STMicroelectronics UM3055 STSW-ONE Graphical User Interface User Manual

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User Interface User Manual

Introduction

This user manual describes the operation of the ST-ONE® Graphical User Interface, optionally associated with STEVAL-PCC020V2.1, the USB to UART interface board.

The STEVAL-PCC020V2.1 is an interface board used to connect a Windows® based PC with digital power supply controllers such as ST-ONE, STNRG012, or STNRG011. The layout and the behavior of the interface board are described in the ST-ONE datasheet.

The GUI allows to update the ST-ONE embedded firmware, calculate the main board's components, monitor in real time the status of the digital controller, and tune specific parameters according to customer needs.

GUI features

- Running on Windows XP (.NET 4.0 framework needed), Windows 7, 8, and 10
- Board components setup
- Real time monitor of the digital controller status
- Connection to ST-ONE using either direct standard COM port or through STEVAL-PCC020V2 board.

Figure 1. ST-ONE GUI main form
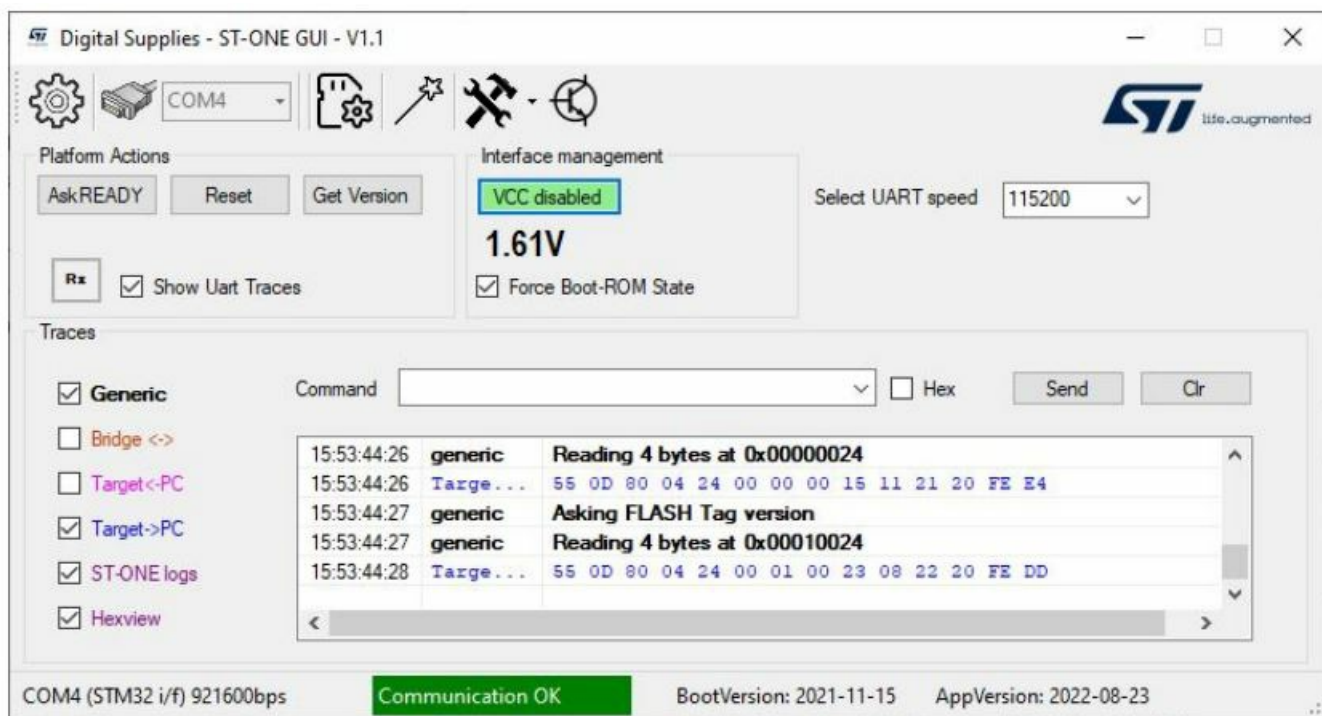
Contents

GUI installation

The ST-ONE GUI installation is performed by a dedicated installer. The installer does not remove previous versions of the GUI: if an equivalent version is already installed on the PC, it is removed when the installer is launched, and a new installation is required.
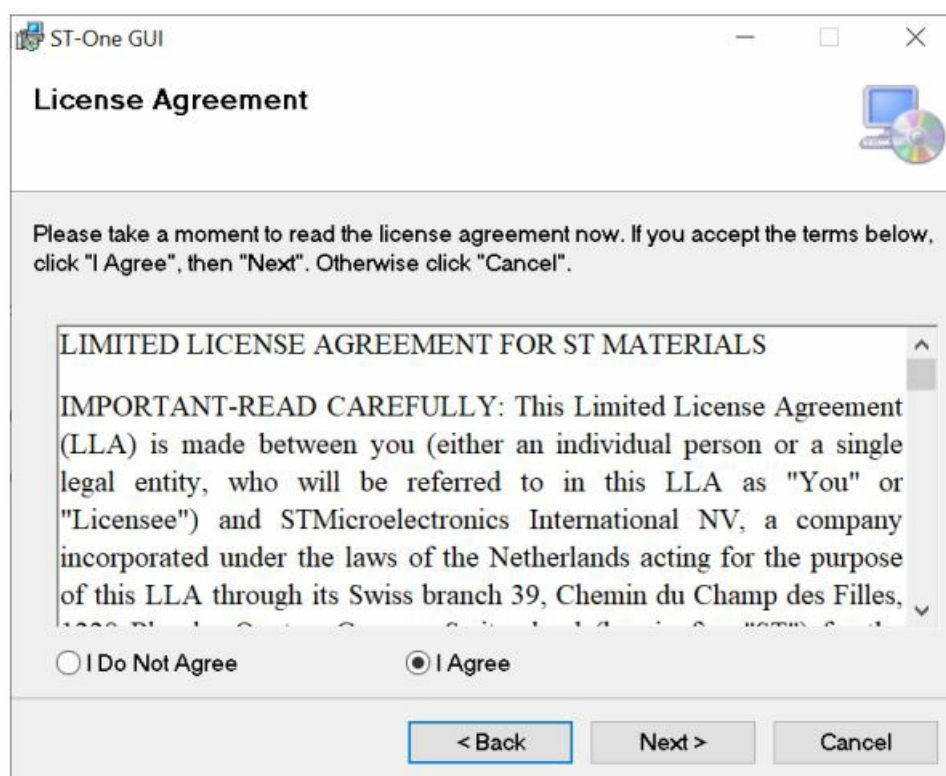Double-click on setup.exe to launch the installer. When the form below appears, select Next to continue.

**Figure 2. ST-ONE installer – welcome page**
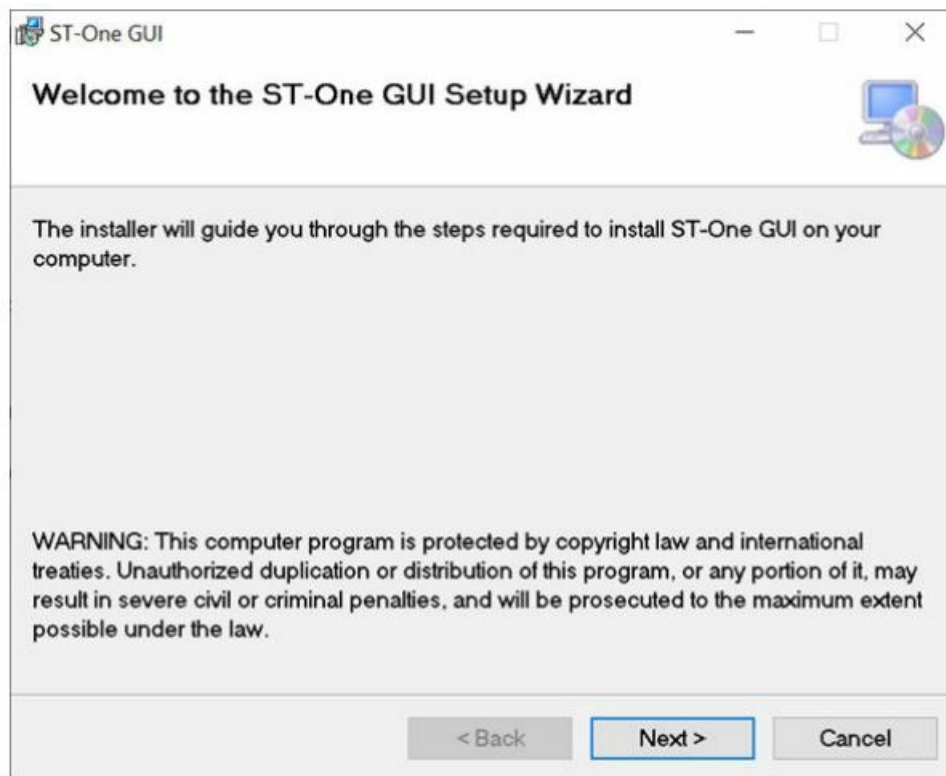
In order to move on with the installation, the license agreement has to be accepted.

