



SGx Uploader Tool Firmware and EEPROM Update Instructions



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Table of Contents

1. Introduction	3
2. Setup Instructions	3
2.1 Hardware Setup	3
2.2 Get the SGx Uploader Software and latest firmware	3
2.3 Connect device to SGx Uploader	4
3. Updating the Firmware	5
3.1 Click the Update firmware button	5
3.2 Select the appropriate firmware binary for the device	5
3.3 Wait for firmware to be flashed, then power cycle the system	6
4. Updating the EEPROM Command List	7
4.1 Read EEPROM Commands	7
4.2 Configure the EEPROM Settings	8
4.3 Modify the Manually added EEPROM Settings	9
4.4 Write EEPROM commands	10
5. Version Notes	11
5.1 SGx Device (RFS-2G42G5050X+ and ISC-2425-25+)	11
5.2 SGx Updater Tool	11

1. Introduction

The ISC-2425-25+ and RFS-2G42G5050X+ are Mini-Circuits RF Energy signal generator products that fall into the category of Signal Generator (SGx) device and share a common firmware.

This short guide will provide the user with step by step instructions to update the firmware or EEPROM contents on either device using the SGx Updater Tool. Users may wish to periodically update their firmware on an as needed basis or simply to keep up to date with the latest feature additions and bug fixes. New firmware versions may be requested by contacting the Mini-Circuits technical support team. The EEPROM may be updated when the user needs to initialize the unit with custom commands on every power cycle. The need for this arises when configuring the SGx Device to communicate with an active splitter or in systems combining multiple PAs.

2. Setup Instructions

The SGx Uploader Tool allows the user to view and modify the contents of the EEPROM as well as update the firmware of SGx devices. The SGx Uploader Tool communicates with the SGx Device through a USB serial connection on a Windows PC.

2.1 Hardware Setup

The RFS-2G42G5050(X)+ signal generator is delivered in a box with no additional accessories. In addition to the amplifier, you will need a USB A to USB Mini-B cable. The Mini-Circuits part number for this type of cable is MUSB-CBL-3+. The ISC-2425-25+ includes a USB A to USB Mini-B cable in the box. Connect the signal generator to a windows PC with the USB cable.

2.2 Get the SGx Uploader Software and latest firmware

The SGx Uploader Tool is required for this setup. Please contact applications support to download this software by emailing apps@minicircuits.com. Extract the executable "SGxProgrammer v#.#.#.exe" and copy it to a local drive. Double click on the executable to run it. If the firmware is being updated, you will need to locate or request the binaries "SGx_Firmware_v2.#.#_LPC1549.bin" and "SGx_Firmware_v2.#.#.HWID6_LPC1549.bin".

2.3 Connect device to SGx Uploader

With your SGx device connected to the PC, check whether a Mini-Circuits RFS device is detected by the software in the Serial Port settings field (see figure 1). If the device is detected, click on it so that it is highlighted as shown in the figure. If the device is not connected, press the “Connect” button until the device shows connected in the Serial Port settings window. The Serial Port Settings show useful information like the currently assigned COM port, the device Serial Number, and the Firmware Version.

