SignalCore™
PRESERVING SIGNAL INTEGRITY

Software Front Panel User Guide

20 GHz RF Signal Source

SC5510A and SC5511A Rev 1

Made in the USA

Contents

Control

Section 1

This section consists of a set of inputs that control the frequency, power, and rf modes of the device.

Section 2

This section consists of a set of inputs referring to the clock source and desired reference out frequency.

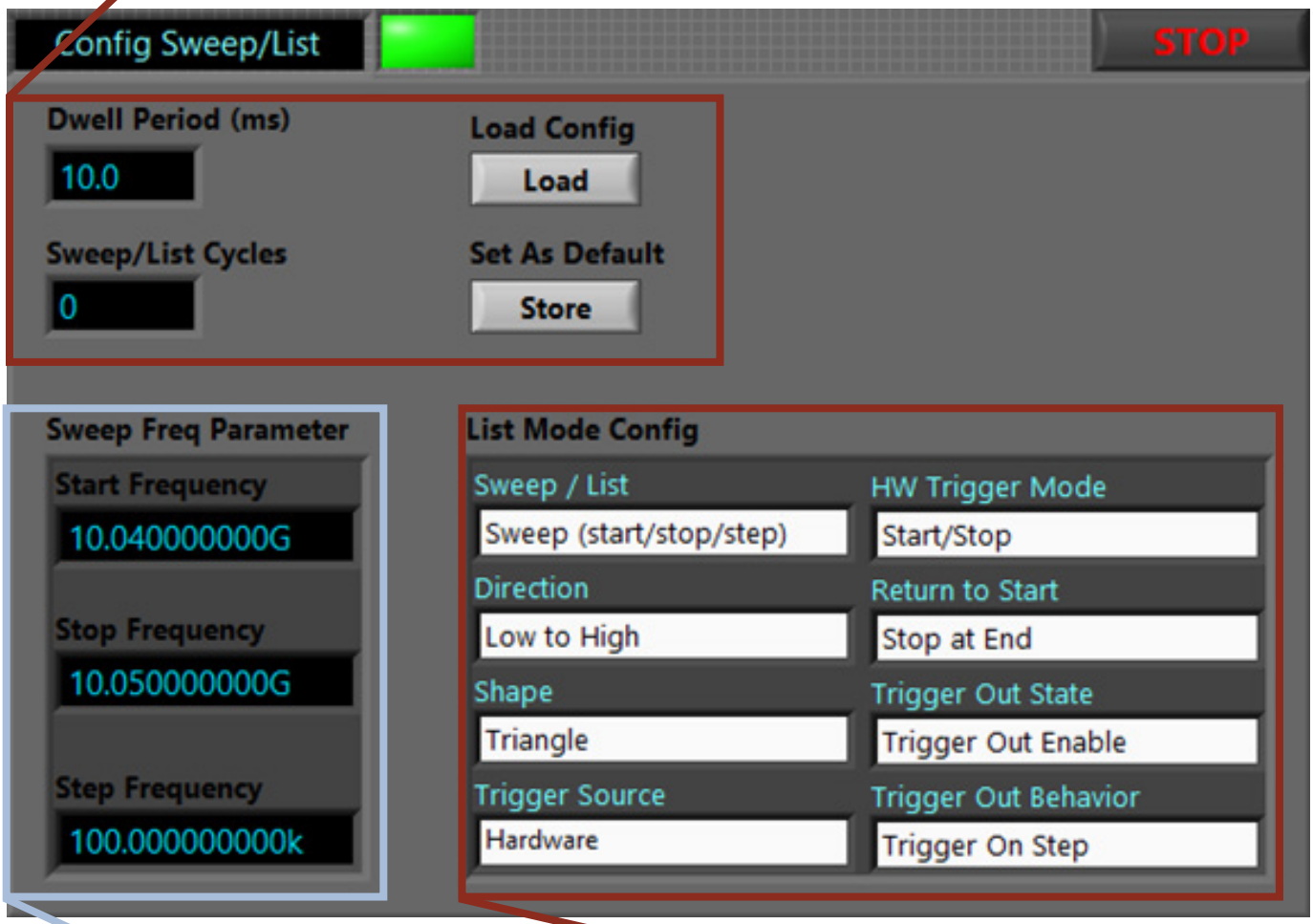
Section 3

The device info section consists of a set of outputs informing the user of the status of the different settings.

Configuration Sweep / List

Section 4

This section contains settings referring to the sweep/list rf mode.



Section 5

The Sweep Frequency Parameter section contains the start, stop, and step inputs for controlling the list sweep parameters.

