

VT590 / Leak sensor

Documentation page: <https://vutlan.atlassian.net/wiki/spaces/DEN/pages/93421575/VT590+Leak+sensor>

Product page: <https://vutlan.com/analog-sensors/22-vt590-spot-water-detector.html>



Function and purpose

For the installation at the bottom of IT racks and cabinets; at the bottom of raised floors; at the bottom of trays and under equipment that can potentially leak. When water is in contact with both metal cores, the sensor indicates the emergence of moisture.

Attention! Metal cores are detectors of water, mount strictly downwards as close as possible to a floor.

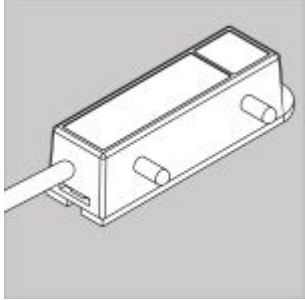
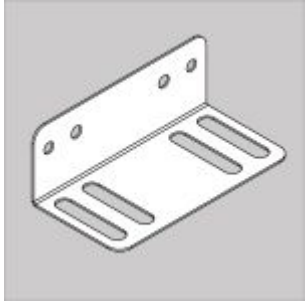


Technical specifications



Communications	Description
Sensor type:	Analog sensor
Outputs:	x1 RJ11 6P4C port
Daisy chain?	No
Max. distance from the monitoring unit:	100 m
Environmental	
Operating temperature:	Min. -10 °C - Max.80 °C
Operating humidity:	5 to 95% (Non-Condensing)
Power requirements	
Power consumption	60mW
Mechanics	
Dimensions:	60×18×18 mm
Mounting:	Mounting bracket included. Installed at the bottom of racks or floors or trays.
Packaging weight:	125 g
Cable length:	3m
General	
Manufactured in:	Slovak Republic, European Union

Manufactured by:	Vutlan s.r.o.
HS Code:	9025 80 400
Warranty:	90 days

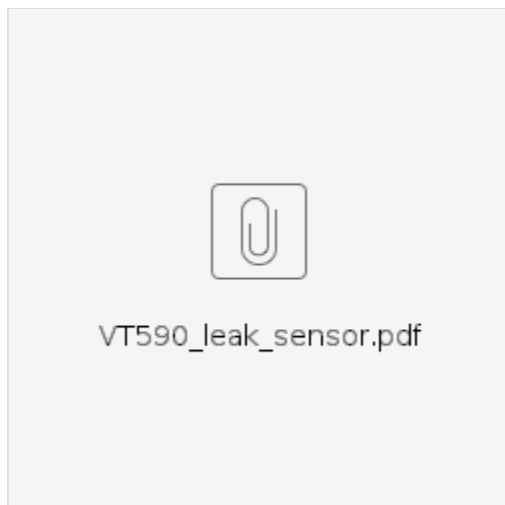
Package includes

Carton box 131x125x42 (W, L, H)

	Package content	Description
1		x1 pc, Water detector probe with 3m cable
2		Bracket
3		x1 pc, Screw 4,2*16
4		x2 pcs, Bolts M3.5x10

