



NATIONAL INSTRUMENTS SCXI-1121 Signal Conditioning Module Instruction Manual

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NATIONAL INSTRUMENTS SCXI-1121 Signal Conditioning Module



Product Information

- **Specifications**
 - **Product Model:** SCXI-1121
 - **Manufacturer:** National Instruments
 - **Function:** Signal Conditioning Module

Product Usage Instructions

- **Calibration Procedure**
 - To ensure accurate measurements, it is essential to calibrate the SCXI-1121 signal conditioning module as per the following procedure:
- **Initial Setup**
 - Configure the Half-Bridge Completion Jumpers.
 - Configure the Gain Jumpers.
 - Configure the Filter Jumpers.
 - Configure the Excitation Jumpers.
- **Verification Procedure**
 - Verify Analog Input Offsets.
 - Verify Voltage Excitation Limits.
 - Verify Current Excitation Limits.
- **Adjustment Procedure**
 - Adjust Analog Input Offsets if necessary.
 - Adjust Voltage Excitation if needed.
 - Adjust Current Excitation if required.
- **Verifying Adjusted Values**

- After adjustments, verify the values to ensure correct calibration.

- **Test Limits**

- Refer to the provided documentation for specified test limits to validate calibration.

FAQs

- **Q: How often should I calibrate the SCXI-1121?**

- **A:** NI recommends performing a complete calibration at least once every year. However, adjust this interval based on your application's accuracy requirements.

- **Q: Do I need special software for calibration?**

- **A:** No, you do not need any special software. The calibration document provided contains all the necessary information for completing the calibration process.

Introduction

- **What Is Calibration?**

- Calibration consists of verifying the measurement accuracy of a device and adjusting for any measurement error. Verification is measuring the performance of the device and comparing these measurements to the factory specifications. During calibration, you supply and read voltage levels using external standards, then you adjust the device calibration constants. The measurement circuitry compensates for any inaccuracies in the device and returns the accuracy of the device to the factory specifications.

- **Why Should You Calibrate?**

- The accuracy of electronic components drifts with time and temperature, which can affect measurement accuracy. Calibration restores these components to their specified accuracy and ensures that the device still meets NI standards.

- **How Often Should You Calibrate?**

- Calibrate the SCXI-1121 at a regular interval as defined by the measurement accuracy requirements of your application. NI recommends that you perform a complete calibration at least once every year. You can shorten this interval based on the accuracy requirements of your application.

- **Software and Documentation**

- You do not need any special software or documentation to calibrate the SCXI-1121. This calibration document contains all the information you need to complete the calibration procedure. Refer to the SCXI-1121 User Manual for more information about the SCXI-1121.

Test Equipment

NI recommends that you use the equipment in Table 1 to calibrate the SCXI-1121. If these instruments are not available, use the requirements listed in Table 1 to select a suitable substitute.

Table 1. Test Equipment

| Equipment | Recommended Model | Requirements |
|------------|-------------------|-----------------------------|
| Calibrator | Fluke 5700A | 50 ppm |
| DMM | NI 4070 | 5 1/2-digit, 15 ppm |
| Resistors | — | 120 W and 800 W, $\pm 10\%$ |

If you do not have custom connection hardware, you need the following connectors:

- Terminal block, such as the SCXI-1320
- Shielded 68-pin connector cable
- 50-pin ribbon cable
- 50-pin breakout box
- SCXI-1349 adapter

These components give easy access to the individual pins on the SCXI-1121 front and rear connectors.

Test Conditions

Follow these guidelines to optimize the connections and environment during calibration:

- Keep connections to the SCXI-1121 short. Long cables and wires can act as antennas, picking up extra noise and thermal offsets that affect measurements.
- Use shielded copper wire for all cable connections to the SCXI-1121.
- Use twisted-pair wire to eliminate noise and thermal offsets.
- Maintain the ambient temperature between 18 °C and 28 °C.
- Keep relative humidity below 80%.
- Allow a warm-up time of at least 15 minutes for the SCXI-1121 to ensure that the measurement circuitry is at a stable operating temperature.

Calibration Process

The calibration process has the following steps:

1. **Initial Setup**—Configure the SCXI-1121 for calibration.
2. **Verification Procedure**—Verify the existing operation of the SCXI-1121. This step determines whether the SCXI-1121 is operating within its test limits.
3. **Adjustment Procedure**—Perform an external calibration that adjusts the SCXI-1121 calibration constants concerning a known voltage source.
4. **Verifying Adjusted Values**—Perform another verification to ensure that the SCXI-1121 is operating within its test limits after adjustments.

Initial Setup

Complete the following steps to configure the SCXI-1121 for calibration. Refer to Figure 1 for steps 1 and 2 and Figure 2 for steps 3 and 4.

1. Remove the grounding screw from the SCXI-1121.
2. Remove the cover on the SCXI-1121 so that you have access to the potentiometers.