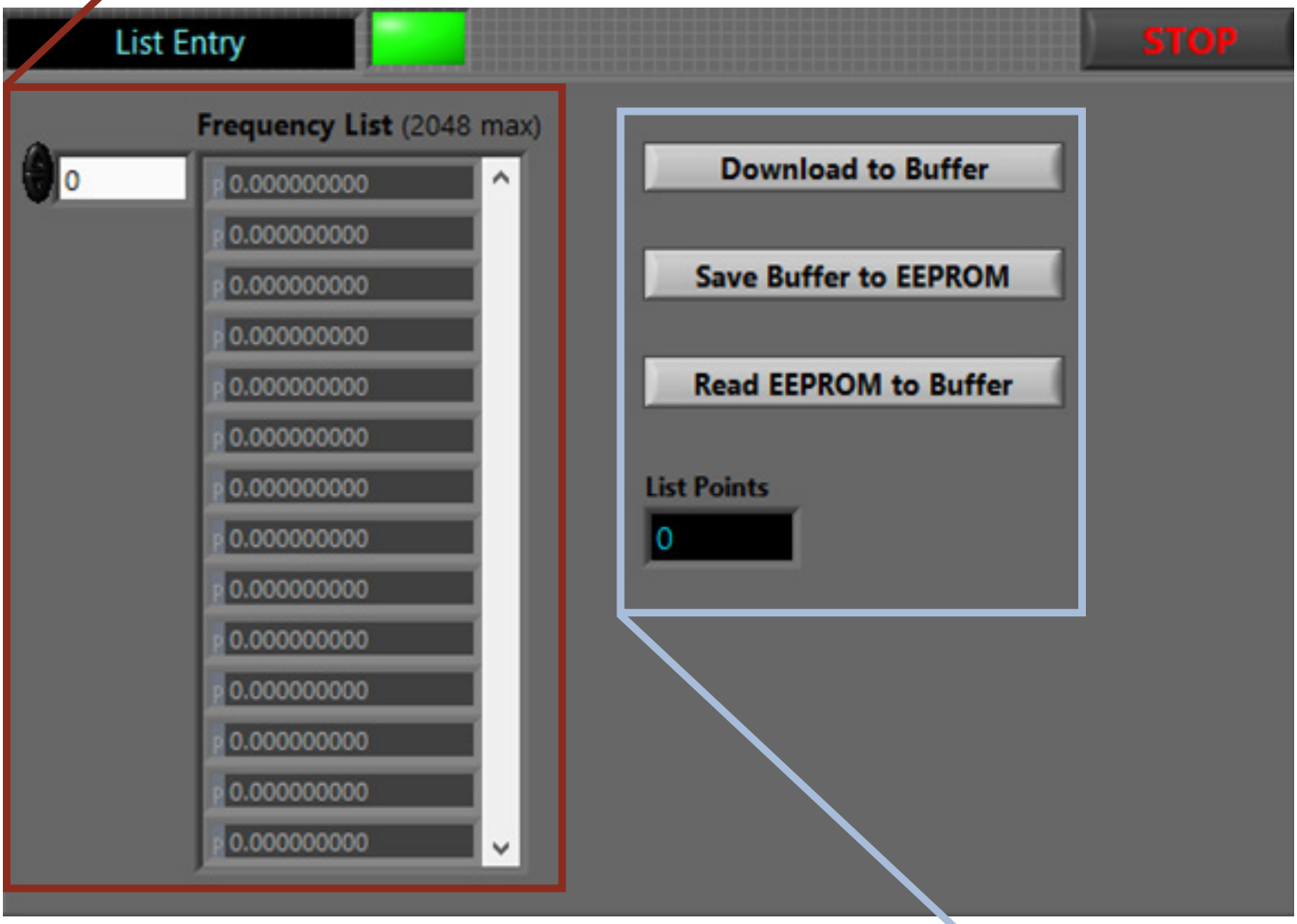
Section 6

The List Mode Configuration section contains a set of inputs referring to the list mode settings.

List Entry

Section 7

The Frequency List will show the selected frequency points.