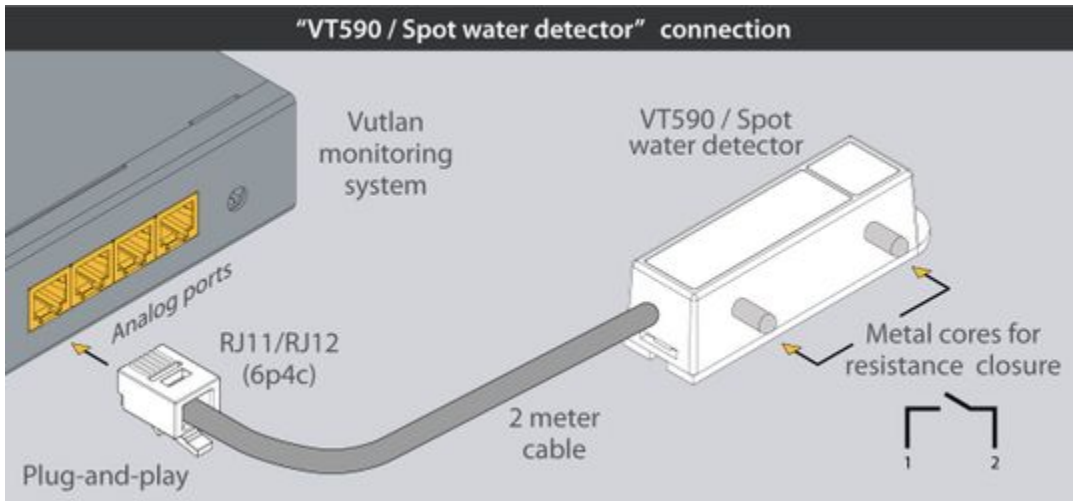
5		x2 pcs, Nuts M3.5
6		x1 pc, Two sided sticker

Drawings



Connecting the leak sensor

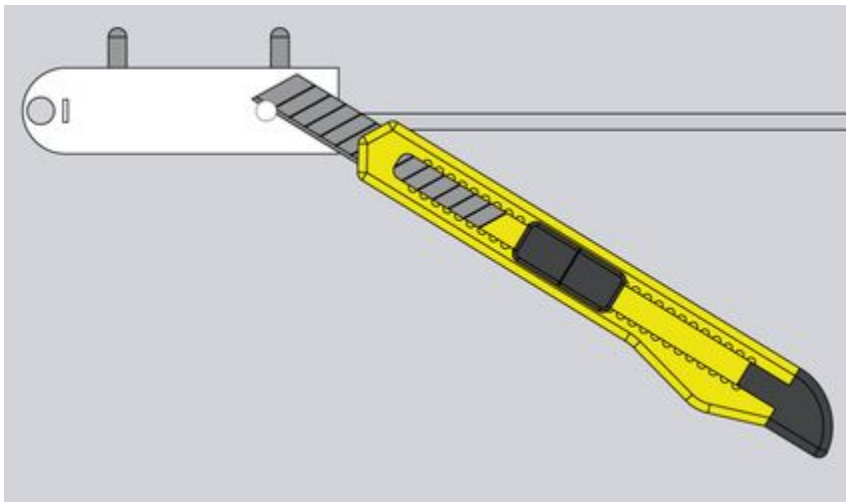
The sensor uses a standard Vutlan analog sensor cable for connecting to the monitoring unit. You can find further instructions at: [Analog sensors connection](#)



Installation using a sticker and a bracket

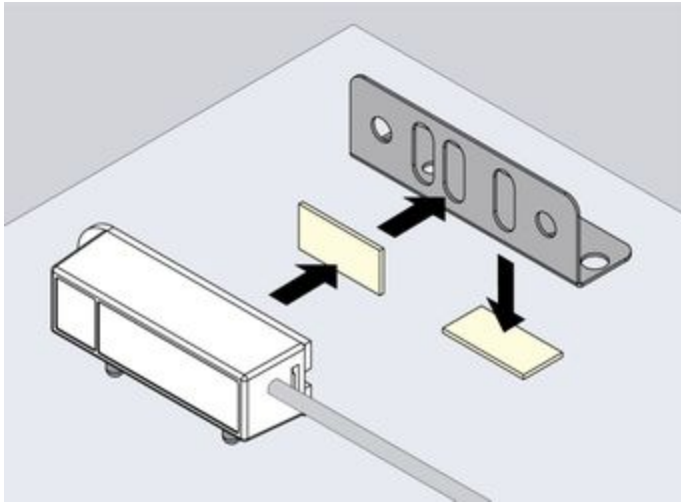
1) There's a round bump at the bottom of the plastic enclosure of the sensor. It is used for fastening when the sensor is mounted together with the on walls using a screw. In the current example, it is not needed. If you are planning to mount a device differently, do not follow this step.