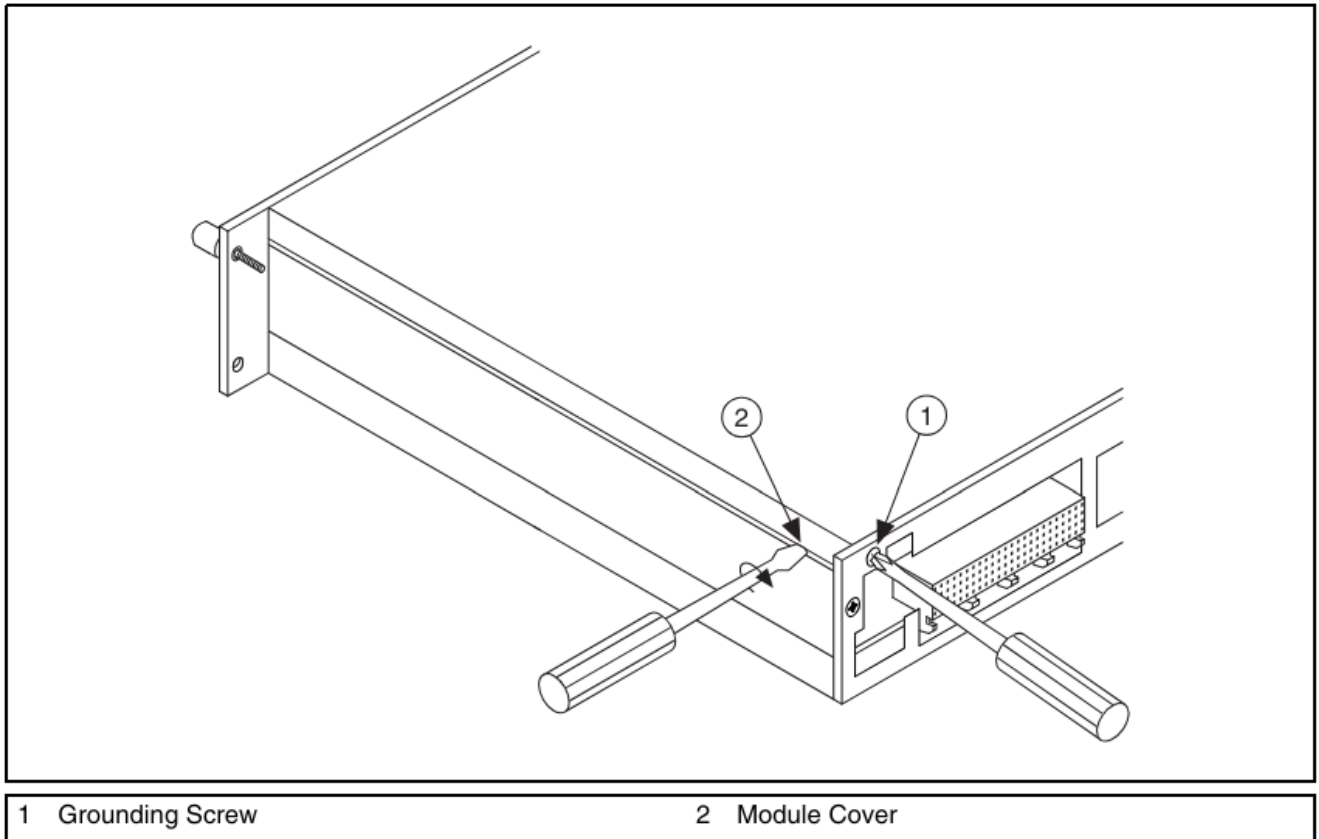


Figure 1. Grounding Screw and Module Cover Removal

3. Remove the side plate of the SCXI chassis.
4. Install the SCXI-1121 into the right-most slot of the SCXI chassis.

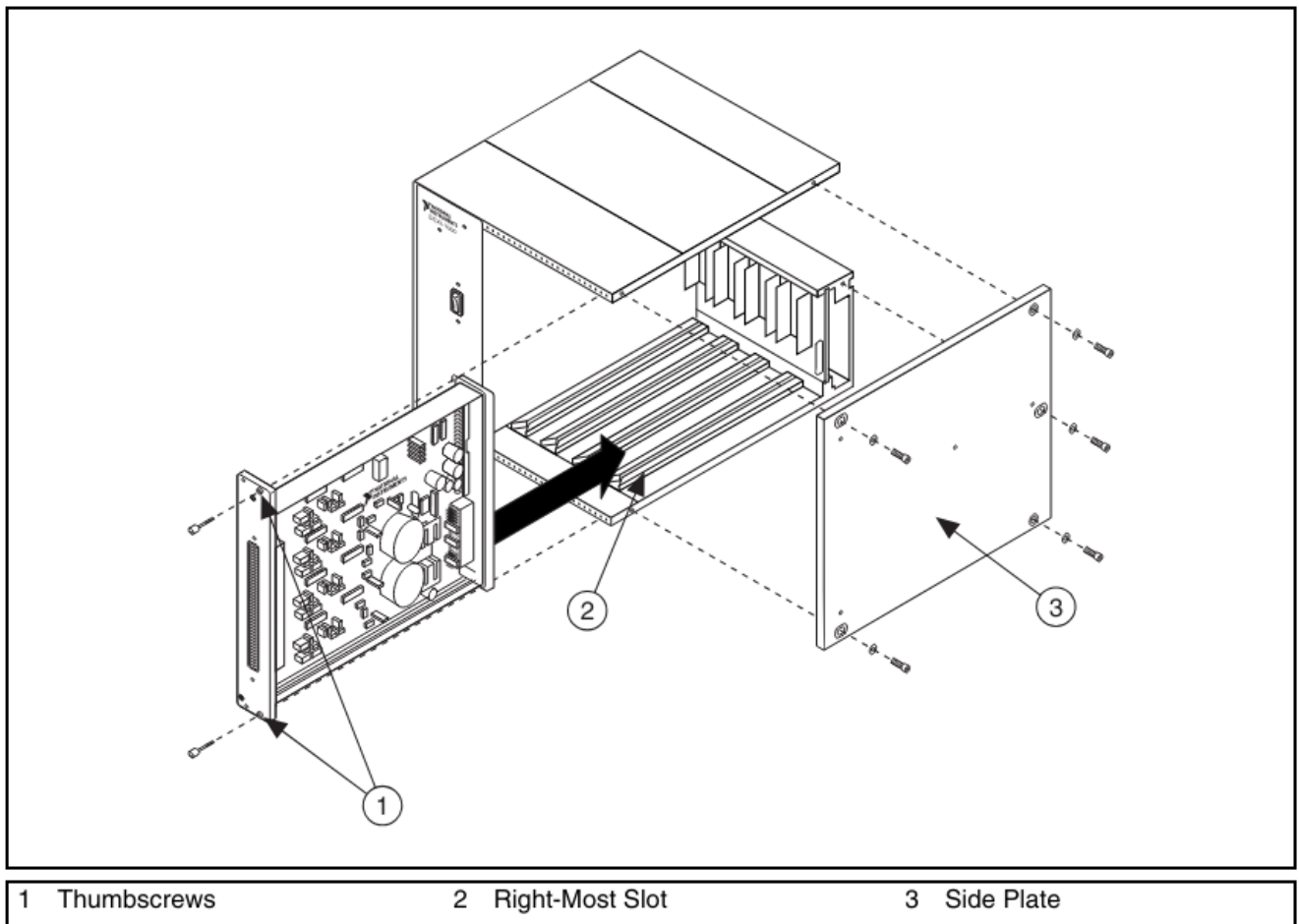
