VT560 / Smoke detector

Functional description & components

Function

At installation indoors, inside the rack, etc., the sensor monitors the occurrence of smoke inside the building. It is a daisy chain sensor, max. distance from the monitoring unit is 150 meters.

The maximum amount of sensors and maximum length can be extended using "VT408 / Sensor extension unit".

Components

The smoke sensor consists of a compact plastic housing with ventilation holes.

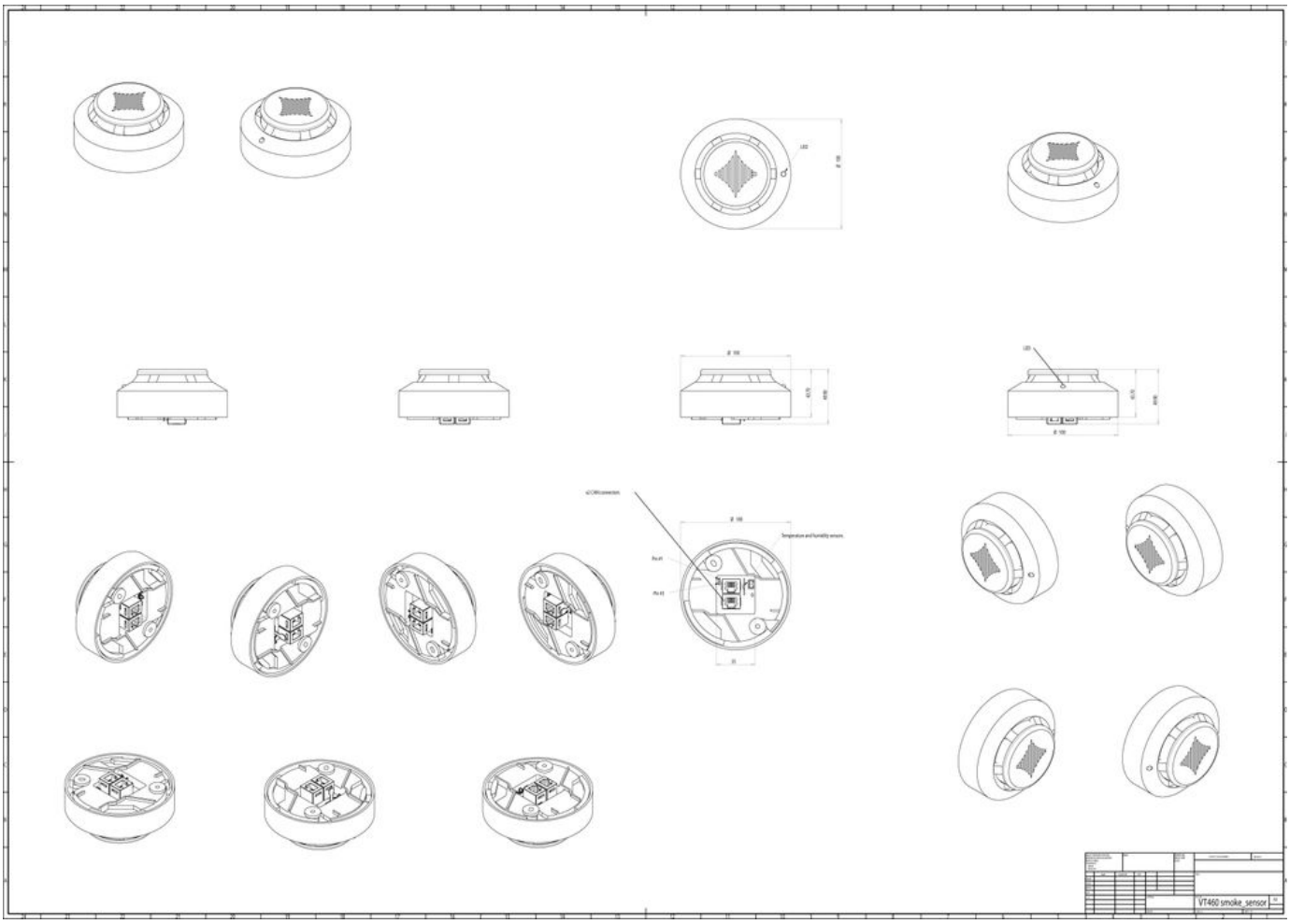
> The sensor can not be used on its own. It must be used together with Vutlan monitoring systems.