Figure 3. ST-ONE installer – license agreement

It is recommended to install the ST-ONEGUI inside a dedicated STMicroelectronics folder on disk C:, as shown below. In case the user do not own the administration rights, it is recommended to install the ST-ONE GUI in a folder where administration rights are not requested

Figure 4. ST-ONE installer – path selection
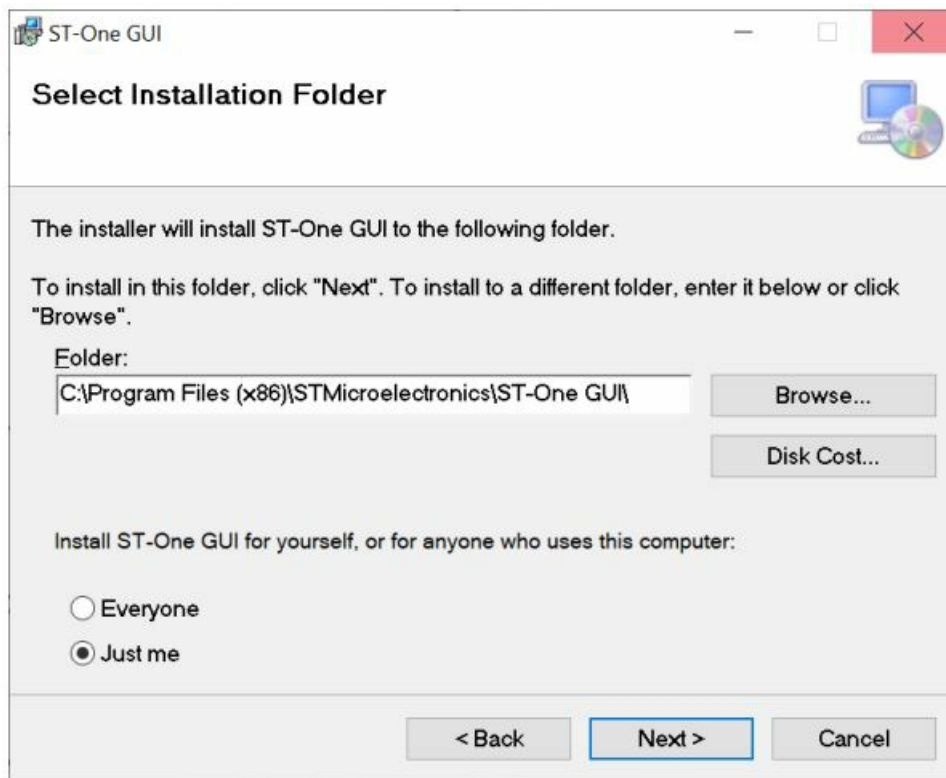
Once the installation is concluded, the tool can be launched.

GUI introduction

2.1 GUI features

The ST-ONE GUI is a tool developed to help a developer to set up and monitor the behavior of the ST-ONE. At a glance, it allows to:

- Program flash memory
- Calculate main board components
- Read event history data (for example, fault history).

2.2 GUI startup screen

The main form is shown in Figure 5.
The GUI is subdivided in 3 areas:

- **Tool bar:** it allows to select the desired actions to be performed on ST-ONE
- **VCC control & basic actions:** it contains UART controls
- **Traces and status:** Internal debug traces and status bar showing the current status of ST-ONE.

Figure 5. ST-ONE GUI startup screen
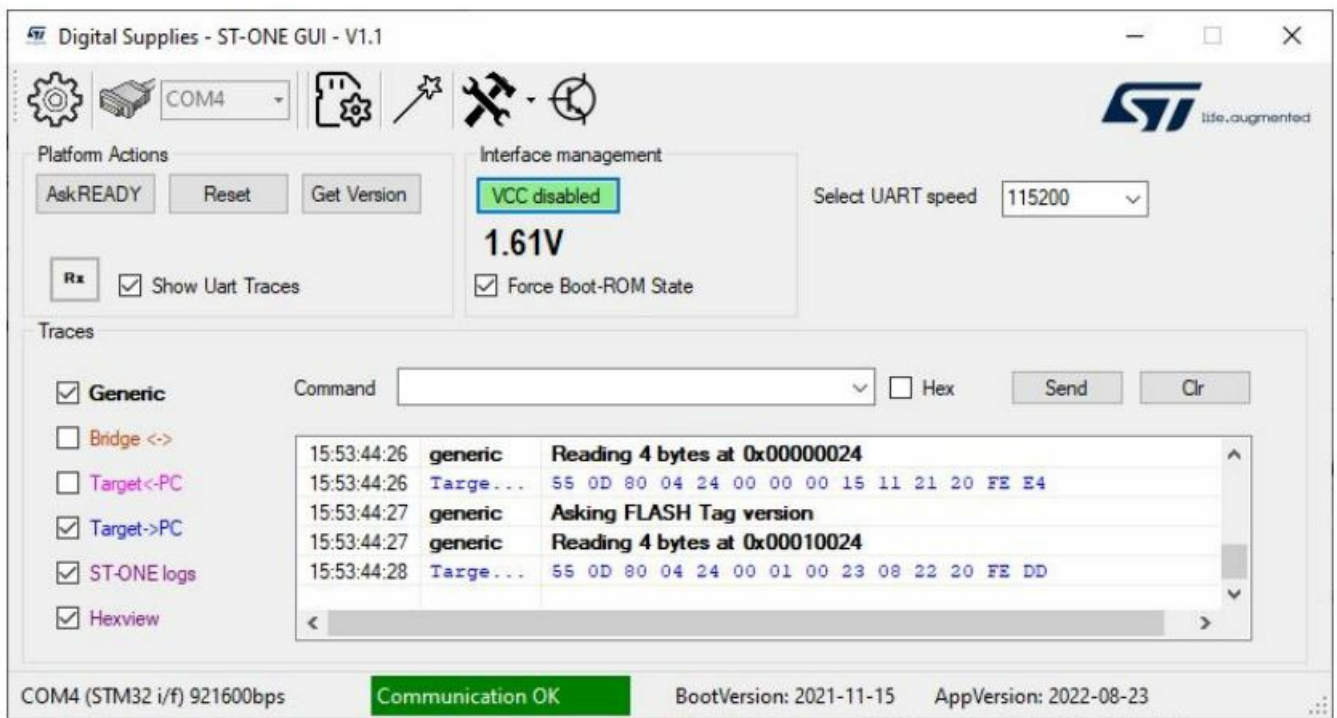
2.3 Connection management

