



BKT EMS

Environmental Monitoring System

- the environmental parameters monitoring system

- installation and configuration manual

- version 11



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Warning:
This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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1 OVERVIEW

The BKT EMS system is designed to monitor environmental parameters (temperature, humidity, etc.) in a telecommunications cabinet or small rooms. Its purpose is to warn users about possible emergency situations and report any failures. The single system controller can support: up to 4 analogue sensors, 4 sensors with potential-free contacts and two signalling devices. With expansion modules there are up to 28 analogue sensors, 68 sensors with potential-free contacts, 10 sensors with CAN bus interface. To keep a satisfactory system performance, it is not recommended to connect more than 80 sensors to the controller.

2 SYSTEM COMPONENTS

2.1 EC335t controller







Hardware	
Analogue inputs	4 inputs (RJ12 sockets) for compatible analogue sensors. Any combination of 4 sensors can be connected to the device. Some sensors can be connected in stacks. The type of a sensor is detected automatically.
Inputs for potential-free contacts	4 inputs (removable 6-pin terminal strip) for any sensors with potential-free contacts
Outputs	2x 12V/250mA voltage outputs (removable 3-pin terminal strip)
CAN connector	Connector (RJ12 socket) for up to 10 CAN devices, e.g., extension modules for additional analogue inputs, additional inputs for potential-free contacts or CAN sensors
Other connectors	10/100Mbps (RJ45 socket) Ethernet port, USB 2.0 port (Mini-B socket)
Other	Optional card of a GSM module; SDXC 512GB slot
Power supply	External 12VDC/1A plug adapter, power consumption ≤ 10W. Power backup from additional power source 12VDC/1A
Dimensions	190x92x34 (width x depth x height)
Operating conditions	Temperature: 0°C - 60°C, Humidity: 0% - 90% RH (no condensation)
Storage conditions	Temperature: -25°C - 85°C, Humidity: 0% - 95% RH (no condensation)
Weight	700g
Part number	122EC003354
Software	
Operating system	Linux
Configuration	Through a web interface
Supported protocols	HTTP, HTTPS, VPN, PING, DHCP, RADIUS, SYSLOG, FTP, SNTP, SMTP, SNMP (v1,v2c,v3), MODBUS TCP
Alarm notification	E-mail, SNMP trap, internet SMS gateway, SMS (optionally with GSM modem)

2.2 Analogue sensors


Any sensors from the table below can be connected to 4 analogue inputs (A1-A4) of the controller or inputs (A1-A8) in additional EE321t extension modules (extension module with additional 8 analogue inputs). One controller can support up to 28 analogue sensors. If longer than included cable is needed, it is a UTP Cat5e cable suggested with terminated RJ14 (6P4C) plugs. Warning: some analogue sensors e.g., ES363 require 6-wire cable terminated with RJ12 (6P6C) cable.


Type	Description	Part number
 <p>Front Rear</p>	<p>ES350 – Temperature sensor Measurement range: -10°C - +100°C Measurement uncertainty: ±1°C Measurement resolution: 0,1°C Power consumption: 60mW Connectors: 1x RJ12 socket Cable: RJ14(6P4C)-RJ14(6P4C), included 2m, maximum allowed length of a connection cable: 100m Dimensions: 60x18x18</p>	122ES003500
 <p>Front Rear</p>	<p>ES351 – Humidity sensor Measurement range: 0% - 100% RH Measurement uncertainty: ±5% RH for 10% - 95% RH Measurement resolution: 0,01% RH Power consumption: 60mW Connectors: 1x RJ12 socket Cable: RJ14(6P4C)-RJ14(6P4C) included 2m, maximum allowed length of a connection cable: 50m Dimensions: 60x18x18</p>	122ES003510
	<p>ES352 – 230V AC voltage sensor Measurement range: 90VAC - 250VAC Power consumption: 60mW Connectors: 1x USB-A socket Cable: USB-A-RJ14(6P4C) included 1,8m, maximum allowed length of a connection cable: 100m Dimensions: 63x66x30</p>	122ES003520
 <p>Front Rear</p>	<p>ES353 – Door sensor (reed relay + magnet) Stack connection of up to 10 sensors Power consumption: 60mW Connectors: 2x RJ12 socket Cable: RJ14(6P4C)-RJ14(6P4C) included 2m, maximum allowed length of a connection cable: 150m Dimensions: 60x18x18</p>	122ES003530
 <p>Front Rear</p>	<p>ES354 – Vibration sensor Stack connection of up to 10 sensors Power consumption: 60mW Connectors: 2x RJ12 socket Cable: RJ14(6P4C)-RJ14(6P4C) included 2m, maximum allowed length of a connection cable: 150m Dimensions: 60x18x18</p>	122ES003540
	<p>ES356 – Optical smoke sensor Stack connection of up to 10 sensors Power consumption: 100mW Connectors: 2x RJ12 socket Cable: RJ14(6P4C)-RJ14(6P4C) included 2m, maximum allowed length of a connection cable: 150m Dimensions: φ100x45</p>	122ES003560
	<p>ES357 – Passive infrared sensor Movement detection range: 100° x 12m Power consumption: 100mW Connectors: 2m long cable from the casing, terminated with a RJ14 (6P4C) plug, maximum allowed length of a connection cable: 50m Dimensions: 112x71x48</p>	122ES003570
	<p>ES358 – External temperature sensor Measurement range: -40°C - +100°C Measurement uncertainty: ±1°C Measurement resolution: 0,1°C Power consumption: 60mW Connectors: 15m long cable from the casing, terminated with a RJ14 (6P4C) plug, maximum allowed length of a connection cable: 100m Dimensions: φ7x30 + 15 m cable</p>	122ES003580

	<p>ES359 – Flood sensor Detection delay: 15s, Power consumption: 60mW Sensor dimensions: 60x18x18, detector dimensions: 37x20x9 Connectors: RJ14 (6P4C) for connection to the controller, maximum allowed length of a connection cable: 100m; RJ9 (4P4C) for connecting to the detector Liquid detector cable length: 1m</p>	122ES003590
 <p style="text-align: center;">Front Rear</p>	<p>ES360 – Flood sensor for a water detection cable Detection delay: 15s Power consumption: 60mW Connectors: 1x RJ12 socket, 1x 2pin terminal block for ES361 wire Cable: RJ14(6P4C)-RJ14(6P4C) included 2m, maximum allowed length of a connection cable: 100m Dimensions: 60x18x18</p>	122ES003600
	<p>ES368 – Sensor detecting water and other conductive liquids An ES360 sensor is required for connection Available lengths: 3m (122ES003680), 6m (122ES003685), 10m (122ES003682), 15m (122ES003683), 25m (122ES003684)</p>	122ES003680 122ES003685 122ES003682 122ES003683 122ES003684
 <p style="text-align: center;">Front Rear</p>	<p>ES362 - 4-20mA sensor Any sensors with 4-20mA output can be connected to the controller. Galvanic insulation 1kV between the input and the output. Measurement uncertainty: 2% (0,4mA) Measurement resolution: 0,1mA Power consumption: 100mW Input voltage: 5V Maximal input current: 24mA Connectors: 1x RJ12 socket, 1x 2pin terminal block for 4-20mA sensor Cable: RJ14(6P4C)-RJ14(6P4C) included 2m, maximum allowed length of a connection cable: 50m Dimensions: 60x18x18</p>	122ES003620
 <p style="text-align: center;">Front Rear</p>	<p>ES363 - 75V DC voltage sensor Galvanic insulation 1kV between the input and the output. Measurement range: 0VDC - 75VDC Measurement uncertainty: ±1% (0,75V) Measurement resolution: 0,1V Power consumption: 100mW Connectors: 1x RJ12 socket, 1x 2pin terminal block as DC voltage input Cable: RJ12(6P6C)-RJ12(6P6C) included 2m, maximum allowed length of a connection cable: 50m Dimensions: 60x18x18</p>	122ES003630

2.3 CAN digital sensors

These sensors are connected to the CAN interface of the EC335t controller. The CAN interface is a serial bus and allows connecting devices in a daisy chain (from device to device). A maximum of 10 devices can be connected to the controller via the CAN interface. The length of the CAN bus should not exceed 200m. It is a UTP Cat 5e suggested as a CAN bus cable.

Type	Description	Part number
	<p>ES340 - Integrated smoke, humidity, temperature sensors; CAN bus Temperature measurement range: -10 - +85°C Measurement uncertainty: ±0,5°C Measurement resolution: 0,1°C Humidity measurement range: 0% - 100% RH Measurement uncertainty: ±3% RH for 10-95% RH Measurement resolution: 1% RH Possibility to connect up to 10 devices in a daisy chain (sensor has 2 CAN ports); Power consumption: 1000mW Connectors: 2x RJ12 socket of CAN bus Cable: RJ12(6P4C)-RJ12(6P4C), included 2m, maximum allowed length of CAN bus: 200m; Dimensions: φ100x45</p>	122ES003400

	<p>ES341 - Integrated pressure 300-1100hPa, humidity 0% -100% RH ($\pm 3\%$ uncertainty for RH 10% - 95% RH), temperature $-40...+85^{\circ}\text{C}$ sensors; CAN bus. Possibility to connect up to 10 devices in a daisy chain. The sensor has 2 CAN ports for daisy chain connection.</p> <p>Measurement uncertainty: $\pm 1,5^{\circ}\text{C}$ Measurement resolution: $0,1^{\circ}\text{C}$ Measurement uncertainty: $\pm 3\%$ RH Measurement resolution: 1% RH Measurement uncertainty: $\pm 1,7\text{hPa}$ Measurement resolution: 1hPa</p> <p>Connectors: 2x RJ12 socket of CAN bus Cable: RJ12(6P4C)-RJ12(6P4C), included 2m, maximum allowed length of CAN bus: 200m Dimensions: 78x66x27 mm.</p>	122ES003410
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2.4 Extension modules and accessories




Expansion modules increase the number of available ports for sensors connected to one controller. The EE321t and EE322 modules must be connected to the CAN interface of the EC335t controller. The CAN interface is a serial bus and allows connecting in a daisy chain (from device to device). A maximum of 10 devices can be connected to the controller via the CAN interface. The length of the CAN bus should not exceed 200m. It is a UTP Cat5e suggested as a CAN bus cable.

Type	Description	Part number
 <p>Front Rear</p>	<p>EE321t – Extension module with additional 8 analogue inputs. The module is connected to a CAN controller connector. The controller supports up to 3 EE321t devices. The module has no 19" brackets.</p> <p>Connectors: 2x RJ12 socket of CAN bus, 8xRJ12 for analogue sensors, power socket 12V@1A Dimensions: 129x29x56</p>	122EE003211
 <p>Front</p> <p>Rear</p>	<p>EE322 – Extension module with additional 32 inputs for potential-free contacts. The module is connected to a CAN controller connector. The controller supports up to 32 inputs of potential-free contacts. 19" brackets included.</p> <p>Connectors: 2x RJ12 socket of CAN bus, 32 terminal blocks for potential-free contacts Dimensions: 215x40x40</p>	122EE003220
 <p>Front Rear</p>	<p>EA313 - Relay 30VDC/5A Maximal contact voltage: 30VDC Maximal contact load: 5A Coil voltage: 12VDC Dimensions: 60x18x18</p>	122EA003130
	<p>EA314t – 19" 1U bracket for EC335t (index 122EC003354) and EE321t module (122EE003211) Dimensions: 484x44x80</p>	122EA003144
	<p>EA315 – Light signal Flashing frequency: 1Hz Power supply 12V, 80mA Connectors: 1x 2pin terminal block Cable: 1.5m 2-wire cable included Dimensions: $\phi 73 \times 45$</p>	122EA003150
	<p>EA316t – 19" 1U bracket for 2x EE321t Dimensions: 484x44x80</p>	122EA003161
	<p>EA319t - LTE modem for EC335t (part number 122EC003354) The modem is mounted in a dedicated controller slot. The modem has SMA connectors for antennas. 2 bayonet antennas are included.</p>	122EA003194

3 SYSTEM STRUCTURE

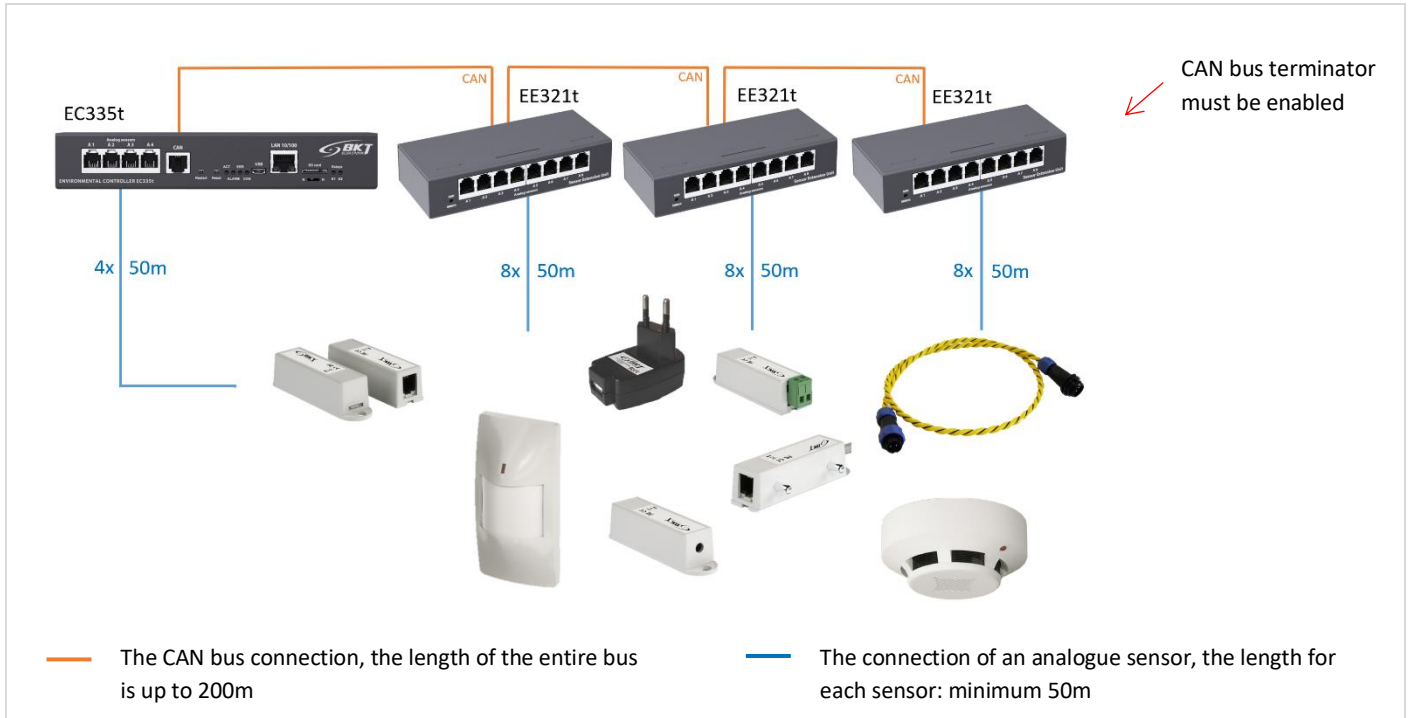
3.1 Number of sensors and wiring

In order to maintain optimal system performance, the number of sensors supported by the EC335t controller should be limited to 80. To connect the sensors with the controller, use the cable supplied with the sensor or use a UTP cat. 5e twisted pair cable terminated with connectors as in the figures below. Inside the IT cabinet, cables should be routed from the sensor to the controller along the cabinet frame or on dedicated cable routes. The cables should be secured using cable ties.

Device connected to the EC335t controller	Restrictions	Type of connection cable	Maximum cable length												
All sensors	Maximum 80 sensor of any type														
Analogue sensors	Up to 28 analogue sensors of any type connected directly to the controller and via extension modules EE321t .	<p>UTP kat5e with RJ14 (6P4C) -RJ14 (6P4C) connectors</p>  <table border="1" data-bbox="774 761 1029 952"> <tr><td>1</td><td>NC</td></tr> <tr><td>2</td><td>12V</td></tr> <tr><td>3</td><td>Sensor detection</td></tr> <tr><td>4</td><td>Signal output</td></tr> <tr><td>5</td><td>GND</td></tr> <tr><td>6</td><td>NC</td></tr> </table> <p>For the ES363 sensor, use UTP kat5e cable with RJ12 (6P6C) -RJ12 (6P6C) connectors</p> 	1	NC	2	12V	3	Sensor detection	4	Signal output	5	GND	6	NC	A minimum of 50m. See the description of individual sensors 2.2 Analogue sensors
1	NC														
2	12V														
3	Sensor detection														
4	Signal output														
5	GND														
6	NC														
CAN devices	Up to 10 CAN devices (up to 3x EE321t and up to 2x EE322 and up to 10x ES340/ES341).	<p>UTP kat5e with RJ14 (6P4C) -RJ14 (6P4C) connectors</p> 	The entire bus is up to 200m.												
Sensors with potential-free contacts	Up to 68 sensors with potential-free contacts connected directly to the controller and via the EE322 extension modules. It should be assumed that each sensor with a potential-free output loads the controller as much as 0.5 analogue sensor.	<p>UTP Cat 5e or other with 0.5mm wire diameter</p>	50m for each sensor.												

3.2 Example 1. Extension modules EE321t

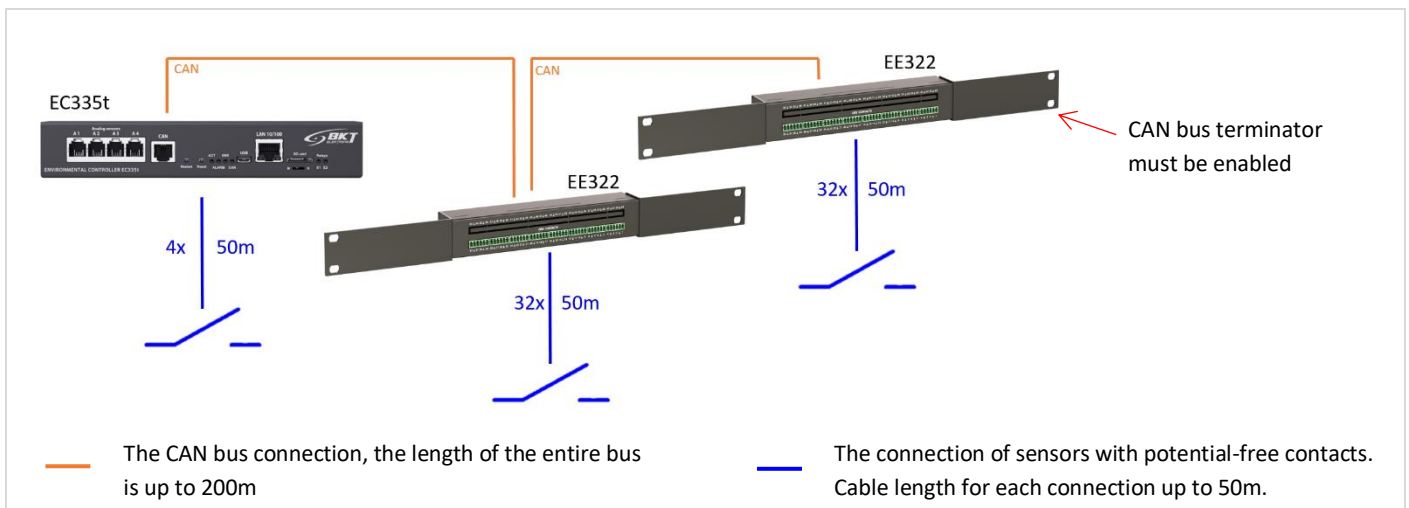
Up to three EE321t modules (extension module with an additional 8 analogue inputs) can be connected to one controller.



Sensor type	Number of sensors as a load for the controller
Analogue sensors connected directly to the controller	4
Analogue sensors connected via EE321t extension modules	24
Total	28

3.3 Example 2. Extension modules EE322

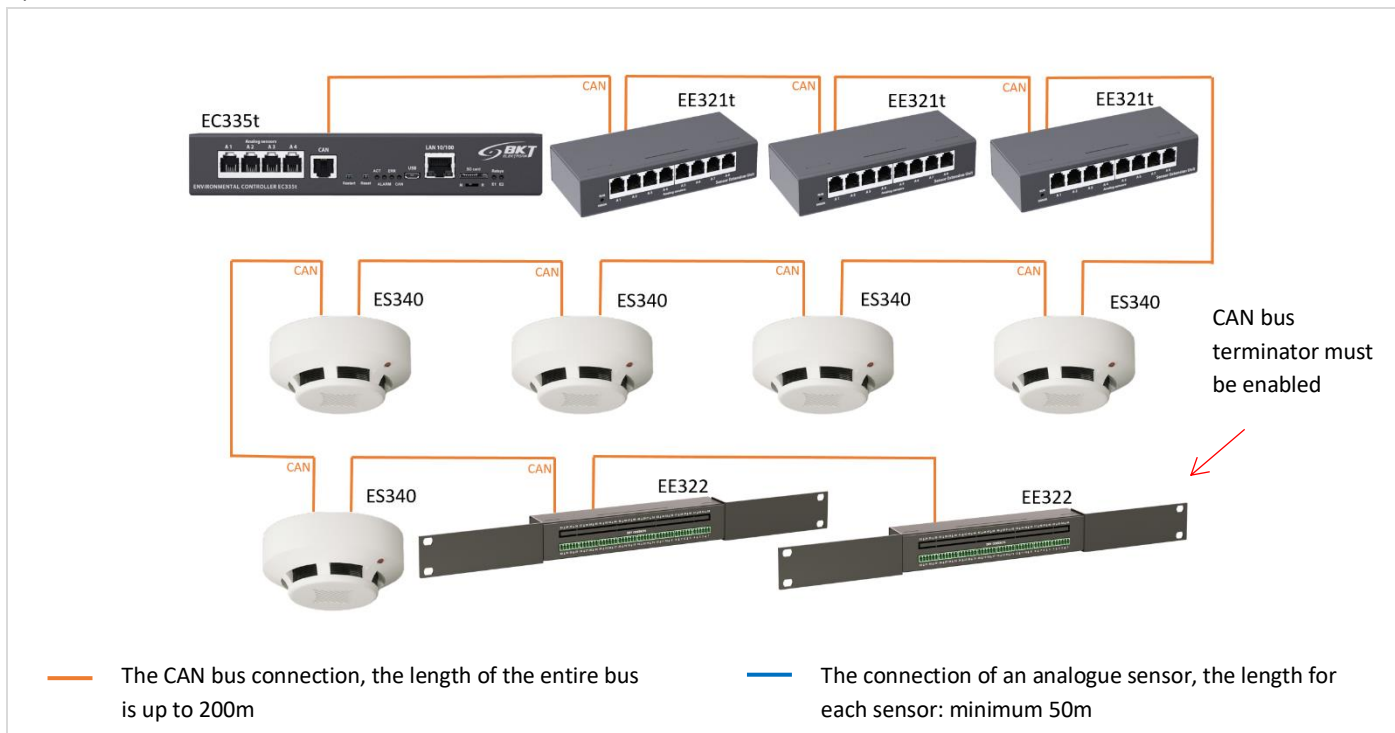
A maximum of two EE322 modules (extension module with an additional 32 inputs for potential-free contacts) can be connected to one controller. It should be assumed that each sensor with a potential-free output loads the controller as much as 0.5 analogue sensors.



Sensor type	Number of sensors as a load for the controller
Sensors with potential-free contacts connected directly to the controller	2 (in real 4)
Sensors with potential-free contacts connected via EE322 extension modules	32 (in real 64)
Total	34

3.4 Example 3. CAN devices

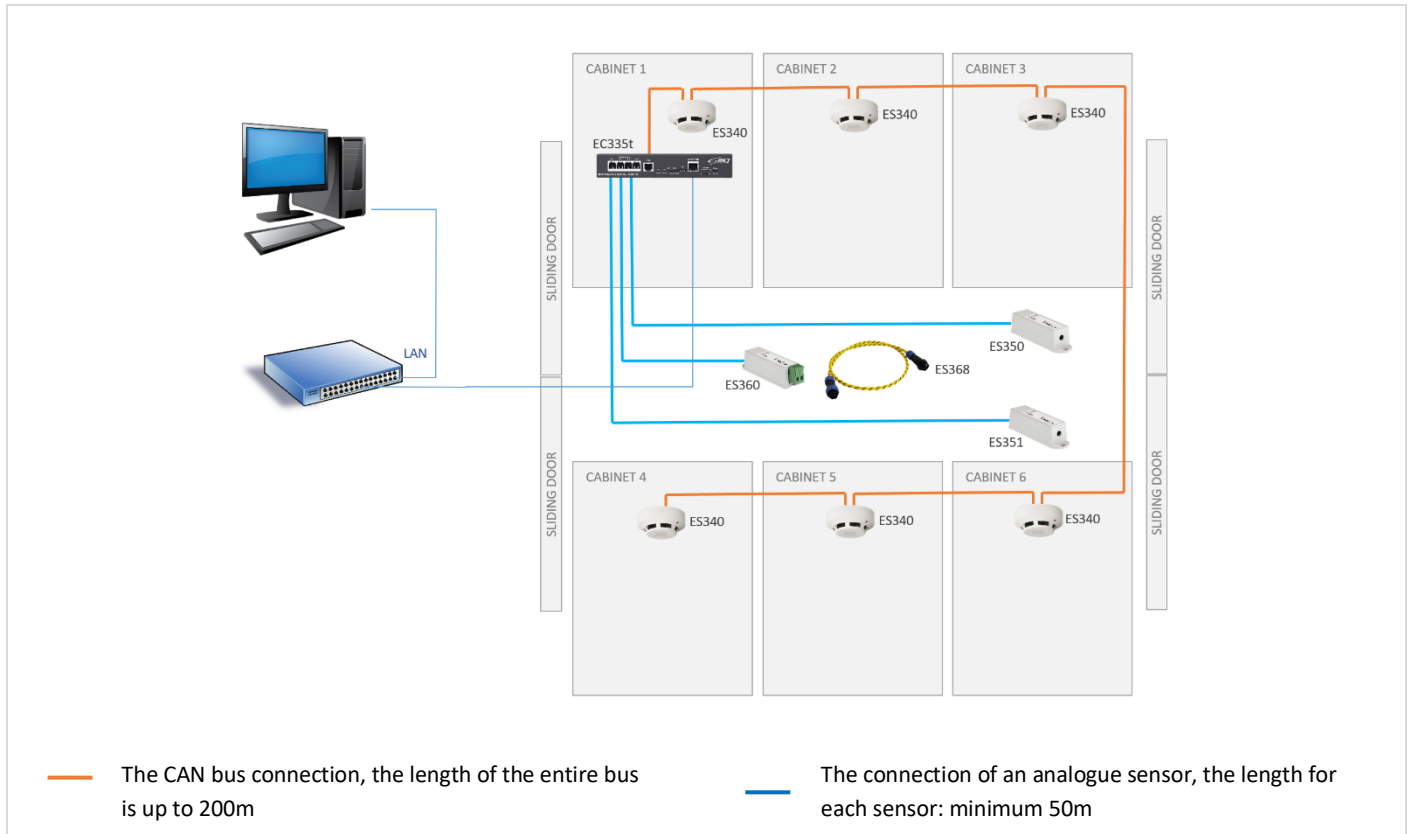
Up to 10 CAN devices can be connected to one controller, but maximum 3 units EE321t, 2 units EE322 or 10 units ES340.



Sensor type	Number of sensors as a load for the controller
Analogue sensors connected to EC335t controller	4
Analogue sensors connected via EE321t extension modules	24
ES340 CAN sensors (temperature, humidity, smoke)	15 (5x3)
Sensors with potential-free contacts connected via EE322 extension modules	32 (in real 64)
Total	75

3.5 Example 4. IT cabinet monitoring

An example of an environmental conditions monitoring system in cold aisle containment built of 6 cabinets: temperature (ES350) and humidity (ES351) in the aisle, temperature at the top of the cabinet, humidity and presence of smoke (ES340). A flood detection sensor was placed under the floor (ES360 + ES368).



