
How to use the STSPIN Studio evaluation software

Introduction

The STSPIN Studio software is designed to help you evaluate the functionality and performance of the STSPIN family of devices. The supported evaluation boards are listed in [Table 1. Supported boards](#).

This software is designed to work with NUCLEO-F401RE board connected to an STSPIN evaluation board.

1 Hardware and software requirements

Software requirements:

- PC with Windows 7 or 10 operating system.
- Framework .NET 4.5.2

Hardware requirements:

- A free USB port.
- A NUCLEO-F401RE Nucleo development board.
- One or more compatible demonstration boards listed in the following table:

Table 1. Supported boards

Board part number	Reference device	Description
X-NUCLEO-IHM06A1	STSPIN220	Low voltage stepper motor driver
X-NUCLEO-IHM12A1	STSPIN240	Low voltage dual brush DC motor driver
X-NUCLEO-IHM14A1	STSPIN820	Advanced 256 microstep integrated motor driver with step-clock and direction interface
X-NUCLEO-IHM15A1	STSPIN840	Compact dual brushed DC motor driver

2 How to run STSPIN Studio

STSPIN Studio includes an updating feature that checks for the latest version of the software online and ensures that you have the latest firmware for each device. Once the latest package has been installed, the user can work offline because the application stores the package in a local cache.

Go to www.st.com and download the installation file. At the end of the installation, you will be able to use STSPIN Studio to download the packages related to your Nucleo expansion board and evaluate the device of your interest.

Follow the steps below to run STSPIN Studio:

1. Connect the NUCLEO-F401RE development board to your PC via USB.
2. Connect the expansion board to the Nucleo development board (check the specific expansion board user manual instructions for details).
3. Run STSPIN Studio

Once opened the STSPIN Studio, a connection window appears and the application tries to establish communication with the microcontroller. During this period, the Nucleo logo in the connection window is green and the “Device: Unknown” text appears below it, as shown in the following figure.

Figure 1. Connection window - establishing communication



If the microcontroller is programmed with an unsupported device or no firmware is present, at the end of the connecting process the Nucleo symbol becomes gray and “Device : Unknown” text remains, as shown in the following figure.

Figure 2. Connection window - no communication with the board



If supported firmware is detected and the respective package is already installed, the STSPIN Studio is ready to work. The name of the Nucleo development board connected to the PC is shown in the connection window. You will see a blue Nucleo symbol with the name of the device installed, as shown in the following figure.

Figure 3. Connection window – communication established


If multiple development boards are connected, the names of each board is listed in the connection window and you must select the board you want to use.

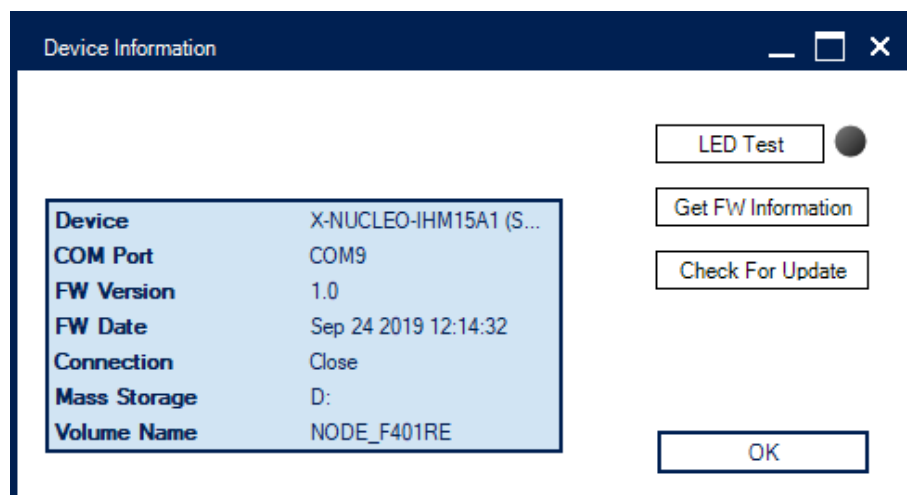
If the Nucleo symbol remains green or the device hasn't been recognized yet, you can try to restart communication by clicking on the Nucleo symbol.

The "Update" button on the right allows you to check for latest packages available online and install them.

2.1 Device information window

The STSPIN Studio connection window shows the recognition and communication status of each Nucleo development board connected to your PC: the color of the nucleo logo indicates to the user if the device has been recognized and shows the name of the target STSPIN board if so.

A wrench icon below each listed Nucleo device provides access to further information regarding the communication status and the firmware present on the corresponding Nucleo development board microcontroller, as shown in the following figure.

Figure 4. Device Information


The information window shows the following details:

- Device name of the development board connected
- Virtual COM used for communication
- Firmware version flashed on the board
- Time and date when the firmware was flashed onto the board
- Connection status
- Name of mass storage peripheral

- Volume label of the mass storage

You can also test the connection with the development board with the “LED test” button, which causes the green LED on the development board to light up for several seconds.

