Monitoring System

captemp®

Nidus-C+ Technical Memory

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1. Nidus-C+ / SensLive system

a. General system overview

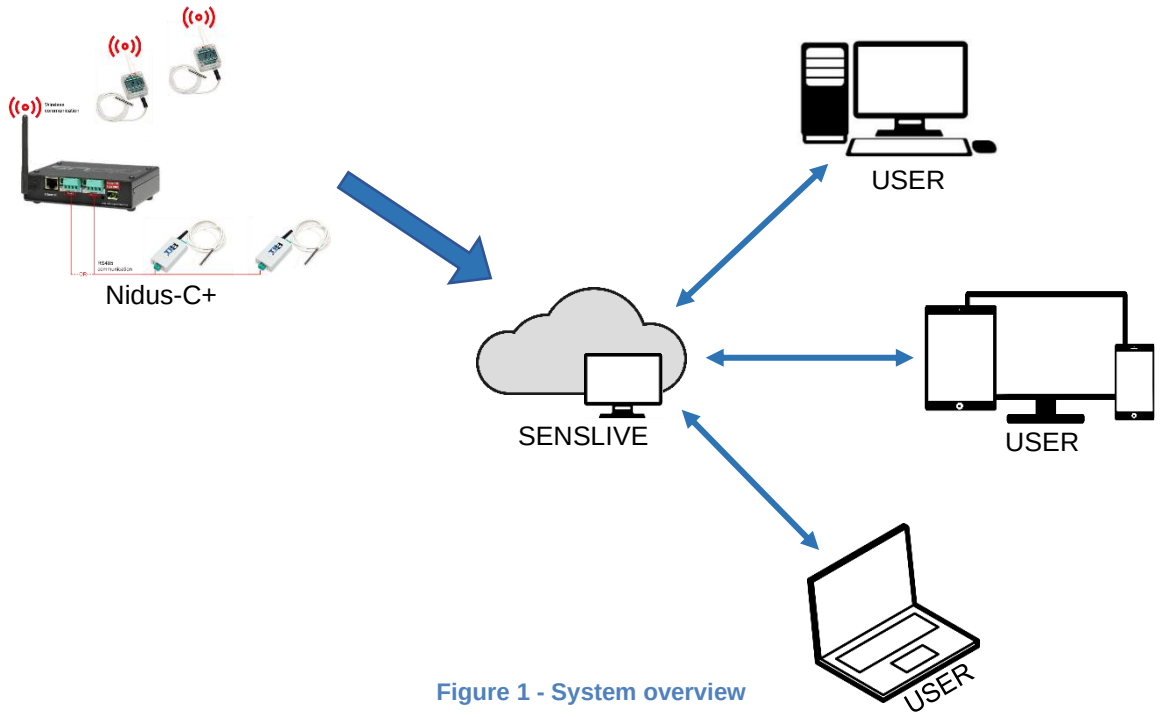


Figure 1 - System overview

The SensLive system (Figure 1) is composed of two parts:

- Hardware: Nidus-C+
  Airo
  TH3
- Software: Nidus-C+ Webpage
  SensLive Portal
  CT Discover

Hardware parts are the means to acquire measurements (TH3 / Airo) and send those measurements (Nidus-C+) to Senslive portal.

Software parts (Senslive portal) is where the measurements are stored permanently and provides measurements visualization and reports to the users.

b. Hardware

i. Nidus-C+

1. Nidus-C+ device specifications

Device specifications

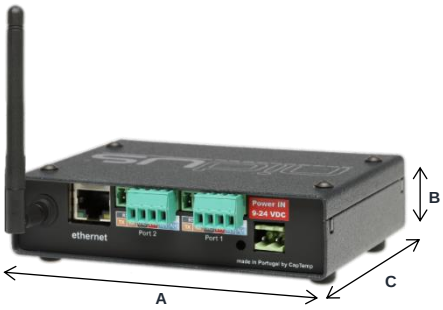


Figure 2 - Nidus-C+ dimensions

Specifications	NIDUS-mini – Master board			
Size (mm) AxBxC	120 X 30 X 90 (mm)			
Mini PCI Express	1	Rabbit Minicore - RCM6700 family		
Battery	1	3,0 V	CR2032	lithium
Serial port	1	TTL	Programming / Serial port	
	2	RS232 / RS485		
Power supply		Vin = 9 - 24Vdc	P= 850mW	
Network protocols	TCP/IP, UDP/IP, SNMP, HTML, XML, PUSH/XML, AJAX, SMS and E-mail			
Data logger	Data logger for more than 100.000 records			
RF Add-on				
RF module	1	1 TTL	433 868 or 915 MHz (ISM) wireless module	

Processor specifications

Processor type
(Rabbit MiniCore)

Specifications	RCM6760
Microprocessor	Rabbit® 6000 up to 200 MHz
Flash Memory (Code and File system)	4 MB serial Flash
Internal SRAM (Code and Data)	1 MB
Battery-Backable SRAM	32 KB (Internal), 512 KB (External)
Power - with Ethernet	260 mA @ 3.3V
Operating Temperature	-40° C to +85° C

Metrologic characteristics

Standard	pr EN 12830
Manufacturer's name	CAPTEMP, Lda
Brand / model	CAPTEMP/NIDUS-XX/XX
Individual product identification	Serial Number
Apt to	Storage (A) Transport (T)
Climate environment type	A / B NIDUS-XX/XX
Accuracy class (pr EN 12830)	1
Measuring interval (degrees Celsius)	-30 °C a +30 °C

Additional characteristics

Stipulated operating conditions of the recording and reading device	Type A, from +5 ºC to + 40 °C Type B, from -30 °C to + 65 °C
Limit conditions of the recording and reading device	Type A, from 0 °C to + 50 °C Type B, from -30 °C to + 70 °C
Conditions for storage and transport of the recording device and sensor reading	Type A, from -20 °C to +60 °C Type B, from -40 °C to +85 °C
Power Supply	12 to 24 VDC - NIDUS-XX/XX
IP Standard	IP 20 - NIDUS-XX/XX
Dimensions	120 x 30 x 90 mm – A x B x C (NIDUS-C+)

2. Communications interfaces

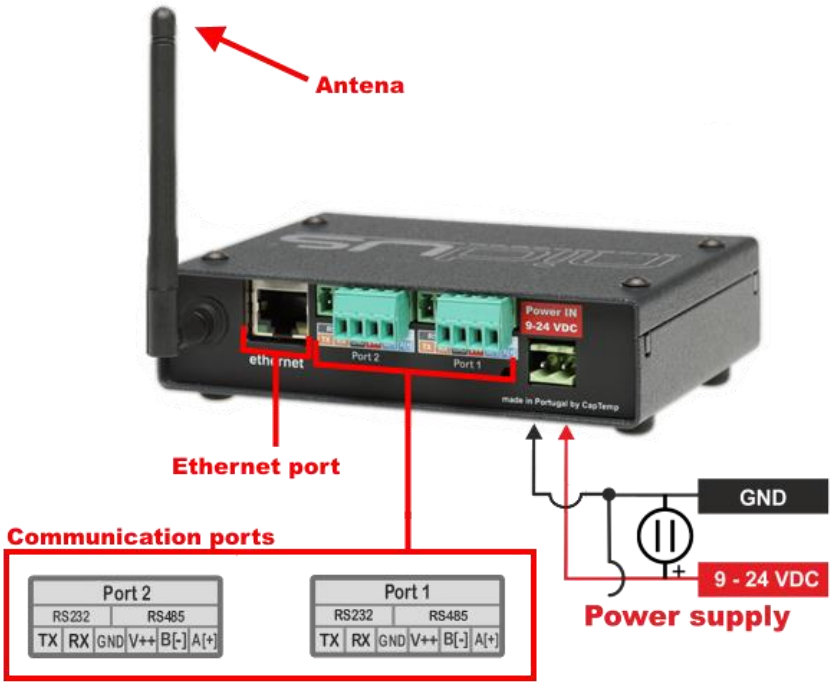


Figure 3 - Nidus-C+ communication interfaces

The Nidus-C+ has the following interfaces (Figure 3):

- Power supply (9 – 24 VDC).
- 1 port with RS232 and RS485 communication.
- 1 Ethernet port to connect to the network.
- RF module (Wireless) to communicate with *Airo* sensors.

3. Connections between Nidus-C+ and device sensors

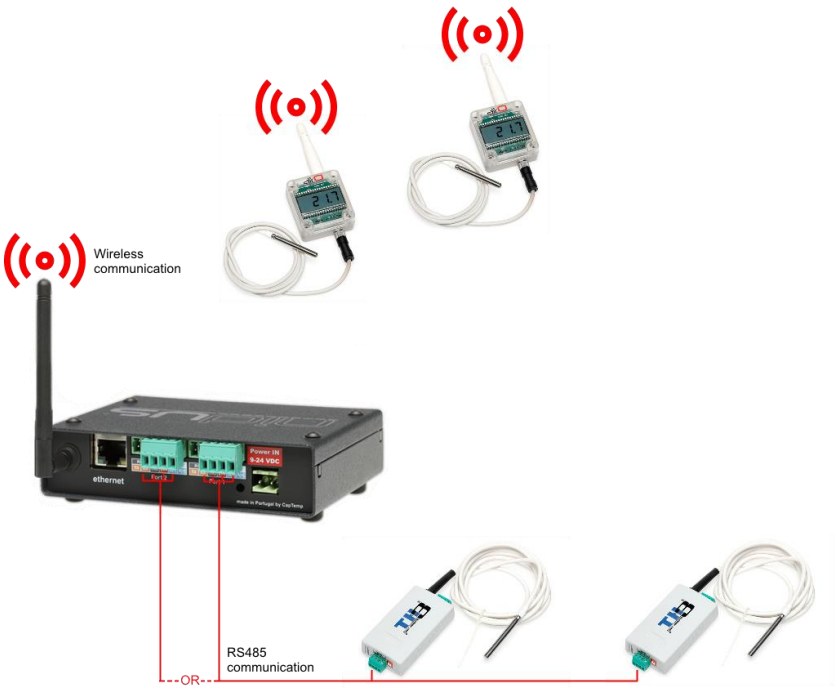


Figure 4 - Nidus-C+ communication with sensors

The Nidus-C+ communicate with (Figure 4):

- TH3[1] sensors throw the RS485 communication port
- *Airo*[2] sensors throw wireless communication

[1] The maximum number of TH3 devices that can be connected to the Nidus is 32.
[2] The maximum number of *Airo* devices that can be connected to the Nidus is 32.