Cut the round bump using a knife so that the bottom of a plastic enclosure will be flat.



2) a) Stick the mounting bracket to the bottom surface.

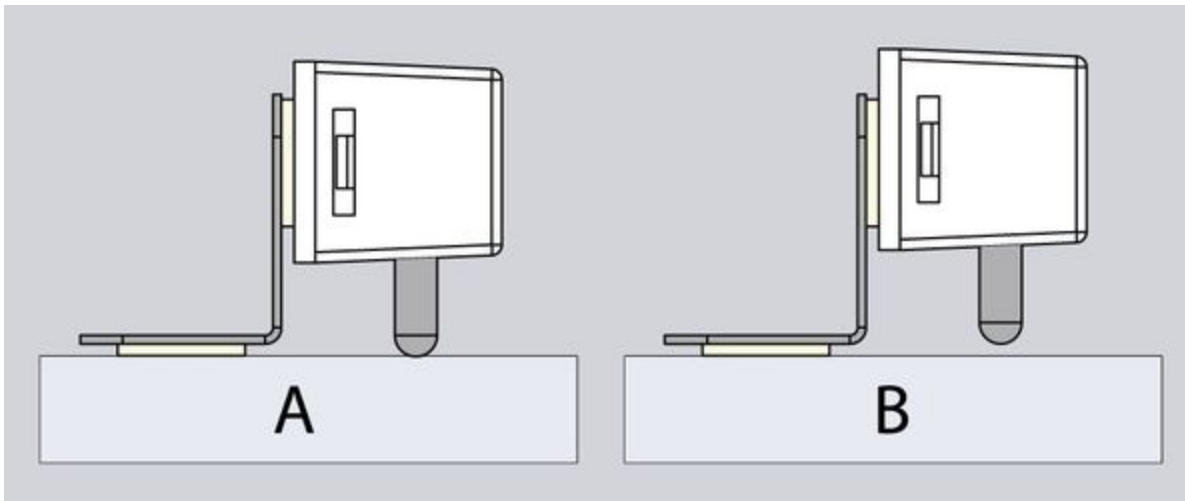
b) Stick a sensor to the mounting bracket following the rule from the next paragraph.



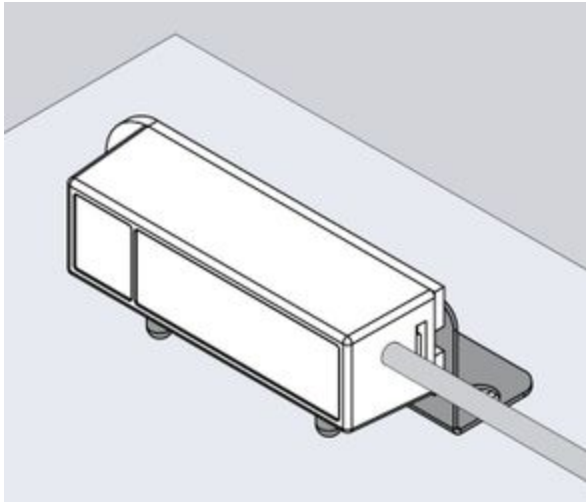
3) If Depending on the surface where the sensor will be installed follow either A or B. If the surface is conductive, then the electric loop between left and right metal bars sticking out the sensor will be closed, which means there's water that connects two bars.

A) If the surface is not conductive. Then mount the sensor metal bars as close to the surface as possible.

B) If the surface is conductive. Then mount the sensor metal bars a bit further from the surface but not too far, so that the detection of water would be possible.



4) The sensor is mounted.

