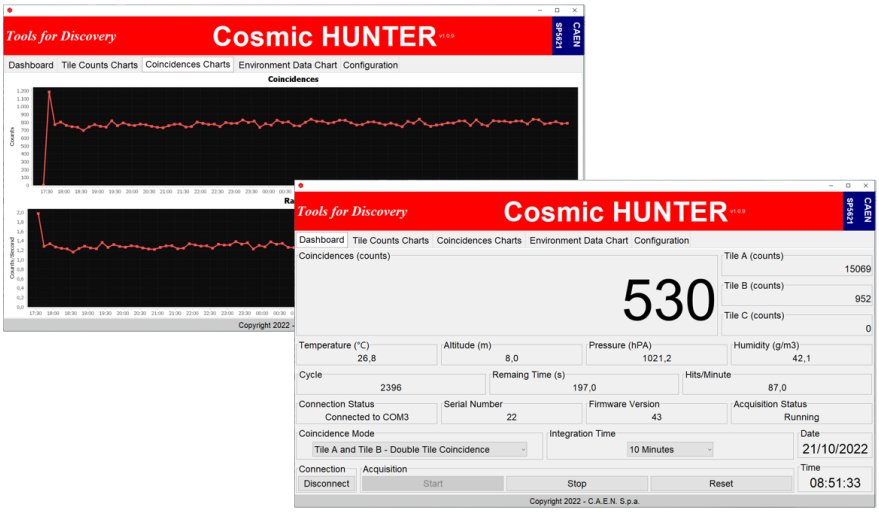


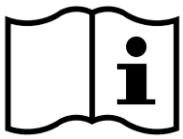
GDXXX

SP5620CH - Cosmic Hunter

Software QuickStart Guide

Rev. 1 - November 14th, 2023

Purpose of this Guide



This QuickStart Guide contains the basic information and commands that will let you use the software for Cosmic Hunter in few steps.

Change Document Record

Date	Revision	Changes
November 3rd, 2022	00	Initial release.
November 14th, 2023	01	Modified §Technical Support.

Symbols, Abbreviated Terms, and Notations

DC	Direct Current
USB	Universal Serial Bus
GUI	Graphical User Interface

Reference Documents

[RD1] GD7330 - Assembling Instructions
[RD2] GD7686 - QuickStart Guide SP5620CH Cosmic Hunter

https://www.caen.it/support-services/documentation-area/

Manufacturer Contacts

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Limitation of Responsibility

If the warnings contained in this manual are not followed, Caen will not be responsible for damage caused by improper use of the device. The manufacturer declines all responsibility for damage resulting from failure to comply with the instructions for use of the product. The equipment must be used as described in the user manual, with particular regard to the intended use, using only accessories as specified by the manufacturer. No modification or repair can be performed

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Index

List of Figures

List of Tables

1 Introduction

The Cosmic Hunter Software Quick Start Guide contains the basic information and commands that will let you use Cosmic Hunter Software in few steps.

Cosmic Hunter kit (consult **[RD2]**) can be managed through a Graphic User Interface (GUI), developed in Java, which allows setting the acquisition parameters, performing the acquisition, visualizing the data in real time during acquisition and recording the data for the offline analysis.

This Guide is intended to give to the user a complete description of all the functionalities of the software interface.

COSMIC HUNTER SOFTWARE REL.1.0.11 OR HIGHER DOES NOT WORK WITH SP5621 COINCIDENCE MODULE FIRMWARE RELEASE < 53.

Important Note: When the software is in use, the acquisition and settings must be managed only via software itself. For correct software operation, it is strongly recommended avoid use of the hardware commands on front panel of SP5621 module.

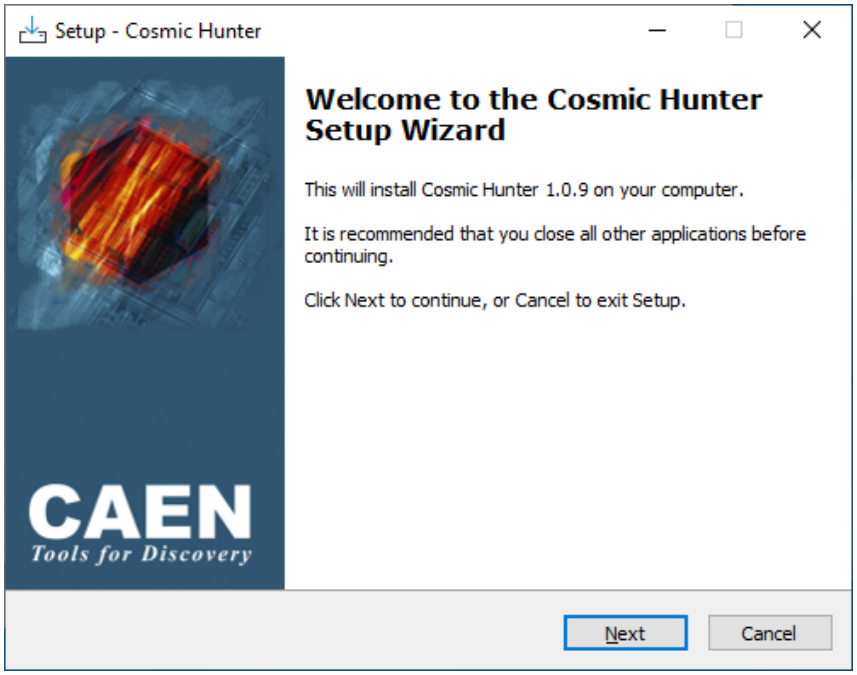
2 System Requirements & Installation Setup

OS	Hardware	Third-party software required
Microsoft Windows 10 (64-bit)	1 available USB port	• java virtual machine (Suggested: https://corretto.aws/downloads/latest/amazon-corretto-11-x64-windows-jdk.msi) • CP210x USB to UART Bridge VCP Drivers