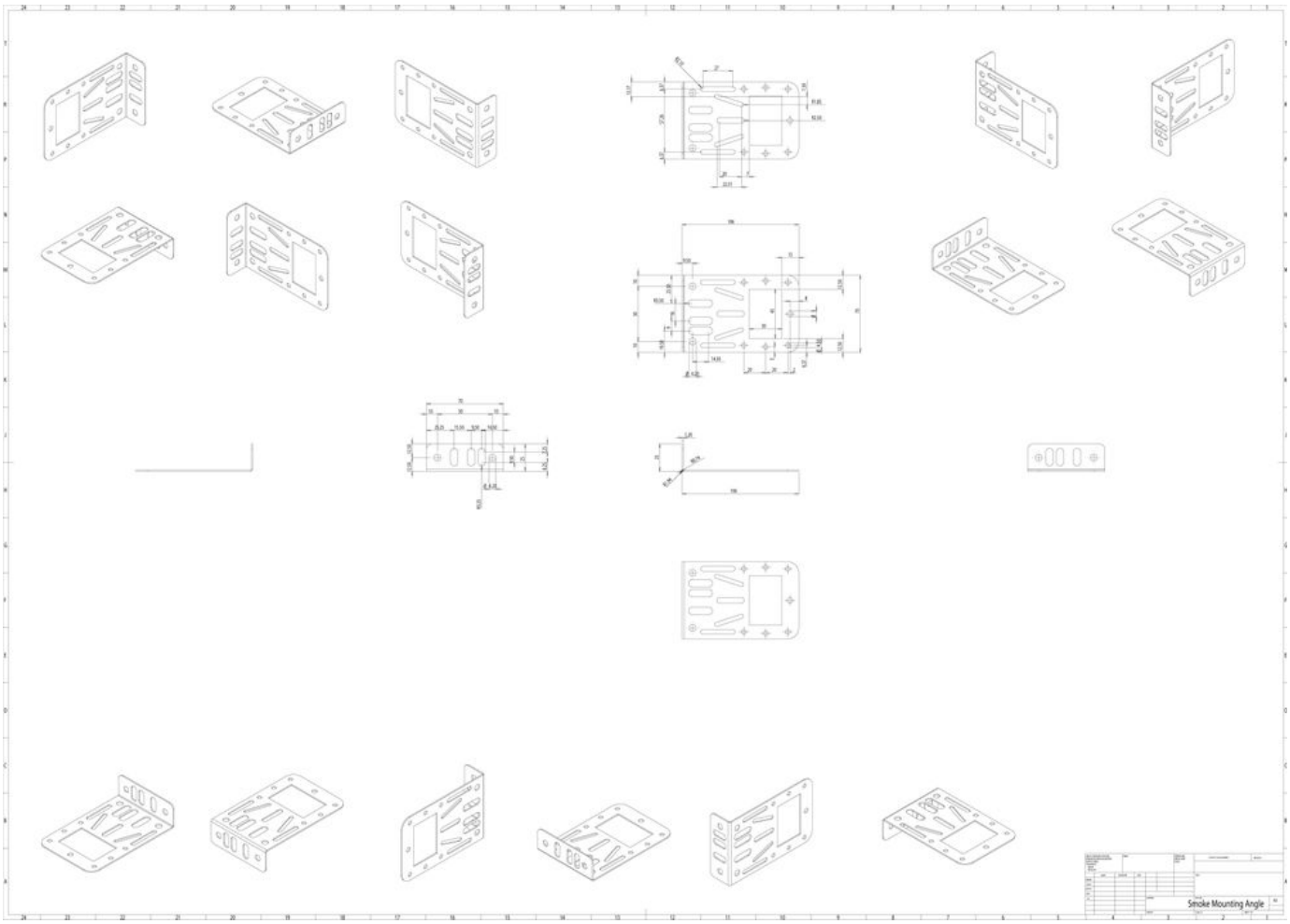
Technical specifications

Feature	Description
Type	Analog
Dimensions	Ø100×45 mm
Sensor weight	150 g
Packaging weight	290 g
Inputs	x2 ports RJ12
Operating temperature	Optimal: -10 °C to +55° C Extended: -10 °C to +80° C
Operating humidity	5% to 95% (Non-Condensing)
Average lifespan	>=10 years
Storage temperature	-10 °C to +55° C
Storage humidity	5% to 95% (Non-Condensing)

Power consumption	100 mW
Status Indicators	Red LED
Max. distance m	150 m
HS Code	8531 10 950
Components	Manufactured in E.U.
Daisy chain	Yes, sensors can be connected in a chain. The system will show all daisy chain sensors in one chain as one sensor.
Mounting	On the ceiling

Drawing



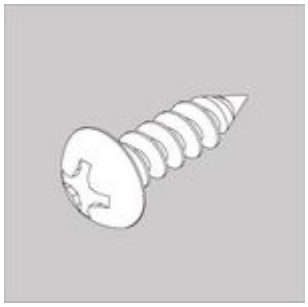


Package content

	Package content	Description	Quantity
1		Smoke detector	1 pc
2		RJ11 6P4C 2m CAN cable	1 pc

3		Sensor bracket	1 pc

Plastic transparent bag 40x60mm:

	Package content	Description	Quantity
1		M3.5 nuts	2 pcs
2		M3.5x10 mm bolts	2 pcs
3		M4.2x16mm screws	2 pcs
4		M3.5 washers	2 pcs

Safety instructions

- Please observe the valid regulations for installation in the country in which the smoke alarm is installed and operated, and the national regulations for accident prevention. Please also observe any internal company regulations, such as work, operating, and safety regulations.
- The technical specifications and limit values stated must not be exceeded under any circumstances. In particular, this applies to the specified ambient temperature range and IP protection category.
- If a higher IP protection category is required for a special application, the smoke alarm must be installed in an appropriate housing or an appropriate enclosure with the required IP protection category.

Siting location requirements

To ensure the proper functioning of the unit, the conditions for the installation site of the unit specified in section “Technical specifications” must be observed.

Electromagnetic interference

Interfering electrical installations (high frequency) should be avoided.

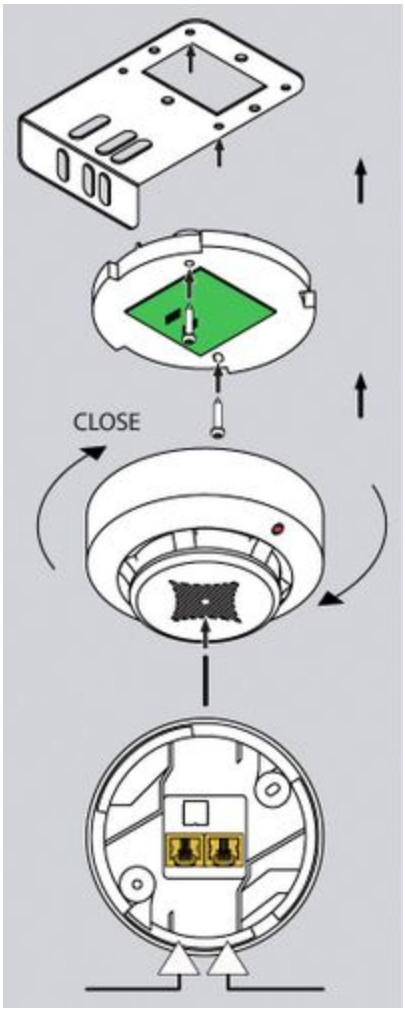
Installation procedure

Notes on assembly

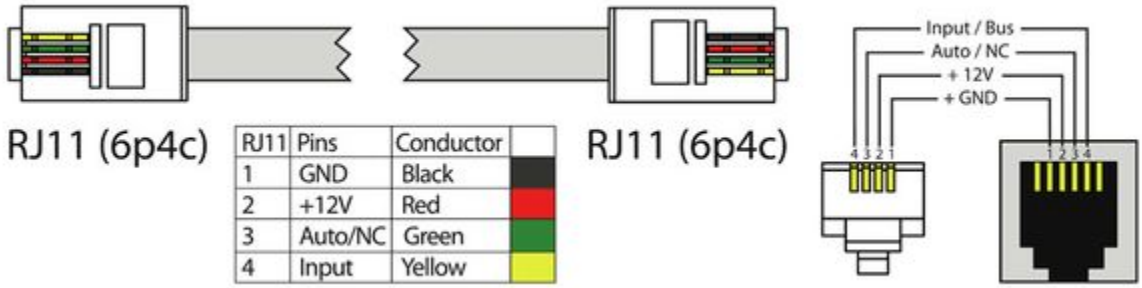
- It is vital to ensure that the smoke alarm is always assembled with the sensor head pointing downwards. In any other position, there is no guarantee that smoke will be detected.
- The smoke alarm must also be positioned so that it is ventilated with an adequate amount of air and the ventilation slots are not covered.

Installation with the mounting plate provided

The smoke alarm is installed using the mounting plate provided.