The communication between the PC and ST-ONE, through PCC020V2, can be implemented with two different configurations. Connect cable A between the PC and PCC020V2, cable B between PCC020V2 and ST-ONE:

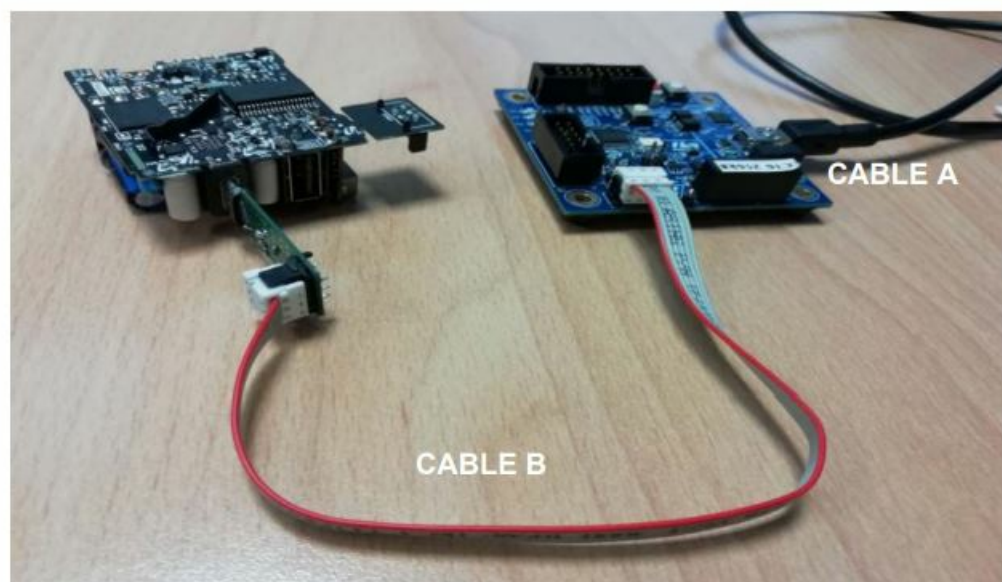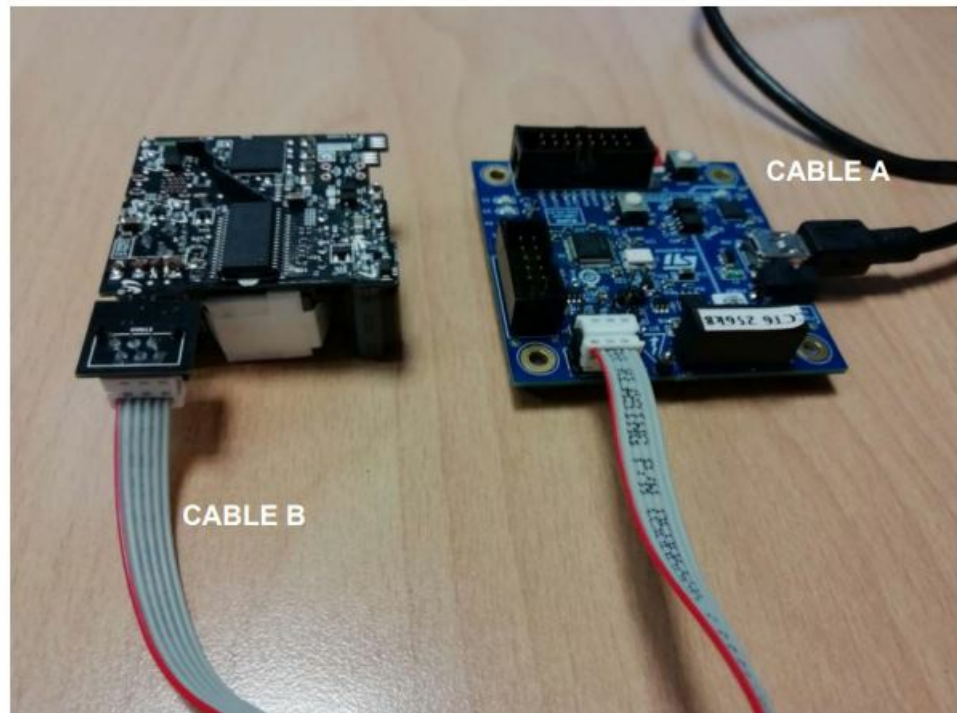**Figure 6. Configuration 1**

