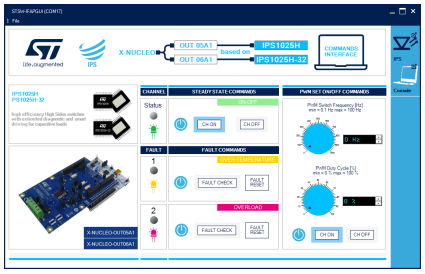
STSW-OUT5G4

Data brief

Evaluation firmware for NUCLEO-G431RB enabling STSW-IFAPGUI on X-NUCLEO-OUT05A1 and X-NUCLEO-OUT06A1 expansion boards



Features

- Full control of the X-NUCLEO-OUT05A1 and X-NUCLEO-OUT06A1 expansion boards via the STSW-IFAPGUI graphical user interface
- Control of:
  - channel applications
  - output channel switching frequency and duty cycle configuration
  - visualization of diagnostic signals (overload and over-temperature diagnostic)

Description

The STSW-OUT5G4 firmware runs on the NUCLEO-G431RB development board and allows the control of the X-NUCLEO-OUT05A1 or X-NUCLEO-OUT06A1 expansion boards using the STSW-IFAPGUI graphical user interface.

The STSW-OUT5G4 contains the software routines that enable the USB-based communication between NUCLEO-G431RB and the system where STSW-IFAPGUI runs, and the control of the X-NUCLEO-OUT05A1 or X-NUCLEO-OUT06A1.

The firmware can control a single expansion board (X-NUCLEO-OUT05A1 or X-NUCLEO-OUT06A1).

The STSW-IFAPGUI is based on a common engine and several plug-ins designed to communicate through USB connection with the application layer running on the NUCLEO-G431RB development board stacked with the expansion board.

Product summary	
Evaluation firmware for NUCLEO-G431RB enabling STSW-IFAPGUI on X-NUCLEO-OUT05A1 and X-NUCLEO-OUT06A1 expansion boards	STSW-OUT5G4
Industrial digital output expansion board based on IPS1025H for STM32 Nucleo	X-NUCLEO-OUT05A1
Industrial digital output expansion board based on IPS1025H-32 for STM32 Nucleo	X-NUCLEO-OUT06A1
STM32 Nucleo-64 development board with STM32G431RB MCU	NUCLEO-G431RB
Graphical user interface for the industrial IPS and IO-Link transceiver evaluation boards based on STM32 Nucleo	STSW-IFAPGUI
Applications	Industrial Safety Industrial Tools

1 How to control a single expansion board

This application scenario is based on the default on-board switches and resistors configuration of X-NUCLEO-OUT05A1 (or X-NUCLEO-OUT06A1).

Step 1. Stack the X-NUCLEO-OUT05A1 (or X-NUCLEO-OUT06A1) on the NUCLEO-G431RB board flashed with the STSW-OUT5G4 firmware through the Arduino connectors.

Step 2. Connect the two stacked boards to your PC or laptop USB port through a micro-USB cable.

The STM32 is supplied via USB (3.3 V) and the flashed firmware starts running.

Press the black button on the NUCLEO-G431RB board to reset the firmware.

Step 3. Launch the STSW-IFAPGUI.

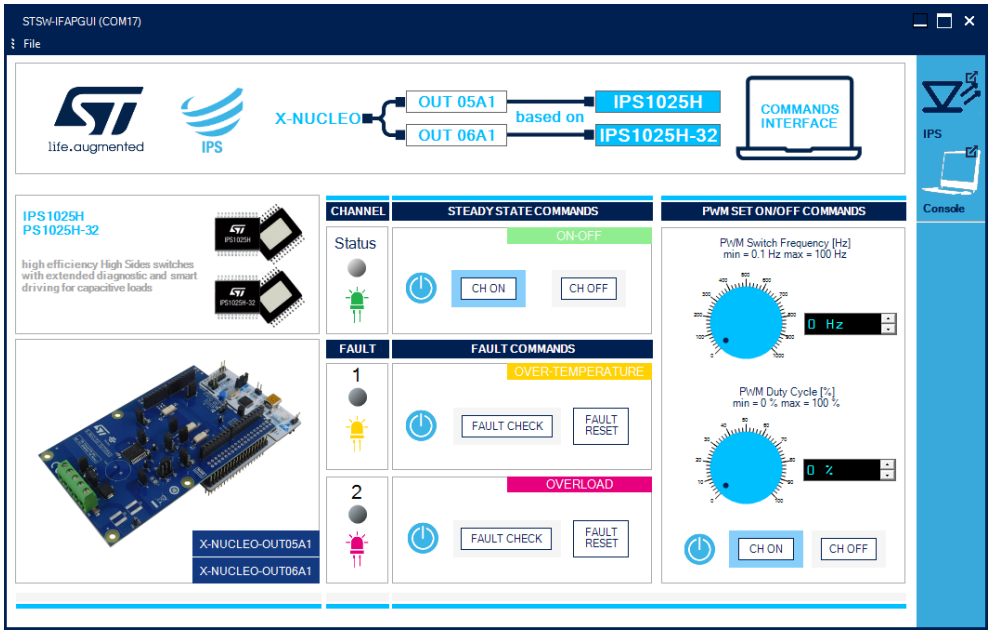
When the application starts, the firmware running on the STM32 is automatically detected and a COM port is opened for communication.

