## 1. Purpose

This document provides instructions for programming or updating the EEPROM on the HRA board using the ST Visual Programmer and ST-LINK V2 USB-to-serial adapter.
The procedure includes setup, configuration, programming, and troubleshooting steps to ensure successful communication and data transfer between the PC and the control board.

## 2. Required Tools and Equipment

| Item | Description |
| --- | --- |
| PC | Windows-based computer with administrator rights |
| Software | ST Visual Programmer |
| Programming tool | ST-LINK V2 USB-to-serial adapter (new or old version) |
| Firmware files | `.hex` files provided by the manufacturer |
| Connection cables | USB cable and 4-pin header cable |
| Power supply | 5 V DC (if required by board) |
| Main Field | The large window in ST Visual Programmer where HEX code is displayed and uploaded. |
| Status Bar | The small window in ST Visual Programmer where the upload and configuration status is displayed. |

## 3. Safety Notice

**CAUTION:** Incorrect wiring, selection of device type, or memory overwrite can permanently damage the board. Perform this procedure only if authorized and trained.

# 4. Programming Instructions

**IMPORTANT:** All EEPROM and firmware programming operations must be coordinated with the manufacturer. Incorrect operation or use of unauthorized files may result in permanent damage to the control board.

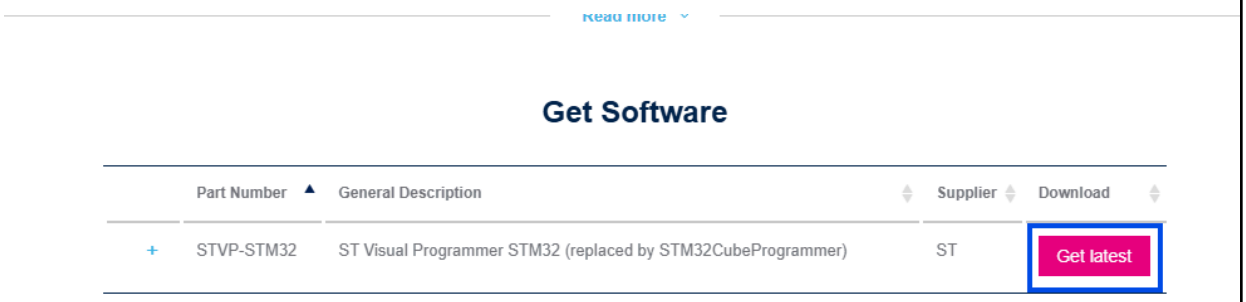
To program/update the EEPROM:

1. Install the **ST Visual Programmer** software.
2. Identify the **COM** port on the HRA board.
3. Connect the programmer.
4. (For initial installation only:) Configure the ST Visual programmer.
5. Activate the USB.
6. Program the EEPROM.
7. Complete the programming.

## 4.1 Installing the ST Visual Programmer software

1. To install **ST Visual Programmer** software on the PC, visit their website at: https://www.st.com/en/development-tools/stvp-stm32.html, and select **Get latest**.

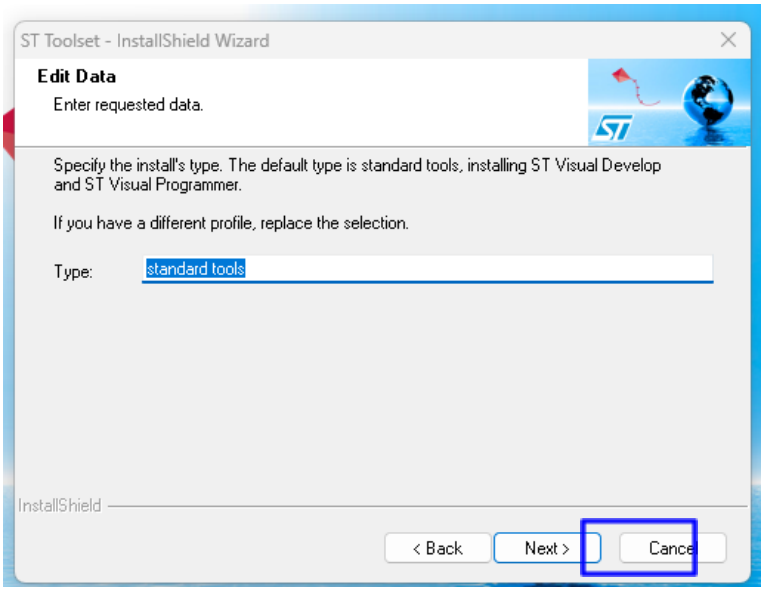
*Figure 1: ST Visual Programmer software download icon*