CC connection:


Figure 7. Configuration 2

GPIO connection:

Caution: AC voltage must always be disconnected during VCC generation, otherwise there would be a conflict between VCC generated by the interface board and the ST-ONE converter output.

The procedures below are recommended:

- For flash programming:
  – Disconnect AC source.
  – Connect the interface board and launch the GUI by pressing VCC button. The VCC button changes to VCC Enabled.
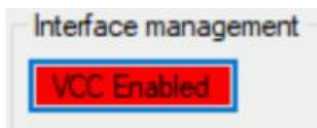
  – Perform operations.
  – Disconnect VCC on the GUI by pressing VCC button. The VCC button changes to VCC Disabled.
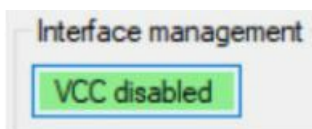
  – Connect AC source

2.4 Establishing the communication link, boot modes

Before being able to perform any operation, the user must ensure a correct communication channel with the ST-ONE device.
First of all, the ST-ONE device must be supplied.

- If a direct UART connection is used, the ST-ONE chip must be powered externally.
- If the STEVAL-PCC020 is used, this is straight forward, the user has to just click on the VCC Enable button.

If the communication is successfully established:

- The ST-ONE boot ROM sends a READY message

The status bar displays Communication OK and the boot and application versions are displayed in the task bar too.
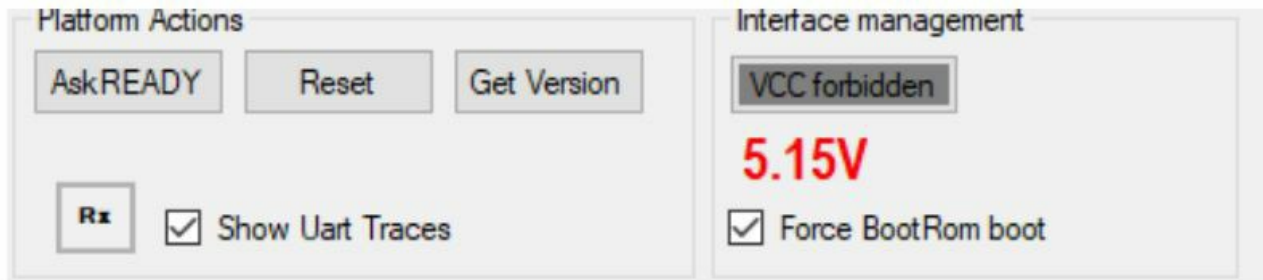
Figure 8. Successful communication with ST-ONE
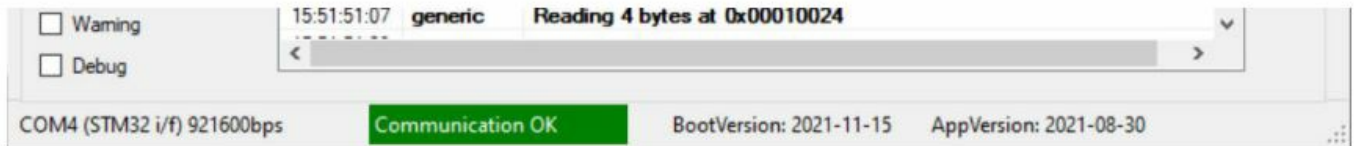
Note:

- The GUI forbids to Enable VCC if VCC is already detected (supply running).

Figure 9. VCC generation forbidden

- When VCC is engaged, if it goes down below a given threshold or above the OVP threshold, VCC is automatically disengaged to protect the interface board.

Boot modes:

At startup, the internal boot ROM checks the status of the Rx line.

