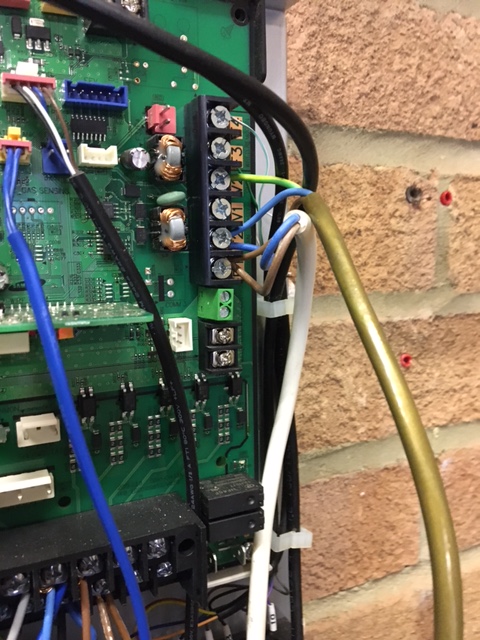
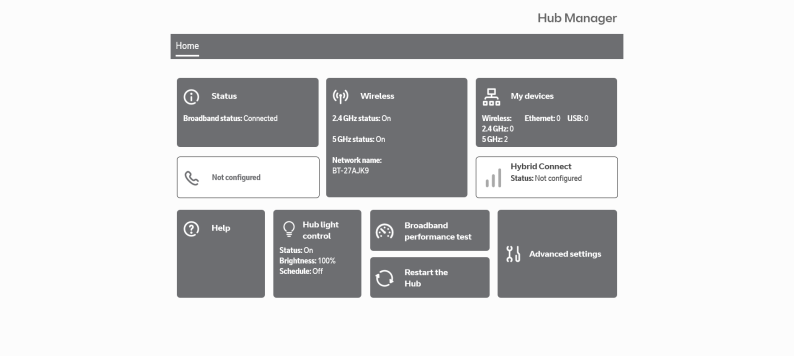
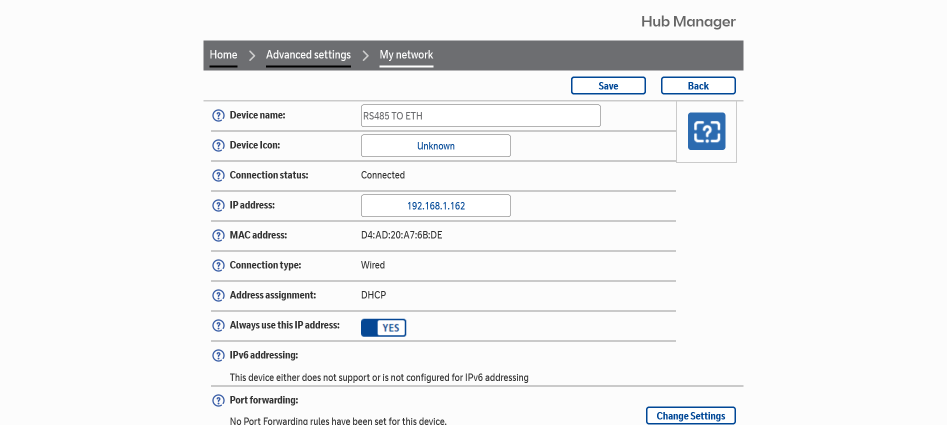
**Step by Step Procedure for Installation**

1. **Install the Waveshare RS485 to ETH and PowerLine adapters (PLAs)**
   1. Switch off the heat pump controller as a precaution.
   2. Remove the controller cover and connect it to Waveshare adapter terminals: F1 to A+, F2 to B- and V2 to earth, then connect the Waveshare adapter to a nearby PLA using an Ethernet (RJ45) cable, as shown in the photos below. I used a metre or so of spare 3-core cable (the gold coloured one). Connect the Waveshere adapter power supply (supplied with the adapter).