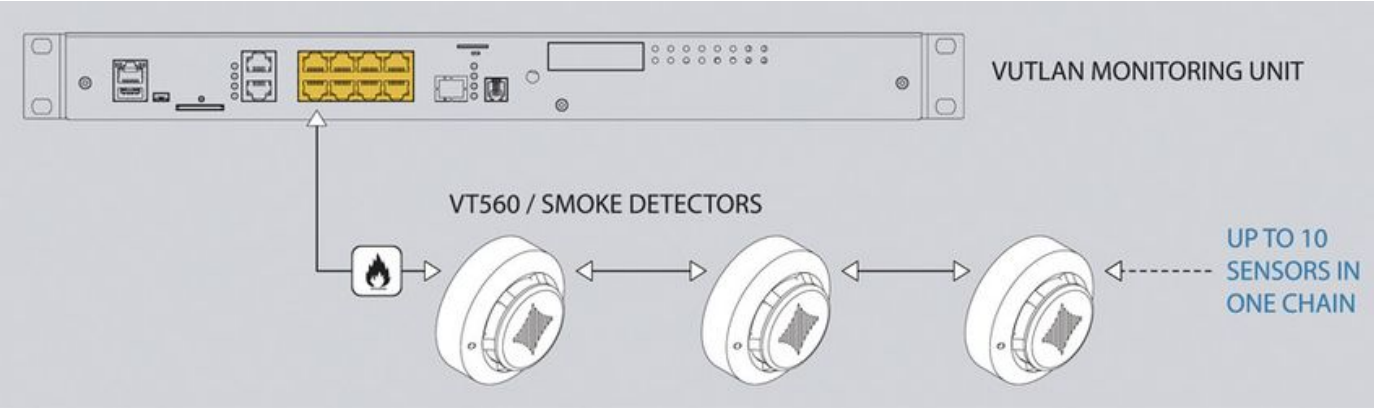
- Uncover the smoke detector head from the base.
- Attach smoke sensor base to the mounting plate using the M4 x 10 screws provided.
- Replace the sensor head onto the base and secure it by twisting until it locks home.
- Secure the mounting plate to the enclosure frame using the 4.8 x 19 screws.
- Remove the red protective cap!



RJ11	Pins	Conductor	
1	GND	Black	
2	+12V	Red	
3	Auto/NC	Green	
4	Input	Yellow	

Connecting the smoke sensor

Connect one end of the RJ11 / RJ12 cable to the monitoring unit and the other end to any of the two inputs of the smoke sensor. It is possible to connect up to 10 sensors on one analog port. To do so connect the new RJ11 cable to a free input of the already connected smoke sensor and the other end to the next smoke sensor in a chain. See the picture below. RJ11 or RJ12 cable pinouts can be found in the picture below. After the system will start and sense the smoke detector, the LED on the smoke detector will blink dimly once a second.