- If it has asserted to ground, the MCU does not start the application. This mode is called the "rescue" mode and it is used to update the application firmware
- Otherwise, if there is a valid application firmware image stored in flash, the MCU branches to the application, which is the normal mode of operation.
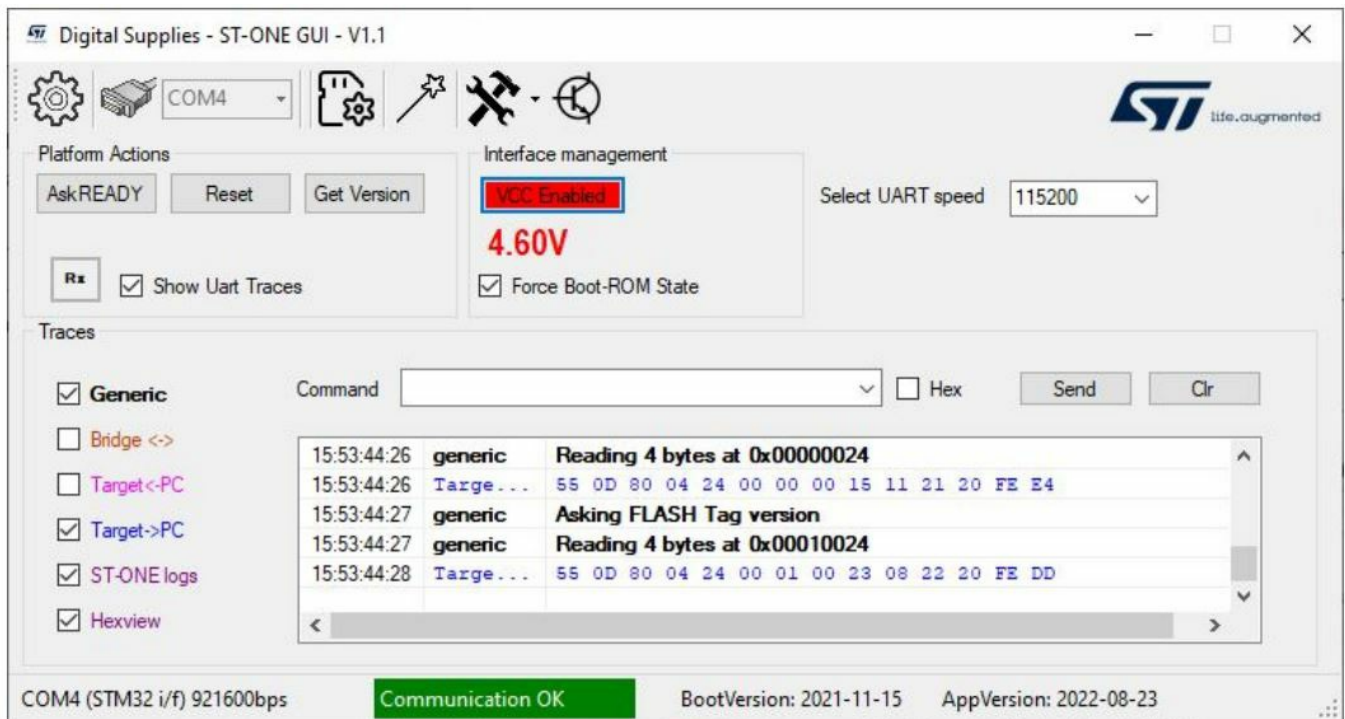
Note:

If the STEVAL-PCC020 interface board is not used, the user must apply the following sequence:

- VCC off, tied UART_RX line to ground in order to select rescue mode.
- Apply VCC
- Release UART_RX line
- Press AskReady button to check if the link has been successfully established.

If the STEVAL-PCC020 board is attached, boot mode can be selected (rescue mode or normal mode)

Figure 10. Rescue mode boot: the MCU remains in boot ROM state

Note that in this case, the application firmware detected that the ST-ONE chip is powered from the secondary side (so by the STEVAL-PCC020 interface in our case).

At startup, **the GUI automatically detects the COM port to be used** (the GUI selects the CP2102 based VCP). In case of multiple CP2102, the user has to manually select the right COM port through the COM port menu.

Figure 11. COM port selection

It is possible to open/close the COM port using the dedicated icon:

Figure 12. COM port open and close

Some sections of the GUI can operate even without a connected ST-ONE board, but real time monitoring is not available.

Once the right COM port is selected, the GUI tries to communicate with the interface board microcontroller with the selected speed, see Figure 2. In case the connection is not correctly established, modify the UART speed or switch between the interface connection selected (for example, from GPIO to CC or from CC to GPIO).

