CCSTH Temperature and Humidity Sensor

User Guide

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3 Introduction

This document outlines how to use the CCSTH temperature and humidity sensor from Circor Solutions.

4 Operating Conditions

Table 1: Operating Conditions

	Minimum	Nominal	Maximum
Temperature (°C)	-20		50
Humidity (%)	0		100

5 Sampling

The device records samples of atmospheric temperature and humidity every 30 minutes to internal memory. Other options are available on request. These are also uploaded to an online server depending on device setup.

6 Measurement Parameters

There are two physical properties measured by this sensor module. The measurement ranges and expected accuracies are given below. Values in parenthesis are the accuracy values for extreme conditions, 100% for humidity and 60 degrees Celsius for temperature.

Table 2: Measurement parameters

	Minimum	Maximum	Typical Accuracy
Temperature (°C)	-20	50	+/- 0.1 (0.3)
Humidity (%)	0	100	+/- 1 (3)

7 Hardware requirements

To communicate with the sensor, the following hardware is required. A computer with a USB port, A USB-A to USB-C cable (with power and data support) and the sensor unit.

8 Power requirements

This device uses two AA 1.5V batteries for power. Using the recommended Duracell MN1500 or Energiser E91 MAX AA batteries. For 30 minute sampling, in online mode, a running time of at-least 9 months can be expected. In offline mode (No data transmission to an online server), the device can record data to memory for at least 24 months.

9 Software requirements

The data access can be done on Windows, MacOS or Linux operating systems. This guide is specific to Windows 10.

Any UART terminal software and the USB driver for the CH340N chip will be required.

The USB driver for the unit can be downloaded from:
https://sparks.gogo.co.nz/ch340.html

The recommended “YAT” USB to UART terminal software can be downloaded from:
https://sourceforge.net/projects/y-a-terminal/

Download and install the above before proceeding.

10 Using the YAT terminal software

Plug the USB-C end of the USB cable to the sensor unit and the other USB-A end, to a personal computer. Launch the YAT terminal software.

10.1 Selecting the correct port

You will need to select the correct “PORT” assigned to the sensor unit by the computer. In the window menu of the YAT software, select (Terminal > Settings >) in that order. A “Terminal Settings” window will pop up. Some settings will need two be configured in this window. Under the “Port” section, your computer might have one or more ports available. You will need to identify which one is for the sensor unit and select it. In this instance we have COM1215 as the port. See the image below. You may identify which one is the correct port by unplugging the sensor to see which port number disappears from the list.

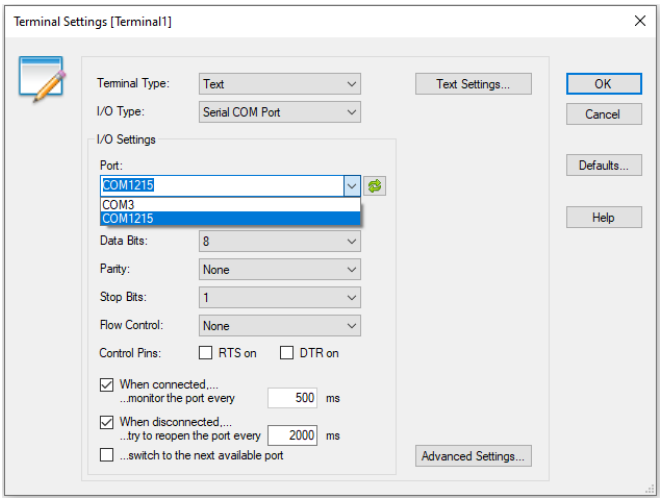

Figure 1: Port selection

10.2 Setting the correct Baud Rate

In the same “Terminal Settings” window, we will set the correct communication baud rate. A baud rate of 500000, is used by the sensor units. Manually type this number in the “Bits per second” section.

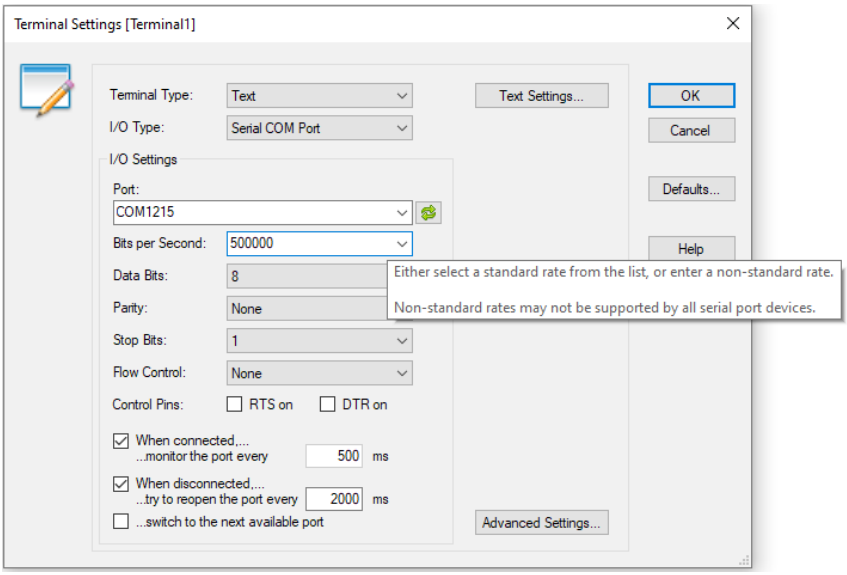

Figure 2: Baud rate

Click OK to save and close the Terminal Settings window. All other settings should be left with default settings, otherwise use the image above for reference.

10.3 Open the communication channel

To send data between the computer and sensor unit, open the communication channel by clicking the green tick icon under the window menu. See the image below.