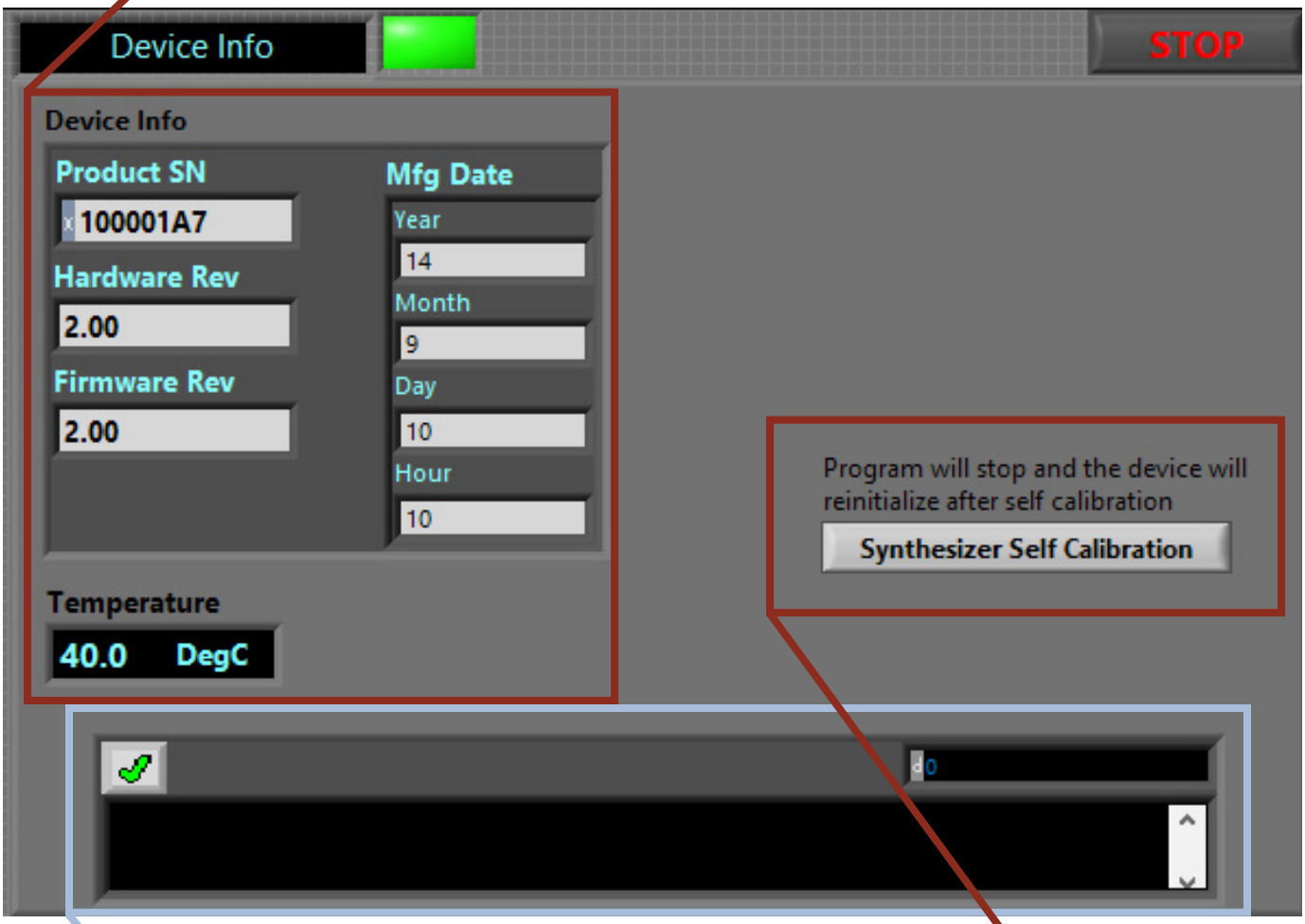
Section 8

This section contains several buttons allowing the user to save and download the frequency list.

Device Info

Section 9

The Device Info section displays information about the particular device.



Section 10

This box contains any error code messages.

Section 11

This button allows the user to initiate a self-calibration on the device.

Control Panel Section 1

RF Frequency

1.1 This box gives the user the ability to adjust the frequency.

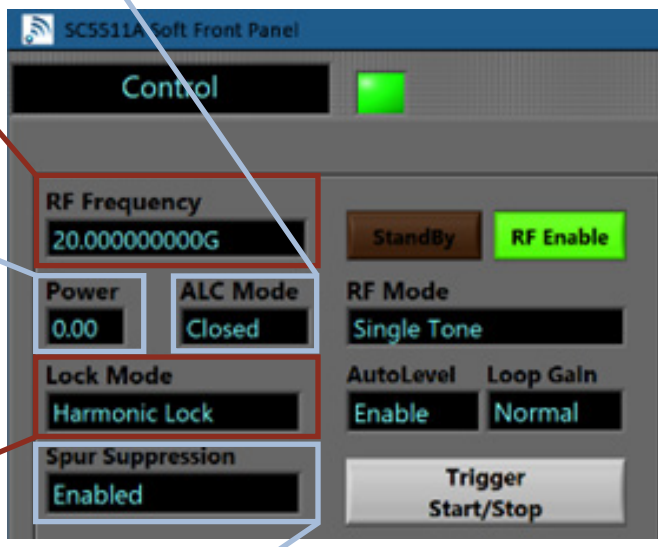
ALC Mode

1.2 ALC Mode can be changed to either Closed or Opened.

Closed	Opened
Level = Accurate Response Time = Slow	Level = Less accurate Response Time = Fast

Power

1.3 The power input will change the power level of the signal.



Tip: To switch between settings, click in the box to open the dropdown menu.

Tip: To edit number inputs, click in the box to type.

Lock Mode

1.4 Lock Mode can be set to either Harmonic Lock or Frac-N Lock.

Harmonic Lock

Uses the harmonic generator to synthesize the final RF frequency.

Frac-N Lock

Uses the fractional frequency generator to synthesize the final RF frequency.

Spur Suppression

1.5 Spur Suppression can either be Enabled or Disabled.

Enabled

Enables spur suppression.

Disabled

Disables spur suppression.

RF Mode

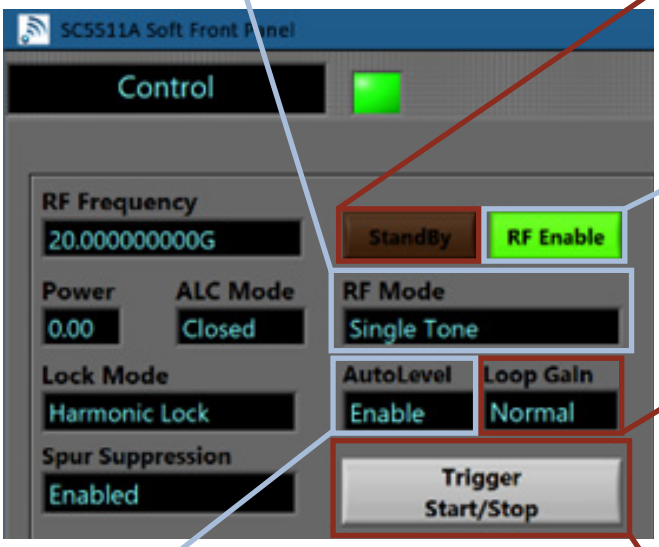
1.6 RF Mode can be set to either Single Tone or List/Sweep by clicking in the box to open the dropdown menu.