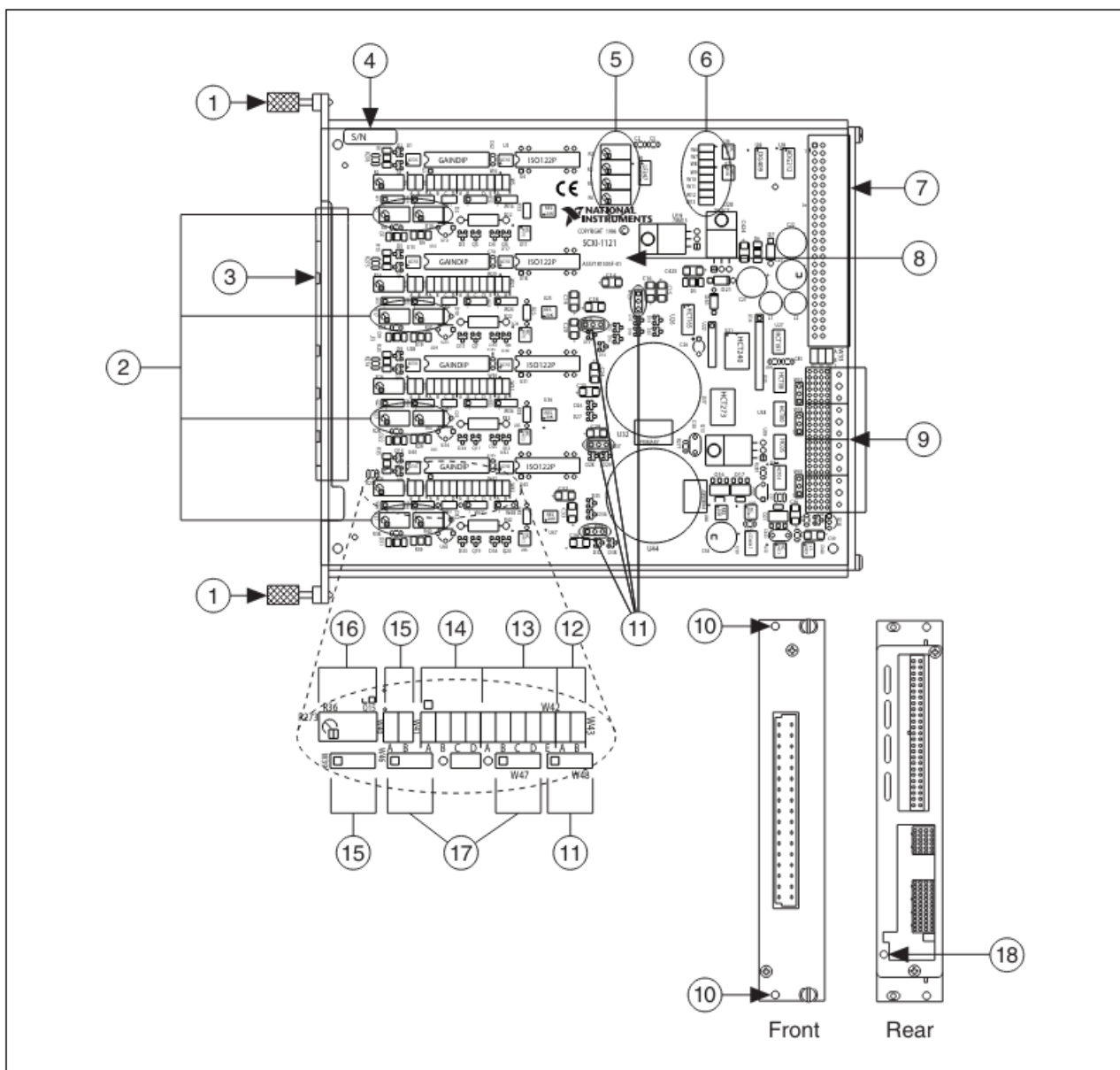


Figure 2. Side Plate Removal and Module Installation

You do not need to cable the SCXI-1121 to a DAQ device. Leave the configuration of the digital jumpers W32, W38, and W45 unchanged because they do not affect this calibration procedure.