The “Auto detect FW version” checkbox allows the user to inhibit the automatic recognition of the firmware. When unchecked, the application does not automatically check the firmware as soon as USB connection is established, and a green Nucleo symbol with “Unknown device” is shown. To check the firmware version and open communication, you need to click on the green Nucleo symbol.

2.2 Starting STSPIN Studio the first time

If the microcontroller is programmed with an unsupported device or no firmware is present, the Nucleo symbol becomes gray and the device is Unknown. In this case, you need to follow the steps below to install the appropriate package.

1. Click on Update button indicated in the following figure.

Figure 5. Update button in Communication window



The Update window shown in the following figure appears.

Figure 6. Update window



2. Install the appropriate device package by clicking on the “Install” button of the latest version in the device section. Before proceeding, remember to switch off the supply of the development board. Once finished, the package firmware is loaded on the Nucleo microcontroller and communication can start.

3. Click on the STM32 Nucleo symbol (Figure 3. Connection window – communication established) to view the control panel for to the associated expansion board.

2.3 Using a board with supported firmware

- If supported firmware is detected and the corresponding package is already installed, then STSPIN Studio is ready to work. You will see a blue Nucleo symbol with the name of the device installed (Figure 3. Connection window – communication established).

In this case you only need to click on the STM32 Nucleo symbol to view the control panel for to the associated expansion board.

2.4 Change the expansion board

To change the expansion board, you need to install a new board package.

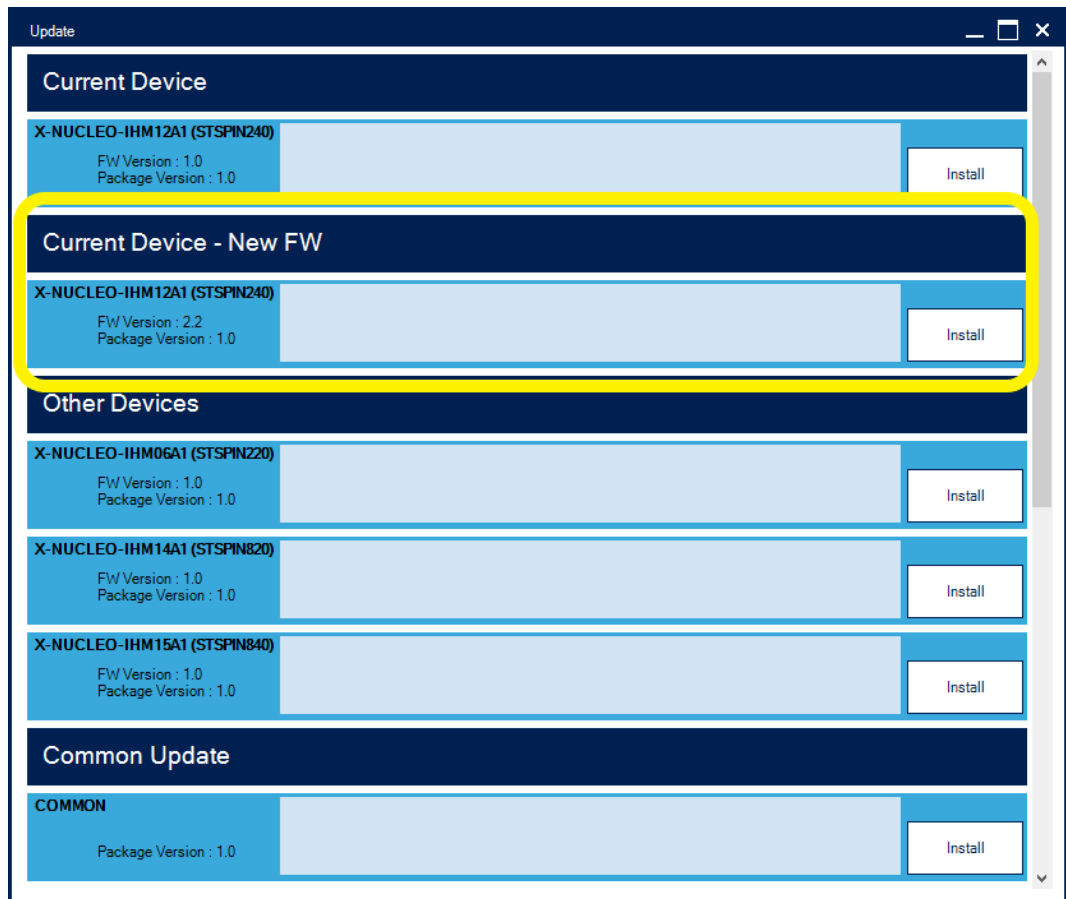
1. Click on the “Update” button (Figure 5. Update button in Communication window) to open the Update window (Figure 6. Update window).
2. Install the appropriate device package by clicking on the “Install” button of the latest version in the device section. Before proceeding, remember to switch off the supply of the development board. Once finished, the package firmware is loaded on the Nucleo microcontroller and communication can start.
3. Click on the STM32 Nucleo symbol (Figure 3. Connection window – communication established) to view the control panel for to the associated expansion board.