2. Follow the on-screen prompts to continue installation.

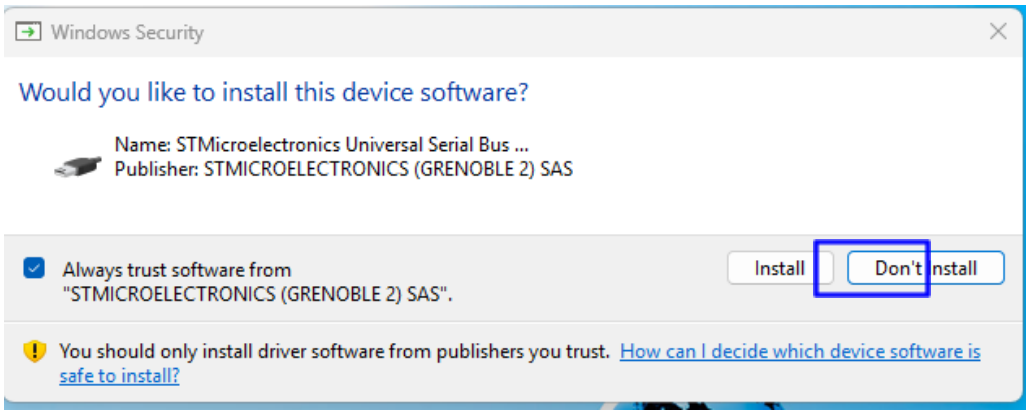
3. When prompted, leave the default **standard tools** setting and click **Next**.

*Figure 2: Standard tools selection*




4. When prompted, click **Install** to complete the installation process.

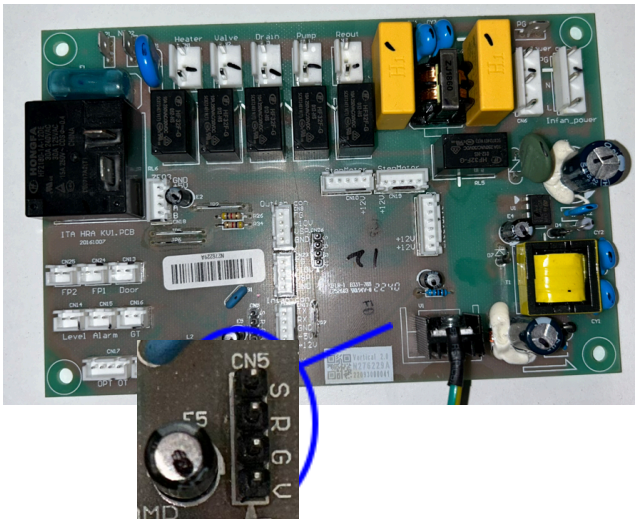
*Figure 3: Installing the ST Visual Programmer software*



## 4.2 Identifying the COM Port on the HRA board

The Port used to program and update the **ST-LINK V2 USB-to-serial interface** is labelled CN5 and is located on the bottom left section of the board. (For the exact location, see Figure 1 below.)