Figure 1. STSW-IFAPGUI COM port opened

Step 4. Click on the GUI STM32 Nucleo icon after it turns blue (it remains green until the firmware identification is complete).

The STSW-IFAPGUI appears on the screen.

Figure 2. STSW-IFAPGUI main control panel



Step 5.

- Use the left side of the GUI to manage channel steady state for IPS1025H (or IPS1025H-32)
- Use the right side of the GUI to manage its PWM settings.

Step 6. Connect the load and supply the power stage of the X-NUCLEO-OUT05A1 (or X-NUCLEO-OUT06A1) with a 24 V rail via the CN1 connector.

Step 7. Select the desired switching frequency and duty cycle of the output channel through the [**PWM SET ON/OFF COMMANDS**] on the right side of the GUI.

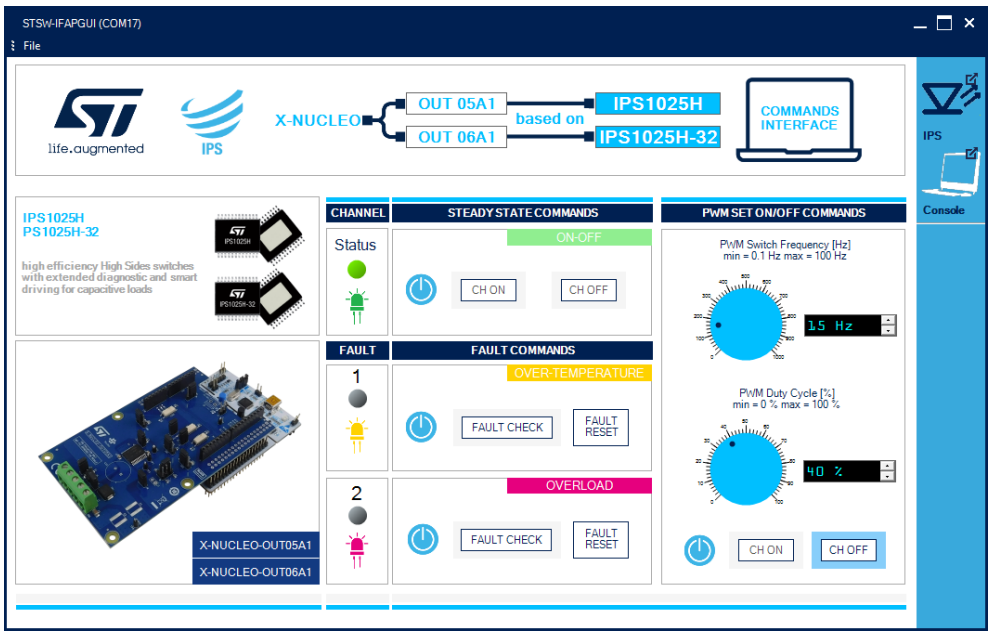
Step 8. The output channel steady state can be activated / deactivated by clicking on the [**CH ON / CH OFF**] buttons on the left side of the GUI in the [**STEADY STATE COMMANDS**].

Step 9. Click on the [**FAULT CHECK**] button on the left side of the GUI to monitor the on/off status on the desired FAULT pin on IPS1025H (or IPS1025H-32) (FAULT1 for over-temperature, FAULT2 for overload).

You can stop monitoring the fault status by clicking again on the related [**FAULT CHECK**] button.

Press [**FAULT RESET**] button to reset the related fault status.

Figure 3. STSW-IFAPGUI in action



Revision history

Table 1. **Document revision history**

Date	Revision	Changes
24-Mar-2022	1	Initial release.

IMPORTANT NOTICE – READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgment.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2022 STMicroelectronics – All rights reserved