

SmartFlash OTP Programming

ABSTRACT

The SmartFlash OTP tool provides a means for the user to update the parameters of the OTP memory in the bq27411 devices. This document describes in detail how to use the SmartFlash tool to successfully update the OTP memory.

1 General Setup and Software Installation

1. Equipment needed:
 - (a) Lab power supply configured for 7.4-V output. (Expect ~5-mA maximum current.)
 - (b) Battery or second power supply with ≥ 3.0 -V output. (Expect ~1-mA maximum current.)
 - (c) EV2300 or EV2400 USB with I²C interface adapter
 - (d) Un-programmed bq27411-G1 device assembled in the battery pack or on the EVM.
 - (e) Example .gg file provided by factory
 - (f) GaugeStudio software installer
 - (g) SmartFlash software executable
2. Install GaugeStudio software (Fuel Gauge evaluation software) ([SLUC424](#)).
3. Connect EV2300 or EV2400 to the unprogrammed device or EVM.
4. Connect battery to BAT(+) and V_{SS}(-) pins.
5. With output disabled, connect lab power supply to PROG(+) and V_{SS}(-) pins.

NOTE: Do not apply 7.4 V to the device until prompted by software.

2 Launch GaugeStudio Software

1. Launch GaugeStudio software.
2. Confirm 'Gauge Dashboard' panel detects EV2x00 adapter and bq27411-G1 device.
3. Click 'DataMemory' large icon to show OTP factory defaults reflected in DataMemory (RAM)
4. Click 'Import' icon to load DataMemory contents from provided sample .gg file.