2.5 Upgrade the firmware with a newer version

Follow the procedure below to check whether a new firmware version is available for use.

- Click on the “Update” button (Figure 5. Update button in Communication window) to see if new firmware is available.

Figure 7. Update window when new firmware is available



- If the “Current Device - New FW” row appears, you can install the new firmware package by clicking on the corresponding “Install” button (Figure 7. Update window when new firmware is available). Before proceeding, remember to switch off the supply of the development board. Once finished, the package firmware is loaded on the Nucleo microcontroller and communication can start.
- Click on the STM32 Nucleo symbol (Figure 3. Connection window – communication established) to view the control panel for to the associated expansion board.

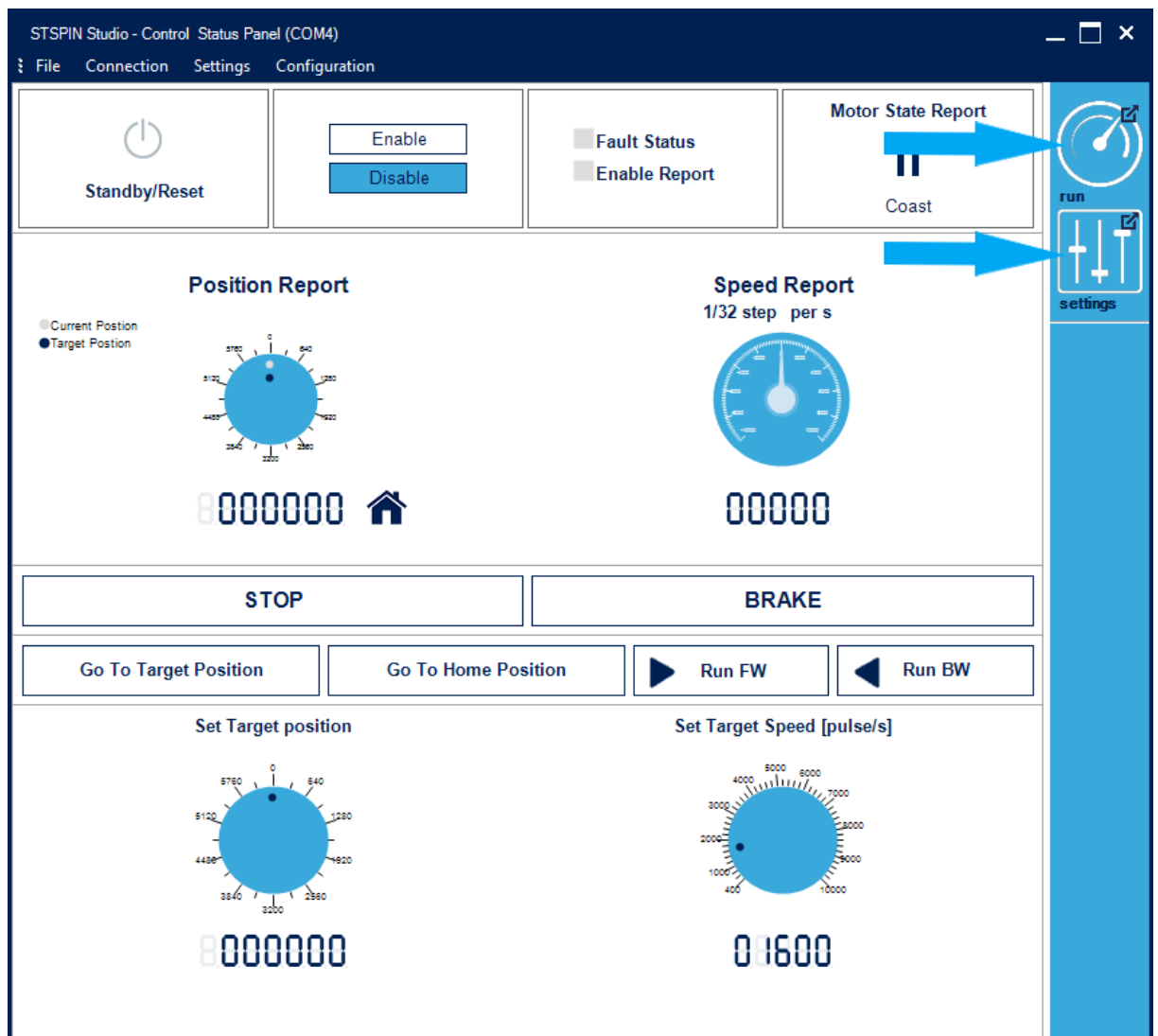
3 How to use the Control Panel

Once you have successfully established communication with the STM32 Nucleo development board as described in the previous sections, you can proceed to use the STSPIN Studio Control Panel.

