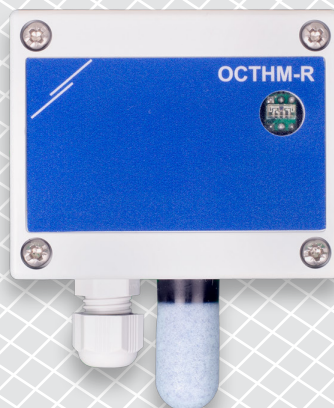# Temperature and humidity control | AC fans
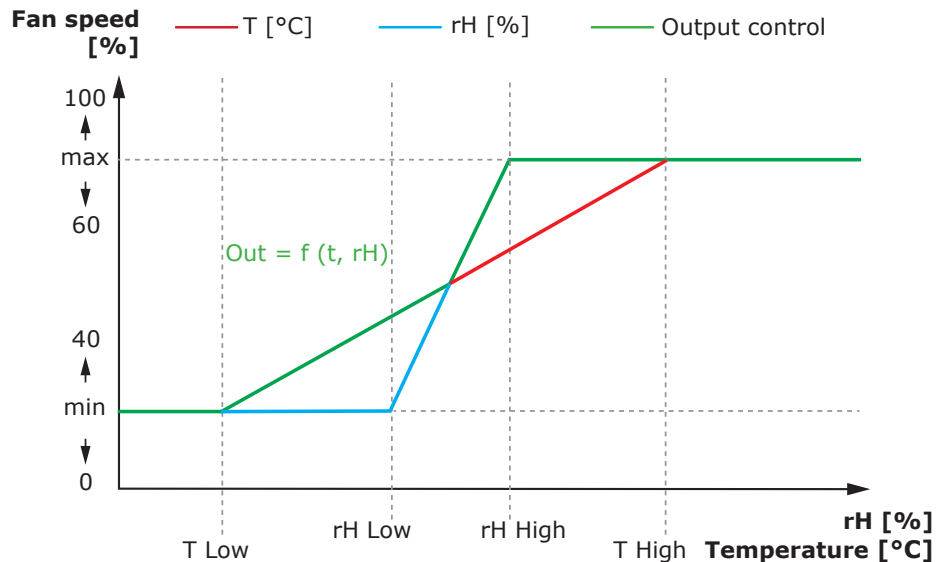
Demand based fan speed control

SOLUTION DESCRIPTION

This solution controls AC motors based on the measured temperature and relative humidity. AC fan speed is controlled to keep temperature and relative humidity in the predefined ranges. When one of these measured values increases, fan speed will increase.

Operational diagram

By default, both the temperature and the relative humidity sensor are active. It is possible to deactivate one of both. To regulate fan speed based on temperature, deactivate the relative humidity sensor and vice versa. When both sensors are active, the highest percentage value of both sensors will be used to regulate fan speed.

Typical applications

- Control extraction fans in spaces with high relative humidity
- Bathroom or kitchen exhaust fans
- Indoor swimming pool exhaust fan

TECHNICAL DATA

The temperature and humidity sensor can be installed outdoor or in harsh environments thanks to the IP65 enclosure. This enclosure offers protection against ingress of water and dirt. The power supply, frequency inverter and internet gateway are available in:

- IP20 enclosure for DIN rail mounting in an electric cabinet
- IP54 / IP66 enclosure for surface mounting in harsh environments
- Temperature range: -30ºC to +70ºC
- Humidity range: 0 -100 %
- Motor frequency: 0 - 500 Hz
- Maximum motor current: see frequency inverter specifications

SENTERAWEB - YOUR PERSONAL HVAC CLOUD

Sentera products are delivered with standard firmware (standard functionality). In order for these products to function according to the solution, application specific firmware must be downloaded via SenteraWeb. Setpoints, ranges and other settings can be adjusted remotely. The measured values and the status of the connected devices can be monitored. Make sure you have the ID code of the desired application as well as the unique serial numbers of the products.