Single Tone

Output is one signal.

List/Sweep

This setting is programmable and sweeps between the starting and ending frequencies. When selected to enable list mode, see sections 4-6.



StandBy

1.7 When activated, StandBy powers down the RF sections of the device to conserve power.

RF Enable

1.8 RF Enable activates the RF power at RF Port 1.

Loop Gain

1.9 Loop Gain can be set to either Normal or Low.

Normal

Select normal for better close in phase noise.

Low

Select low for better far out phase noise and spur suppression.

AutoLevel

1.10 AutoLevel can either be Enabled or Disabled.

Enabled

Switching speed = Slower
Power = Leveled on frequency change

Disabled

Switching speed = Faster
Power = Not leveled on frequency change
*Suitable for frequency changes within 100 MHz range.

Trigger Start / Stop

1.11 Activates the software trigger.

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Section 2

Ref. Clock Source

2.1 Ref. Clock Source can be set to Internal 10 MHz or Lock to External.

Internal 10 MHz

Locks to an internal 10 MHz oscillator.

Lock to External

Locks to a 10 MHz external source.

Tip: To switch between settings, click in the box to open the dropdown menu.

Tip: To edit number inputs, click in the box to type.

Ref. Out Freq

2.2 Ref. Out Freq can be set to 10 MHz or 100 MHz.

10 MHz

Outputs a 10 MHz signal.

100 MHz

Outputs a 100 MHz signal.

RF2 Freq

2.3 The RF2 Frequency can be set to the user's preference in 25 MHz step resolution.

StandBy

2.4 StandBy will turn on when the device is on standby. When activated, it turns off the internal LO to conserve energy.

Interval (s)

2.5 Sets the time interval for fetching the device status.

Fetch Status

2.6 When activated, this function will fetch the status at the selected intervals.

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Section 3

Synth Mode

3.1 Synth Mode will show either Harmonic or FracN.

Harmonic

Harmonic will show when the harmonic lock mode is selected.

FracN

FracN will show when the FracN lock mode is seleected.

RF Out

3.2 RF Out will show either Enabled or Disabled.

Enabled

Enabled will show when RF Out is active.

Disabled

Disabled will show when RF Out is inactive.

AutoLevel

3.3 AutoLevel will show either Enable or Disable.

Enable

Enable will show when the AutoLevel setting is set to Enable.

Disable

Disable will show when the AutoLevel setting is set to Disable.

ALC Mode

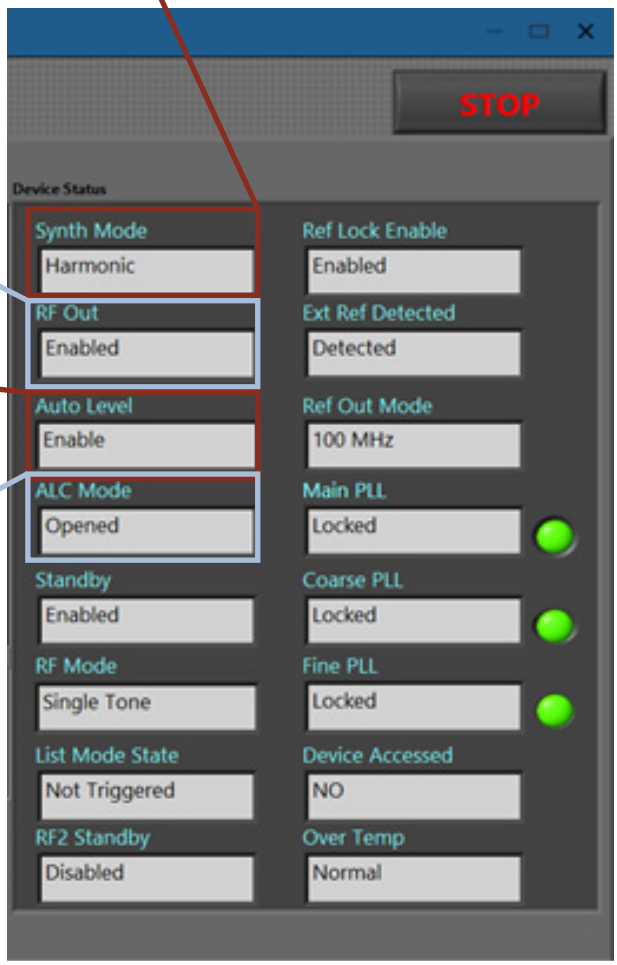
3.4 ALC Mode will show either Opened or Closed.

Opened

Opened will show when the ALC Mode input is set to Opened.

Closed

Closed will show when the ALC Mode input is set to Closed.