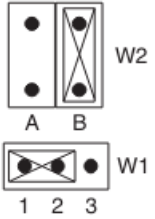
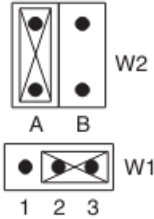
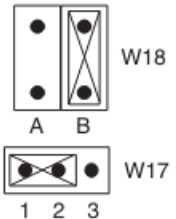
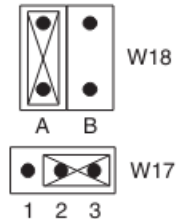
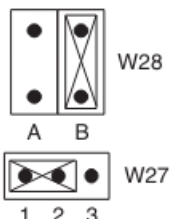
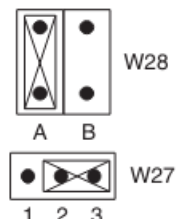
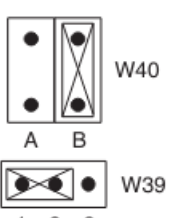
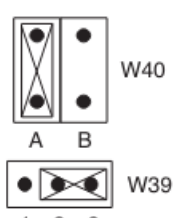
Configuring the Half-Bridge Completion Jumpers

Verify that the half-bridge completion network is disabled before calibrating the SCXI-1121. Refer to Figure 3 for the location of the half-bridge completion jumpers. Refer to Table 2 for the correct jumper settings to disable the completion network.



1. Thumbscrews
2. Voltage and Current Adjust
3. Front Connector
4. Serial Number
5. Output Null Adjust Potentiometers
6. Second-Stage Filter Jumpers
7. Rear Signal Connector
8. Product Name, Assembly Number, Revision Letter
9. SCXIbus Connector
10. Terminal Block Mounting Hole
11. Excitation Level Jumpers
12. First-Stage Filter Jumpers
13. Second-Stage Gain Jumpers
14. First-Stage Gain Jumpers
15. Half-Bridge Completion Jumpers
16. Input Null Adjust Potentiometers
17. Excitation Mode Jumpers

Figure 3. SCXI-1121 Parts Locator Diagram**Table 2.** Completion Network Jumpers

| Channel | Jumpers | Enable Completion | Disable Network (Factory Setting) |
|---------|-------------|---|---|
| 0 | W1 and W2 |  |  |
| 1 | W17 and W18 |  |  |
| 2 | W27 and W28 |  |  |
| 3 | W39 and W40 |  |  |

Configuring the Gain Jumpers

- Each input channel has two user-configurable gain stages. The first-stage gain provides gains of 1, 10, 50, and 100. The second-stage gain provides gains of 1, 2, 5, 10, and 20. The SCXI-1121 ships with the first-stage gain set to 100 (position A) and the second-stage gain set to 10 (position D).
- To change the gain setting of a specified channel on the SCXI-1121, refer to Table 3 for the gain jumper reference designators. Refer to Figure 3 for the location of the gain jumpers. Move the jumper to the position indicated in Table 4.

Table 3. Gain Jumper Reference Designators

| Input Channel Number | First-Stage Gain Jumper | Second-Stage Gain Jumper |
|----------------------|-------------------------|--------------------------|
| 0 | W3 | W4 |
| 1 | W19 | W20 |
| 2 | W29 | W30 |
| 3 | W41 | W42 |

Table 4. Gain Jumper Positions

| Gain | Setting | Jumper Position |
|--------------|---------|---------------------|
| First-Stage | 1 | D |
| | 10 | C |
| | 50 | B |
| | 100 | A (factory setting) |
| Second-Stage | 1 | A |
| | 2 | B |
| | 5 | C |
| | 10 | D (factory setting) |
| | 20 | E |

The order of the settings for the first- and second-stage gain does not matter as long as the first-stage gain multiplied by the second-stage gain equals the desired final gain value.

Configuring the Filter Jumpers

- Each input channel also has two user-configurable filter stages.
- The SCXI-1121 ships in the 4 Hz position.
- Refer to Table 5 for the correct jumper setting for the desired cutoff frequency.
- Refer to Figure 3 for the locations of the jumper blocks on the SCXI-1121.
- Verify that both filter stages are set to the same filter setting to ensure that you achieve the desired bandwidth.

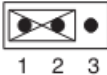
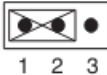

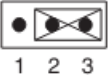


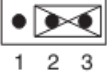
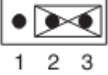
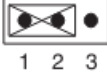
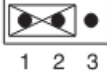
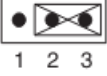
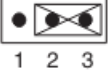
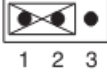

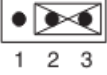
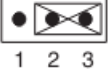
Table 5. Filter Jumper Settings

| Input Channel Number | First Filter Jumper | | Second Filter Jumper | |
|----------------------|------------------------|-------|-------------------------|-------|
| | 4 Hz (Factory Setting) | 4 kHz | 4 Hz (Factory Setting) | 4 kHz |
| 0 | W5-A | W5-B | W6 | W7 |
| 1 | W21-A | W21-B | W8 | W9 |
| 2 | W31-A | W31-B | W10 | W11 |
| 3 | W43-A | W43-B | W12 | W13 |

Configuring the Excitation Jumpers

You can configure each excitation channel of the SCXI-1121 to either a voltage or current excitation mode. Each channel has two jumpers for this purpose. Set both jumpers in the same mode for correct operation of the excitation channel. Refer to Table 6 to determine how to set up the SCXI-1121 in the desired mode. The SCXI-1121 ships to you in the voltage mode.

Table 6. Voltage and Current Mode Excitation Jumper Settings

| Excitation Channel | Jumpers | Voltage Mode (Factory Setting) | Current Mode |
|--------------------|-------------|---|---|
| 0 | W14 and W15 |   |   |
| 1 | W22 and W23 |   |   |
| 2 | W34 and W35 |   |   |
| 3 | W46 and W47 |   |   |

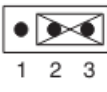

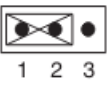



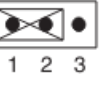

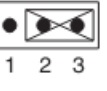

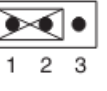



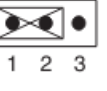

Configuring the Excitation Level

Each excitation channel of the SCXI-1121 has two different current or voltage levels. You can set a given channel to one of the following levels:

- **In the current mode**—0.150 mA or 0.450 mA
- **In the voltage mode**—3.333 V or 10 V

After selecting the excitation mode of the desired operation—voltage or current, refer to Table 7 to set the SCXI-1121 for the level of operation. The SCXI-1121 ships with the voltage mode set to 3.333 V.