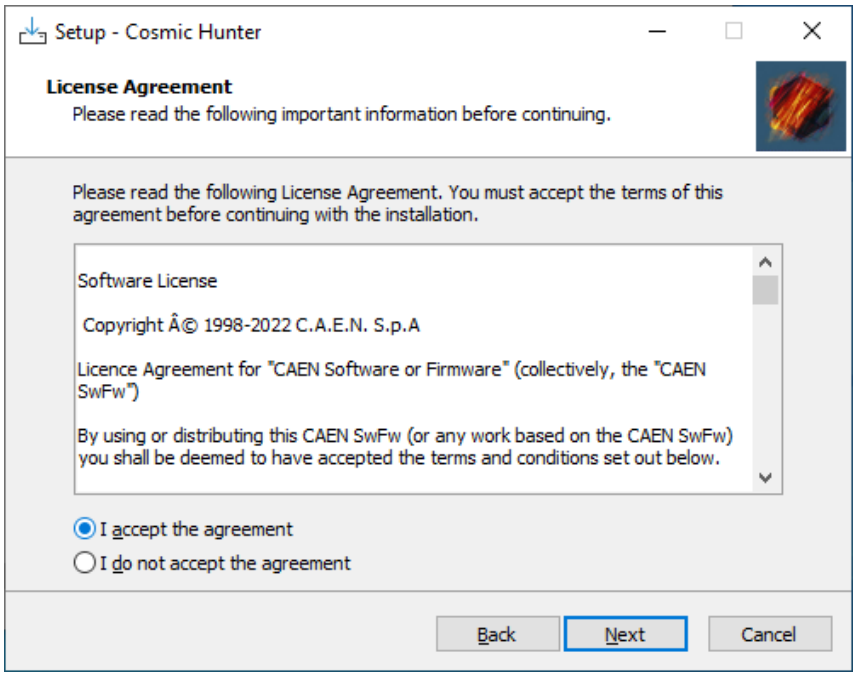
Tab. 2.1: Host PC requirements.

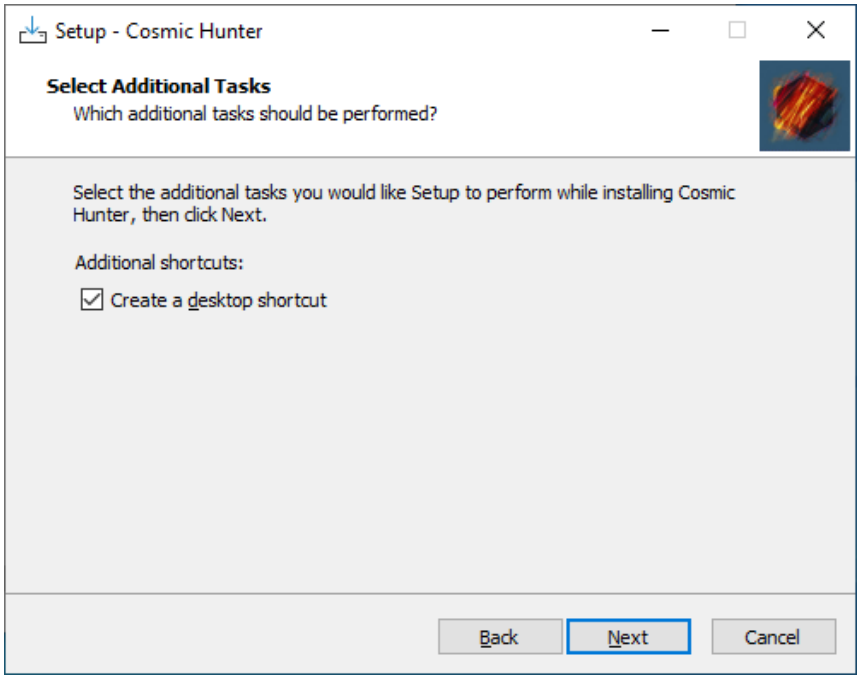
First, be sure to have installed all the third-party software listed in **Tab. 2.1**, then:

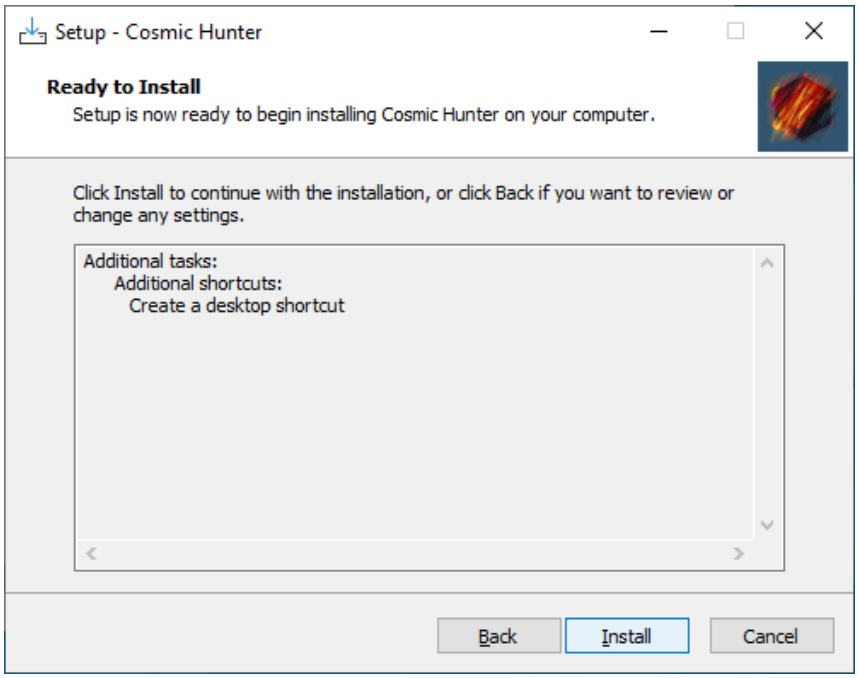
- go to Cosmic Hunter kit web page;
- go to the "Downloads" section and download the software package in the Software tab (**login is required before the download**);
- uncompress the downloaded package;
- launch, as administrator, the setup file.