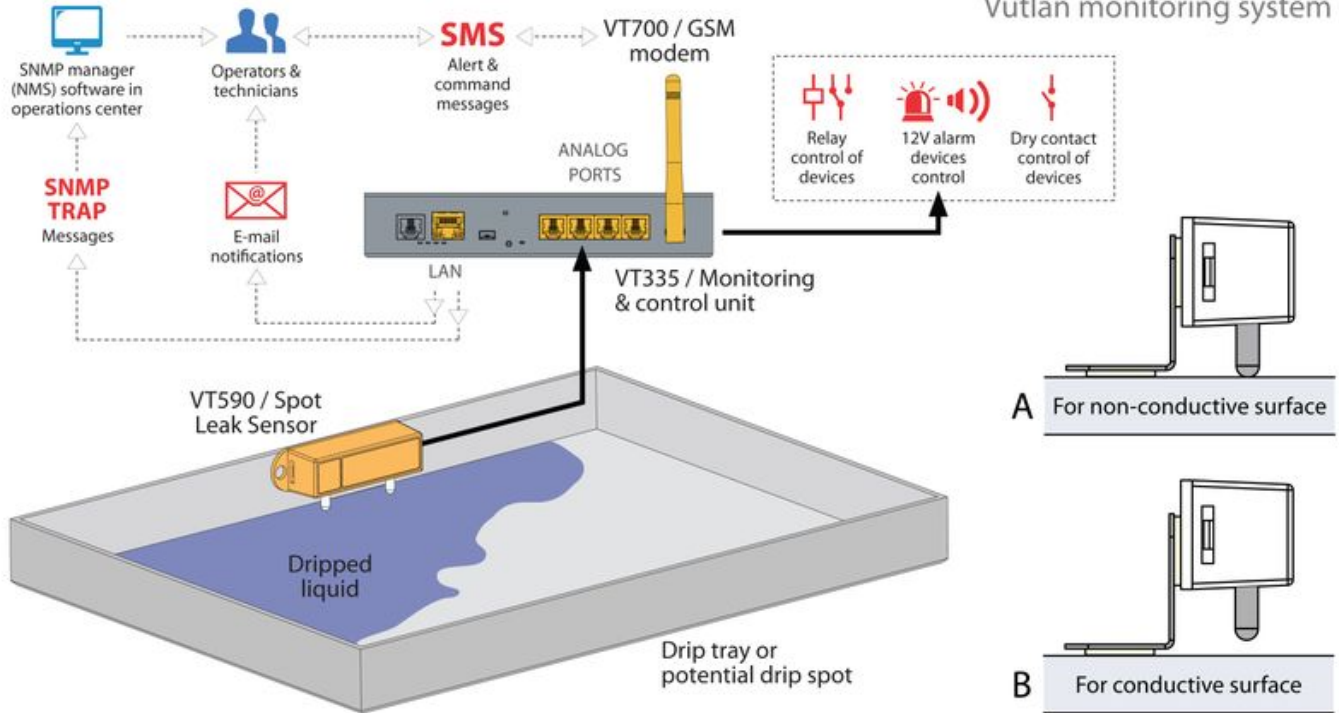


Installation examples

Please find installation examples in our article "Water leakage detection using cable sensor and spot sensor" <https://vutlan.com/blog/post/leakage-detection.html>.

