiltern House
45 Station Road
Henley-on-Thames
Oxon, RG9 1AT England
Tel: (44) 491-577013
Telex: 851 849782
FAX: (44) 491-578933

ASIA/PACIFIC HEADQUARTERS
Allen-Bradley(Hong Kong) Limited
2901 Great Eagle Center
23 Harbour Road
G.P.O. Box 9797
Wanchai, Hong Kong
Tel: (852) 5-739391
Telex: 780 64347
FAX: (852) 5-745326

CANADA HEADQUARTERS
Allen-Bradley Canada Limited
135 Dundas Street
Cambridge, Ontario N1R 5X1
Canada
Tel: (519) 623-1810
Telex: 069 59317
FAX: (519) 623-8930

LATIN AMERICA HEADQUARTERS
1201 South Second Street
Milwaukee, WI 53204 USA
Tel: (414) 382-2000
Telex: 43 11 016
FAX: (414) 382-2400

MOTION CONTROL DIVISION
4300 West Brown Deer Road
Brown Deer, WI 53223-0800

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