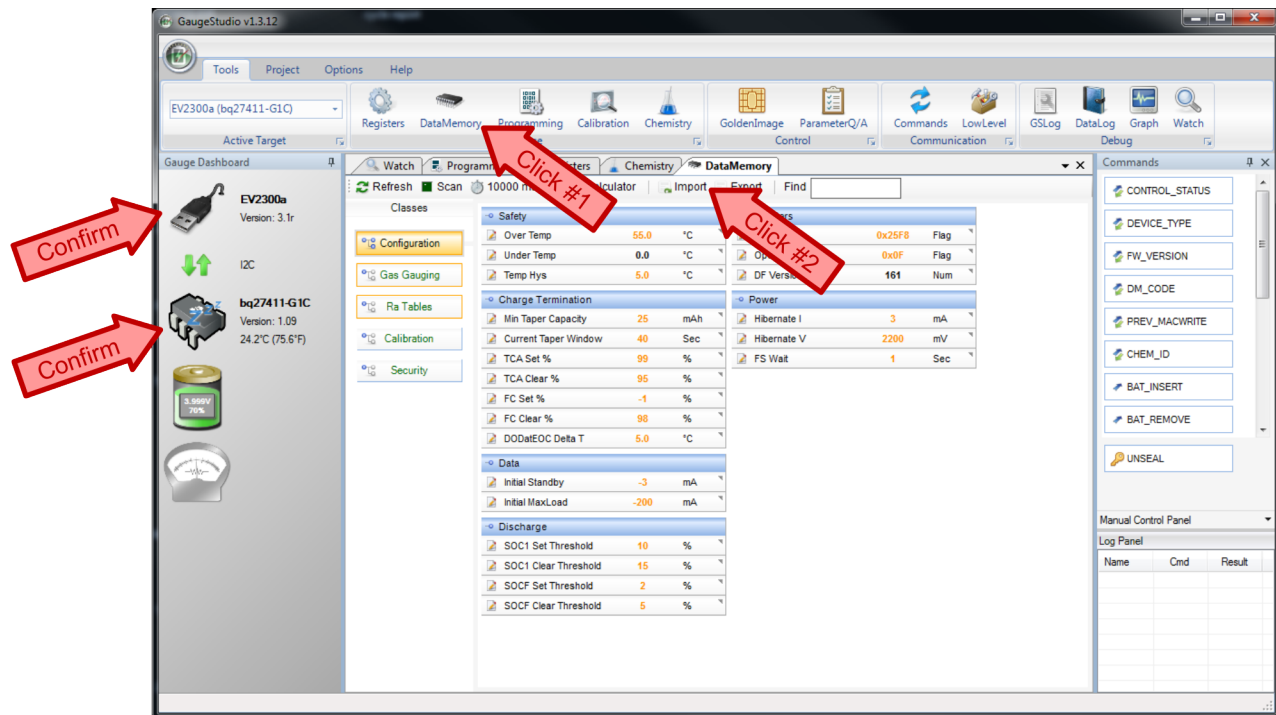


Figure 1. Launch GaugeStudio Software

3 Load .GG File

This procedure imports the gas gauge data or the data memory image to the device.

1. Browse to a click desired template or sample *.GG parameter file. (Example: bq27411-G1C_v109.gg shown in [Figure 2](#).)
2. Click 'Open' button.

