		Doc. No.: MD11-WOI-76-001
Type: JS-MD Single	Subject: Service Bulletin	ATA: 76
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev.: 00

Title: Work Instructions for SOLO 8000/400 Firmware Updates
Service Bulletin

1 Document Management

1.1 List of Revisions

Rev.	Date	Description	Author	Affected Sections / Pages
00	11.03.2024	Initial Issue	JSU Jonker	all

Unless shown impracticable due to the scope of the revision, the changes due to the latest revision are marked by a vertical line at the right page margin.

1.2 List of Validity


Rev.	Valid for / Restrictions	Type Def. Reference
00	JS-MD Single / Model JS-MD 3 RES	MD11-CDL-00-001

1.3 Document Acceptance

A **CVE** independently from his area of expertise or a second **DE** checks the form and content of the document according to section 1.1 and 1.2 and correctness and completeness of the content. The **CVE** approves the document.

	Function	Digital Signature <i>(includes Date and Name)</i>
Prepared	DE	
Checked	DE / CVE	
Approved	CVE	

Note: If no digital signature is used, the name and the date must be indicated in the digital signature box.


		Doc. No.: MD11-WOI-76-001
Type: JS-MD Single	Subject: Service Bulletin	ATA: 76
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev. : 00

2 Contents

1	Document Management	1
1.1	List of Revisions.....	1
1.2	List of Validity.....	1
1.3	Document Acceptance	1
2	Contents	2
3	Summary	2
4	Work Instructions.....	3
4.1	Flashing Firmware to the DCU	4
4.2	Flashpoint Firmware to the RFU	6
4.3	HV Battery Update	9
5	References	10
6	Appendix	11
6.1	HV battery communication/debug cables	11
6.2	Updated software driver	11

3 Summary

This document contains all necessary steps to complete the content of the Service Bulletin SB-MD11-002 SOLO 8000/400 Firmware Updates /1/.

		Doc. No.: MD11-WOI-42-001
Type: JS-MD Single	Subject : Service Bulletin	ATA: 42
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev. : 00

4 Work Instructions


Work instructions are provided in this section to update (or “flash”) the firmware on the DCU, RFU and the HV batteries. The following software tools are required to perform the update:

- DCU and RFU: Flashmagictool
- HV Batteries: Atmel Flip 3.4.7

The firmware update requires the following steps:

1. Install the appropriate firmware flash tools.
2. Download the latest firmware for the applicable hardware units (a link to a project file is provided where with all the configurations completed.
3. Connect the hardware unit the PC, using the correct cable.
4. Configure the flash program.
5. Perform the firmware update.
6. Confirm new software is updated and test the system.


Note: It is good practise to create separate file directories on the Windows PC for the DCU, RFU and HV batteries, in order to keep the required firmware tools and project files separate.

		Doc. No.: MD11-WOI-42-001
Type: JS-MD Single	Subject : Service Bulletin	ATA: 42
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev. : 00

4.1 Flashing Firmware to the DCU

The following instructions are required to update the firmware of the DCU:

1. Download and install the software using the link (valid for Windows Vista/7/8/10/11):
<https://www.flashmagictool.com/download.html&d=13.50/FlashMagic.exe>
 2. Download the files using the link:
<https://www.dropbox.com/scl/fo/54u5k2rf114sz3uanqnx/h?rlkey=m89zopvc7cuh9vqge28wzy4fe&dl=0>
 3. Connect the computer to the DCU with the USB cable Type A/B. The USB port is located at the rear of the DCU.
 4. Open Project File: "FlashMagic_DCU.fmx"
 5. Once opened verify the following adjustments:
 - Device:** LPC1788
 - Serial Port:** Check this port number after switching on the main switch of the DCU. Look into the status line what new COM-port is shown.
 - Baud rate:** 57600 Baud
 - Erase:** Select "Entire Device"
 - File:** Select the hex file with the new firmware.
 - Options:**
 - Verify after programming
 - Go after Programming
- Note:** If a Comport number does not become active on Flashmagic tool when inserting the USB cable, the reason might be outdated software drivers on the connected Windows PC. Refer to the **update driver** section in the Appendix.

