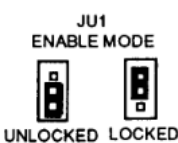
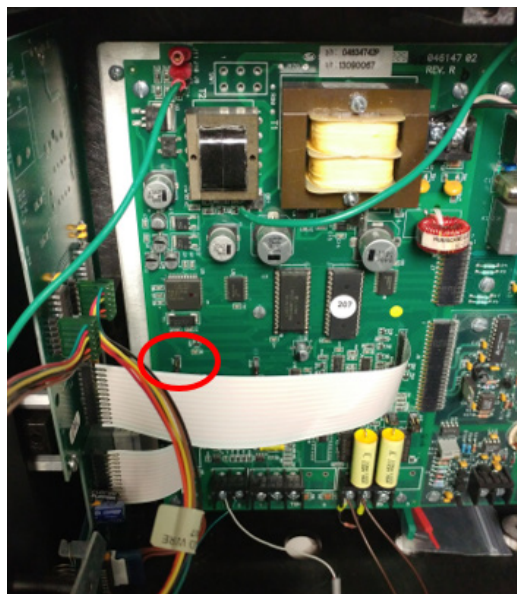
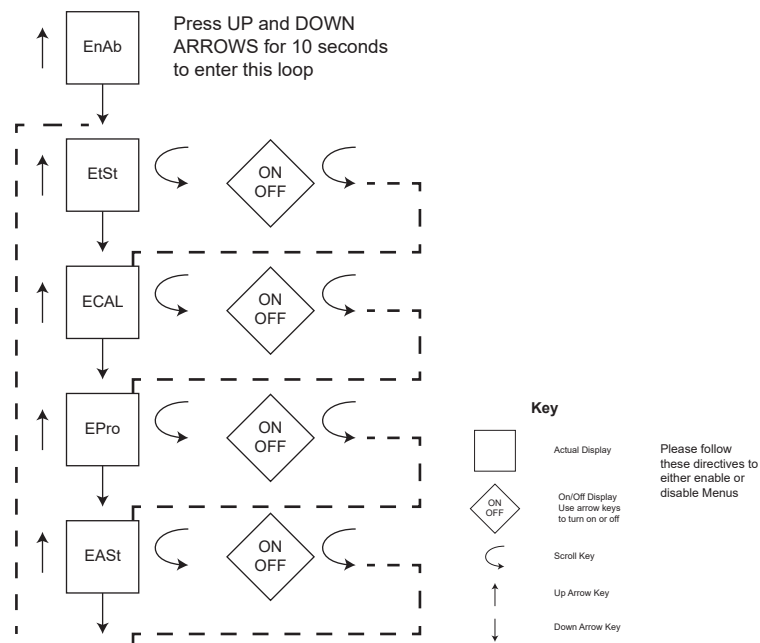


JU1 Jumper must be on the bottom 2 pins in order to access the Enable menu



ENABLE MODE FLOW CHART



Input Correction

Single Pen Recorder

1. Press the **Scroll Key** to scroll to **PROG**
2. Press the **Down Key** to display **Pen1**
3. Press the **Down Key** repeatedly until **ICor** is displayed
4. Press the **Scroll Key** to display the correct factor
5. Use the **UP/Down Key** to adjust the correction factor
6. Then Scroll to **AL1** and press the **UP Key** to get out of program
7. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and press the **Down Key** to go back to the Main Screen

Dual Pen Recorder

After completing the steps for Single Pen Recorder:

1. Press the **Scroll Key** to scroll to **PROG**
2. Press the **Down Key** to display **Pen1**
3. Press the **Scroll Key** to display **Pen2**
4. Press the **Down Key** repeatedly until **ICor** is displayed
5. Press the **Scroll Key** to display the correction factor
6. Use the **UP/Down Key** to adjust the correction factor
7. Then Scroll to **AL1** and press the **UP Key** to get out of program
8. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and press the **Down Key** to go back to the Main Screen

Chart Range Setup

The chart has a chart range upper value (**Cru**) and a chart range lower value (**Crl**)

Single Pen Recorder

1. Press the **Scroll Key** to scroll to **PROG**
2. Press the **Down Key** to display **Pen1**
3. Press the **Down Key** repeatedly until **Cru** is displayed
4. Press the **Scroll Key** to display the **Cru** value
5. Use the **UP/Down Key** to adjust the **Cru** value
6. Then **Scroll** to **Crl** and press the **Scroll Key** to display the **Crl** value
7. Use the **UP/Down** key to adjust the **Crl** value
8. Then Scroll to **PAEC**
9. Press the **UP Key** to get out of program
10. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and Press the **Down Key** to go back to the Main screen