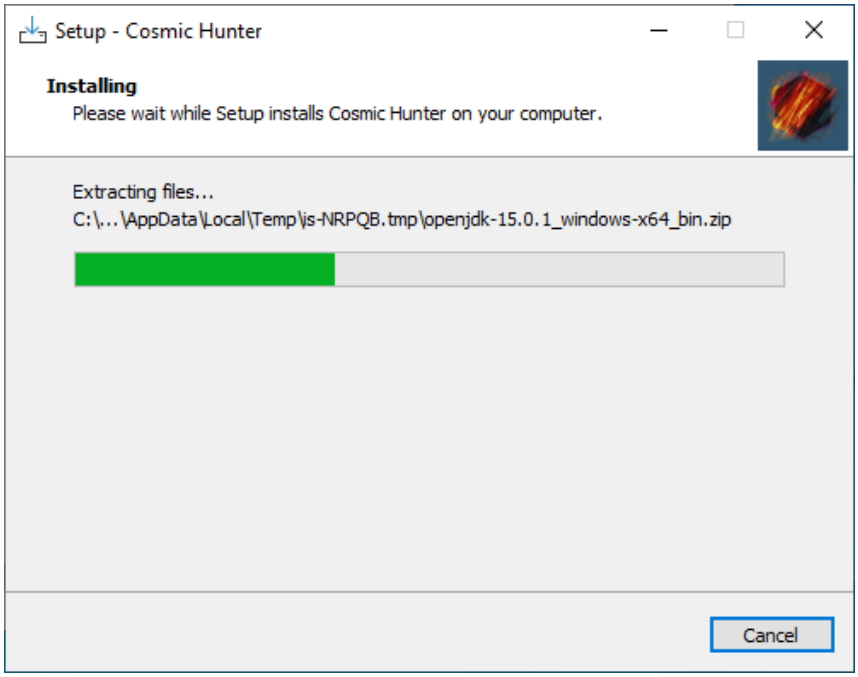


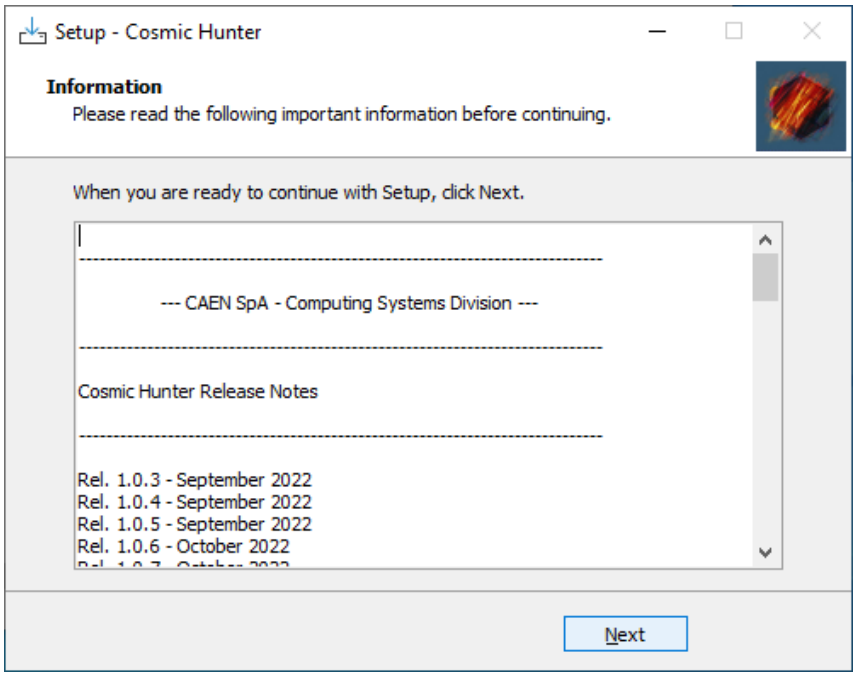
- **Complete** the **Installation wizard** and **Create a Desktop shortcut** as described in the following figures**.**


Setup - Cosmic Hunter
License Agreement
Please read the following important information before continuing.
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.
Software License
Copyright Â© 1998-2022 C.A.E.N. S.p.A
Licence Agreement for "CAEN Software or Firmware" (collectively, the "CAEN SwFw")
By using or distributing this CAEN SwFw (or any work based on the CAEN SwFw) you shall be deemed to have accepted the terms and conditions set out below.
I accept the agreement
I do not accept the agreement
Back
Next
Cancel


Setup - Cosmic Hunter
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing Cosmic Hunter, then click Next.
Additional shortcuts:
Create a desktop shortcut
Back
Next
Cancel


Setup - Cosmic Hunter
Ready to Install
Setup is now ready to begin installing Cosmic Hunter on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Additional tasks:
Additional shortcuts:
Create a desktop shortcut
Back
Install
Cancel


Setup - Cosmic Hunter
Installing
Please wait while Setup installs Cosmic Hunter on your computer.
Extracting files...
C:\...\AppData\Local\Temp\is-NRPQB.tmp\openjdk-15.0.1_windows-x64_bin.zip
Cancel



Important Note: For information about the firmware installed on the device, contact CAEN Support Team and provide them with the module PID ID.

3 Hardware Connection

SP5621 Coincidence Module can be directly handled via micro-B USB, just connecting the module to the host PC via the USB cable (the USB driver is specified in the third-party software column in **Tab. 2.1**).