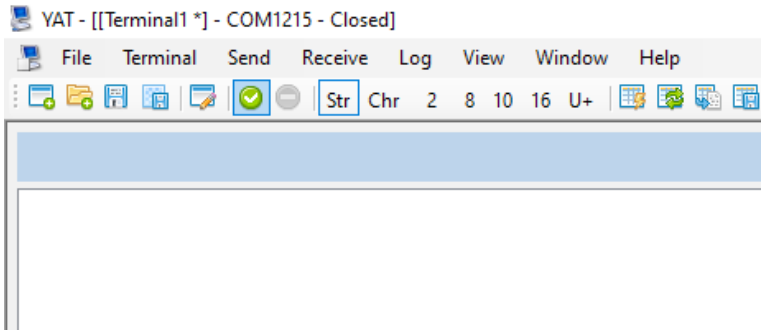

Figure 3: Open communication channel from icon

Alternatively select (Terminal > Open/Start) from the menu. An image is shown below for illustration.

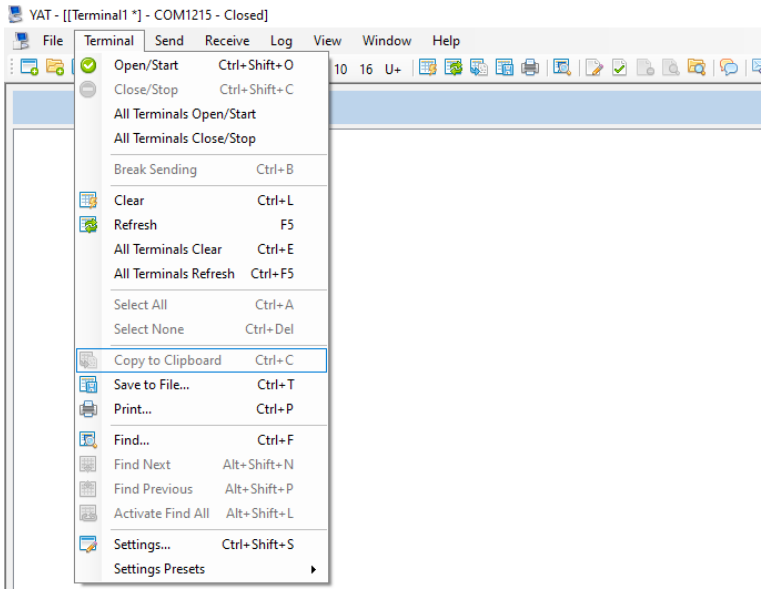

Figure 4: Open communication channel from menu

11 Setting the time

During any data logging project, it is vital that the time on the device is set correctly. To set the time we will send the the correct time information to the sensor unit using the YAT software. At the bottom of the application window, there is a section labelled “Text:”. Any commands we send to the unit should be typed in here.

To set the time, use the command format given below. The commands are case sensitive and should be type exactly as given. An example is given below in quotation marks. You may modify the date and time accordingly to the correct time. Use 24 hour notation for hours in time.

“TIME,2024-09-09_08:24:00” “TIME,YYYY-MM-DD_HH-mm-ss”

After typing the above, press ENTER to send the command to the unit. The unit will respond as shown below to acknowledge the input.

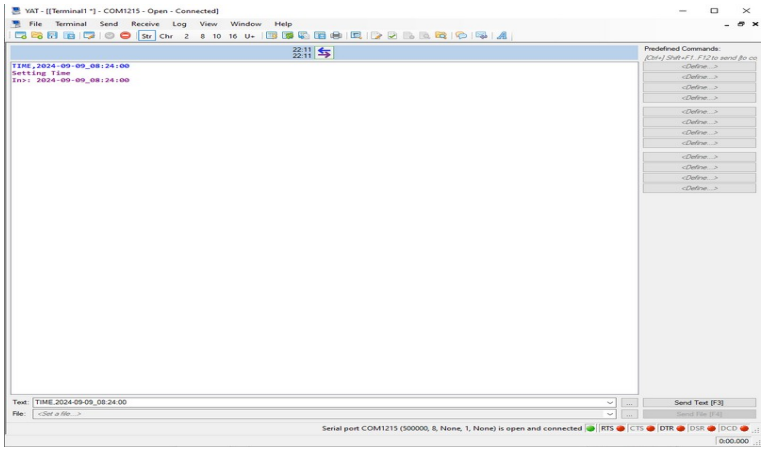

Figure 5: Set the time

To check the time you may send the command “TIME”. The device time will be displayed along with other information to be covered ahead. See below.

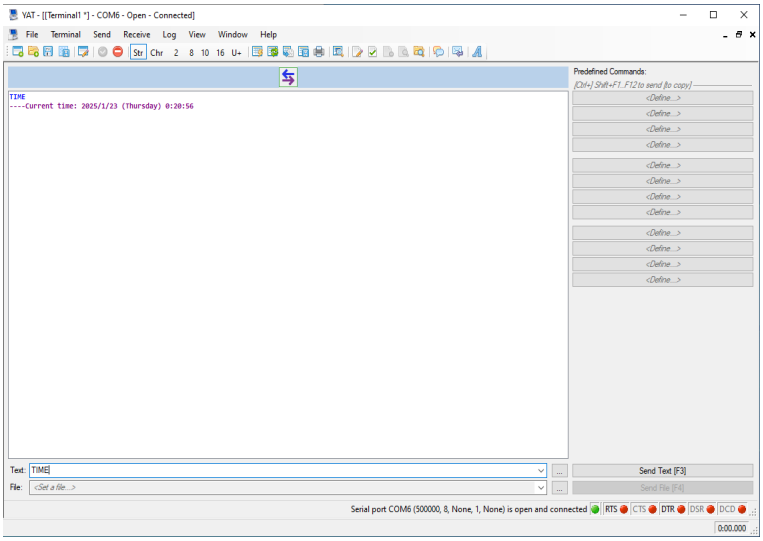

Figure 6: Get current time

12 Starting a project

The term “project” will be used to describe a device logging activity for a given period of time.