Table 7. Excitation Level Jumper Settings

| Excitation Channel | Jumpers | 3.333 V or 0.150 mA (Factory Setting) | 10 V or 0.450 mA |
|--------------------|-------------|---|---|
| 0 | W16 and W26 |   |   |
| 1 | W24 and W25 |   |   |
| 2 | W36 and W37 |   |   |
| 3 | W48 and W49 |   |   |

Verification Procedure

The verification procedure determines how well the SCXI-1121 is meeting its test limits. You can use this information to select the appropriate calibration interval for your application.

Verifying Analog Input Offsets

Complete the following steps to verify the analog input offsets:

1. Refer to Table 12 in the Test Limits section for all acceptable settings for the SCXI-1121. NI recommends verifying all ranges and gains, but you can save time by checking only those ranges used in your application.
2. Set the channel gain on all channels to the gain you want to test, starting with the smallest gain available for the SCXI-1121. Refer to Table 12 for available gains.
3. Set the channel filter for all channels on the SCXI-1121 to 10 kHz.
4. Connect the calibrator to the analog input channel you are testing, starting with channel 0. If you do not have an SCXI terminal block such as the SCXI-1320, refer to Table 13 to determine the pins on the 96-pin front connector that correspond to the positive and negative inputs of the specified channel. For example, the positive input for channel 0 is pin A32, which is labelled CH0+. The negative input for channel 0 is pin C32, which is labelled CH0–.
5. Set the DMM to voltage mode, and connect it to the output of the same channel to which the calibrator was connected in step 4. Refer to Table 14 to determine the pins on the 50-pin rear connector that correspond to the positive and negative outputs for the specified channel. For example, the positive output for channel 0 is pin 3, which is labelled CH 0+. The negative output for channel 0 is pin 4, which is labelled CH 0–.
6. Set the calibrator voltage to the value specified by the Test Point entry listed in Table 12.
7. Read the resulting output voltage on the DMM. If the output voltage result falls between the Upper Limit and the Lower Limit values, the SCXI-1121 passed the test.

8. Repeat steps 4 through 7 for the remaining test points.
9. Repeat steps 4 through 8 for the remaining analog input channels.
10. Repeat steps 2 through 9 for the remaining gain and filter values specified in Table 12.

You have completed verifying the analog input offsets. If any of your measurements fall outside the test limits listed in Table 12, adjust the SCXI-1121 as described in the Adjusting Analog Input Offsets section.

Verifying Voltage Excitation Limits

Complete the following steps to verify the voltage excitation limits:

1. Connect a 120 Ω resistor to the output of the excitation channel you are testing, starting with excitation channel 0. If you have a terminal block such as the SCXI-1320, the excitation channel connections are marked on the terminal block. If you do not have a terminal block, refer to Table 13 for connection information.
2. Configure the excitation channel to the 3.333 V level.
3. Set the DMM to voltage mode, and connect the DMM leads to the excitation output as closely as possible to the resistor body.
4. Compare the DMM reading to the limits for excitation shown in Table 8. If the reading falls between the Upper Limit and the Lower Limit values, the SCXI-1121 passed the test.

• **Table 8.** SCXI-1121 Voltage Excitation Limits

| Test Point (V) | Upper Limit (V) | Lower Limit (V) |
|----------------|-----------------|-----------------|
| 3.333 | 3.334333 | 3.331667 |
| 10 | 10.020000 | 9.980000 |

5. Configure the excitation channel to the 10 V level, replace the 120 Ω resistor with the 800 Ω resistor, and repeat steps 3 and 4.
6. Repeat steps 2 through 5 for all remaining channels.

You have completed verifying the voltage excitation limits. If any of your measurements fall outside the test limits listed in Table 8, adjust the SCXI-1121 as described in the Adjusting Voltage Excitation section.

Verifying Current Excitation Limits

Complete the following steps to verify current excitation limits:

1. Remove the resistor from the excitation channel if you have not already done so.
2. Configure the channel to the 0.150 mA excitation level.
3. Set the DMM to current mode, and connect it to the excitation channel output, starting with excitation channel 0. If you do not have a terminal block, refer to Figure 3 for connection information.
4. Compare the DMM reading to the limits for excitation shown in Table 9. If the reading falls between the Upper Limit and Lower Limit values, the SCXI-1121 passed the test.

• **Table 9.** SCXI-1121 Current Excitation Limits

| Test Point (mA) | Upper Limit (mA) | Lower Limit (mA) |
|-----------------|------------------|------------------|
| 0.150 | 0.150060 | 0.149940 |
| 0.450 | 0.450900 | 0.449100 |

- Configure the channel for 0.450 mA excitation level and repeat steps 2 and 4.
- Repeat steps 2 through 5 for all remaining channels.

You have completed verifying the current excitation limits. If any of your measurements fall outside the limits listed in Table 9, adjust the SCXI-1121 as described in the Adjusting Current Excitation section.

Adjustment Procedure

The adjustment procedure adjusts the analog input offsets, the voltage excitation limits, and the current excitation limits.