Figure 13. Traces during GUI connection

15:23:36:42	generic	HW:STM32 - HVDPS interface
15:23:36:42	generic	FW:3.6.14835 Date:Feb 14 2020 17:59:06
15:23:36:44	generic	Requesting READY message @ 115200 bps...
15:23:36:50	error	unable to find Uart Speed
15:26:08:64	generic	HW:STM32 - HVDPS interface
15:26:08:64	generic	FW:3.6.14835 Date:Feb 14 2020 17:59:06
15:26:08:65	generic	Requesting READY message @ 115200 bps...
15:26:08:73	error	unable to find Uart Speed

Note:

If the GUI does not find a SiLabs based VCP, an error message pops up.
Check in the Device Manager that the SiLabs VCP is correctly recognized. (see Figure 14)

Figure 14. SiLabs VCP in the device manager
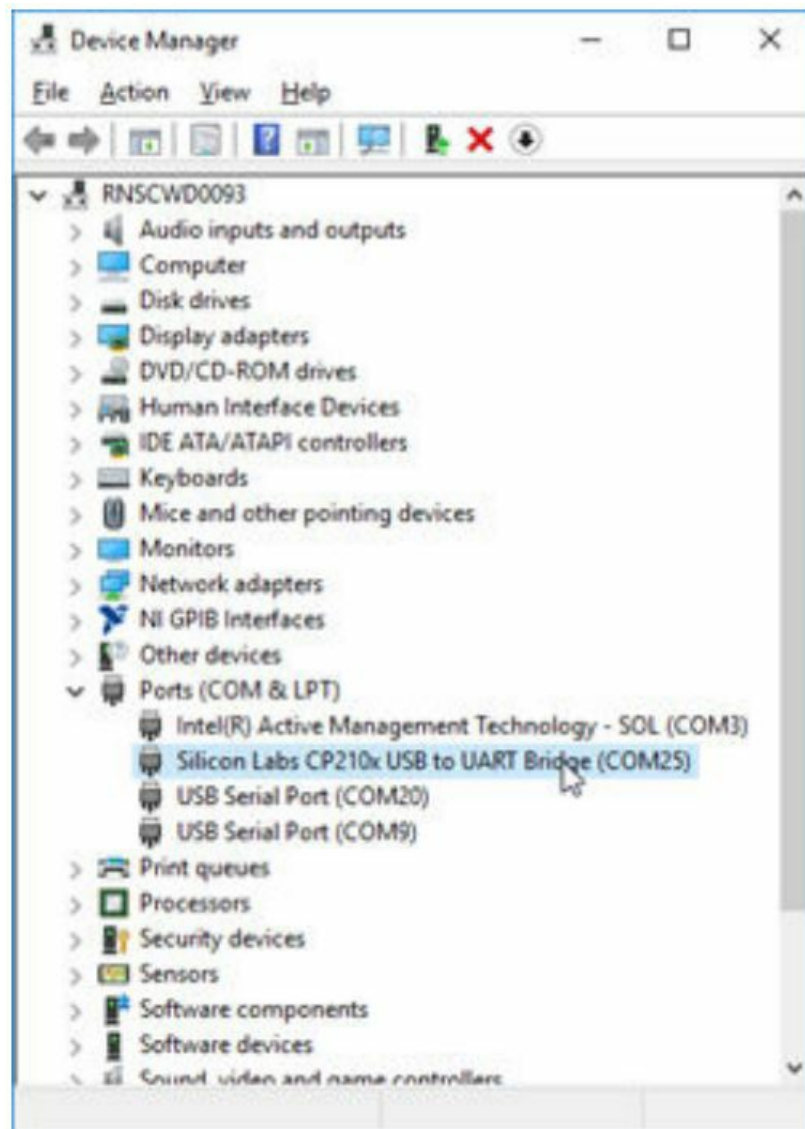
2.5 Settings

The GUI settings are accessible by clicking the Settings icon.

Figure 15. Available settings panels

Settings

COM port (main) | Paths | GUI

default Port COM [COM4] [Use current]

ST-ONE Communication Interface

- ○ Direct Serial Connection
- ● UART mode
- ○ I²C mode

I2C address (0x) [38]

☐ Log UART messages on a txt file

UART Tx Delay (ms) [5]

☑ AutoDetect SiLabs Port

☐ UART Rx<->Tx swap

☐ Uart Tx Open Drain

[Save Settings]

Settings

COM port (main) | **Paths** | GUI

Editor path [...] [C:\Program Files (x86)\Notepad++\notepad++.exe]

Default Flash [...] [C:\ST-ONE\GUI\ExamplePath]

Default Param [...] [C:\ST-ONE\GUI\ExamplePath]