12.1 Check the running project

To check if there is a running project at any given time, enter the command “PROJECT”. The device should respond with the start and end date and time of the last set project. Some other information displayed should help tell if there is a project currently running. No changes will be made by this command. See the image below.

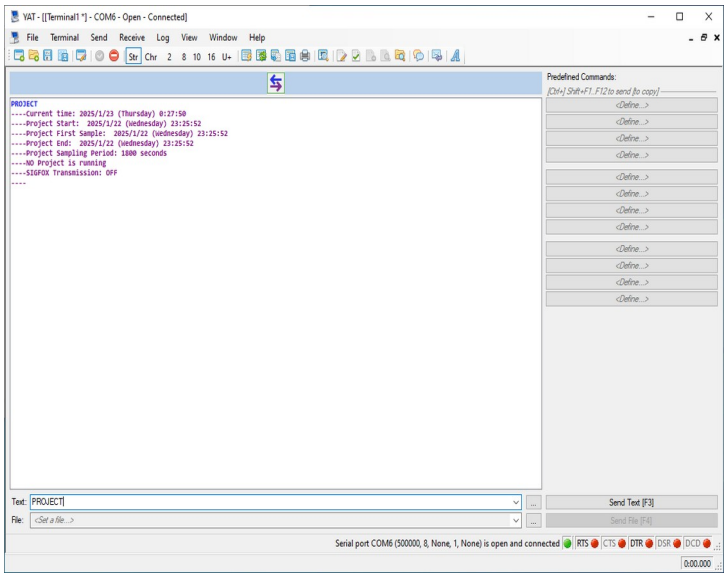

Figure 7: Check the running project

12.2 Start a one day project

Before starting any project, verify that the time is set correctly. Use the command “TIME”.

To start a project that lasts one day, enter the command “PROJECT:DAY”, and the unit will respond with a new project end date that should be 24 hours from current time. The image below gives an illustration. If this is not the case, check that the current set time is correct.

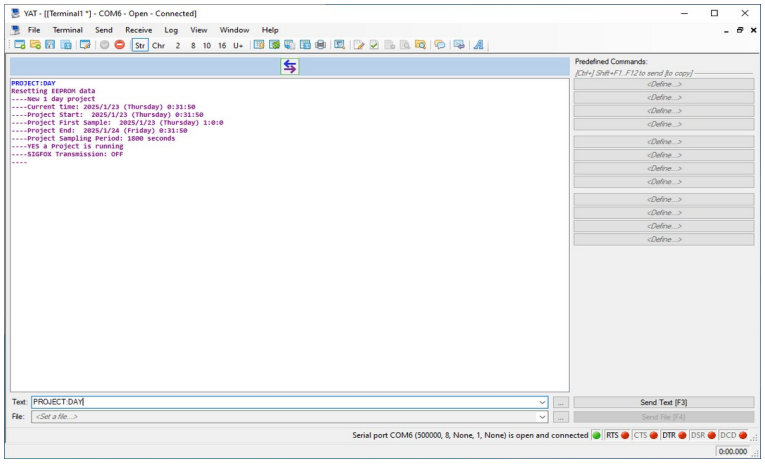

Figure 8: Start one day project

12.3 Start a one week project

Before starting any project, verify that the time is set correctly. Use the command “TIME”.

For a one week project, enter: “PROJECT:WEEK”

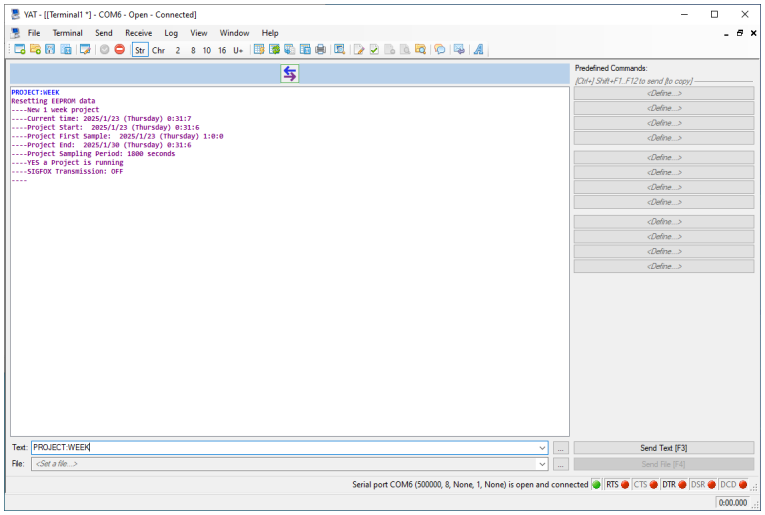

Figure 9: Start one week project

12.4 Start a one month project

Before starting any project, verify that the time is set correctly. Use the command “TIME”.

For a one month project, enter: “PROJECT:MONTH”.