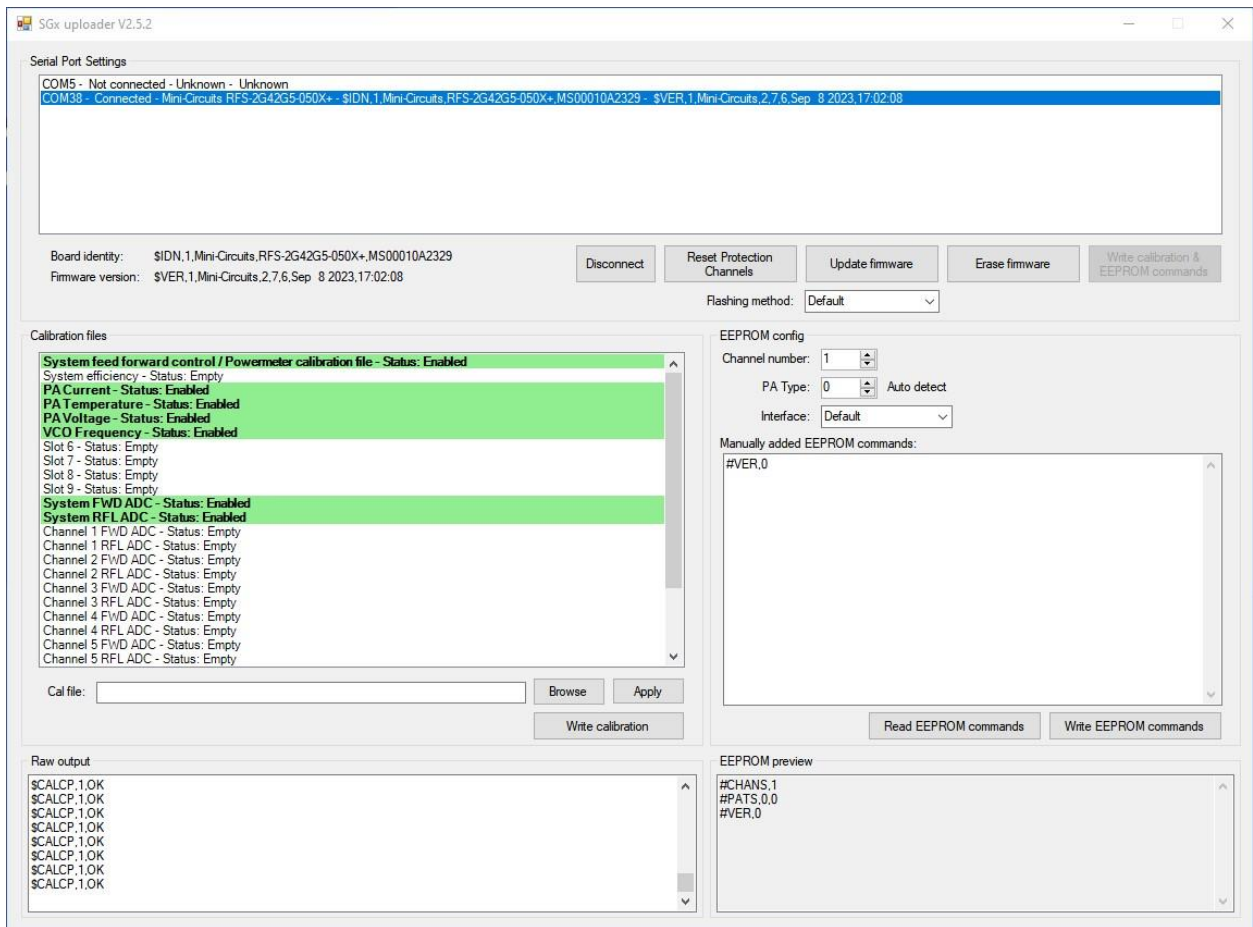


Figure 1: SGx Uploader Tool. A single RFS-2G42G5050X+ SGx device is connected.

3. Updating the Firmware

Firmware updates are made quick and easy using the provided SGx Uploader software. All firmware versions 2.X.X are designed to be backwards compatible and firmware upgrades will not remove functionality on existing systems. Nonetheless, it is good practice and generally recommended to ensure that every device in a multi-channel system shares the same firmware version. Thus, the user may be required to update firmware on one or more units.

Another reason to update firmware is to be compatible with the features in the Toolkit GUI. As of GUI version 2.7.0.2, the dependencies are related to GUI features that can be activated or de-activated using config items. The following config settings could affect the GUI minimum firmware version requirement:

- If 'support_splitter_controls_attenuation' is true, the minimum firmware version is set to 2.8.14
- If 'splitter_channel_count' is greater than 1, the minimum firmware version is set to 2.8.10
- If 'support_power_offset' is true, set the minimum firmware version is set to 2.8.0.0
- Otherwise the minimum firmware version is set to 1.6.4

By default, all features that require a firmware greater than 2.8.0 are disabled in the config file. If one of these features is activated and the current device firmware is less than minimum, a warning message will appear indicating that not all activated features are supported by the current firmware.