After the correct driver installation, a COM port will be associated to SP5621; please check the port number as shown in **Fig. 3.1**.

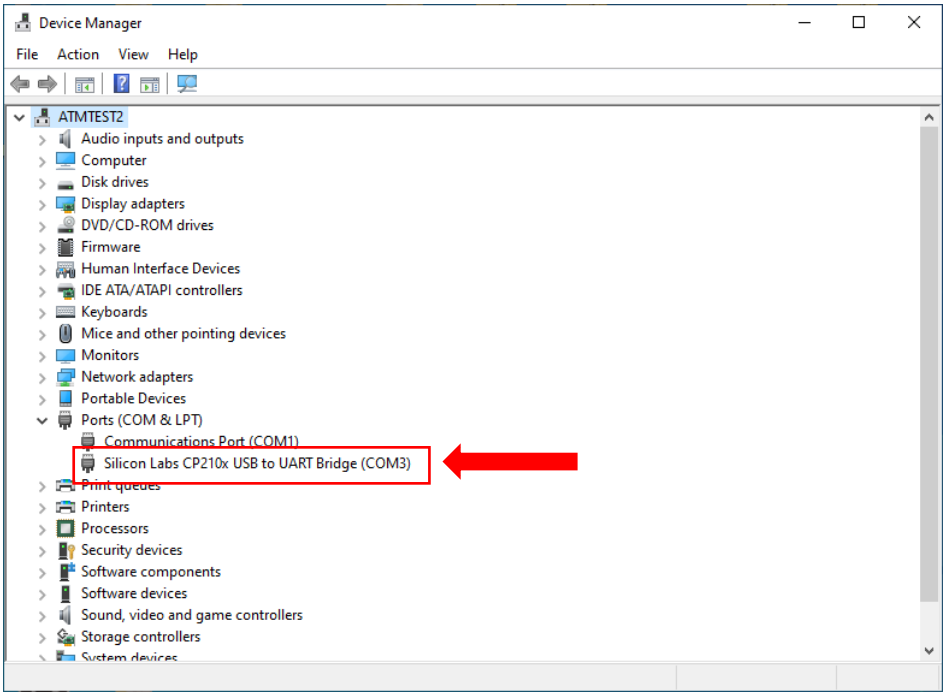


Fig. 3.1: Tracking the SP5621 port assignment on a PC running Windows 10.

4 Software Description

When the installation procedure has been completed, the user can run the program by clicking the correspondent icon. An alternative way to launch the software is via the command line (for example, C:\Program Files\Cosmic Hunter>cosmichunter) or via the Windows search bar.

Fig. 4.1: Cosmic Hunter Software Icon.

The simple graphical interface of the Cosmic Hunter Software helps the user to perform its own experimental activity. Press the button in the opening window to connect to the device, as shown in the opening window in **Fig. 4.2**.

Fig. 4.2: Cosmic Hunter Software - Opening window.

The software communication will be opened by the SP5621 COMM Port selection (**Fig. 4.3**).

Fig. 4.3: COM Port selection.

After a few seconds, the connection will be operative, and the GUI will appear in the run. You can press the "Reset" button to reset the counters (**Fig. 4.4**).

The Cosmic Hunter software allows the user to perform the same operations allowed by the SP5621 coincidence module and visualize the results in real time. Indeed, via this main GUI, it is possible to visualize the device status, counter results, plots of the measurements, and environmental parameters. Moreover, it is possible to modify the system configuration and save the data.

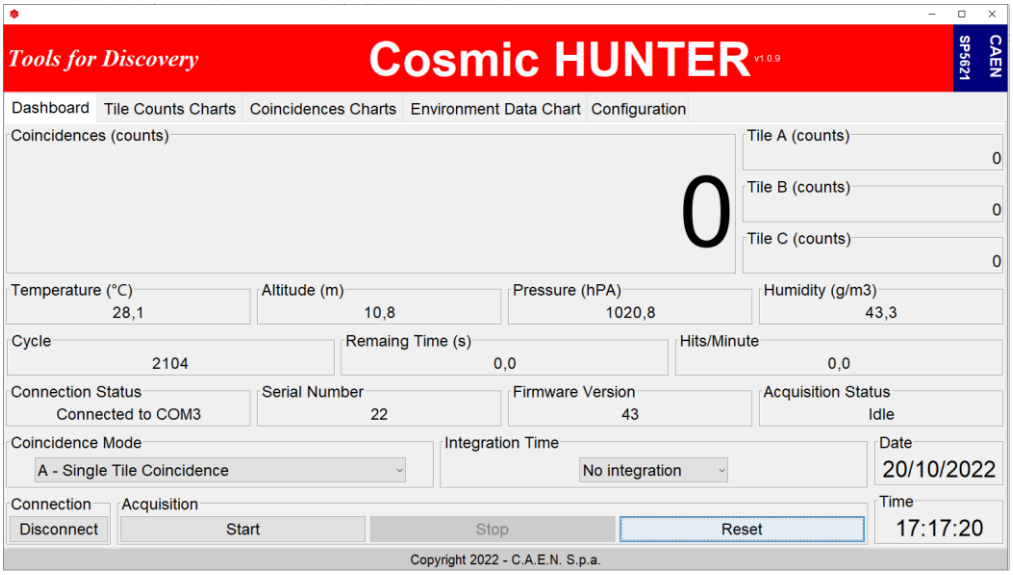


Fig. 4.4: Cosmic Hunter Software GUI.

The GUI is composed of several tabs: Dashboard, Tile Counts Charts, Coincidence Charts, Environmental Data Chart and Configuration.