Single spot overflow detection

VT590 / Spot leak sensor
Vutlan monitoring system

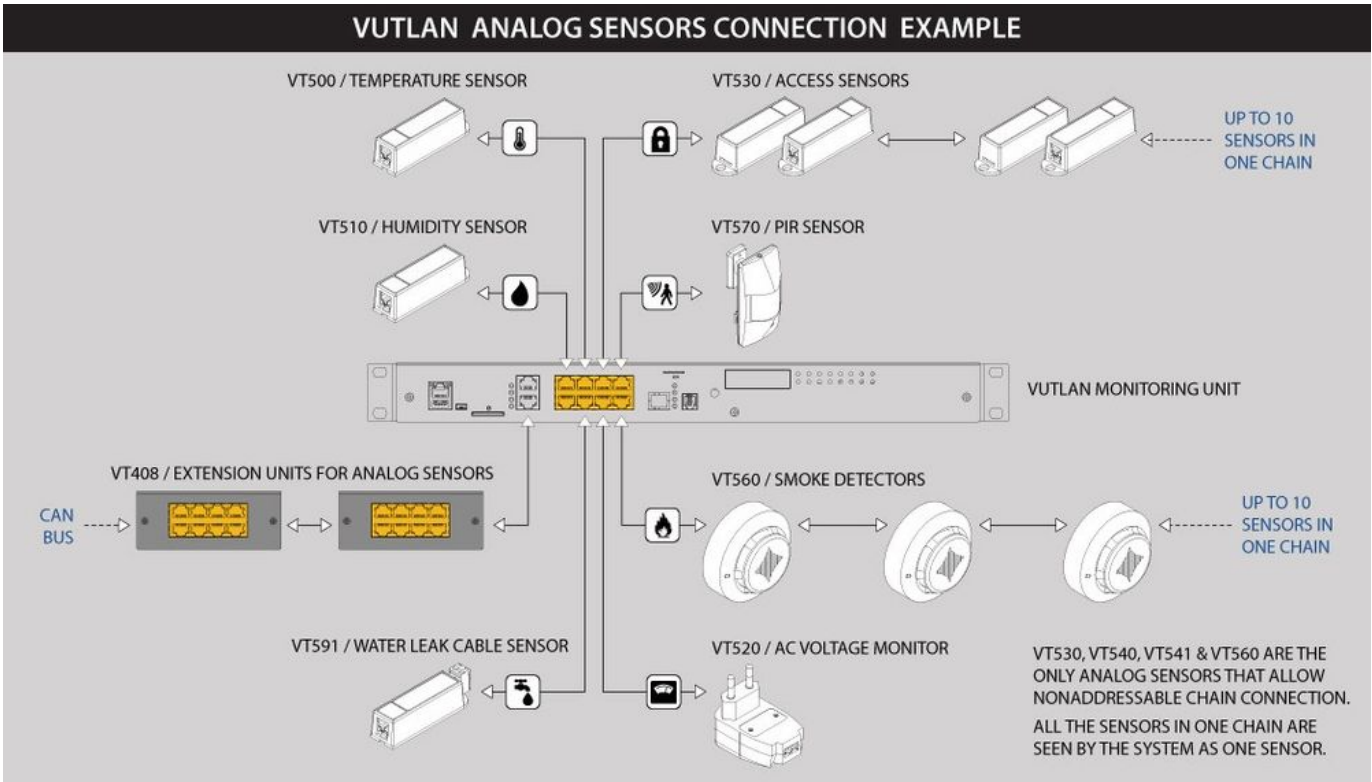


Connecting analog sensors

The sensor uses a standard Vutlan analog sensor cable for connecting to the monitoring unit.

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 3-pair cable CAN FTP for sensor connection!