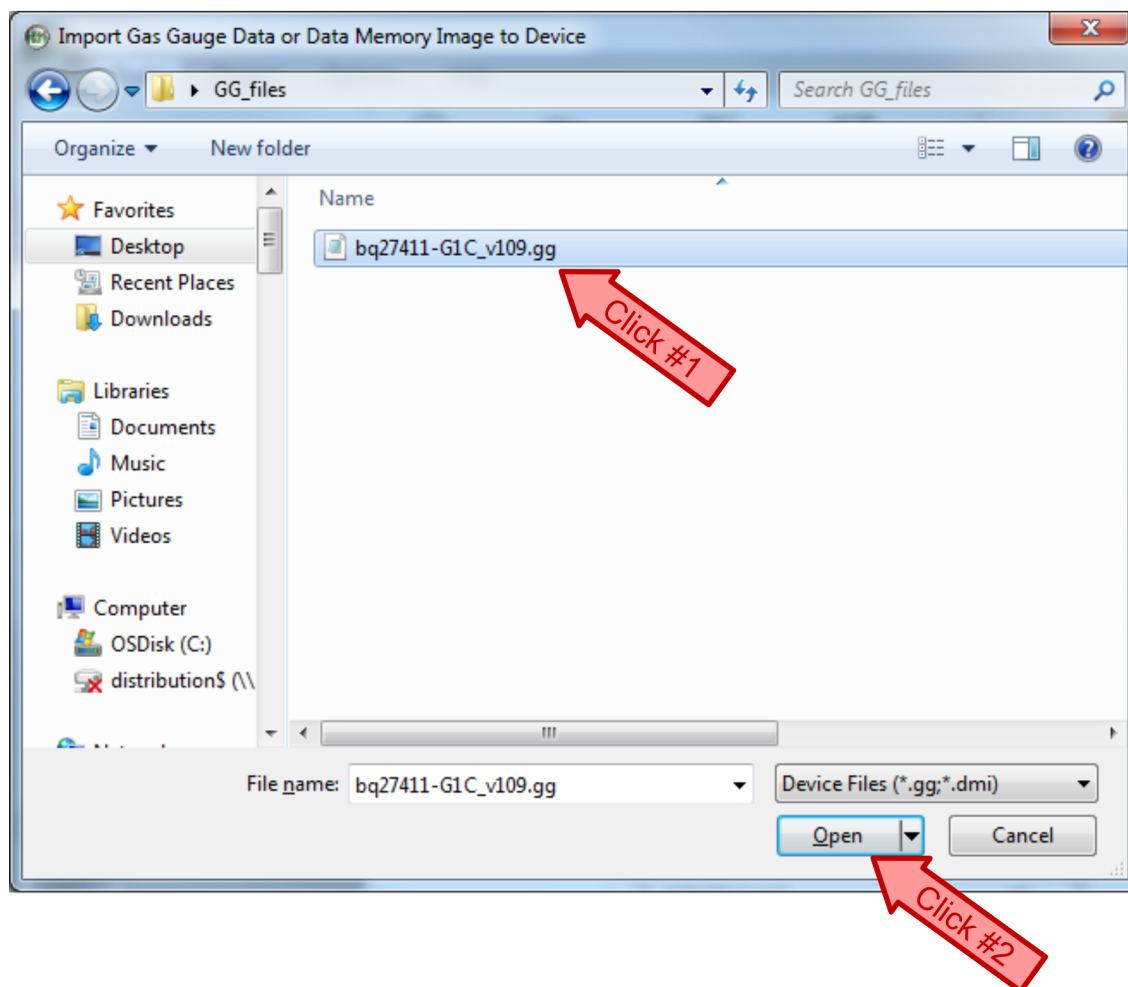


Figure 2. Load .GG File

4 Confirm or Update DataMemory Parameters

1. Imported DataMemory (RAM) parameters that differ from the factory defaults will appear in orange font.
2. Confirm or update DataMemory (RAM) parameters as required.