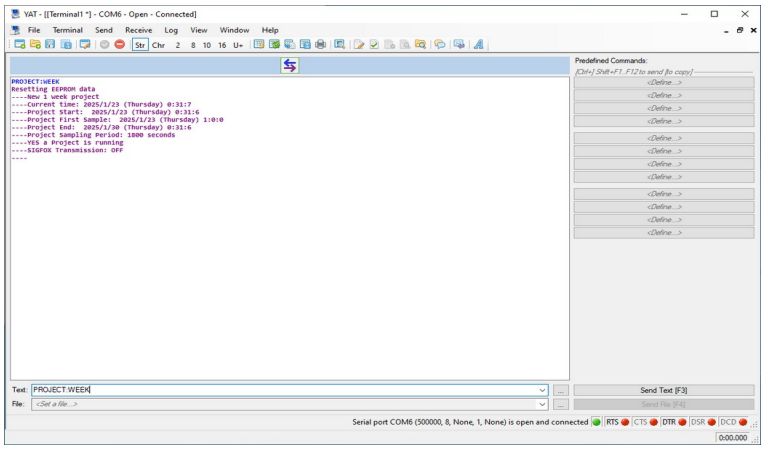

Figure 10: Start one month project

12.5 Start a one year project

Before starting any project, verify that the time is set correctly. Use the command “TIME”.

For a one year project, enter: “PROJECT:YEAR”.

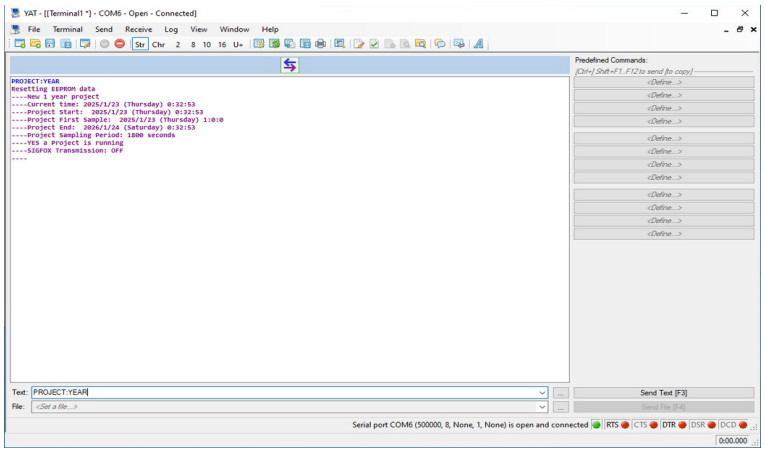

Figure 11: Start one year project

12.6 Start a two year project

For a two year project, enter: “PROJECT:MAX”.

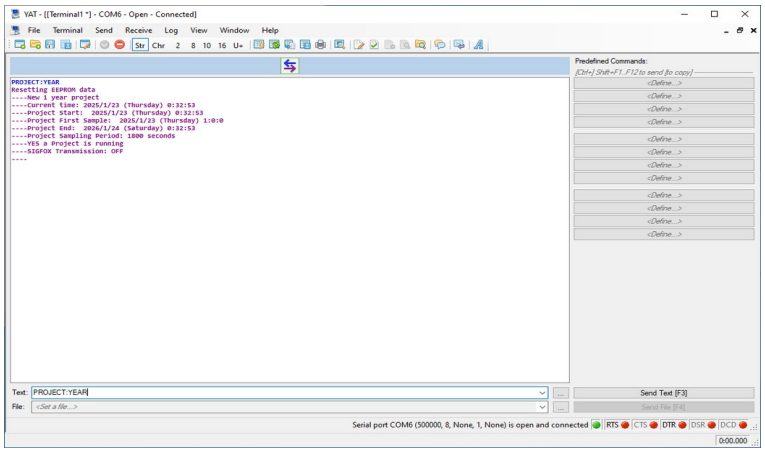

Figure 12: Start two year project

12.7 Stop the running project

To terminate a project that is currently running use the command: “PROJECT:STOP”.

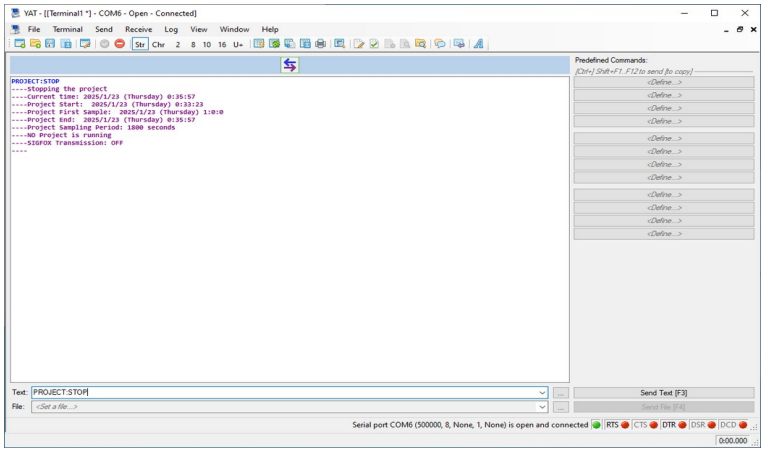

Figure 13: Stop the running project

12.8 Enable wireless upload of data

See Chapter 17.

12.9 Retrieve data from the unit

The sensor unit uploads all recorded data to a web server. The recommended and primary means for retrieving data for network enabled devices is from this server using a web browser. You may access the data from the URL supplied with your purchase of the device. Contact support for login details.

NB: Devices released for local ONLY recording do not upload to a server. Use the method below.

A secondary means to retrieve data recorded on the device is via the same YAT terminal software used above. Enter the command “DATA” and send it to the unit. The unit will print out all stored recordings by the sensor in comma separated format as shown below.