Dual Pen Recorder

After completing the steps for Single Pen Recorder:

1. Press the **Scroll Key** to scroll to **PROG**
2. Press the **Down Key** to display **Pen1**
3. Press the **Scroll Key** to display **Pen2**
4. Press the **Down Key** repeatedly until **Cru** is displayed
5. Press the **Scroll Key** to display the **Cru** value
6. Use the **UP/Down** key to adjust the **Cru** value
7. Then **Scroll** to **Eul** and press the **Scroll Key** to display the **Crl** value
8. Use the **UP/Down** key to adjust the **Crl** value
9. Then Scroll to **PAEC**
10. Press the **UP Key** to get out of program
11. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and Press the **Down Key** to go back to the Main screen

Decimal Point Setup

Single Pen Recorder

1. Press the **Scroll Key** to scroll to **PROG**
2. Press the **Down Key** to display **Pen1**
3. Press the **Down Key** repeatedly until **dPoS** is displayed
4. Press the **Scroll Key** to display the decimal point
5. Use the **UP/Down Key** to adjust the decimal point
6. Scroll to CRU and adjust the (chart range upper) as this will have been affected by adding the decimal
7. Scroll to CRL and adjust the value (chart range lower) as this will have been affected by adding the decimal
8. Then Scroll to PAEC and press the **UP Key** to get out of program
9. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and press the **Down Key** to go back to the Main Screen

Dual Pen Recorder

After completing the steps for Single Pen Recorder:

1. Press the **Scroll Key** to scroll to **PROG**
2. Press the **Down Key** to display **Pen1**
3. Press the **Scroll Key** to display **Pen2**
4. Press the **Down Key** repeatedly until **dPoS** is displayed
5. Press the **Scroll Key** to display the decimal point
6. Use the **UP/Down Key** to adjust the decimal point
7. Scroll to CRU and adjust the (chart range upper) as this will have been affected by adding the decimal
8. Scroll to CRL and adjust the value (chart range lower) as this will have been affected by adding the decimal
9. Then Scroll to PAEC and press the UP Key to get out of program
10. Scroll to Oper (Recorders) or Ctrl (Controllers) and press the Down Key to go back to the Main Screen
11. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and press the **Down Key** to go back to the Main Screen

Chart Rotation Time (Crt) Setup

1. Press the **Scroll Key** to scroll to **PROG**
2. Press the **Down Key** to display **Pen1**
3. Press the **Down Key** repeatedly until **Crt** is displayed
4. Press the Scroll key to display the chart rotation time
5. Use the **UP/Down key** to adjust the rotation time to a desired value
6. Then **Scroll to PAPu** and press the **UP Key** to get out of program
7. Scroll to CRU and adjust the (chart range upper) as this will have been affected by adding the decimal
8. Scroll to CRL and adjust the value (chart range lower) as this will have been affected by adding the decimal
9. Then Scroll to PAEC and press the UP Key to get out of program
10. Scroll to Oper (Recorders) or Ctrl (Controllers) and press the Down Key to go back to the Main Screen
11. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and Press the **Down Key** to go back to the Main screen

Engineering Unit Setup for Transmitters

The Recorder has an Engineering unit upper value (**Euu**) and an engineering unit lower value (**Eul**), which correspond to the transmitter 4-20 mA range.

Make sure the input type "**InPS**" is set at 31.

Single Pen Recorder

1. Press the **Scroll Key** to scroll to **PROG**
2. Press the **Down Key** to display **Pen1**
3. Press the **Down Key** repeatedly until **Euu** is displayed
4. Press the **Scroll Key** to display the **Euu** value
5. Use the **UP/Down Key** to adjust the **Euu** value
6. Then **Scroll** to **Eul** and press the **Scroll Key** to display the **Eul** value
7. Use the **UP/Down** key to adjust the **Eul** value
8. Then Scroll to **HyAo**
9. Press the **UP Key** to get out of program
10. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and Press the **Down Key** to go back to the Main screen

Dual Pen Recorder

After completing the steps for Single Pen Recorder:

1. Press the **Scroll Key** to scroll to **PROG**
2. Press the **Down Key** to display **Pen1**
3. Press the **Scroll Key** to display **Pen2**
4. Press the **Down Key** repeatedly until **Euu** is displayed
5. Press the **Scroll Key** to display the **Euu** value
6. Use the **UP/Down** key to adjust the **Euu** value
7. Then **Scroll** to **Eul** and press the **Scroll Key** to display the **Eul** value
8. Use the **UP/Down** key to adjust the **Eul** value
9. Then Scroll to **HyAo**
10. Press the **UP Key** to get out of program
11. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and Press the **Down Key** to go back to the Main screen

Default Settings (Cal 1)

This procedure can be used when there has been a change that makes the recorder not perform the way it is supposed to, but that change cannot be identified. The unit can be defaulted back to factory settings and re-programmed.