3.1 Click the Update firmware button

After connecting to the SGx device in the SGx Uploader, click on the button “Update Firmware” indicated in Figure 2 (Red). Click “ok” in the subsequent dialog boxes.

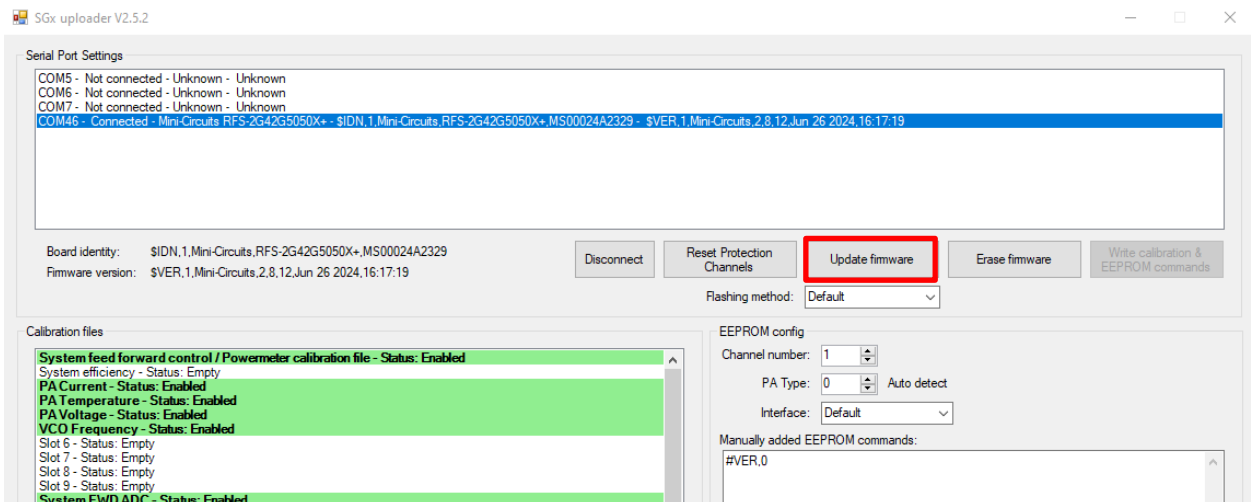


Figure 2. Update firmware button

3.2 Select the appropriate firmware binary for the device

Check the serial port settings string for any mention of ID6. If the string contains “ID6” then select the “HWID6” binary. Otherwise, select the standard binary. The ISC-2425-25+ might use the standard or the HWID6 binary depending on the hardware revision, so it is important to check the

return of \$VER as shown in figures 3 and 4 below. The RFS-2G42G5050(X)+ always uses the standard binary.

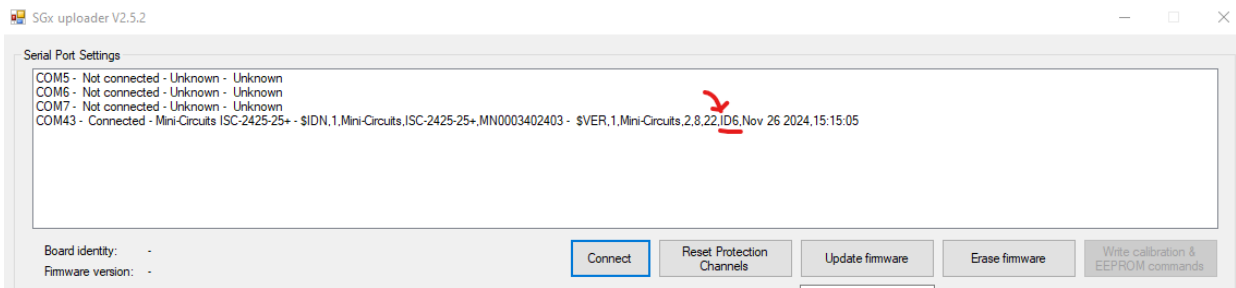


Figure 3: Example device that shows “ID6” in the firmware version request string. This device must use the “HWID6” binary: “SGx_Firmware_v#.#.#.HWID6_LPC1549.bin”.