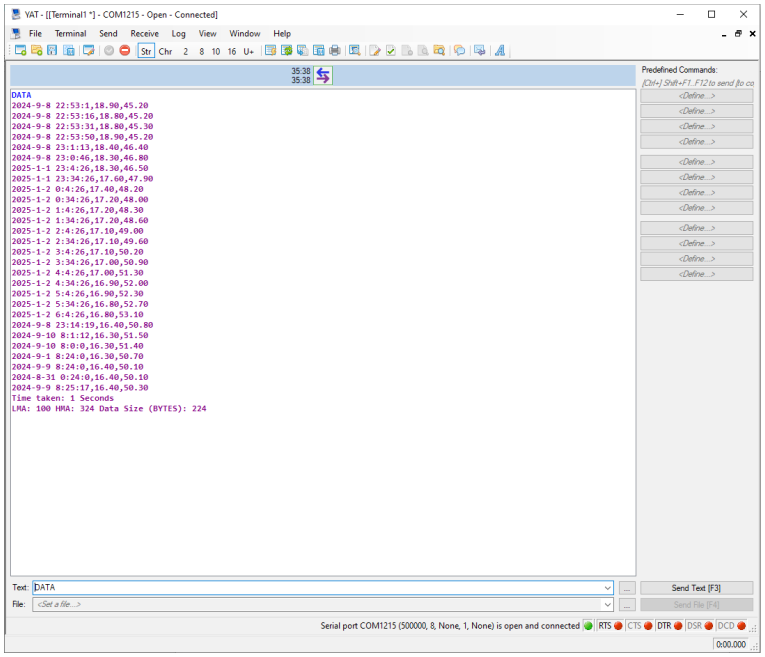

Figure 14: Retrieve data

To copy this into a CSV file for spreadsheet analysis, highlight the relevant data as shown below.

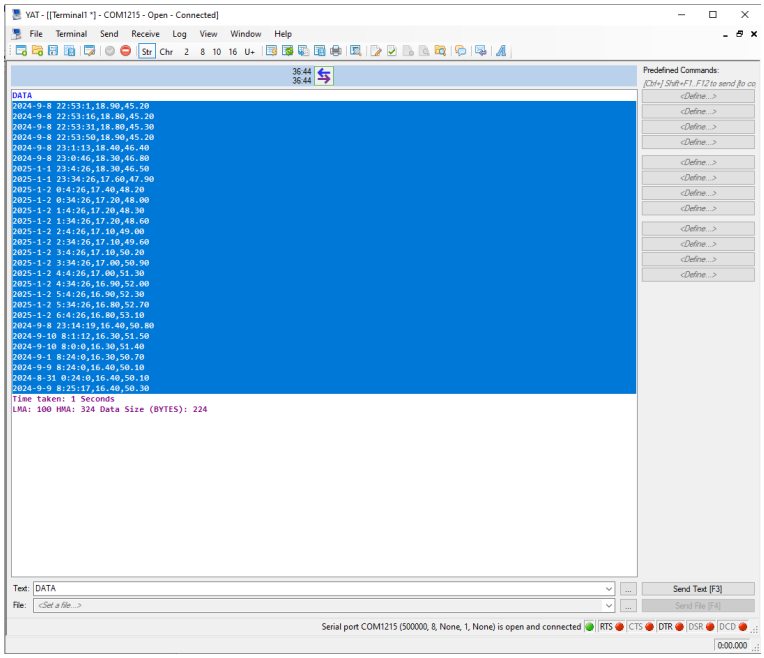

Figure 15: Highlight data

Right click and copy to the clipboard.

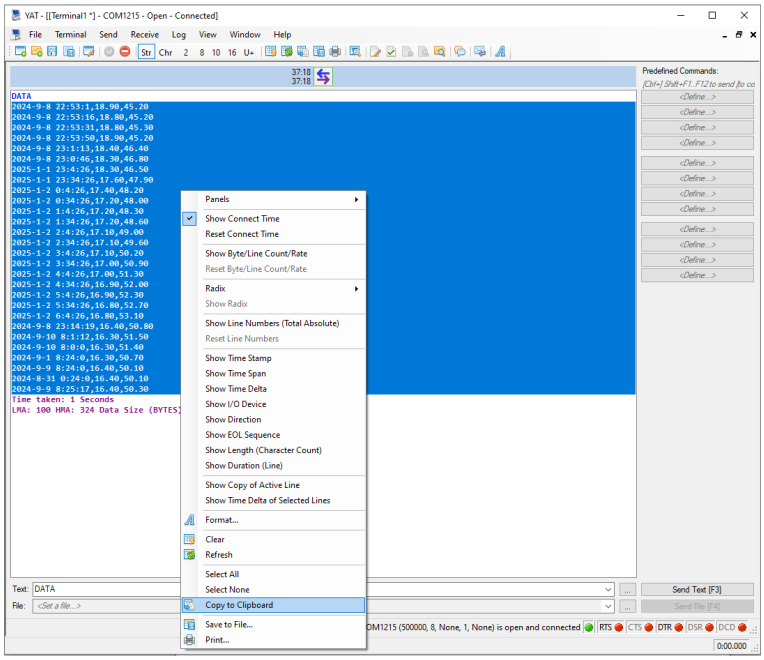

Figure 16: Copy data

Open the windows application “Notepad” and paste the copied information to a new file.