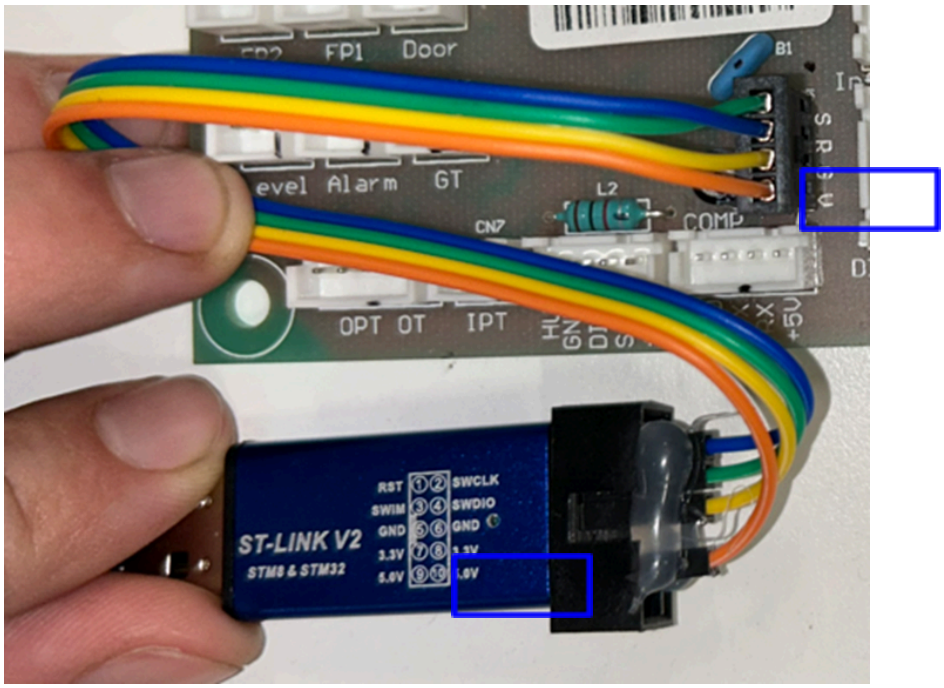
*Figure 4: COM port connection location*



## 4.3 Connecting the Programmer

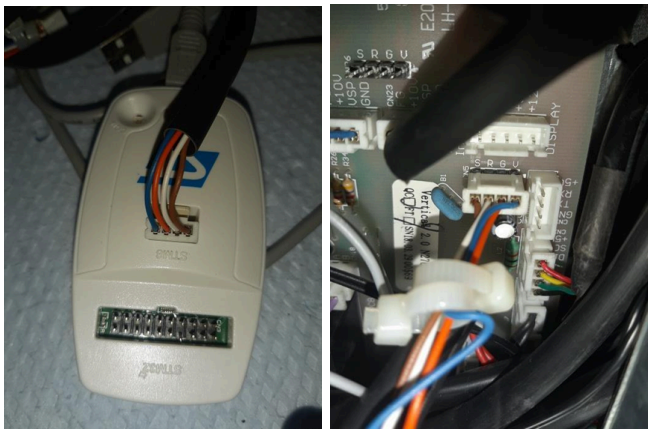
1. Connect the ST-LINK (Version 2) adapter to the COM port.
    - Verify that the **5.0 V line** aligns with the V pin.
    - Cable colors may vary; always check polarity labels on the board.

*Figure 5: Pin connection locations*



2. If using the **ST-LINK Version 1 adapter**, follow the same logic and pin locations.

*Figure 6: Pin connection locations*



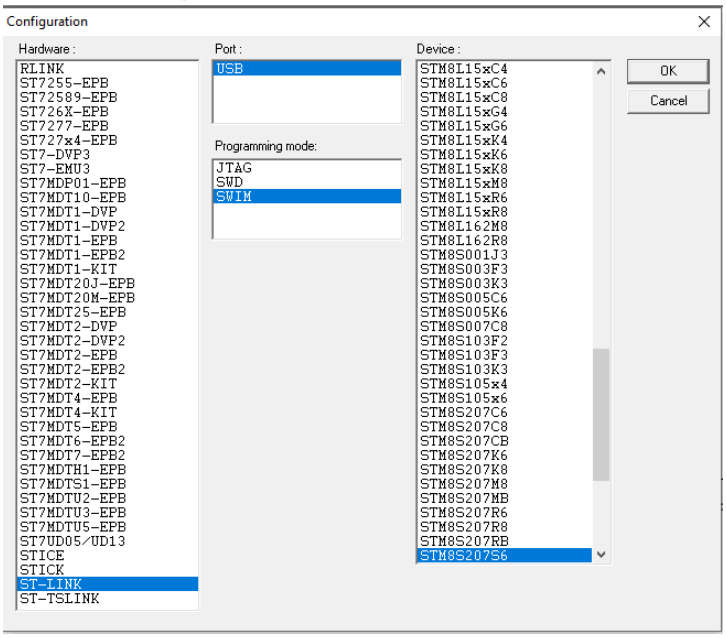
3. Connect the ST-LINK USB plug to the PC.