Via the SenteraWeb HVAC cloud, it is possible to:

- Easily adjust parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime.
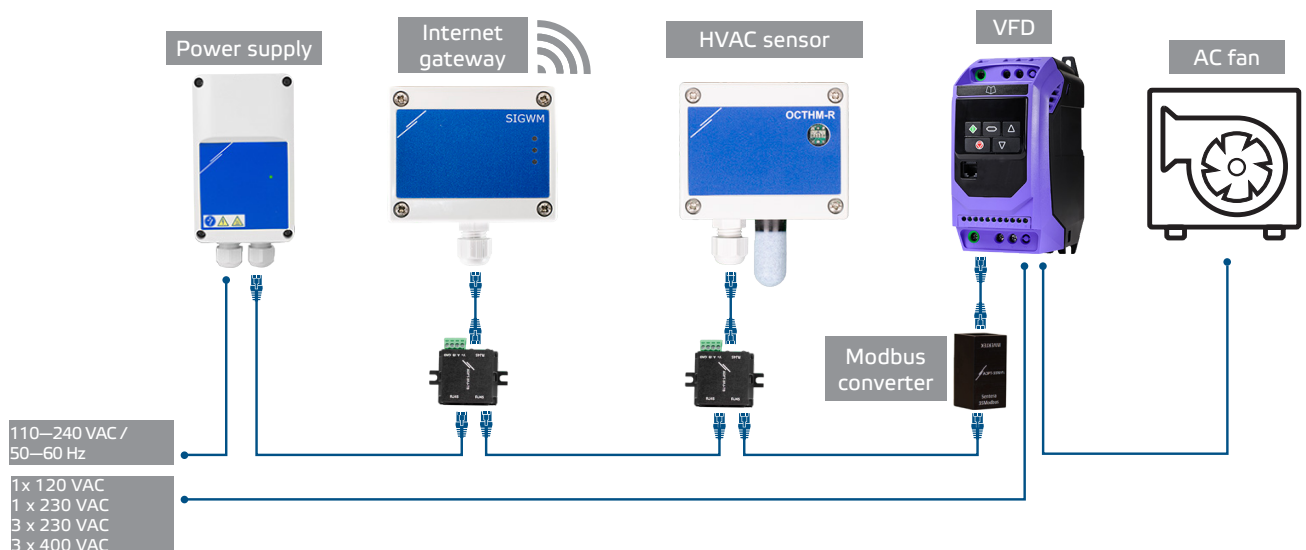
SENTERA INTERNET GATEWAY

The Sentera Internet Gateway is used to connect your installation to the SenteraWeb HVAC cloud and to download the application specific firmware.

- When the firmware is downloaded, the internet gateway can be left installed or can be removed.
  - ▶ If the Gateway is left installed, the instalation remains connected to the SenteraWeb HVAC cloud and makes it possible to use the above described features. Installations that are inactive for more than one month will be deleted automatically. To prevent the installation from being deleted, it can be archived. Archived installations can be activated again at any moment.
  - ▶ If the Gateway is removed, it can be used to set up another installation. In that case, you have to disconnect the current installation from SenteraWeb as every internet gateway has a unique serial number and it can be used to create one installation at a time.
- They are available with only Wi-Fi connection or combined with LAN connection.
- There are versions for DIN rail mounting or surface mounting.
- It allows you to download the required application specific firmware into the connected devices and to adjust the settings.

See chapter "How to connect your installation to SenteraWeb" for more information.

WIRING AND CONNECTIONS

One example of the solution is shown in the connection diagram below, different combinations are possible.

Install the products following the mounting instructions on the corresponding products' pages on sentera.eu.

Supply voltage

The HVAC sensor and the internet gateway require a supply voltage of 24 VDC. We recommend using Sentera 24 VDC power supply, as it offers overload and overvoltage protection.

UTP cabling for data (Modbus) and power distribution (24 VDC)

Sentera devices communicate via Modbus RTU. To facilitate wiring, some Sentera devices (-M and -H series) are available with RJ45 connectors to connect 24 VDC power and Modbus data communication. These devices can be connected via one single UTP cable. This simplifies wiring and connection.


The advantages of Modbus communication over an analogue (0-10 Volt) control signal are:

- Higher reliability
- Reduced risk of disturbances and data loss
- Longer cables lenghts are possible
- Status and feedback from the connected frequency inverter and motor are available.

