The RHFAD128 GUI

Introduction

The RHFAD128 is specifically designed to sustain ionizing dose and heavy ions for space applications by using a high-end proven CMOS technology.

This device is a low-power, multiplexed eight-channel 12-bit analog-to-digital converter for conversion from 50 ksps to 1 Msps. The architecture is based on the successive-approximation register with internal track-and-hold. The RHFAD128 features 8 analog inputs that can be programmed to be either 8 single-ended or 4 differential inputs using the control register bits. The output serial data are straight binary and are compatible with SPI.

EVAL-RHFAD128V2 is the evaluation board of the RHFAD128.

This board can be connected to a NUCLEO-L476RG and be monitored with a graphical user interface (GUI): the RHFAD128_GUI.

1 Getting started

1.1 System requirements

The RHFAD128_GUI software needs the following system requirements to perform:

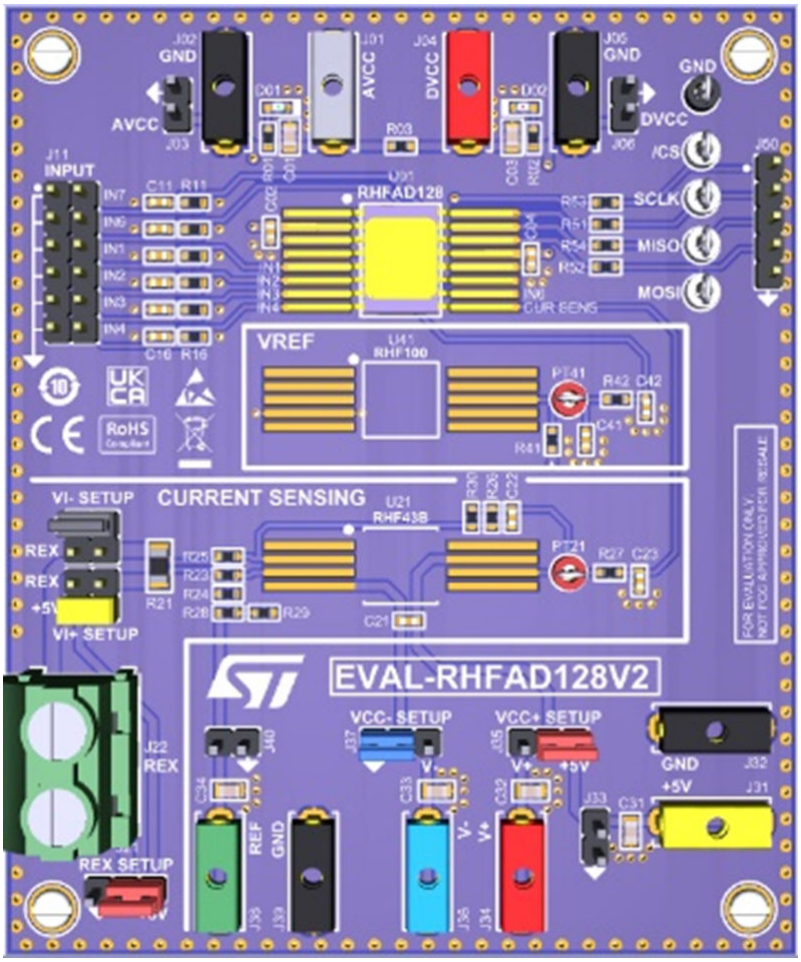
Table 1. System requirements

Main components	
NUCLEO-L476RG	STM32 Nucleo development board
Mini-B USB cable	With USB data support
AKI_BIN_for_NucleoL476RG	Software for Nucleo
RHFAD128_GUI	RHFAD graphical user interface
EVAL-RHFAD128V2	RHFAD128 evaluation board
Operating system	Windows OS
STSW-LINK009	SW for Nucleo connection

1.2 Hardware configuration

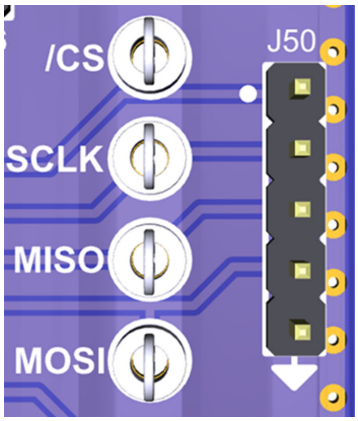
1.2.1 RHFAD128 (EVAL-RHFAD128V2)

Figure 1. EVAL-RHFAD128V2



Connect the EVAL-RHFAD128V2 to the Nucleo using the following pinout.