		Doc. No.: MD11-WOI-42-001
Type: JS-MD Single	Subject: Service Bulletin	ATA: 42
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev.: 00

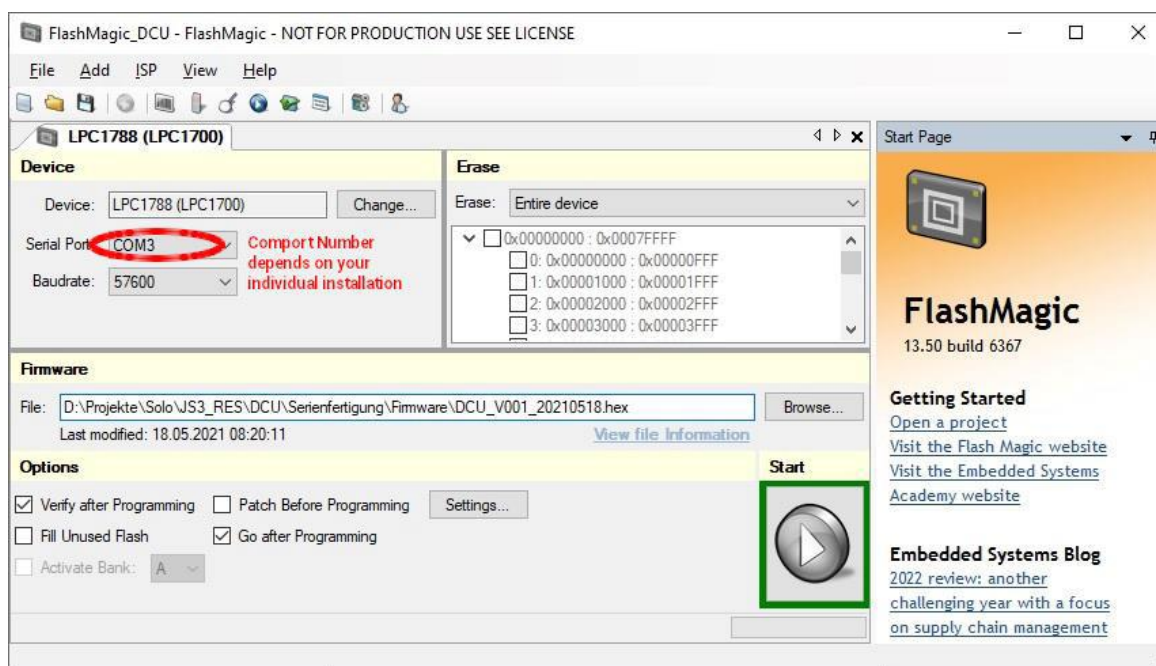



Figure 1: Adjustments to verify

6. Turn propulsion main switch on.
7. Click the large button below the Start icon to initiate the flashing process.
8. Within 10 seconds programming progress should be displayed in footer of the flash magic window. Verify progress as follows:
 - Programming phase - memory address is counting down
 - Verification process - memory address is counting up.
 - When completed - footer is cleared
9. Turn propulsion main switch off.
10. Unplug USB from DCU.

		Doc. No.: MD11-WOI-42-001
Type: JS-MD Single	Subject : Service Bulletin	ATA: 42
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev. : 00

4.2 Flashpoint Firmware to the RFU

This section provides the instructions to update the firmware of the RFU.

Due to part supply challenges, the RFU is certified with two different microcontrollers:

- RFU S/N 001 to 009 and 063 onwards: LPC11C24 microcontroller.
- RFU S/N 010 to 062: LPC11C22 microcontroller

Caution: Depending on the type of microcontroller, the correct project and firmware file must be selected. The serial number of the RFU device can be retrieved from the S/N sticker of the manufacturer on the device or by navigating into the device's screen on the DCU.

The following instructions are required to update the firmware of the RFU.

1. Download and install the software using the link (valid for Windows Vista/7/8/10/11):
<https://www.flashmagictool.com/download.html&d=13.50/FlashMagic.exe>
2. Download the files using the link:
3. <https://www.dropbox.com/scl/fo/modzjny2sjev90o679it/h?rlkey=b86uy8nudwulpkg4a4ecyob8s&dl=0>
4. Connect the computer and the RFU with the USB mini-B cable.
5. Using the flashMagic.exe software and open the project file depending on the serial number of the RFU:
 - "FlashMagic_RFU_LPC11C24.fmx"
 - or
 - "FlashMagic_RFU_LPC11C22.fmx"
6. Verify that the configuration selected is correct:


Device:

 - LPC11C24/301 (LPC1000)
 - or
 - LPC11C22/301 (LPC1000)

Serial Port: Observe the status line after connecting the RFU USB port and read what COM-port is added.

Baud rate: 57600 Baud

Erase: Select "Entire Device"

		Doc. No.: MD11-WOI-42-001
Type: JS-MD Single	Subject : Service Bulletin	ATA: 42
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev. : 00

File: Select the hex file with the new firmware.