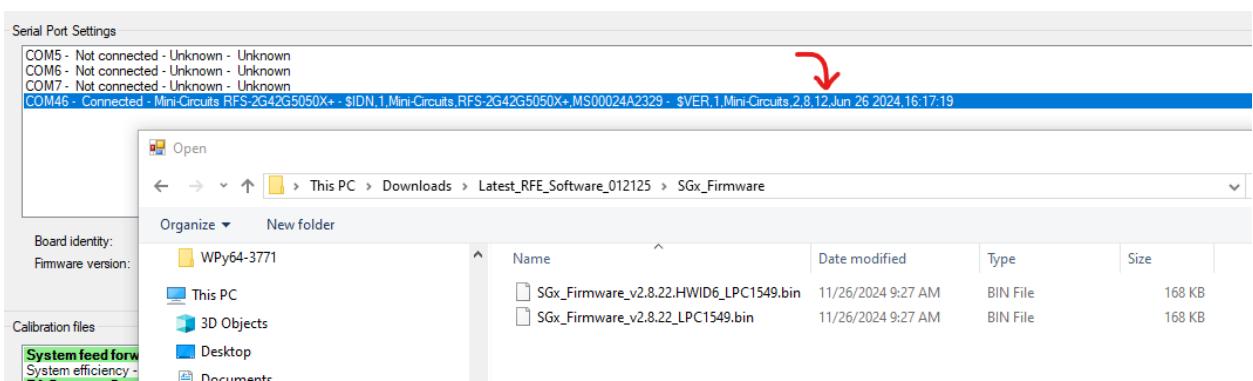


Figure 4: Example device that does not show “ID6” in the firmware version request string. This device must use the standard binary: “SGx_Firmware_v#.#.#_LPC1549.bin”.

3.3 Wait for firmware to be flashed, then power cycle the system

After the firmware is selected, the SGx device will be flashed. Once it is done, power cycle the system by disconnecting and reconnecting the USB. Then click ‘OK’ to return to the main SGx Uploader window.

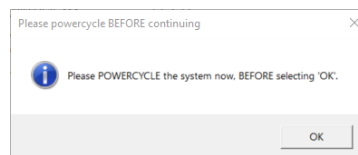


Figure 5: popup requesting a power cycle after firmware flashing is completed

4. Updating the EEPROM Command List

The EEPROM configuration settings and other manually added EEPROM commands run every time the amplifier is power cycled or reset.

4.1 Read EEPROM Commands

After connecting to the SGx device in the SGx Uploader, click the Read EEPROM commands button. A window will pop up listing the commands currently running in the EEPROM on boot. Select and copy the entire list of commands. Close the window.