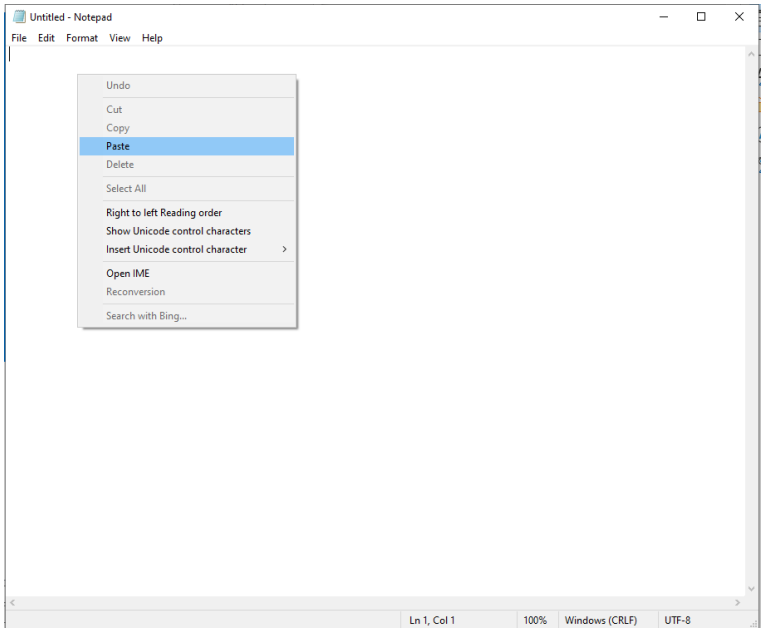

Figure 17: Paste data to Notepad

Save the file as a CSV file using the menu (File > Save As)

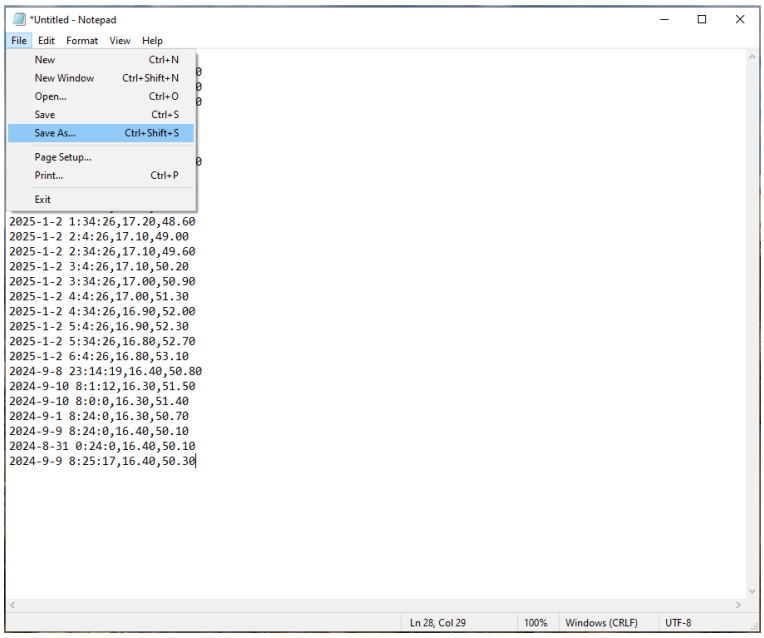

Figure 18: Notepad Save As

Name the file with a ".csv" extension. For example "CCSTH001.csv".

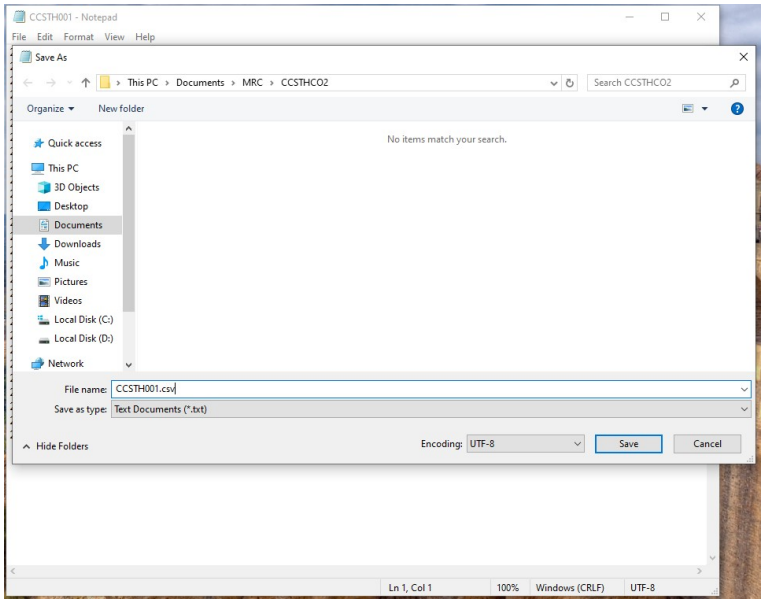

Figure 19: Notepad file naming

You may now open the file with your preferred spreadsheet application.

12.10 Clear the memory

The sensor unit will retain recorded information until the memory is full, then write over the oldest recordings. If the user wants to delete old records from the memory they can do so with the command: “CLEAR”.

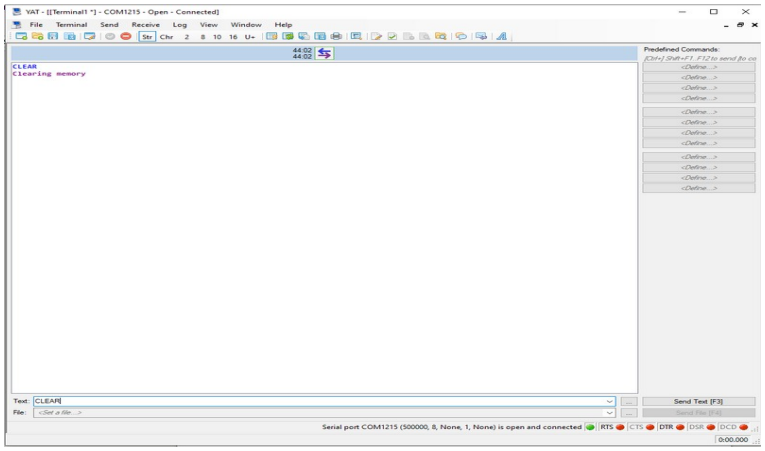

Figure 20: Clear the memory

13 Read the Temperature

To read the temperature from the sensor at the present moment use the command “TEMP”. See the example below.