1. Press the **Scroll Key** to scroll to **CAL**
2. Press the **Down Key** to display **CAL1**
3. Press and hold the **Down Key** and press the **Scroll Key** while holding the **Down Key**
4. Release both the **Down** and **Scroll Keys**
5. The display will blank momentarily while re-initializing and **P.dn** will be displayed during this time
6. Once the pen(s) reach Pen Home **CAL1** will be displayed on the screen
7. Press the **UP Key** to get out of **CAL** mode
8. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and Press the **Down Key** to go back to the Main screen

Quick Calibration (CAL 2)

This procedure is used when there is an internal glitch or when the recorder behaves abnormally. Performing the quick **CAL 2** will help clean up internal firmware malfunction. If there is no change after performing **CAL 2**, the problem is probably more serious and further steps should be taken to determine the source of the problem.

1. Press the **Scroll Key** to scroll to **CAL**
2. Press the **Down Key** to display **CAL1**
3. Press the **Down Key** to display **CAL2**
4. Press and hold the **Down Key** and Press the **Scroll Key** while holding the **Down Key**
5. Release both the **Down** and **Scroll Keys**
6. Press and hold the **UP Key** and Press the **Scroll Key** while holding the **Down Key**
7. Release both the **UP** and **Scroll Keys**
8. **CAL1** will be displayed on the screen
9. Press the **UP Key** to get out of **CAL** mode
10. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and Press the **Down Key** to go back to the Main screen

Pen Calibration (Cal 9)

1. Press the **Scroll Key** to scroll to **CAL**
2. Press the **Down Key** to display **CAL1**
3. Press the **Scroll Key** repeatedly until **CAL9** is displayed
4. Press and hold the **Down Key** and Press the **Scroll Key** while holding the **Down Key**
5. Release both the **Down** and **Scroll Keys**
6. Pen 1 is displayed, Press the **Scroll Key** to start the pen calibration
7. The pen moves down towards the inner ring of the chart
8. Press **UP/Down Key** to make the pen track on the inner ring of the chart
9. Then press the **Scroll Key** to move the pen to the outer ring of the chart
10. Press **UP/Down Key** to make the pen track on the outer ring of the chart
11. Then press the **Scroll Key** to move the pen to the center of the chart
12. Pen 1 is displayed on the screen
13. For a Single Pen Recorder step 12 concludes the calibration, Press the **UP Key** twice to display **CAL**
14. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and Press the **Down Key** to go back to the Main screen.
15. For a Dual Pen Recorder, start from step 12.
16. Press the **Down Key** display Pen 2 and repeat step 6 through 11.
17. Pen 2 is displayed on the screen
18. Press the UP key twice to display **CAL**
19. Scroll to **Oper** (Recorders) or **Ctrl** (Controllers) and press the **Down Key** to go back to the Main screen.

Test Pen and Chart Motors (Test 8)

1. Press the **Scroll Key** to scroll to **TEST**
2. Press the **Down Key** to display **TEST1**
3. Press the **Scroll Key** repeatedly until **TEST8** is displayed
4. Press and hold the **Down Key** and press the **Scroll Key** while holding the **Down Key**
5. Release both the **Down** and **Scroll Keys**
6. **"ALL"** is displayed on the screen
7. Pen(s) will move up and down and the chart will rotate fast
8. If the chart does not rotate, the chart motor could be faulty
9. If the pen or one of the pens does not rotate, the pen motor of that pen could be faulty

Pen and chart motors are connected to the stepper drive board, which means in some cases the stepper drive board could be the problem. To determine whether the fault is on the stepper drive board or on the pen and chart motors, pen and chart plugs on the stepper drive can be swapped during the test.

This will help determine whether the problem follows the pen/chart motors (part number: **SPI0128407/SPI0128103**) or the connection on the stepper drive board (part number: **SP56014E0158**).