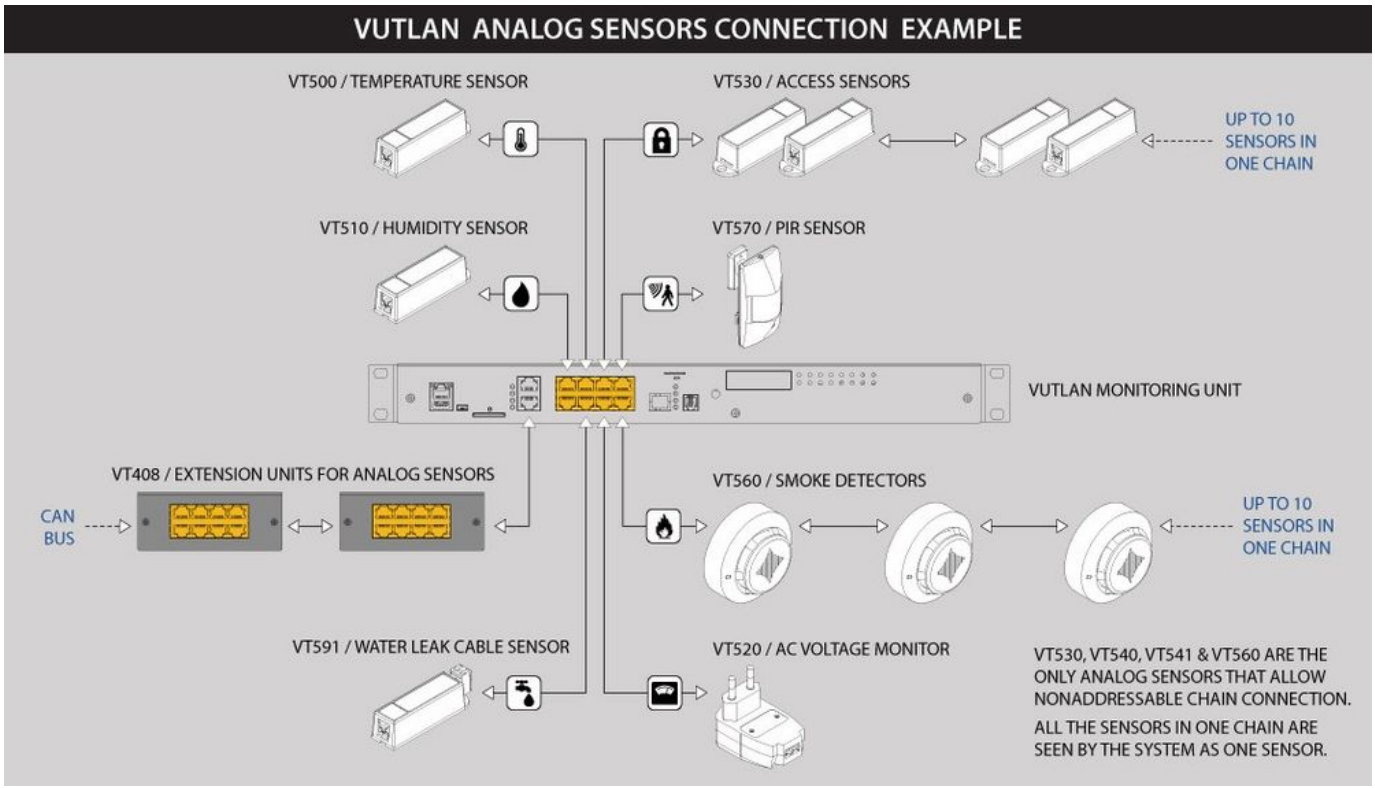
Testing the smoke sensors

During system operation, take a needle or paper clip and insert it into the hole on the cover of the sensor, try to move it there until the blinking dimly LED will flash brightly. That means that sensor is in a good state. After inspection, return the sensor /s to a normal state. To do this, either disconnect them from the system, or in a system interface, go to the smoke sensors tab, and restart them.

Connecting analog sensors

Analog sensors connection

Connect the analog sensor by a supplied RJ-11 (6P4C) cable to any analog port "A1 .. A8" or "Sensor" port. The determination of the sensor type and connection will occur automatically.



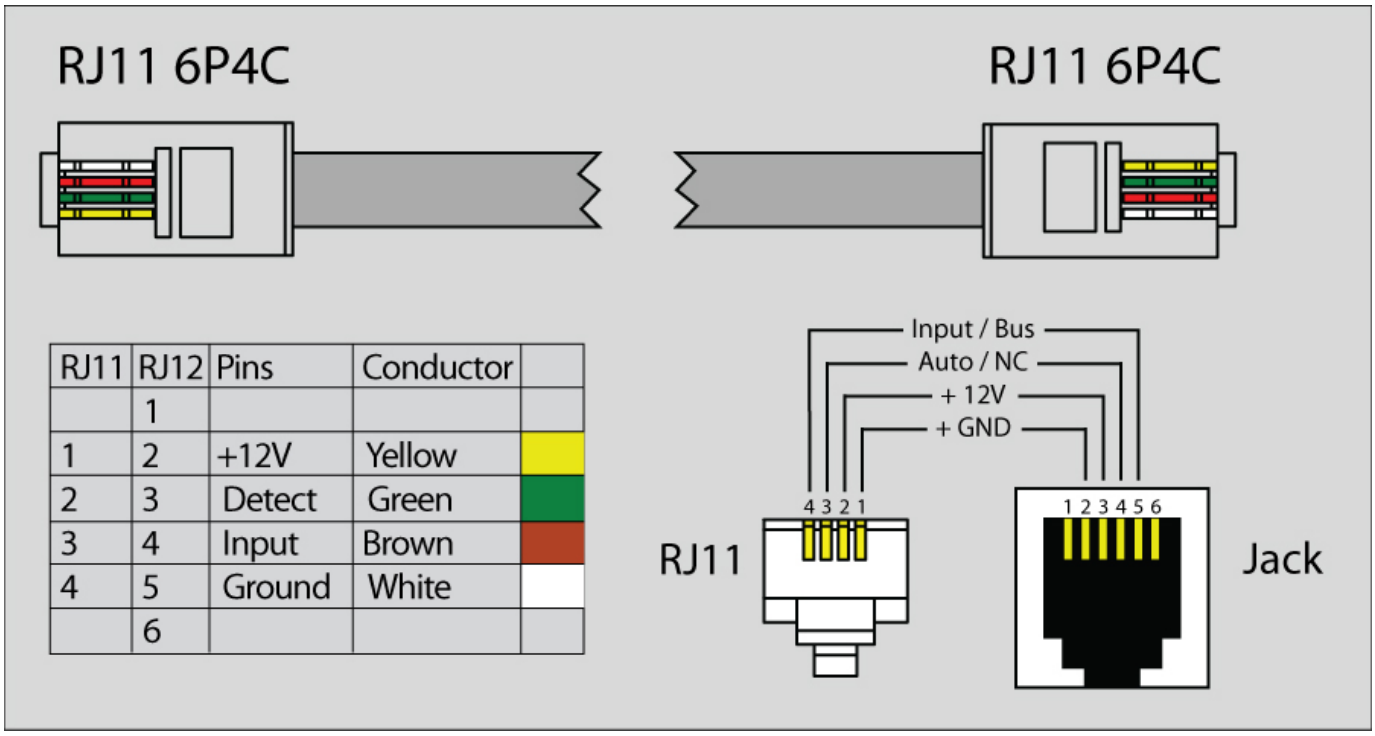
If strong electromagnetic interference is present, we recommend using a 3-pair cable CAN FTP for sensor connection!