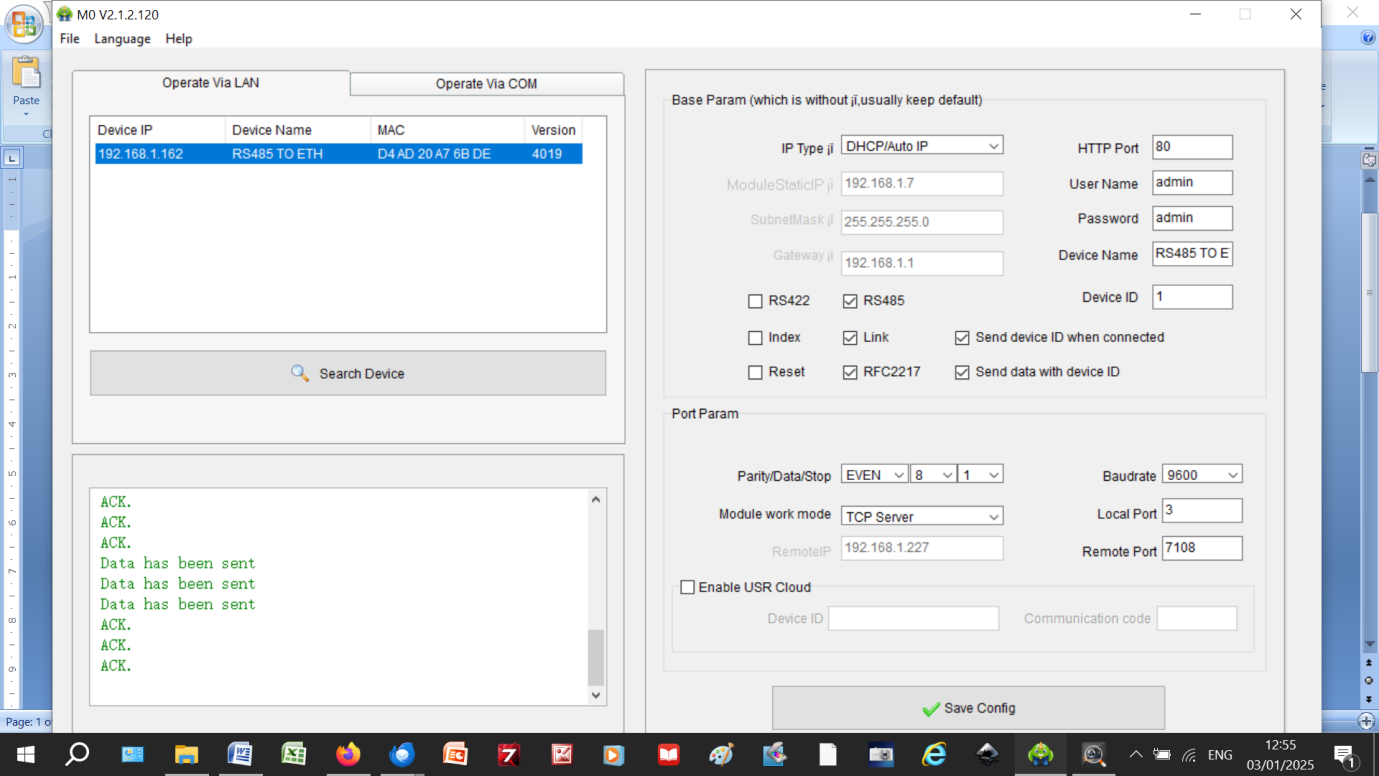
* 1. Connect the matching PLA to the broadband router, using a second Ethernet cable.
  2. Replace the controller cover and switch it on (the controller takes a minute or two to get going).
  3. Switch on both PLAs and confirm that are communicating (the BT PLAs have blue LEDs that illuminate when communication is established.
  4. Switch on the Waveshare adapter.

1. **Set up a permanent IP address for the Waveshare adapter**
   1. Go into your router management pages. For a BT router (“Hub Manager”) if you have not changed any defaults you can do this by typing 192.168.1.254 or into your browser and logging in (I simply use <https://www.cleancss.com/router-default/192.168.1.254> and hit the Admin login button). You should see something like this: 
   2. Now you need to identify the connected devices. For the BT Hub, I click on Advanced settings/My network (which requires the admin password that came with the router on an attached label). Amongst the list of connected devices shown, you should see “RS485 TO ETH” (if you installed the above Waveshare adapter, and have not changed its name, or an equivalent name if you installed a different adapter).
   3. Alongside this device name you should see a (DHCP assigned) Private IP address. Make a note of it. This address needs to be made permanent if you wish to avoid reconfiguring the virtual port (more on this below) every time you use your monitoring setup. Clicking on the RS485 TO ETH list entry should give you a screen like this:



The important thing is to make sure that the “Always use this IP address” button is switched to Yes. Hit “Save” if you had to change it. You can now exit the router manager.