ii. TH3

1. TH3 device specifications

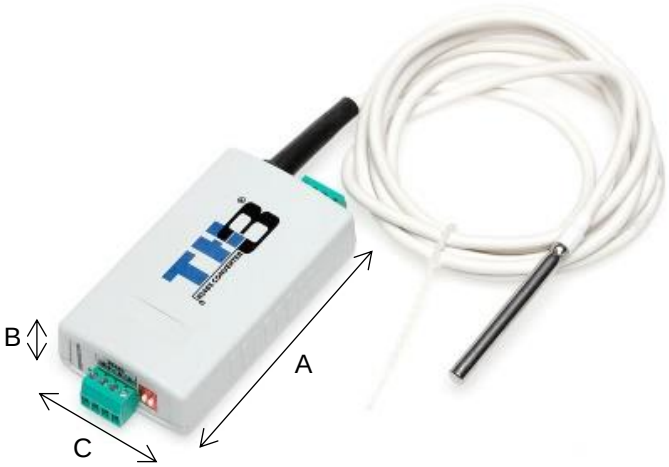


Figure 5 - TH3 dimensions

Technical specifications:

Basic parameters	
+ Models	**TH3-Temp OW**
+ Range of measured	-55 to +125°C
+ Resolution	12 bits (0,0625ºC)
+ Accuracy	+/- 0,5 °C in range from -10°C to +55°C
+ Analog Output	NA
+ Measuring speed	Respond to a request within 35ms at maximum. Internal measuring's' updated every 2 seconds
+ Measuring element	Maxim Dallas DS18B20 Silicone Cable Inox probe (IP68)
+ Digital Input type	2X dry contact
+ Outside size A x B x C	90 x 25 x 50 (mm)
Communication	
+ Communication parameters	9600 8N1
+ Communication line	RS-485 with power to 1'200 meters
+ Status indication	**Red** indicator: - Blink 3 times = during startup (everything OK) - Blink every 2 seconds after startup (everything OK) - Blink faster = wrong address - Blink slowly = No sensor found (ERROR)
+ Function modes	Question-Answer / Client mode to configuration / Can be configured remotely without removing from the BUS
+ Question-Answer	Temperature is reported upon request according to protocol Termination character for all communications is **only** carry return
Others	
+Measured temperature range	-10°C up to +70°C
+ Waterproof enclosure	IP22
+ Power supply	+9V to +48V DC, reverse polarity protection
+ Power consumption	3W
+ RS-485 line termination	Internal resistor 120Ω activated by external switch

2. Communication interfaces

Figure 6 - TH3 communication interfaces

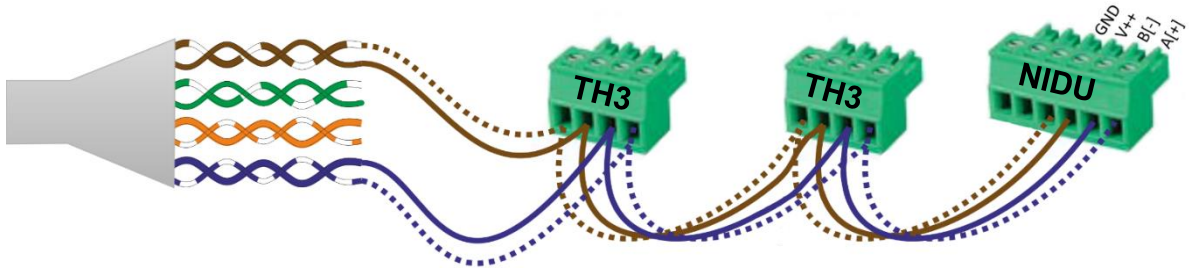
The TH3 controller has the following connections (Figure 6):

- 1 Status LED that indicates the TH3 state:
  - Blink 3 times during startup = everything OK
  - Blink every 2 seconds after startup = everything OK
  - Blink faster = wrong address
  - Blink slowly = No sensor found (ERROR)
- 1 RS485 port where the communication line will be connected.
- DIP switch termination resistors[3].
- 2x Digital inputs
- 1 digital sensor – DS18B20 Temperature Sensor

[3] DIP switch termination resistors should always be activated in the last TH3 on the communications cable line.

3. Connection between TH3 and Nidus devices

Nidus-C+ → TH3 (short distance < 100m)



Important notes:

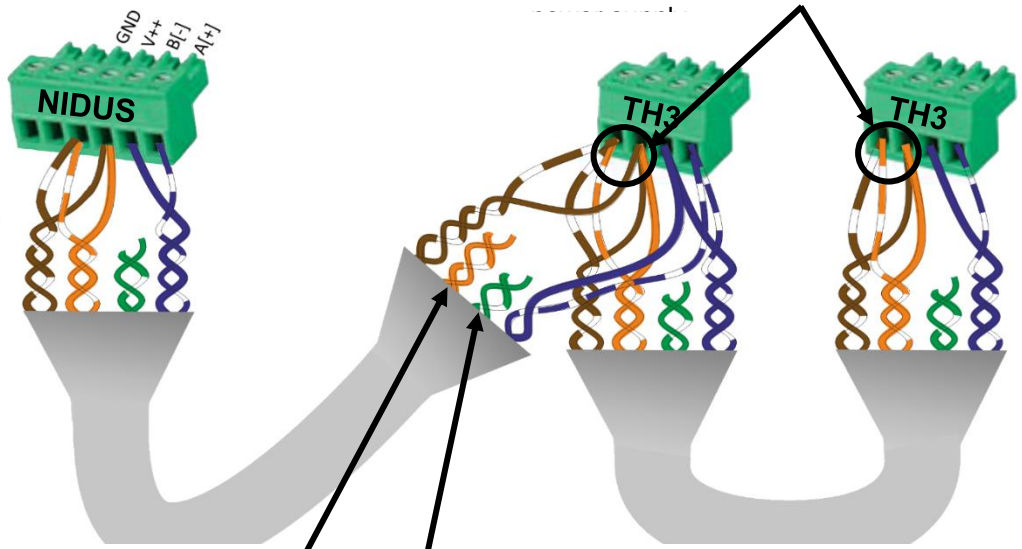
- The last TH3 on the RS485 line must have at least a voltage of **9 Volts** and the **DIP switches must be turned ON**.

Figure 7 - Nidus cable connection with TH3 (short distance < 100m)

Nidus-C+ → TH3 (long distance between 100m and 1200m)

Important notes:

- Join the **brown** and **orange** pairs between controllers to increase the cable section for



Important notes:

- Do **NOT** connect the **orange** and **green** pair on the first connector.
- The last TH3 on the RS485 line must have at least a voltage of **9 Volts** and the **DIP switches must be turned ON**.

Figure 8 - Nidus cable connection with TH3 (long distances between 100 and 1200m)

iii. Airo

1. *Airo* device specifications

Figure 9 - *Airo* dimensions

Technical specifications

Basic parameters	
+ Models	**airO - Temp OW**
+ Range of measured	-55 to +125°C
+ Resolution	12 bits (0.0625ºC)
+ Accuracy	+/- 0,5 °C in range from -10°C to +55°C
+ Measuring element	DS18B20 Silicone Cable Inox probe (IP68)
+ Digital Input type	2X dry contact (Optional)
+ Outside size A x B x C	64 x 28 x 59 (mm) (antenna 85 mm)
Communication	
+ Communication radio band	433, 868 or 915 MHz - ISM radio band (industrial, scientific and medical) FREE License
+ Encryption Data	YES
Others	
+Measured temperature range	-10°C up to +70°C
+ Waterproof enclosure	IP65
+ Power supply	1 X Lithium Battery AA Size Cell 3.6V 2600mAh Long life = 4 years reading every 15 minutes
+ Power consumption	Sleep mode 18 µA | wake up mode 26 mA
Sensor options	
+ Support sensors	1 DS18B20 Temperature Sensor
+ Log file	260 records

2. Communication interfaces

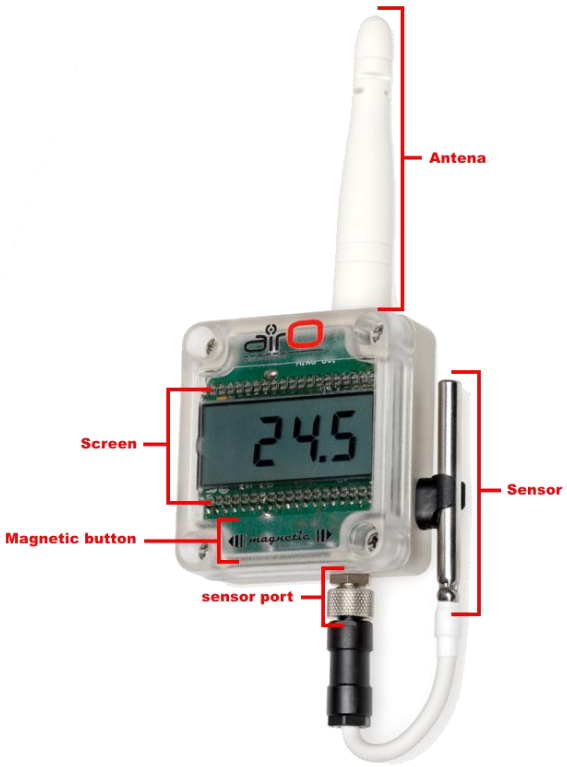


Figure 10 - Airo communication interfaces

The *Airo* device has the following interfaces (Figure 10):

- Wireless antenna to communicate with Nidus devices.
- Screen to show information about the sensor value and other configurations.
- Magnetic button to turn ON/OFF the device and manually force the communication.
- Sensor port connection
- Digital Temperature Sensor DS18B20.

3. Connection between *Airo* and Nidus devices

Figure 11 - *Airo* connection with Nidus

Start-up sequence:

Turn ON

- To switch ON the *Airo*, pass the magnet through the base of the device. The *Airo* screen will turn on and show the following configurations (this may be slightly different depending on the *Airo* configurations):

  1. **Lc 2.2**: screen version
  2. **na2.7**: firmware version (certified)
  3. **SS-1**: number of sensors (certified version fixed to 1)
  4. **bat**: battery
  5. **3.34**: battery level in Volts
  6. **Ch00**: wireless channel
  7. **868**: wireless frequency
  8. **Po00**: signal quality (0 to 99%)
  9. **XX.X**: sensor value

Manual reading/communication

- To force the *Airo* to read and communicate, pass the magnet through the base of the device, like shown on the left image. The text "----" will appear for brief seconds and then the sensor values appear again.