Ref Lock Enable

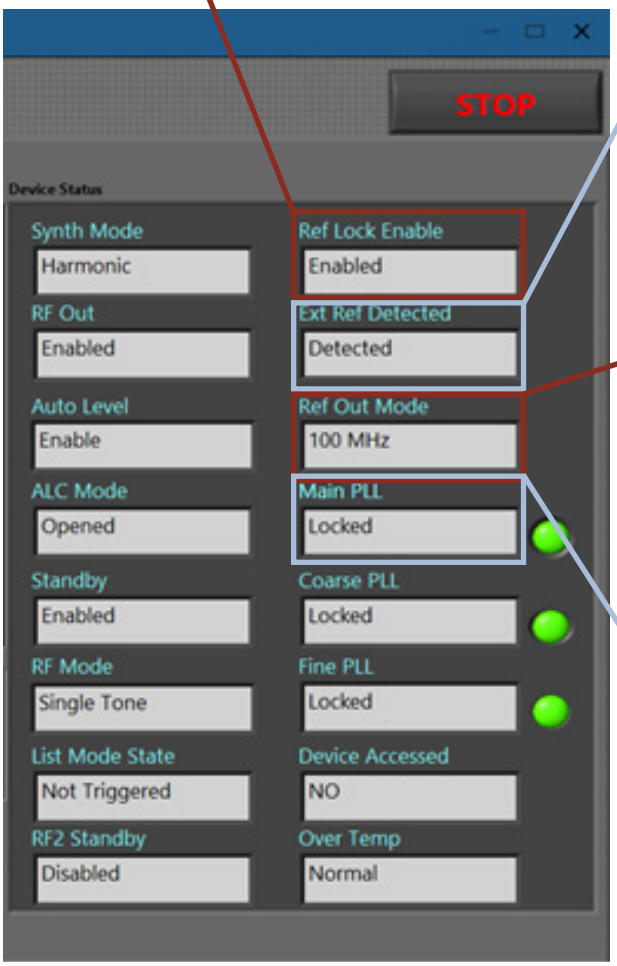
3.5 Reference Lock Enable will show either Enabled or Disabled.

Enabled

Enabled will show when reference lock is enabled.

Disabled

Disabled will show when reference lock is disabled.



Ext. Ref Detected

3.6 External Reference Detected will show either Detected or Not Detected.

Detected

Detected will show when an external reference source is detected.

Not Detected

Not Detected will show when no external reference sources are detected.

Ref Out Mode

3.7 Reference Out Mode will show either 10 MHz or 100 MHz.

10 MHz

10 MHz will show when Reference Out Frequency is set to 10 MHz.

100 MHz

100 MHz will show when Reference Out Frequency is set to 100 MHz.

Main PLL

3.8 Main PLL will show either NOT Locked or Locked.

NOT Locked

NOT Locked will show when the Main PLL is not locked.

Locked

Locked will show when the Main PLL is Locked.

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Standby

3.9 Standby will show either Enabled or Disabled.

Enabled
Enabled shows when Standby is on.

Disabled
Disabled shows when Standby is inactive.

RF Mode

3.10 RF Mode will show either Single Tone or List/Sweep.

Single Tone
Single Tone will show when the RF Mode input is set to Single Tone.

List/Sweep
List/Sweep will show when the RF Mode input is set to List/Sweep.

List Mode State

3.11 List Mode State will show either Not Triggered or Triggered.

Not Triggered
Not Triggered will show when the List Mode state is not triggered.

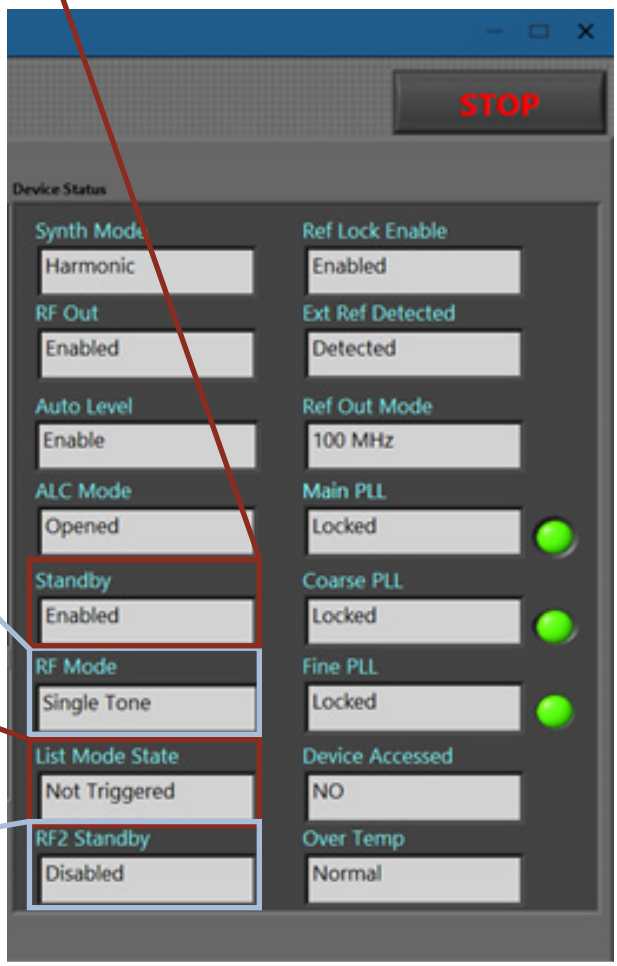
Triggered
When triggered, list / sweep is currently active.