(This process is called adding a DHCP reservation. If you are using any other router the setup will be different, and the process and terms used may be different.   
On a Virgin Media Hub you would need to go into the DHCP >>> Reserved List screen to assign an IP reservation by selecting the device and clicking the “ASSIGN” button.   
For other routers please see your router’s manual or online help.)

1. **Configure the Waveshare adapter with the correct communication (TCP/IP) settings**
   1. The following notes assume that you are going to use the above Waveshare adapter – other adapters may differ somewhat.
   2. Download the adapter software. In the case of the Waveshare adapter this can be found in the User Manual: <https://files.waveshare.com/upload/6/6d/RS485-TO-ETH-user-manual-en.pdf> (a useful reference worth printing out in any case). Click on the Setup Software link. This offers you M0-Config, USR-TCP232-Test, and USR-VCOM options. You will need the first and last of these.
   3. Click on the M0-Config link. This will give you a page from which you can download a compressed file RS485\_TO\_ETH\_Config.7z. (7z is a free-to-use file compression-decompression tool.) Execute the decompression (using 7z Opener) to a folder of your choice. Once decompressed, you will find that a Config subfolder has been created in your chosen folder, which contains RS485 TO ETH.exe.
   4. Execute this file by double clicking it. (You will be asked for your computer Admin password to proceed.) On the Operate Via LAN tab, hit the Search Device button. This will detect the Waveshare adapter (showing the same IP address that you noted in 2.3 above). Clicking on this device will expand the page to look like this: 
   5. The Base Param should not need to be changed, however you may wish to consider changing the default username and password (as this default is publicly documented for all Waveshare devices) to ones of your own choosing to prevent unauthorised access or changes.
   6. Replicate all the entries in the Port Parameters section on your own setup. These are as follows for the Samsung controller (taken from the MIM-B19N user manual, p8): <https://downloadcenter.samsung.com/content/UM/202311/20231106103022295/DB68-07538A-03_IM_Modbus_Interface_Module_GB_EN_221130-D01.pdf>):

Parity: EVEN

Data: 8

Stop: 1

Baudrate: 9600

Module Work Mode: TCP Server

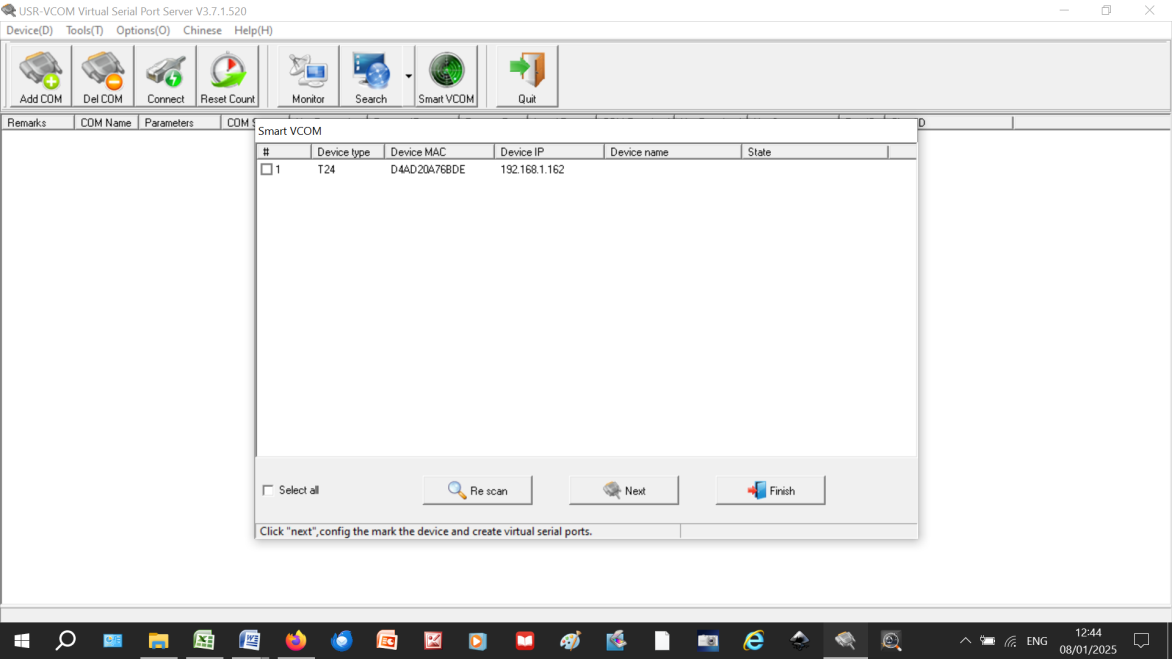
Local Port: 3

Remote Port: 7108 (Default Port)