Sensor type	Number of sensors as a load for the controller
Analogue sensors connected directly to the controller	3
ES340 CAN sensors (temperature, humidity, smoke)	18 (6x3)
Total	21

4 INSTALLATION OF DEVICES

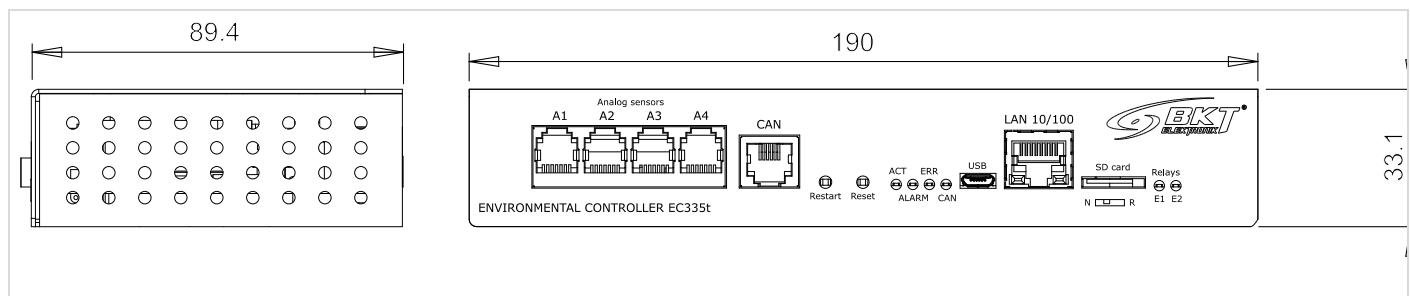
4.1 EC335t controller installation

4.1.1 Package contents

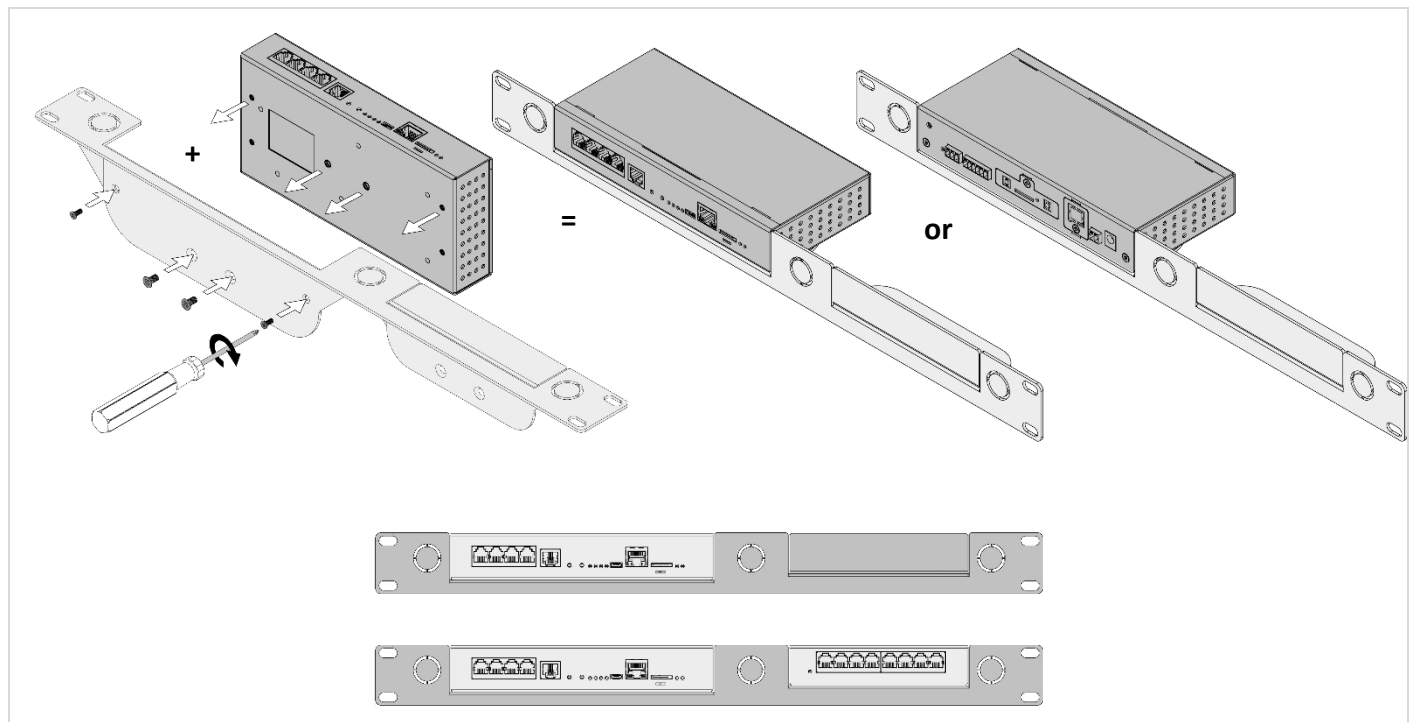
EC335t box contains:

EC335t controller - 1pc.	Power supply 230V AC, 12V DC 1A - 1pc.	RJ45-RJ45 patchcord - 1pc.	USB cable: mini B USB plug - USB A socket - 1pc.	Self-adhesive foot - 4pcs.	2-pin terminal block - 1pc.	3-pin terminal block - 1pc.	6-pin terminal block - 1pc.

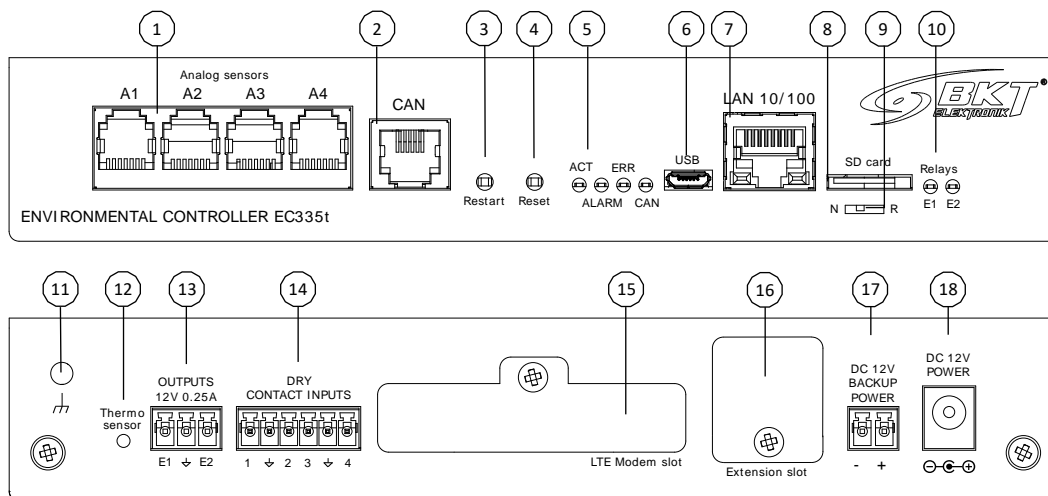
4.1.2 Controller dimensions



4.1.3 1U 19" bracket installation



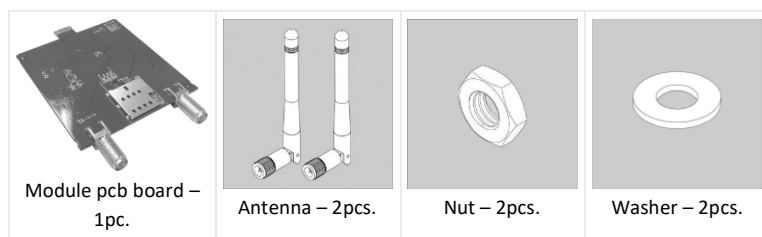
4.1.4 Device connectors



1. Analogue sensor inputs	6. Mini-B USB for pendrive or camera	16. RS485 module slot
2. CAN bus connector for extension units	7. RJ45 Ethernet connection	17. Power backup input for additional power source 12VDC/1A
3. Controller reboot button. Press and hold for 2s. Wait 60s for rebooting.	8. SD card socket for measurements storage	
4. Restore factory settings button. Press and hold for 5s. Wait 60s for rebooting.	9. Working mode switch: N-normal mode, R-factory programming (do not use)	18. Main power supply 12VDC/1A
5. Status LEDs ACT- device status LED ALARM – programmable LED, ERR – error LED, CAN – CAN bus status LED	10. Voltage output status LEDs	
	11. Enclosure earthing (M4 thread)	
	12. Local temperature sensor	
	13. Voltage outputs 12VDC 0.25A	
	14. Inputs for external voltage-free contacts	
	15. EA319t LTE modem slot	
	16. RS485 module slot	

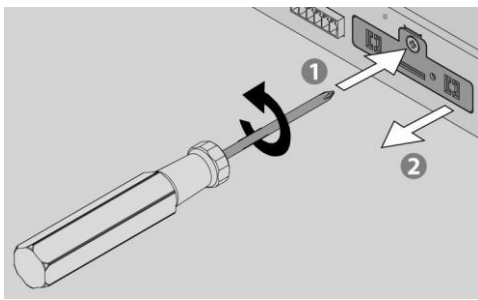
4.2 Installation of EA319t – LTE modem

4.2.1 Package contents

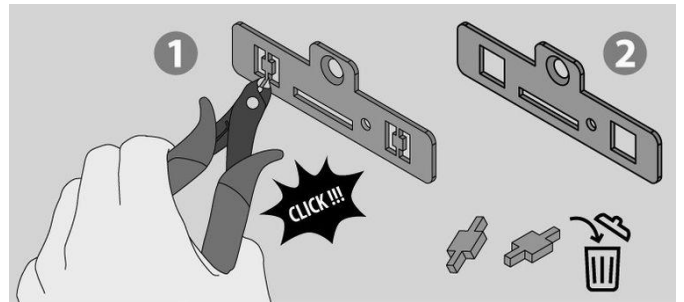


4.2.2 Assembly procedure

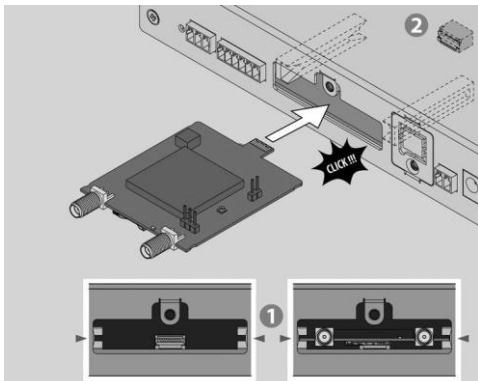
The method of assembling the modem is shown below.



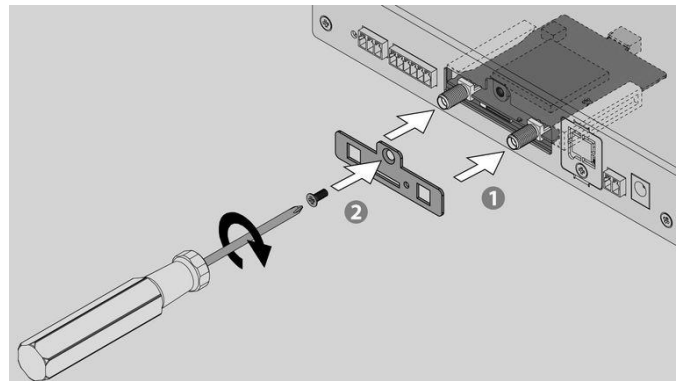
Unscrew the cover at the back of the controller.



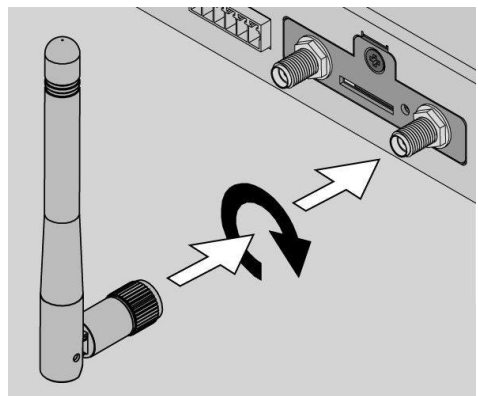
Cut out the hole blanks in the cover.



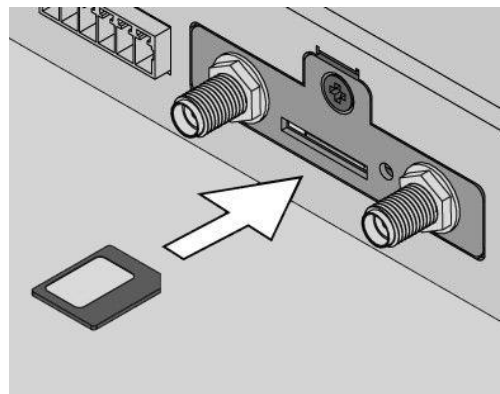
Carefully slide the modem PCB into the controller along the guides (1) so that its end is inserted into the connector (2).



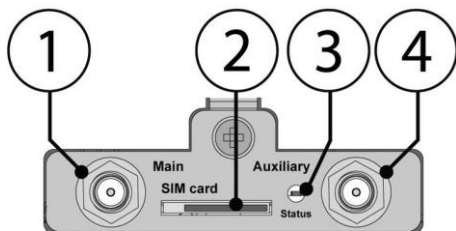
Install and screw the cover, then washers and nuts onto the antenna connectors.



Screw on the bayonet antennas.



Place the microSIM card in the module - with the contacts facing up, with the cutout facing inside the controller. Push the card until it clicks. To remove the card, push it again until it clicks.



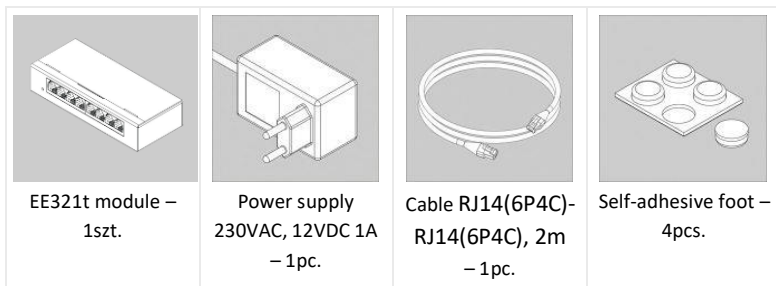
1. SMA socket for GSM antenna
2. microSIM card slot
3. LED, blinks when modem is powered
4. SMA socket for GSM antenna

4.3 Installation of EE321t module – 8 analogue inputs extension

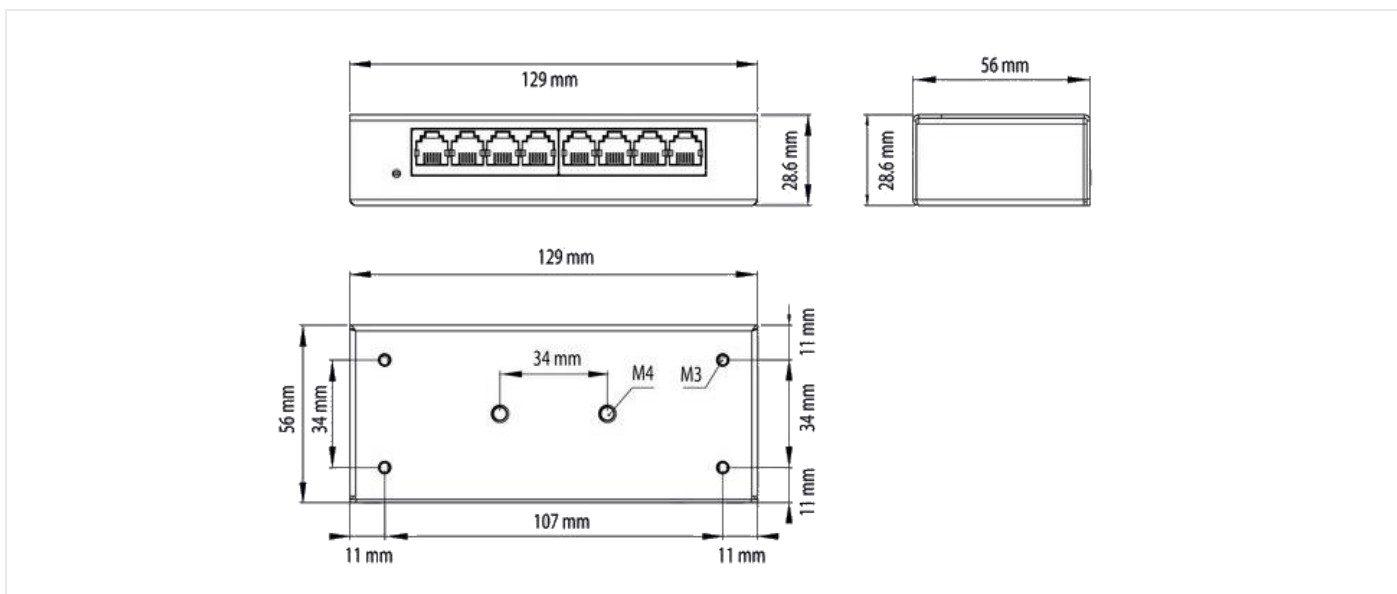
You can connect 3 EE321t devices that extend the number of analogue ports to the controller.

4.3.1 Package contents

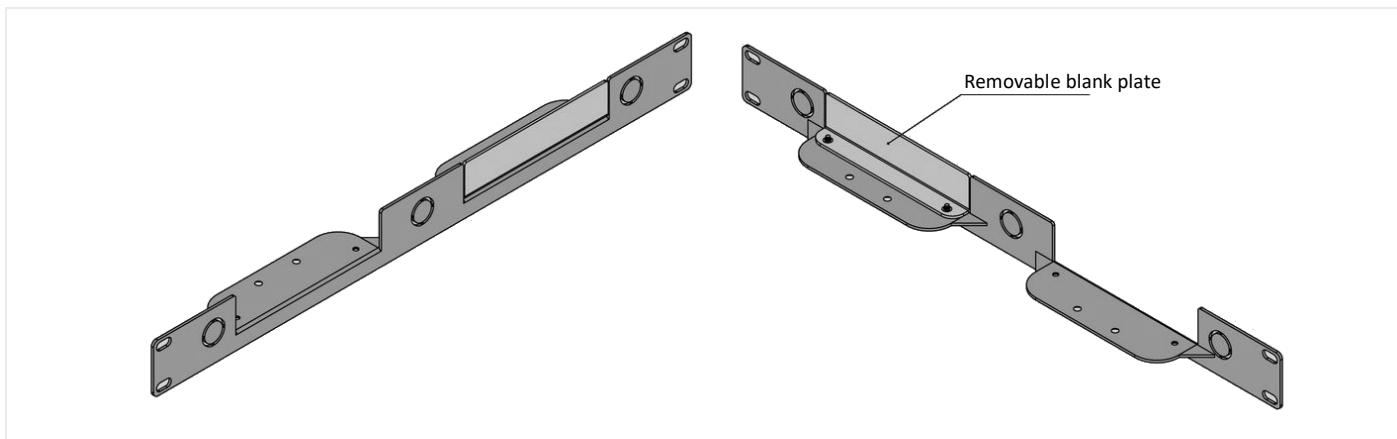
The packaging of the EE321t module includes:

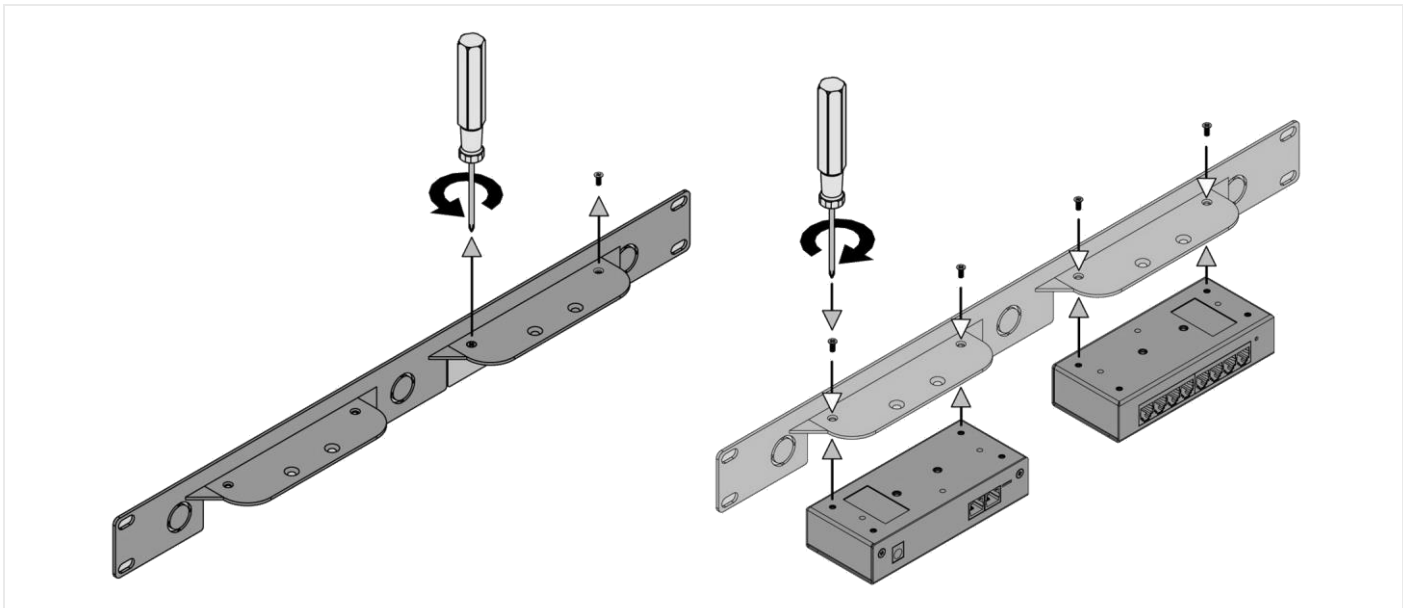


4.3.2 EE321t dimensions

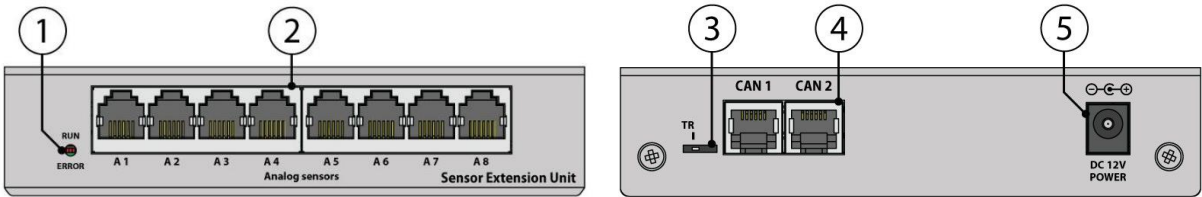


4.3.3 1U 19'' bracket installation



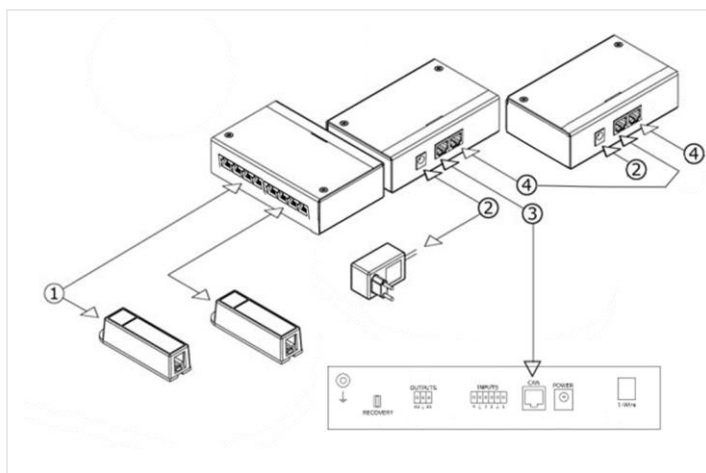
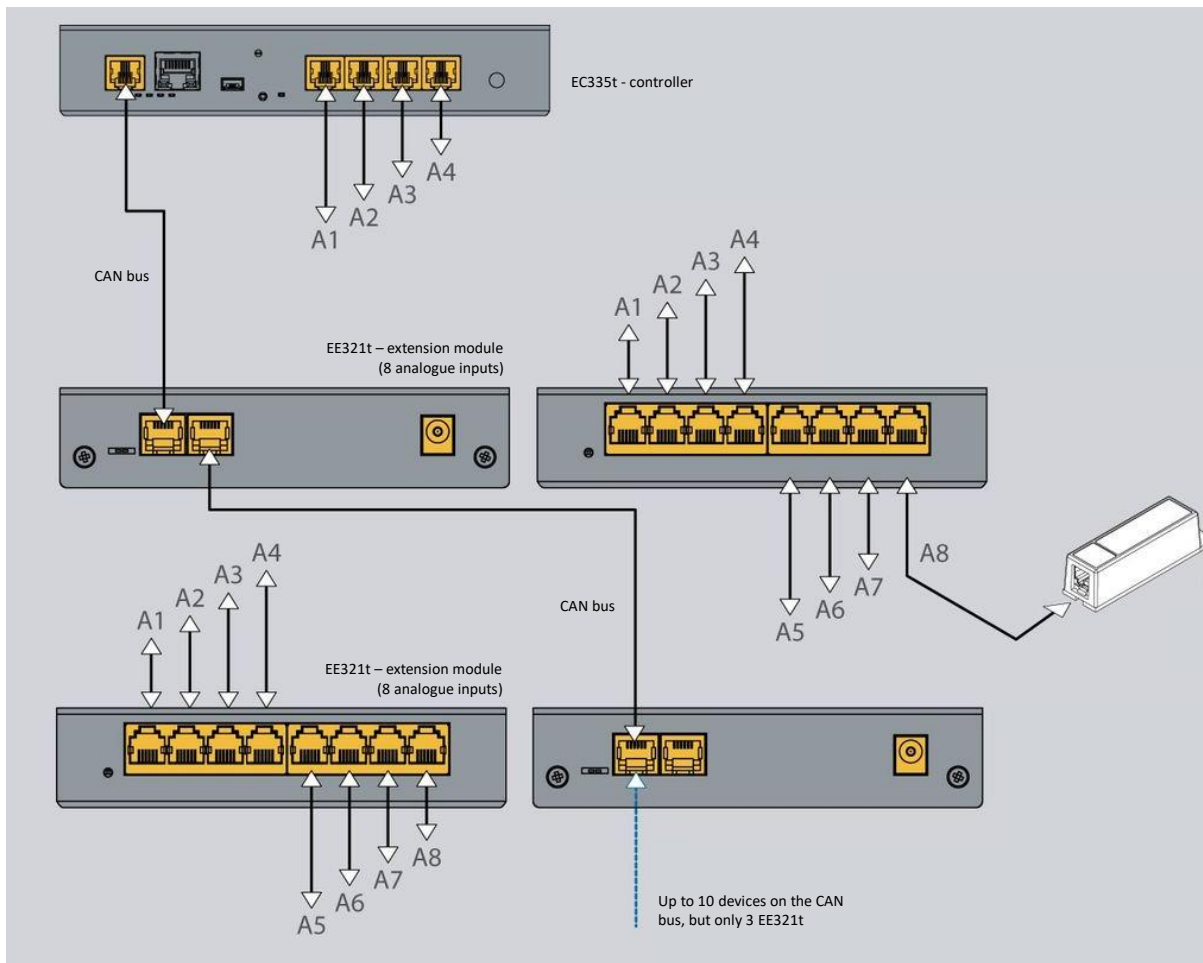


4.3.4 Device connectors



1. Signal LEDs (see in table 4.3.5 Connecting the EE321t module)
2. 8 inputs for analogue sensors
3. Switches: FR - firmware update and TR – bus terminator (see in the table 4.3.5 Connecting the EE321t module)
4. CAN bus connectors
5. Power connector 12VDC/1A

4.3.5 Connecting the EE321t module



The devices should be connected in a cascade (from one device to another). The CAN socket number is irrelevant, either CAN1 or CAN2 can be used. The maximum CAN bus length is 200 m.

1. Connection of sensors to a device extending the number of analogue inputs.
2. Connection of 12VDC/1A power supply.
3. Connection of a CAN bus to the EC335t controller.
4. Cascade connection of the CAN bus (from one device to another).



For CAN bus connections, UTP cat5e cable terminated with RJ14(6P4C) - RJ14(6P4C) plugs.

<p>TR-on</p> <p>TR-off</p>	<p>The bus terminator in the last device (from the controller) must be enabled. The bus terminator in the other devices must be disabled. The TR switch (activating the terminator) in ON and OFF position is shown in the drawing on the left.</p>
	<p>The EE321t module has two LEDs that signal the states:</p> <p>RUN (green) flashes - the EE321t module is not connected to the controller</p> <p>RUN (green) is on - the EE321t module is connected to the EC335t controller and is correctly configured in the controller</p> <p>ERR (red) is on - the EE321t module is connected to the EC335t controller but is not configured correctly in the controller</p>

4.4 Installation of EE322 module– extension of 32 inputs for voltage-free contacts

Up to two EE322 devices, that extend the number of inputs for potential-free contacts, can be connected to the controller.