4.1. Dashboard Tab

The “Dashboard” Tab represents the main window of the software. The upper side of the dashboard tab allows the user to visualize the coincidence counts, the counts of each scintillating tile, the values of the environmental parameters (temperature, humidity and pressure), the altitude value, the number of cycles (completed measurements), the remaining time at the end of the ongoing measurement, and the hits per minute value.

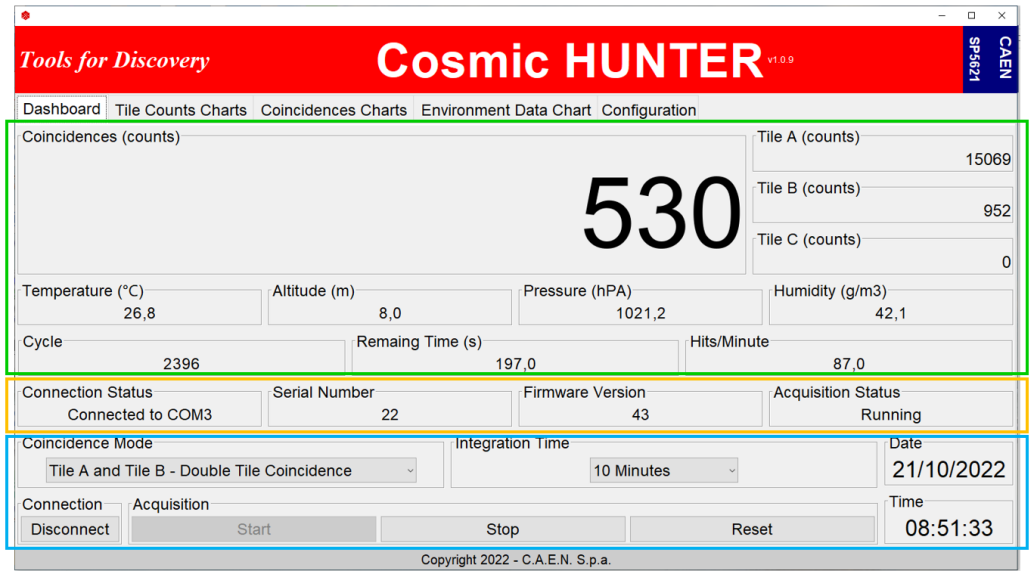


Fig. 4.5: Cosmic Hunter Software GUI – Dashboard tab. The green box contains the measurement results, the yellow box the status and the blue box the control settings management.

Important Note: The altitude value is inferred on pressure measurement, and it needs a calibration. Once pressure is stable, the user must set the corresponding altitude value to the location quote where the measurement takes place. See Sec. **4.5**.

In the middle part of the window, the connection status, the acquisition status, the serial number and the firmware release of the SP5621 module are displayed.

The lower part of the window is dedicated to the settings. The coincidence mode can be selected among seven different types of coincidence (**Fig. 4.6**):

- Tile A and Tile C - double tile coincidence
- Tile A - single tile coincidence
- Tile C – single tile coincidence
- Tile B – single tile coincidence
- Tile A and Tile B – double tile coincidence
- Tile C and Tile B - double tile coincidence
- Tile A & Tile B & Tile C - triple tile coincidence

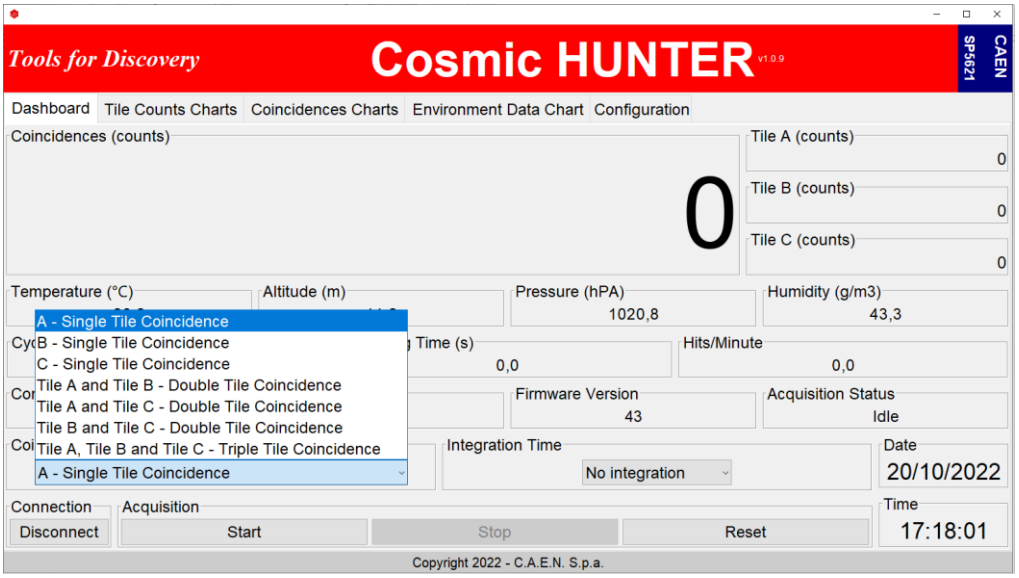


Fig. 4.6: Dashboard tab: Coincidence selection.

It is possible to select the integration time from no integration to several available recording times (**Fig. 4.7**):

- 10 minutes
- 30 minutes
- 1 hour
- 2 hours
- 4 hours
- 6 hours
- 12 hours
- 18 hours
- and 24 hours

“Start”, “Stop”, “Reset” and “Disconnect” buttons are in this part of the dashboard. “Start”, “Stop”, “Reset” buttons allows to start the acquisition counting and data plot, stop them and reset the counters respectively. “Disconnect” button allows the user to disconnect the device and stop the software running.

On the lower right side, date and time are shown.