6P4C RJ11 cable wiring/pinouts

1- Yellow, 2- Green, 3- Red, 4 - Black

Colors are true for this telephone cable. Both ends match the colors and pinouts (identical).

Please refer to the RJ connectors comparison table:



Daisy chain connection

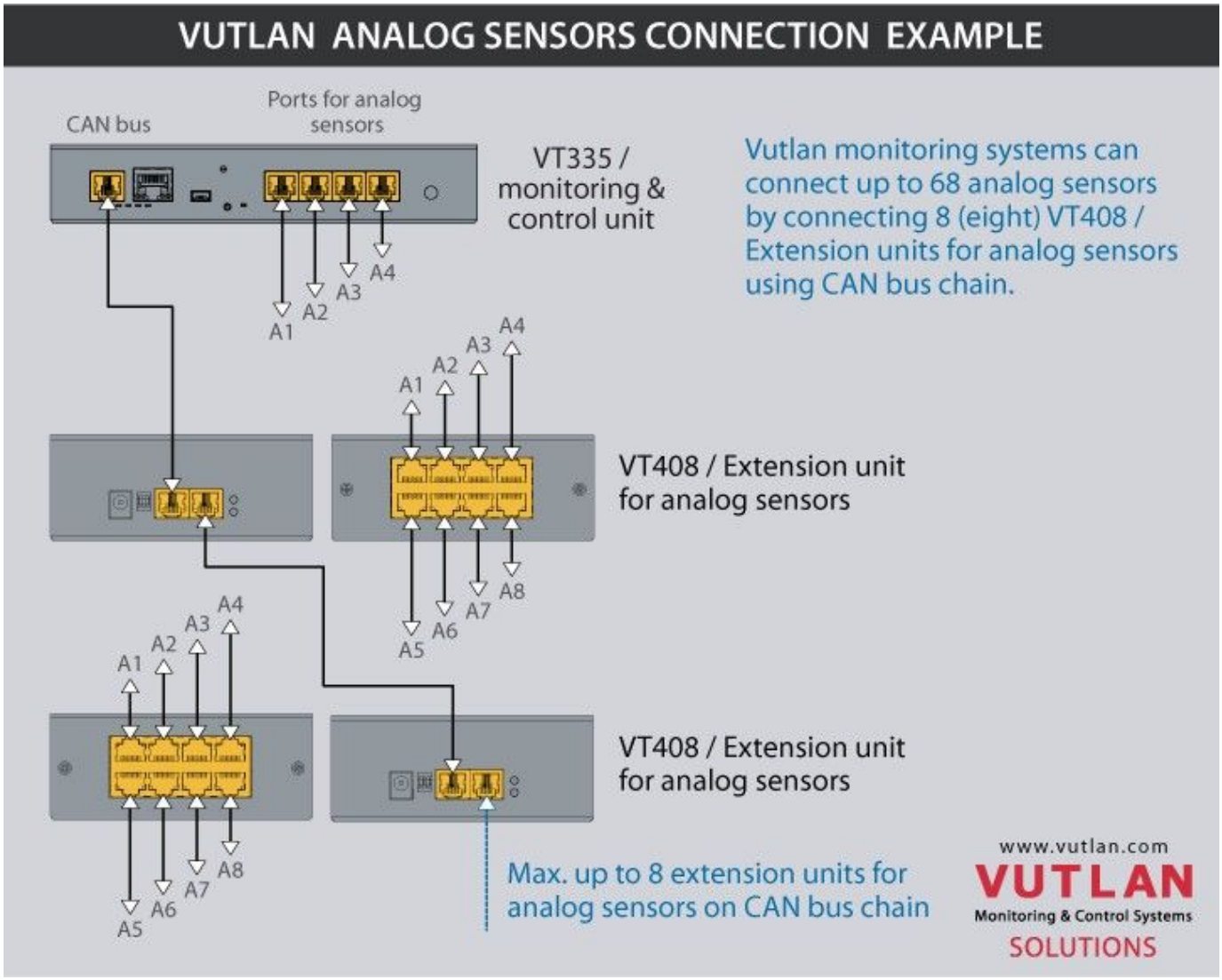
Some of the analog sensors can be connected in a daisy chain. Please refer to the article "Chain connection of analog sensors".