4.4.1 Package contents

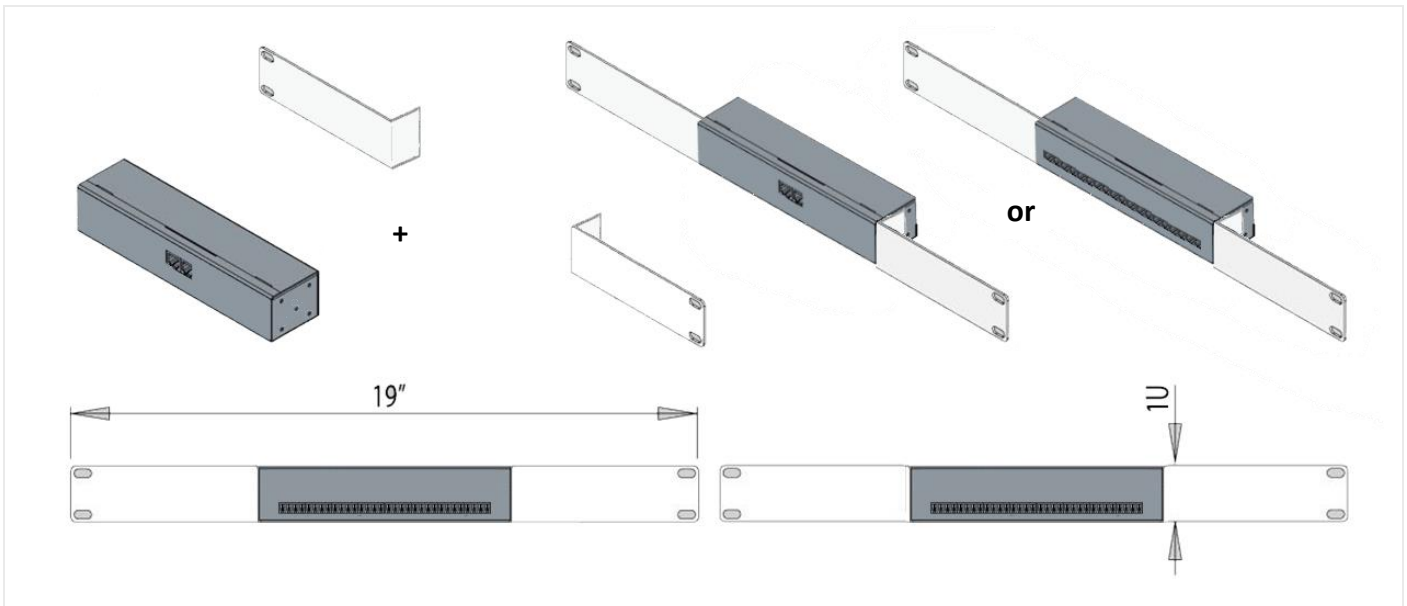
The packaging of the EE322 module includes:

<p>EE322 module – 1pc.</p>	<p>Cable RJ14(6P4C)- RJ14(6P4C), 2m – 1pc.</p>	<p>Self-adhesive foot – 4 pcs.</p>	<p>6-pin terminal block– 1pc.</p>	<p>M3x8 bolts – 6pcs.</p>	<p>1U 19" bracket - 2pcs.</p>

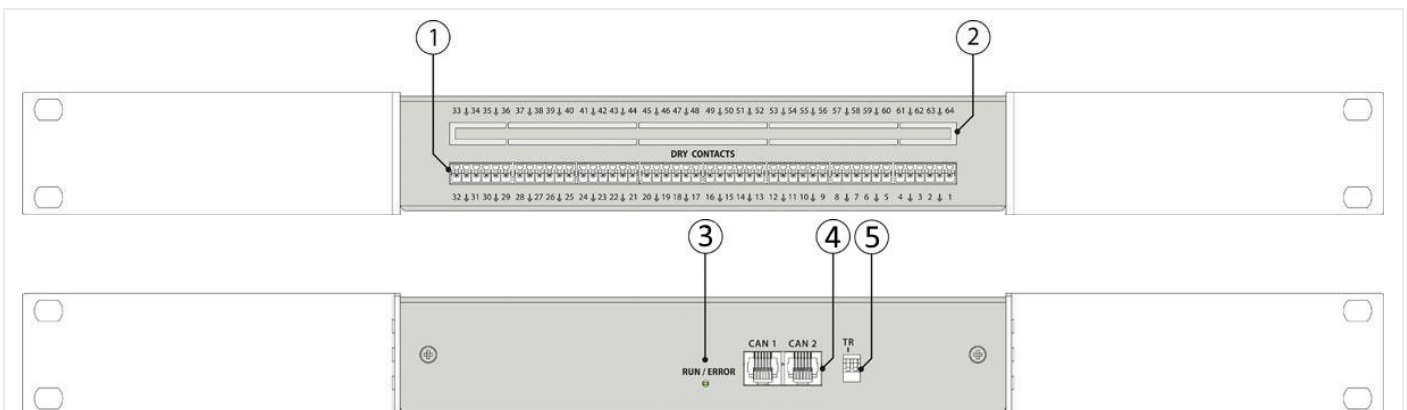
4.4.2 EE322 dimensions



4.4.3 1U 19" bracket installation

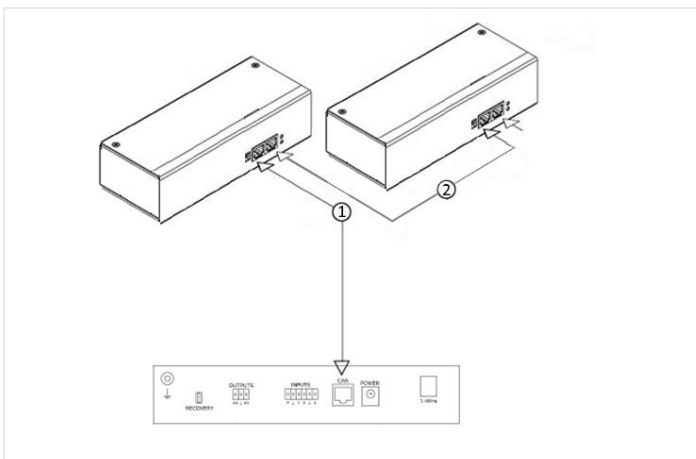
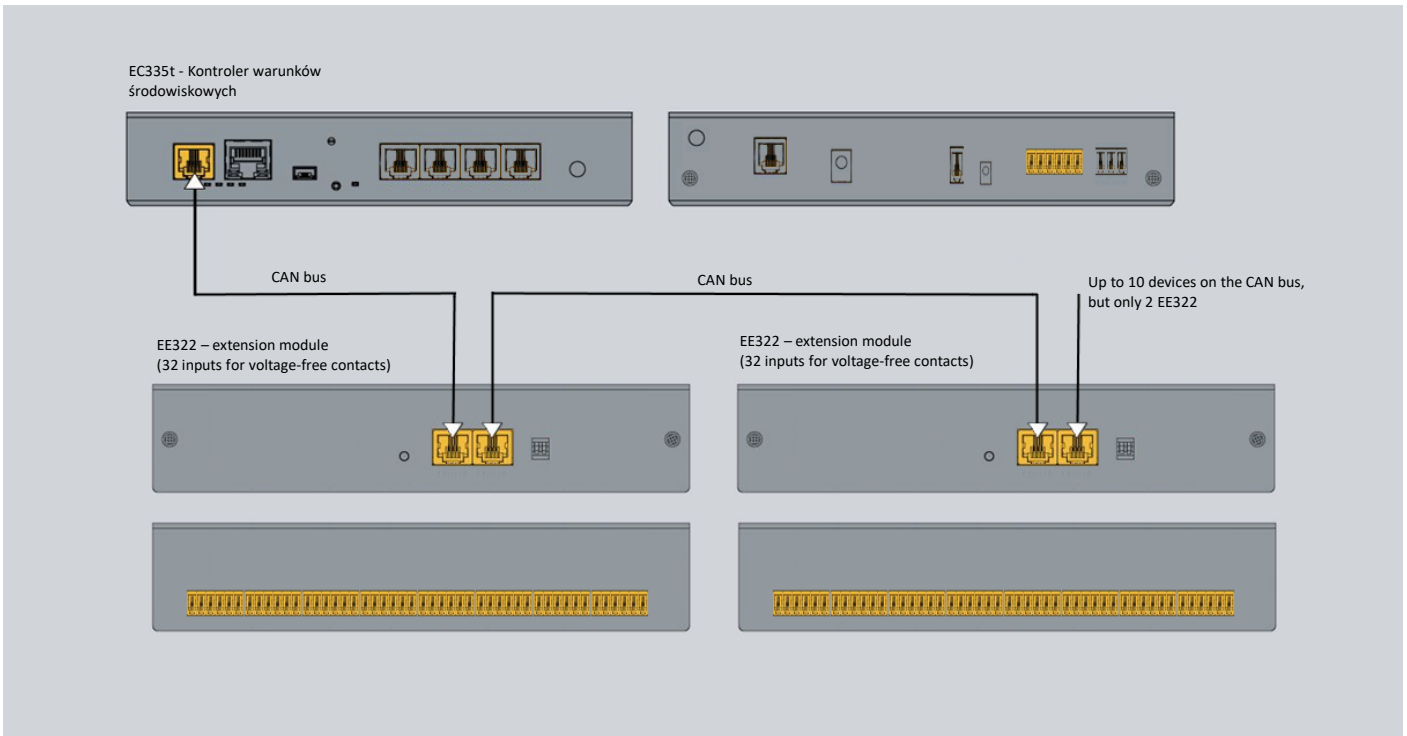


4.4.4 Device connectors



1. 1. Inputs for 32 sensors with potential-free contacts
2. 2. Optional additional inputs
3. 3. LED indicating connection error with the EC335t controller
4. 4. CAN bus inputs
5. 5. FR switches - firmware update and TR - bus terminator (see in the table 4.4.5 Connecting the EE322 module)

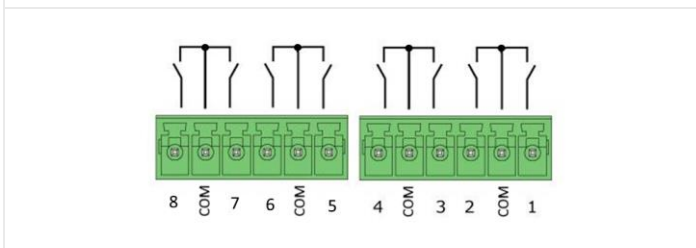
4.4.5 Connecting the EE322 module



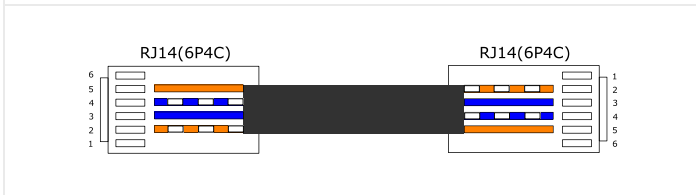
The devices should be connected in a cascade (from the EC335t controller to the next EE322 device, etc.). The CAN socket number does not matter, you can use any CAN1 or CAN2. The maximum length of the CAN bus can be 200m.

1. Connection of the CAN bus to the EC335t controller
2. Cascade connection of the CAN bus (from the device to the device)

EE322 devices do not require an additional power supply - they are powered from the CAN bus.



A way to connect voltage-free contacts to the EE322 module.

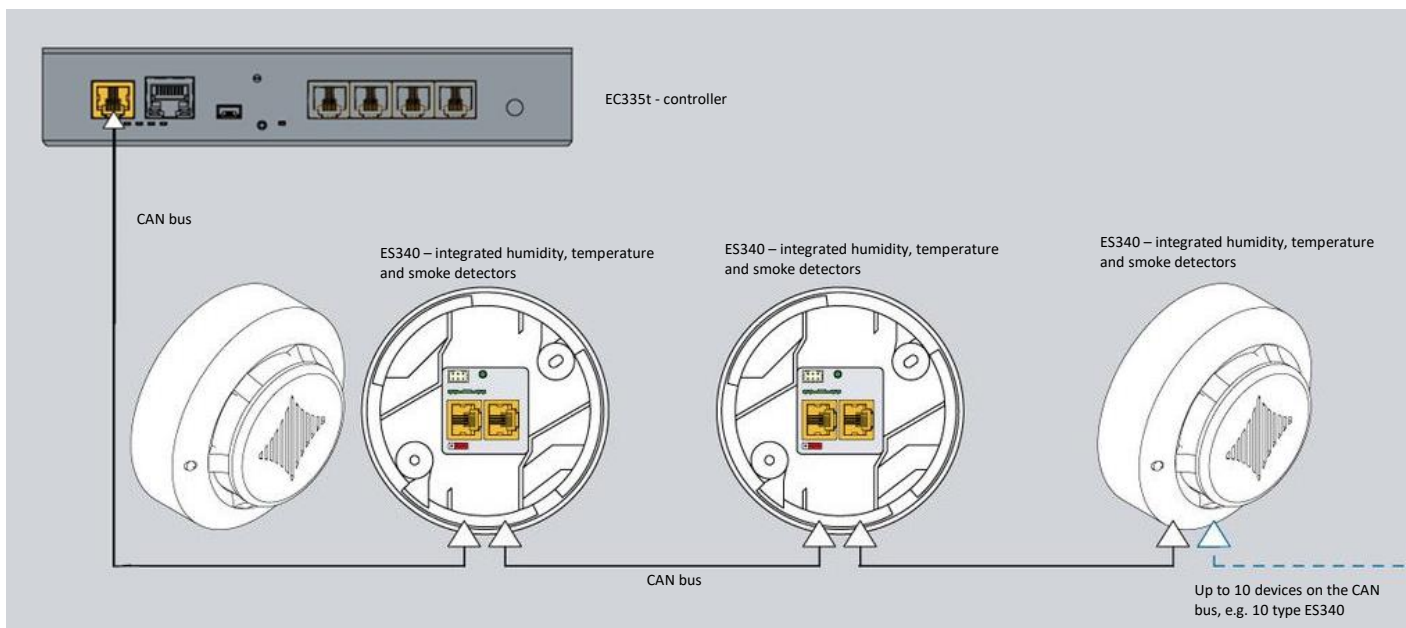


For CAN bus connections, use UTP cat5e cable terminated with RJ14 (6P4C) - RJ14 plugs (6P4C).

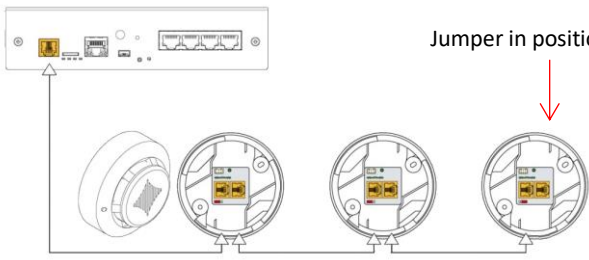

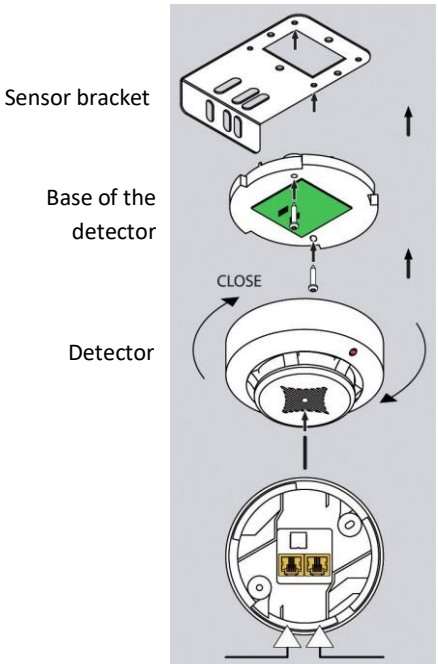
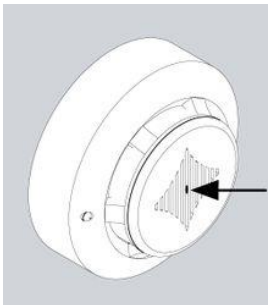
<p>TR-on, FR-off TR-off, FR-off</p>	<p>The last (from the controller) device must have the bus terminator turned on. The other devices must have the terminator turned off. The TR switch (activating the terminator) in the on and off position is shown in the drawing on the left.</p> <p>The FR switch is for service and must always be in the off position during normal operation.</p>
<p>RUN ● ERROR</p>	<p>The EE322 module has one LED indicating the status:</p> <p>LED off - the EE322 module is not connected to the controller</p> <p>Lights up in red - the EE322 module is connected to the EC335t controller but is not configured correctly in the controller</p> <p>Lights up green - the EE322 module is connected to the EC335t controller and is correctly configured in the controller</p>

4.5 Installation of ES340 sensor – smoke, humidity, temperature

ES340 is a detector with three sensors integrated in one housing: optical smoke, temperature and humidity. The sensor is connected to the CAN bus connector on the EC335t controller.



<p>JUMPER</p> <p>1 </p> <p>2 </p>	<p>The devices should be connected in a cascade (from the EC335t controller to the next ES340 sensor, etc.). The CAN socket number does not matter, you can use any CAN1 or CAN2. The maximum length of the CAN bus can be 200m.</p> <p>In the ES340 sensor, place the jumper in the appropriate position:</p> <p>1 – CAN bus terminator disabled</p> <p>2 – CAN bus terminator enabled. Only the last device on the CAN bus should have a jumper in position 2.</p>
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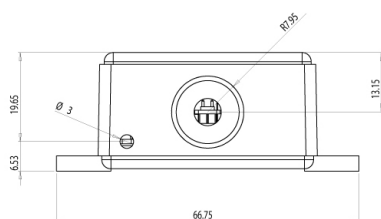
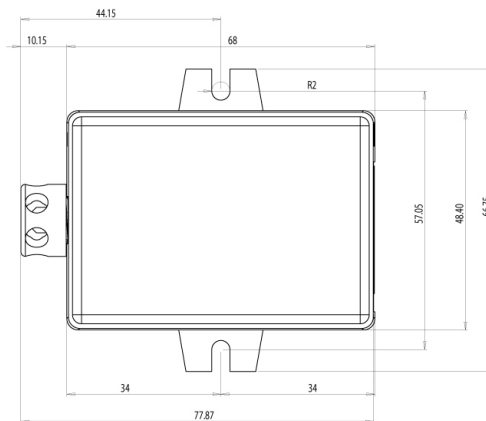
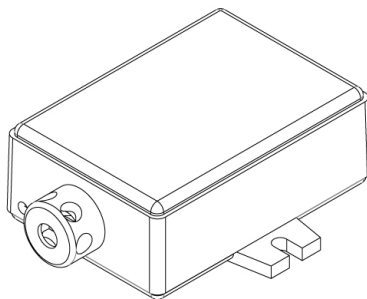
 <p style="text-align: center;">Jumper in position 2</p>	
	<p>For CAN bus connections, use UTP cat5e cable terminated with RJ14 (6P4C) - RJ14 plugs (6P4C).</p>
	<p>The detector should be mounted in a horizontal position - with CAN connectors facing up.</p> <p>For mounting in the cabinet, you can use the attached bracket to which the detector base should be screwed, and then place the detector in it and lock it by a small rotation.</p> <p>To avoid false alarms, the mounting location should be chosen accordingly: - away from ventilation openings, dusty places, smoky areas, etc.</p>
	<p>It is possible to test the operation of the optical smoke sensor by inserting, for example, an office paper clip into the hole shown in the picture. The detector should react by permanently lighting the LED. It is an alarm condition of the detector and to turn it off, disconnect the detector for a moment from the power supply or perform a reset via the web interface of the controller.</p>

4.6 Installation of ES341 sensor – pressure, humidity, temperature

The ES341 is a detector with three sensors integrated in one housing: pressure, temperature and humidity. The detector is connected to the CAN bus connector on the EC335t controller.

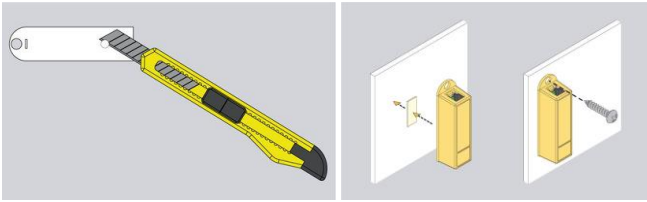
	<ol style="list-style-type: none"> The ES341 sensor has one LED to indicate the status: LED off – the sensor is not connected to the controller Solid red light – The sensor is connected to the EC335t controller, but not properly configured in the controller Solid green light – The sensor is connected to the EC335t controller and is properly configured in the controller Sensor. Bus terminator. Only the last device on the CAN bus should have the jumper in the ON position. CAN bus connectors.
	<p>For CAN bus connections, use the original 4-core cable or UTP cat5e terminated with RJ14 (6P4C) -RJ14 (6P4C) plugs.</p>

Dimensions of the ES341 sensor



4.7 Installation of analogue sensors

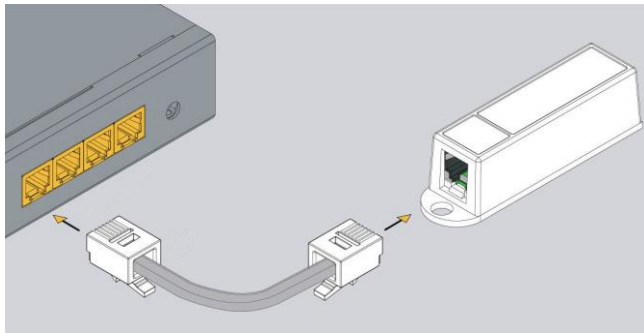
Installation



The assembly of most analogue sensors is uncomplicated and consists in mounting the sensor in the selected location. You can use the hole in the sensor housing with a diameter of 5.5mm or an adhesive double-sided tape.

For mounting in IT cabinets, use a cage nuts and bolts with M4 or M5 size.

Connection



Analog sensors should be connected to the analogue inputs of the controller or inputs of the EE321t extension module. Use the cable supplied with the sensor or cable:

Supplied cable or UTP cat5e with RJ14 (6P4C) -RJ14 (6P4C) connectors

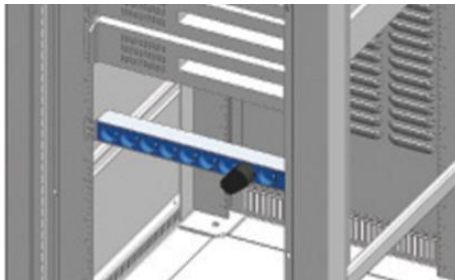


For the ES363 sensor, use supplied cable or UTP cat5e cable with RJ12 (6P6C) -RJ12 (6P6C) connectors



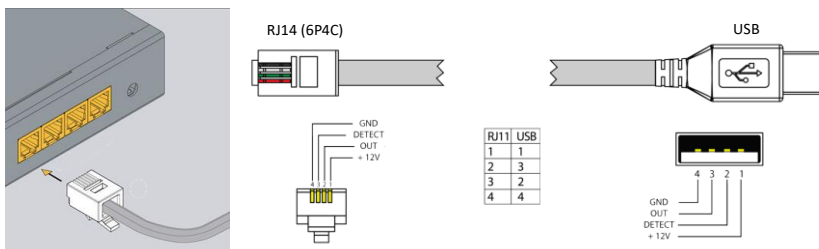
4.7.1 ES352 - 230VAC voltage sensor

Installation



The ES352 sensor should be placed in a socket, e.g., in a power strip.

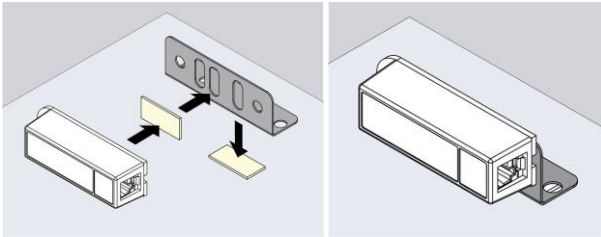
Connection



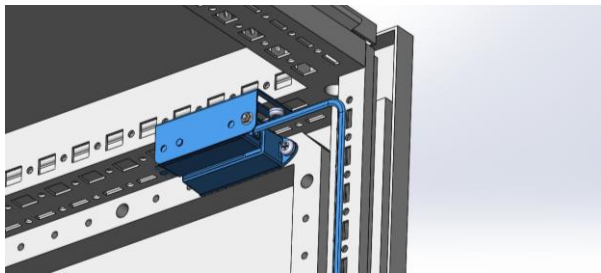
To connect with the controller, use the supplied cable, which can be extended to a maximum of 100m. The sensor should be connected to one of the analogue inputs of the controller or the EE321t extension module.

4.7.2 ES353 – door sensor

Installation

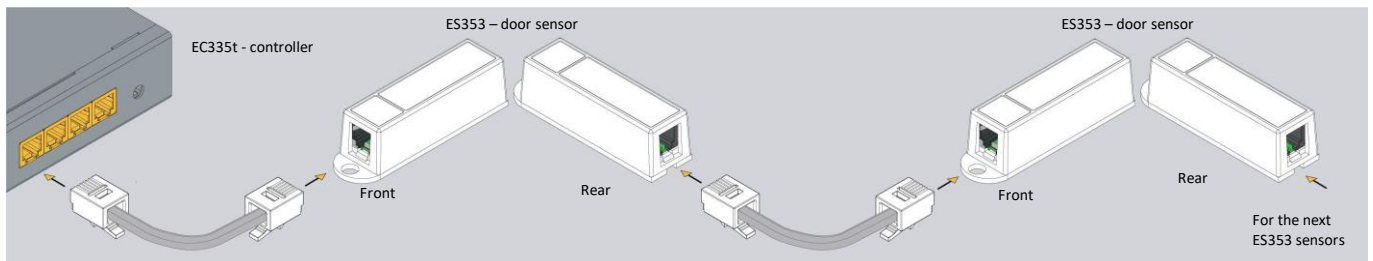


The ES353 door sensor additionally has a metal bracket that allows the sensor to be mounted in a different plane from the magnet, if necessary.



The bracket should be used when mounting the sensor in an IT cabinet. The assembly method is shown in the figure beside. If the magnet cannot be screwed to the door leaf, stick it using double-sided tape.

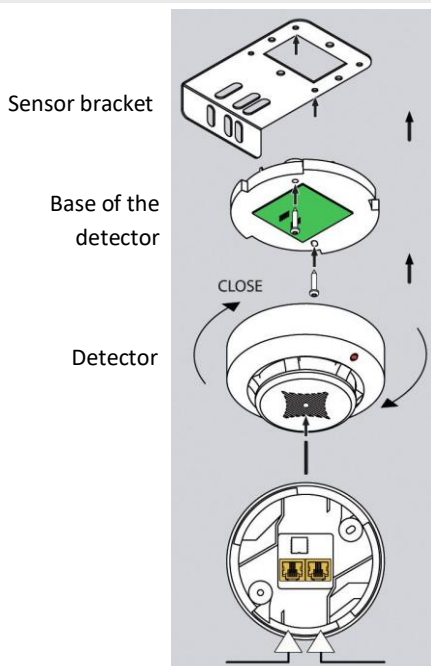
Connection



Sensors ES353 - door sensor, ES354 - vibration sensor, ES356 - a smoke detector can be connected in a cascade, that is, from the sensor to the sensor. Up to 10 sensors can be placed in one cascade. The entire cascade occupies only one analogue port in the controller, but the controller is then unable to distinguish the sensors in the cascade and determine from which of them an alarm was generated.

4.7.3 ES356 – smoke sensor

Installation

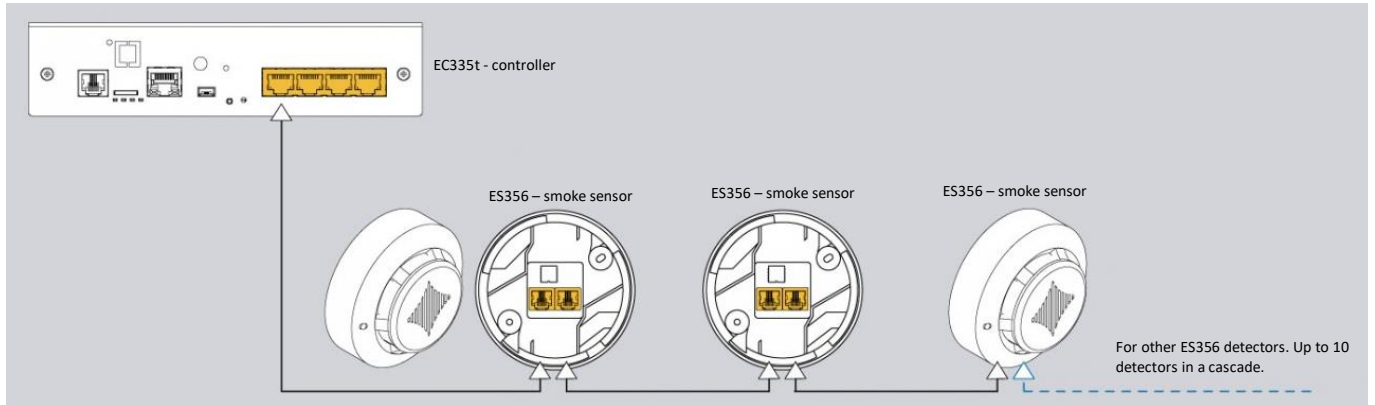


The detector should be mounted in a horizontal position - with RJ12 connectors facing up.

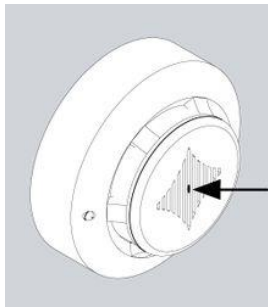
For mounting in the cabinet, you can use the attached bracket to which the detector base should be screwed, and then place the detector in it and lock it by a small rotation.

To avoid false alarms, the mounting location should be chosen accordingly: - away from ventilation openings, dusty places, smoky areas, etc.

Connection



The ES356 smoke detectors can be connected in a cascade, from the detector to the detector. Up to 10 detectors can be placed in one cascade. The entire cascade occupies only one analogue port in the controller, but the controller is then unable to distinguish the sensors in the cascade and determine from which of them an alarm was generated.



It is possible to test the operation of the optical smoke sensor by inserting, for example, an office paper clip into the hole shown in the picture. The detector should react by permanently lighting the LED. It is an alarm condition of the detector and to turn it off, disconnect the detector for a moment from the power supply or perform a reset via the web interface of the controller. Reset via the web interface disconnects power from all analogue sensors, which may result in additional alarms being generated during this time.

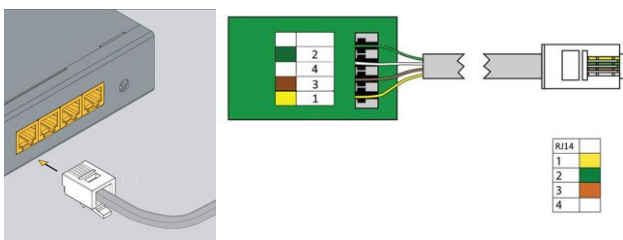
4.7.4 ES357 – PIR sensor

Installation



The detector should be mounted to the wall at a height of about 2.2 m using the attached adjustable handle. Do not install the detector in the vicinity of heat or cold sources, or in direct sunlight, which may cause false alarms.