ADDITIONAL CABLING GUIDELINES

A Modbus RTU network should follow these topology guidelines:

- The maximum length of the main line should be limited to 1.000 m. If a longer main line is necessary, we advise to use Modbus RTU repeaters.
- It is advisable to minimise the length of the branches. The use of a 3-way splitter (type ADPT-3RJ-TB) can be helpful.
- In case of long cable lenghts or strong electrical pollution, we advise to activate the Network Bus Terminator (NBT) on two devices in the Modbus network. These NBTs reduce electrical reflections. Every Sentera device features an NBT that can be activated via the parameter settings. NBT is deactivated by default.
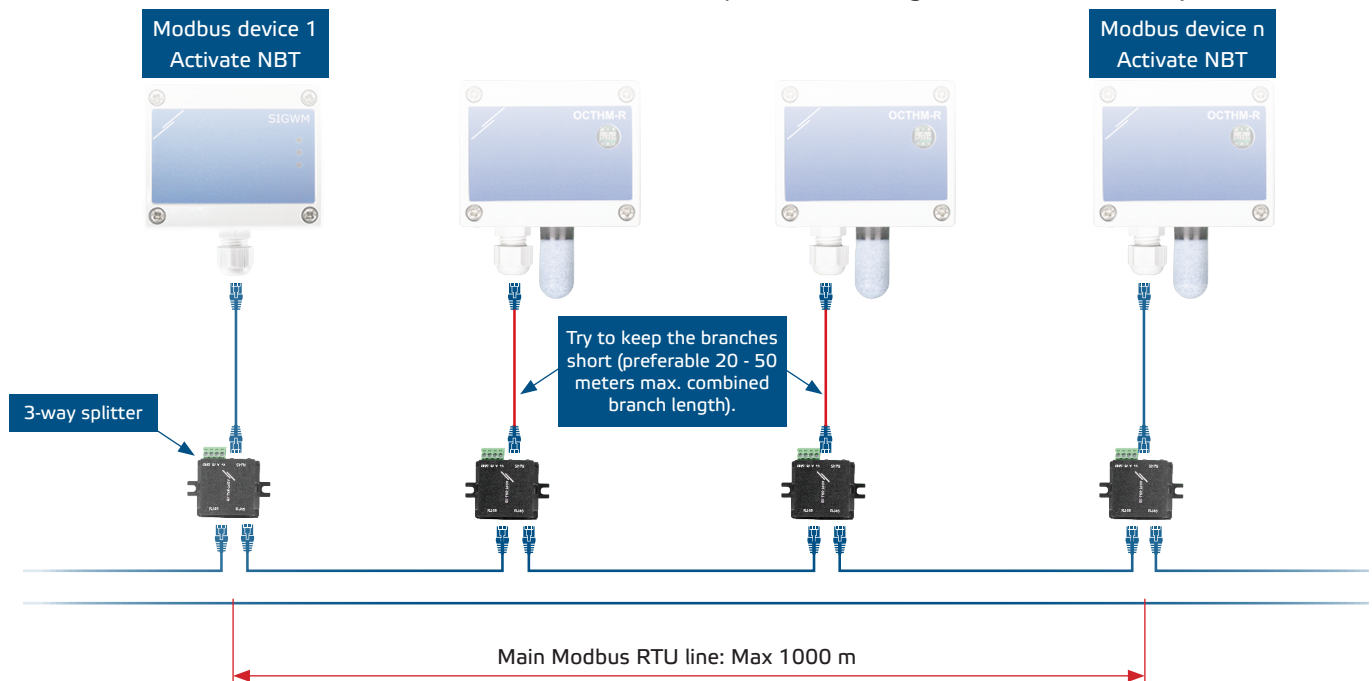
HOW TO CONNECT YOUR INSTALLATION TO SENTERAWEB

1. Create an account on SenteraWeb

First create an account on SenteraWeb.
Go to https://www.senteraweb.eu/en/Account/Login. Here you can register or log in.

2. Create your installation

- Once logged in, add a new installation;

- Make sure that the internet gateway is powered and connected to the internet (green LED);

- Register the internet gateway via its serial number;

- Once the internet gateway is registered, your installation is created;

- Register the other connected devices. To add a device, use its serial number.

3. Download your application specific firmware

When all the devices have been added to your SenteraWeb installation, you can download the required firmware for this solution via the solution ID code:

- Select your installation in SenteraWeb and click "Link to solution";

- Enter the solution ID code and click "Submit";

- The solution specific firmware will be downloaded into the connected devices (this download can take up to two minutes);

- After the download, check the functionality of all devices

- When the solution is operational, you can choose to leave the internet gateway connected or to remove (check chapter "*Sentera Internet Gateway*" for more information).