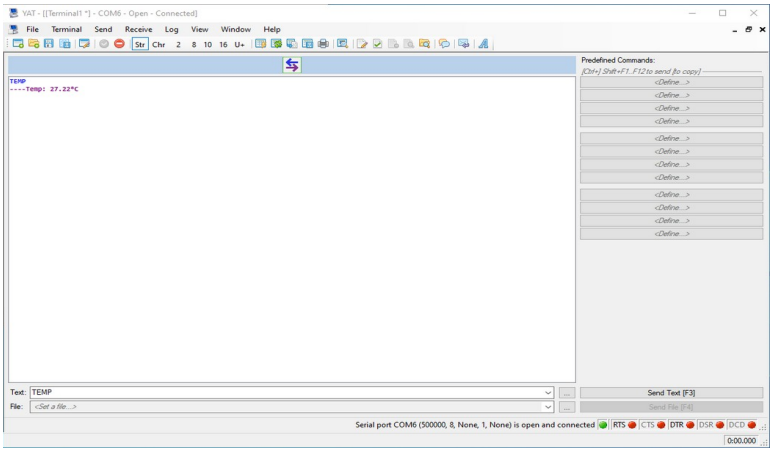

Figure 21: Read the temperature value

14 Read the Humidity

To read the humidity from the sensor at the present moment use the command “HUM”. See the example below.

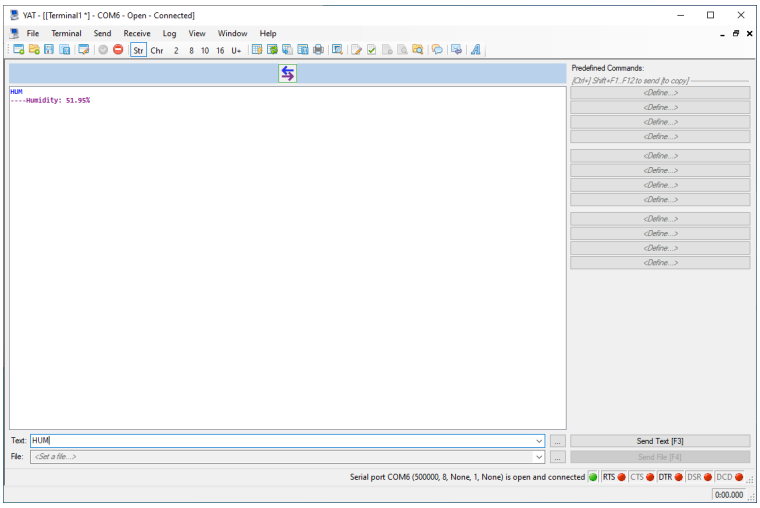

Figure 22: Read the humidity value

15 Read the Battery Voltage

To read the battery level at the present moment use the command “BATTERY”. See the example below.

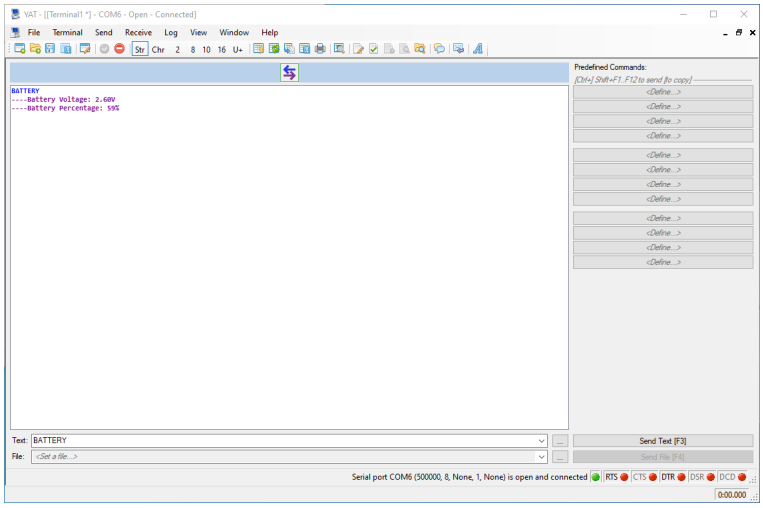

Figure 23: Check the battery level

16 Read the Serial Number

To read the serial number of the device use the command “SN”. See the example below.

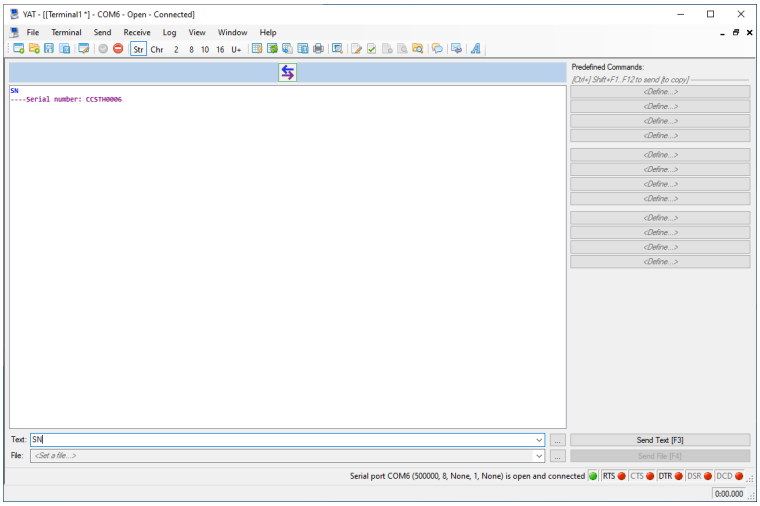

Figure 24: Retrieve the serial number

17 Enable or Disable Wireless Transmission

This function should only be performed on devices that are network activated. Devices for local only recording with no network registration should leave this disabled. **Network registered devices should have this enabled. Otherwise no upload of data will occur.**

To enable wireless upload of data through the SIGFOX network use the command “SIGFOX:ON”. See the example below.