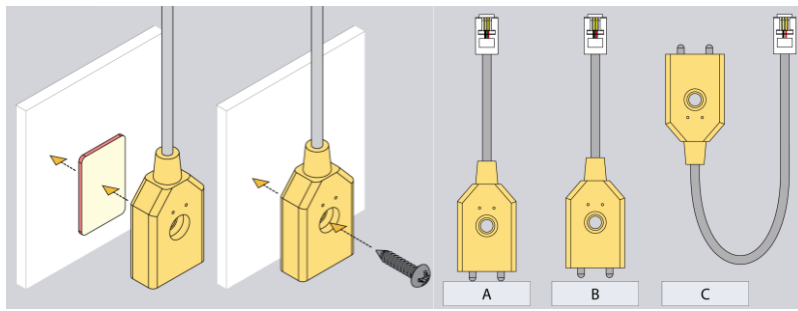
Connection



The ES357 detector has a cable permanently connected to the detector, which should be connected to the analogue input of the controller. This cable can be extended to a maximum of 50m.

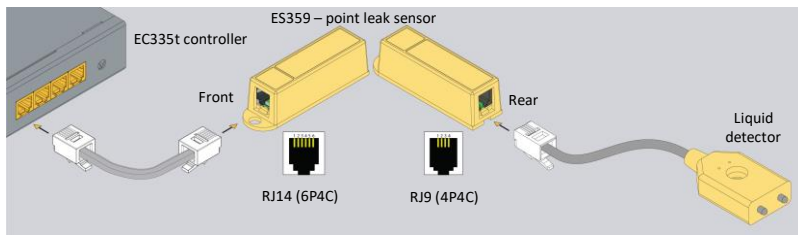
4.7.5 ES359 – point leak sensor

Installation



The ES359 liquid detector should be mounted so that its metal probes are short-circuited by the liquid during a leak. If the surface is not conductive, the probes can touch the surface (Figure A). Otherwise, the detector must be mounted so that its probes are slightly above the surface (Figure B). To check the liquid level in the container, place a detector as in Figure C. The detector can be glued to the surface with double-sided tape or screwed on.

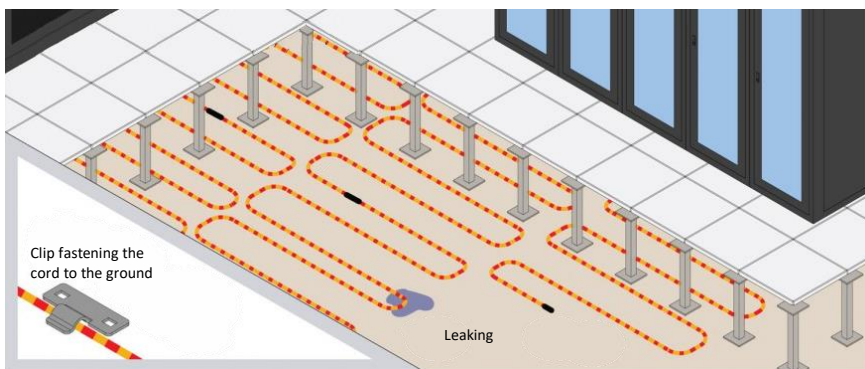
Connection



The sensor (its RJ14 connector) should be connected to the analogue input of the controller. This cable can be extended to a maximum of 100m. Connect a liquid detector to the sensor (its RJ9 connector).

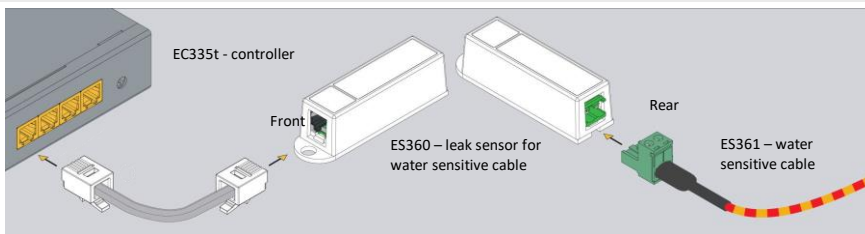
4.7.6 ES360 + ES368 - linear leak sensor

Installation



The ES368 water detection cable should be placed on the monitored surface, e.g. under the technical raised floor of the server room. The cable can be distributed evenly over the whole surface of the floor or only in sensitive parts, e.g. under air conditioning modules. Use non-metallic fastening brackets to fasten the cable. You can use the attached plastic handles. Together with the cable, 1 holder is provided for every 2 m of cable. The conduit is even sensitive to condensed air when the air humidity is high and the temperature is around the dew point. This situation can cause false flood alarms.

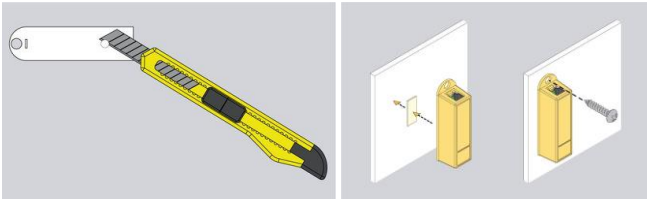
Connection



For the ES360 sensor (flood sensor for the water sensitive cable), connect the ES368 water sensitive cable using the terminal block provided.

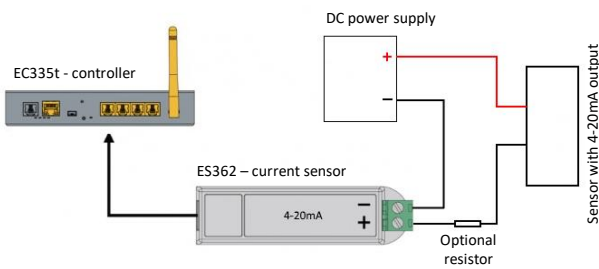
4.7.7 ES362 - 4-20mA current sensor

Installation



The sensor can be installed using a hole in its housing with a diameter of 5.5mm or use a double-sided adhesive tape.
For mounting in IT cabinets, use a cage nuts and bolts with M4 or M5 size.

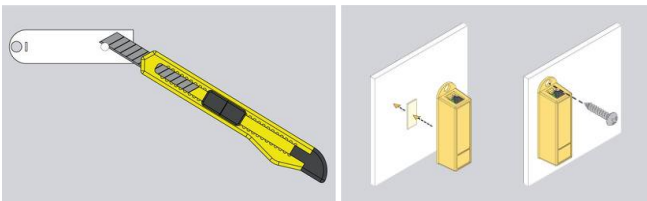
Connection



The ES362 sensor should be connected to one of the analogue inputs of the controller using the supplied cable. A circuit in which the current from the 4-20 mA range will be monitored should be connected to the sensor's connector terminal, paying attention to the correct polarity. Use a 1mm² wire.
ES362 input voltage: 5V
ES362 maximum input current: 24mA

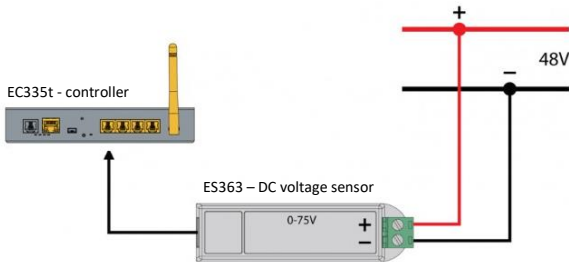
4.7.8 ES363 - 0-75VDC voltage sensor

Installation



The sensor can be installed using a hole in its housing with a diameter of 5.5mm or use a double-sided adhesive tape.
For mounting in IT cabinets, use a cage nuts and bolts with M4 or M5 size.

Connection

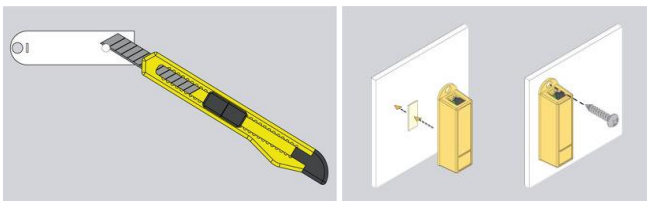


The ES363 sensor should be connected to one of the analogue inputs of the controller using the supplied wire or wire terminated with RJ12 (6P6C) -RJ12 (6P6C) plugs with a maximum length of 50m.
A monitored voltage should be connected to the sensor's connector terminal, observing the correct polarity. Use a 1mm² wire.

4.8 Installation of accessories

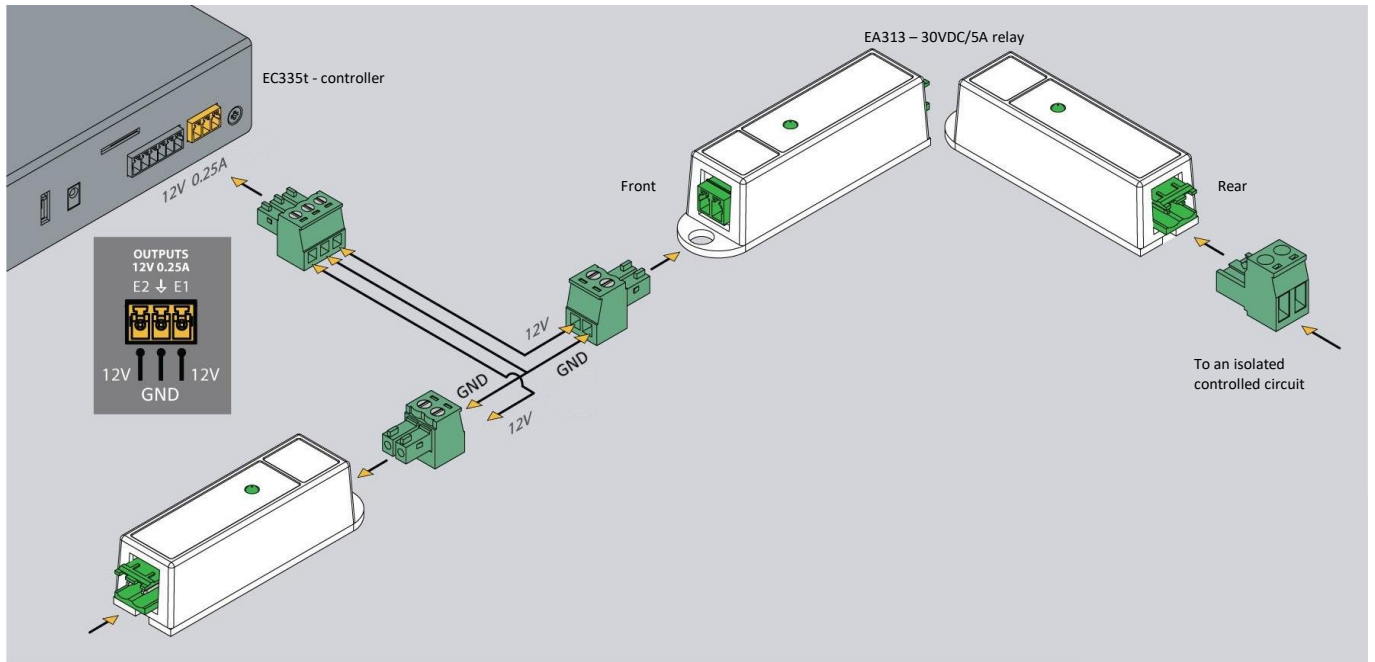
4.8.1 EA313 - 30V/5A relay

Installation

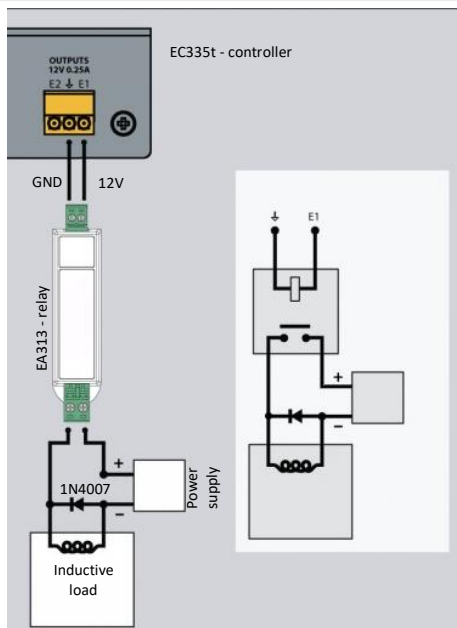


The installation of the relay is similar to the installation of analogue sensors in the same housing. You can use the hole in the sensor housing with a diameter of 5.5mm or adhesive double-sided tape.
For mounting in IT cabinets, use a cage nuts and bolts with M4 or M5 size.

Connection



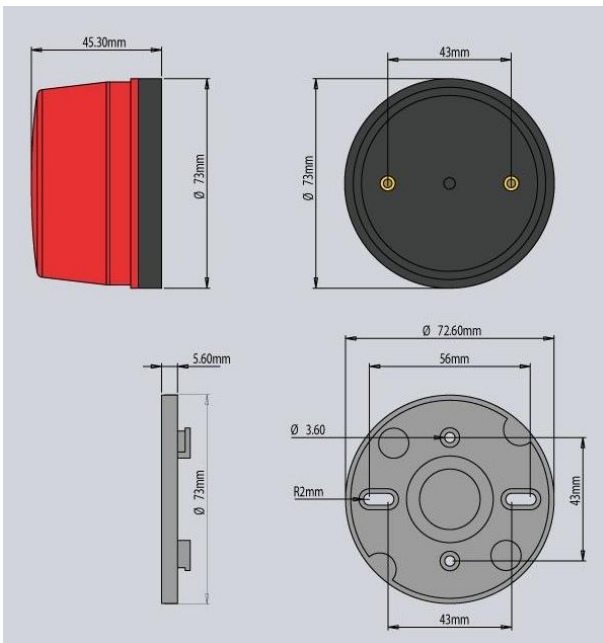
The EA313 relay is used to isolate the EC335t controller output circuit from the circuit of the controlled device. To connect between the controller and EA313, use a wire with a cross-section of 1mm². The cable should not be longer than 100m



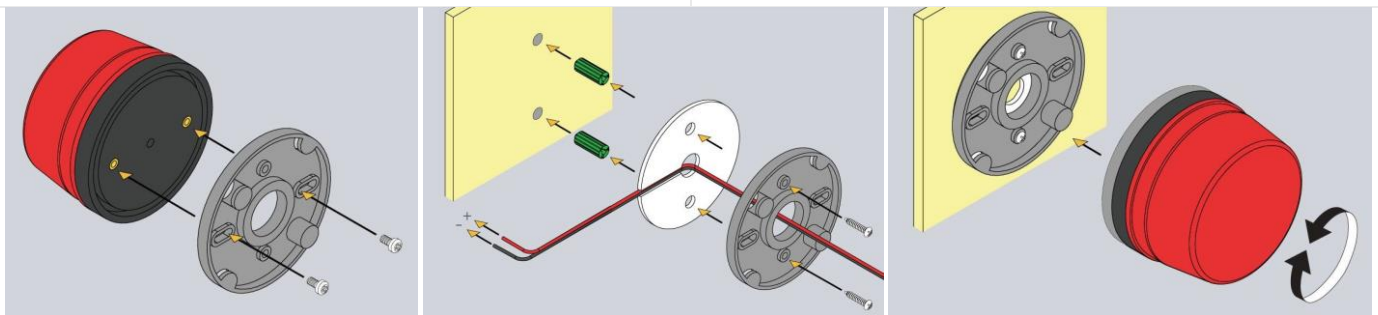
In the case of controlling an inductive load (e.g. an electromagnetic lock of the door), a diode connected in parallel with the load should be used. It protects the contacts of the relay against overvoltage.

4.8.2 EA315 - light signal

Installation

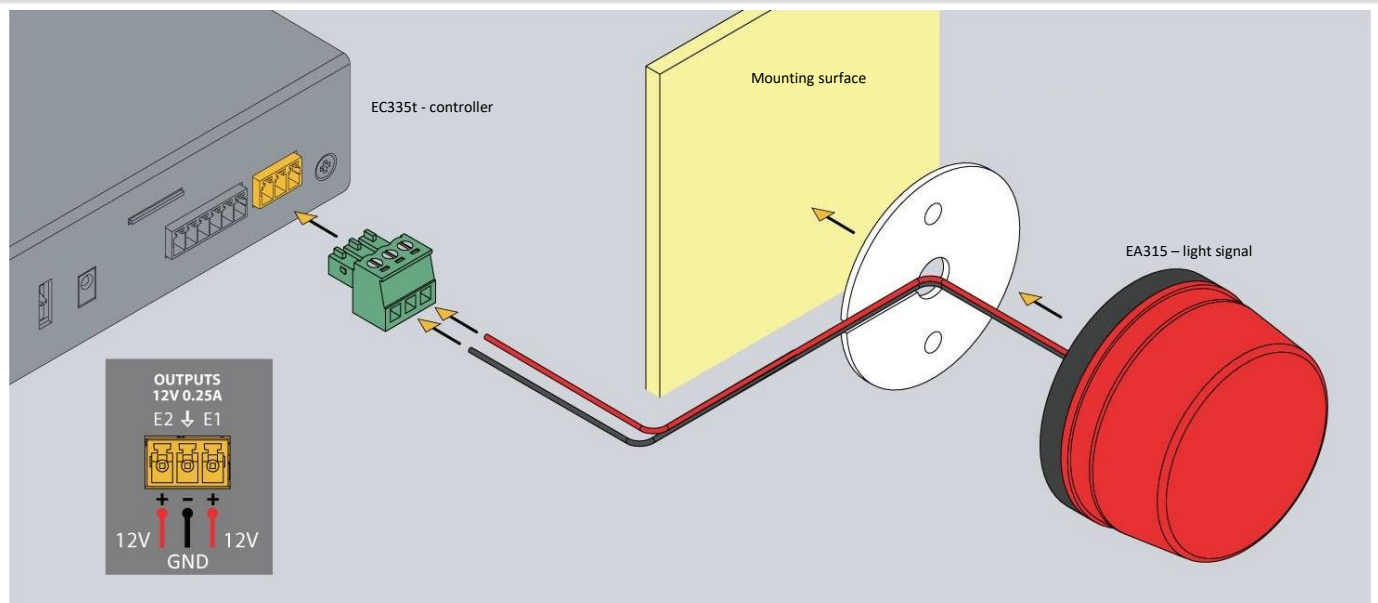


The dimensions of the device are shown in the figure on the left.



The method of mounting the device is shown in the above drawings.

Connection



The light signal should be connected to one of the controller voltage outputs. Use the attached wire or cable with a cross-section of 1mm². The maximum length of the connecting cable should not exceed 100m.

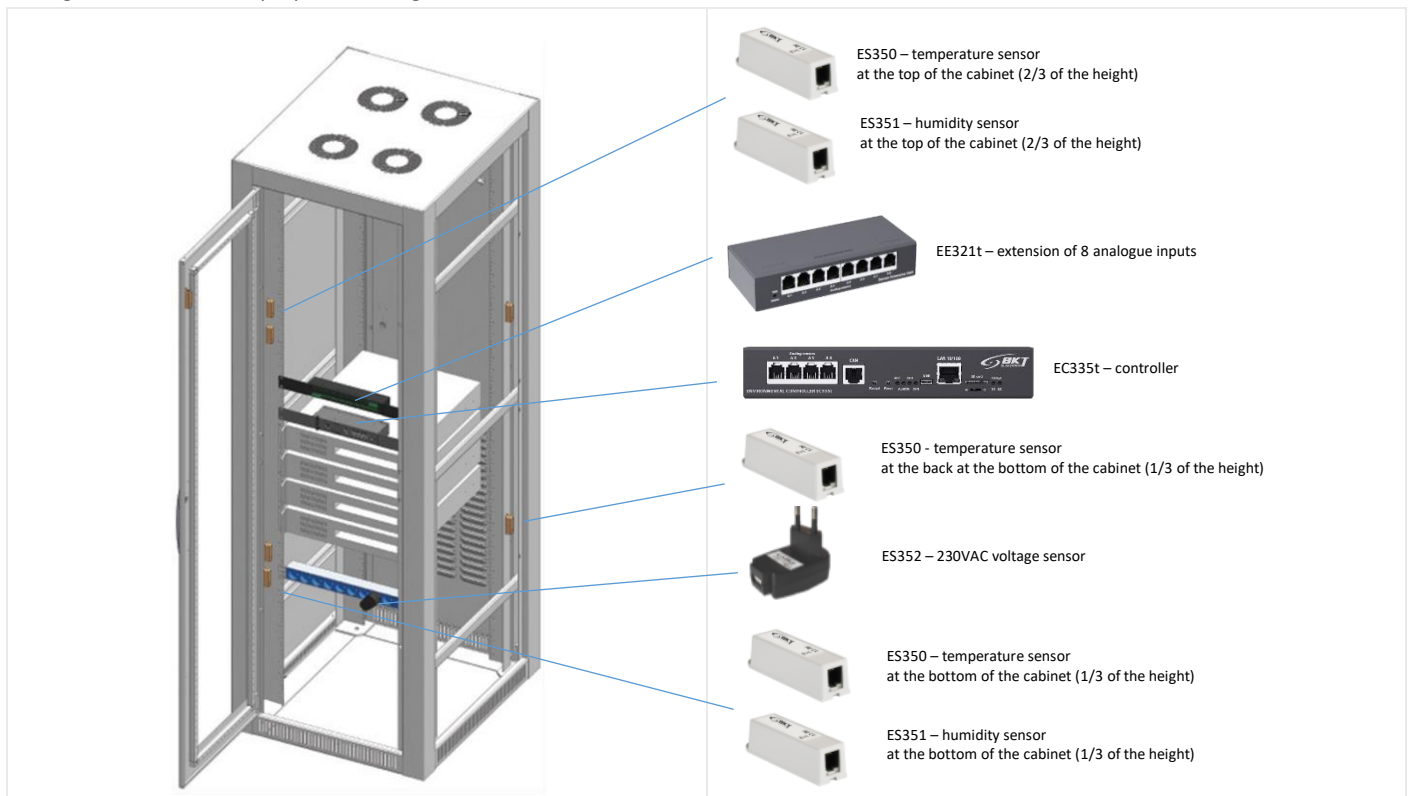
4.9 An example of placing devices in the cabinet

The number and type of sensors in the cabinet should be selected depending on the parameters to be monitored and the conditions in which the devices in the cabinet operate. For example, if a rack is completely filled with high-power appliances or there is no forced ventilation, two or more temperature sensors may be appropriate. In server racks, sensors installed at the front of the rack will measure the temperature of the air entering the rack, and sensors at the back will measure the air leaving the rack. The temperature measurement on the back of the rack may be corrupted if the temperature sensor is installed directly in front of the active device fan.

Proposed arrangement of temperature sensors in the cabinet

Number of temperature sensors	Cabinet installation location
1	At the front, half the height of the cabinet
2	At the front and back of the cabinet halfway up
4	Two at the front and two at the rear of the cabinet at 1/3 and 2/3 of its height

The figure below shows a proposed arrangement of devices in the cabinet













Sensor cables should be neatly routed along the cabinet frame and fastened with cable ties.

5 CONFIGURATION
















The configuration information provided is related to firmware version 7.0.1 b134. Devices with a different version of the firmware may have a user interface that is slightly different from the one described here.

5.1 Horizontal menu



	Show and hide the vertical menu.
	Run the initial configuration wizard.
	Add a new element. This function is available only on certain screens selected from the vertical menu.
	Refresh the view.
	Additional settings. This function is available only on certain screens selected from the vertical menu.
	Creates desktop templates. The function is available only after selecting <i>Dashboard</i> from the vertical menu.
	Reset the smoke sensors. This function is available only after selecting 'Reset the smoke sensors' from the vertical menu.
	Write the configuration to non-volatile memory of the module. Any configuration changes must be written to non-volatile memory, if they need to be kept after resetting the device.
	Log out.

5.2 Vertical menu

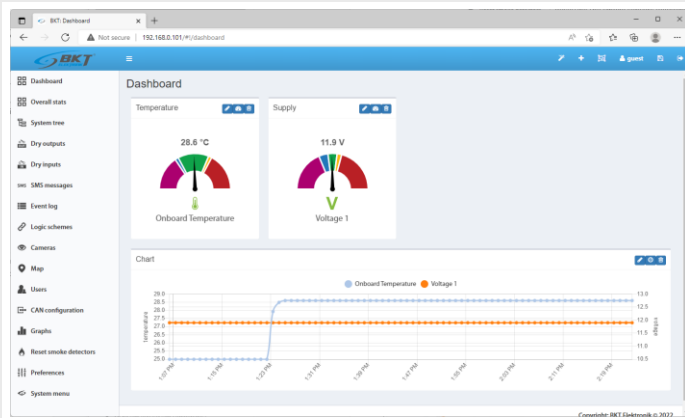
 Dashboard	Customizable dashboard.
 Overall stats	General view of the system status.
 System tree	View of all system components, incl. sensor values.
 Dry outputs	View of the relay outputs status (not available in EC335t).
 Dry inputs	View of the potential-free contact status.
SMS SMS messages	Text message settings (available only if modem is installed)
 Event log	View of the system event history.
 Logic schemes	Creating relations between the sensors and potential alarms.
 Cameras	Camera image preview.
 Map	View of sensor parameters against the room layout.
 Users	User management.
 CAN configuration	Configuration of extension modules.
 Graphs	Displaying sensor values on charts.
 Reset smoke detectors	Resetting the smoke sensors following an alarm.
 Preferences	System settings.
 System menu	Firmware update and data export.

5.3 Saving settings into non-volatile memory



All new setting must be saved into FLASH non-volatile memory. Otherwise, they will only be valid until the next reboot.

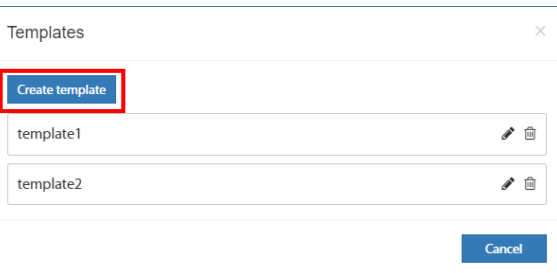
5.4 Dashboard



Selecting the *Dashboard* from the vertical menu allows you to view the previously configured views of the system. Each user can set their own desktop.



The administrator (user with the full access to the system) can additionally define templates that will be available to other users.



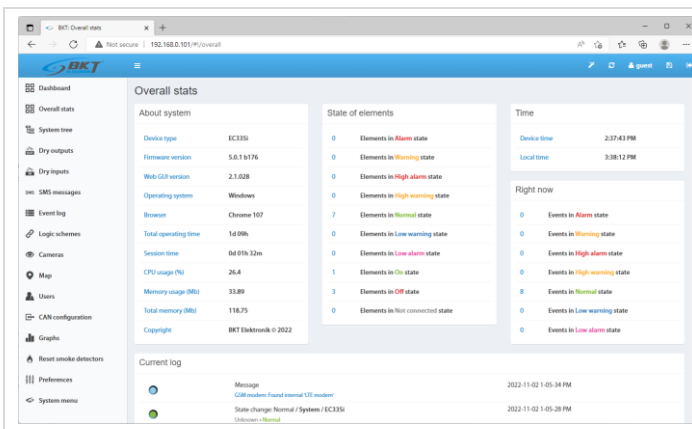
- manage templates

- add element to the template

- save template

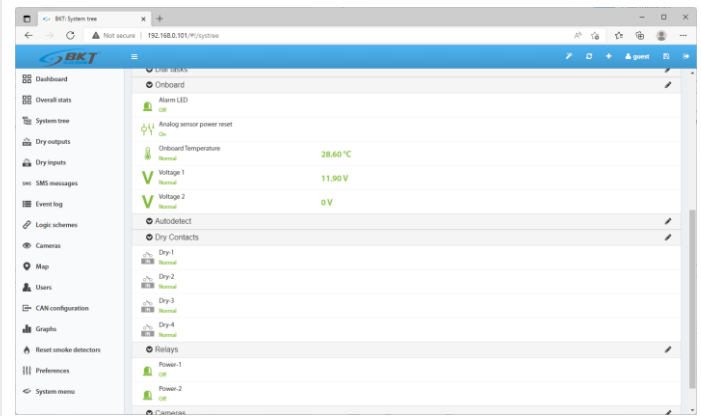
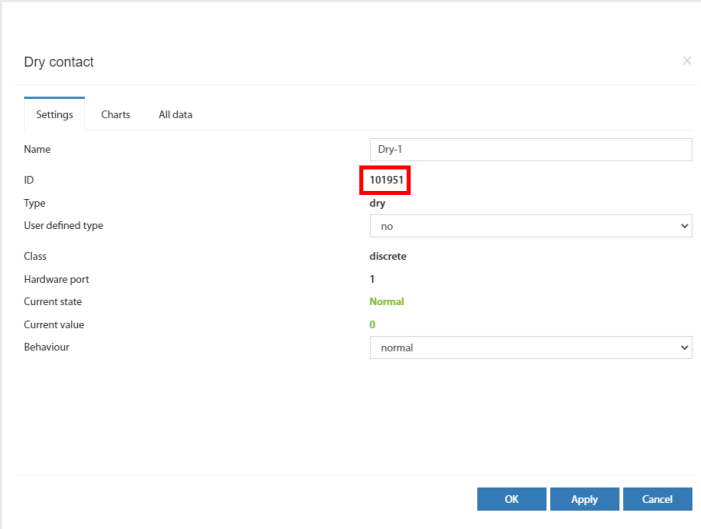
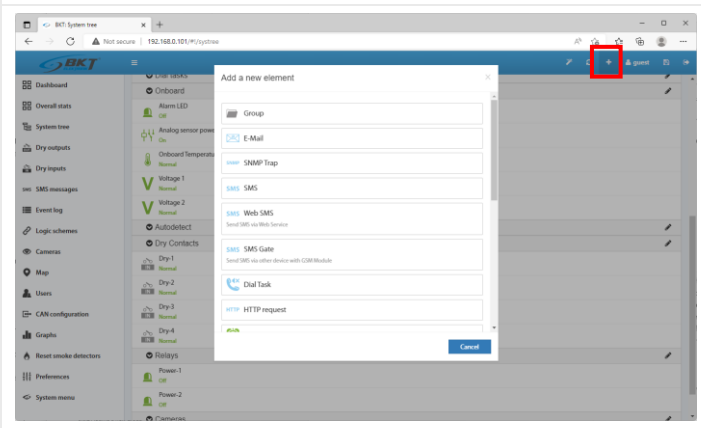
- end template editing





















5.5 General statistics



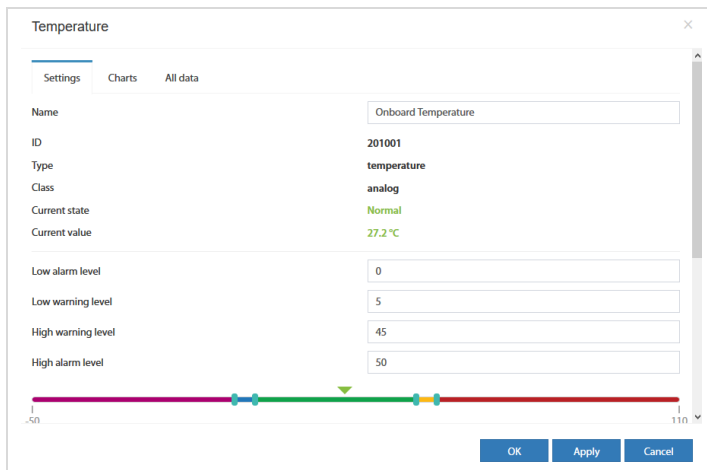
Select *Overall Stats* from the vertical menu to display basic data on the system status.