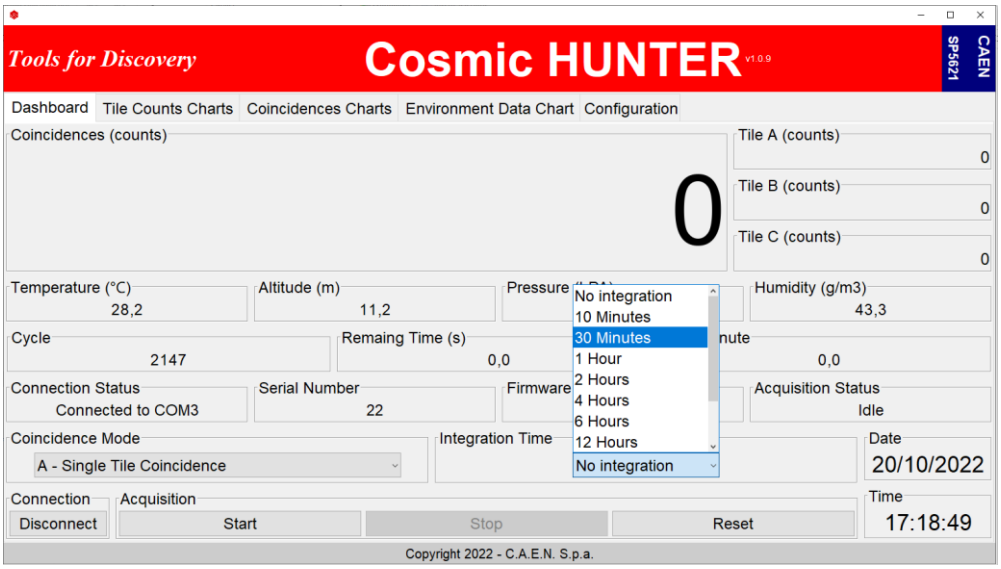


Fig. 4.7: Dashboard tab: Integration time selection.

Important Note: No integration mode does not produce any plots and data saving. This operation mode allows the user to see the counting values on the Dashboard tab continuously (about every two seconds).

4.2. Tile Counts Charts Tab

The "Tile Counts Charts" Tab allows the user to visualize the counts trend in time of every single scintillating tile (Tile A, Tile B and Tile C). The counting time of each data is defined via the *integration time* selection in the Dashboard tab. "*No integration"* selection does not produce any resulting plot.

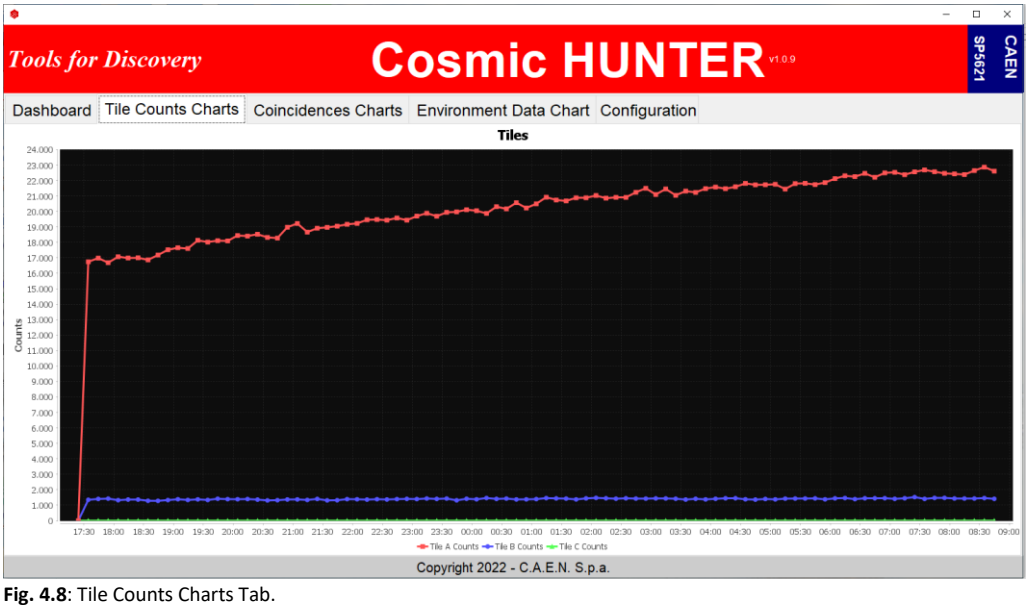


Fig. 4.8: Tile Counts Charts Tab.

4.3. Coincidence Charts Tab

The "Coincidence Charts" Tab allows the user to visualize two plots. The first one shows the counts trend in time of the selected coincidence type in the Dashboard tab. It could be a single, double, or triple coincidence.

The second graph displays the coincidence counts rate trend in time.

