

## Specifications

**Accuracy:** Includes linearity, zero span drift and offset  
 Multiplication: 0.25% FS  
 Division: 0.4% FS

**Zero Adjustment:**  $\pm 10\%$

**Span Adjustment:**  $\pm 10\%$

**Stability:** 0.04% of FS/ $^{\circ}$ C

**Repeatability:**  $\pm 0.1\%$  FS

**Input Impedance:**  $> 1M\Omega$

**Response Time:** 100ms

**Input Overload Protection:** VDC: 250VAC or VDC  
 Current: 150mA:10 $\Omega$ ; 50mA:100 $\Omega$

For general specifications, see the Series 8000 manual, which provides general information for the entire series.

## Setup Procedure

Check that all pin jumpers are open before continuing with setup. This will help ensure that your unit is correctly setup after you complete reconfiguration.

- I. Disassemble the Series 8000 unit as described on page 6 of the main manual.
- II. Remove the Multiply/Divide Input Board.
- III. Setup the board as described below and on page 15-2.
- IV. Follow the calibration instructions on pages 15-2 and 15-3.
- V. Reassemble the unit as described in the main manual, pages 4 to 6.

## Setup Instructions

## Select Multiply/Divide

Determine whether you will be using multiplication or division and whether your inputs are voltage or current. Note that one input *may* be voltage and the other current. The board's standard configuration is multiplication. Leave the board configured for multiplication until after you have calibrated it and then reset for division use if using the division function, this simplifies the calibration procedure and results in an accurate calibration for division as well. Close the following pin jumpers for (see page 15-4 for pin locations):

Multiplication Setup:	E33 to E34	E36 to E37	E39 to E40
Division Setup:	E34 to E35	E37 to E38	E40 to E41

## Range Selection (VDC or mA)

The following table shows the necessary setup for current use and the appropriate attenuator and gain settings for each VDC and current range

## Voltage Inputs

VDC Range	Gain Settings	
	Channel A	Channel B
0-0.1	E4-E5/E11-E9	E17-E18/E24-E22
0-0.2	E4-E5/E12-E13	E17-E18/E25-E26
0-0.5	E4-E5/E8-E9	E17-E18/E21-E22
0-1.0	E4-E5/E7-E9	E17-E18/E20-E22
0-2.5	E4-E5/E9-E10	E17-E18/E22-E23
0-5.0	E5-E6/E11-E9	E18-E19/E24-E22
0-25	E5-E6/E8-E9	E18-E19/E21-E22
0-50	E5-E6/E7-E9	E18-E19/E20-E22
0-125	E5-E6/E9-E10	E18-E19/E22-E23

## Current Inputs

Current (mA)	Gain Settings		Setup for Current	
	CH A	CH B	CH A	CH B
0-1	E4-E5/E11-E9	E17-E18/E24-E22	E2-E3	E14-E15
0-2	E4-E5/E9-E13	E17-E18/E25-E26	E2-E3	E14-E15
0-5	E4-E5/E8-E9	E17-E18/E21-E22	E2-E3	E14-E15
0-10	E4-E5/E7-E9	E17-E18/E20-E22	E2-E3	E14-E15
0-20	E4-E5/E9-E13	E17-E18/E22-E26	E1-E2	E15-E16
0-50	E4-E5/E8-E9	E17-E18/E21-E22	E1-E2	E15-E16
0-100	E4-E5/E7-E9	E17-E18/E20-E22	E1-E2	E15-E16

## Input Offsets

You can use an offset input of 25%, such as 4-20mA or 1-5V, simply by closing pin jumpers for the preamp which receives the input:

Channel	Offset ON	Offset OFF
CH A	E28-E29	E27-E28
CH B	E31-32	E30-E31

## Calibration (for both multiplication and division use)

Check that the board is set up for multiplication (see page 15-1). If you will be using the board for division, you will reset for division at the end of the calibration procedure.

- Step 1.** Set both inputs to full scale input. Adjust the span potentiometer for minimum output from the unit.
- Step 2.** With Channel A at full scale, set the B channel input to zero (or minimum) Adjust the B channel zero pot to 0V output. This may take several turns.

*Note: It is preferable to remain on the positive side of zero, rather than on the negative side of zero, as this will result in a more accurate calibration.*

- Step 3. Rough center both gain potentiometers:** Turn each one 20 turns clockwise and then 10 turns counterclockwise or monitor the output, turning the potentiometer clockwise until the voltage does not increase as you adjust, and then turn the potentiometer 10 turns counterclockwise.
- Step 4.** Set channel B's input to full scale input and adjust the B gain potentiometer until you get 0.98V output from the unit.
- Step 5.** Repeat Steps 2 and 4 for the A Channel.
- Step 6.** Adjust the span pot until the output from the output board is at full scale.

**For division use:** Perform the calibration above while configured for multiplication, and then reset the board for division (see page 15-1). Readjust the span potentiometer as needed. This calibration is accurate for both division and multiplication.

**Fine gain adjustment:** If, in calibration, you cannot get to your full scale output value, check that all your settings are correct. If they are, then you need to improve your gain by opening SB1. If your board has been previously configured, it is possible that SB1 might have been opened, in which case you might need to reduce gain by closing SB1.

## Reference Information

For Multiplication:

$$\frac{V_{\text{Output}}}{V_{\text{Output Full Scale}}} = \left( \frac{A_{\text{Input}}}{A_{\text{Full Scale}}} \right) \times \left( \frac{B_{\text{Input}}}{B_{\text{Full Scale}}} \right)$$

For Division:

$$\frac{V_{\text{Output}}}{V_{\text{Output Full Scale}}} = \left( \frac{A_{\text{Input}}}{A_{\text{Full Scale}}} \right) + \left( \frac{B_{\text{Input}}}{B_{\text{Full Scale}}} \right) \times 0.1$$

For Division,  $\frac{B_{\text{input}}}{B_{\text{full scale}}}$  must be no smaller than 10% of  $\frac{A_{\text{input}}}{A_{\text{full scale}}}$

## Multiply/Divide Function Board Part Locations

A Zero Potentiometer

A Gain Potentiometer

B Zero Potentiometer

B Gain Potentiometer

Span Potentiometer