5.6 System tree (system components)

	<p>Select <i>System tree</i> from the vertical menu to display all system components. On this page, you can add, remove and modify settings of individual components.</p>
	<p>Each element of the system has an individual 6-digit ID number. This number can be used when configuring email or text messages. The first 3 digits indicate the type of element, and the remaining three the consecutive number of element of such type:</p> <ul style="list-style-type: none"> 101xxx - input for potential-free contacts 201xxx - temperature sensor 202xxx - humidity sensor 203xxx - voltage sensor etc. <p>The item ID number can be read after clicking on the item in the system tree.</p>
	<p>In order to add a new component, click the '+' button in the horizontal menu.</p> <p>To maintain proper performance of the device, it is recommended to use max 200 components in the system.</p> <p>To maintain the settings after restarting the controller, write them to non-volatile memory.</p>

 Group	Add sensor groups
 E-Mail	Add email notification content
 SNMP Trap	Add SNMP Trap notifications
 SMS	Add SMS (text message) notifications
 Web SMS Send SMS via Web Service	- sent by the WEB gateway
 SMS Gate Send SMS via other device with GSM Module	- sent by a modem installed in another device
 Dial Task	Add dial notification
 HTTP request	Add REST notification
 Timer	Add schedule
 Trigger	Add triggers (flags)
 Ping	Add PING query
 SNMP Get (analog)	Add SNMP Get query for analogue value
 SNMP Get (discrete)	Add SNMP Get query for binary value
 Modbus RTU (reading)	Add Modbus RTU read query (not applicable)
 Modbus RTU (writing)	Add Modbus RTU write query (not applicable)
 Modbus TCP (reading)	Add Modbus TCP read query
 Modbus TCP (writing)	Add Modbus TCP write query
 Math sensor	Add mathematical sensor
 IP Camera	Add IP camera
 Dew point	Add virtual dew point sensor

5.6.1 Setting the sensor parameters



Analog sensors are automatically recognized by the controller shortly after they are connected to the appropriate ports and then they are displayed in the system tree. In order for the sensors connected to the CAN bus to be visible in the system tree, the procedure 5.14 CAN configuration (extension module) must be carried out beforehand.

After clicking on the sensor symbol in the system tree a window will pop up, where you can configure the basic parameters of the sensor.

Field	Description
Name	Name of the element in the system
Low alarm level	Threshold for low value alarm
Low warning level	Threshold for low value warning
High warning level	Threshold for high value warning
High alarm level	Threshold for high value alarm
Hysteresis type	Disabled – hysteresis and delay deactivated. The alarm will be generated immediately after exceeding the threshold value Value – hysteresis is on. The alarm will be generated immediately after exceeding the value = threshold value ± hysteresis value. Time – alarm delay is on. The alarm will be generated with a defined delay after exceeding the threshold value. The alarm will not be generated if the measured value falls below the alarm threshold within the specified delay.
Value	The hysteresis value in the unit of a given sensor
Low alarm	Delay time in seconds before low state alarm signalling
Low warning	Delay time in seconds before the low state warning signalling
Normal	Delay time in seconds before the normal state signalling
High warning	Delay time in seconds before the high state warning signalling
High alarm	Delay time in seconds before the high state alarm signalling
Formula type	Select the method of correction of the value read from the sensor. Linear – correction by linear function „ $y=kx+b$ ” Simple – offset correction with value „ b ”
K z ($k*x + b$)	The k value of the function $y = kx + b$ that allows to recalculate the value read from the sensor before comparing it with the threshold values
B z ($k*x + b$)	The b value of the function $y = kx + b$ that allows to recalculate the value read from the sensor before comparing it with the threshold values

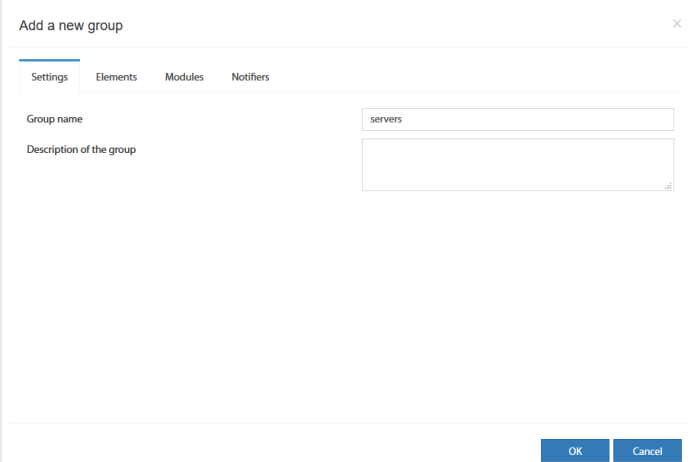


After clicking on the *Charts* tab, the graphs of the measurement values from the last 100 seconds (reading every 1s), 100 minutes (reading every 1 minute), 100 hours (reading every 1h) and 100 days (reading every 1 day) are available.

It is possible to export this data to xml or csv files.

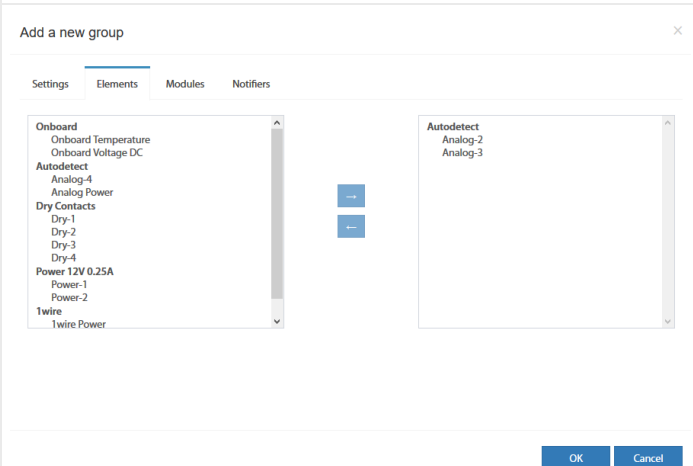
5.6.2 Adding a new group

To add a new element, select **System tree**  from the vertical menu, and then click on  in the horizontal menu.



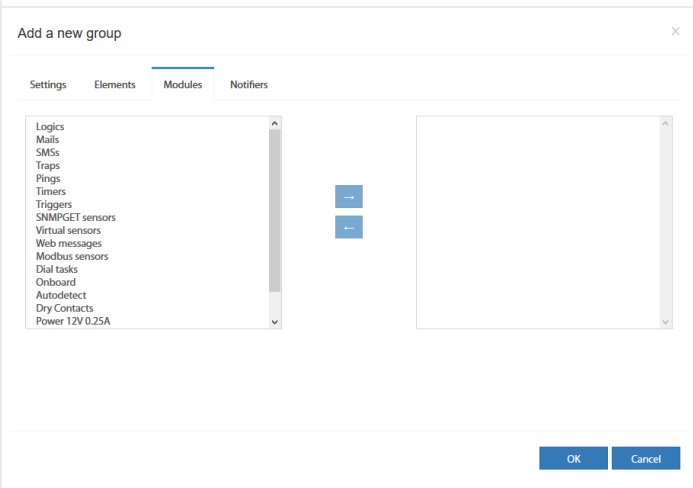
The screenshot shows the 'Add a new group' dialog box with the 'Settings' tab selected. It contains two input fields: 'Group name' with the text 'servers' and 'Description of the group' which is empty. At the bottom right, there are 'OK' and 'Cancel' buttons.

By default, there is one group of devices in the system (system group). Additional groups divide the system into parts. It is then possible to assign individual elements (sensors) to the appropriate groups. You can give the user permission to manage a specific group. It is also possible to set individual email or text messages for individual groups. In the *Settings* tab, enter the unique name of the created group.



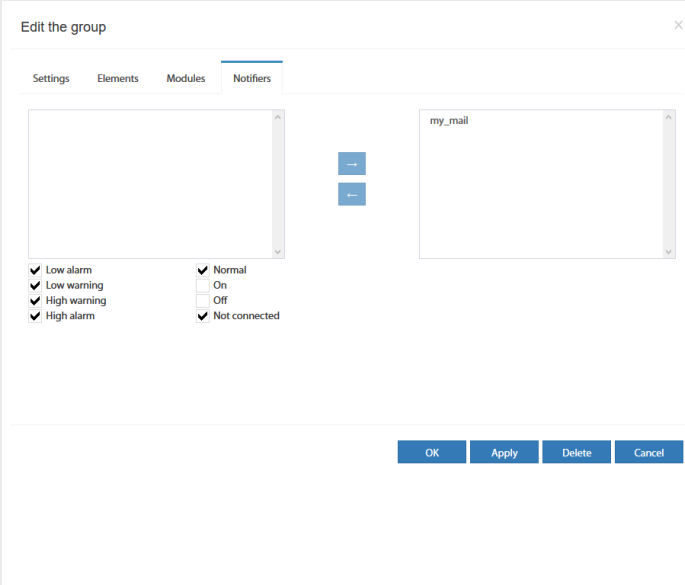
The screenshot shows the 'Add a new group' dialog box with the 'Elements' tab selected. It features two scrollable lists of system elements. The left list includes: Onboard (Onboard Temperature, Onboard Voltage DC), Autodetect (Analog-4, Analog Power), Dry Contacts (Dry-1, Dry-2, Dry-3, Dry-4), Power 12V 0.25A (Power-1, Power-2), and Twire (Twire Power). The right list includes: Autodetect (Analog-2, Analog-3). Between the lists are two blue arrow buttons pointing in opposite directions. 'OK' and 'Cancel' buttons are at the bottom right.

In the *Elements* tab, select individual system elements (sensors) that will belong to the given group.



The screenshot shows the 'Add a new group' dialog box with the 'Modules' tab selected. It features two scrollable lists. The left list includes: Logics, Mails, SMSs, Traps, Pings, Timers, Triggers, SNMPGET sensors, Virtual sensors, Web messages, Modbus sensors, Dial tasks, Onboard, Autodetect, Dry Contacts, and Power 12V 0.25A. The right list is currently empty. Between the lists are two blue arrow buttons pointing in opposite directions. 'OK' and 'Cancel' buttons are at the bottom right.

In the *Modules* tab it is possible to add to the group entire modules present in the system tree. It is recommended to add individual elements (sensors) to a group rather than entire modules, as notifications are then more precise. They apply to a single sensor, not the entire module.



In the *Notifications* tab, you can choose how to notify about any alarm conditions of any sensor in a given group.

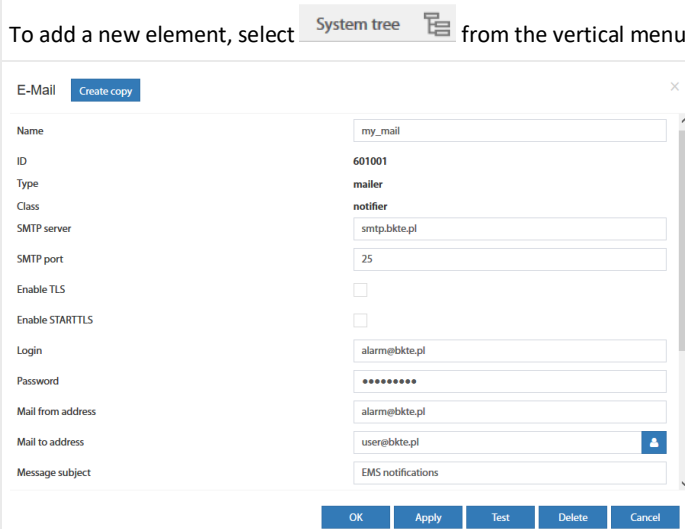
You must configure e-mail, sms or snmp trap notifications to make them visible in this window (see chapter 5.6.3 *Adding an email notification* and 5.6.5 *Adding an SMS notification*).

Using tickboxes, you can choose in which emergency situations you want to send a notification.

Low alarm	Exceeding the low alarm threshold
Low warning	Exceeding the low warning threshold
High warning	Exceeding the high warning threshold
High alarm / Alarm	Exceeding the high alarm threshold or alarm (for sensors without alarm thresholds)
Normal	Normal state of element
On	Element on (e.g. Power output)
Off	Element off (e.g. Power output)
Not connected	Element disconnected from controller

5.6.3 Adding an email notification

To add a new element, select **System tree** from the vertical menu, and then click on **+** in the horizontal menu.



The system allows you to configure notifications that will be used to inform about alarm situations.

Each notification contains a configuration of the e-mail account and the content of the message. In order not to have to enter them each time, you can set the default mail settings (see chapter 5.17.13 SMTP settings).

In order for the notification to be sent during an alarm, it should be placed in a logic scheme diagram (see chapter 5.10 Logical schemes) or in a group notification (see chapter 5.6.2 Adding a new group).

Configuration of email notification

Field	Description
Name	The name of the notification. The system can have many different notifications. It is to facilitate their recognition.
SMTP server	The name or IP number of the SMTP mail server
SMTP port	Communication port of the mail server
Enable TLS	Use an encrypted connection
Enable STARTTLS	Start with an unencrypted connection and negotiate encryption
Login	The username of the e-mail account
Password	The password of the user of the e-mail account
Mail from address	The Email address of user
Mail to address	Email addresses of recipients. Up to 10 addresses to be separated by semicolon ";"
Message subject	Subject of email
Message text	The content of the email. The text of the message is limited to 1024 characters. The content may contain variables that will be inserted dynamically when the notification is activated. Dynamic variables:
%1	Definition of logic scheme (see chapter 5.10 Logical schemes) or name of the group generating the notification (see chapter 5.6.2 Adding a new group).

%2	The status of system elements that have been entered as a condition of the logic scheme or state of the element in the element group which generated notification.
%3	Date and time of the event
%4	The name of the logical scheme or name of the group generating the notification
%5{id}	Sensor name with id or %8
%6{id}	Sensor status with id or %8
%7{id}	The value read from the sensor with id or %8
%8	The identifier of the sensor that generated the notification
\n	New line character

Examples of the dynamic content of an email notification message

Notification with information about the activated logic diagram, and the state of the system elements that were entered as the conditions of the logic scheme.

The content of the email notification configured	The content of the sent email
Logic activated:\n%4\nSystem element status:\n%2	Logic activated:\n'Warning state'\nSystem element status:\n'Onboard Temperature' (id=201001) in state 'normal'\n'EC335t' (id=100) in state 'warning'

Notification with information on the status of selected sensors:

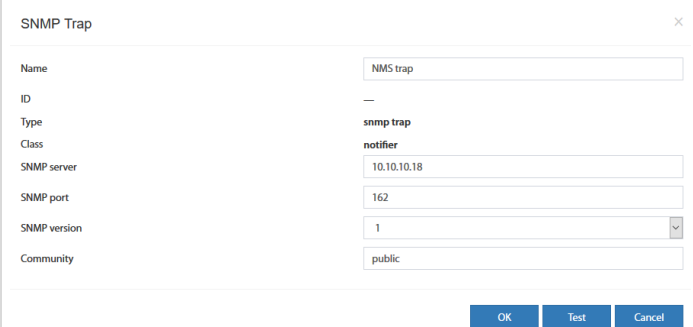
The content of the email notification configured	The content of the sent email
Status of system sensors:\n%5{201002} - %7{201002} - %6{201002}\n%5{201003} - %7{201003} - %6{201003}\n%5{202001} - %7{202001} - %6{202001}\n	Status of system sensors:\n'Temperature in cabinet 1' - '18,2°C' - 'normal'\n'Temperature in cabinet 2' - '17,1°C' - 'low warning'\n'Humidity' - '42%' - 'normal'

By default, a notification similar to the following is proposed in the notification:

The content of the email notification configured	The content of the sent email
Logic %4:\n--\nDefinition:\n%1\n\nCurrent sensor state:\n%2\n--\nSystem time: %3	Logic 'Warning state':\n--\nDefinition:\nif\n 'Onboard Temperature' (id=201001) in state 'high warning'\nor 'EC335t' (id=100) in state 'warning'\nthen\n 'email-service' (id=601001) changes to state 'on' immediately, once\n\nCurrent sensor state:\n'EC335t' (id=100) in state 'warning'\n--\nSystem time: 12:18:04 2020/11/25

5.6.4 Adding a trap notification

To add a new element, select **System tree**  from the vertical menu, and then click on  in the horizontal menu.



The dialog box shows the following configuration for an SNMP Trap:

- Name: NMS trap
- ID: --
- Type: snmp trap
- Class: notifier
- SNMP server: 10.10.10.18
- SNMP port: 162
- SNMP version: 1
- Community: public

Trap is an alarm message used in the SNMP protocol. Such a message can be sent to the master monitoring system.

In order for the notification to be sent during an alarm, it should be placed in a logic scheme diagram (see chapter 5.10 Logical schemes) or in a group notification (see chapter 5.6.2 Adding a new group).

Example Trap message

Source: 192.168.0.101
 Timestamp: 191 hours 30 minutes 1 second
 SNMP Version: 1
 Enterprise: .iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification
 Community: public
 Specific: 201999
 Generic: enterpriseSpecific
 Variable Bindings:

Name: 1.3.6.1.4.1.47394.2.2.1.1
 (.iso.org.dod.internet.private.enterprises.bkt.ctlNotifiers.ctlNotifiersTrapsTable.ctlNotifiersTrapsEntry.ctlNotifiersTrapId.602001)
Value: [Integer] 602001

Name: 1.3.6.1.4.1.47394.1.5 (.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification)
Value: [OctetString] Trap (name: trap, ID: 602001) was worked. Time: 14:30:00 2019/05/06 Logic: 'grupa-temp', Element: 'Analog-3';, in state: 'normal';, value: '21.40';

Name: 1.3.6.1.4.1.47394.1.5.1 (.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification.macroLogicDefinition)
Value: [OctetString] group 'grupa-temp' notification

Name: 1.3.6.1.4.1.47394.1.5.2 (.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification.macroStateOfSensors)
Value: [OctetString] 'Analog-3' (id=201999) in state 'normal';

Name: 1.3.6.1.4.1.47394.1.5.3 (.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification.macroDataAndTime)
Value: [OctetString] 14:30:00 2019/05/06

Name: 1.3.6.1.4.1.47394.1.5.4 (.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification.macroLogicName)
Value: [OctetString] grupa-temp

Name: 1.3.6.1.4.1.47394.1.5.5 (.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification.macroSensorName)
Value: [OctetString] Analog-3

Name: 1.3.6.1.4.1.47394.1.5.6 (.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification.macroSensorState)
Value: [OctetString] normal

Name: 1.3.6.1.4.1.47394.1.5.7 (.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification.macroSensorValue)
Value: [OctetString] 21.40

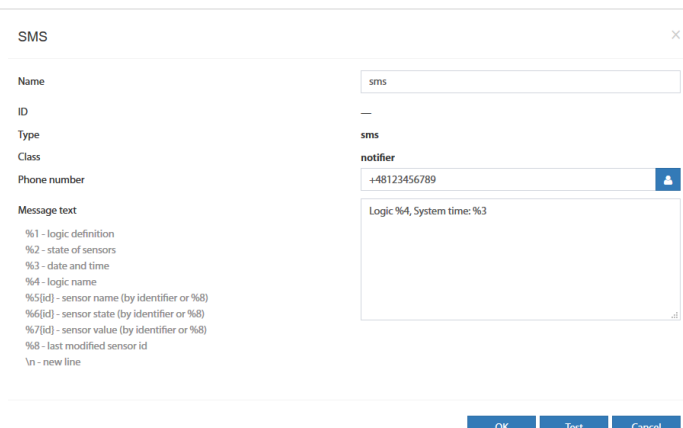
Name: 1.3.6.1.4.1.47394.1.5.8 (.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification.macroLastModifiedSensorID)
Value: [Integer] 201999

Name: 1.3.6.1.4.1.47394.1.5.20 (.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification.trapID)
Value: [Integer] 602001

Name: 1.3.6.1.4.1.47394.1.5.21(.iso.org.dod.internet.private.enterprises.bkt.ctlUnit.ctlUnitTrapNotification.trapName)
Value: [OctetString] trap

5.6.5 Adding an SMS notification

To add a new element, select **System tree** from the vertical menu, and then click on **+** in the horizontal menu.





If an optional GSM modem is installed in the controller, it is possible to send an SMS notification. After installing the modem, configure it, see chapter 5.8 GSM modem settings.

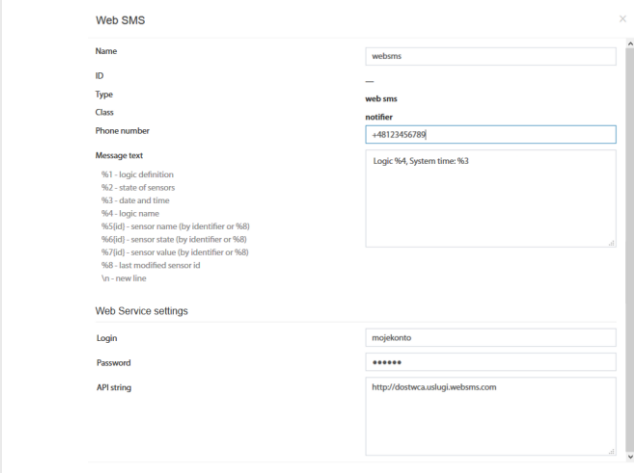
In order for the notification to be sent during an alarm, it should be placed in a logic scheme diagram (see chapter 5.10 Logical schemes) or in a group notification (see chapter 5.6.2 Adding a new group).

Configuration of SMS notification

Field	Description																		
Name	The name of the notification. The system can have many different notifications. It is to facilitate their recognition.																		
Phone number	Up to 10 numbers in one notification, which should be separated by semicolon ";" The numbers should be in the format + 48xxxxxxxx																		
Message text	The content of the text message. The content may contain variables that will be inserted dynamically when the notification is activated. Dynamic variables: <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td>%1</td> <td>Definition of logic scheme (see chapter 5.10 Logical schemes) or name of the group generating the notification (see chapter 5.6.2 Adding a new group).</td> </tr> <tr> <td>%2</td> <td>The status of system elements that have been entered as a condition of the logic scheme or state of the element in the element group which generated notification.</td> </tr> <tr> <td>%3</td> <td>Date and time of the event</td> </tr> <tr> <td>%4</td> <td>The name of the logical scheme or name of the group generating the notification</td> </tr> <tr> <td>%5{id}</td> <td>Sensor name with id or %8</td> </tr> <tr> <td>%6{id}</td> <td>Sensor status with id or %8</td> </tr> <tr> <td>%7{id}</td> <td>The value read from the sensor with id or %8</td> </tr> <tr> <td>%8</td> <td>The identifier of the sensor that generated the notification</td> </tr> <tr> <td>\n</td> <td>New line character</td> </tr> </table> Examples of the use of dynamic variables are similar to those used in email notifications. See chapter 5.6.3 <i>Adding an email notification</i> .	%1	Definition of logic scheme (see chapter 5.10 Logical schemes) or name of the group generating the notification (see chapter 5.6.2 Adding a new group).	%2	The status of system elements that have been entered as a condition of the logic scheme or state of the element in the element group which generated notification.	%3	Date and time of the event	%4	The name of the logical scheme or name of the group generating the notification	%5{id}	Sensor name with id or %8	%6{id}	Sensor status with id or %8	%7{id}	The value read from the sensor with id or %8	%8	The identifier of the sensor that generated the notification	\n	New line character
%1	Definition of logic scheme (see chapter 5.10 Logical schemes) or name of the group generating the notification (see chapter 5.6.2 Adding a new group).																		
%2	The status of system elements that have been entered as a condition of the logic scheme or state of the element in the element group which generated notification.																		
%3	Date and time of the event																		
%4	The name of the logical scheme or name of the group generating the notification																		
%5{id}	Sensor name with id or %8																		
%6{id}	Sensor status with id or %8																		
%7{id}	The value read from the sensor with id or %8																		
%8	The identifier of the sensor that generated the notification																		
\n	New line character																		

5.6.6 Adding WEB SMS notification

To add a new element, select **System tree**  from the vertical menu, and then click on  in the horizontal menu.



SMS notifications can also be sent via an SMS web gateway. A GSM modem is not required then. Get configuration data from your service provider.

Configuration of web sms notification

Field	Description												
Name	The name of the notification. The system can have many different notifications. It is to facilitate their recognition.												
Phone number	Up to 10 numbers in one notification, which should be separated by semicolon ";" The numbers should be in the format + 48xxxxxxxx												
Message text	See chapter 5.6.5 <i>Adding an SMS notification</i> .												
Login	The username of the web-> sms service												
Password	The user password of the web-> sms service												
API string	The service provider's url, which sends an SMS message, for example: https://api.smsglobal.com/http-api.php?action=sendsms&user=user&password=secret&to=12345678&text=Hello The following variables can be used in the url address: <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td>\$LOGIN\$</td> <td>User name from the Login field</td> </tr> <tr> <td>\$PASSWORD\$</td> <td>User's password from the Password field</td> </tr> <tr> <td>\$PASSWORD_MD5\$</td> <td>User password encrypted with the MD5 algorithm</td> </tr> <tr> <td>\$PASSWORD_SHA1\$</td> <td>The user's password is encrypted with the SHA-1 algorithm</td> </tr> <tr> <td>\$PHONES\$</td> <td>The telephone number of the SMS recipient from the Phone number field</td> </tr> <tr> <td>\$MESSAGE\$</td> <td>Message text from the Message text field</td> </tr> </table>	\$LOGIN\$	User name from the Login field	\$PASSWORD\$	User's password from the Password field	\$PASSWORD_MD5\$	User password encrypted with the MD5 algorithm	\$PASSWORD_SHA1\$	The user's password is encrypted with the SHA-1 algorithm	\$PHONES\$	The telephone number of the SMS recipient from the Phone number field	\$MESSAGE\$	Message text from the Message text field
\$LOGIN\$	User name from the Login field												
\$PASSWORD\$	User's password from the Password field												
\$PASSWORD_MD5\$	User password encrypted with the MD5 algorithm												
\$PASSWORD_SHA1\$	The user's password is encrypted with the SHA-1 algorithm												
\$PHONES\$	The telephone number of the SMS recipient from the Phone number field												
\$MESSAGE\$	Message text from the Message text field												

5.6.7 Adding sms gate notification

To add a new element, select **System tree** from the vertical menu, and then click on **+** in the horizontal menu.

It is also possible to send SMS via a GSM module installed in another controller (SMS Gate option).

