Kit Instructions

1334-MOD-N4

Isolated Signal Conditioner Card

Description

The 1334-MOD-N4 Isolated Signal Conditioner Card is designed for use in both the Bulletin 1334 and 1335 AC Drive. The card provides a means of controlling the Drive output frequency (speed) from an external analog signal. All card input and output signals are electrically isolated from one another.

The basic functions provided by the card are:

- 0 to +5V DC or +5 to 0V DC Input
- 0 to +10V DC or +10 to 0V DC Input
- 4 to 20mA DC or 20 to 4mA DC Input
  (**only one of the above inputs may be connected at any one time**)
- Frequency Range Scaling for 0-60, 0-120, or 0-200 Hz Operation
- Inverse Operation Selection
- Adjustable Clamp
- AUTO/MANUAL Mode Selection
- Independently Adjustable Offset and Gain (MIN & MAX Speed) Adjustments
- +12V DC, 20mA DC Output Source for Exclusive Use With the 3-15 PSI Transducer Options

Frequency Range Scaling

Jumper positions **W1** through **W3** are for scaling the operating frequency range of the Isolated Signal Conditioner Card. The standard factory setting of this jumper is with the jumper covering the pins at position **W3**. This scales the card for 60 Hz operation. For 120 Hz operation, move the jumper to the **W2** position. For 200 Hz operation, move the jumper to the **W1** position. Positions **W4** through **W8** should not be used.

Inverse Operation

Jumper **W9** on the card selects either normal or inverse operation. When placed in the **NORM** position, an increase in the magnitude of the applied external reference signal will cause an increase in the Drive output frequency (speed). When placed in the **INV** position, a decrease in the magnitude of the applied external reference signal will cause an increase in the Drive output frequency.

Adjustable Clamp Operation

In the event that the external reference signal to the card were to exceed its rated limit, the card's output frequency signal to the Drive would continue to follow the input signal until saturation occurs. To guard against this type of over frequency condition, an adjustable clamp function helps keep the output frequency of the card from following an increase in speed command beyond the preset value set by **CLAMP** potentiometer **R8**. Whenever the clamp is activated, LED **CR2** on the card is illuminated.

AUTO/MANUAL Operation

S2, the (2) position **AUTO/MAN** slide switch located on the card selects whether the Drive will follow the external reference signal applied to the card (**AUTO** operation), or reference signal from the manual speed pot (**MAN** operation). If required, AUTO/MAN selection may be accomplished remotely by a customer supplied AUTO/MAN switch when the card mounted switch is left in the AUTO position.

Description (continued)

Offset & Gain Adjustments

When the **AUTO** mode is selected, the normal MIN & MAX Drive speed adjustments on the Modulator Logic Board are inoperative. Instead, two pots on the card now set the MIN & MAX speeds. **R19** the **OFFSET** pot establishes the MIN speed of the Drive, while **R14** the **GAIN** pot establishes the MAX speed of the Drive.