Maximum cable length test

Model		50m	100m	120m	150m	200m
VT406	DC current converter		ok			
VT407	AC current converter		ok			
VT410	DC voltage monitor					
VT416	DC ampere meter		ok			
VT417	AC ampere meter 16A					
VT420	Converter 4-20mA		ok			
VT500	Temperature sensor		ok			
VT501	Outdoor temperature sensor		ok			
VT510	Humidity sensor		x			
VT530	Access sensor		ok			
VT540	Vibration sensor		ok			
VT550	Wind velocity meter		x			
VT560	Smoke detector		ok			
VT570	PIR sensor		ok			
VT590	Spot water detector		ok			
VT591	Water leak sensor		ok			

Extending the number of analog sensors

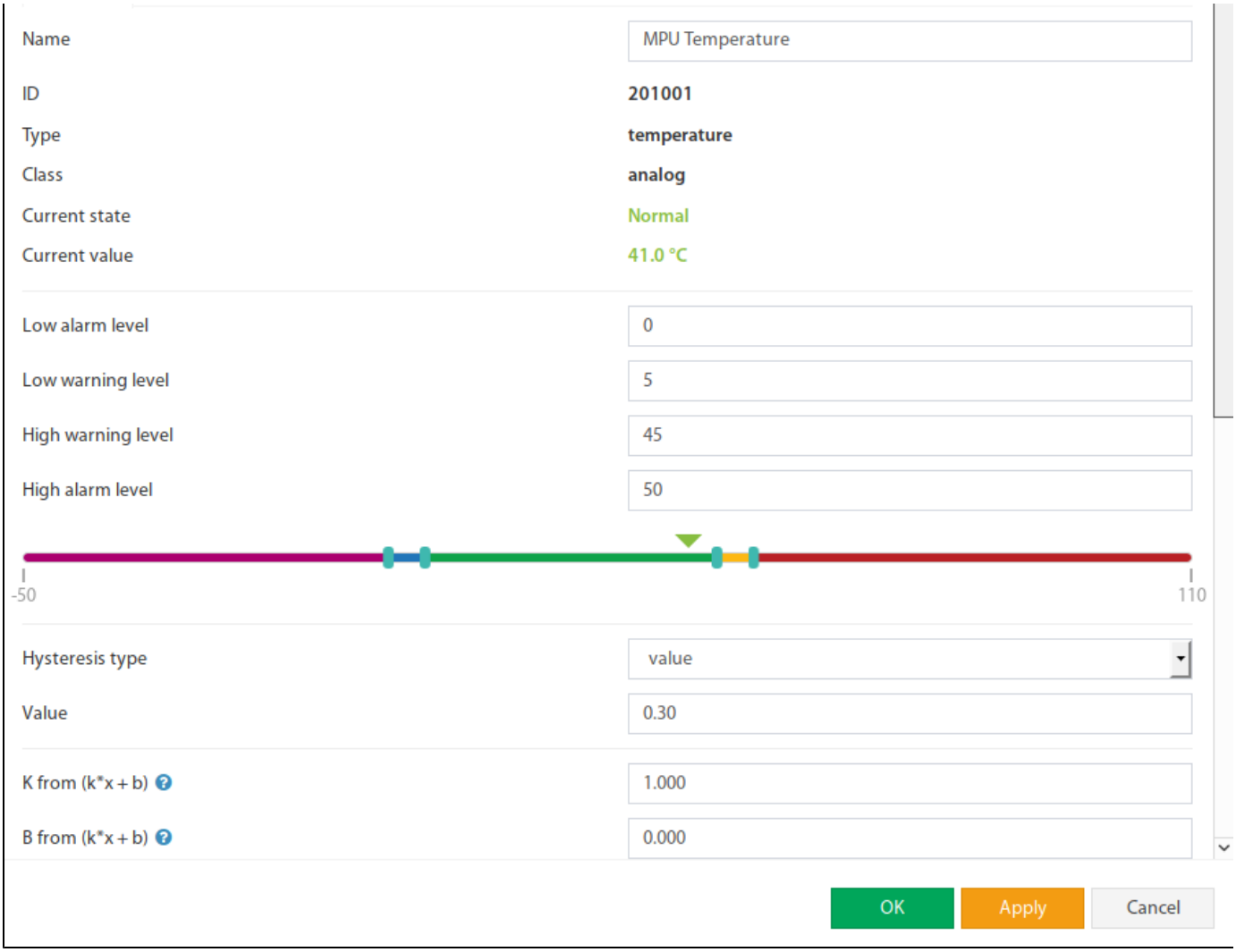
Using CAN extension "VT408 / Sensor extension unit" it is possible to increase the number of analog sensors connected to the monitoring unit up to 80 sensors.