Figure 2. SPI connectors on the EVAL-RHFAD128V2 and the pinout for the connection to the Nucleo



Nucleo PIN	SPI pin
PB12	Chip select
PB13	SCLK
PB14	MISO
PB15	MOSI

1.3 Software configuration

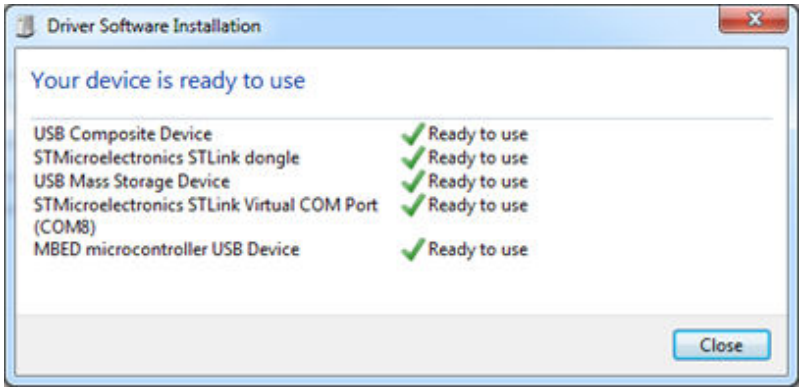
1.3.1 Nucleo connection

1 - Connect the NUCLEO-L746RG to the laptop using a Mini-B USB cable:

Figure 3. NUCLEO-L476RG used to run the GUI

2 - Please make sure that STLINK is installed and up to date:

Figure 4. **STLINK must be installed**



3 - Launch the RHFAD128_GUI

a. Unzip the zipped folder RHFAD128_GUI.zip

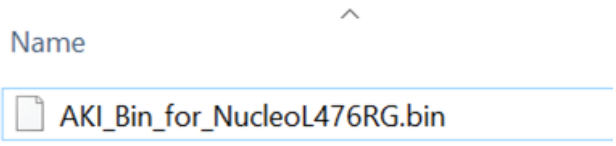
Figure 5. **There are two documents: RHFAD128_GUI folder containing the RHFAD128_GUI.exe to launch on the laptop - AKI_Bin_for_NucleoL476RG.bin to upload in the Nucleo**

4 - **Upload the binary into the STM32 Nucleo board**

Connect the Nucleo board to the PC using a USB Mini-B cable, drag and drop the binary file to the Nucleo board (NODE_L476RG)

- use the binary file: AKI_Bin_for_NUCLEOL476RG.bin

Figure 6. **This file must be uploaded in the Nucleo**



2 Use of the GUI

In the RHFAD128_GUI folder, click on the RHFAD128_GUI.exe file to open the GUI.
The following window must appear.