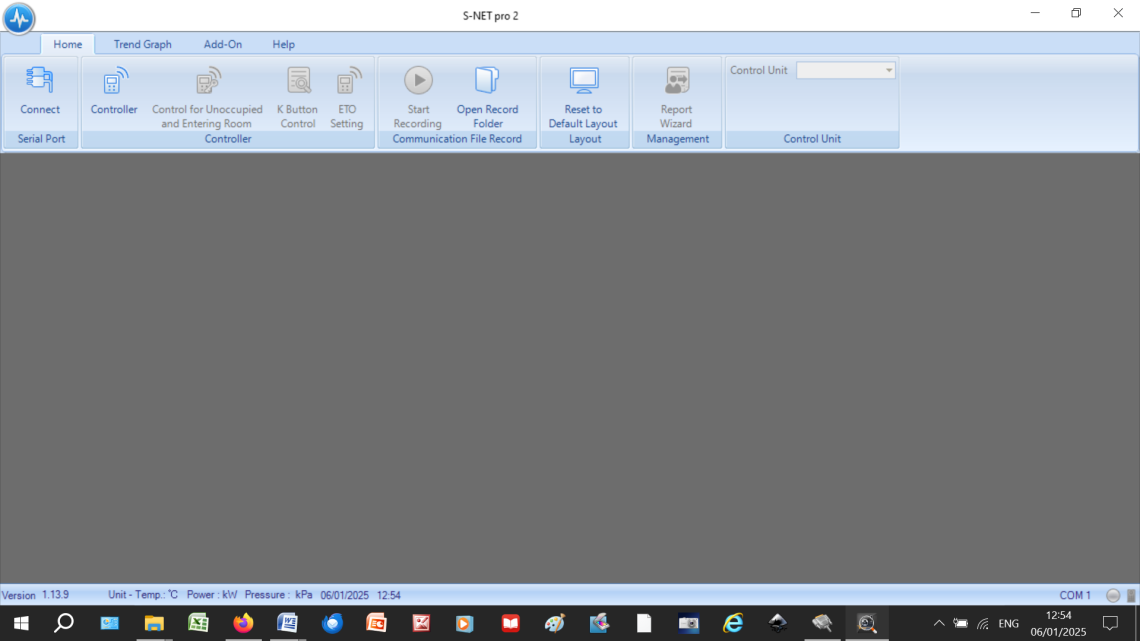
Note: The default remote port should be left as it is in almost all cases. In very rare cases, this may create a problem on your computer. If this is the case this Remote Port value can be changed (say to 7107 or 7109).

It is suggested that you label the Waveshare interface with these settings – should there be problems in their future having these to hand will help you reset the device.