RF2 Standby

3.12 RF2 Standby will show either Enabled or Disabled.

Enabled
Enabled will show when RF2 standby is enabled.

Disabled
Disabled will show when RF2 standby is disabled.



Coarse PLL

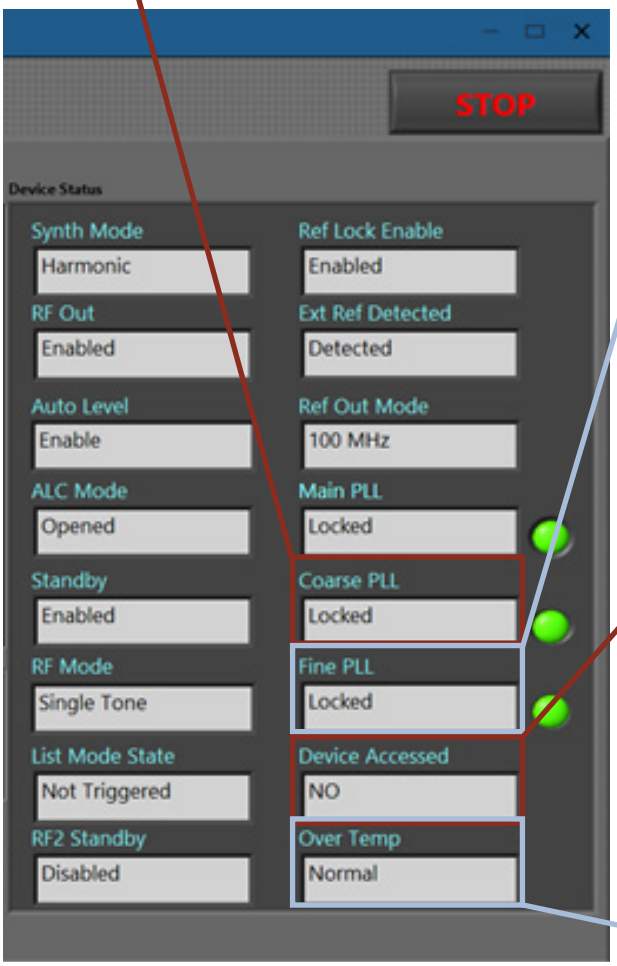
3.13 Coarse PLL will show either NOT Locked or Locked.

NOT Locked

NOT Locked will show when the Coarse PLL is not locked.

Locked

Locked will show when the Coarse PLL is locked.



Fine PLL

3.14 Fine PLL will show either NOT Locked or Locked.

NOT Locked

NOT Locked will show when the Fine PLL is not locked.

Locked

Locked will show when the Fine PLL is locked.

Device Accessed

3.15 Device Accessed will show either YES or NO.

YES

YES will show when the device is opened in software.

NO

NO will show when no device is found.

Over Temp

3.16 Over Temp will show either Normal or Over Temp.

Normal

Normal will show when the device is operating at normal temperatures.

Over Temp

Over Temp will show when the device exceeds normal operating temperatures.

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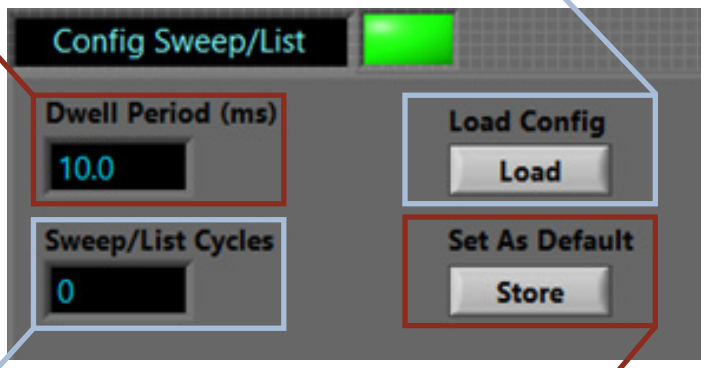
Config Sweep/List Section 4

Dwell Period (ms)

4.1 The Dwell Period can be set to the desired amount of milliseconds (ms). It is the length of time it sits at each step frequency.

Load Config

4.4 The load configuration can be toggled on or off by clicking the “Load” button. When clicked, it will load the settings from your computer to your device.



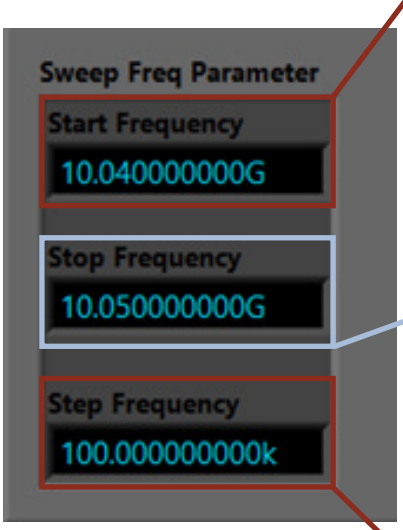
Sweep/List Cycles

4.2 The sweep/list cycles can be changed to the user’s preference.

Set As Default

4.3 This function stores the current device configurations as the device defaults on reset or power-up. It will not perform an immediate reset.