Default Param [...] [C:\ST-ONE\GUI\ExamplePath]
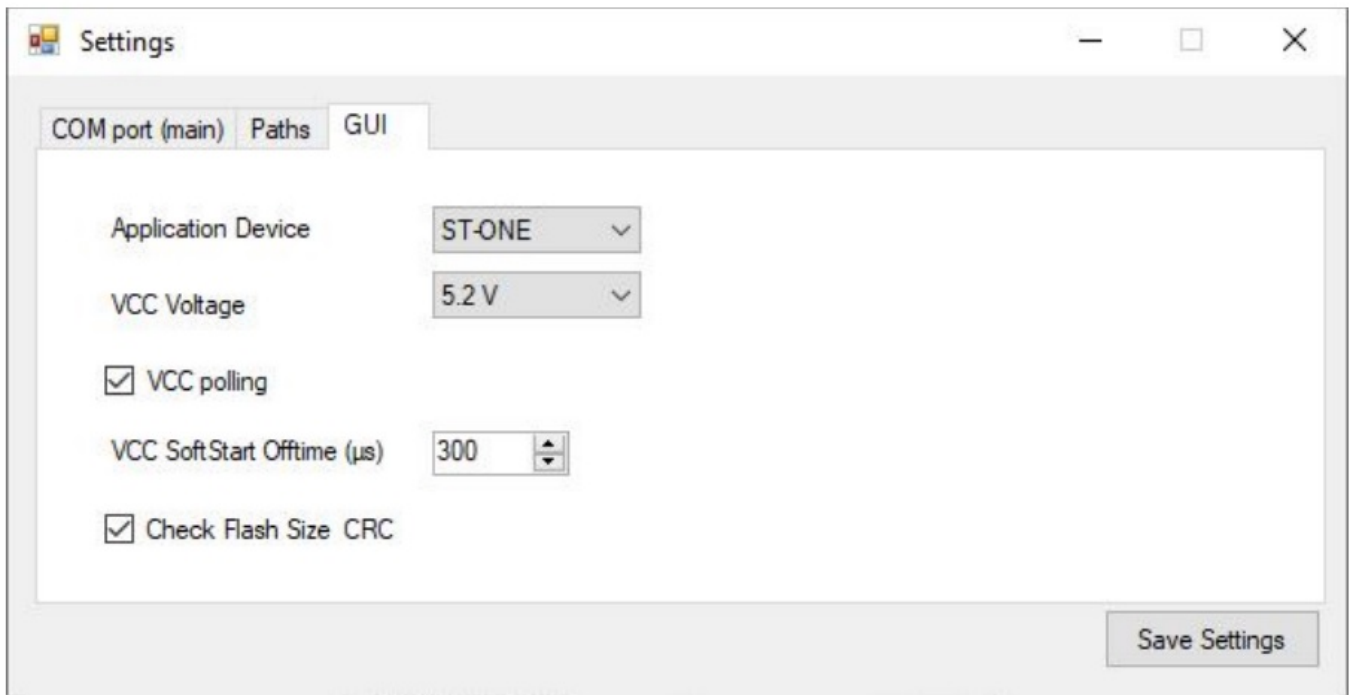
[Save Settings]

The Save Settings button allows to save the settings into the config.xml file, located in: ".\\xml\\config.xml", maintaining the same choices for the next time the GUI is opened.

Table 1. GUI settings

All the options configurable through the *Settings* form are listed below:

COM port (main)	
Default port COM	The UART COM port used by default if autodetection is not enabled.
Direct serial connection	Check this box to use the GUI without the STEVAL-PCC020V2 board (using a standard USB 2 serial cable), otherwise VCC cannot be supplied.
AutoDetect SiLabs port	Autodetect SiLabs COM port.
UART Tx open drain	If checked, Tx is open drain (then a pull-up resistor is needed on the ST-ONE Rx line).
Log UART messages from STNRG	Option to log the UART exchange on a file (uart_trace.txt on the GUI executable directory).
Default paths	
Editor path	Default path for the text editor.
Flash	Default path for the application firmware.
Parameters	Default path for the flash parameters.
Flash + parameters	Default path for the complete file to set up both application firmware and flash parameters.
GUI settings	
Application device	Select the target device (ST-ONE or ST-ONE MP); this choice automatically configures the correct .xml files package.
VCC voltage	Select the VCC voltage
VCC polling	Enable or disable VCC polling
VCC SoftStart off-time	PWM off-time used during VCC startup. The longer this value is, the smoother the VCC. The default value may be fine with most of the ST-ONE applications.
Check flash size CRC	Check the correctness of the CRC computed from the flash content.

GUI features

3.1 Application flash parameters editor

Figure 16. Application flash parameters editor

Documents / Resources

STMicroelectronics UM3055 STSW-ONE Graphical User Interface [pdf] User Manual
STEVAL-PCC020V2.1, UM3055 STSW-ONE, UM3055 STSW-ONE Graphical User Interface, S
TSW-ONE Graphical User Interface, Graphical User Interface, User Interface

References

- **STMicroelectronics: Our technology starts with you**
- **STMicroelectronics Trademark List - STMicroelectronics**
- **ST-ONE - Fully integrated controller for smart chargers - STMicroelectronics**

Manuals+,