Figure 7. Device selection window

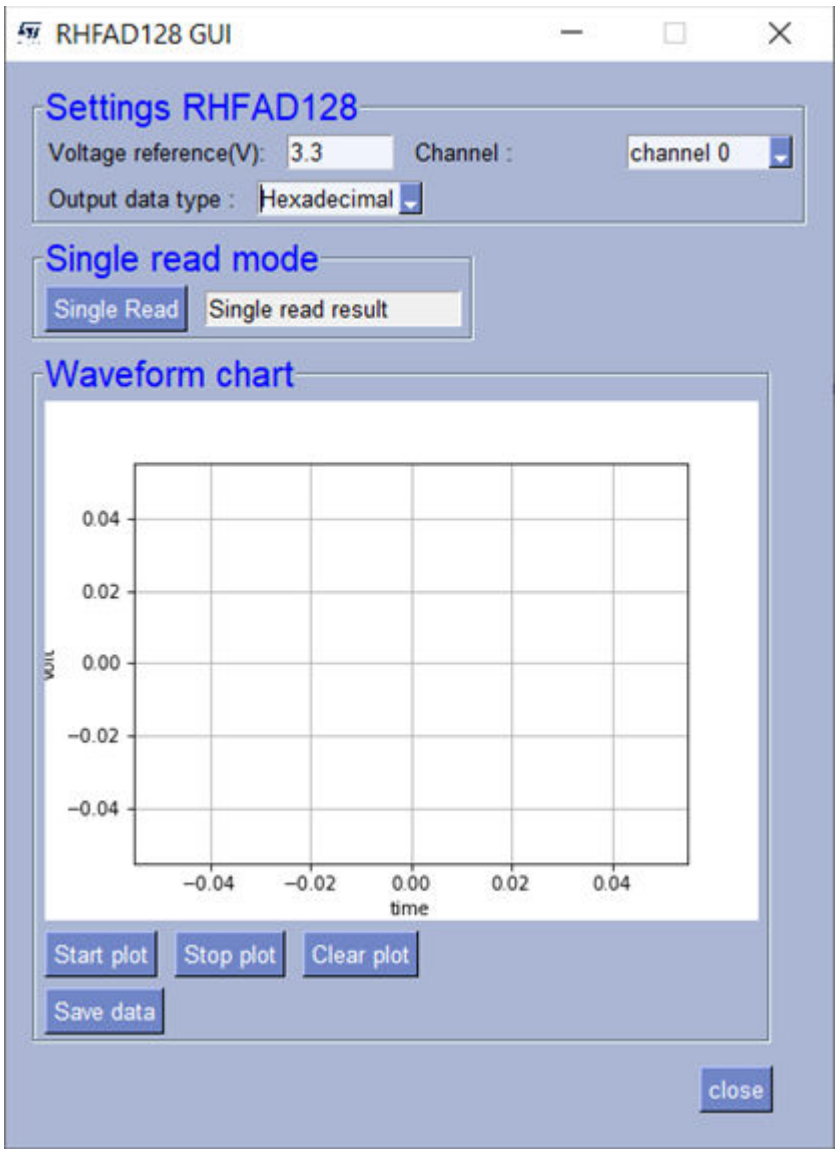


Figure 8. **RHFAD128_GUI interface**

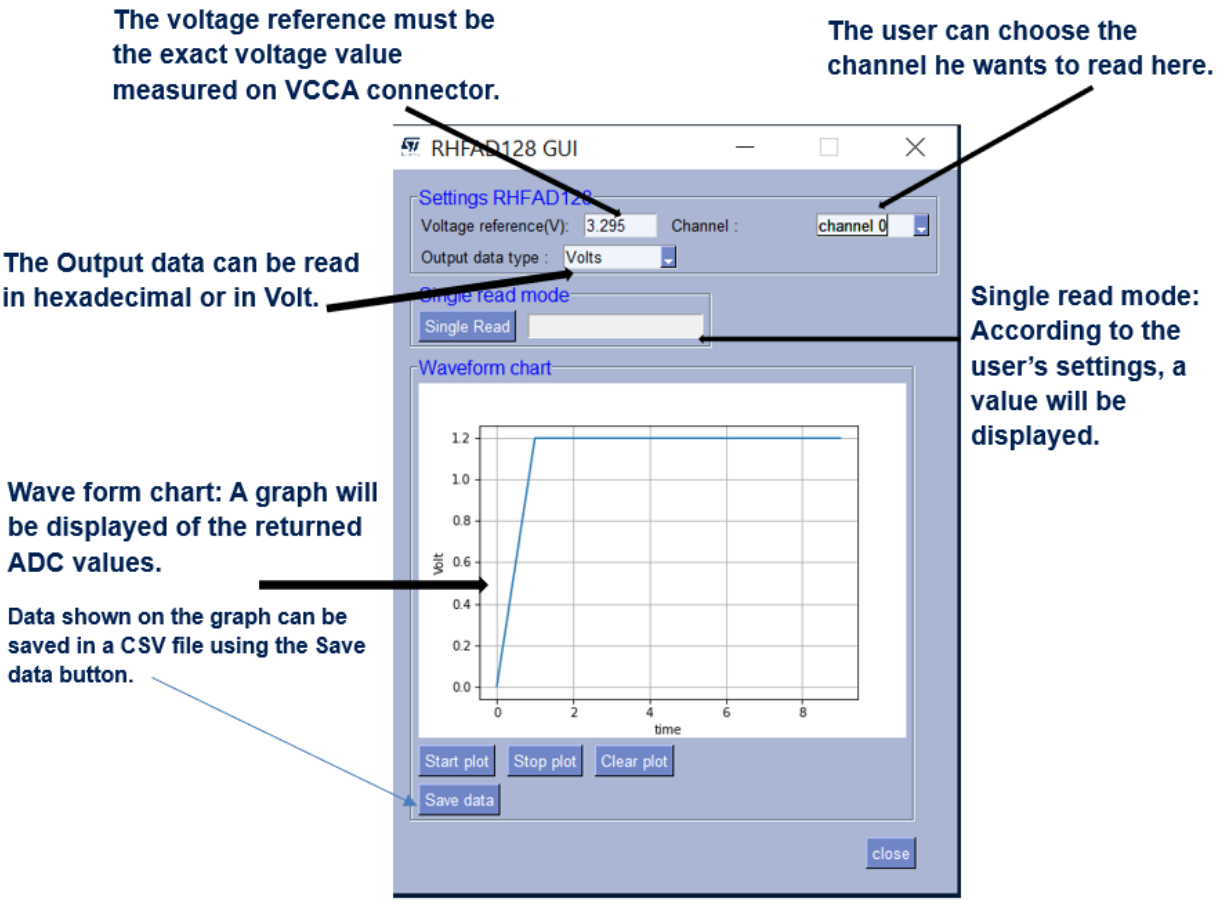


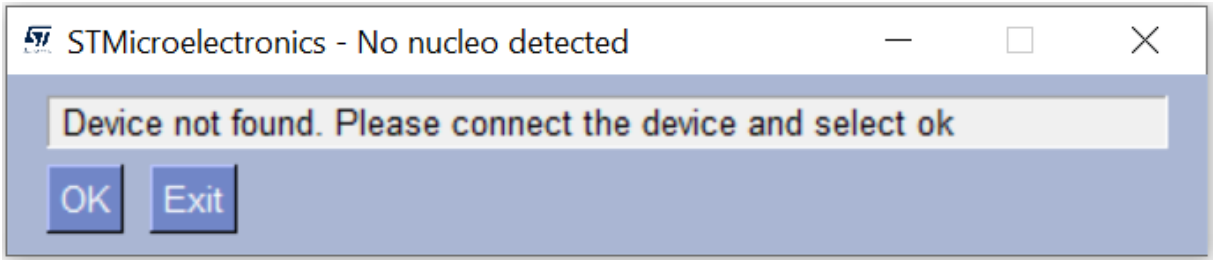
Table 2. **SPI speed used by the GUI to communicate with the RHFAD128**

Product	SPI speed used by the GUI
RHFAD128	500 Msps

3 Troubleshooting

3.1 Device not found

Figure 9. **Device not found window**



Issue:

- The Nucleo board is not detected

Resolution:

- Please connect the appropriate Nucleo board
- Be sure that STLINK is installed and up to date
- It is also better to have only one Nucleo board connected to the computer
- Then click on “OK”.

3.2 Connection issue

Figure 10. **Connection issue message**

Issue:

- In case of unwanted disconnection or a problem in reading the device, the message “Connection issue” appears in the Single read mode communication box.

Resolution:

- Close the GUI and disconnect/reconnect the Nucleo board and restart the GUI
- If the problem persists, check if the board is correctly connected.

4 List of acronyms

Table 3. **List of acronyms**

Term	Meaning
GUI	Graphical user interface

Revision history

Table 4. **Document revision history**

Date	Version	Changes
29-May-2023	1	Initial release.

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