

Getting Started Guide

SC2215 – 26.5 GHz Programmable Gain Amplifier

Number: SCT-UM0697VC

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Revision History

Revision	Date	Author	Description
1.0	2020-Oct-22	L. McClennan	Initial Release

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1. Purpose

This document explains how to install, configure, and test the SCT SC2215. The SC2215 is a 2-channel, 26.5 GHz high power amplifier with configurable gain control, in a single-slot PXI module. The si2215 instrument driver, which is used to program the device, is available at www.signalcraft.com/support.

2. Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) stated in the product specifications. These requirements and limits provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.

This product is intended for use in industrial locations and environments. However, harmful interference may occur in some installations, when the product is connected to a peripheral or test device, or if the product is used in residential or commercial areas. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any changes or modifications to the product not expressly approved by SCT could void your authority to operate it under your local regulatory rules.



CAUTION: To ensure the specified EMC performance, operate this product only with shielded cables and accessories.



CAUTION: To ensure the specified EMC performance, the length of all I/O cables except for that connected to the GPS antenna input must be no longer than 3 m (10 ft).

3. Unpacking and Installation



CAUTION: To prevent electrostatic discharge from damaging the device, ground yourself using a grounding strap or by holding a grounded object, such as a computer chassis.

- Touch the antistatic package to a metal part of a computer or PXIe chassis.
- Remove the device from the package and inspect the device for loose components or any other sign of damage. Notify your reseller if the device appears damaged in any way. Do not attempt to install a damaged device.



CAUTION: Never touch the exposed pins of any connectors.

- Store the device in the antistatic package when the device is not in use.

3.1 Other Equipment

There are several required items not included in your device kit that are needed to install and operate the SC2250.

- A PXI Express chassis
- A PXI Express embedded controller or MXI controller system

Additional items will also be useful for most applications:

- PXI Chassis Slot Blocker kit
- SMA (m)-to-SMA (m) cables

3.2 Installing the si2215 Instrument Driver

- Download and install the latest version of National Instruments NI-RFSA software available at [NI-RFSA](#)
NOTE: Minimum version of NI-RFSA as indicated upon driver installation.
- Download the latest version of the si2215 instrument driver available at www.signalcraft.com/support.
- Unzip the downloaded instrument driver to a convenient location on your computer and run either the 32-bit (x86) or 64-bit (x64) installer depending upon the version of Windows that is installed.
- Follow the instructions provided by the installation prompts.
NOTE: Access and security messages will appear during installation. Accept the prompts to complete the installation.
- When the installer completes, select **Yes** in the dialog box that prompts you to restart.

3.3 Installing the SC2215 Hardware

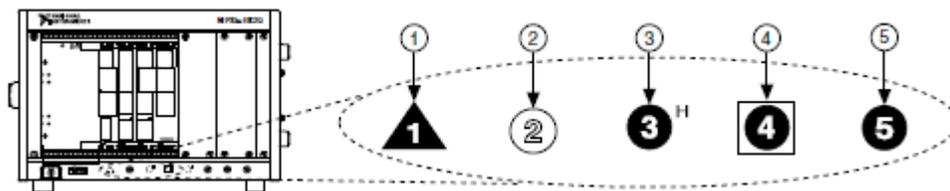


CAUTION: To prevent damage to the module caused by ESD or contamination, handle the device using the edges or the metal face plate.



CAUTION: Ground yourself with a resistor-isolated wrist strap before installing the module, before touching the center pin of any connector, and before removing or adjusting any connections to the module.

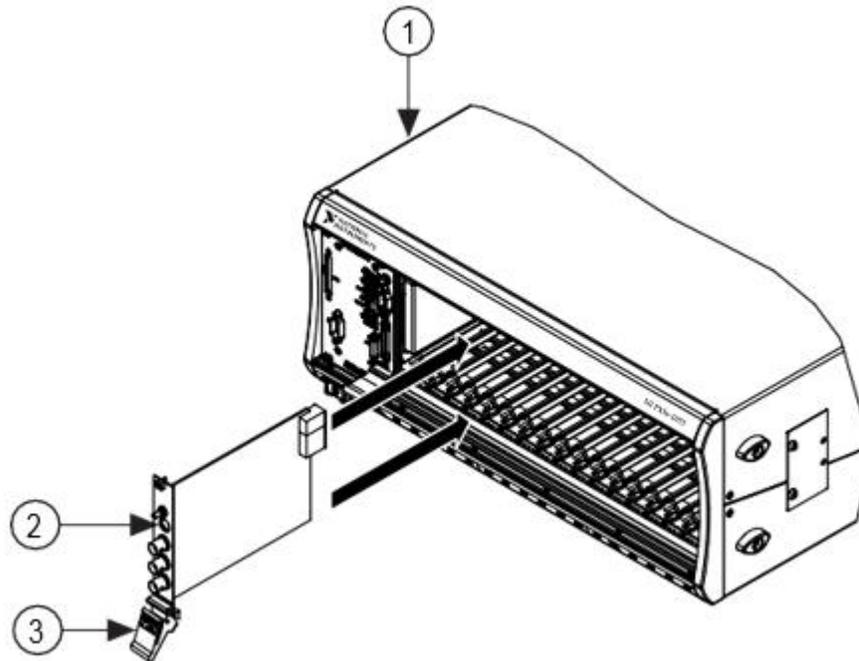
- Ensure that the environment you are using the SC2215 in meets the specifications outlined in the *SC2215 Product Specification* available at <https://www.signalcraft.com/support>.
- Ensure the AC power source is connected to the PXIe chassis before installing the module. The AC power cord grounds the chassis and protects it from electrical damage while you install the module.
- Ensure that the PXIe chassis is powered off.
- Inspect the slot pins on the chassis backplane for any bends or damage prior to installation. Do not install a device if the backplane is damaged.
- Remove the black plastic caps from all the captive screws on the module front panel.
- Identify a supported slot in the PXI chassis. SC2215 modules can only be installed in PXI Express peripheral slots. The following figure shows the symbols that indicate the slot types.