Turn OFF

- To switch OFF the *Airo*, put the magnet on top of the device (like shown on the left image) and maintain that position. The text on the screen will change to "--" and after that wait until the display show the "Off" message.

Reading or communicating

- When the *Airo* screen message is "- - - -", this means either the *Airo* is reading the sensor value or is sending data to the Nidus device.

iv. Cloud Computer / Local Computer

1. Specifications

The machine that will host the SensLive system must have at least the following specifications:

1. Operating System: **Linux distribution**
2. CPU: **Dual Core 1 GHz**
3. RAM: **2GB**
4. Storage: **20GB**

c. Software

i. CT Discover

1. Search Nidus on Network

1. Turn ON the Nidus power and connect Nidus to the network by the ethernet interface.

2. Open legally relevant software “CT Discover” to perform the Nidus search on the network it was connected to. Go to “UDP Finder” tab(Figure 12) and click on “Search Devices” button (Figure 13)

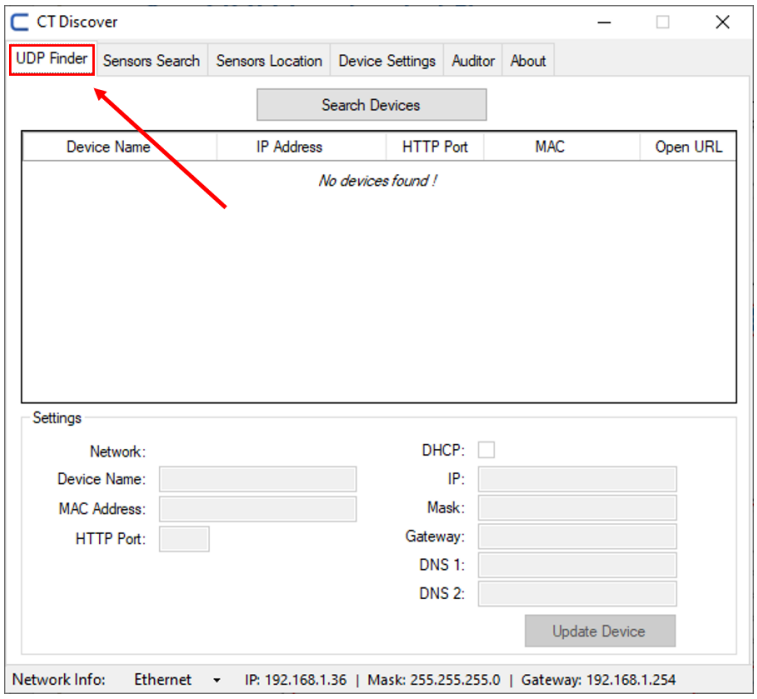


Figure 12 – CT Discover "UDP Finder" Tab

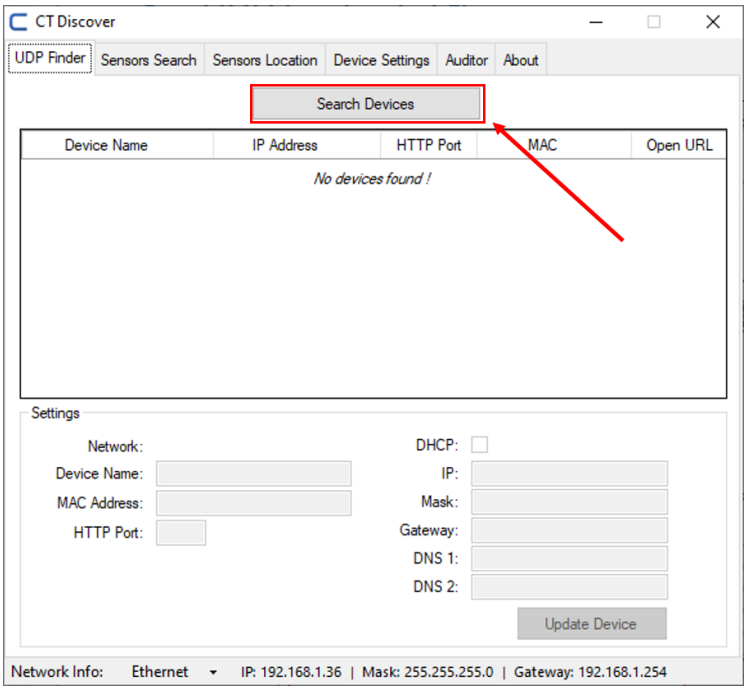


Figure 13 – CT Discover "Search Devices" button

3. Wait for “CT Discover” search in each network card of your computer. After finish the search the “CT Discover” show the detected Nidus and their IP, Port and MAC. If no Nidus are found, verify the power and network cables. By factory-default, the Nidus have IP 192.168.1.199/24.

4. To update the network settings, select the correct nidus from list and update network configuration. After changes, click on “Update Device” button to send new configuration to Nidus. The Nidus will restart and apply the new configuration (Figure 14).

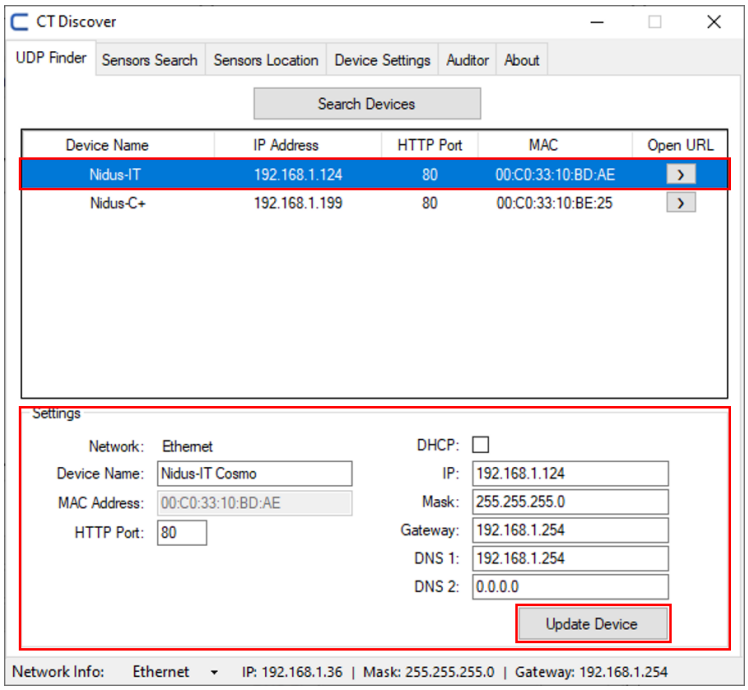


Figure 14 – CT Discover - Update Network Settings

2. Device Settings

1. Go to “Device Settings” tab(Figure 15). If some Nidus is selected in “UDP Finder”, the connection data (IP, Port, Username, Password) is filled. If not insert the connection data. The Nidus default login credentials are admin(username) and 123(password). To unlock click on “Connect” button(Figure 16).

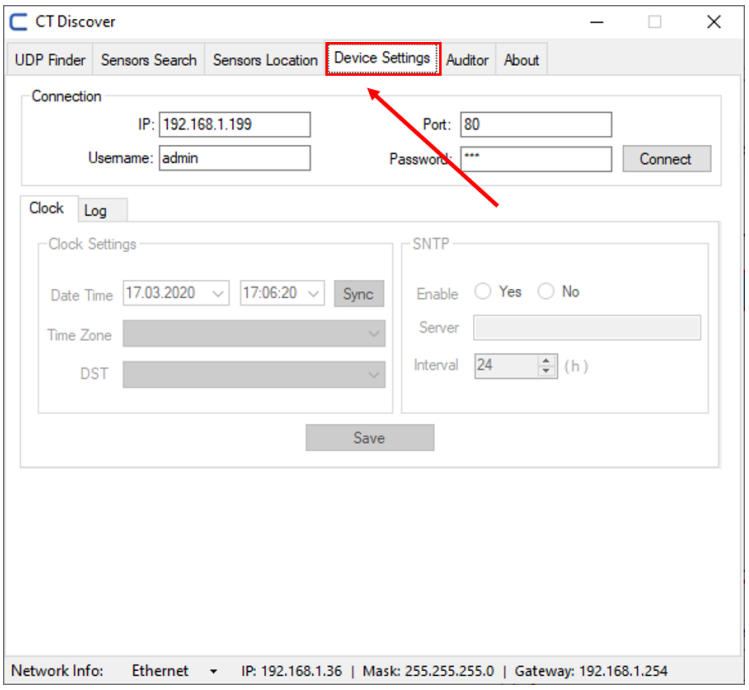


Figure 15 – CT Discover "Device Settings" Tab

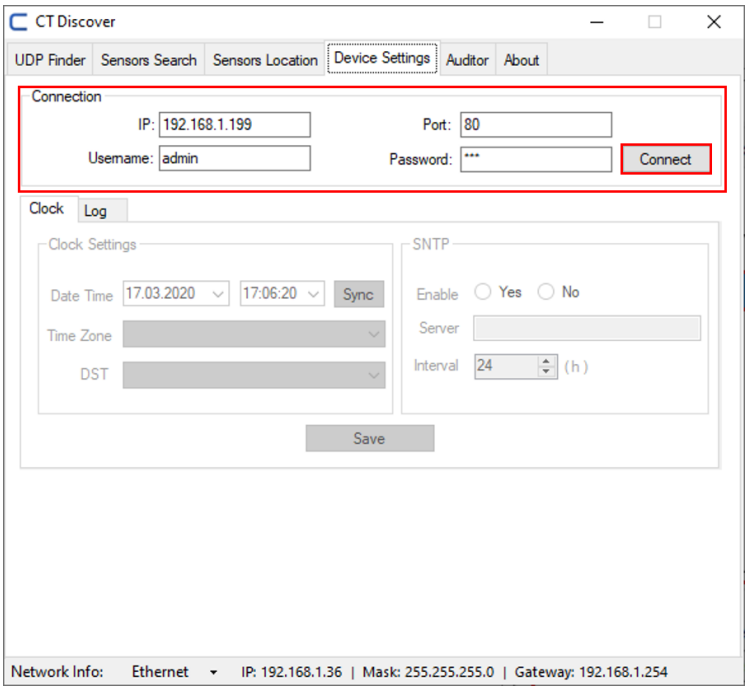


Figure 16 – Connection data – Not connected

2. After make the connection, “CT Discover” will unlock the Clock tab and request the current settings to show.
3. The clock options available to change are (Figure 17):
    a. Date Time
    b. Time Zone
    c. DST
    d. SNTP Enable/Disable

e. SNTP Server

f. SNTP Interval

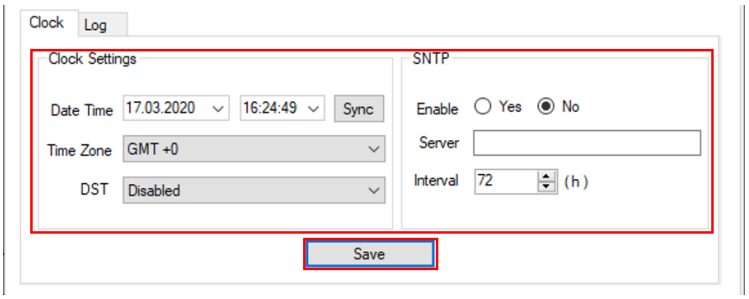


Figure 17 – Clock Settings

4. After make the changes, click in “Save” button to upload to Nidus the new settings. An information box is presented after upload notifying the success or failure.