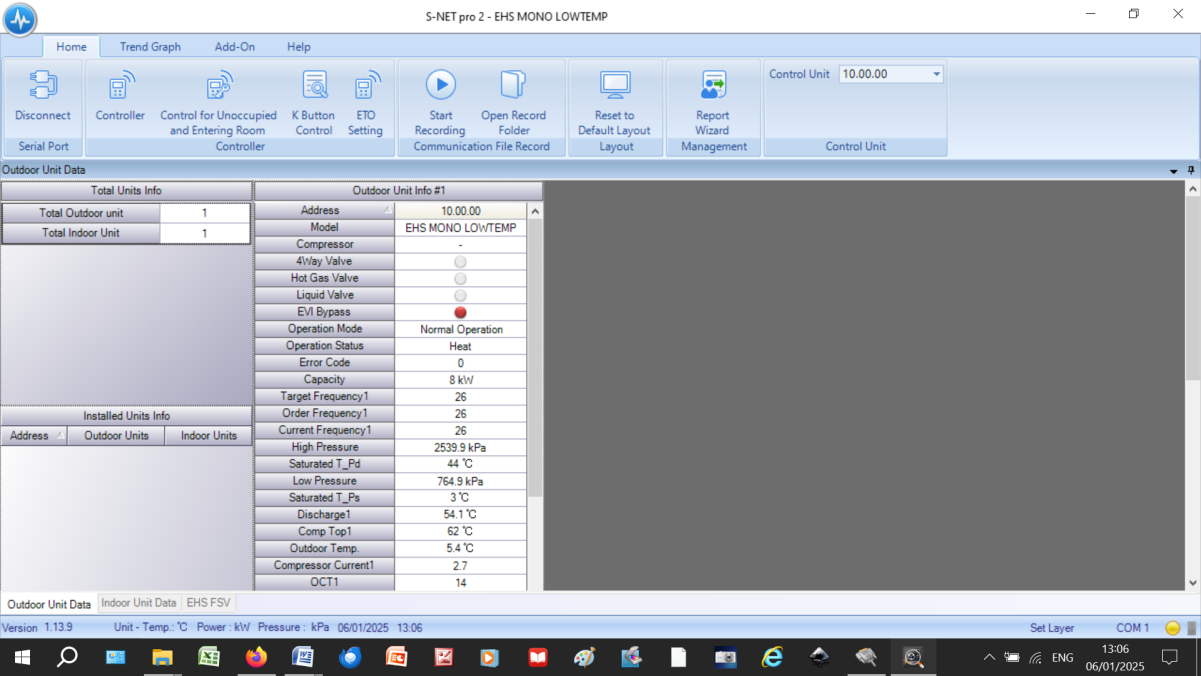
* 1. Hit the Save Config button and exit the application.

1. **Create a virtual port on your computer**
   1. Click on the M0-Config link identified in 3.2 above. This will give you a page from which you can download a compressed file USR-VCOM\_V3.7.1.520.7z. Execute the decompression (using 7z Opener) to a folder of your choice. Once decompressed, you will find that a USR-VCOM\_V3.7.1.520 subfolder has been created in your chosen folder, which contains USR-VCOM\_V3.7.1.520\_Setup.exe.
   2. Execute this file by double clicking it. (You will be asked for your computer Admin password to proceed.) This will open the Serial Port Server.
   3. Hit the Smart VCOM button. This will find the Waveshare adapter (with the correct IP address): 

Check the box under #, then Next, then Finish. This will connect the port. You should see the Net Received count increasing rapidly.

1. Make a note of the COM port number in use (COM1, COM2 etc.).
2. **Important:** The USR-VCOM software must be running, and the virtual port connected, every time you wish to monitor your Samsung controller. If the VCOM software is closed the virtual port will be disconnected. Once installed, the virtual port will activate every time you switch on your computer, requiring you to enter your Admin password.
3. In the unlikely event that the device is not found your router may be blocking the searches, or if you are using Powerline Adapters something may be blocking the data transmission. Powerline Adapters need to be on the same consumer unit, and generally will not work if you plug them into a surge protected extension socket. Powerline adapters can also sometimes “de-link” and you need to re-pair them to each other. These troubleshooting processes are beyond the scope of this document.
4. **Install the SNET-Pro2 software**
   1. Go to <https://www.samsunghvac.com/Software-Downloads/SNET-Pro2> and click on SNET Pro 2 Service Software. This will download a compressed file S-NET\_pro+2+v1.13.9 which can be decompressed (using 7z Opener) to a folder of your choice.
   2. Once decompressed, you will find that a S-NET\_pro+2+v1.13.9 folder has been created in your chosen folder, which contains executable file S-NET\_pro+2+v1.13.9.msi.
   3. Double click on this file to install and run SNET-Pro2. You should see this: 
   4. If you click on the Setup button (top left – the round electrical signal icon) you will see (under Serial Port) that this has been successfully installed, and the Option button, which allows you to modify some of the display units (for example, you may prefer kPa to the default kgf/cm2 for pressure units) and the Excel write interval (the default is 10s – shorter intervals may be better for cause-and-effect analysis, but will generate larger record files). Hit OK to save any changes – these will be applied every time you start SNET-Pro2.

Depending upon your computer, there may be more than one COM port present, in which case you should select whichever COM port was allocated by the USR-VCOM software (step 4.4).

* 1. Hit Connect, then select the F1/F2 communication layer.
  2. After a few seconds you will see the Outdoor Unit operating parameters displayed: 

Now you’re in business!