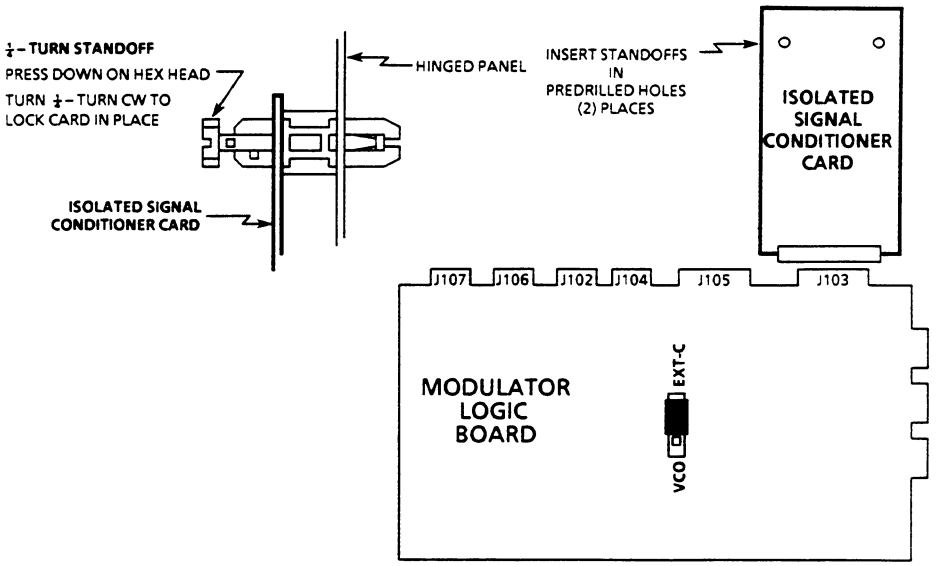
+ 12V DC, 20mA DC Output Source

In addition to the input signal functions described, the Isolated Signal Conditioner Card also provides a + 12V DC source rated at 20mA Max. **This signal is for exclusive use with the 3-15 PSI P/I Transducer, Options 1334-MOD-N3 or 1335-MOD-N5.**

Each 1334-MOD-N4 Option Kit Includes:

- (1) Isolated Signal Conditioner Card, P/N 50917
- (2) ¼ Inch, ¼-Turn Standoffs, P/N 201104

Two predrilled holes have been provided above Modulator Logic Board connector **J103**. Installation requires removing power to the Drive and installing (2) ¼ – turn standoffs into the predrilled holes. The card is then plugged onto the edge connector while pressing the top of the card onto the (2) installed standoffs. The card is then secured to the standoffs as shown below.