3. Save .GG file for future reference by clicking 'Export' button.

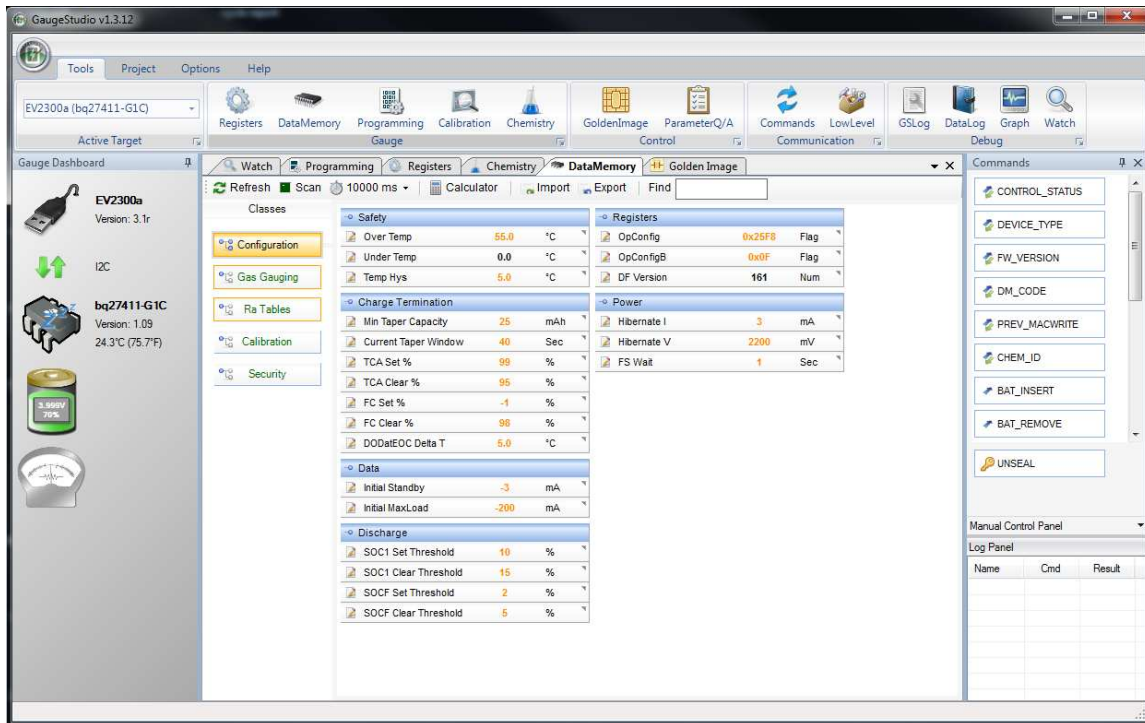


Figure 3. Confirm or Update DataMemory Parameters

5 Save .OTFS File

1. Click 'GoldenImage' icon.
2. From 'GoldenImage' panel, enter desired .OTFS base file name. Example: bq27411-G1C_v109

NOTE: No "Options" changes are required.