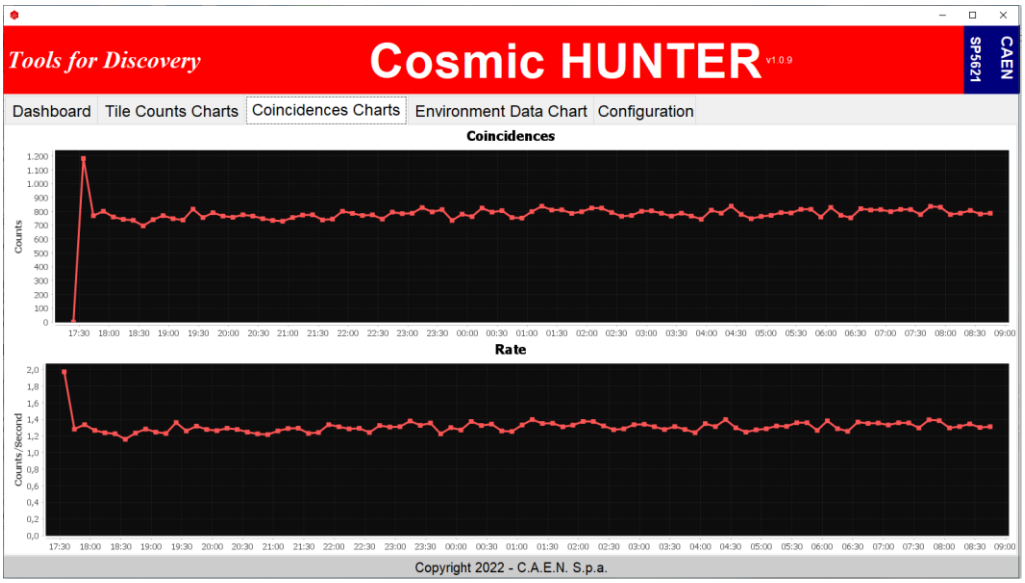


Fig. 4.9: Coincidence Charts Tab.

Important Note: No integration mode does not produce any plots in Coincidence Charts Tab.

4.4. Environmental Data Chart Tab

Pressure, altitude, humidity and temperature trend are displayed on "Environmental Data Chart" Tab whichever integration mode is selected but “No integration” mode.

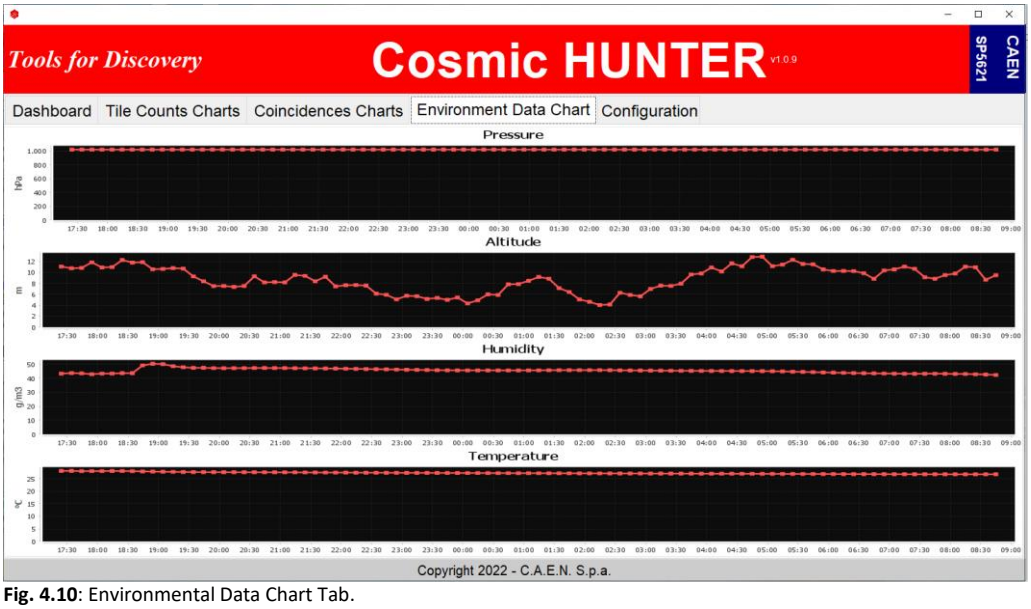


Fig. 4.10: Environmental Data Chart Tab.

4.5. Configuration Tab

The Configuration Tab is organized in three sections: Data, Altitude and Time (**Fig. 4.11**).

The first section is dedicated to the data saving. Once selected the "Data Saving" box, the user can select a destination folder and write the file name.

The saving cannot be deselected during the acquisition phase.

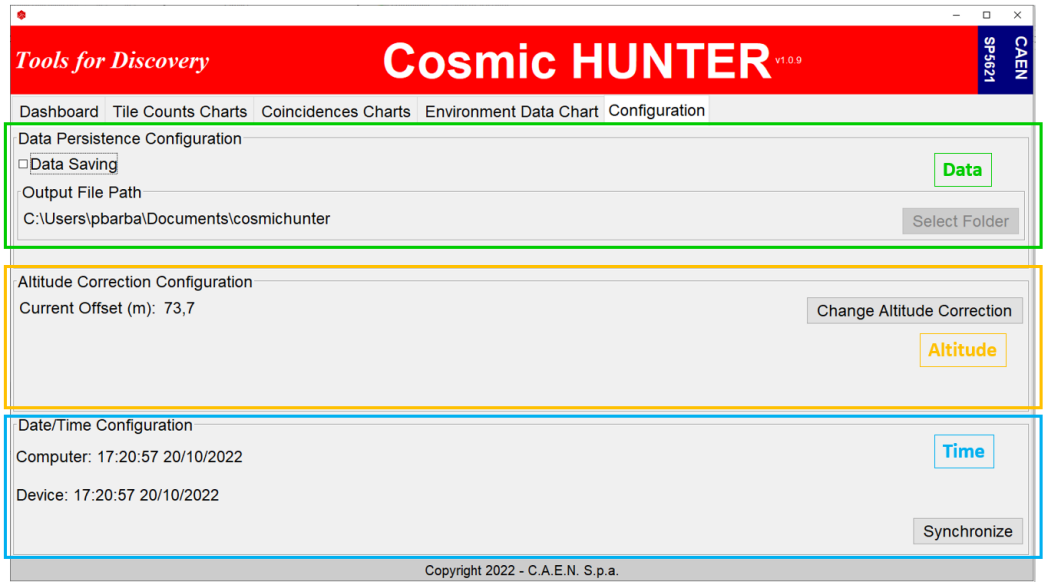


Fig. 4.11: Configuration Tab.

Important Note: When the system runs in **"**No integration" mode, data saving is disabled.