Depending on the expansion board you are using, you will find two different controls:

- Stepper control with “run” and “settings” panels
- Dual DC control with “run” panel only

Figure 8. Main Stepper control panel



3.1 Stepper Control: run panel

After selecting the “run” panel, you can perform the functions listed below:

- control Enable and Standby/Reset pins
- command to the device: GoToPosition, GoToHome, RunFW, RunBW
- set the Target Position and the Maximum Speed
- set home position
- stop the motor in two different ways (Soft stop and Hard Stop)

- view the Fault Report
- view the Speed Report, the Current Position Report and Motor State Report
- By enlarging the window, you can monitor the graph of Current Position and Speed during usage, as shown in the following figure.

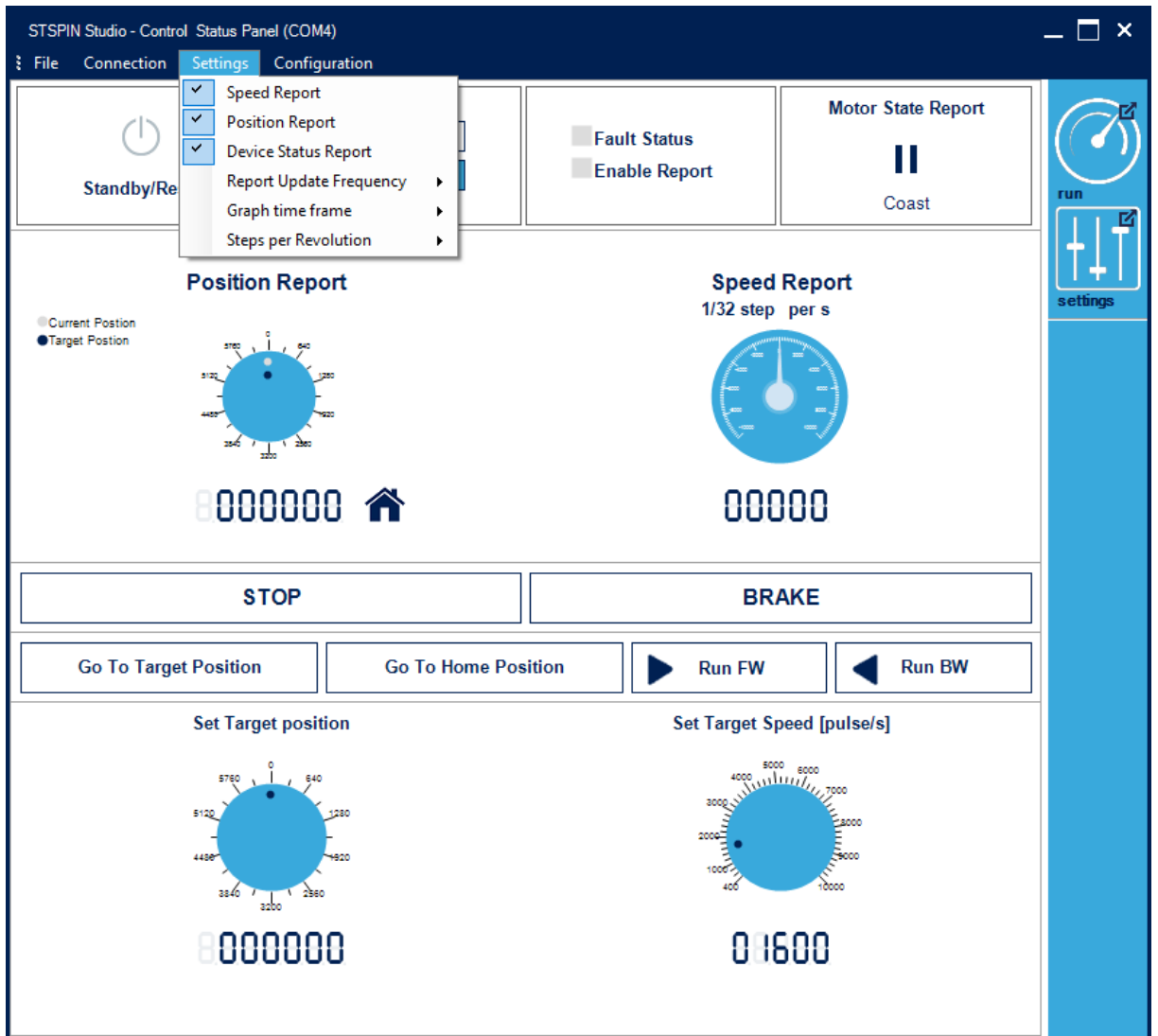
Figure 9. Stepper control with run panel