- Options:**
- Verify after programming
 - Go after Programming
 - Patch Before Programming: click on “Settings...”.

The Memory Patch Editor opens. With “+” add a new line with:

- LPC11C24: Address = 0x7FFE and “Bytes” equals the serial number as a 16-bit integer in Hex-“**Little Endian**” format.

Or

- LPC11C22: Address = 0x3FFE and “Bytes” equals the serial number as a 16-bit integer in Hex-“**Little Endian**” format

(This depends on the SN of RFU installed)

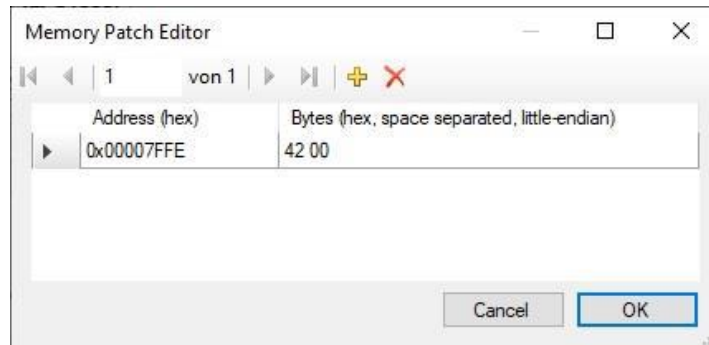



Figure 2: Memory patch editor

Note: The following the link below provides a converter to convert the unit serial number from ASCII to Little Endian Format:

https://www.save-editor.com/tools/wse_hex.html

		Doc. No.: MD11-WOI-42-001
Type: JS-MD Single	Subject: Service Bulletin	ATA: 42
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev.: 00

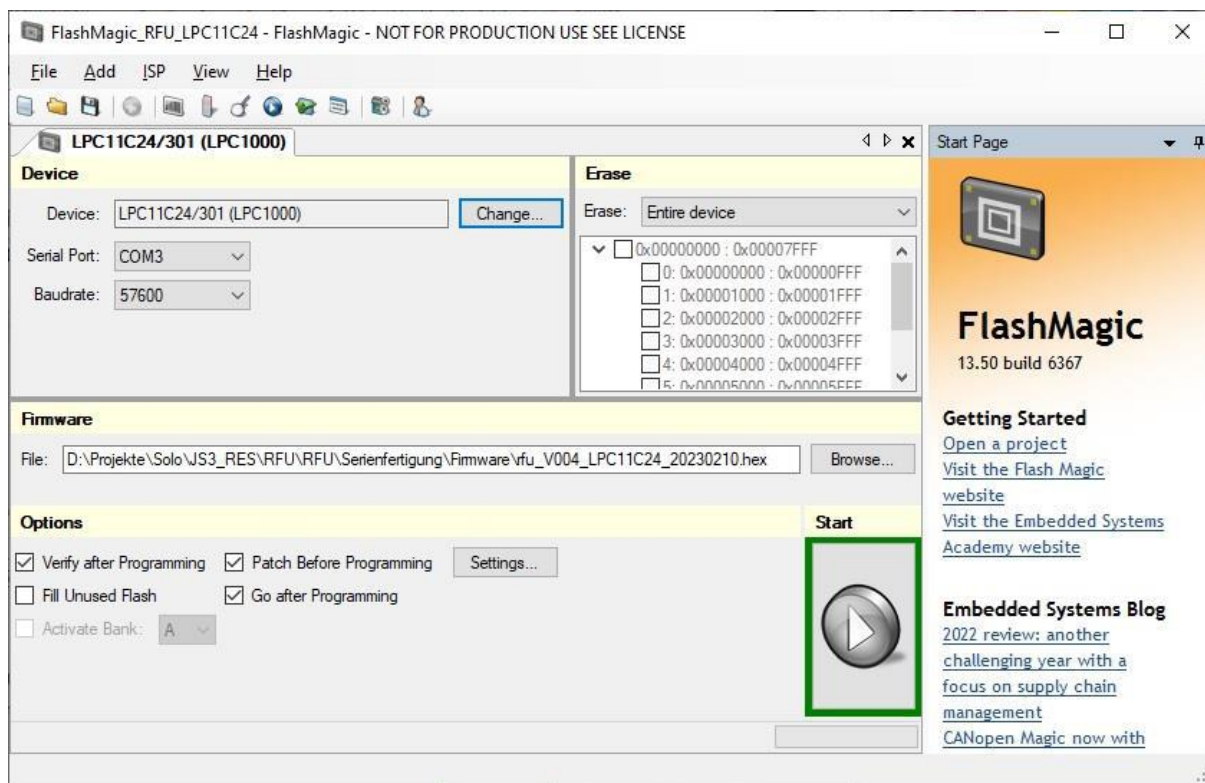


Figure 3: Adjustments to verify

7. Turn propulsion main switch on.


Note: If a Comport number does not become active on Flashmagic tool when inserting the USB cable, the reason might be outdated software drivers on the Windows PC. Refer to the **update driver** section in the Appendix.