The middle section of the Configuration tab is dedicated to the altitude calibration. Once pressure is stable, the user must press "Change Altitude Correction" button and set the corresponding altitude value to the location quote where the measurement takes place (**Fig. 4.12**). This procedure allows the user to visualize the correct altitude values on Dashboard tab with ±1 meter accuracy due to the employed sensor.

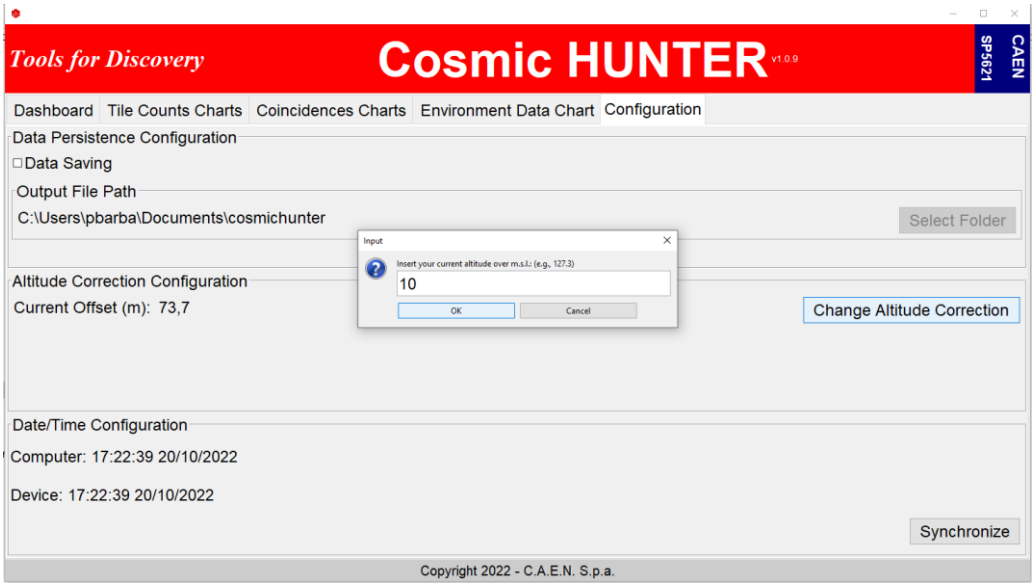


Fig. 4.12: Configuration Tab.: Altitude Calibration.

The last section allows the user to synchronize data/time of the coincidence module SP5621 with the PC. Without this synchronization, the saved date/time in acquired file could be different from the real one but equal to the one set on the module display.

Important Note: When the software is in use, the acquisition and settings must be managed only via software itself. For correct software operation, it is strongly recommended avoid use of the hardware commands on front panel of SP5621 module.

4.6. Saving Data to File

Select the "Data Saving" box in the Configuration tab to enable the record of the data to file.
The files name has the following general format: cosmichunter_YYYYMMDDhhmmss, where “YYYYMMDDhhmmss” stands for the year (YYYY), the month (MM), the day (DD), the hour (hh), the minute (mm)and the second (ss) of data acquisition respectively.
The data will be saved in the .csv (comma-separated values) format, compatible with Excel, Open Office, etc..
The data file of the measurement is a matrix (see **Fig. 4.13**), whose columns represent respectively: the serial number, the firmware release, the recording data&time, the selected coincidence mode, the integration time in seconds, the number of coincidence signals, the number of signals of the scintillator A, the number of signals of the scintillator B, the number of signals of the scintillator C, Hits per Minute, the pressure [hPa], the altitude [m], the temperature [°C] and the humidity [%].
For each cycle, a row of values separated by commas is saved and appended to the previous row.

Serial Number	Firmware Version	Date/Time	Coincidence Mode	Acquisition Time	Coincidences	Tile-A	Tile-B	Tile-C	Hits Per Minute	Pressure	Altitude	Temperature	Humidity
22	43	20/10/2022 12:38	AB	600	892	26717	1596	0	0,024778	1022,18	10,30	26,2	50,54
22	43	20/10/2022 12:48	AB	600	861	25933	1612	0	0,023917	1022,11	10,83	26,36	50,13
22	43	20/10/2022 12:58	AB	600	849	25102	1536	0	0,023583	1021,95	12,20	26,61	49,58
22	43	20/10/2022 13:08	AB	600	826	24342	1500	0	0,022944	1021,84	13,09	26,78	48,59
22	43	20/10/2022 13:18	AB	600	865	23615	1495	0	0,024028	1021,71	14,13	26,93	48,31
22	43	20/10/2022 13:28	AB	600	844	22814	1468	0	0,023444	1021,64	14,78	26,96	48,33
22	43	20/10/2022 13:38	AB	600	844	22495	1533	0	0,023444	1021,6	15,07	27,05	47,93
22	43	20/10/2022 13:48	AB	600	862	21845	1539	0	0,023944	1021,55	15,48	27,26	47,75
22	43	20/10/2022 13:58	AB	600	822	20848	1440	0	0,022833	1021,49	16,02	27,46	47,4
22	43	20/10/2022 14:08	AB	600	793	20382	1421	0	0,022028	1021,4	16,75	27,62	46,61

Fig. 4.13: Example of data stored with 10 minutes of integration time.

The sensor accuracy is about ±3% for measuring humidity, about ±1 hPa for barometric pressure, and about ±1.0°C for temperature. Because pressure changes with altitude, and the pressure measurements are so good, the sensor can be also used as an altimeter with ±1 meter accuracy.

5 Technical Support

To contact CAEN specialists for requests on the software, hardware, and board return and repair, it is necessary a MyCAEN+ account on www.caen.it:

https://www.caen.it/support-services/getting-started-with-mycaen-portal/

All the instructions for use the Support platform are in the document:

A paper copy of the document is delivered with CAEN boards.

The document is downloadable for free in PDF digital format at:

https://www.caen.it/safety-information-product-support

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