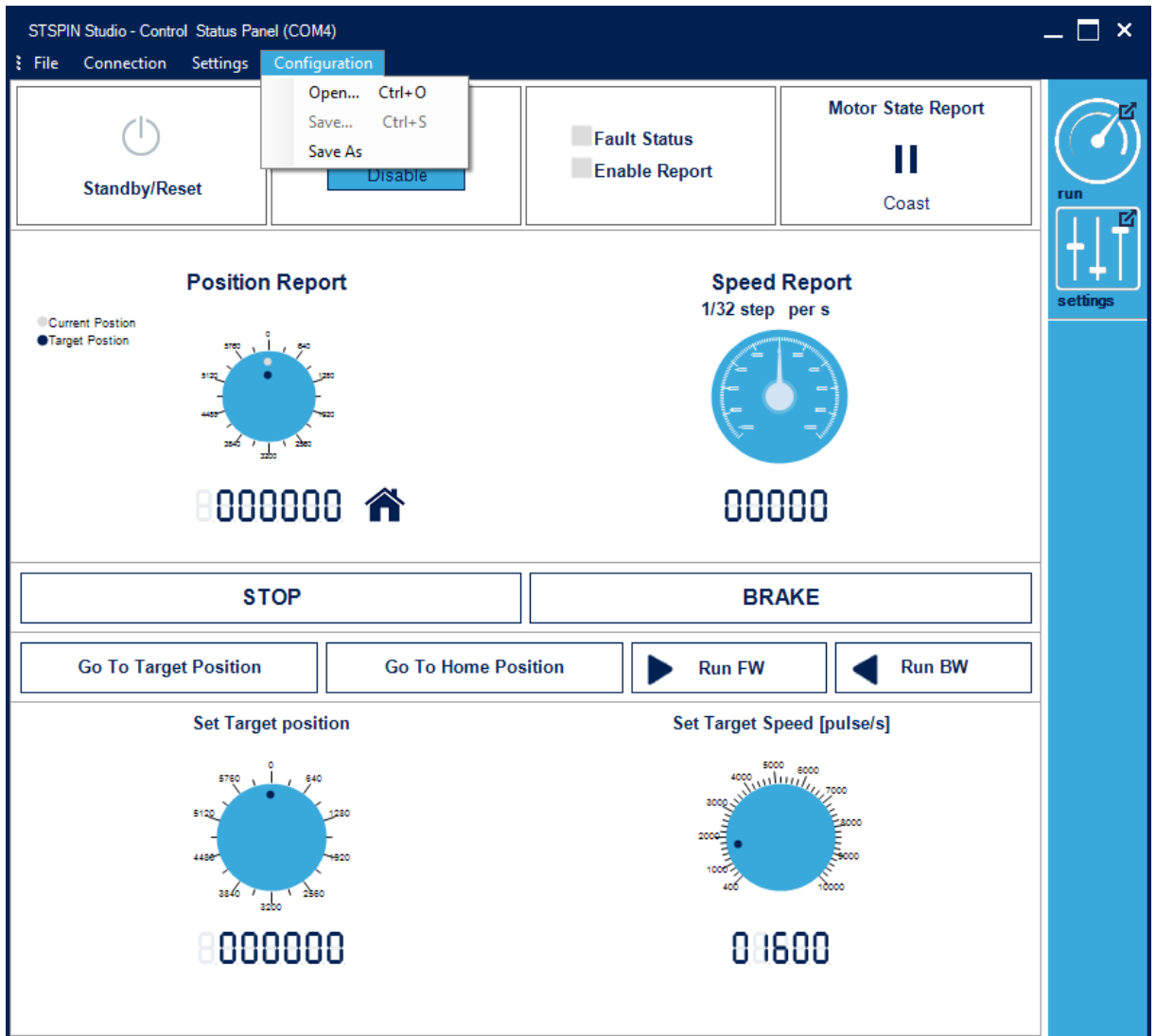
Under “Settings” in the top menu bar (Figure 10. Settings drop down menu), you can select the following options:

- Speed Report
- Position Report
- Device Status Report
- Report Update Frequency: choose from four different rates at which the values are updated
- Graph time frame: time window in the Position and Speed graphs
- Steps per revolution: choose from three common step values per revolution or set a custom value