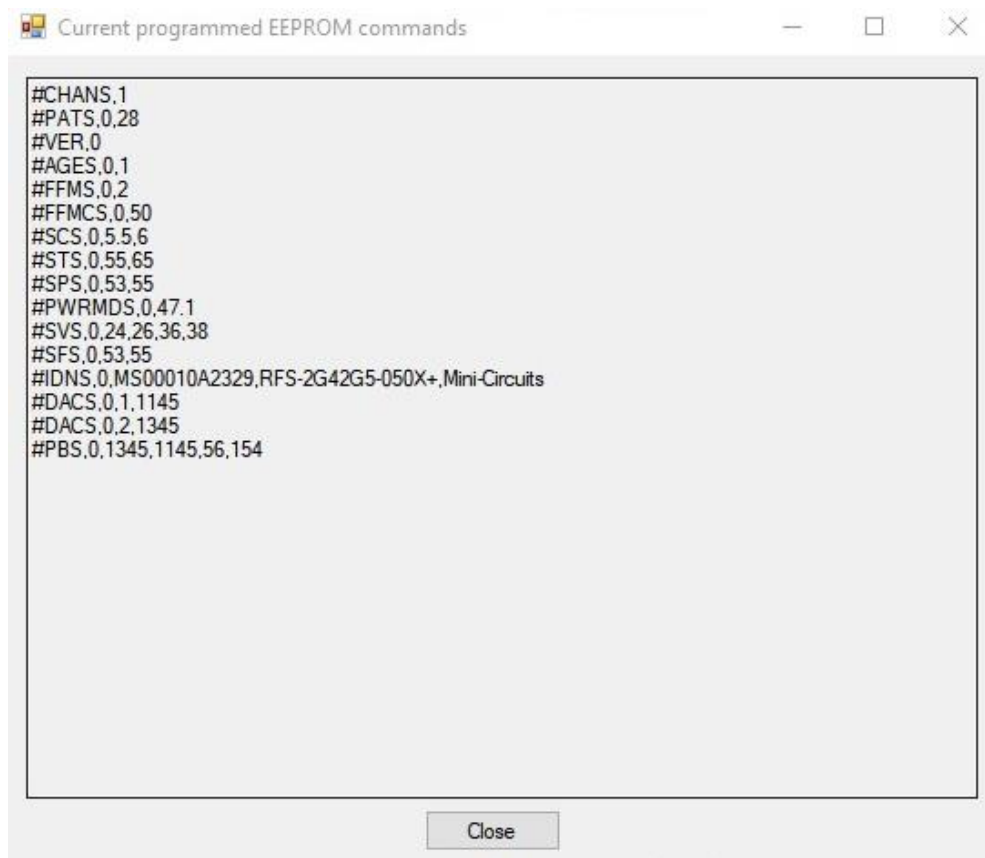


Figure 6: Commands currently programmed in the EEPROM. Note that the “#” character preceding each API command is only used when running commands in the EEPROM. Normally, the API commands start with the “\$” character.

4.2 Configure the EEPROM Settings

Paste the EEPROM commands list to the “manually added EEPROM commands” field indicated in Figure 7 (Red). Using the combo boxes, select the channel number, PA Type, and Interface settings as indicated in Figure 7 (Orange).

- *Channel number* is always 1 for single channel systems.
- *PA Type* is always **28** for the RFS-2G42G5050(X)+.
- The default single PA channel PA type for the ISC-2425-25+ when used with the ZHL-2425-250(X)+ is **25**. This is likely what you want to select.
- *Interface* “default” selection will enable communication in USB Mode only. If the user would like to communicate over UART by default, the user may select “UART” as the interface. Note that if UART is selected, a #COMS command will be inserted in the EEPROM command sequence and communication over USB will be disabled.