Section 5



Tip: To edit number inputs, click in the box to type.

Start Frequency

5.1 Sets the start frequency for a sweep. Start frequency should always be lower than stop frequency.

Stop Frequency

5.2 Sets the stop frequency for a sweep. Stop frequency should always be greater than the start frequency.

Step Frequency

5.3 Sets the step frequency for a sweep. Step size should not exceed the difference between the start and stop frequencies.

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Section 6

Tip: To switch between settings, click in the box to open the dropdown menu.

6.1 Sweep / List

Sweep / List can be set to either Sweep (start/stop/step) or List.

Sweep (start/stop/step)

The device computes the frequency points using the start, stop, and step frequencies declared in Section 5.

List

When enabled, the device will switch to each frequency that the user has manually entered into the Frequency List in Section 7.

6.2 Direction

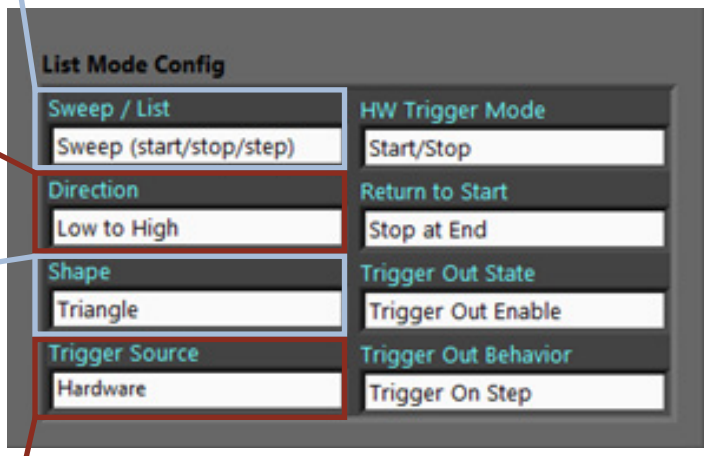
Direction can be changed to Low to High or High to Low.

Low to High

Starts from the lowest value frequency and sweeps to the highest.

High to Low

Starts from the highest value frequency and sweeps to the lowest.



6.3 Shape

Shape can be chagned to Triangle or Sawtooth.

Triangle

Triangular waveform. Frequency reverses direction at the end of the list and steps back towards the beginning to complete a cycle.

Sawtooth

Sawtooth waveform. Frequency returns to the beginning frequency upon reaching the end of a sweep cycle.

6.4 Trigger Source

Trigger Source can be changed to Hardware or Software.

Hardware

A high-to-low transition on the TRIGIN pin will trigger the device. It can be used for both start/stop or step-on-trigger functions.

Software

The software trigger can only be used to start and stop a sweep/list cycle. It does not work for step-on-trigger mode.

HW Trigger Mode

6.5 The hardware trigger mode can be set to either Start / Stop or Step.

Start / Stop

When triggered, the signal will start and continue until stopped.

Step

Each time the user enables the trigger pin, it will step to the next frequency.

Return to Start

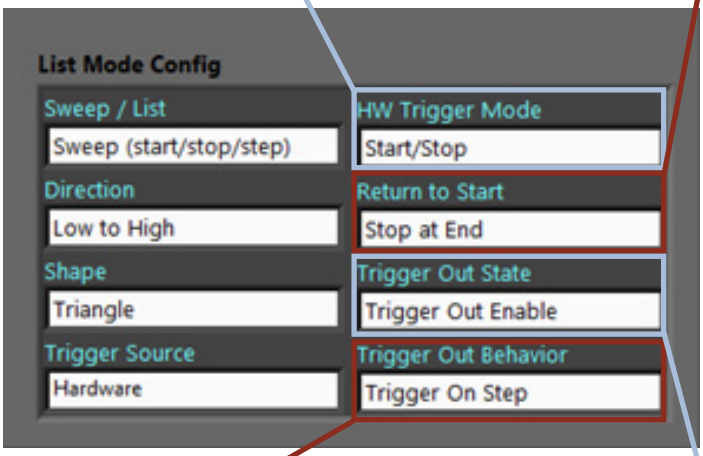
6.6 Return to Start mode can be set to Return to Start or Stop at End.

Return to Start

The signal will return to the starting frequency.

Stop at End

The signal will stop at the last frequency.



Trigger Out State

6.7 The trigger out state can be set to Trigger Out Enable or Trigger Out Disable.

Trigger Out Enable

Enables the trigger signal on the TRIG OUT pin.

Trigger Out Disable

Disables the trigger signal on the TRIG OUT pin.

Trigger Out Behavior

6.8 The trigger out behavior can be set to either Trigger on Step or Trigger On Cycle.

Trigger on Step

The trigger will pulse on each stepped frequency.

Trigger on Cycle

The trigger out pulses on each cycle completion.