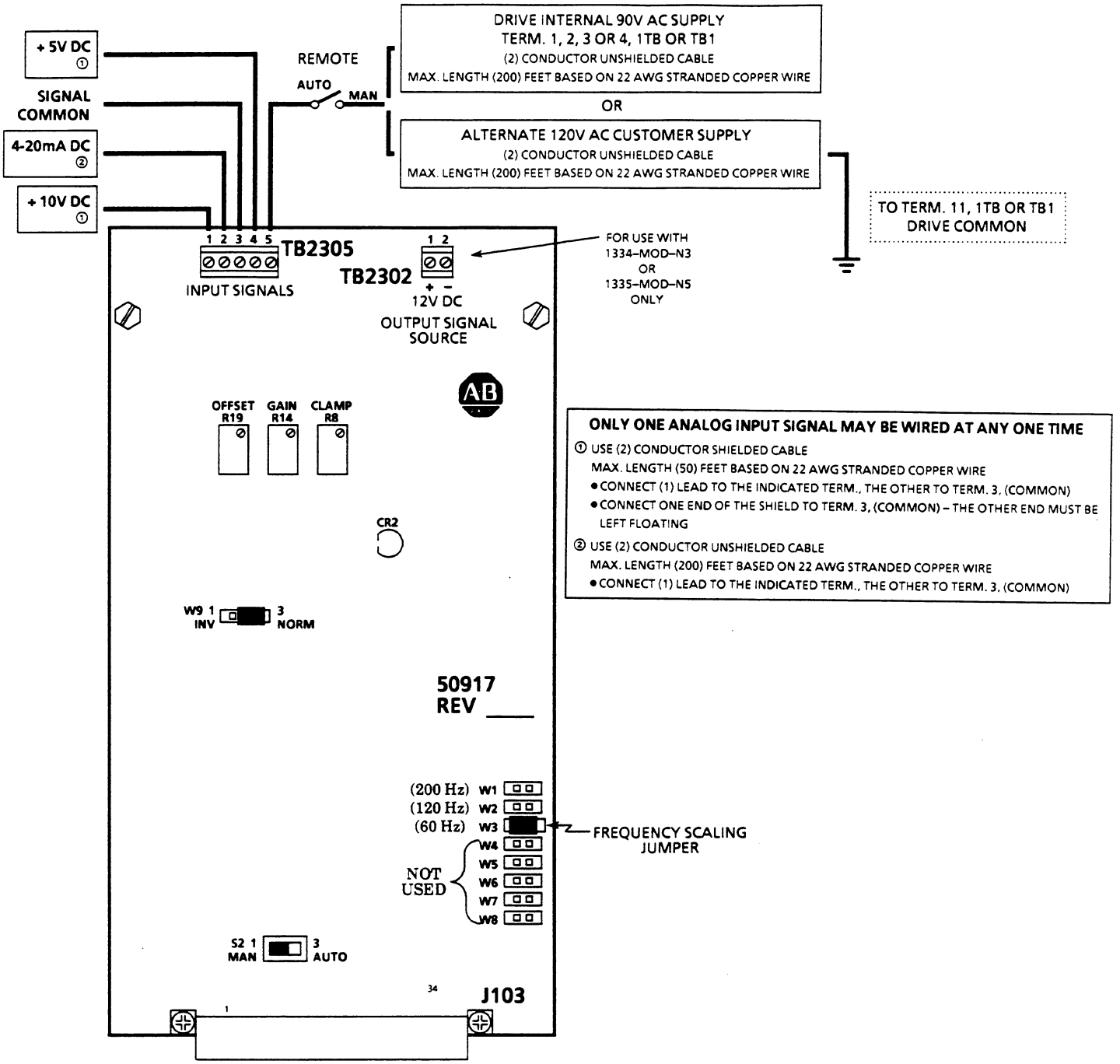
Card Wiring

All interconnection wiring to the Isolated Signal Conditioner Card is made to terminal blocks **TB2305** or **TB2302** as shown on the following page.

If a remote AUTO/MAN switch is to be used, either the 90VAC option supply at the Drive (18) terminal control wiring terminal block may be used, or a customer installed 120V AC power supply.

If Option 1335-MOD-N5, the local 3-15 PSI P/I Transducer has been installed, interconnection wiring has already been made between card terminal block **TB2302** and terminal block **1TB** on the transducer.

If Option 1334-MOD-N3, the remote 3-15 PSI P/I Transducer is to be installed, refer to the Option Kit Instructions supplied with the transducer for interconnection wiring.



Card Adjustments

WARNING

To avoid hazard of electrical shock, remove power when instructed and wait for the bus to completely discharge. Exercise extreme care when performing adjustments with power applied to the Drive.

Card Adjustments (continued)

MIN & Max Speed Adjustment Procedure

1. **Remove input power to the Drive.** Determine the required operating frequency range for the Drive and motor. Verify that the jumper at the right hand side of the Isolated Signal Conditioner Card is in the correct position to correspond to the required frequency range – **W1** (200 HZ), **W2** (120 HZ), or **W3** (60 HZ). Verify that jumper **W9** on the card is in the correct position for **NORM** or **INV** operation. Set the **VCO/EXT C** jumper on the Modulator Logic Board in the Drive to **EXT C**.

2. Set either the local (card mounted) or remote (if installed) **AUTO/MAN** selector switch to the **MAN** position. Apply input power and start the Drive. Verify that the Drive manual speed pot has control of motor speed.

3. Stop the Drive and locate **R8**, the (25) turn **CLAMP** adjustment pot on the card. Turn the pot to the full CCW position. When the pot's full CCW position is reached, a "clicking" sound will be heard as the pot is rotated. If **CR2**, the output clamp LED lights, check all input signals and wiring to **TB2305**. If signals and wiring are correct, the Isolated Signal Conditioner Card may be inoperative.

4. Set the local **AUTO/MAN** selector switch to the **AUTO** position. If a remote AUTO/MANUAL selector switch is used, both the card mounted and remote AUTO/MANUAL switches must be set to **AUTO** in order for the AUTO mode to be selected.

5. Start the Drive and slowly adjust the external input reference signal to the card to the value that corresponds to minimum reference speed.

6. Adjust **OFFSET** pot **R19** on the card to obtain the required minimum motor speed.

7. Slowly adjust the external input reference signal to the card to the value that corresponds to maximum reference speed.

8. Adjust **GAIN** pot **R14** on the card to obtain the required maximum motor speed.

9. Repeat steps **5 – 8** until no further adjustment of the **OFFSET** and **GAIN** pots are required.

Clamp Adjustment Procedure

1. With the Drive stopped, set the external speed reference signal to the card for maximum speed. Observe **CR2**, the output clamp LED on the card. Slowly turn **CLAMP** pot **R8** CW until the LED is illuminated, then back off (1) turn. This will allow a nominal (5) Hz over frequency condition to occur should the external reference signal exceed the maximum speed setting made in step **8**. A more precise clamp setting can be made by performing steps **1a – 1c**.

1a. With **CLAMP** pot **R8** set at its full CCW position, apply the maximum external reference signal to the card.

1b. Increase the external reference signal to the required value at which clamp activation is desired.

1c. Advance **R8** CW until the output clamp LED just illuminates.

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