5. To update log interval, select Tab Log (Figure 18).

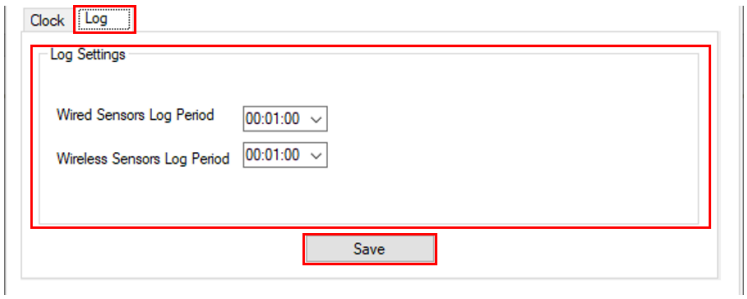


Figure 18 – Log settings tab

6. The current log intervals are showed to user and can be changed by updating the values in box and click in “Save” button (Figure 18). An information box is presented after upload notifying the success or failure.

3. Sensor Search

- ### TH3: Add/ Remove sensors

1. To add and/or remove wired sensors, go to “Sensors Search” tab and insert Nidus connection data and make the connection if it’s not connected. If the Nidus is already connected the button will show “Disconnect” (Figure 19).

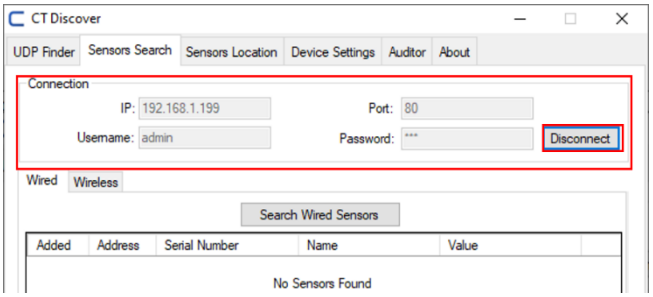


Figure 19 – Connection Data- Connected

2. To start a wired search, select the “Wired” option and click “Search Wired Sensors” button (Figure 20). For each wired sensor found on Nidus, one entry is added in the table. On the table the user can check if the sensor is already added to Nidus or not, by checking the symbol on first column. Sensors already added will have the symbol ✔ , and new sensors the symbol ✕ .

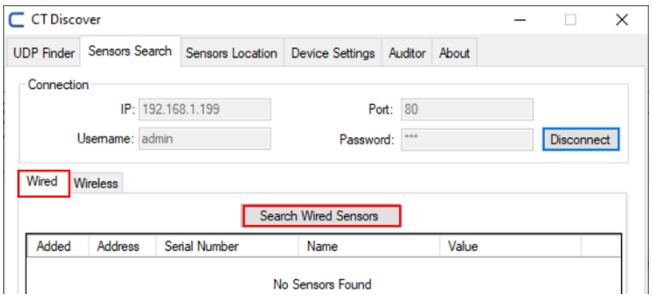


Figure 20 – Sensor Search Wired option

3. To add sensors, select the checkbox’s on last column and click on button to add (➕) (Figure 21)

4. To remove sensors, select the checkbox’s on last column and click on button to remove (🗑) (Figure 21)

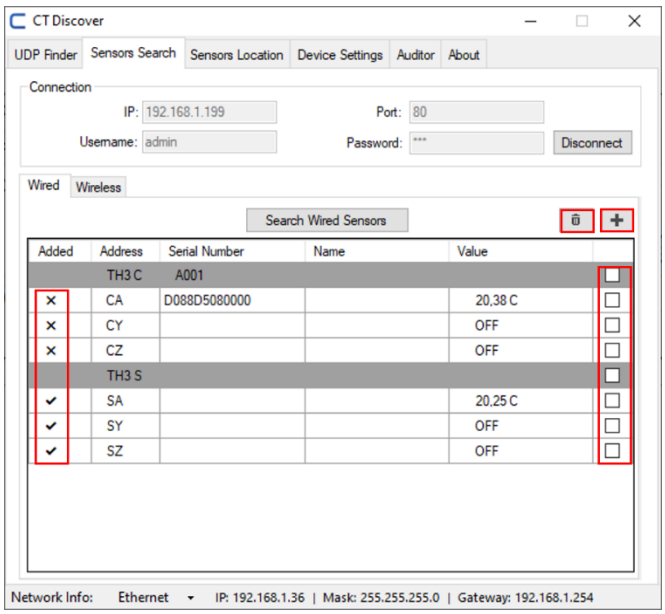


Figure 21 – Wired Sensors Table

- Airo: Add/ Remove sensors

1. To add and/or remove wireless sensors, go to “Sensors Search” tab and insert Nidus connection data and make the connection if it’s not connected. If the Nidus is already connected the button will show “Disconnect” (Figure 22).

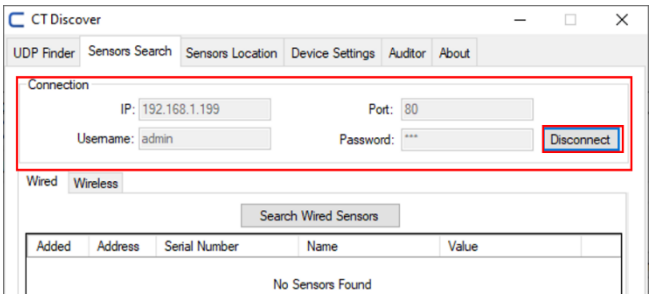


Figure 22 – Connection Data- Connected

2. To start a wireless search, select the “Wireless” option and click “Search Wireless Sensors” button (Figure 23). For each wireless sensor found on Nidus, one entry is added in the table. On table the user can check if the sensor is already added to Nidus or not, by checking the symbol on first column. Sensors already added will have the symbol ✔, and new sensors the symbol ✕. The search will run until the user stops it, by clicking again in button to stop the search. An icon will be showed if the search is running (◌). To Nidus detect the Airo the user need to pass the magnet on Airo and wait for the communication

Figure 23 – Sensor Search Wireless Option

3. To add sensors, select the checkbox’s on last column and click on button to add (➕) (Figure 24)

4. To remove the sensors, select the checkbox’s on last column and click on button to remove (🗑) (Figure 24).

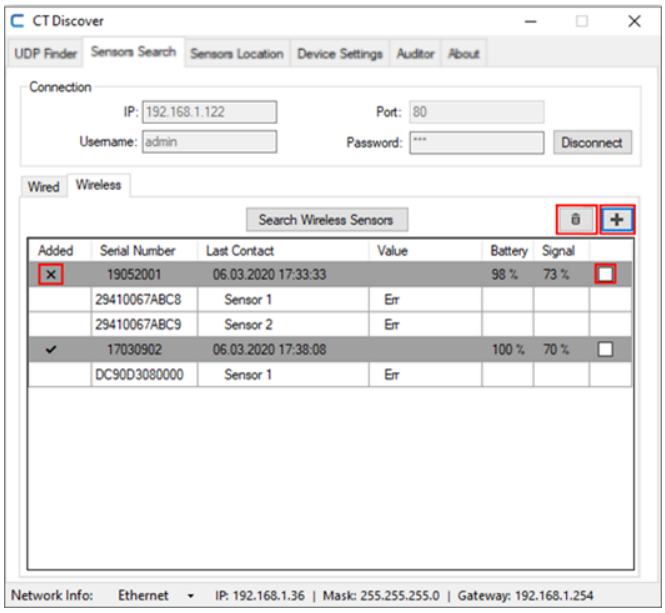


Figure 24 – Wireless Sensors Table

4. Sensor Location

1. Go to “Sensor Location” tab (Figure 25).

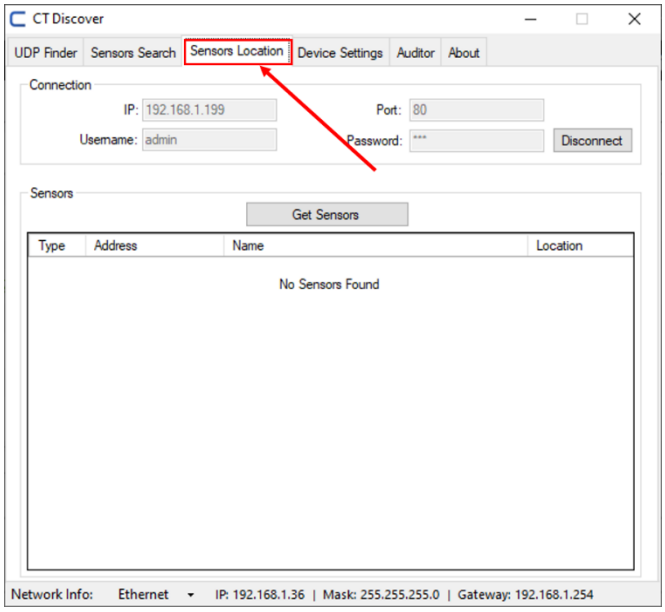


Figure 25 – CT Discover “Sensors Location” tab

2. Insert the Nidus connection data if nidus is not connected (Figure 26).

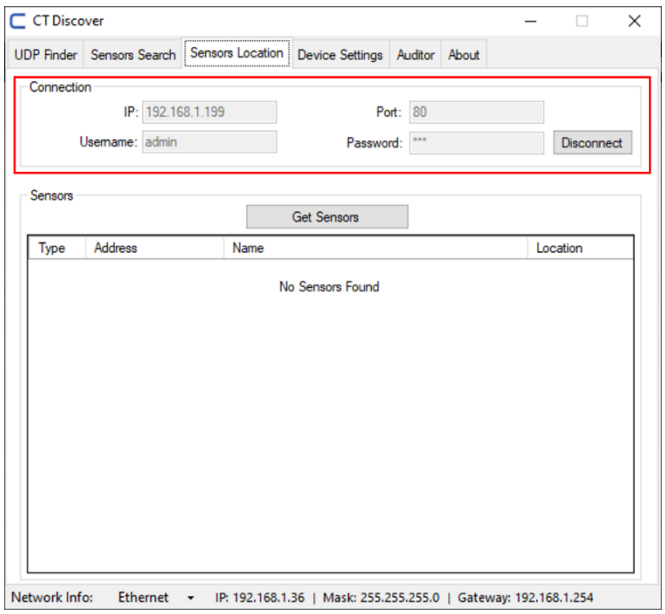


Figure 26 – Connection data - Connected

3. Click on “Get Sensors” button and wait for Nidus response. The added sensors will appear on table. The first column specifies if is a wired sensor ( ) or a wireless sensor ( ) (Figure 27).