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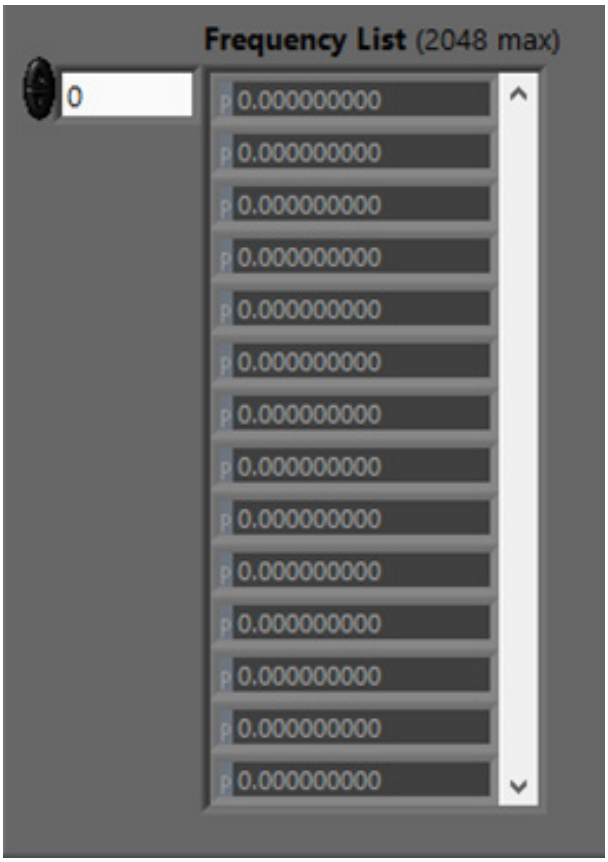
Section 7

7.1 Frequency List

The frequency list is displayed on this tab. By default, 6 frequency points are set from 12 GHz to 12.05 GHz at 10 MHz step resolution.



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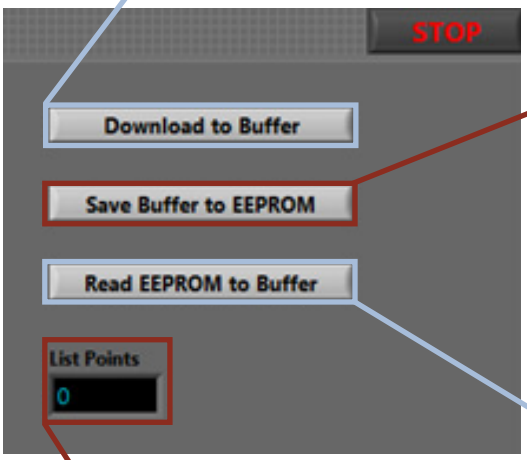
Section 8



Download to Buffer

8.1 Clicking Download to Buffer will save the frequency list to the device's RAM.

Save Buffer to EEPROM

8.2 Clicking Save Buffer to EEPROM will save the frequency list to the device's EEPROM.

Read EEPROM to Buffer

8.3 Clicking Read EEPROM to Buffer will retrieve the saved information and display it in the frequency list.

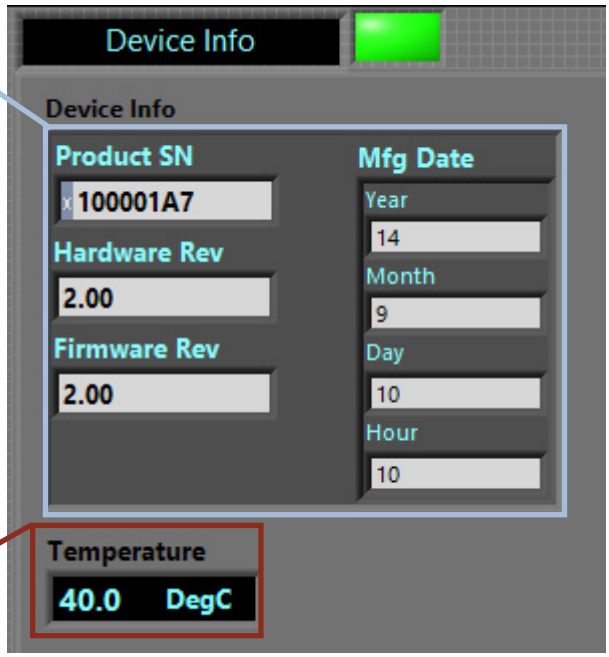
List Points

8.4 List Points displays the number of frequency points when the user selects Read EEPROM to Buffer.

Device Info Section 9

9.1 Device Info

In this tab, the Device info is listed, including the Product SN, Hardware Revision number, and Software Revision number. The Manufacturing Date is listed here as well.



9.2 Temperature

This box displays the current device operating temperature.

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Section 10

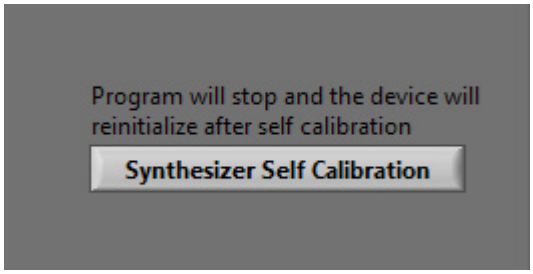
10.1 Error Codes

This box will display error codes as needed. If you have a question about an error, email support@signalcore.com.

Section 11

11.1 Self-Calibration

When the Synthesizer Self-Calibration button is clicked, the device will perform a self-calibration. After calibrating, the GUI will reset and the user will need to run the executable to restart the GUI.



SignalCore Inc.
512.501.6000
sales@signalcore.com
www.signalcore.com

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