8. Click the big button below **Start** icon to start the flashing process.

9. Within 10 seconds programming progress should be displayed in footer of the flash magic window. Verify progress as follows:

- Programming phase - memory address is counting down
- Verification process - memory address is counting up
- When completed - footer is cleared

10. Turn propulsion main switch off.

		Doc. No.: MD11-WOI-42-001
Type: JS-MD Single	Subject : Service Bulletin	ATA: 42
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev. : 00


4.3 HV Battery Update

The batteries provide serial information when switched on. The firmware of the HV batteries is updated through this serial communication.

This serial communication can be established by a dedicated cable that facilitates connection between a PC and the HV battery. Refer to the appendix for more information.


Warning: HV batteries can only be maintained by trained personnel. Before performing any work on the charger, be sure to unplug the charger from the wall socket and the HV batteries. The charger is opened to install the debug cables.

1. Download and install the software using the link:
<https://www.microchip.com/en-us/development-tool/flip>
2. Download the files using the link:
3. <https://www.dropbox.com/scl/fo/tu6e0h2oeo582ldbzfge3/h?rlkey=ii70vtbfmhbaymlyq2to5sfbc&dl=0>
4. Connect the Serial Plug to the Windows PC.
5. Connect the HV battery plug with the data-pins to the HV battery.
6. When using the dedicated battery update cable, ensure the serial port is not connected other devices or programs (e.g. H-Term used to download logged data from the HV battery.)
7. Press and hold the Programming Button on the HV battery communication cable while connecting the cable to the 12V avionics battery.
8. Start Flip by Atmel (<https://www.microchip.com/en-us/development-tool/flip>)
9. Select AT89C51CC03 as the chip.
10. Uncheck "BLJB" if checked (this is only required if the option is available)
11. Connect Serial Port in Flip with 9600 Baud.
12. Select the supplied Hex file.
13. Click "Run".
14. After a successful flash, all 4 statuses should be green.
15. Switch Off the charger or unplug the cable from the HV battery and wait for 1 minute.
16. The HV Battery should be updated. Verify the serial-number of the HV battery firmware on the DCU.

		Doc. No.: MD11-WOI-42-001
Type: JS-MD Single	Subject : Service Bulletin	ATA: 42
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev. : 00

5 References

/1/ SB-MD11-002 SOLO 8000/400 Firmware Updates

		Doc. No.: MD11-WOI-42-001
Type: JS-MD Single	Subject : Service Bulletin	ATA: 42
Model/s: JS-MD 3 RES	Title: Work Instructions for SOLO 8000/400 Firmware Updates	Rev. : 00

6 Appendix

6.1 HV battery communication/debug cables

Battery communication cables can be ordered from the manufacturer.

Alternatively, the HV charger can be adopted to facilitate communication with the HV batteries. Two serial ports are located on the PCB of the charger (located inside the black metal box of the charger) as well as two boot loader connectors. When the boot loader pins are bridged and the charger switched on, the batteries will boot into a flash-enabled state to which new firmware can be uploaded using the appropriate software. Only HV Battery A is used for firmware updates.

Contact the support desk support@js1.co.za for more information on cables.

6.2 Updated software driver

The following section is applicable to update Windows software driver. This is only required if the connected PC does not recognise the USB-Serial cable when connected to a free USB port.

1. Click start or press the Windows-Key.
2. Type "device manager" and open.
(alternatively use the short-cut Windows + X and then press M to access it)
3. Navigate and expand the icon "Ports (COM & LPT)" from the list.
4. Right-click on the port which contains "CP210x" and select the **Uninstall device** option.
5. Download the driver manually from this side.
<https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers?tab=downloads>
6. Extract or unzip the downloaded folder.
7. In the device manager, select **Update driver**.
8. Select the lower option **browse my computer for driver software**.
9. Navigate to the downloaded folder and perform extraction.
10. Complete the installation.