Adjusting Analog Input Offsets

Complete the following steps to adjust the offset null value:

- Set the channel gain on the channel you are adjusting to a gain of 1. Set the filter value to 4 Hz.
- Connect the calibrator to the analog input channel you want to adjust. Refer to Table 13 to determine the pins on the 96-pin front connector that correspond to the positive and negative inputs of the specified channel. For example, the positive input for channel 0 is pin A32, which is labelled CH0+. The negative input for channel 0 is pin C32, which is labelled CH0–.
- Set the DMM to voltage mode, and connect it to the output of the same channel to which the calibrator was connected in step 2. Refer to Table 14 to determine the pins on the 50-pin rear connector that correspond to the positive and negative outputs for the specified channel. For example, the positive output for channel 0 is pin 3, which is labelled CH 0+. The negative output for channel 0 is pin 4, which is labelled CH 0–.
- Set the calibrator voltage to 0.0 V.
- Adjust the output null potentiometer of the channel until the DMM reading is 0.0 ± 3.0 mV. Refer to Figure 3 for the potentiometer location and Table 10 for the potentiometer reference designator.

• Table 10. Calibration Potentiometers Reference Designators

| Input Channel Number | Input Null | Output Null |
|----------------------|------------|-------------|
| 0 | R02 | R03 |
| 1 | R16 | R04 |
| 2 | R26 | R05 |
| 3 | R36 | R06 |

- Set the channel gain to a gain of 1000.0 on the channel you are adjusting. Refer to Tables 3, 4, and 5 for more information.
- Adjust the input null potentiometer of channel 0 until the DMM reading is 0.0 ± 6.0 mV. Refer to Figure 3 for the potentiometer location and Table 10 for the potentiometer reference designator.

8. Repeat steps 1 through 7 for the remaining analog inputs.

You have completed adjusting the analog input offsets.

Adjusting Voltage Excitation

When you adjust the excitation channels, always start with the voltage excitation and then proceed to the current excitation. Use the voltage excitation reference as the voltage reference for the current excitation.

Complete the following steps to adjust the voltage excitation:

1. Connect the 120 Ω resistor across the output of the excitation channel you are adjusting.
2. Configure the excitation channel to a 3.333 V excitation level.
3. Set the DMM to voltage mode, and connect the DMM leads to the excitation outputs as closely as possible to the resistor body.
4. Adjust the excitation voltage potentiometer until the voltage reading falls between 3.334333 V and 3.331667 V.
Refer to Figure 3 for the potentiometer location and Table 11 for the potentiometer reference designator.

Table 11. Excitation Calibration Potentiometer Reference Designators

| Input Channel Number | Excitation Channel | |
|----------------------|--------------------|--------------|
| | Voltage Mode | Current Mode |
| 0 | R10 | R7 |
| 1 | R20 | R17 |
| 2 | R30 | R27 |
| 3 | R40 | R37 |

Note This step calibrates the 10 V excitation level at the same time, but the accuracy achieved is limited to ±0.2%. To achieve better accuracy at the 10 V level, follow steps 1 through 4 but set the excitation level to 10 V instead of 3.333 V. If you do so, the 3.333 V level of this channel will then be calibrated to ±0.2% instead of to ±0.04%. In the factory, the SCXI-1121 is calibrated for 3.333 V. Repeat steps 1 through 4 for all remaining channels. You have completed adjusting the voltage excitation channels.

Adjusting Current Excitation

Complete the following steps to adjust the current excitation:

1. Remove the resistor from the excitation channel if you have not already done so.
2. Configure the channel for 0.150 mA current excitation level.
3. Set the DMM to current mode, and connect it to the excitation channel output you want to adjust.
4. Adjust the excitation current potentiometer until the current reading falls between 0.150060 mA and 0.149940 mA. Refer to Figure 3 for the potentiometer location and Table 11 for the potentiometer reference designator.
 - **Note** This step calibrates the 450 µA level at the same time, but the accuracy achieved is limited to ±0.2%. To achieve better accuracy at the 450 µA level, follow steps 1 through 4 but set the excitation level to 450 µA instead of 150 µA. If you do so, the 150 µA level of this channel will then be calibrated to ±0.2% instead of ±0.04%. In the factory, the SCXI-1121 is calibrated for 150 µA.

5. Repeat steps 1 through 4 for all remaining channels.

- You have completed adjusting the current excitation channels.

Verifying Adjusted Values

After completing the adjustments, it is important to verify the analog input operation, the voltage excitation, and the current excitation again by repeating the steps listed in the Verification Procedure. Verifying the adjusted values ensures that the SCXI-1121 is operating within its test limits after adjustments.

Note If the SCXI-1121 fails after calibration, return it to NI for repair or replacement. For more information about how to contact NI for repair or replacement, refer to the Technical Support Information document.

Test Limits

Table 12 contains test limits for the SCXI-1121. If the module was calibrated within the last year, the output should fall between the Upper Limit and Lower Limit values.

Table 12. SCXI-1121 Test Limits

| Gain | Test Point (V) | 4 Hz Filter Setting | | 10 kHz Filter Setting | |
|-------|----------------|---------------------|-----------------|-----------------------|-----------------|
| | | Upper Limit (V) | Lower Limit (V) | Upper Limit (V) | Lower Limit (V) |
| 0.01* | 225.0000 | 2.269765 | 2.230236 | 2.346618 | 2.303382 |
| 0.01* | 0.0000 | 0.005144 | -0.05144 | 0.006510 | -0.006510 |
| 0.01* | -225.0000 | -2.230236 | -2.269765 | -2.303382 | -2.346618 |
| 0.02* | 225.0000 | 4.534387 | 4.465613 | 3.750713 | 3.689287 |
| 0.02* | 0.0000 | 0.005146 | -0.005146 | 0.006540 | -0.006540 |
| 0.02* | -225.0000 | -4.465613 | -4.534387 | -3.689287 | -3.750713 |
| 0.05* | 90.0000 | 4.534387 | 4.465614 | 4.686836 | 4.613164 |
| 0.05* | 0.0000 | 0.005146 | -0.005146 | 0.006620 | -0.006620 |
| 0.05* | -90.0000 | -4.465614 | -4.534387 | -4.613164 | -4.686836 |
| 0.01* | 45.0000 | 4.534387 | 4.465613 | 4.686936 | 4.613064 |
| 0.01* | 0.0000 | 0.005146 | -0.005146 | 0.006720 | -0.006720 |
| 0.01* | -45.0000 | -4.465613 | -4.534387 | -4.613064 | -4.686936 |