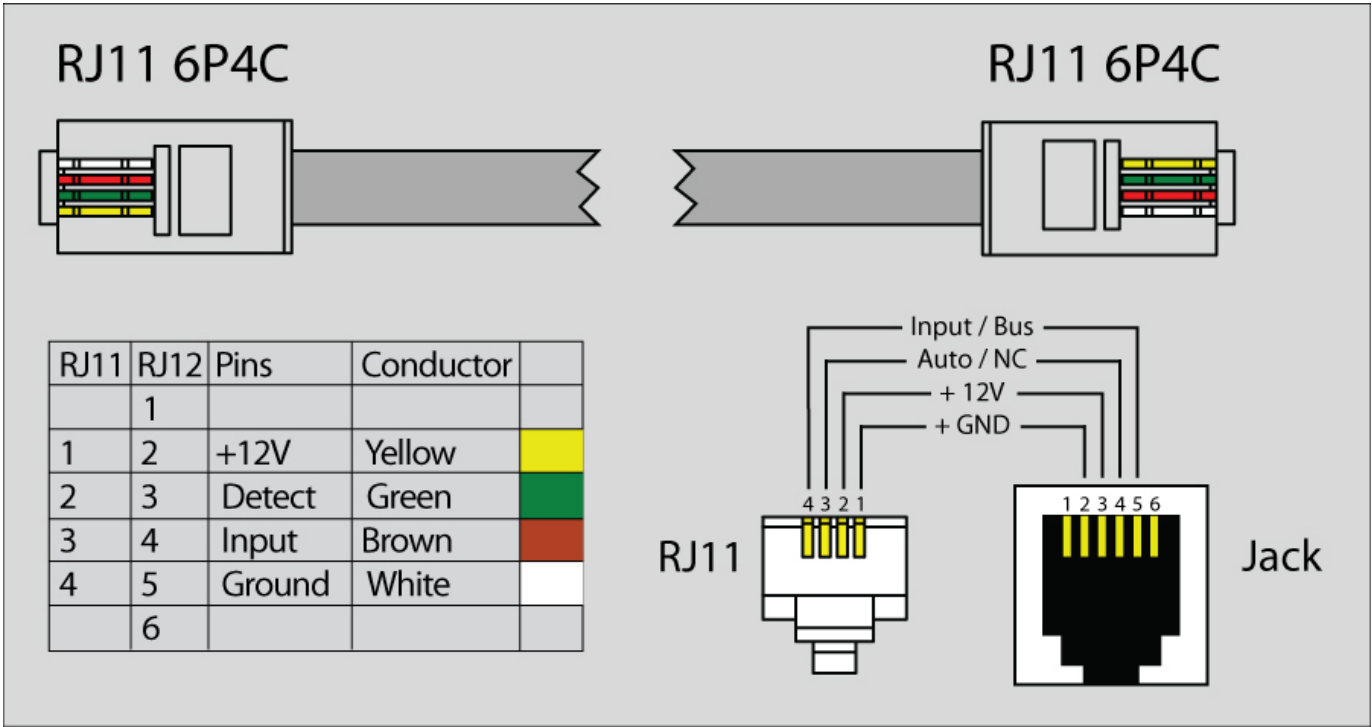
6P4C RJ11 cable wiring / pinouts



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:



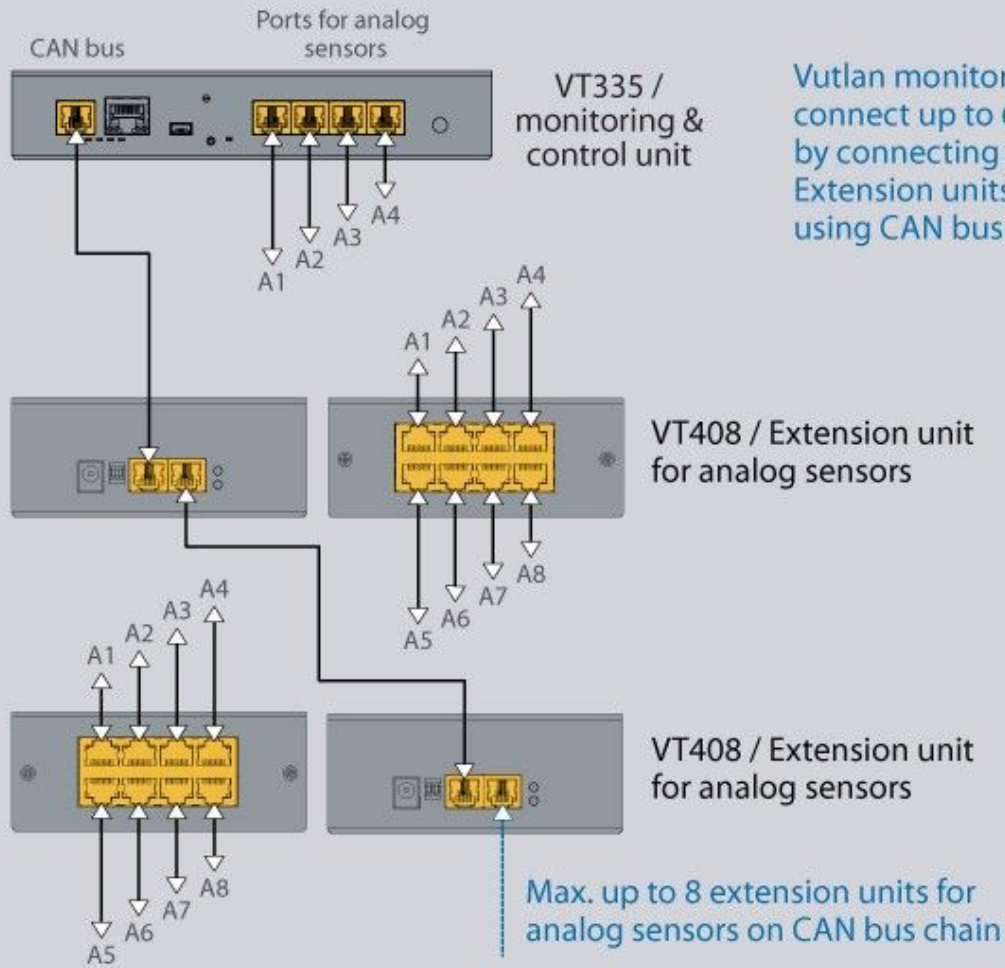
Daisy chain connection

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

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.

VUTLAN ANALOG SENSORS CONNECTION EXAMPLE



Vutlan monitoring systems can connect up to 68 analog sensors by connecting 8 (eight) VT408 / Extension units for analog sensors using CAN bus chain.

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SOLUTIONS

Configure analog sensors

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.

Temperature

Settings Charts All data

Name MPU Temperature

ID 201001

Type	temperature
Class	analog
Current state	Normal
Current value	41.0 °C
Low alarm level	<input type="text" value="0"/>
Low warning level	<input type="text" value="5"/>
High warning level	<input type="text" value="45"/>
High alarm level	<input type="text" value="50"/>
Hysteresis type	value
Value	<input type="text" value="0.30"/>
K from (k*x + b) ?	<input type="text" value="1.000"/>
B from (k*x + b) ?	<input type="text" value="0.000"/>
<input type="button" value="OK"/> <input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

All sensors include:

1	Name	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:

Current state	Normal
Current value	41.0 °C
Low alarm level	<input type="text" value="0"/>
Low warning level	<input type="text" value="5"/>
High warning level	<input type="text" value="45"/>
High alarm level	<input type="text" value="50"/>

On the picture above, "Current value" equals 41.0 and is represented by the small triangle. Currently the triangle is green because it is situated in an "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 value of the sensor has left the current range.


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.

i 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 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 tuned 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 $20*(x-0.021)$

Example: Using fuel tanks.

Each fuel tank has it's 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](#)

API: managing system elements by 3rd party Software

Vutlan has an open API. Read more at:

[Application programming interface \(API\) \(EN\) v.2: https://vutlan.atlassian.net/wiki/spaces/API/pages/335904791/Application+programming+interface+API+EN+v.2](https://vutlan.atlassian.net/wiki/spaces/API/pages/335904791/Application+programming+interface+API+EN+v.2)

[Analog sensors API: https://vutlan.atlassian.net/wiki/spaces/API/pages/335806556/Analog+sensors](https://vutlan.atlassian.net/wiki/spaces/API/pages/335806556/Analog+sensors)

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