## 4.4 Configuring the ST Visual Programmer

**IMPORTANT:** Perform this configuration only during first setup. The settings are retained for future sessions.

1. Click the **ST Visual Programmer** icon to open. The Configuration window will open (as in Figure 7 below).

*Figure 7: ST Visual Programmer Configuration window*




2. In the Configuration window, select the parameters from the following table:

*Table 2: ST Visual Programmer configuration parameters*

| Field | Value |
|---|---|
| Hardware | ST-LINK |

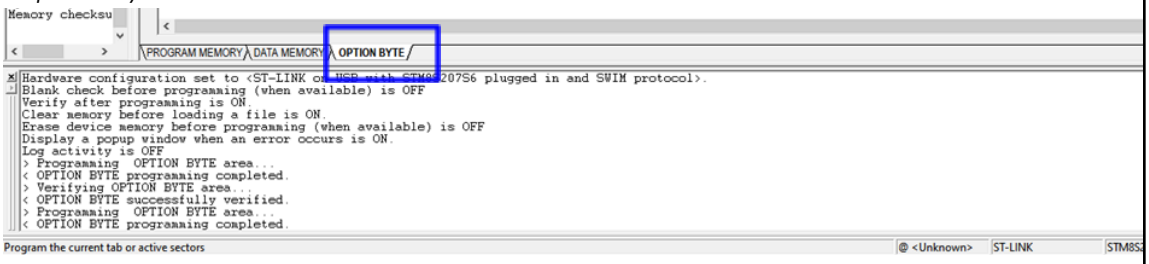
| Field | Value |
|---|---|
| Port | USB |
| Programming Mode | SWIM |
| Device | STM8S207S6 |

3. Click **OK** to save the configuration.

## 4.5 Activating the USB (Option Byte)

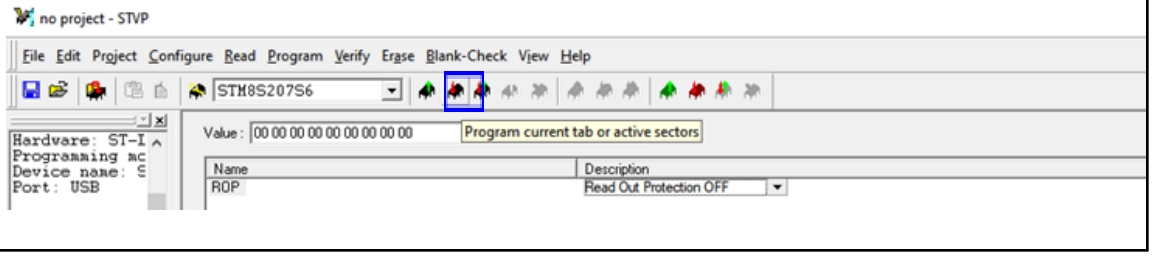
1. Open the **Option Byte** tab at the bottom of the main field.