Configuration of sms gate notification



Field	Description
Name	The name of the notification. The system can have many different notifications. It is to facilitate their recognition.
Phone number	Up to 10 numbers in one notification, which should be separated by semicolon ";" The numbers should be in the format + 48xxxxxxxx
Message text	See chapter 5.6.5 <i>Adding an SMS notification</i> .
Login	The name of the user who can log in to another EC335t device where a GSM modem is installed. Such user must have read and write permissions for the GSM modem and E-mail, SNMP and SMS notifications. See chapter 5.13 <i>Users</i> .
Password	The password of this user
IP Address	The IP address of the EC335t device with the GSM modem installed

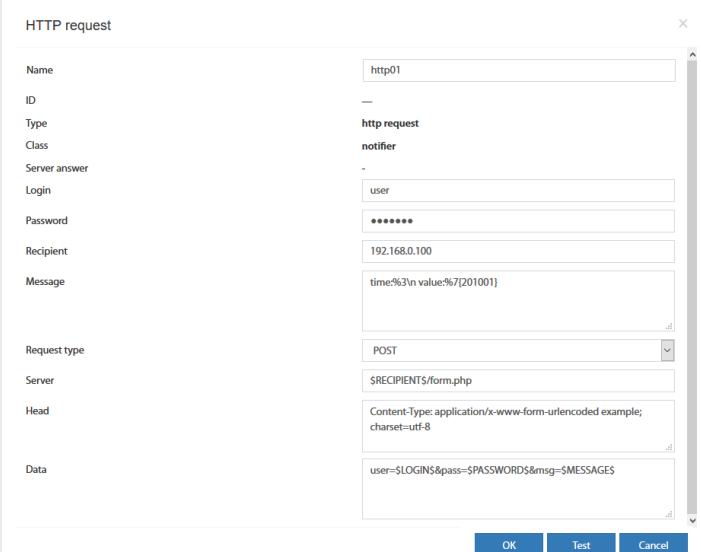
5.6.8 Adding phone call

To add a new element, select **System tree** from the vertical menu, and then click on **+** in the horizontal menu.

It is also possible to get the user's attention by making a call to him. It is only a ringing tone. The device does not have a voice communicator, e.g. playing a voice message.

5.6.9 Adding HTTP notification

To add a new element, select **System tree**  from the vertical menu, and then click on  in the horizontal menu.





The controller enables sending an HTTP notification (GET, POST, DELETE, PUT) to a defined server. It can be used to send e.g. an alarm value of defined sensor. Such feature can be used together with logical schemes (5.10 Logical schemes).

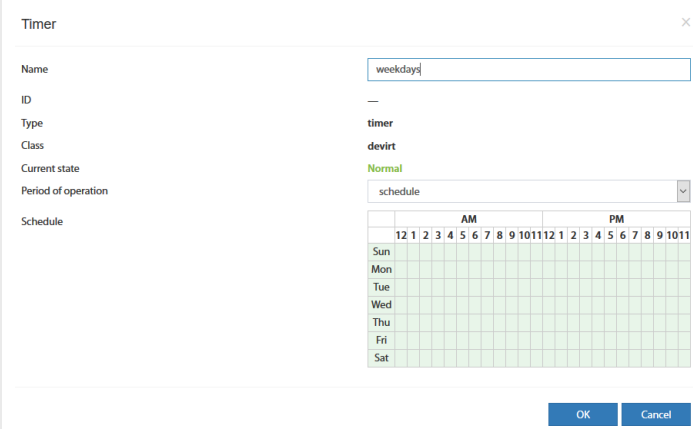
Field	Description																		
Name	Element name.																		
Login	User name – to the http query can be entered as: \$LOGIN\$																		
Password	User password – to the http query can be entered as: \$PASSWORD\$																		
Recipient	Server address – to the http query can be entered as: \$RECIPIENT\$																		
Message	<p>Message content - to the http query can be entered as: \$MESSAGE\$</p> <p>The message may contain the following characters:</p> <table border="1" style="width: 100%;"> <tr> <td>%1</td> <td>Definition of logic scheme (see chapter 5.10 Logical schemes) or name of the group generating the notification (see chapter 5.6.2 Adding a new group).</td> </tr> <tr> <td>%2</td> <td>The status of system elements that have been entered as a condition of the logic scheme or state of the element in the element group which generated notification.</td> </tr> <tr> <td>%3</td> <td>Date and time of the event</td> </tr> <tr> <td>%4</td> <td>The name of the logical scheme or name of the group generating the notification</td> </tr> <tr> <td>%5{id}</td> <td>Sensor name with id or %8</td> </tr> <tr> <td>%6{id}</td> <td>Sensor status with id or %8</td> </tr> <tr> <td>%7{id}</td> <td>The value read from the sensor with id or %8</td> </tr> <tr> <td>%8</td> <td>The identifier of the sensor that generated the notification</td> </tr> <tr> <td>\n</td> <td>New line character</td> </tr> </table>	%1	Definition of logic scheme (see chapter 5.10 Logical schemes) or name of the group generating the notification (see chapter 5.6.2 Adding a new group).	%2	The status of system elements that have been entered as a condition of the logic scheme or state of the element in the element group which generated notification.	%3	Date and time of the event	%4	The name of the logical scheme or name of the group generating the notification	%5{id}	Sensor name with id or %8	%6{id}	Sensor status with id or %8	%7{id}	The value read from the sensor with id or %8	%8	The identifier of the sensor that generated the notification	\n	New line character
%1	Definition of logic scheme (see chapter 5.10 Logical schemes) or name of the group generating the notification (see chapter 5.6.2 Adding a new group).																		
%2	The status of system elements that have been entered as a condition of the logic scheme or state of the element in the element group which generated notification.																		
%3	Date and time of the event																		
%4	The name of the logical scheme or name of the group generating the notification																		
%5{id}	Sensor name with id or %8																		
%6{id}	Sensor status with id or %8																		
%7{id}	The value read from the sensor with id or %8																		
%8	The identifier of the sensor that generated the notification																		
\n	New line character																		
Request type	Type of HTTP request: GET, POST, DELETE, PUT																		
Server	Server path – may contain definitions: \$LOGIN\$, \$PASSWORD\$, \$RECIPIENT\$, \$MESSAGE\$																		
Head	Header of HTTP request – may contain definitions: \$LOGIN\$, \$PASSWORD\$, \$RECIPIENT\$, \$MESSAGE\$																		
Data	Body of HTTP request - may contain definitions: \$LOGIN\$, \$PASSWORD\$, \$RECIPIENT\$, \$MESSAGE\$ e.g. https://\$RECIPIENT/aggregate/cgi.php?action=put&user=\$LOGIN&password=\$PASSWORD&message=\$MESSAGE																		

In fields *Server*, *Head* and *Data* the following variables can be used:

\$LOGIN\$	User name from the Login field
\$PASSWORD\$	User's password from the Password field
\$PASSWORD_MD5\$	User password encrypted with the MD5 algorithm
\$PASSWORD_SHA1\$	The user's password is encrypted with the SHA-1 algorithm
\$RECIPIENT	Server address from Recipient field
\$MESSAGE\$	Message text from the Message field

5.6.10 Adding a timer



To add a new element, select **System tree**  from the vertical menu, and then click on  in the horizontal menu.

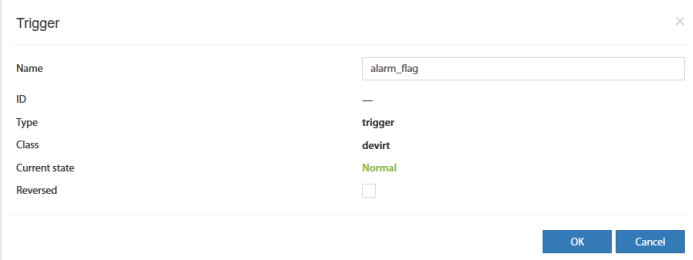


Time dependencies can be added to the system. Timers (schedulers) are used for this. The timer can be in an active (alarm) or normal state at defined times. The timer can be configured as one-time or periodical weekly or monthly.

In logical schemes, they can be used as conditions for the execution of instructions.



5.6.11 Adding a trigger

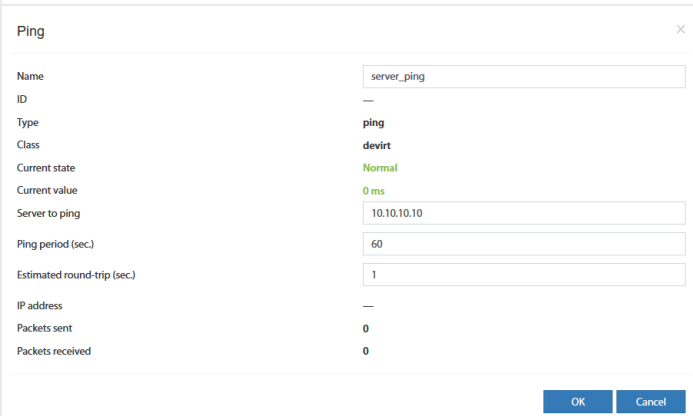
To add a new element, select **System tree**  from the vertical menu, and then click on  in the horizontal menu.



Trigger has a similar function as the flag. It can be in two states: alarm and normal state. It allows you to link two independent logic schemes.

5.6.12 Adding PING functions

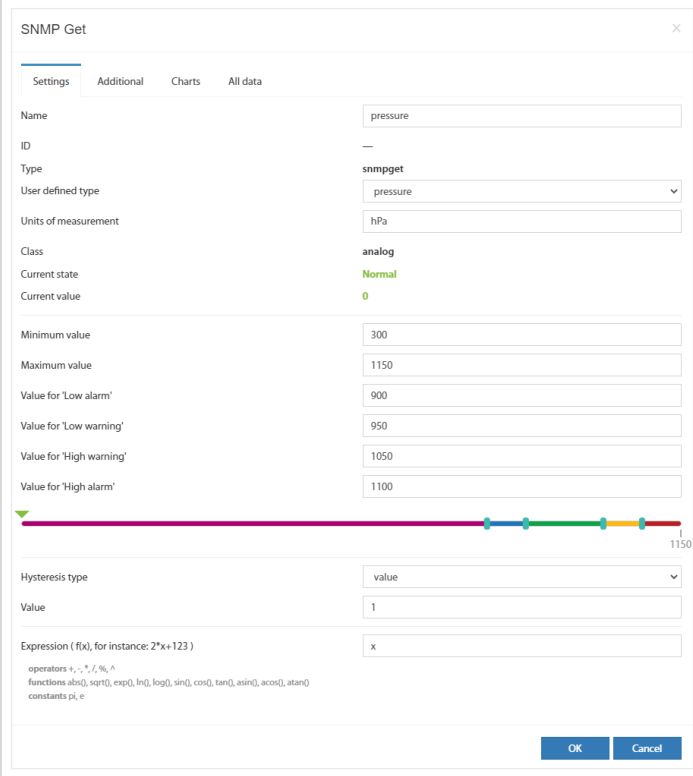
To add a new element, select **System tree**  from the vertical menu, and then click on  in the horizontal menu.



The controller can control external devices by sending PING periodically. In logic diagrams (see chapter 5.10 *Logical schemes*) or in notifications for groups (see chapter 5.6.2 *Adding a new group*), you can define e.g. sending an alarm email when the external device stops responding to PING.

5.6.13 Adding an SNMP Get

To add a new element, select **System tree**  from the vertical menu, and then click on  in the horizontal menu.

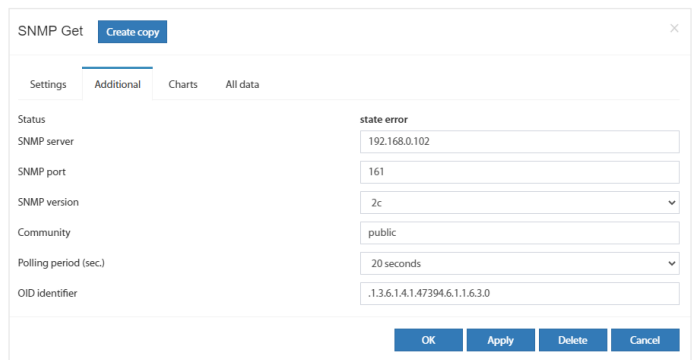


The controller can query the external device for its parameters using the SNMP v1 or v2 protocol. The values of this parameter deviating from the defined one can generate notifications.

There are two types of read variables – analogue and discrete:

Analogue value – the read integer or String type numerical variable. After being recalculated with the formula contained in the *Expression* field, it is comparable to the four alarm thresholds and on this basis the normal or alarm condition of the SNMP Get element is determined.

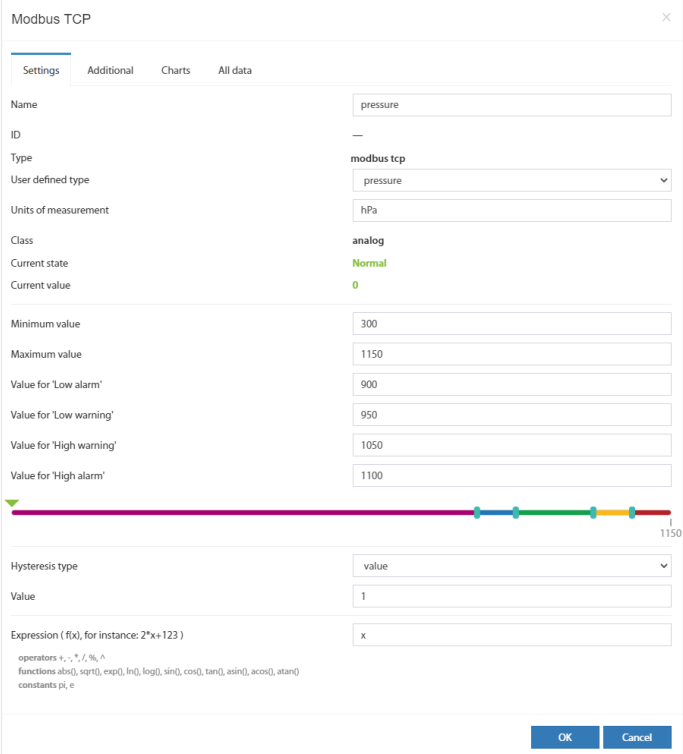
Discrete (binary) – this variable can exist only in two states: normal or alarm. The current state is defined using *Normal value* field entered on *Additional* tab. The read Integer or String variable is compared to the string contained in the *Normal value* field. Then the SNMP Get element status is set.



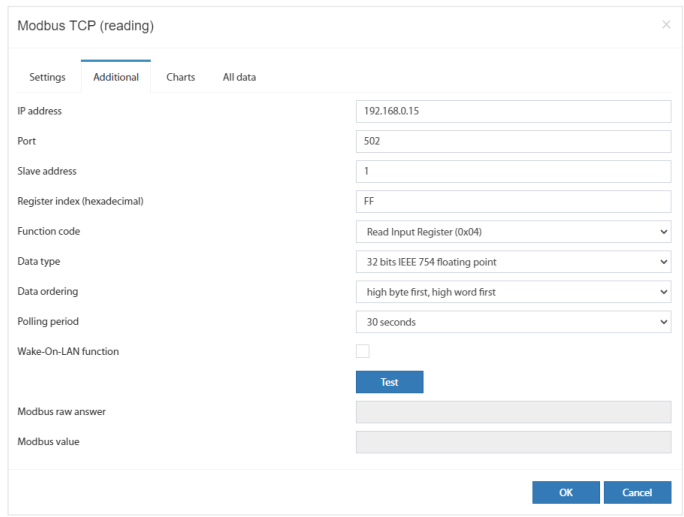
Field	Description
Name	SNMP Get element name.
User defined type	Sets adequate icon for this element.
Unit	Unit of read variable.
Minimum value	Defines the range of changes of the read value.
Maximum value	Defines the range of changes of the read value.
Value for low alarm	Threshold for low value alarm.
Value for low warning	Threshold for low value warning.
Value for high warning	Threshold for high value warning.
Value for high alarm	Threshold for high value alarm.
Hysteresis type	Please see 5.6.1 <i>Setting the sensor parameters</i>
Expression f(x)	Field available for the Analog variable type. The function enables the conversion of the read analogue value "x" before comparison with the alarm thresholds. The expression can contain the following characters: operators: "+", "-", "*", "/", "%" (the remainder), "^" (exponentiation); functions: "abs()", "sqrt()", "exp()", "ln()", "log()", "sin()", "cos()", "tan()", "asin()", "acos()", "atan()"; constants: "pi" (3.1415926...), "e" (2.7182818...)
Normal value	Field available for a discrete variable. In this field, enter the string that the read variable must contain in order for the SNMP Get element to be in the normal state.
SNMP Server	The IP address of the device being polled.
SNMP Port	Communication port of the device being polled (usually 161).
SNMP version	Version 1 or 2c can be chosen.
Community	SNMP password to read (read-only community string).
Polling period (sec.)	The frequency of sending queries to the device being polled (in seconds).
OID identifier	The identifier of the SNMP variable in the format „1.3.6.1.2.1.1.3.0”.

5.6.14 Adding Modbus TCP element

To add a new element, select **System tree** from the vertical menu, and then click on **+** in the horizontal menu.



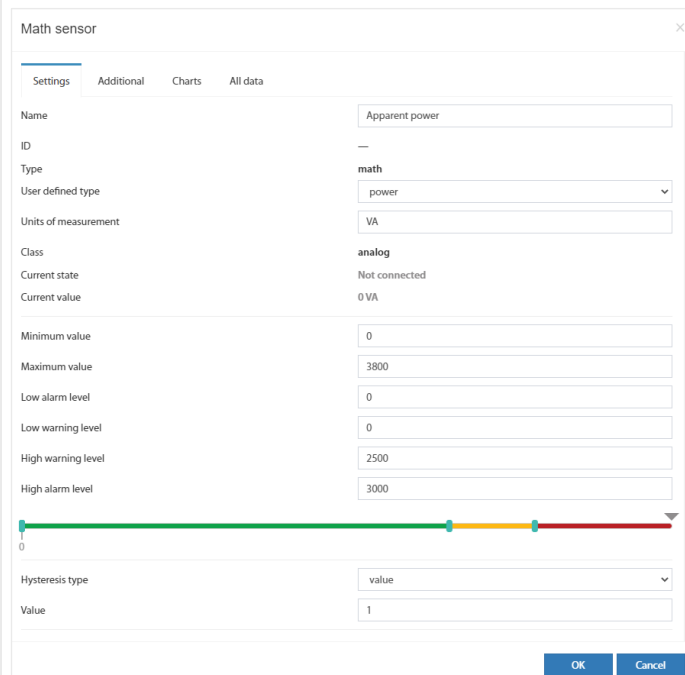
The controller can query the external device about its parameters using the Modbus TCP protocol. It can also write the defined value to the appropriate modbus register.



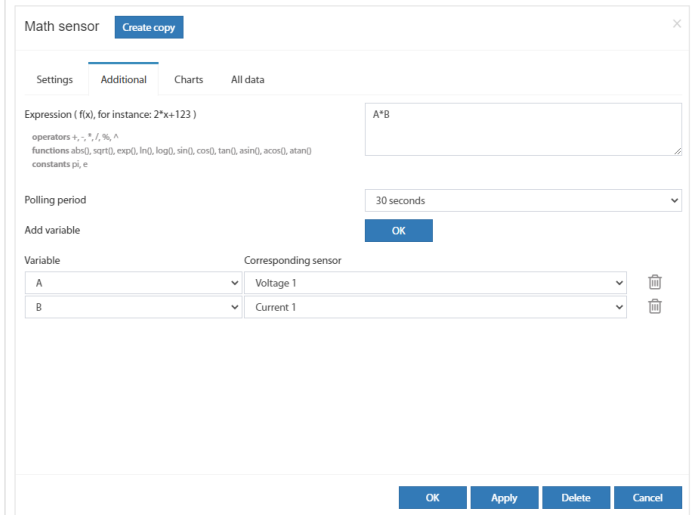
Field	Description
Name	Element name.
User defined type	Sets adequate icon for this element.
Unit	Unit of read variable.
Minimum value	Defines the range of changes of the read value.
Maximum value	Defines the range of changes of the read value.
Value for low alarm	Threshold for low value alarm.
Value for low warning	Threshold for low value warning.
Value for high warning	Threshold for high value warning.
Value for high alarm	Threshold for high value alarm.
Hysteresis type	Please see <i>5.6.1 Setting the sensor parameters</i>
Expression f(x)	Field available for the Analog variable type. The function enables the conversion of the read analogue value "x" before comparison with the alarm thresholds. The expression can contain the following characters: operators: "+", "-", "*", "/", "%" (the remainder), "^" (exponentiation); functions: "abs()", "sqrt()", "exp()", "ln()", "log()", "sin()", "cos()", "tan()", "asin()", "acos()", "atan()"; constants: "pi" (3.1415926...), "e" (2.7182818...)
IP address	The IP address of the device being polled.
Port modbus	Communication port of the device being polled (usually 502).
Slave address	Modbus device slave address
Register index	Address of polled modbus register.
Function code	Modbus function code. Available: 0x01, 0x02, 0x03, 0x04 for reading and 0x05, 0x06 for writing
Data type	Type of the date being polled. Available: unsigned and signed 16 bit and 32 bit word, 32 bit float value.
Data order	The order of reading bytes from the register.
Polling period (sec.)	The frequency of sending queries to the device being polled (in seconds).

5.6.15 Adding virtual mathematical element

To add a new element, select **System tree**  from the vertical menu, and then click on  in the horizontal menu.




The controller enables monitoring of a virtual variable created from the conversion of the values of other variables monitored in the system. In this way, you can, for example, monitor the apparent power consumed by a device, with the following variables available: current consumption and voltage.



Field	Description
Name	Element name.
User defined type	Sets adequate icon for this element.
Unit	Unit of read variable.
Minimum value	Defines the range of changes of the read value.
Maximum value	Defines the range of changes of the read value.
Value for low alarm	Threshold for low value alarm.
Value for low warning	Threshold for low value warning.
Value for high warning	Threshold for high value warning.
Value for high alarm	Threshold for high value alarm.
Hysteresis type	Please see 5.6.1 Setting the sensor parameters
Expression f(x)	Field available for the Analog variable type. The function enables the conversion of the read analogue value "x" before comparison with the alarm thresholds. The expression can contain the following characters: operators: "+", "-", "*", "/", "%" (the remainder), "^" (exponentiation); functions: "abs()", "sqrt()", "exp()", "ln()", "log()", "sin()", "cos()", "tan()", "asin()", "acos()", "atan()"; constants: "pi" (3.1415926...), "e" (2.7182818...)

5.6.16 Adding a camera

To add a new element, select **System tree** from the vertical menu, and then click on **+** in the horizontal menu.



The camera's handling function is treated as a gadget and is not recommended for larger installations because it can affect system performance. In very small installations this gadget may be desirable.

The controller automatically recognizes a UVC (USB Video Class) camera connected to a USB port that supports MPEG compression. It is recommended to use Logitech type C210, C270, C310, C510 cameras.

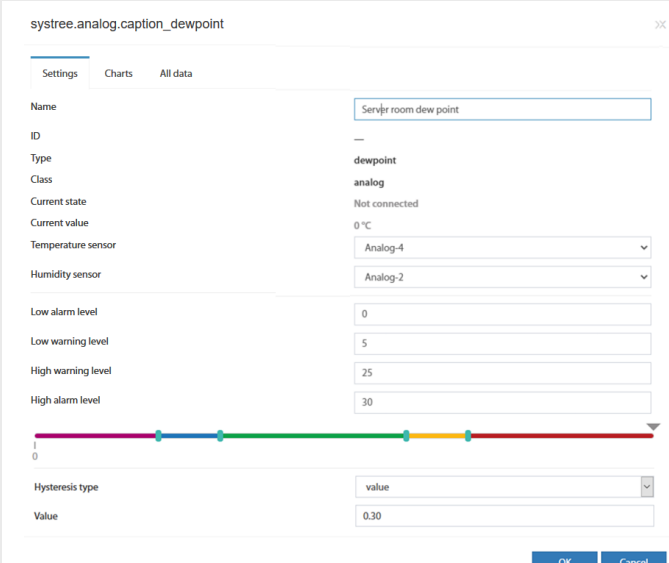
The controller also allows you to configure IP cameras transmitting JPEG images or an MJPEG stream. The controller can handle up to 4 cameras.

The preview of the image from the cameras is available after selecting the **Cameras** button from the vertical menu.

Field	Description
Name	Camera name.
URL	The address for the video stream of the camera available via the http or https protocol.
Username	Username, if necessary.
Password	User password.
Recommended FPS	The frame rate refresh of the JPEG image or the direct MJPEG stream.

5.6.17 Adding a dew point

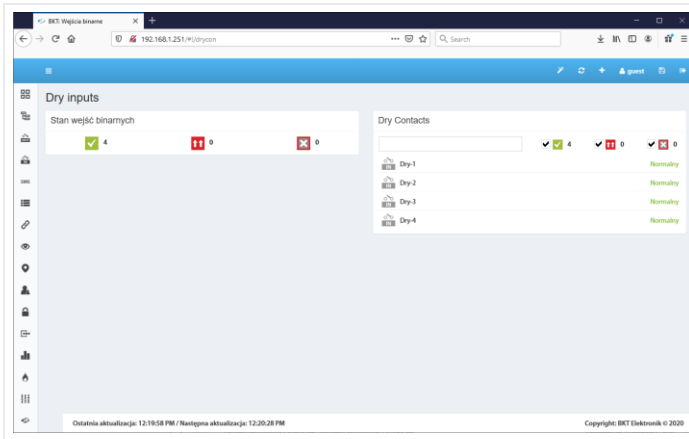
To add a new element, select **System tree** from the vertical menu, and then click on **+** in the horizontal menu.



It is possible to add a virtual dew point sensor that calculates the condensing temperature based on temperature and humidity sensors selected connected to the system.

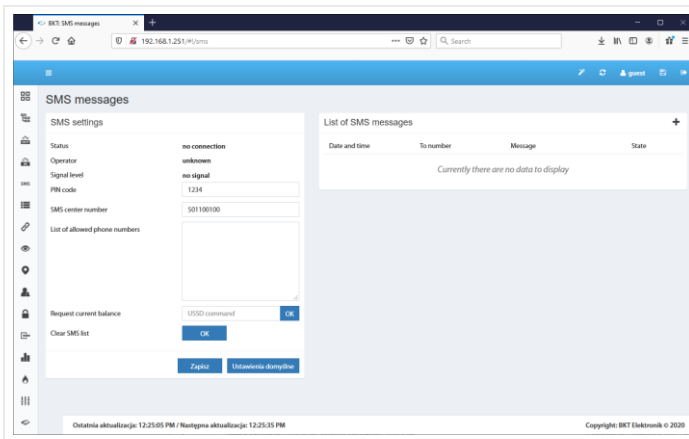
Field	Description
Name	Element name.
Temperature sensor	Selected temperature sensor.
Humidity sensor	Selected humidity sensor.
Low alarm level	Threshold for low value alarm.
Low warning level	Threshold for low value warning.
High warning level	Threshold for high value warning
High alarm level	Threshold for high value alarm.
Hysteresis type	Please see 5.6.1 Setting the sensor parameters

5.7 Dry contacts (binary inputs for potential-free contacts)



Select *Dry contacts* from the vertical menu to view the state of binary inputs for potential-free contacts.

5.8 GSM modem settings

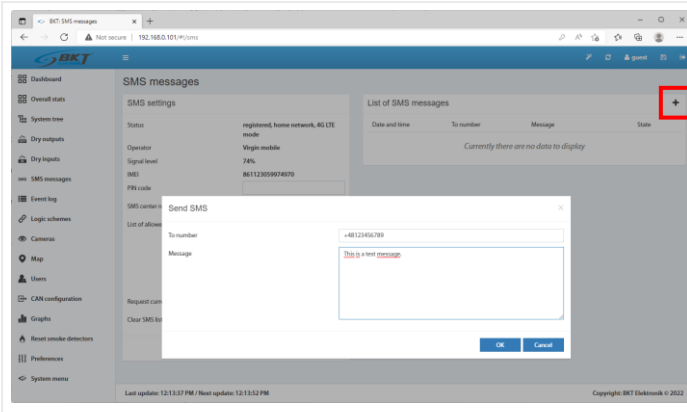


The modem allows sending text messages by the device and receive SMS commands sent from authorized phone numbers.

The configuration of the GSM/SMS modem can be done by selecting *SMS Messages* from the vertical menu. This button is visible only when the modem is installed in the controller and the correct SIM card PIN has been entered.

There was a problem observed with SIM cards from some GSM providers that were protected with a PIN code. In this case, it is suggested to remove the PIN code from the SIM card before inserting it in the controller.

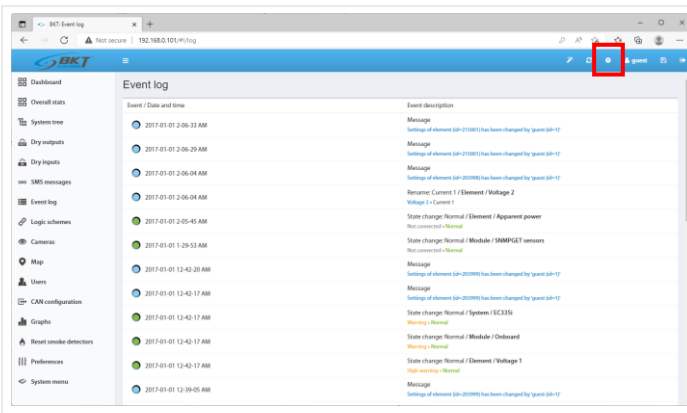
Field	Description																												
PIN code	The PIN code must be entered before inserting the SIM card.																												
SMS center number	GSM provider number of short message system center. Usually in format +48xxxxxxxx or without the country prefix.																												
List of allowed phone numbers	List of telephone numbers from which you can send commands to the controller. The list can contain a maximum of 10 phone numbers separated by a semicolon ";". The numbers should have format +48xxxxxxxx																												
	Available commands:																												
	<table border="1"> <thead> <tr> <th>Command</th> <th>Example</th> <th>Response</th> </tr> </thead> <tbody> <tr> <td colspan="3">Sensor status reading</td> </tr> <tr> <td>get 'sensor ID'</td> <td>get 201001</td> <td>Onboard-Temperature[201001]</td> </tr> <tr> <td>get 'sensor-name'</td> <td>get Onboard-Temperature</td> <td>state=normal value=23.5</td> </tr> <tr> <td colspan="3">Switching on the Power-1 output</td> </tr> <tr> <td>set 'sensor ID' on</td> <td>set 304001 on</td> <td rowspan="2">The element was switched on</td> </tr> <tr> <td>set 'sensor-name' on</td> <td>set 'Power-1' on</td> </tr> <tr> <td colspan="3">Switching off the Power-1 output</td> </tr> <tr> <td>set 'sensor ID' off</td> <td>set 304001 off</td> <td rowspan="2">The element was switched off</td> </tr> <tr> <td>set 'sensor-name' off</td> <td>set 'Power-1' off</td> </tr> </tbody> </table>	Command	Example	Response	Sensor status reading			get 'sensor ID'	get 201001	Onboard-Temperature[201001]	get 'sensor-name'	get Onboard-Temperature	state=normal value=23.5	Switching on the Power-1 output			set 'sensor ID' on	set 304001 on	The element was switched on	set 'sensor-name' on	set 'Power-1' on	Switching off the Power-1 output			set 'sensor ID' off	set 304001 off	The element was switched off	set 'sensor-name' off	set 'Power-1' off
Command	Example	Response																											
Sensor status reading																													
get 'sensor ID'	get 201001	Onboard-Temperature[201001]																											
get 'sensor-name'	get Onboard-Temperature	state=normal value=23.5																											
Switching on the Power-1 output																													
set 'sensor ID' on	set 304001 on	The element was switched on																											
set 'sensor-name' on	set 'Power-1' on																												
Switching off the Power-1 output																													
set 'sensor ID' off	set 304001 off	The element was switched off																											
set 'sensor-name' off	set 'Power-1' off																												
Request current balance (USSD code)	In the case of prepaid phones, you can enter the balance inquiry code here or any other USSD code.																												
Clear SMS list	Clears the list of sent text messages.																												