Figure 10. Settings drop down menu



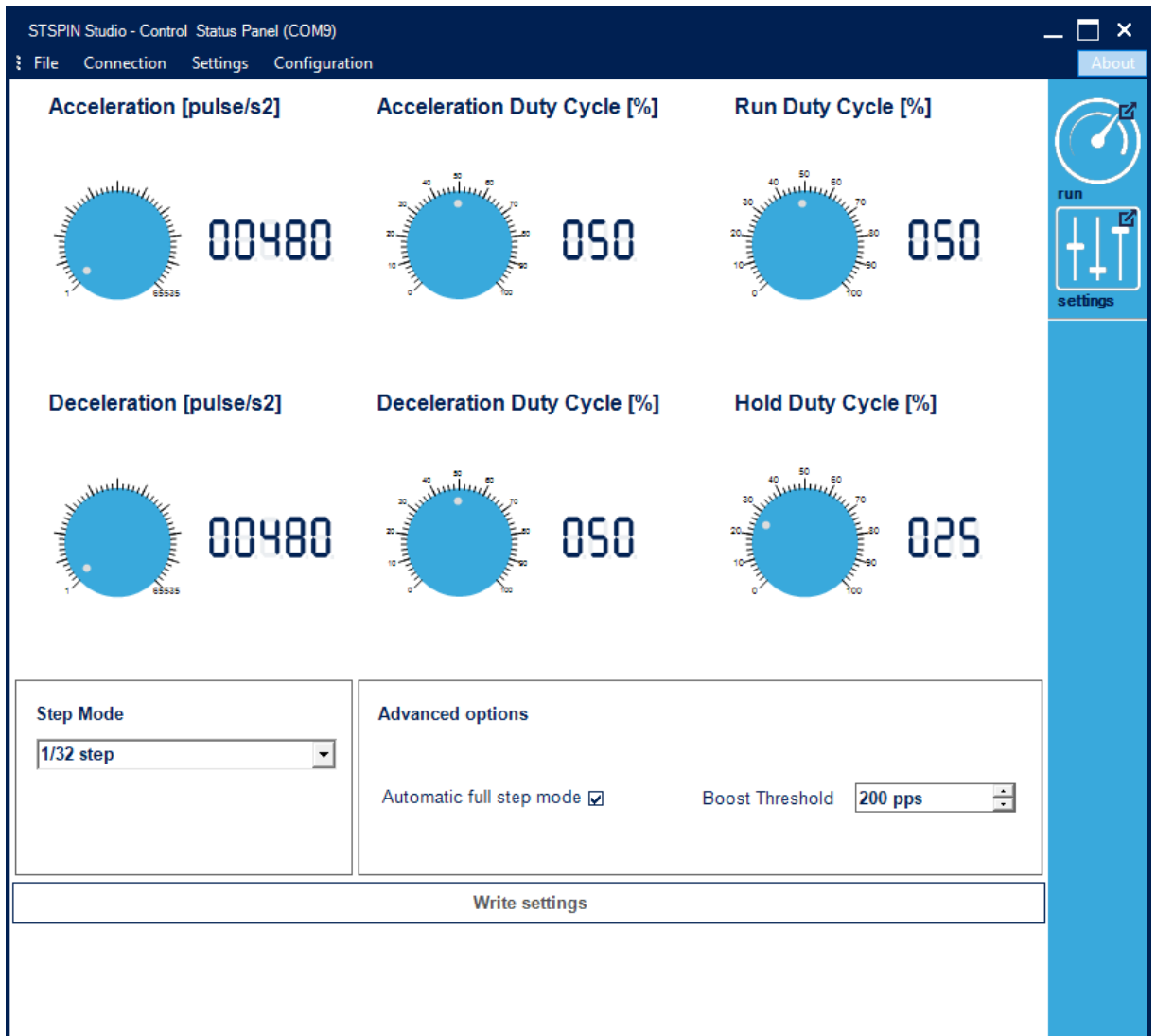
Under “Configuration” in the top menu bar (Figure 11. Configuration drop down menu), you can save and load your settings preferences.

Figure 11. Configuration drop down menu


3.2 Stepper control: settings panel

When selecting the settings panel ([Figure 12. Stepper control - settings panel](#)):

- You can control the firmware parameters such as Acceleration, Deceleration, Duty Cycle, Step Mode, Decay for STPIN820 and Torque Boost Speed Threshold (if Automatic Full Step is set).
- Remember to click on Write settings when you have changed the settings.