*Figure 8: Option Byte tab location*



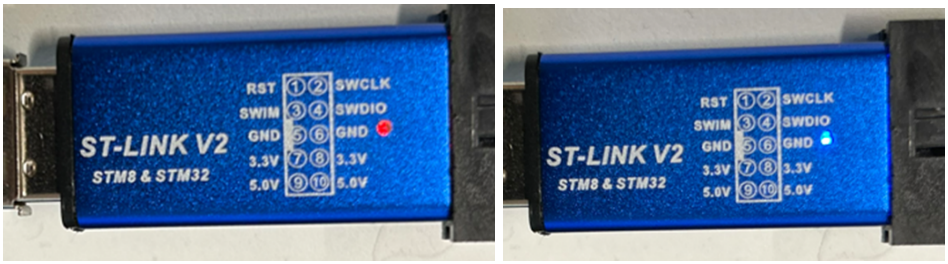

2. Click the **Program current tab or active sectors** icon in the top navigation bar to activate USB communication.

*Figure 9: Program current Tab or active sectors location*



3. Observe the LED on the tool: the USB light should blink red to blue repeatedly.

*Figure 10: Flashing USB light confirmation*




4. Confirm that the success message in Figure 11 appears in the lower status bar.

*Figure 10: Flashing USB light confirmation*

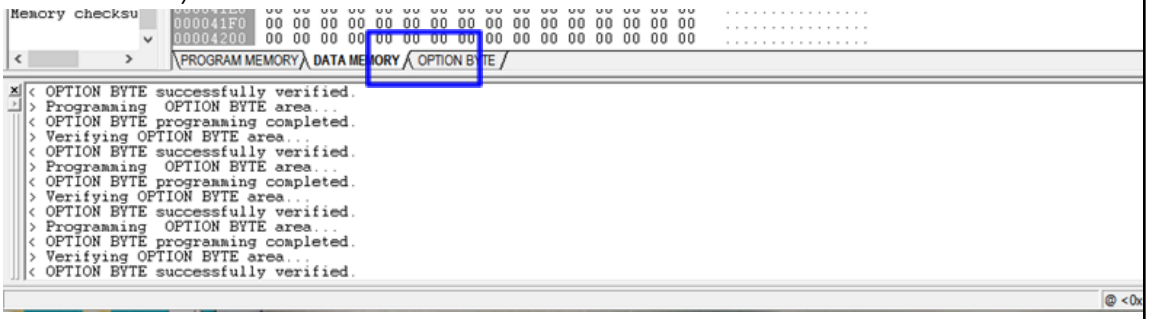
```
Hardware configuration set to <ST-LINK on USB with STM8S207S6 plugged in and SWIM protocol>
Blank check before programming (when available) is OFF
Verify after programming is ON.
Clear memory before loading a file is ON.
Erase device memory before programming (when available) is OFF
Display a popup window when an error occurs is ON.
Log activity is OFF
> Programming  PROGRAM MEMORY area...
< PROGRAM MEMORY programming completed.
> Verifying PROGRAM MEMORY area...
< PROGRAM MEMORY successfully verified.
```

## 4.6 Programming the EEPROM

### 4.6.1 Load Data Memory

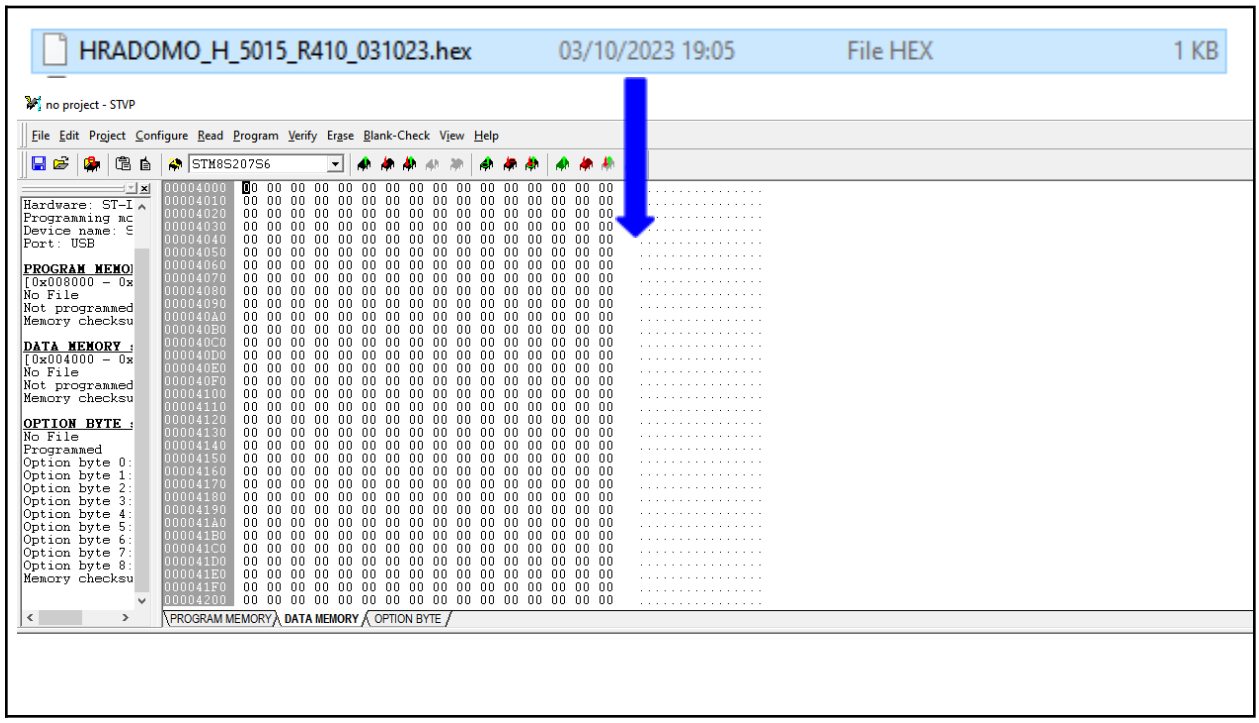
1. Select the **Data Memory** tab (located above the status bar)..