3. Click 'Create Image File' button.
4. Exit GaugeStudio software.

NOTE: Important because EV2x00 adapter must be freed for SmartFlash.

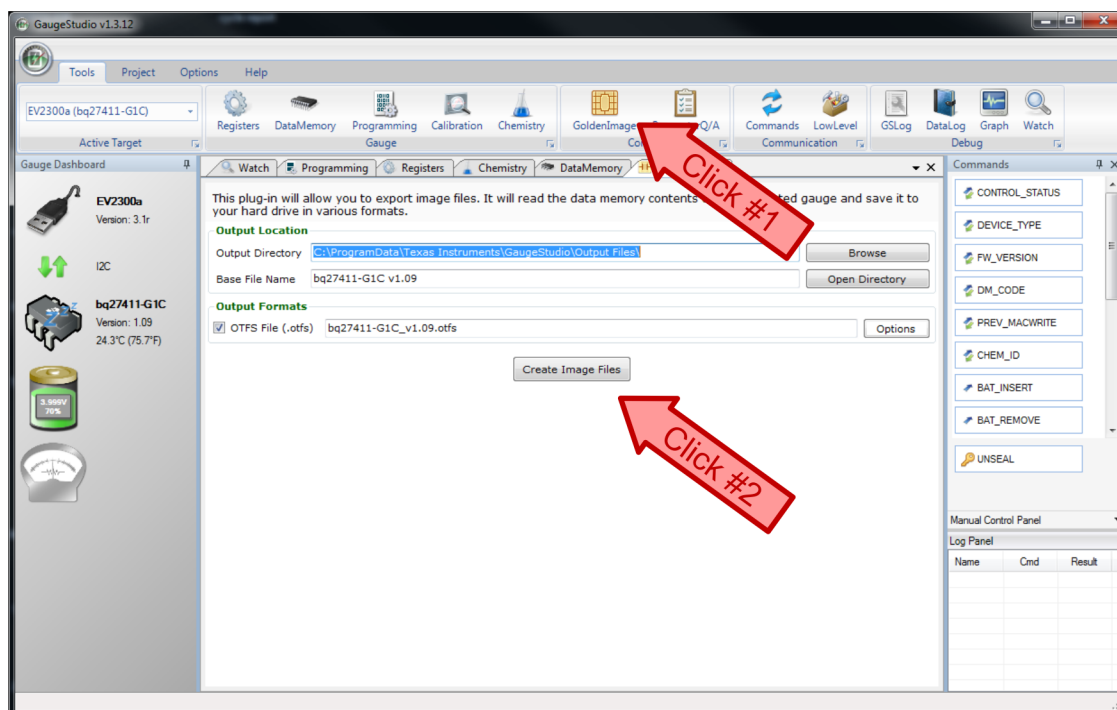


Figure 4. Save .OTFS File

6 Launch SmartFlash Software

1. Launch SmartFlash software.
2. Confirm auto-detection of EV2x00 adapter, Gauge = 421 and Version ≥ 109 .
3. Click File > Open.