The device also allows you to send any SMS to any recipient directly from the web interface.

The function is available after clicking on the '+' button.

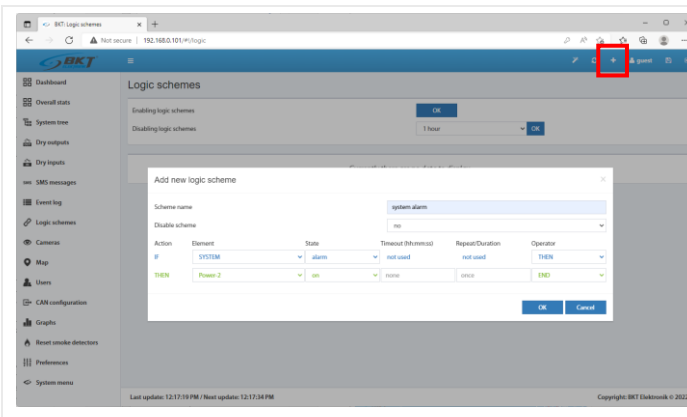
5.9 Event log



After selecting the Event Log from the vertical menu, logs of all system events are displayed. See also the chapter 5.17.5 *Saving of events and measured values on a USB disk*.

The export of events to the file is possible after selecting .

5.10 Logical schemes



Creating links between system elements (sensors, inputs, outputs, etc.) is possible after selecting the *Logic Schemes* from the vertical menu. To add a new logical dependence, click on the "+" button in the horizontal menu. The IF THEN conditional sentence is used, as well as the logical functions AND and OR. The Timeout function means a delay in the execution of instructions. The Repeat function allows you to repeat the execution of an instruction after a defined time if the logic diagram still remains active. This can be, for example, for resending an email with information about the alarm.

In order for the settings to be kept after restarting the controller, they should be saved to non-volatile memory.

An example of the simplest logical scheme that sends an email notification and sms when an alarm condition occurs in the system.

Edit logic scheme ✕

Scheme name: SYSTEM_ALARM
 Disable scheme: no

Action	Element	State	Timeout	Repeat	Operator
IF	SYSTEM	alarm	not used	not used	THEN
THEN	IT-mail-global-state	send mail	none	once	AND
THEN	IT-sms-global-state	send SMS	none	once	END

An example of a logic scheme that sends an email and sms notifications when a warning state occurs in the system.

Edit logic scheme ✕

Scheme name: SYSTEM_WARNING
 Disable scheme: no

Action	Element	State	Timeout	Repeat	Operator
IF	SYSTEM	warning	not used	not used	THEN
THEN	IT-mail-global-state	send mail	none	once	AND
THEN	IT-sms-global-state	send SMS	none	once	END

An example of a logic scheme that sends an email and sms notification when the sensors are disconnected from the controller.

Edit logic scheme ✕

Scheme name: SENSOR_DISCONNECTED
 Disable scheme: no

Action	Element	State	Timeout	Repeat	Operator
IF	Module: 'EE325-1097'	not connected	not used	not used	OR
IF	Module: 'EE325-1106'	not connected	not used	not used	OR
IF	Module: 'EE325-1127'	not connected	not used	not used	OR
IF	Module: 'EE325-1135'	not connected	not used	not used	OR
THEN	IT-mail-global-state	send mail	none	once	AND
THEN	IT-sms-global-state	send SMS	none	once	END

If the system returns to normal, you must create the logical scheme below to notify the user.

Edit logic scheme ✕

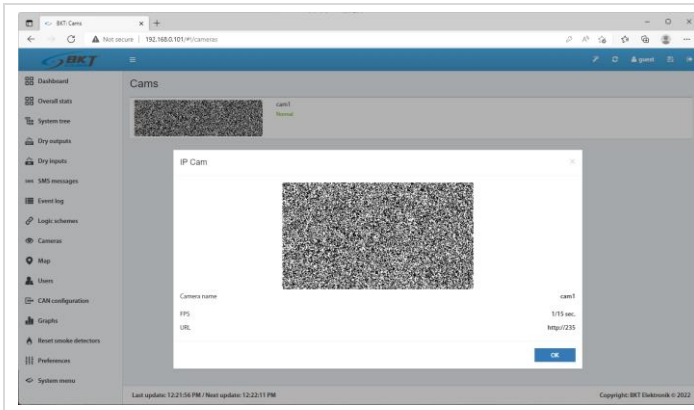
Scheme name: SYSTEM_NORMAL
 Disable scheme: no

Action	Element	State	Timeout	Repeat	Operator
IF	SYSTEM	normal	not used	not used	AND
IF	SENSOR_DISCONNECTED	normal	not used	not used	THEN
THEN	IT-mail-global-state	send mail	none	once	AND
THEN	IT-sms-global-state	send SMS	none	once	END

In the above examples, as the text of the sms and email messages the status of all sensors was entered, as shown in the table below. See also chapter 5.6.3 *Adding an email notification*.

The content of the email notification configured	The content of the sent email
Server room status: %4\n CONTROLLER\n %5{201001}-%7{201001}°C-%6{201001}\n %5{203001}-%7{203001}V-%6{203001}\n SERVER ROOM\n %5{107001}-%6{107001}\n %5{201006}-%7{201006}°C-%6{201006}\n %5{201023}-%7{201023}°C-%6{201023}\n %5{202009}-%7{202009}%-%6{202009}\n %5{106009}-%6{106009}\n	Server room status: 'SYSTEM_NORMAL' CONTROLLER 'Onboard-Temperature'-'27.80°'C-'normal' 'Onboard-Voltage DC'-'12.00'V-'normal' SERVER ROOM 'Leak under raised floor'-'normal' 'Cab_GPD__temp_dn'-'23.06°'C-'normal' 'Cab_GPD__temp_up'-'24.50°'C-'normal' 'Cab_GPD__humi'-'27.00%' 'normal' 'Cab_GPD__smoke'-'normal'

5.11 Cameras



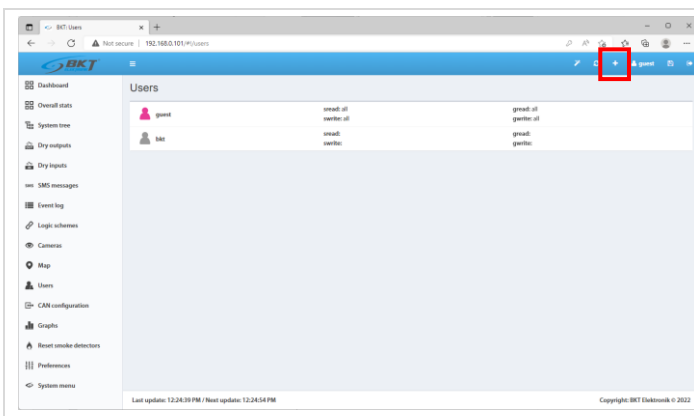
Select *Cameras* from the vertical menu to view the image captured from installed cameras. Select *System tree* to configure the cameras. See chapter 5.6.16 *Adding a camera*.

5.12 Map



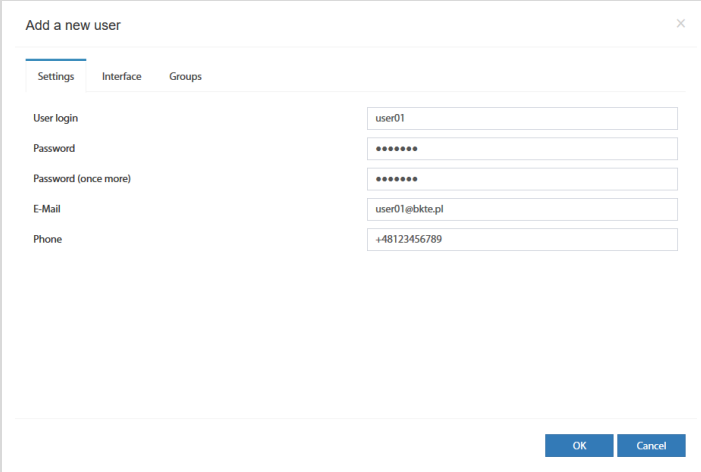
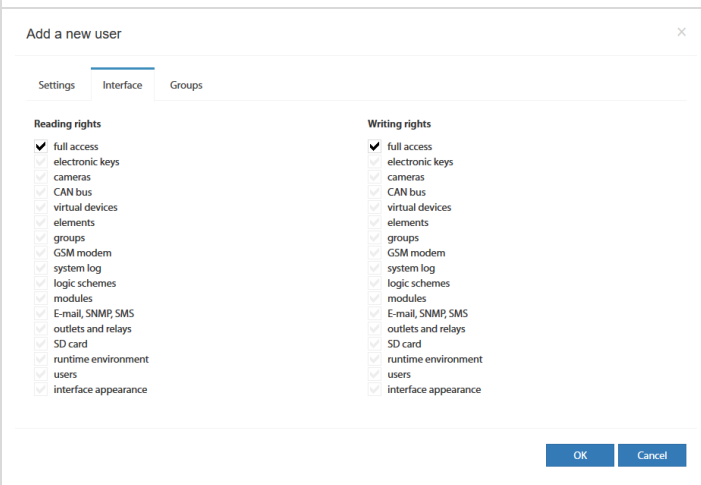
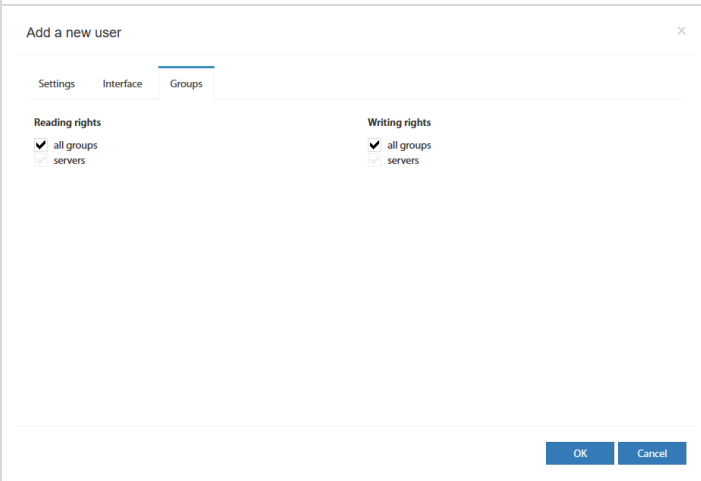
The system provides a function of displaying the state of sensors against the building layout. Select *Map* from the vertical menu. Click *Settings* in the horizontal menu to configure this page. To maintain the settings after restarting the controller, write them to non-volatile memory.

5.13 Users



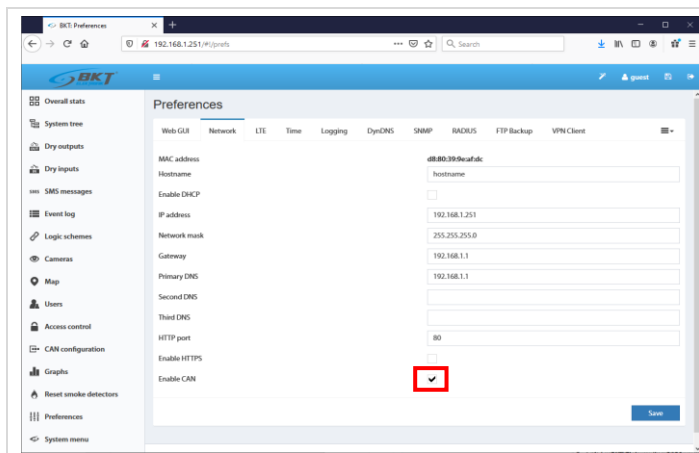
Select *Users* from the vertical menu to manage system users, create new users, remove users and grant rights.

Click the '+' button in the horizontal menu to add a new user.

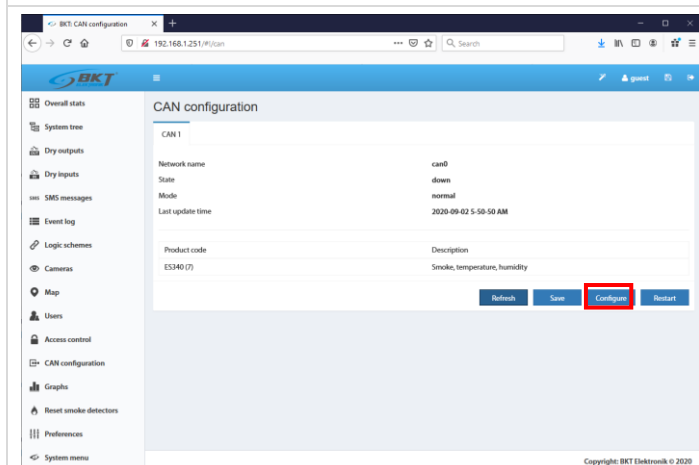
	<p>Enter the user name and password in the pop-up window and grant it appropriate right.</p>
	<p>On the second tab give the user permission to read and/or write to individual parts of the system.</p>
	<p>The last tab allows you to grant read and/or write permissions to individual groups of elements defined in chapter 5.6.2 Adding a new group.</p> <p>To maintain the settings after restarting the controller, write them to non-volatile memory.</p>

5.14 CAN configuration (extension module)

Devices extending the number of analogue ports - EE321t , binary input ports for potential-free contacts - EE322 and ES340 sensors can be connected to the controller.



Activate the CAN bus. Select Preferences→Network from the vertical menu. Check the *Enable CAN* box and click *Save*.



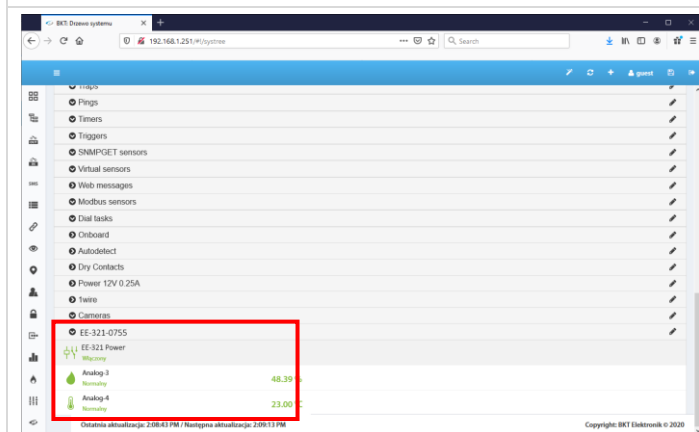
Select *CAN configuration* from the vertical menu, then click the *Configure* button and wait approx. 2 minutes until the CAN bus is scanned and the device is configured. When the device appears on the list, click the *Save* button.

Refresh – refresh the list of devices on the bus and their status.

Save – write CAN settings to non-volatile memory.

Configure – search for extension modules on the bus.

Restart – restart the CAN bus.



Following configuration, the extension module and sensors connected to it will be automatically detected and displayed in the system tree. Select *System tree* from the vertical menu.



The operating status of the CAN bus is signalled on the controller with the CAN indicator light.

CAN is off – the CAN bus has not been activated in the configuration.

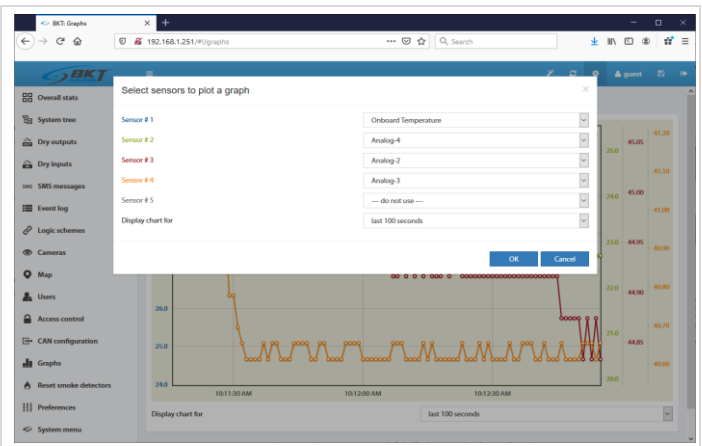
CAN flashes – the CAN bus is active, but there is no communication with the extension module.

CAN is on – the CAN bus is active and there is communication with the extension module.

5.15 Graphs

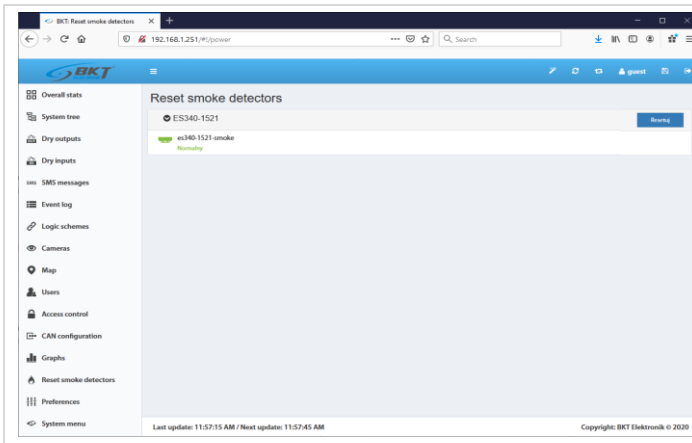


It is possible to display changes of values from the sensors on a chart. Select *Graphs* from the vertical menu.



To add the sensor to a chart, use the '+' button from the horizontal menu.

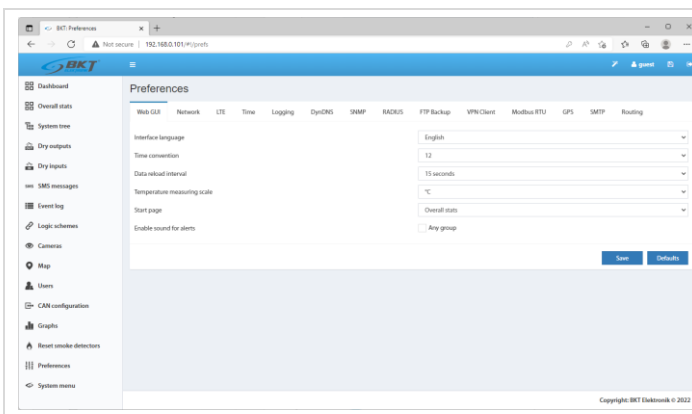
5.16 Reset smoke detectors



Once triggered (smoke detection), the sensors require a manual restart. This can be done through the controller web interface. Select *Reset smoke detectors* from the vertical menu. Resetting involves disconnecting the power supply from the sensors for a few seconds. All analogue sensors connected to the device where smoke is will be disconnected from the power supply for a moment.

5.17 Preferences (system settings)

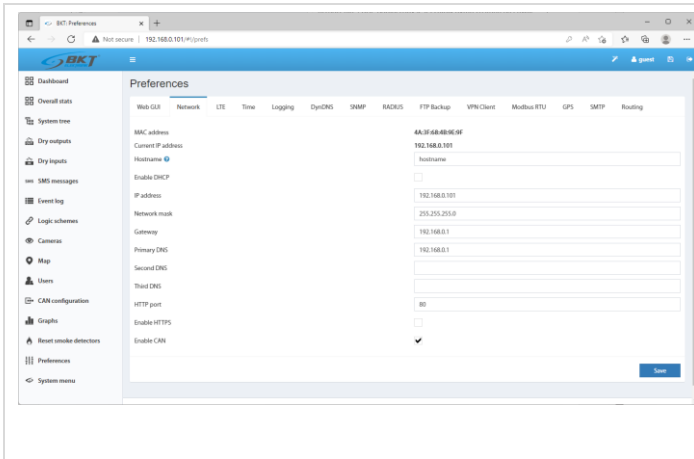
5.17.1 Web interface settings



Select *Preferences* → *Web GUI* from the vertical menu. Set the following web interface parameters:

- Language
- time format 12h/24h
- automatic refresh rate
- temperature unit (Celsius or Fahrenheit degrees)
- default start page
- activate an acoustic signal via the website when the alarms are active

5.17.2 Network settings

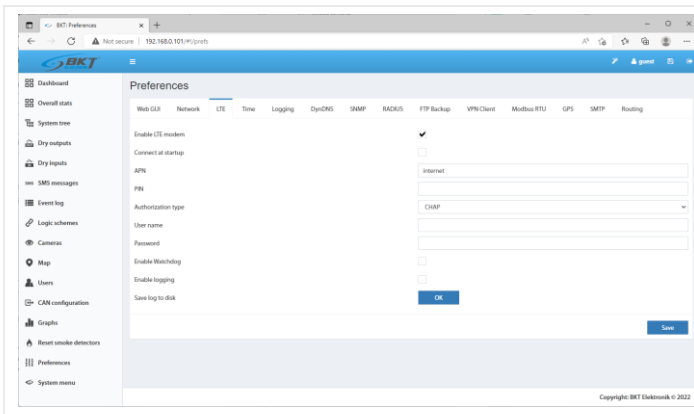


Select *Preferences*→*Network* from the vertical menu.

- IP address, subnetwork mask, broadcast, gate, DNS – to enter static network settings.
- HTTP port – it determines an access port to the device via a browser (default: 80).
- Enable HTTPS – activate encrypted connection via a browser.
- Enable DHCP – activate automatic import of network settings from a DHCP server.
- Enable CAN – this function must be checked if extension modules are to be used in the system.

Saving the settings will restart the controller. Wait until the ACT LED starts flashing on the controller front panel. Only then the controller will be available under the new IP address.

5.17.3 LTE modem settings

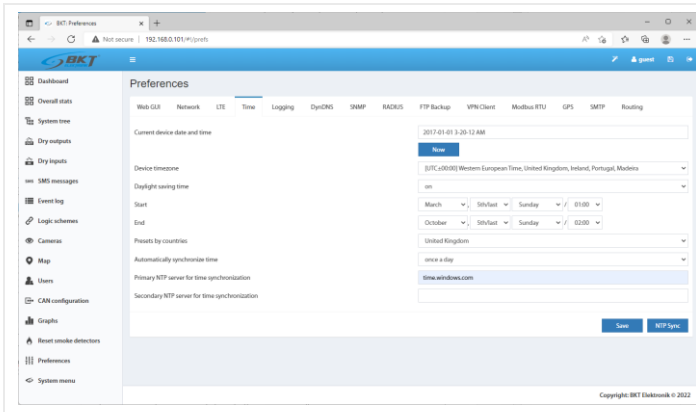


If an LTE modem is installed in the device, it enables connection to the Internet. The LTE connection can serve as a failover to Ethernet or as a primary connection. For a remote connection to the EC335t controller via LTE connection, a global static IP address from the GSM provider is required.

From the vertical menu, select Properties-> LTE. The menu is only available when the modem is installed.

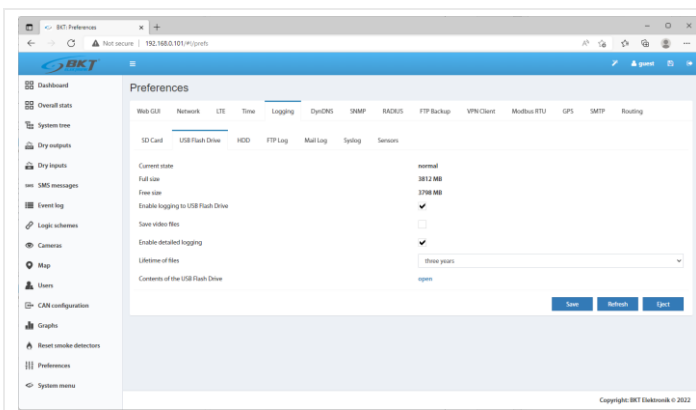
Field	Description
Enable LTE modem	Enables LTE connection
Connect at startup	It activates the LTE connection right after starting the controller. If checked, then LTE connection will be used as primary for all network services. If unchecked, the connection will only be activated after the Ethernet connection is lost. The Ethernet connection is tested by pinging the DNS server (see chapter 5.17.2 Network Settings). If any of the DNS servers respond to the ping, the controller considers the Ethernet connection to be active. For this reason, all DNS servers should be in the external network.
APN	Access point name – GSM provider name
PIN	Personal identification number if required by provider
Authorization type	Authorization type defined by GSM provider.
User name	User name if required by provider
Password	Password if required by provider
Enable routing for internal network	Enables Internet access for devices in the internal network. The controller does not automatically provide IP addresses for such a network, so the network settings of the devices must be entered manually.
Enable Watchdog	Enables checking the LTE connection. If checked, the modem sends a ping to the server defined in "IP Address or hostname of ping destination" with the frequency specified in "Watchdog period". If the modem does not receive a response within the time specified in the "Watchdog timeout", it recognizes the LTE connection as broken and will attempt to re-establish the LTE connection.
Watchdog period	The frequency of checking the connection to the server.
Watchdog timeout	Time for a reply from the server.
IP Address or hostname of ping destination	The IP address of the server used to test the LTE connection.
Enable logging	Enable logging of LTE connection status. Use this feature only for debugging when setting up a connection. During normal operation, logging should be turned off.
Save log to disk	Button to download LTE logs.

5.17.4 Time settings

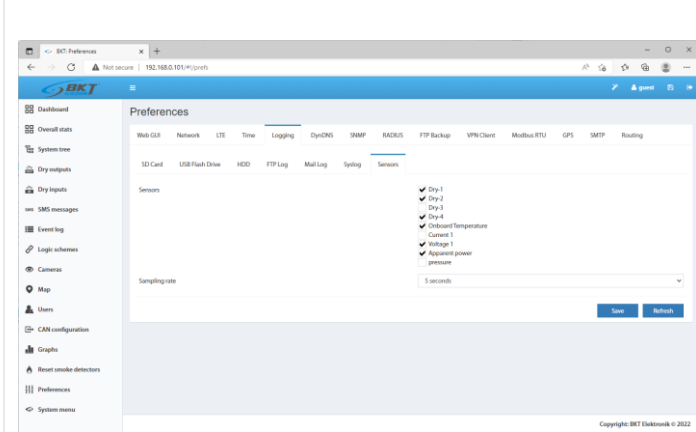


It is possible to set the device clock time manually and to set cyclical synchronisation with NTP servers. Select *Preferences*→*Time* from the vertical menu.

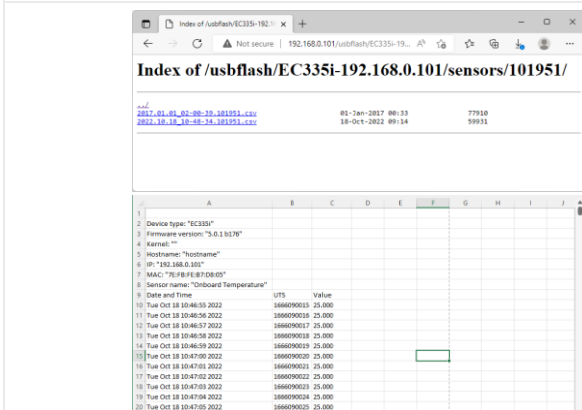
5.17.5 Saving of events and measured values on a USB disk or SD card



In the vertical menu select: *Preferences*→*Logging*→*USB Flash Drive*. Values read from the sensors and system logs can be saved to files on a USB disk or SD card previously formatted to the FAT32 system. After installing the USB drive or SD card you will be able to view its contents directly from the device's web interface after clicking on *Open Contents of the USB Flash Drive*.



To save the values read from the sensors on the USB disk, on the *Preferences*→*Logging*→*Sensors* tab, select required sensors and specify the measurement interval. The device can record measured values from up to 30 sensors.



The values read from the sensors are saved on the USB drive in csv files.