*Figure 11: Data Memory tab*



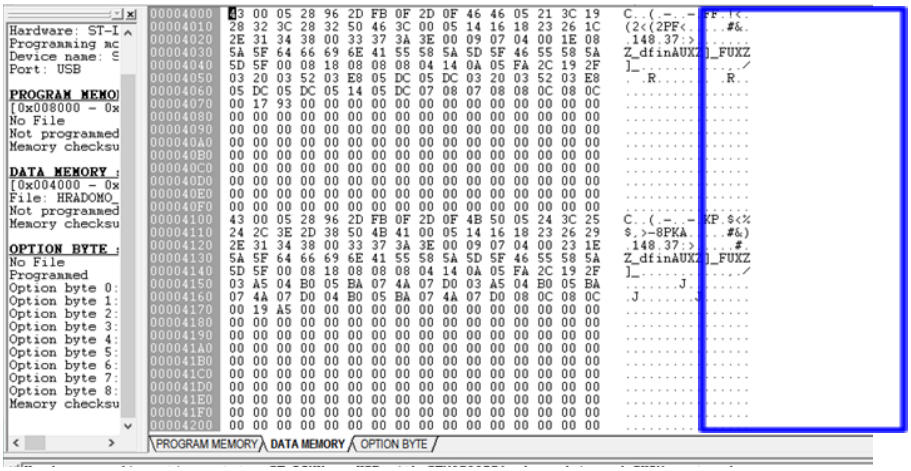

2. Drag and drop the `.hex` file provided by the manufacturer into the main field.

*Figure 12: Hex file drag and drop*



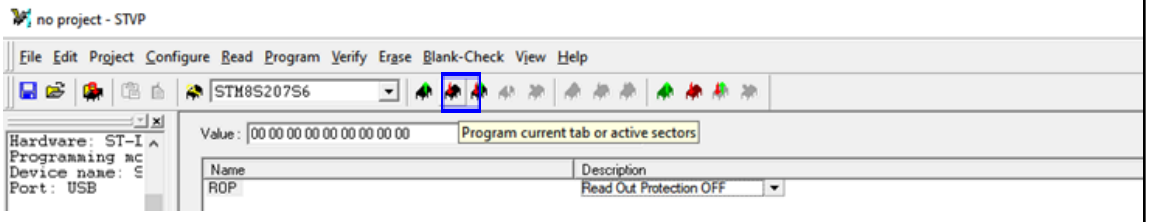

3. Wait for symbols to appear adjacent to the HEX code to confirm the upload to the ST Visual Programmer.

*Figure 12: Hex file drag and drop*



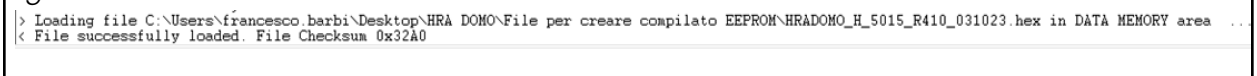

4. Click the **Program current tab or active Sectors** icon in the top navigation bar to program the board.

*Figure 13: Program current Tab or active sectors location*




5. Check the lower status bar for confirmation.

*Figure 14: Lower status bar confirmation*

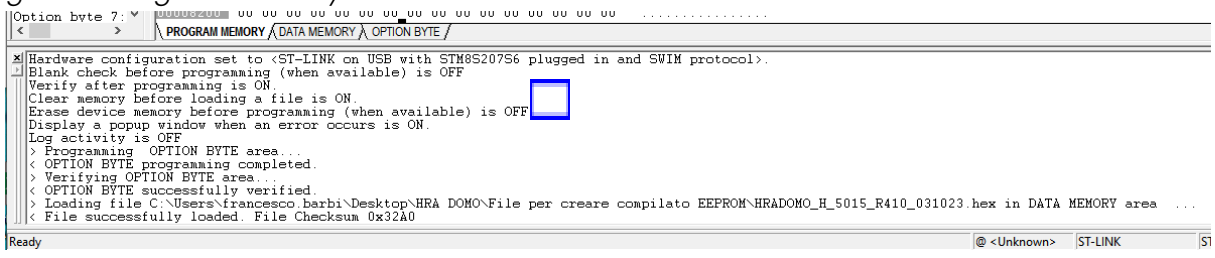


## 4.7 Uploading firmware

To upload firmware to the ST-LINK adapter:

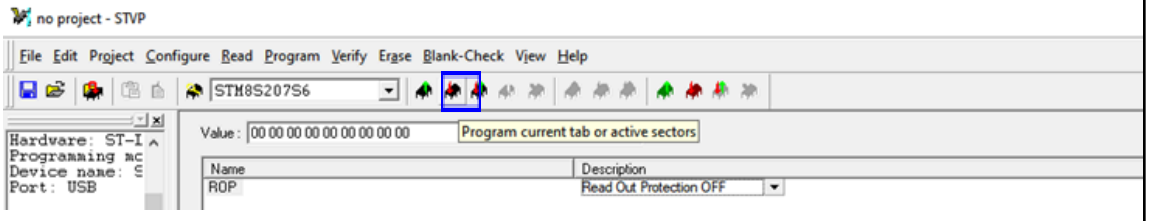
1. Open **ST Visual Programmer.**
2. Select the **Program Memory** tab (located above the status bar).

*Figure 15: Program Memory tab*




3. Drag the firmware file into the main field.
4. Click the **Program current tab or active sectors** icon in the top navigation bar to send the firmware to the USB.

*Figure 16: Program current Tab or active sectors location*




5. Repeat Sections 4.5 and 4.6 to ensure that the firmware is correctly installed on the USB.

## 4.8 Completing the Programming

1. After programming, disconnect the USB cable.

2. Power the board and verify the correct startup or LED indication.
3. Reinstall any covers or housings as required.

## 5. Troubleshooting

## 5. Troubleshooting

| Status | Problem | Solution |
| --- | --- | --- |
| Unit power off | No connection detected | Disconnect the remote control and EEV valve, then retry. |
| Unit powered | No connection detected | Verify that the correct serial port is selected in ST Visual Programmer. |
| Unit powered or off | No connection detected | Check if the USB connection is frozen. Disconnect and reconnect the USB cable from the PC. |
| Software | “Wrong device selected!” | Verify the selected microcontroller is STM8S207S6 and that the correct serial port is selected. |
| Software | USB not recognized during Option Byte activation | Repeat Option Byte programming. Check that the cable is connected and power is supplied. |
| Communication | “Connection Error” | Confirm correct microcontroller type (STM8S207S6) and verify cable polarity. |

## 6. Revision History

| Revision | Date | Description |
| --- | --- | --- |
| 01 | 11/03/2025 | Initial release |