| | | | | | |
|-------|----------|------------|-----------|------------|-----------|
| 0.02* | 22.5000 | 4.534387 | 4.465613 | 4.687516 | 4.612484 |
| 0.02* | 0.0000 | 0.005146 | −0.005146 | − 0.007300 | −0.007300 |
| 0.02* | −22.5000 | − 4.465613 | −4.534387 | − 4.612484 | −4.687516 |
| 0.05* | 9.0000 | 4.534388 | 4.465613 | 4.686911 | 4.613089 |
| 0.05* | 0.0000 | 0.005147 | −0.005147 | 0.006695 | −0.006695 |
| 0.05* | −9.0000 | − 4.465613 | −4.534388 | − 4.613089 | −4.686911 |
| 1 | 4.5000 | 4.534295 | 4.465705 | 4.535671 | 4.464329 |
| 1 | 0.0000 | 0.005144 | −0.005144 | 0.006520 | −0.006520 |
| 1 | − 4.5000 | − 4.465705 | −4.534295 | − 4.464329 | −4.535671 |
| 2 | 2.2500 | 4.534292 | 4.465708 | 4.535693 | 4.464307 |
| 2 | 0.0000 | 0.005141 | −0.005141 | 0.006542 | −0.006542 |
| 2 | −2.2500 | − 4.465708 | −4.534292 | − 4.464307 | −4.535693 |

| Gain | Test Point (V) | 4 Hz Filter Setting | | 10 kHz Filter Setting | |
|------|----------------|---------------------|-----------------|-----------------------|-----------------|
| | | Upper Limit (V) | Lower Limit (V) | Upper Limit (V) | Lower Limit (V) |
| 5 | 0.9000 | 4.534293 | 4.465707 | 4.535706 | 4.464294 |
| 5 | 0.0000 | 0.005142 | −0.005142 | 0.006555 | −0.006555 |
| 5 | − 0.9000 | − 4.465707 | −4.534293 | − 4.464294 | −4.535706 |
| 10 | 0.4500 | 4.534387 | 4.465613 | 4.535771 | 4.464229 |
| 10 | 0.0000 | 0.005236 | −0.005236 | 0.006620 | −0.006620 |
| 10 | − 0.4500 | − 4.465613 | −4.534387 | − 4.464229 | −4.535771 |
| 20 | 0.2250 | 4.534456 | 4.465544 | 4.535979 | 4.464021 |
| 20 | 0.0000 | 0.005305 | −0.005305 | 0.006828 | −0.006828 |

| | | | | | |
|------|----------|------------|-----------|------------|-----------|
| 20 | − 0.2250 | − 4.465544 | −4.534456 | − 4.464021 | −4.535979 |
| 50 | 0.0900 | 4.534694 | 4.465306 | 4.536146 | 4.463854 |
| 50 | 0.0000 | 0.005543 | −0.005543 | 0.006995 | −0.006995 |
| 50 | − 0.0900 | − 4.465306 | −4.534694 | − 4.463854 | −4.536146 |
| 100 | 0.0450 | 4.535095 | 4.464905 | 4.536551 | 4.463449 |
| 100 | 0.0000 | 0.005944 | −0.005944 | 0.007400 | −0.007400 |
| 100 | − 0.0450 | − 4.464905 | −4.535095 | − 4.463449 | −4.536551 |
| 200 | 0.0225 | 4.535892 | 4.464108 | 4.537797 | 4.462203 |
| 200 | 0.0000 | 0.006741 | −0.006741 | 0.008646 | −0.008646 |
| 200 | 0.0225 | − 4.464108 | −4.535892 | − 4.462203 | −4.537797 |
| 250 | 0.0180 | 4.536294 | 4.463706 | 4.538614 | 4.461387 |
| 250 | 0.0000 | 0.007143 | −0.007143 | 0.009463 | −0.009463 |
| 250 | − 0.0180 | − 4.463706 | −4.536294 | − 4.461387 | −4.538614 |
| 500 | 0.0090 | 4.538303 | 4.461698 | 4.540951 | 4.459049 |
| 500 | 0.0000 | 0.009152 | −0.009152 | 0.011800 | −0.011800 |
| 500 | − 0.0090 | − 4.461698 | −4.538303 | − 4.459049 | −4.540951 |
| 1000 | 0.0045 | 4.542321 | 4.457679 | 4.546501 | 4.453499 |
| 1000 | 0.0000 | 0.013170 | −0.013170 | 0.017350 | −0.017350 |
| 1000 | − 0.0045 | − 4.457679 | −4.542321 | − 4.453499 | −4.546501 |
| 2000 | 0.00225 | 4.551389 | 4.448611 | 4.558631 | 4.441369 |

| Gain | Test Point (V) | 4 Hz Filter Setting | | 10 kHz Filter Setting | |
|---|----------------|---------------------|-----------------|-----------------------|-----------------|
| | | Upper Limit (V) | Lower Limit (V) | Upper Limit (V) | Lower Limit (V) |
| 2000 | 0.00000 | 0.022238 | −0.022238 | 0.029480 | −0.029480 |
| 2000 | −0.00225 | − 4.448611 | −4.551389 | − 4.441369 | −4.558631 |
| * Value available only when used with the SCXI-1327 high-voltage terminal block | | | | | |

Panel Diagrams

SCXI-1121 Front and Rear Panel Diagrams


Table 13 shows the pin assignments for the SCXI-1121 front panel connector. Table 14 shows the pin assignments for the SCXI-1121 rear signal connector.