Analog sensor configuration

Sensor configurations

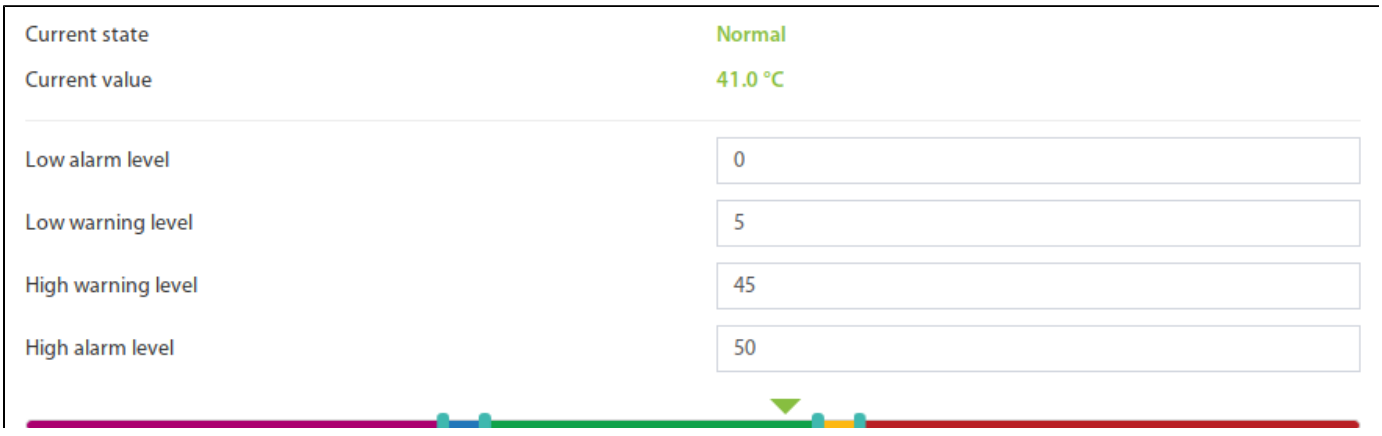
To configure a sensor, go to "Main menu" >> "System tree" and click on the sensor element in the tree. A modal window with sensor properties will pop up. Change the needed settings and click "OK" or "Apply" at the bottom of the "Properties" window.



All sensors include:

1	Name	The name is given by the system automatically. You can change it to anything you want.
3	ID	System ID of the element.
4	Type	Example: temperature, humidity, vibration.
5	Class	Examples: analog, CAN, switch, discrete.
6	Hardware port	The external port number on the device panel to which the sensor is connected (if the sensor is external).

All sensors have threshold controls:



In the picture above, the "Current value" equals 41.0 and is represented by the small triangle. Currently, the triangle is green because it is situated in the "Normal" range. Hence the sensor says that "Current state" is "Normal". This value is used by the system "Logic schemes" menu to notify the administrator or take action.

Hysteresis

Sensors have the option of setting the hysteresis state. Hysteresis can be a time, a value or it can be disabled.

If the hysteresis is set in a time, the sensor will transmit to a new state with a delay of the specified number of seconds in the corresponding field. The time counting will begin from the moment when the measured value of the sensor has left the current range.
Each state has its own field. Which determines the time that the sensor value must continuously hold for the state to change to the specified.

Hysteresis type	time
Low alarm	1
Low warning	1
Normal	0
High warning	1
High alarm	1

If you set the hysteresis by value, the sensor transition to a new state will occur when the measured value of the sensor exits beyond the current range, adjusted for the specified hysteresis value.

Hysteresis type	value
Value	0.30

You can calibrate the sensors. Use K and B coefficients. After the calibration, please, save the values in flash memory.

To save sensor properties in the device flash memory press "  " then "OK" to confirm.

Example: Why do we need to use Hysteresis
Let's say that we have a temperature sensor. Let's say that we have set up threshold values.

We have set the value 25.5 °C to be a threshold value between Normal/Alarm states.

If the temperature drops just below 25.5 °C You will have a "Normal" state.

If the temperature goes just above 25.5 °C You will have a "Warning" state.

Sometimes the temperature may stay at 25.5 °C and jump up and down by 0.1-0.3 °C. In this case, You will get too many notifications that the sensor is showing a Warning or Normal state.

In this case, we need to use a Hysteresis.

If the type "time" is chosen, the system will wait for a specified time before the State of the sensor is declared.

If type "value" is used, unless the temperature drops by a larger amount than specified, the sensor state will not be declared.

Tuning the sensor value

Sensor readings can be tunned by a linear formula "y = k * x - b"

Example VT407 + HAT-100Q1 / AC current converter:

Metered current for HAT: from 0 to 100A (This means that the range equals 100, **k = 100**)

The output of VT407 is 0-5V (That means that the range is equal to 5)

"**b**" = the value that the sensor shown in WebUI when there's no current. Let's say that **b = + 0.021**

You should use the following formula for HAT: **100/5*(x-y)**

The expression formula would be 20*(x-0.021)

> Point is used as decimal separator (3.14)

Example: Using fuel tanks.

Each fuel tank has its own formula for volume vs height. Please see this useful resource for finding out such a formula.

https://www.calculatorsoup.com/calculators/construction/tank.php

In this can, You need to use non-linear formula.

- Tuning the sensor value