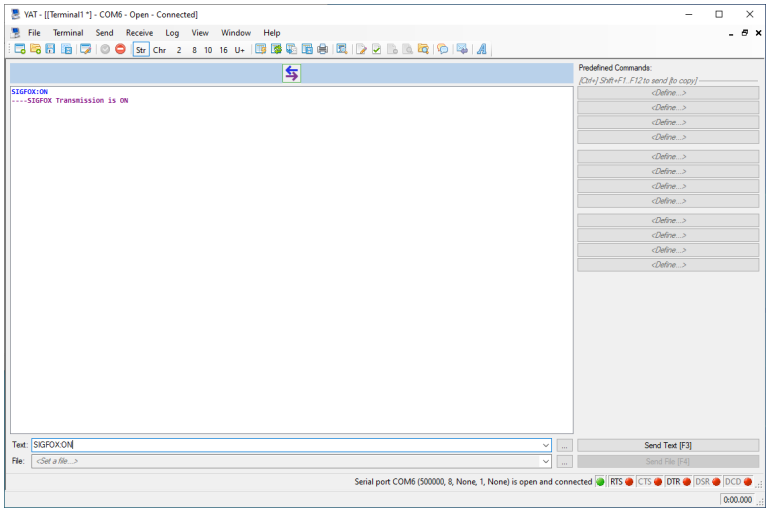

Figure 25: Enable wireless uploads

To disable wireless upload of data through the SIGFOX network use the command "SIGFOX:OFF". **This is vital for saving power if the device does not need the wireless radio. See the example below.**

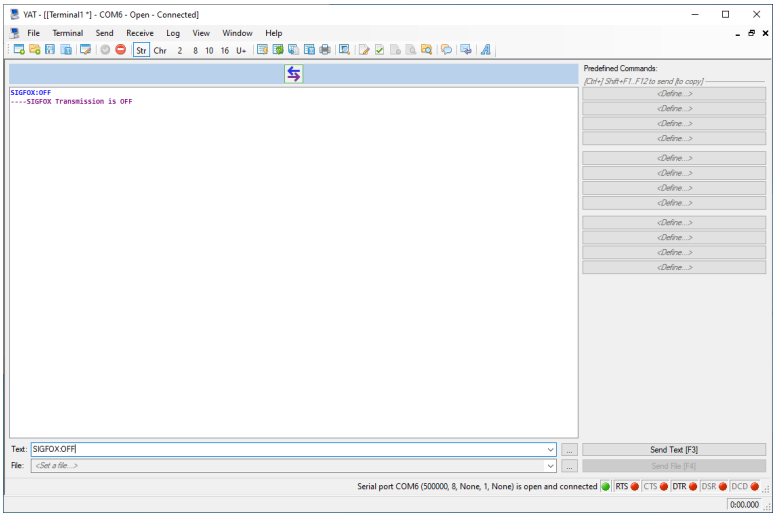

Figure 26: Disable wireless uploads

18 Command list

- TIME - Print out the clock time on the device
- TIME,YYYY-MM-DD_hh:mm:ss - Set the time on the clock (24 hour clock)
- BATTERY - Check the battery level
- TEMP - Read the current temperature value
- HUM - Read the current humidity value
- SN - Read the device's serial number
- DATA - Print all recorded data stored in memory
- CLEAR - Delete any running projects and restore default settings
- PROJECT - Check the setup of the currently running project if any
- PROJECT:DAY - Start a project that ends 24 hours from now
- PROJECT:WEEK - Start a project that ends 7 days from now
- PROJECT:MONTH - Start a project that ends 31 days from now
- PROJECT:YEAR - Start a project that ends 12 months from now
- PROJECT:MAX - Start a project that ends 24 months from now

- PROJECT:STOP - Stop any running project.
- SIGFOX - Check if SIGFOX wireless transmission is on.
- SIGFOX:ON - Switch ON SIGFOX wireless transmission.
- SIGFOX:OFF - Switch OFF SIGFOX wireless transmission.

19 Example, One month offline project

1. Check the time.

   TIME

2. Set the time if incorrect. Otherwise skip this step

   TIME,2025-01-27_13:00:30

3. Stop the running project if any. Otherwise skip.

   PROJECT:STOP

4. Start a one month projects

   PROJECT:MONTH

5. Switch off SIGFOX wireless transmission.

   SIGFOX:OFF

20 Example, One month online project

6. Check the time.

   TIME

7. Set the time if incorrect. Otherwise skip this step

   TIME,2025-01-27_13:05:30

8. Stop the running project if any. Otherwise skip.

   PROJECT:STOP

9. Start a one month projects

   PROJECT:MONTH

10. Switch on SIGFOX wireless transmission.

    SIGFOX:ON

21 Example, STOP a project

11. Stop the project

    PROJECT:STOP

22 Mechanical parameters

Table 3: Mechanical parameters

Parameter	**Value**
Width (mm)	53
Length (mm)	97.5
Height (mm)	23.5
Weight (No batteries) (g)	45
Weight (with batteries) (g)	92

23 Addendum

Updated copies of this document can be requested from Circor Solutions

24 Changes to the document

24.1 2026-02-02

- Limited max operating temperature to 50 ℃

- Added notes on availability of other sampling periods on request.