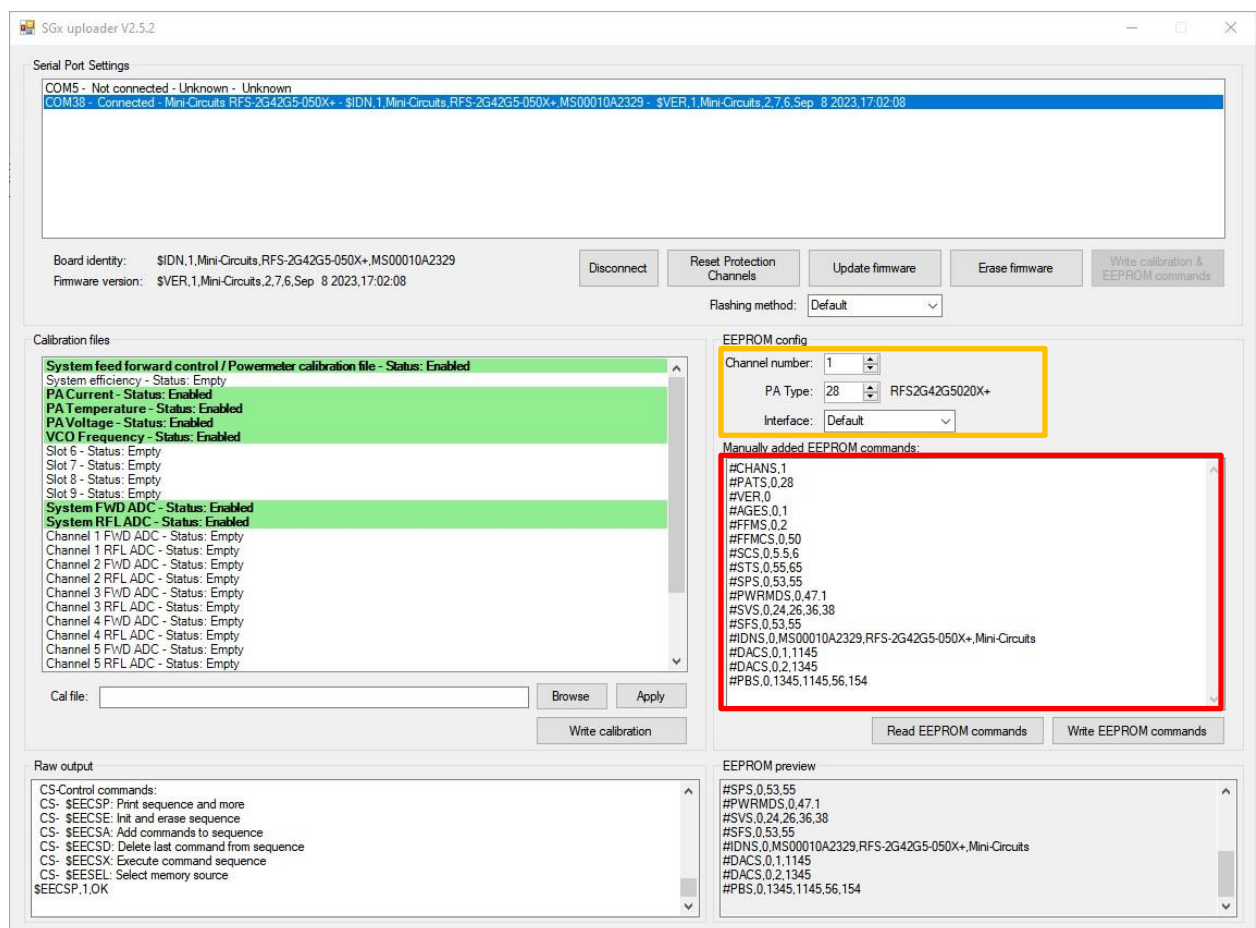


Figure 7. EEPROM Config settings

4.3 Modify the Manually added EEPROM Settings

The selections made in the Channel number, PA Type, and Interface combo boxes will append CHANS, PATS, and COMS commands to the beginning of the EEPROM command list. They are not needed in the list of “Manually added EEPROM commands”. Remove any of these three commands from the beginning of the “Manually added EEPROM commands list”. The EEPROM preview window should now show no duplicate commands.

Note: In the below example, “#RFSS,0,1” and “#GCS,0,0” commands were added to the bottom of the “Manually added EEPROM commands” list to tell the device to boot in amplifier mode.