- | | |
|---------------------------------------|-----------------------------------|
| 1. PXI Express System Controller Slot | 4. PXI Express System Timing Slot |
| 2. PXI Peripheral Slot | 5. PXI Express Peripheral Slot |
| 3. PXI Express Hybrid Peripheral Slot | |

Figure 1 - PXI Chassis Compatibility Symbols

- Touch any metal part of the chassis to discharge static electricity.
- Ensure that the ejector handle is in the unlatched (downward) position.
- Place the module edges into the module guides at the top and bottom of the chassis. Slide the module into the slot until it is fully inserted.



1. PXI Express Chassis
2. Hardware Module
3. Ejector Handle in Down (Unlatched Position)

Figure 2 - Module Installation

- Latch the module in place by pulling up on the ejector handle.
- Secure the device front panel to the chassis using the front-panel mounting screws, which are found at the top and bottom of the module, under the ejector handle.
- Cover all empty slots using filler panels or slot blockers to maximize cooling air flow.
- Power on the chassis.

4. Front Panel Connections

4.1 Direct Connections to the SC2215

The SC2215 is a precision RF instrument that is sensitive to ESD and transients. Ensure you are making proper direct connections to the SC2215 to avoid damaging the device.



CAUTION: Apply external signals only while the SC2215 is powered on. Applying external signals while the device is powered off may cause damage.

To prevent possible damage to the device, use caution when connecting signal sources directly to the connectors of the SC2215. Users should ensure they are properly grounded when manipulating cables or antennas connected to the

SC2215 connectors. Ensure that there are no signal transients greater than the RF and DC specifications for the module that are being generated and sourced to the SC2215 connectors.

4.2 SC2215 Front Panel



Figure 3 - SC2215 Front Panel



The signal pins of this product's input/output ports can be damaged if subjected to ESD. To prevent damage, employ industry-standard ESD prevention measures during installation, maintenance, and operation.

Connector		Use	Connector Type
CH 0	RF IN	Channel 0 amplifier input terminal.	2.92mm (f)
	RF OUT	Channel 0 amplifier output terminal.	2.92mm (f)
CH 1	RF IN	Channel 1 amplifier input terminal.	2.92mm (f)
	RF OUT	Channel 1 amplifier output terminal.	2.92mm (f)

Table 1 - SC2215 Front Panel Connector Description

LED	Use
ACCESS	<p>Indicates the basic hardware status of the SC2215</p> <p>OFF – The module is not yet functional.</p> <p>AMBER – The module is being accessed.</p> <p>GREEN – The module is ready to be programmed.</p>
ACTIVE	<p>Indicates the operational status of the SC2215</p> <p>OFF – The module is in an uninitialized state.</p> <p>GREEN – The module is in a ready state or in use.</p>

Table 2 - SC2215 Front Panel LED Indicators

5. Programming the SC2215

5.1 Configure in MAX

Use National Instruments Measurement & Automation Explorer (MAX) to configure your SC2215 hardware. MAX informs other programs about which devices reside in the system and how they are configured. MAX is automatically installed with NI-RFSA

- Launch MAX by navigating to **Start»All Programs»National Instruments»NI MAX** or by clicking the NI MAX desktop icon.
- In the Configuration pane, expand **Devices and Interfaces** to see the list of installed devices. Installed devices appear under the name of their associated chassis.
- Expand your Chassis tree item. MAX lists all devices installed in the chassis. SC2215 devices appear as “SCT SC2215” in the list. Your default device names may vary.
- Record the device identifier, typically “PXI[m]Slot[n]” where [m] is the chassis number and [n] is the slot number MAX assigns to the hardware. Use this identifier when programming the SC2215.



CAUTION: When you install, uninstall, or move a device in your system, resource identification of your devices may change. Whenever any of these changes occur, verify resource identification of all your devices in MAX, and, if necessary, make changes to your software and documentation.

5.2 Instrument Driver

The instrument driver provided with the SC2215 is an IVI-C driver. You can use the si2215 instrument driver to program the SC2215 in an ADE, which supports the use of C/C++ libraries, of your choice.

To get started with the si2215 instrument driver, see the SC2215 help file which can be found **Start»All Programs»SCT»SI2215 IVI X.X.X. Driver Documentation**.