4. To update a sensor location, click on cell corresponding to location and write the new location. Unsaved locations will be in Bold text format. To save click on “Save” button (Figure 27).

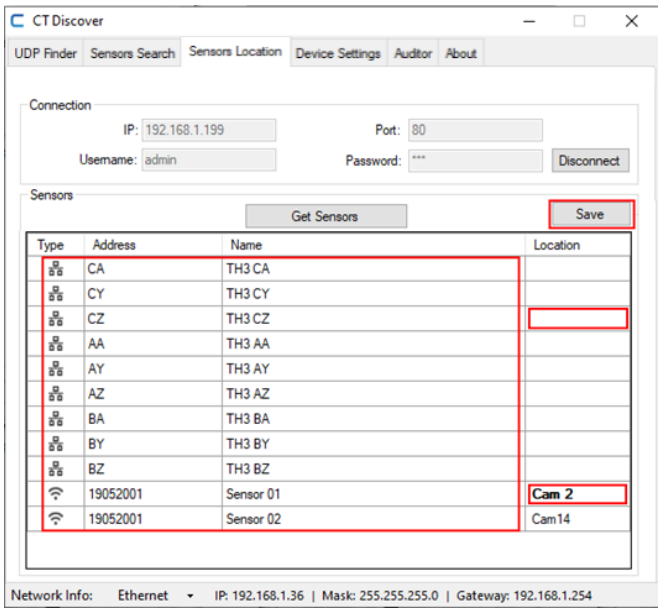


Figure 27 – Sensors location table

5. Auditor

1. Go to “Auditor” tab (Figure 28).

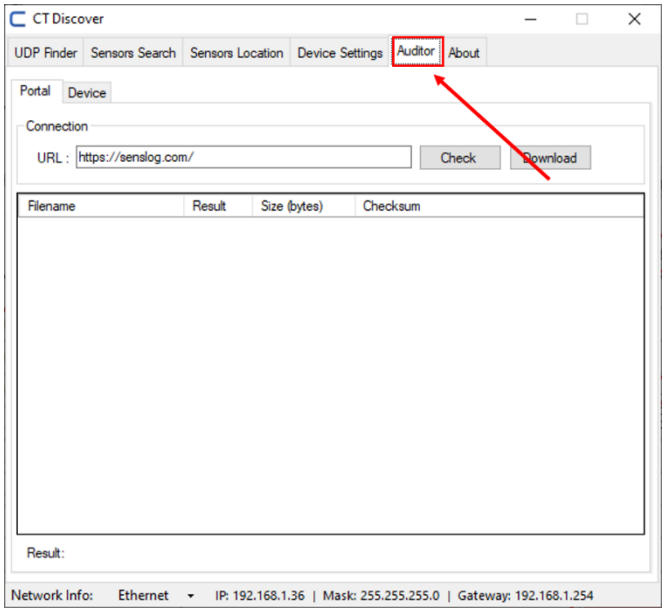


Figure 28 – CT Discover – “Auditor” tab

2. To validate the Senslive select the option “Portal” (Figure 29).

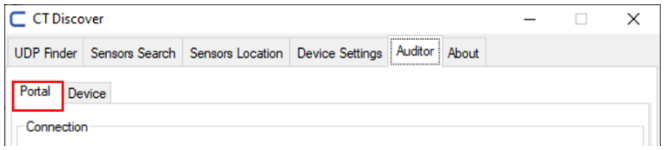


Figure 29 – Portal Option

3. Insert the URL of Senslive and select the button “Check” to compare the Senslive files with the CT Discover software copy. The button “Download” will download to local computer the Senslive certified files (Figure 30).

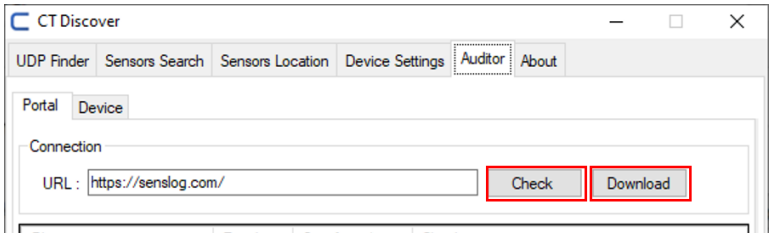


Figure 30 – Portal “Check” and “Download” buttons

4. If option “Check“ is selected the files are validated by legally relevant software “CT Discover” and showed in table the file name, size and respective checksum. At the end, an overall checksum is calculated and presented to user (Figure 31).

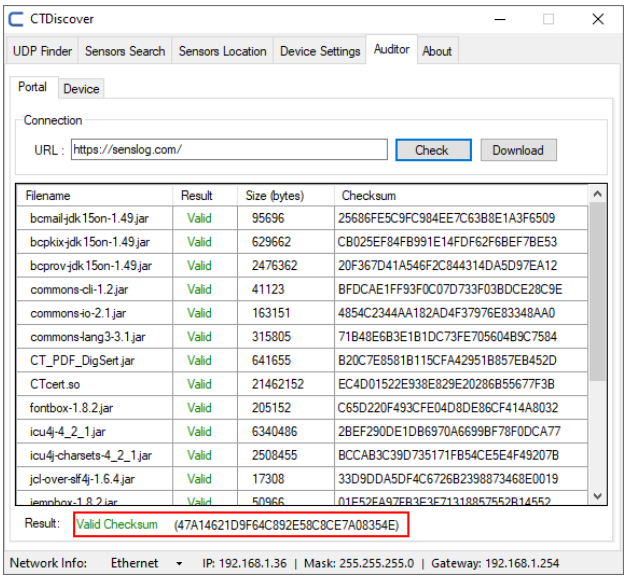


Figure 31 – Senslive Result - Valid

5. If option “Download” is selected a box will be showed to user to select the path of download (Figure 32).

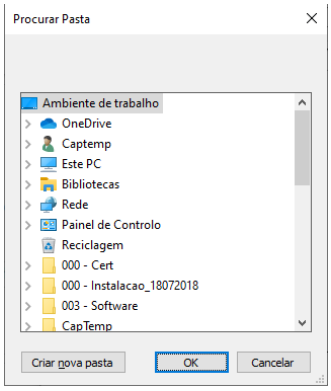


Figure 32 – Senslive Files Destination path box

6. In order to validate the Nidus Device, select the option “Device” (Figure 33).

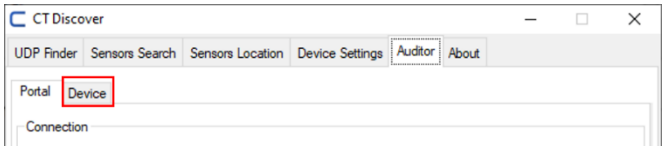


Figure 33 – Device Option

7. On the top the user can change Nidus IP and Port. If in “UDP Finder” the user selects one Nidus from List, the IP and port will be auto filled. To unlock the download and check buttons the user need click on Button “Connect” (Figure 34Figure 33).

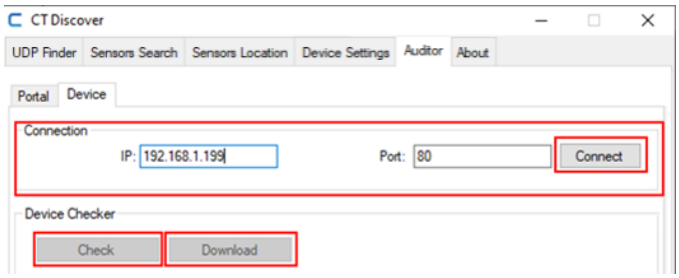


Figure 34 – Connection data – Not Connected

8. The user can download the Nidus software select the “Download” button. One box will appear to select the destination of download (Figure 35).

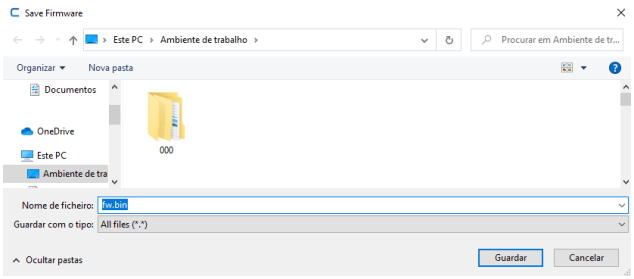


Figure 35 – Save Firmware Location Box

9. Instead of download the Nidus software, the user can verify the Nidus software integrity and authenticity status. This action show if the software running on Nidus is valid or if it is adulterated, by validating the respective CRC32 and version (Figure 36 and Figure 37).