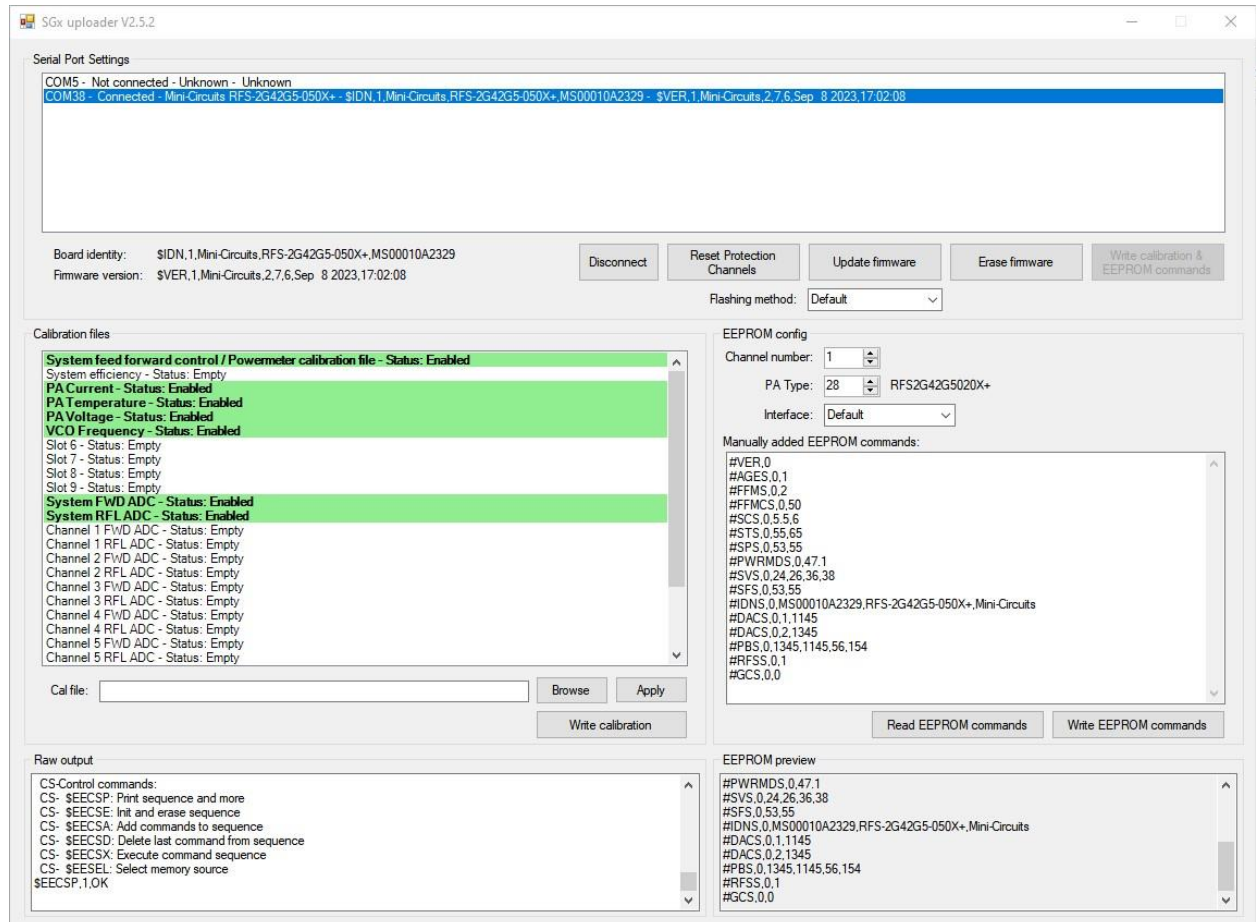


Figure 8. SGx Uploader with modified “Manually Added EEPROM Commands” field

4.4 Write EEPROM commands

Select the “Write EEPROM commands” button to write settings. When finished, a pop-up window will appear indicating successful completion. The changes will take effect the next time the device is rebooted.

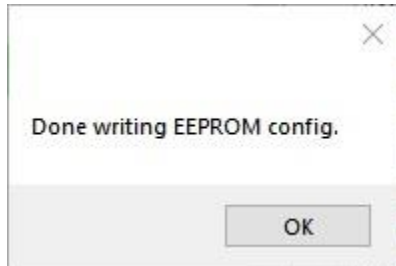


Figure 9: Dialog box indicating successful completion.

5. Version Notes

5.1 SGx Device (RFS-2G42G5050X+ and ISC-2425-25+)

This documentation is valid for all firmware versions 2.#.#. The latest firmware at the time of this writing is 2.8.22.

5.2 SGx Updater Tool

This documentation is valid for software versions 2.#.# The latest software version at the time of this writing is 2.5.6.

Version 2.5.2 has a bug that causes the Serial Port Settings window to shrink over time. Fixed in version 2.5.6.