
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 ksp/s to 1 Msp/s. 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:

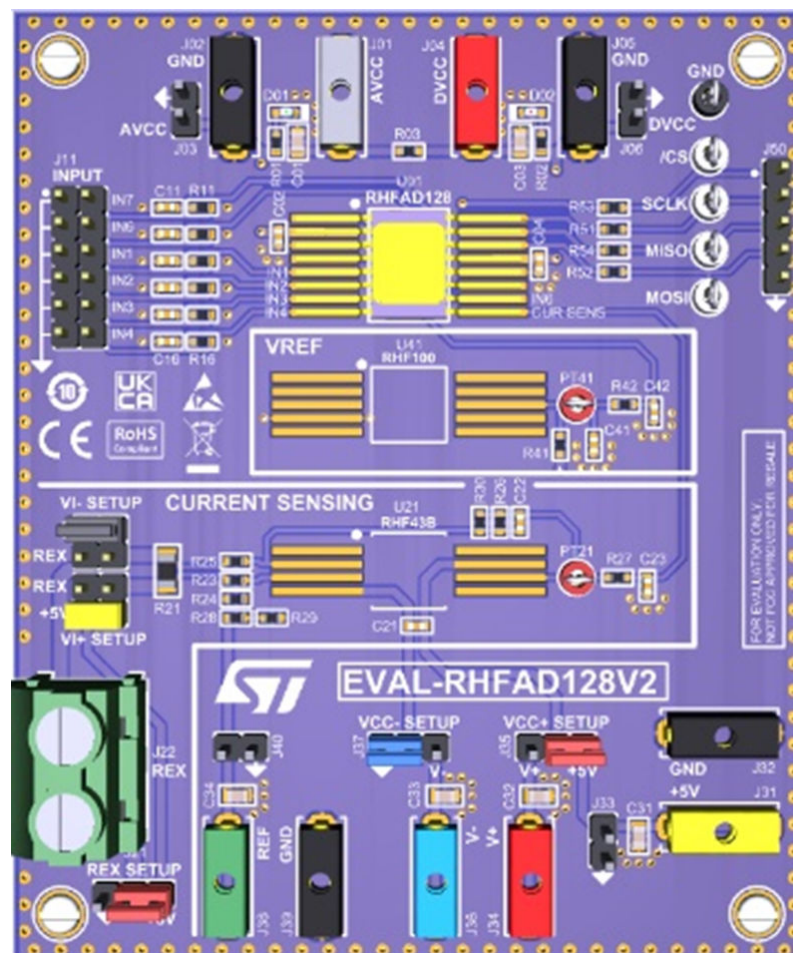
Table 1. System requirements

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

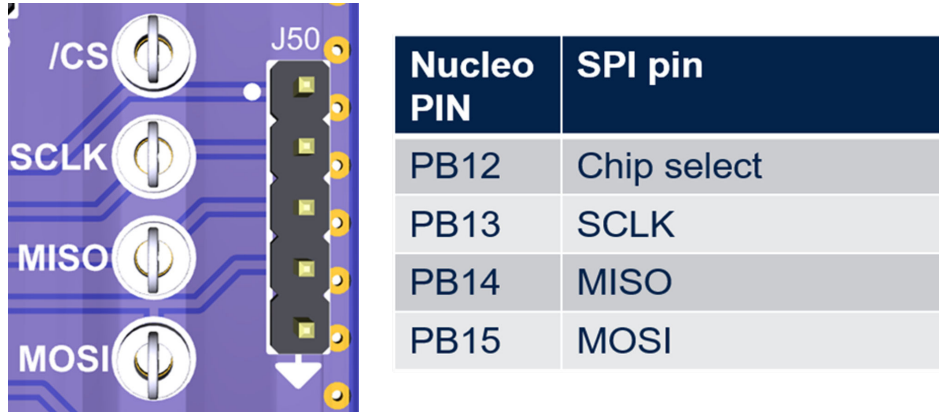
1.2.1 RHFAD128 (EVAL-RHFAD128V2)

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



1.3 Software configuration

1.3.1 Nucleo connection

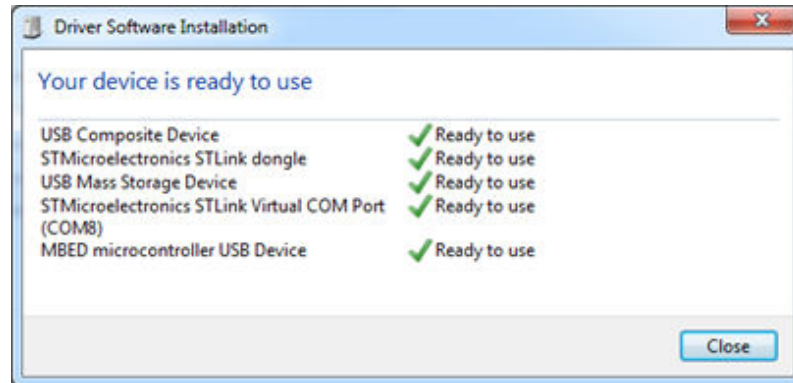
1 - Connect the NUCLEO-L746RG to the laptop using a Mini-B USB cable:

Figure 3. NUCLEO-L746RG 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

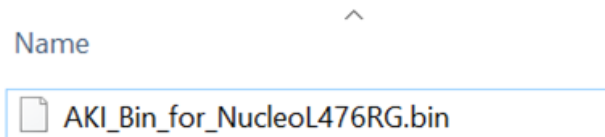


4 - Upload the binary into the STM32 Nucleo board

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

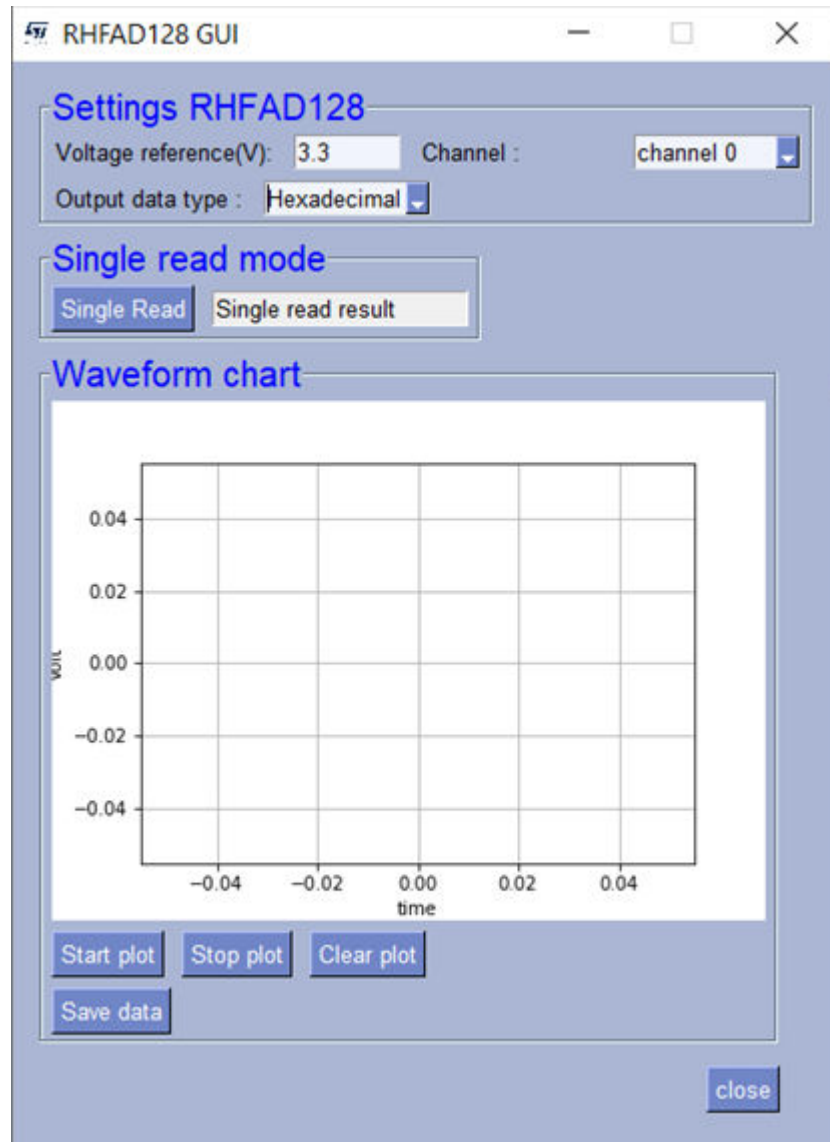


Figure 8. RHFAD128_GUI interface

The voltage reference must be the exact voltage value measured on VCCA connector.

The user can choose the channel he wants to read here.

The Output data can be read in hexadecimal or in Volt.

Single read mode: According to the user's settings, a value will be displayed.

Wave form chart: A graph will be displayed of the returned ADC values.

Data shown on the graph can be saved in a CSV file using the Save data button.

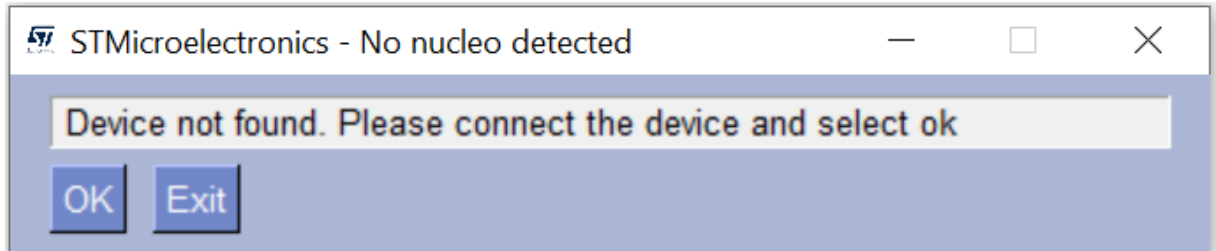
Table 2. SPI speed used by the GUI to communicate with the RHFAD128

Product	SPI speed used by the GUI
RHFAD128	500 Msp/s

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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