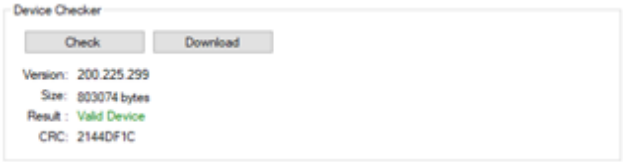


Figure 36 – Nidus Valid Software

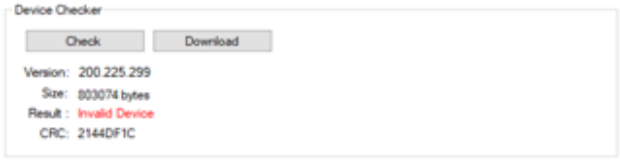


Figure 37 – Nidus Invalid Software

ii. Nidus

1. Sensor value visualization

- #### TH3: View values

1. Access your Nidus webpage.

2. To see the *Airo* values, go to the “Sensors” tab (Figure 38)

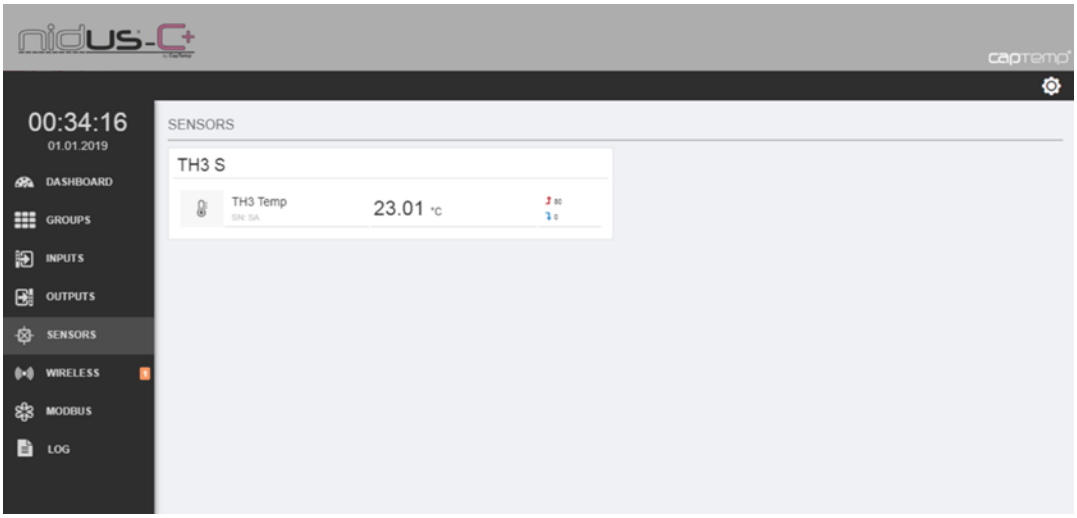


Figure 38 - Nidus main page: "Sensors" tab

- #### Airo: View values

1. Access your Nidus webpage.

2. To see the *Airo* values, go to the “Wireless” tab (Figure 39)

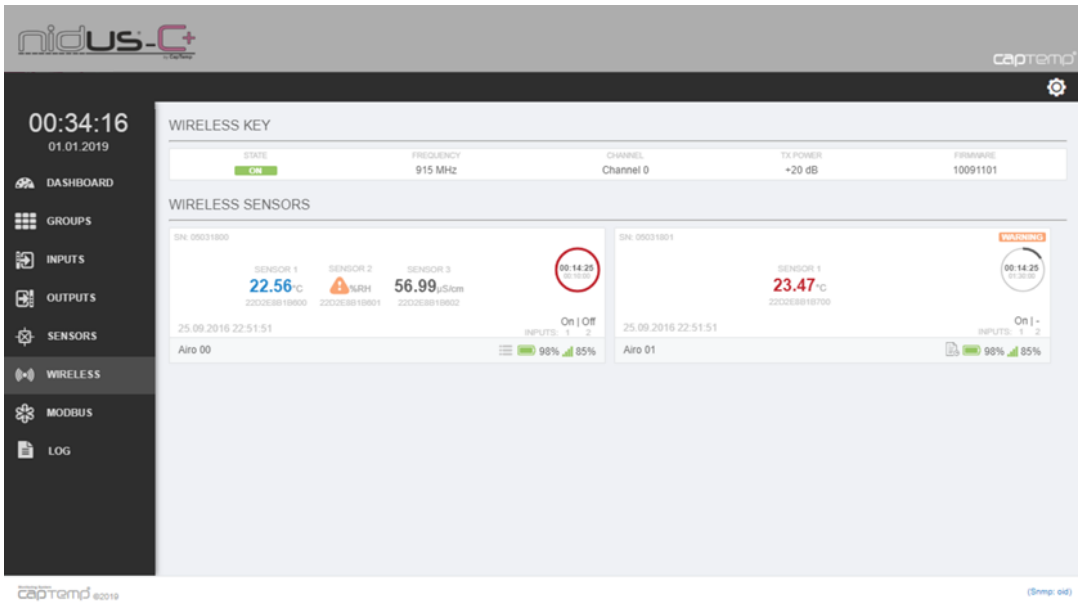


Figure 39 - Nidus main page: "Wireless" tab

iii. Senslive

1. Device registration

1. Access your Nidus webpage.
2. In the homepage, there is available a section with portal communication status, as shown in Figure 40.

Figure 40 - Portal communication section on Nidus homepage

Note:

- If section does not appear, it means that portal is disabled at Nidus administration settings. It must be enabled, as shown in Figure 41.

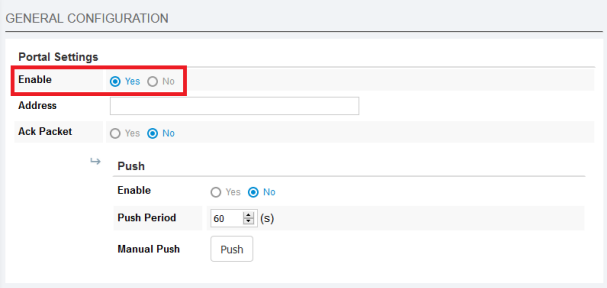


Figure 41 - Enabling portal at Nidus administration settings

3. There are 3 status for portal communication:

- Cannot reach portal
- Not registered
- Registered

3.1 **"Cannot reach portal"** means that the address configured cannot be reached or is invalid. Please check if the address is well configured or if the push is enabled (Figure 42).

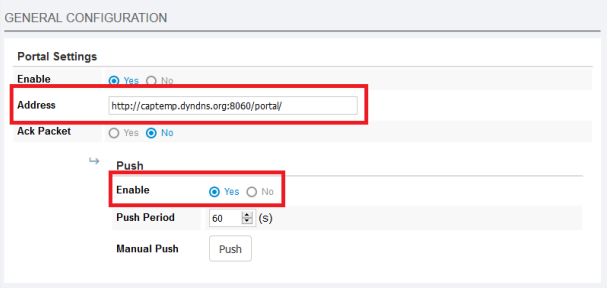


Figure 42 - Portal address configuration

3.2 "**Not Registered**" means that Nidus can communicate with portal but is not registered yet. At this point, becomes available a button to do the Nidus registration on SensLive, as shown in Figure 43.

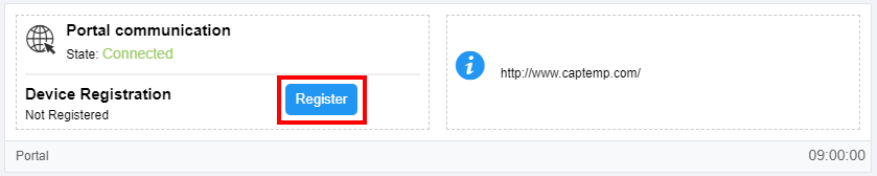


Figure 43 - Button for Nidus registration

By clicking on "Register" button, it will be open a webpage for Nidus registration. You have two options:

- Create Account
- I Have Account

Figure 44 - Nidus registration options

If you or your company have an account, please choose **"I Have Account"** and login with your credentials.

Else, you can sign up by clicking on **"Create Account"**. You will be redirect to a new account form, as shown in Figure 45.

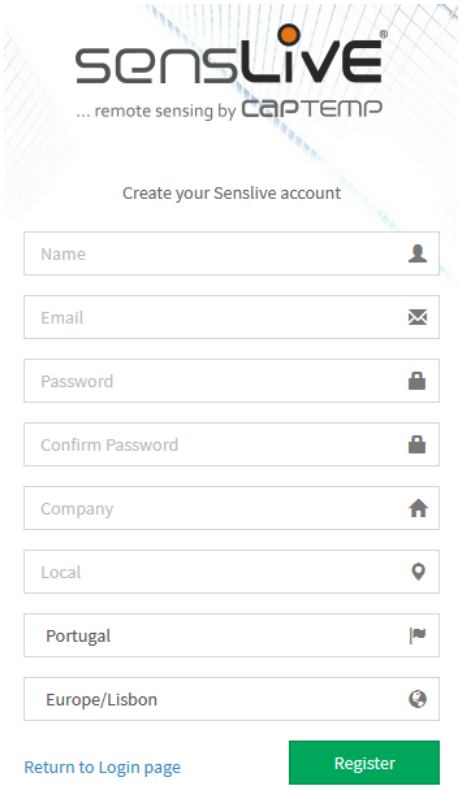


Figure 45 - Signup form

All fields are mandatory:

- **Name**: Your profile name;
- **Email**: Your e-mail. Will be used as username. Must be unique;
- **Company**: Company name. Must be unique. If your company already has a SensLive account, please do not create another account;
- **Local**: The default local of company. You can create more locals after login on your account;
- **Country**: Company's country;
- **Time zone**: Country's time zone.

After sign up, you will be redirected to login page, where you can now login with your created account.

2. Data visualization

When the user login in the SensLive page, can view the menu selected in Figure 46.

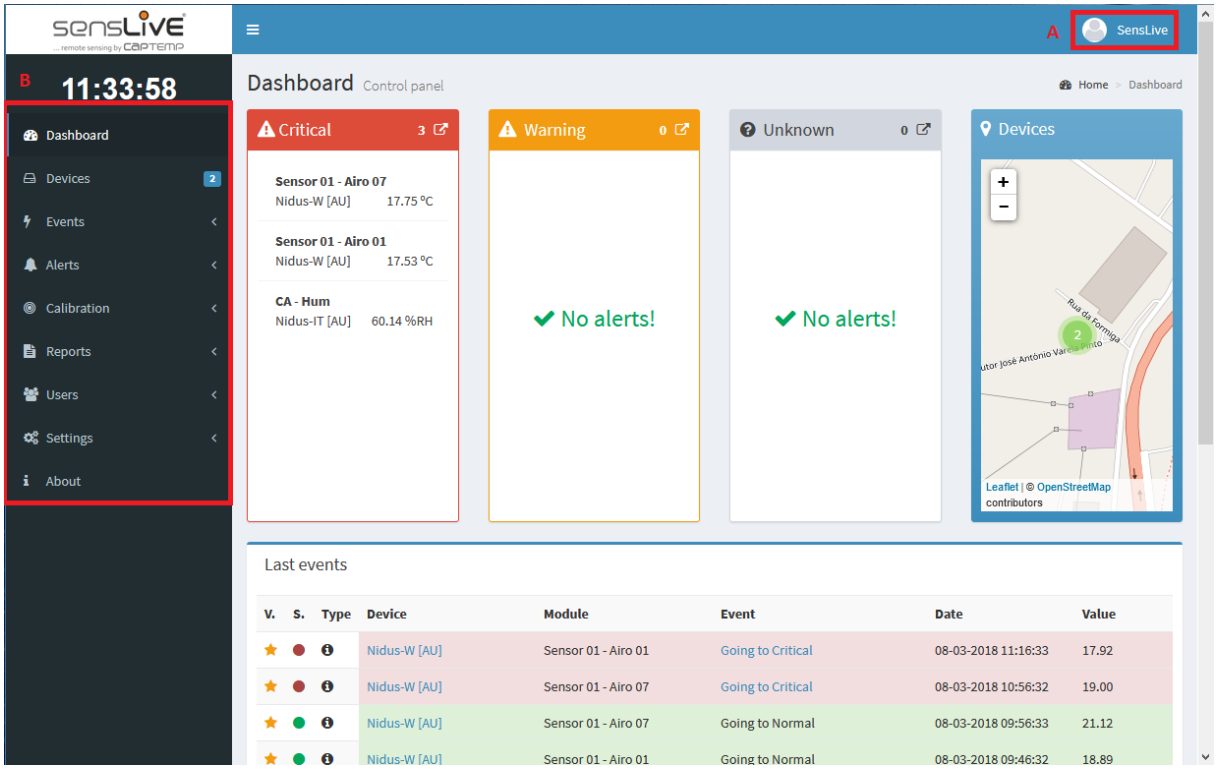


Figure 46 - SensLive main page

To create reports, the user goes to:

- Custom charts

In this page user can generate line charts and export it to PDF. Figure 47 shows available options.