Table 13. Front Connector Pin Assignments

| Front Connector Diagram | Pin Number | Column A | Column B | Column C |
|--|------------|----------|----------|----------|
| <div> <div>Column A B C</div> <div> <div>32</div><div>○</div><div>○</div><div>○</div> <div>31</div><div>○</div><div>○</div><div>○</div> <div>30</div><div>○</div><div>○</div><div>○</div> <div>29</div><div>○</div><div>○</div><div>○</div> <div>28</div><div>○</div><div>○</div><div>○</div> <div>27</div><div>○</div><div>○</div><div>○</div> <div>26</div><div>○</div><div>○</div><div>○</div> <div>25</div><div>○</div><div>○</div><div>○</div> <div>24</div><div>○</div><div>○</div><div>○</div> <div>23</div><div>○</div><div>○</div><div>○</div> <div>22</div><div>○</div><div>○</div><div>○</div> <div>21</div><div>○</div><div>○</div><div>○</div> <div>20</div><div>○</div><div>○</div><div>○</div> <div>19</div><div>○</div><div>○</div><div>○</div> <div>18</div><div>○</div><div>○</div><div>○</div> <div>17</div><div>○</div><div>○</div><div>○</div> <div>16</div><div>○</div><div>○</div><div>○</div> <div>15</div><div>○</div><div>○</div><div>○</div> <div>14</div><div>○</div><div>○</div><div>○</div> <div>13</div><div>○</div><div>○</div><div>○</div> <div>12</div><div>○</div><div>○</div><div>○</div> <div>11</div><div>○</div><div>○</div><div>○</div> <div>10</div><div>○</div><div>○</div><div>○</div> <div>9</div><div>○</div><div>○</div><div>○</div> <div>8</div><div>○</div><div>○</div><div>○</div> <div>7</div><div>○</div><div>○</div><div>○</div> <div>6</div><div>○</div><div>○</div><div>○</div> <div>5</div><div>○</div><div>○</div><div>○</div> <div>4</div><div>○</div><div>○</div><div>○</div> <div>3</div><div>○</div><div>○</div><div>○</div> <div>2</div><div>○</div><div>○</div><div>○</div> <div>1</div><div>○</div><div>○</div><div>○</div> </div> </div> | 32 | CH0+ | NC | CH0− |
| | 31 | NC | NC | NC |
| | 30 | EX0+ | NC | EX0− |
| | 29 | NC | NC | NC |
| | 28 | EGND0 | NC | NC |
| | 27 | NC | NC | NC |
| | 26 | CH1+ | NC | CH1− |
| | 25 | NC | NC | NC |
| | 24 | EX1+ | NC | EX1− |
| | 23 | NC | NC | NC |
| | 22 | EGND1 | NC | NC |
| | 21 | NC | NC | NC |
| | 20 | CH2+ | NC | CH2− |
| | 19 | NC | NC | NC |
| | 18 | EX2+ | NC | EX2− |
| | 17 | NC | NC | NC |
| | 16 | EGND2 | NC | NC |
| | 15 | NC | NC | NC |
| | 14 | CH3+ | NC | CH3− |
| | 13 | NC | NC | NC |
| | 12 | EX3+ | NC | EX3− |
| | 11 | NC | NC | NC |
| | 10 | EGND3 | NC | NC |
| | 9 | NC | NC | NC |
| | 8 | NC | NC | RSVD |
| | 7 | NC | NC | NC |
| | 6 | SCAL | NC | RSVD |
| | 5 | NC | NC | NC |
| | 4 | +5V | NC | MTEMP |
| | 3 | NC | NC | NC |
| | 2 | CGND | NC | DTEMP |
| | 1 | NC | NC | NC |


NC—No Connection

Table 14. Rear Signal Pin Assignments

| Rear Connector Diagram | Signal Name | Pin Number | Pin Number | Signal Name |
|--|-------------|------------|------------|-----------------------|
|  | AOGND | 1 | 2 | AOGND |
| | CH 0+ | 3 | 4 | CH 0– |
| | CH 1+ | 5 | 6 | CH 1– |
| | CH 2+ | 7 | 8 | CH 2– |
| | CH 3+ | 9 | 10 | CH 3– |
| | CH 4+ | 11 | 12 | CH 4– |
| | NC | 13 | 14 | NC |
| | NC | 15 | 16 | NC |
| | NC | 17 | 18 | NC |
| | OUTREF | 19 | 20 | NC |
| | NC | 21 | 22 | NC |
| | NC | 23 | 24 | DIG GND |
| | SERDATIN | 25 | 26 | SERDATOUT |
| | DAQD*/A | 27 | 28 | NC |
| | SLOT0SEL* | 29 | 30 | NC |
| | NC | 31 | 32 | NC |
| | DIG GND | 33 | 34 | NC |
| | NC | 35 | 36 | AI HOLD COMP, AI HOLD |
| | SERCLK | 37 | 38 | NC |
| | NC | 39 | 40 | NC |
| | NC | 41 | 42 | NC |
| NC—No Connection RSVD—Reserved | RSVD | 43 | 44 | NC |
| | NC | 45 | 46 | NC |
| | NC | 47 | 48 | NC |
| | NC | 49 | 50 | NC |

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Documents / Resources

| | |
|---|--|
|  | NATIONAL INSTRUMENTS SCXI-1121 Signal Conditioning Module [pdf] Instruction Manual SCXI-1121 Signal Conditioning Module, SCXI-1121, Signal Conditioning Module, Conditioning Module, Module |
|---|--|

References

- [NI Test and Measurement Systems, a part of Emerson - NI](#)
- [User Manual](#)

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