Figure 12. Stepper control - settings panel


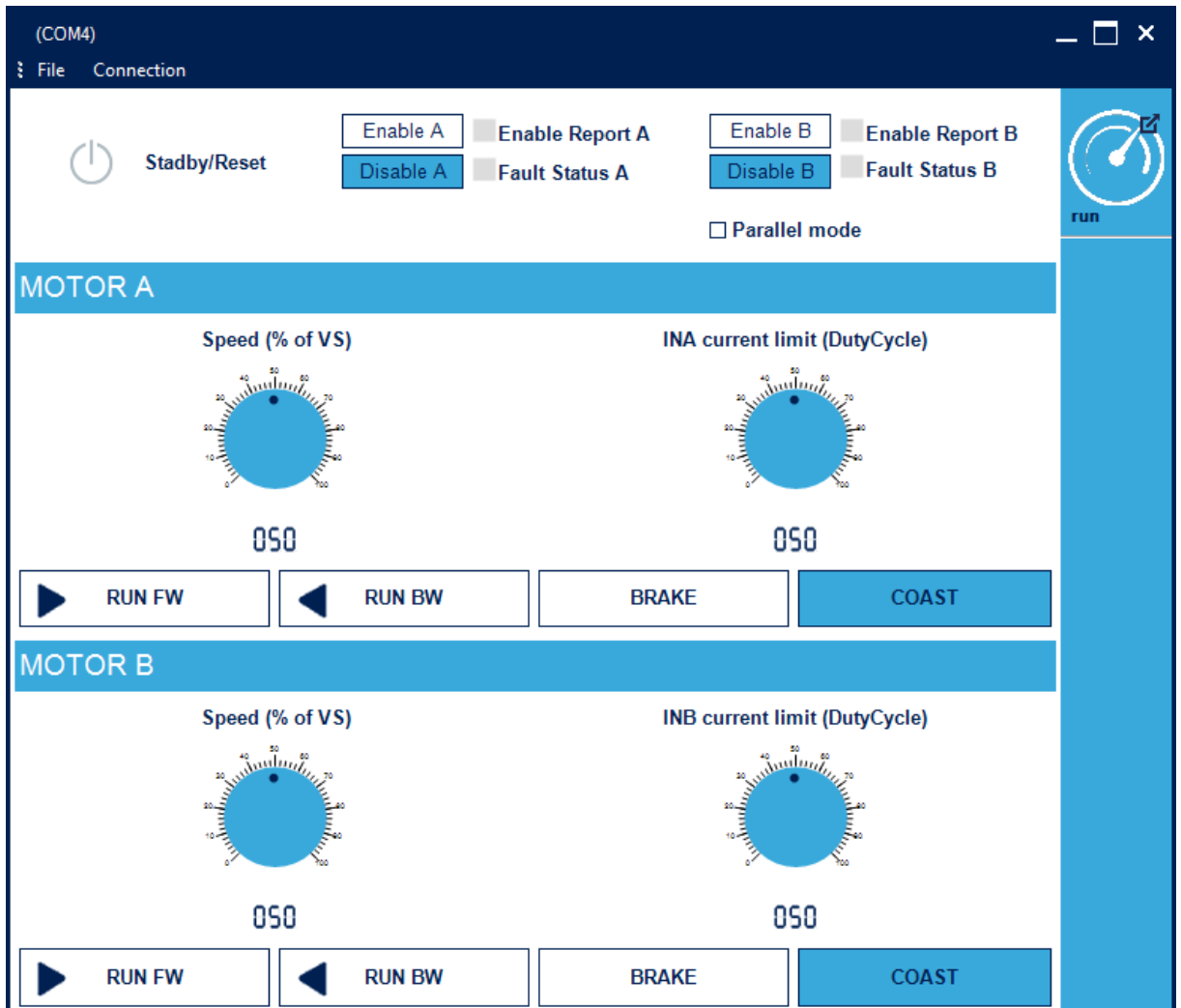
3.3 Dual DC Control: run panel

After selecting the “run” panel (Figure 13. Dual DC Control panel), you can perform the functions listed below:

- Control Enable and Standby/Reset pins: for STSPIN840, you can control the two enable pins independently
- Command the device: RunFW, RunBW
- Set the Duty cycle of PWM and the Duty Cycle for the Current Limiter reference
- Stop the motor in two different modes: stop and brake
- View the Fault Report: for STSPIN840, you can view two fault reports
- For STSPIN840, you can select Parallel Mode to use only side A of the firmware.

Note: Be sure to implement the HW settings for parallel mode described in the STSPIN840 datasheet.

Figure 13. Dual DC Control panel

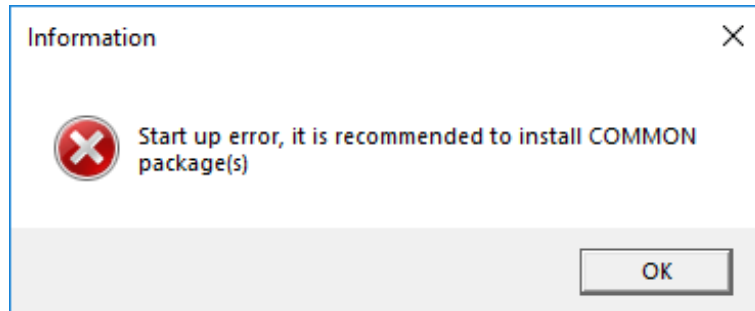


4 Troubleshooting

Common Package file missing

If the start up error figured below appears, some of the common package files may be missing and you will be prompted to install them.