Figure 47 - Custom chart

In Figure 47, there are indicated the following sections:

1. Section **A**: Field to choose device;
2. Section **B**: Field to choose sensor;
3. Section **C**: Field to choose date interval;
4. Section **D**: Field to trace horizontal line for minimum value (optional);
5. Section **E**: Field to trace horizontal line for maximum value (optional);
6. Section **F**: Button for refreshing graph;
7. Section **G**: Button for generating graph in PDF format.

If SensLive detects that a value has been manipulated, it will be indicated by a red warning symbol.

If SensLive does not detect any manipulated values, it will be added the tag [Certified Values] to chart title when exported to PDF.

If SensLive detects manipulated values, it will be added the number of manipulated values to chart subtitle when exported to PDF.

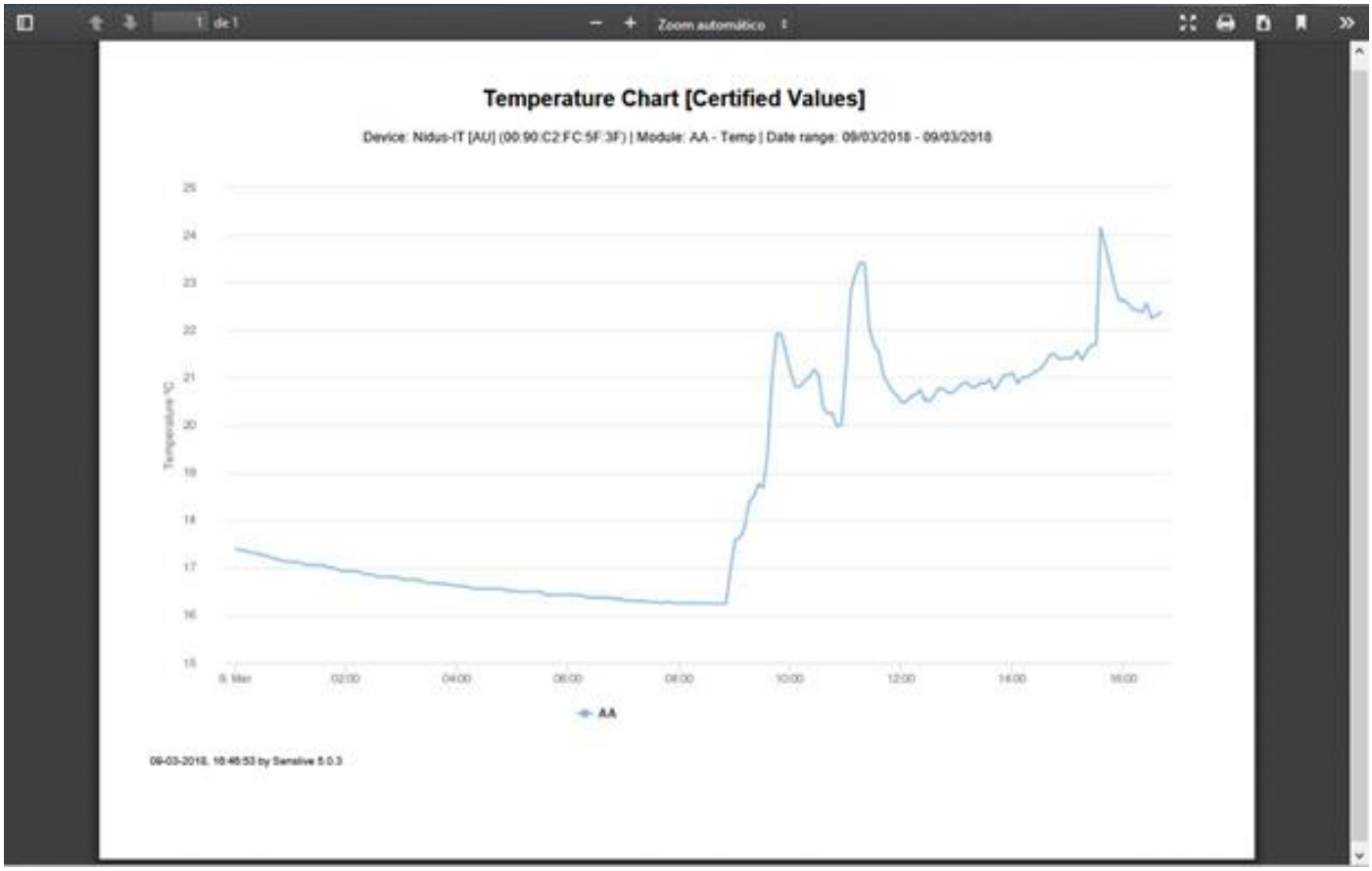


Figure 48 - Custom chart in PDF format

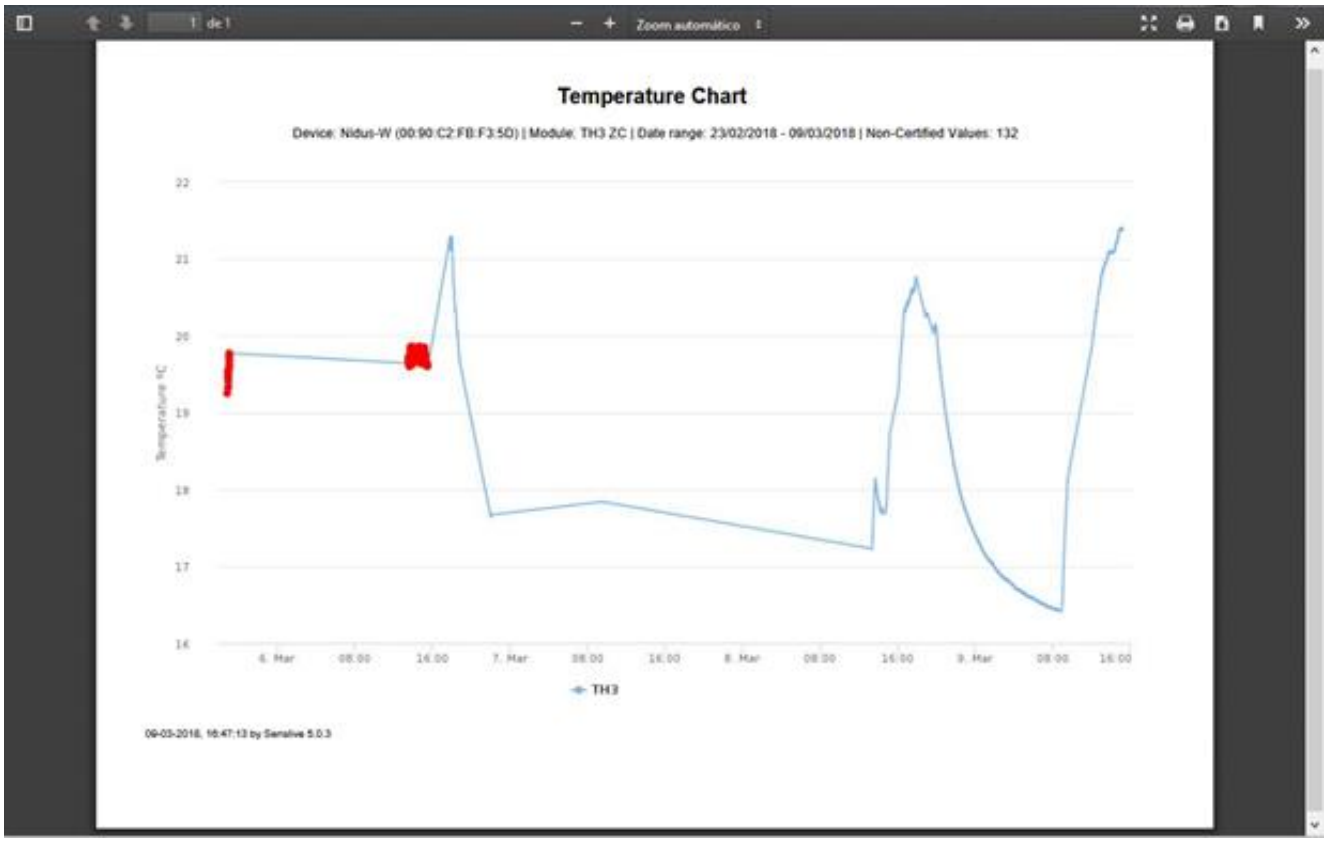


Figure 48 - Custom chart with manipulated values in PDF format

- Data listing

In this page user can view data in listing format and export it to CSV. Figure 0 shows available options.