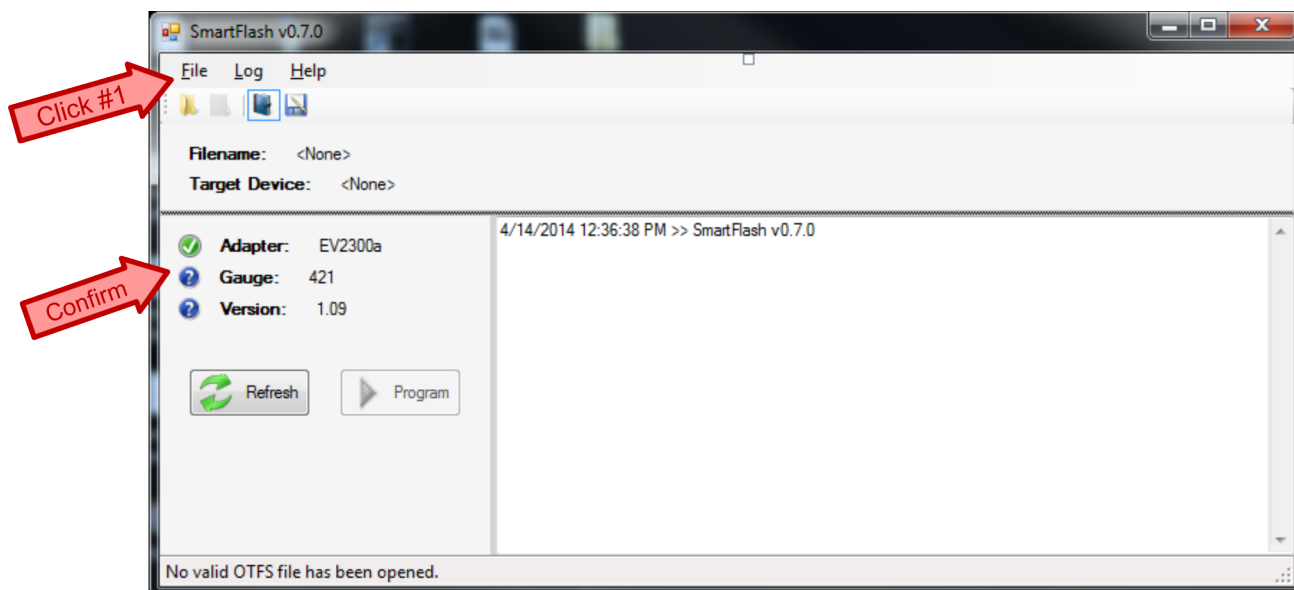


Figure 5. Launch SmartFlash Software

7 Open .OTFS File

1. From pop-up dialog box, click desired .OTFS file and click Open.
2. Confirm successful file load from log window.

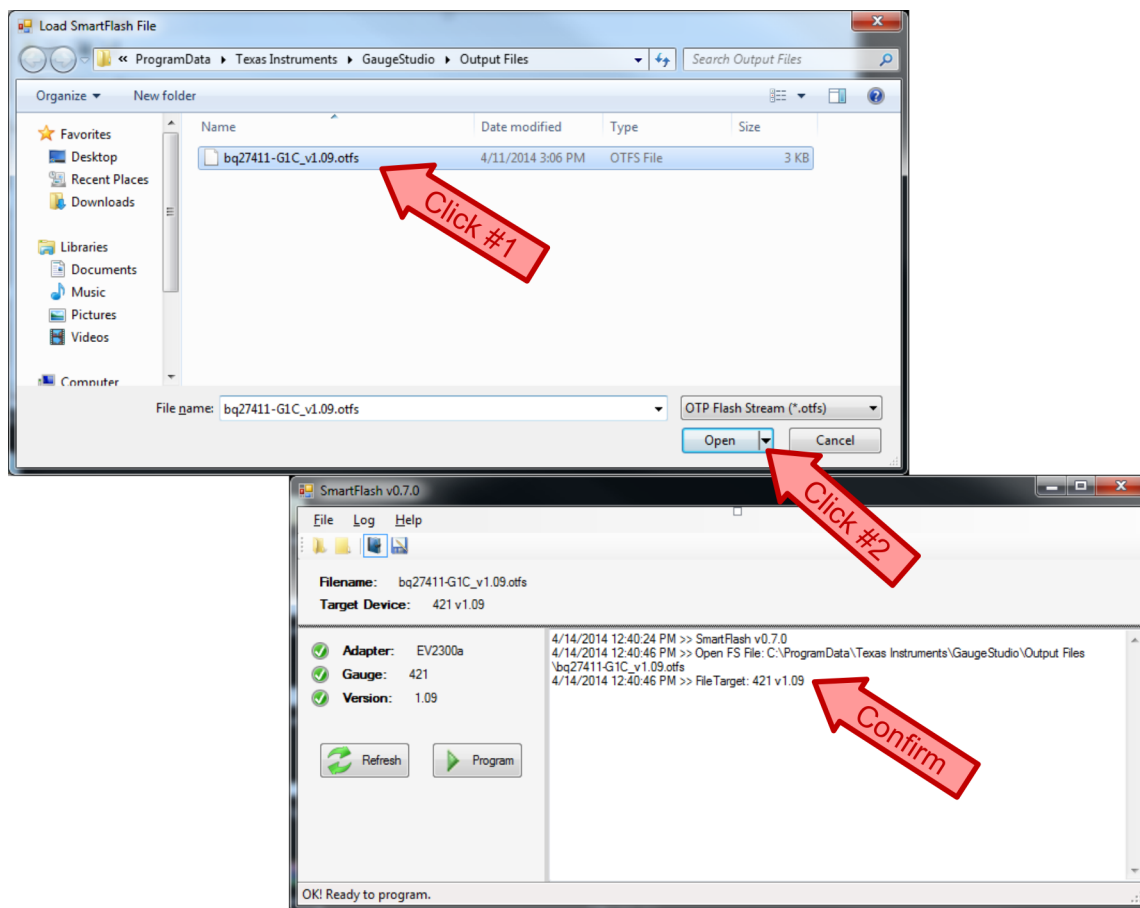


Figure 6. Open .OTFS File

8 Program OTP

1. Click 'Program' icon.
2. When 'Apply Programming Voltage' pop-up dialog box appears, enable 7.4-V power supply and click OK.
3. After a brief, approximately 1-second, delay for OTP programming and when 'Remove Programming Voltage' pop-up dialog box appears, disable the power supply and click OK.