Figure 14. Start up error



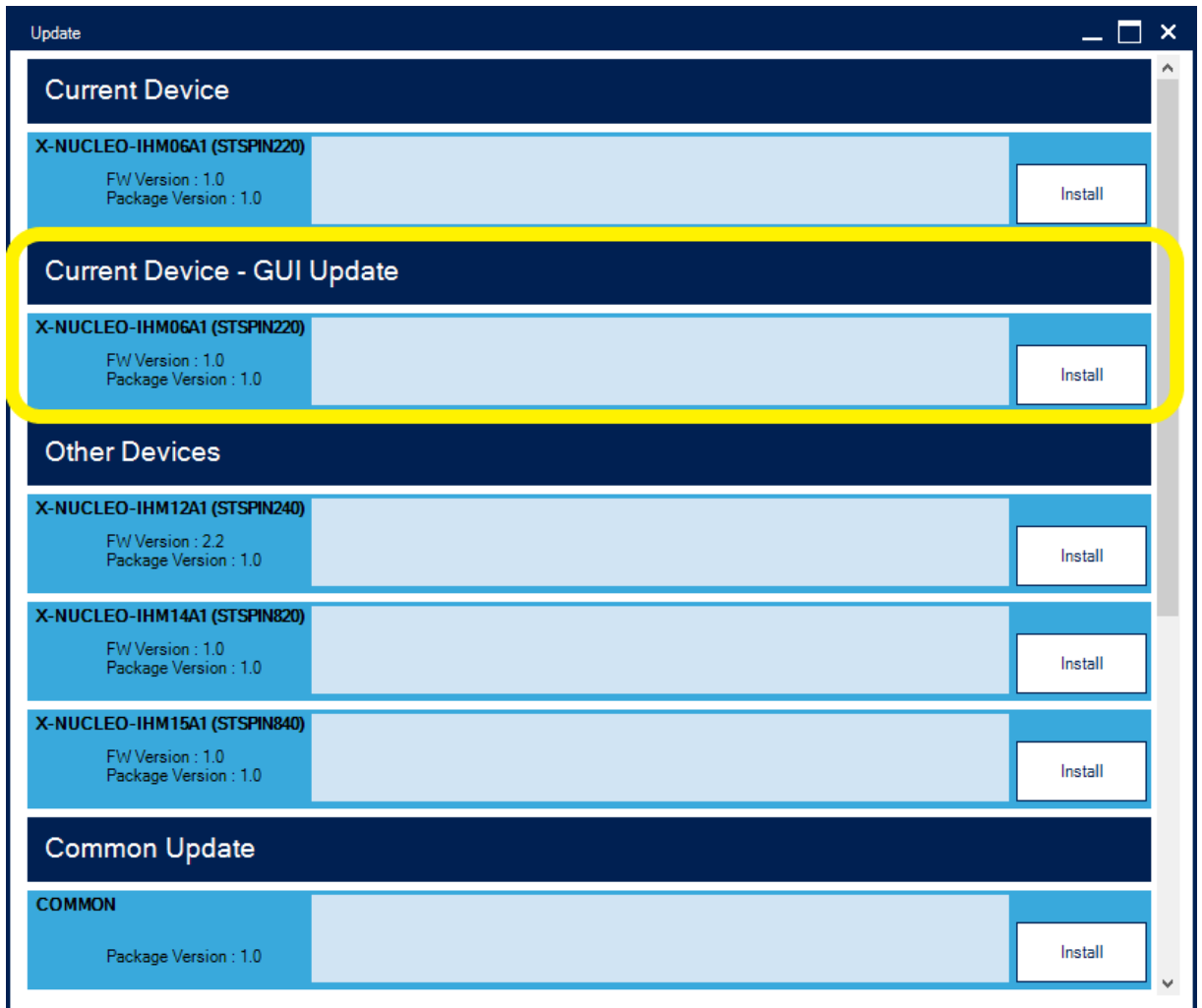
1. Click on the error message OK button and the Update window in [Figure 6. Update window](#) will appear
2. Install the Common package by clicking on the corresponding "Install" button on the right. Once finished, the installation a window will appear on the screen, allowing the user to establish communication with the expansion board.
3. Proceed as described in [Section 2 How to run STSPIN Studio](#)

Board package file missing

If a GUI-Update section appears in the Update Window ([Figure 15. Update window - GUI Update](#)), some of the files in the board package may not be installed and a new package installation is recommended.

1. Click on the corresponding "Install" button for the GUI Update section. Before proceeding remember to switch off power supply to the development board. Once installation has finished, a window will appear on the screen to allow the user to establish the communication with the expansion board.
2. Proceed as described in [Section 2 How to run STSPIN Studio](#)

Figure 15. Update window - GUI Update



Revision history

Table 2. Document revision history

Date	Version	Changes
16-Jan-2020	1	Initial release.

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