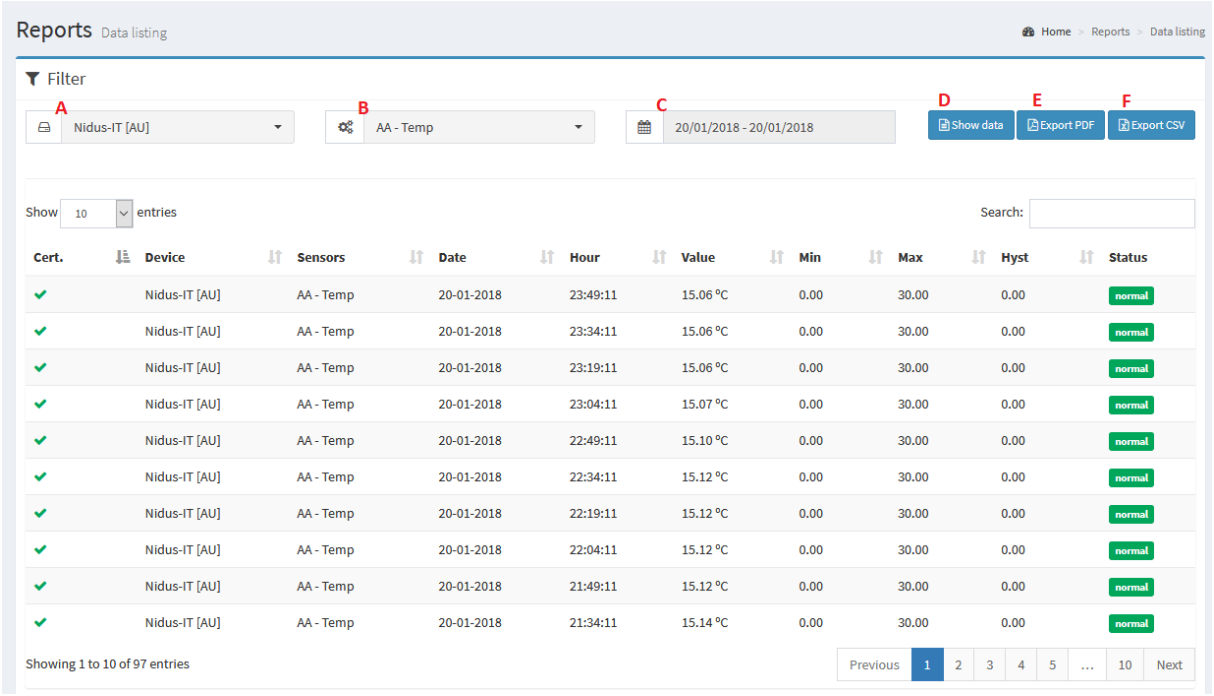


Figure 50 - Data listing

In Figure , there are indicated the following sections:

- Section **A**: Field to choose device;
- Section **B**: Field to choose sensor;
- Section **C**: Field to choose date interval;
- Section **D**: Button for refreshing data;
- Section **E**: Button for exporting to PDF format;
- Section **F**: Button for exporting to CSV format.

If SensLive detects that a value has been manipulated, it will be indicated by a red warning symbol on column “Cert”.

If SensLive does not detect any manipulated values, it will be added the tag [Certified Values] to chart title when exported to PDF.

If SensLive detects manipulated values, it will be added the number of manipulated values to chart subtitle when exported to PDF.

Monitoring System captemp

Data listing

Device: Nidus-IT+ - CERT (00:C0:C0:33:33:33) | Module: TH3 CA
Date range: 14/09/2018 - 15/09/2018 | Non-Certified Values: 1

Cert.	Device	Module	Serial	Value	Date
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	26.85 ºC	14-09-2018 01:00:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	26.82 ºC	14-09-2018 01:01:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	26.82 ºC	14-09-2018 01:02:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	26.81 ºC	14-09-2018 01:03:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	26.81 ºC	14-09-2018 01:04:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	26.81 ºC	14-09-2018 01:05:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	26.8 ºC	14-09-2018 01:06:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	26.81 ºC	14-09-2018 01:07:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	26.81 ºC	14-09-2018 01:08:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	26.81 ºC	14-09-2018 01:09:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.5 ºC	14-09-2018 13:51:00
No	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.5 ºC	14-09-2018 13:52:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.5 ºC	14-09-2018 13:53:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.51 ºC	14-09-2018 13:54:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.53 ºC	14-09-2018 13:55:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.53 ºC	14-09-2018 13:56:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.55 ºC	14-09-2018 13:57:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.56 ºC	14-09-2018 13:58:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.56 ºC	14-09-2018 13:59:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.54 ºC	14-09-2018 14:00:00
Yes	Nidus-IT+ - CERT	TH3 CA	A001D088D5080000	27.56 ºC	14-09-2018 14:01:00

18-09-2018, 10:28:52 by Senslive 5.0.3

Figure 51 - Data listing in PDF format

2. System maintenance

a. Seals

i. Seal models

1. Nidus-C+

!! DO NOT NEED SEAL !!

The Nidus-C+ do not need sealing because the digital temperature sensors have a unique serial number that allows to trace the measurements, if the sensor is replaced, the new sensor will have a different serial number.

2. TH3

!! DO NOT NEED SEAL !!

The TH3 do not need sealing because the digital temperature sensors have a unique serial number that allows to trace the measurements, if the sensor is replaced, the new sensor will have a different serial number.

3. Airo

!! DO NOT NEED SEAL !!

The *Airo* do not need sealing because the digital temperature sensors have a unique serial number that allows to trace the measurements, if the sensor is replaced, the new sensor will have a different serial number.

b. Labels

i. Label regulations

Nidus-C+ has the following label which is assigned in the manufacturing process:

Figure 52 - Example: MAC: 00:90:C2:F2:72:0F is the hardware unique identifier

Airo has the following label which is assigned in the manufacturing process:

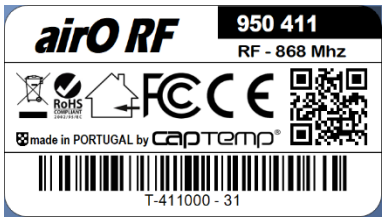


Figure 53 - Example: 41100031 is the hardware unique serial number.

TH3 has the following label which is assigned in the manufacturing process:

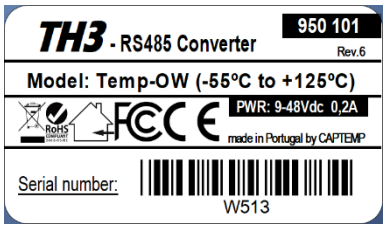


Figure 494 - Example: W513 is the hardware unique serial number.

Figure 505 – Temperature sensor: Sensor unique Serial Number

ii. Device label explanation

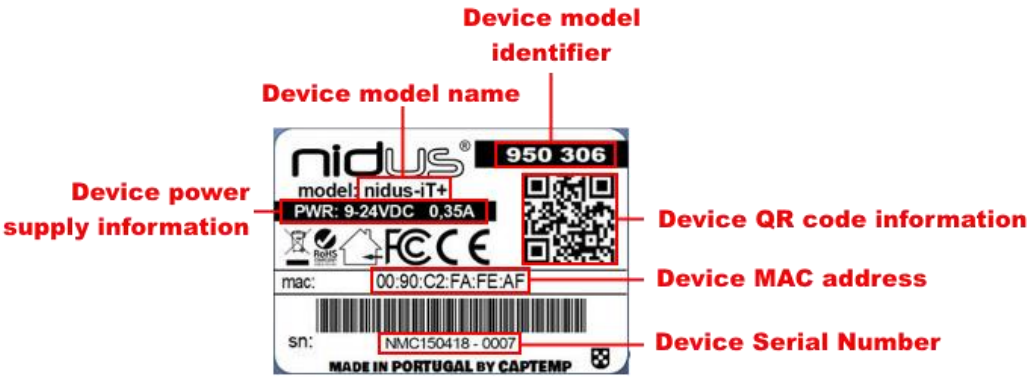


Figure 516 - Nidus label explanation

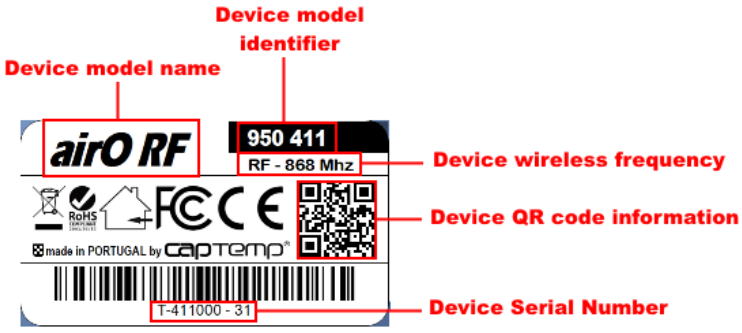


Figure 527 - *Airo* label explanation

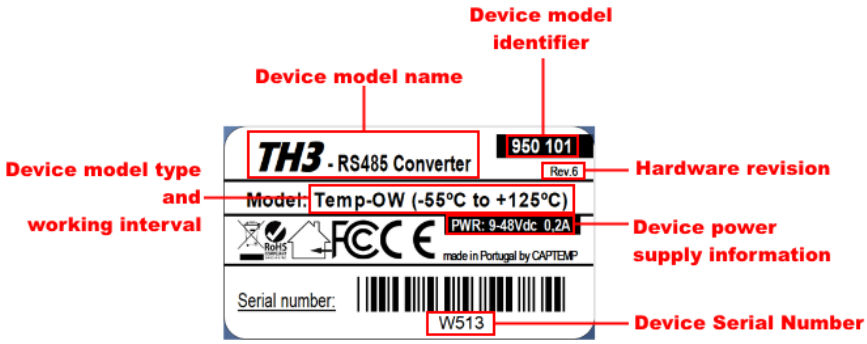


Figure 58 - TH3 label explanation

c. Preventive maintenance

i. Device maintenance

Not applicable.

ii. System maintenance

Not applicable.

d. Model Conformity Examination

The evaluation of conformity must be made according the following norms:

- Norm EN12830.
- REAL DECRETO 244/2016 y ORDEN ITC 3701/2006.
- WELMEC 7.2 Software Guide. According the requirements of the norm (EN12830)

e. Device Inspection

i. Periodic inspection

The temperature registers, when in use, must be certified periodically according the norm EN12830.

ii. Post-repair inspection

Not applicable.

When a temperature sensor is malfunctioning, it must be replaced by a new one, accompanied by the respective verification certificate.

Senslive will automatically create a new sensor in the portal and the old one will remain for data query.

Document History

Version	Date	Updated by	Notes
TM_03_01_rev0	11.02.2019	Luis Silva	First release
TM_03_01_rev1	12.06.2019	Luis Silva	Removal of revisions in references
TM_03_01_rev2	11.11.2019	Luis Silva	Added CT Discover to Software list in chapter “1. Nidus C+ / Senslive system” subtopic “a. General system overview” Updated chapter “c. Software” to include CT Discover software
TM_03_01_rev3	21.07.2020	Luis Silva	Updated chapter “Data visualization” Updated figures index

Distribution

Name	Title	Review/Approval
Pedro de Miguel	Welmec auditor	Pending
Juan Gonzales	Director F2I2	Pending