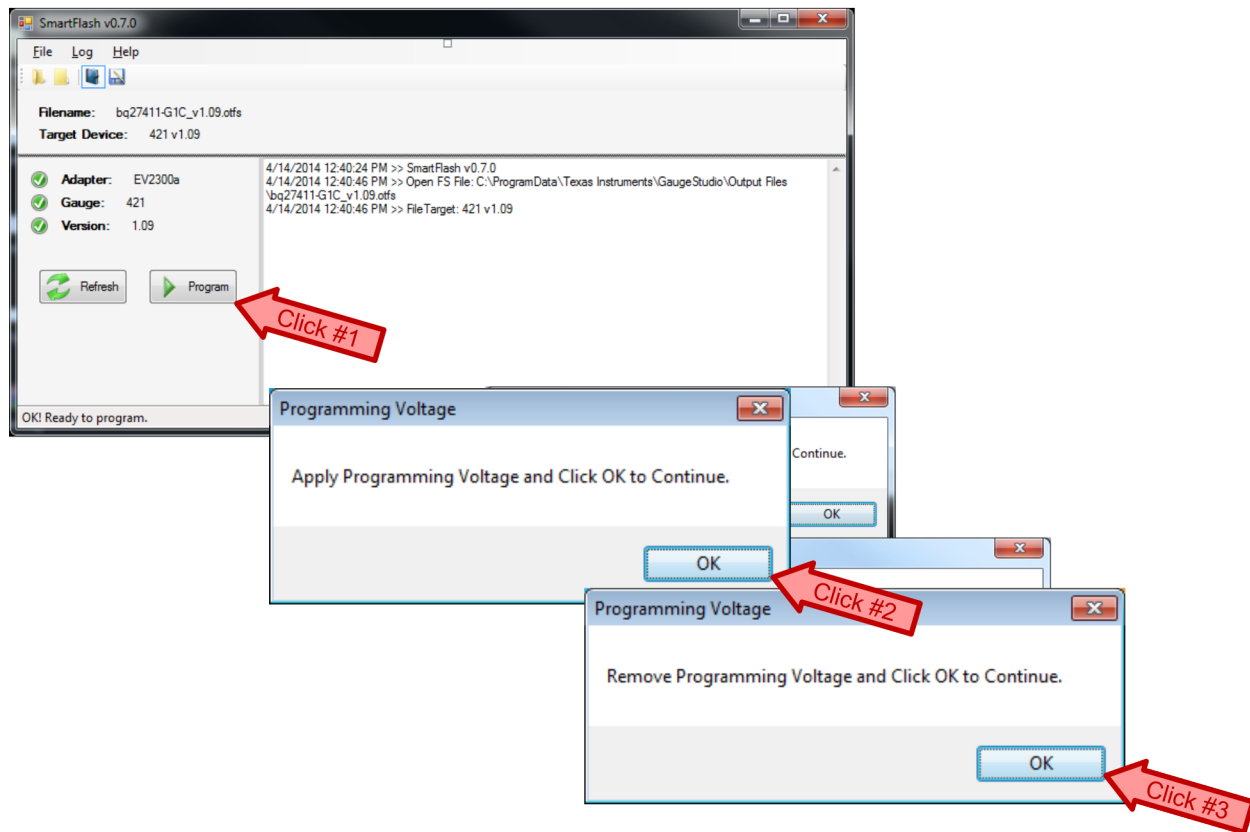


Figure 7. Program OTP

9 Confirm Success

1. Confirm message 'Programming completed successfully!' message from log window.
2. The device is now fully programmed.

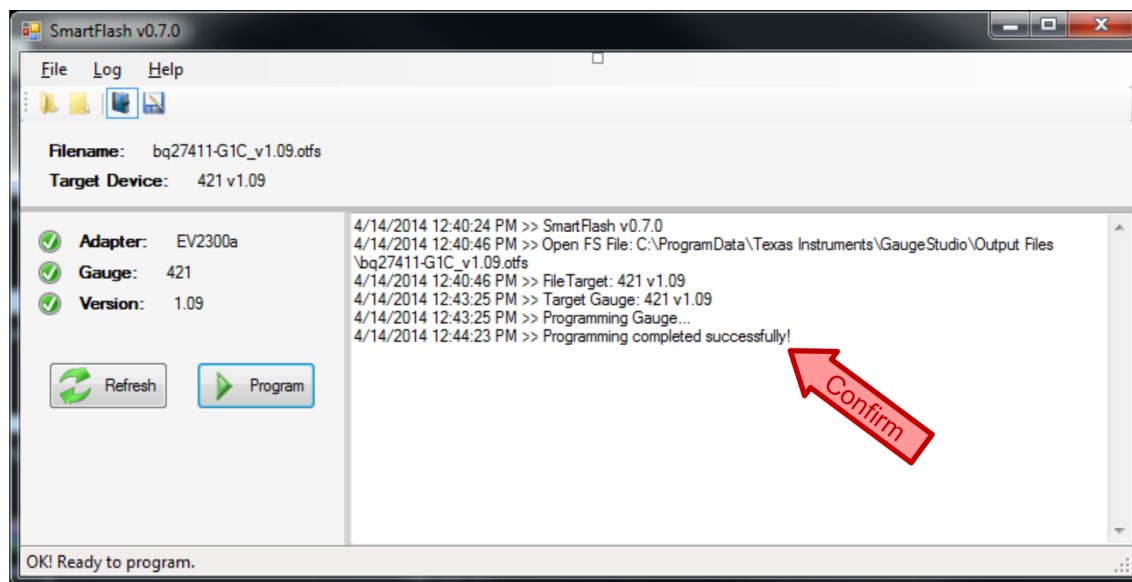


Figure 8. Confirm Success

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