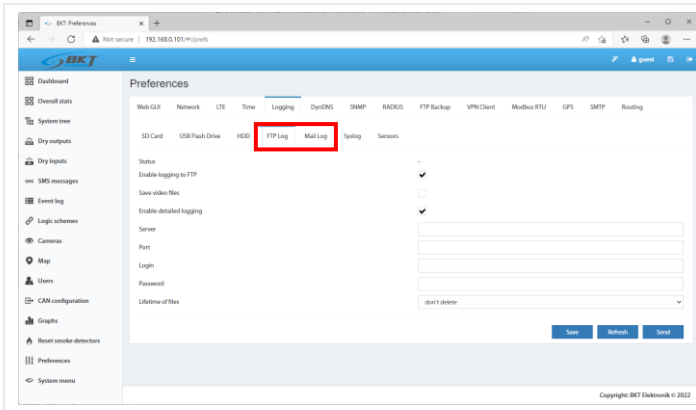
Direct access path to data on the SD card:

<http://{login}:{pass}@192.168.0.101/sdcard/>

Direct access path to data on the USB drive:

<http://{login}:{pass}@192.168.0.101/usbflash/>

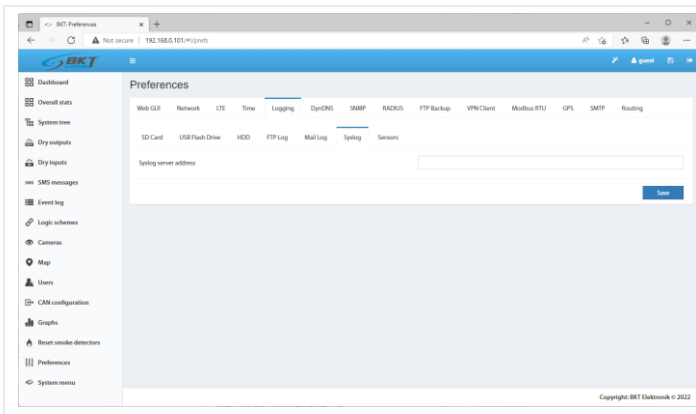
5.17.6 Sending logs and sensor values to FTP, MAIL



The device enables the transmission of system events and measurement values to an FTP server and via e-mail. Install an SD card or USB flash drive in advance. Data is sent to the FTP server once a day at 00:00. The e-mail message with the data in the attachment is sent once a day at the selected time.

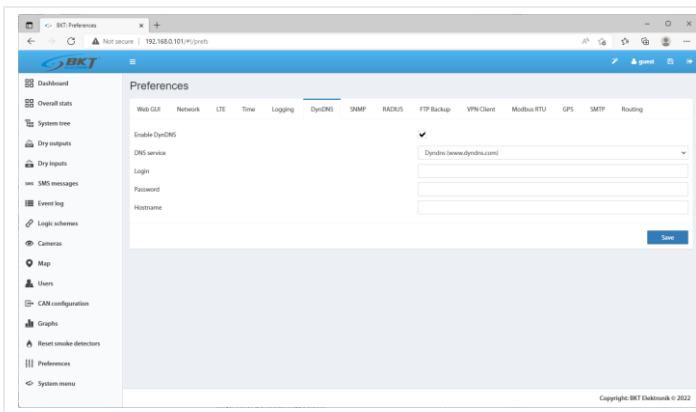
Preferences->Logging-> FTP Log
Preferences->Logging-> Mail Log

5.17.7 Saving logs to SYSLOG



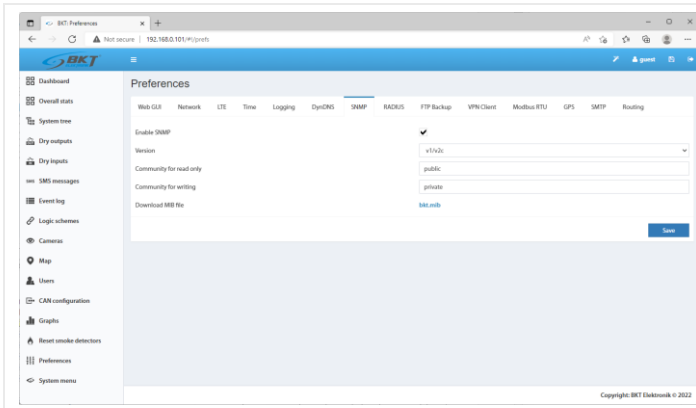
The device also allows transfer only system events to the SYSLOG server. Select *Preferences->Logging-> Syslog*

5.17.8 DynDNS settings



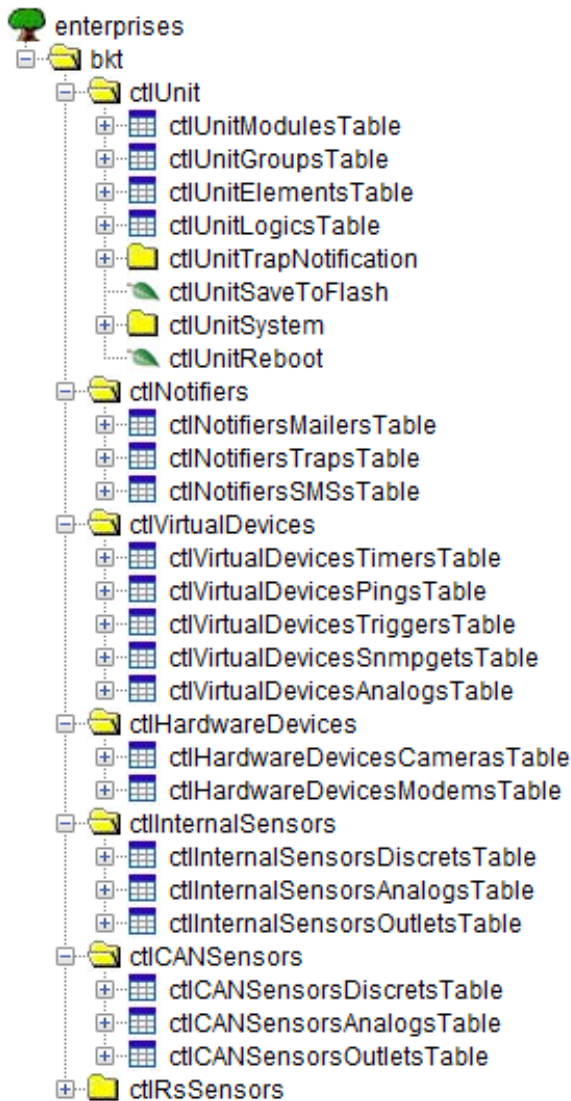
The DynDNS (www.dyndns.com) or no-IP (www.no-ip.org) services can be used with the device. Select *Preferences->DynDNS* from the vertical menu.

5.17.9 SNMP settings



The device supports the SNMP (Simple Network Management Protocol) in versions 1, 2c and 3. The default port to access the device via SNMP is 161. In this tab, a MIB (Management Information Base) with communication data can be downloaded. Select **Właściwości** → **SNMP Preferences** → **SNMP** from the vertical menu.

Baza MIB systemu



The SNMP MIB database is a reflection of the system tree available from the vertical menu. All information required to establish communication with the controller is located in the MIB database.

- ctlUnit – units in the system tree
 - ctlUnitModulesTable – modules in the system tree
 - ctlUnitGroupsTable – created groups of units
 - ctlUnitElementsTable – elements (sensors)
 - ctlUnitLogicsTable – created logical schemes
 - ctlUnitTrapNotification – system SNMP Trap message
 - ctlUnitSaveToFlash – saving settings to flash memory
 - ctlUnitSystem – device information (sn, mac, firmware etc.)
 - ctlUnitReboot – device rebooting
- ctlNotifiers – created notifications
 - ctlNotifiersMailsTable – created mail notifications
 - ctlNotifiersTrapsTable - created SNMP Trap notifications
 - ctlNotifiersSMSsTable - created text message notifications
- ctlVirtualDevices - virtual elements
 - ctlVirtualDevicesTimersTable – timers
 - ctlVirtualDevicesPingsTable – pings
 - ctlVirtualDevicesTriggersTable – triggers
 - ctlVirtualDevicesSnmppgetsTable - SNMP Get (virtual sensors)
 - ctlVirtualDevicesAnalogTable – mathematical values
- ctlHardwareDevices – other devices
 - ctlHardwareDevicesCamerasTable – USB and IP cameras
 - ctlHardwareDevicesModemsTable – GSM modem
- ctlInternalSensors – details of system sensors
 - ctlInternalSensorsDiscretsTable – inputs for potential-free contacts
 - ctlInternalSensorsAnalogTable – analogue sensors
 - ctlInternalSensorsOutletsTable – output modules (relays)
- ctlCANSensors – details of CAN sensors
 - ctlCANSensorsDiscretsTable - inputs for potential-free contacts
 - ctlCANSensorsAnalogTable - analogue sensors
 - ctlCANSensorsOutletsTable – output modules (relays)
- ctlRsSensors – not available in current firmware

Section **ctlUnit** – system tree

This section contains the full system tree. Chapter 5.6 System tree (system components).

- ctlUnitModulesTable** – information about modules in the system tree, ie: Logics, Mails, SMSs, Traps, Pings, Timers, Triggers, etc.
- ctlUnitGroupsTable** – information about created groups of elements. Chapter 5.6.2 *Adding a new group*.
- ctlUnitElementsTable** – basic information about sensors in the system tree. Chapter 5.6.1 *Setting the sensor parameters*.
- ctlUnitLogicsTable** – information about created logic diagrams. Chapter 5.10 *Logical schemes*.
- ctlUnitTrapNotification** – object identifier OID of system SNMP Trap notification.
- ctlUnitSaveToFlash** - saving settings to the flash memory when set to "1"
- ctlUnitSystem** – device information informacja o urządzeniu (serial number, mac, firmware etc.)
- ctlUnitReboot** – device rebooting when set to „1”

Section **ctlNotifiers** – created notifications

This section contains notifications that were created while programming the controller.

- ctlNotifiersMailsTable** – created MAIL notifications. Chapter 5.6.3 *Adding an email notification*.
- ctlNotifiersTrapsTable** - created SNMP Trap notifications. Chapter 5.6.4 *Adding a trap notification*.
- ctlNotifiersSMSsTable** – created SMS notifications. Chapter 5.6.5 *Adding an SMS notification*.

Section **ctlVirtualDevices** - virtual elements

This section contains elements that were created while programming the controller.

- ctlVirtualDevicesTimersTable** – created timers. Chapter 5.6.10 *Adding a timer*.
- ctlVirtualDevicesPingsTable** – created pings. Chapter 5.6.12 *Adding PING functions*.
- ctlVirtualDevicesTriggersTable** – created triggers. Chapter 5.6.11 *Adding a trigger*.
- ctlVirtualDevicesSnmpgetsTable** - created SNMP Get. Chapter 5.6.13 *Adding an SNMP Get*.
- ctlVirtualDevicesAnalogTable** - created mathematical values. Chapter 5.6.15 *Adding virtual mathematical element*.

Section **ctlHardwareDevices** – other devices

This section contains other elements that have been connected to the system.

- ctlHardwareDevicesCamerasTable** – USB and IP cameras. Chapter 5.6.16 *Adding a camera*.
- ctlHardwareDevicesModemsTable** – GSM modem. Chapter 5.8 *GSM modem settings*.

Section **ctlInternalSensors** – details of system sensors

This section contains detailed information about sensors connected to the system, except for CAN sensors.

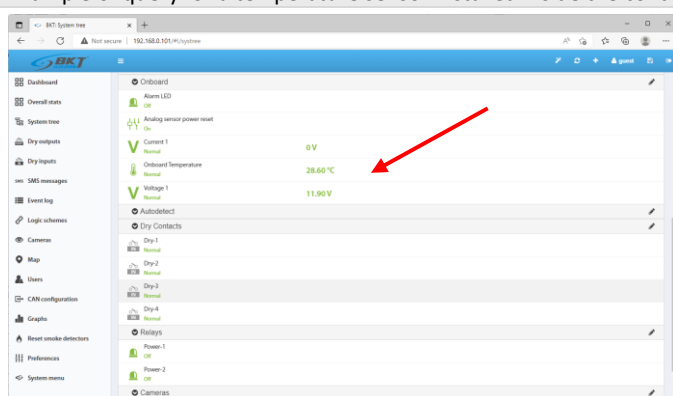
- ctlInternalSensorsDiscretsTable** – inputs for potential-free contacts.
- ctlInternalSensorsAnalogTable** – analogue sensors.
- ctlInternalSensorsOutletsTable** - output modules (relays).

Section **ctlCANSensors** - details of CAN sensors

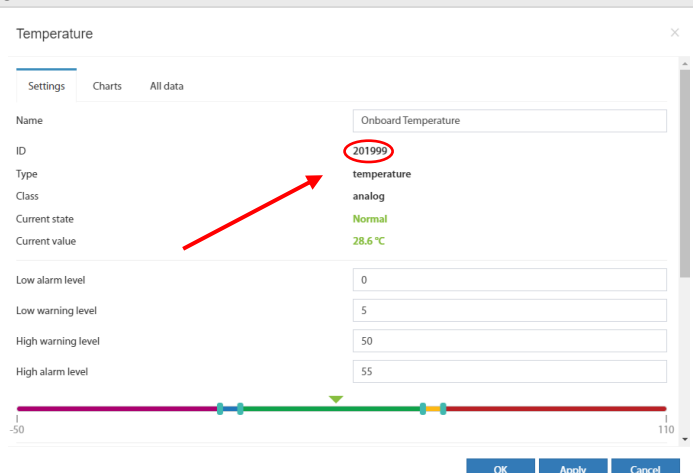
This section contains detailed information about CAN sensors connected to the system.

- ctlCANSensorsDiscretsTable** - inputs for potential-free contacts of CAN modules.
- ctlCANSensorsAnalogTable** – analogue sensors of CAN modules.
- ctlCANSensorsOutletsTable** – output modules (relays) of CAN modules.

Example of query for a temperature sensor installed inside the controller



The required temperature sensor in the system tree.



Identifier of required sensor.

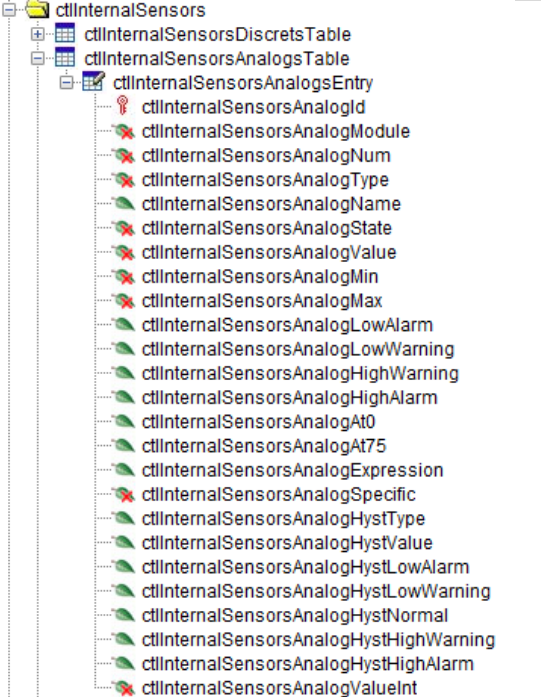


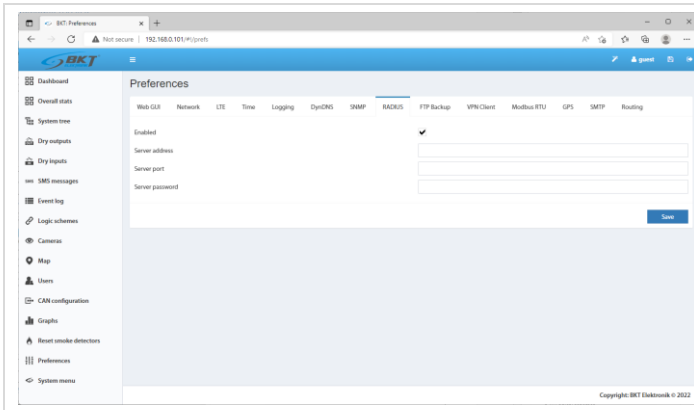
Table **ctlInternalSensorsAnalogTable** from section **ctlInternalSensors**.

To ask for the sensor, use the SNMP object identifier (OID) extended after the dot with the sensor identification number, eg:
 ctlInternalSensorsAnalogValue.201999 (.1.3.6.1.4.1.47394.5.2.1.7.201999) – value read from sensor 201999.

The complete query table for the 201999 sensor is given below.

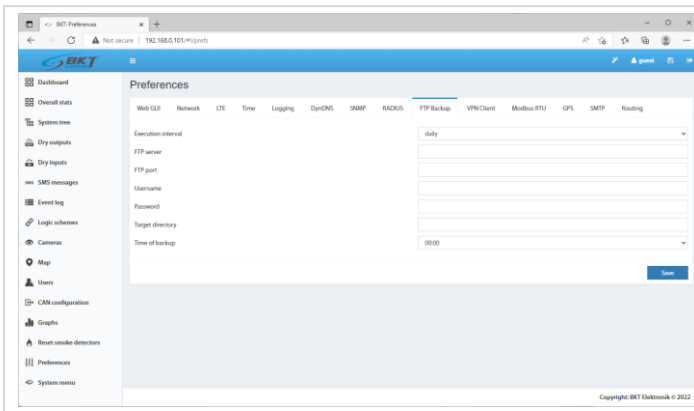
OID – SNMP object identifier	Value	Description
ctlInternalSensorsAnalogId.201999 .1.3.6.1.4.1.47394.5.2.1.1.201999	201999	Identifier of the element in the system
ctlInternalSensorsAnalogModule.201999 .1.3.6.1.4.1.47394.5.2.1.2.201999	2020	The identifier of the module to which this element belongs (onboard sensors)
ctlInternalSensorsAnalogNum.201999 .1.3.6.1.4.1.47394.5.2.1.3.201999	-1	Consecutive number of element in the module
ctlInternalSensorsAnalogType.201999 .1.3.6.1.4.1.47394.5.2.1.4.201999	temperature	Type of element (temperature sensor)
ctlInternalSensorsAnalogName.201999 .1.3.6.1.4.1.47394.5.2.1.5.201999	Onboard Temperature	Name of element
ctlInternalSensorsAnalogState.201999 .1.3.6.1.4.1.47394.5.2.1.6.201999	normal	Element current status
ctlInternalSensorsAnalogValue.201999 .1.3.6.1.4.1.47394.5.2.1.7.201999	28.6	Temperature value read from sensor
ctlInternalSensorsAnalogMin.201999 .1.3.6.1.4.1.47394.5.2.1.8.201999	-50.0	Permissible minimum value of the alarm threshold
ctlInternalSensorsAnalogMax.201999 .1.3.6.1.4.1.47394.5.2.1.9.201999	110.0	Permissible maximum value of the alarm threshold
ctlInternalSensorsAnalogLowAlarm.201999 .1.3.6.1.4.1.47394.5.2.1.10.201999	0.0	Set value of the low alarm threshold
ctlInternalSensorsAnalogLowWarning.201999 .1.3.6.1.4.1.47394.5.2.1.11.201999	5.0	Set value of the low warning threshold
ctlInternalSensorsAnalogHighWarning.201999 .1.3.6.1.4.1.47394.5.2.1.12.201999	45.0	Set value of the high warning threshold
ctlInternalSensorsAnalogHighAlarm.201999 .1.3.6.1.4.1.47394.5.2.1.13.201999	50.0	Set value of the high alarm threshold
ctlInternalSensorsAnalogExpression.201999 .1.3.6.1.4.1.47394.5.2.1.16.201999	x	A function that converts the value read from the sensor into a value that will be processed in the system
ctlInternalSensorsAnalogSpecific.201999 .1.3.6.1.4.1.47394.5.2.1.17.201999	um="°C"	A unit of value read from the sensor
ctlInternalSensorsAnalogHystType.201999 .1.3.6.1.4.1.47394.5.2.1.18.201999	value	Hysteresis type (value – hysteresis enabled)
ctlInternalSensorsAnalogHystValue.201999 .1.3.6.1.4.1.47394.5.2.1.19.201999	0.30	Hysteresis value (0.30°C)
ctlInternalSensorsAnalogValueInt.201999 .1.3.6.1.4.1.47394.5.2.1.25.201999	2860	Integer value read from the element (sensor) (sensor value multiplied by 100)

5.17.10 RADIUS settings



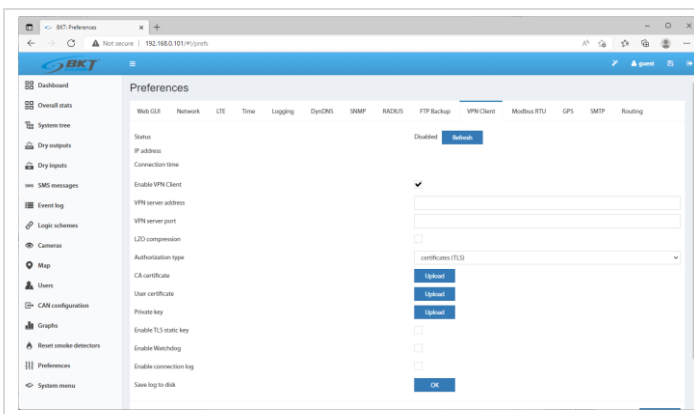
The device supports the RADIUS (Remote Authentication Dial-In User Service) protocol. Select *Preferences*→*RADIUS* from the vertical menu.

5.17.11 FTP backup settings



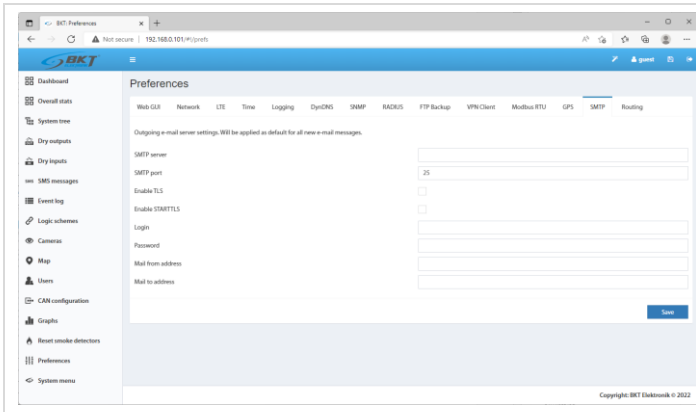
Device settings can be saved to a file on an FTP server on a regular basis. Select *Preferences*→*FTP Backup* from the vertical menu.

5.17.12 VPN client settings



The device uses the OpenVPN library to provide a VPN client. The service configuration is available after selecting *Preferences*-> *VPN Client* from the vertical menu.

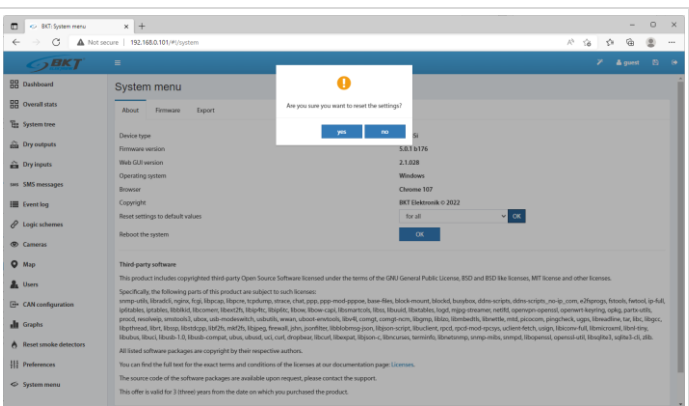
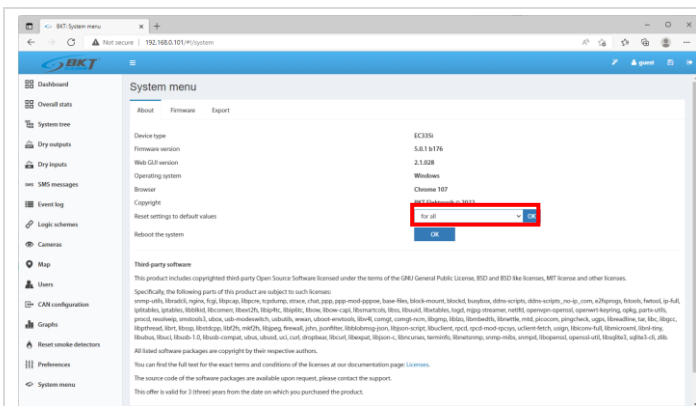
5.17.13 SMTP settings



In the Properties-> SMTP menu it is possible to set the default mail server configuration for the email notifications created later.

5.18 System menu (system management)

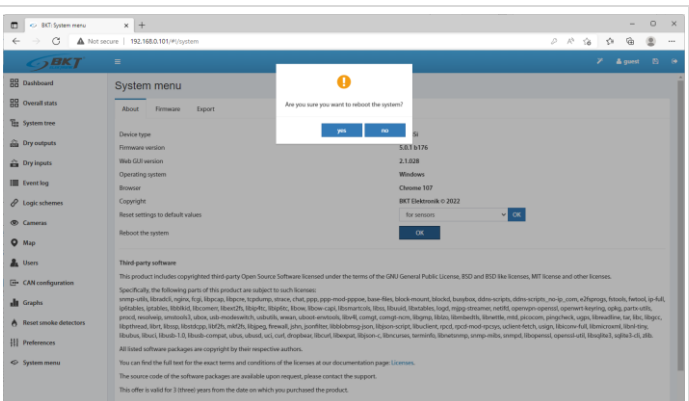
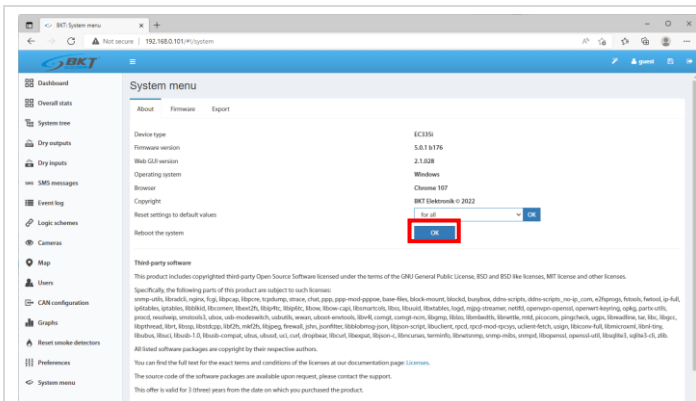
5.18.1 Restoring default settings through a website



Select *System menu*→*About* from the vertical menu, select *Sensors* or *All settings* and click *OK* next to *Reset settings to default values*.

Confirm to reset default values and wait until the process is completed. When resetting all settings, the device's IP number will be changed to the default (192.168.0.101).

5.18.2 Restarting the device



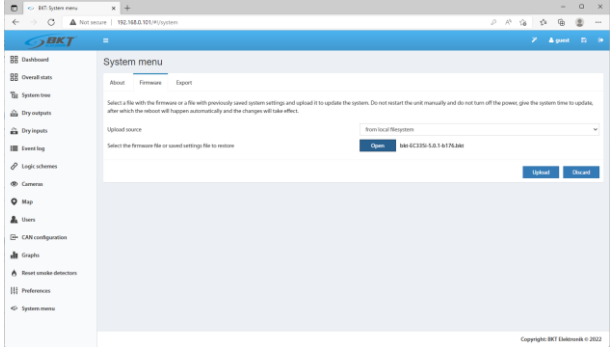
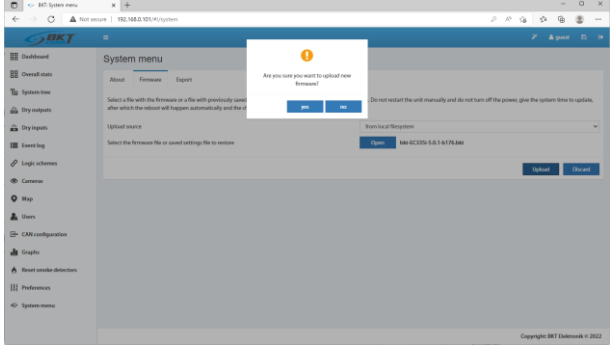
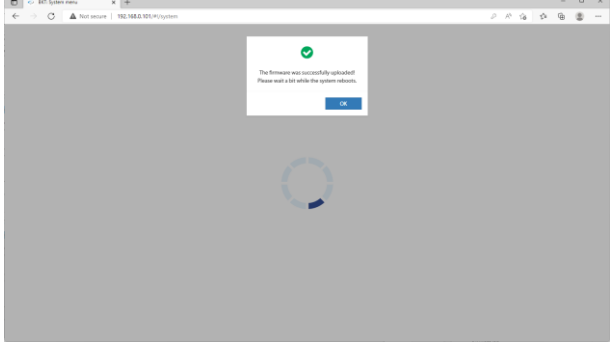

Select *System menu*→*About* from the vertical menu and click *OK* next to *Reboot the system*.

Confirm to restart the device and wait until the restarting process is completed.

5.18.3 Firmware update

Note:

- A file with a firmware update is available at <https://www.bkte.pl>.
- Make sure that the device will not be disconnected from the power supply while updating the firmware.
- After the upgrade, the device may need to be manually reconfigured.

1		<p>Back up the current system settings, see chapter 5.18.4 <i>Export data to a file (Download current settings)</i>.</p>
2		<p>Sometimes the firmware updates consist of two files:</p> <ul style="list-style-type: none"> • system kernel update, e.g. <i>firmware-kernel.bkt</i> • firmware update, e.g. <i>bkt_EC335t-7.0.1-b176.bkt</i> <p>In this case, begin the update from the kernel file.</p> <p>From the vertical menu, select Menu system->Firmware and after clicking on Browse, point to the file with the firmware file update, eg <i>firmware-kernel.bkt</i></p>
3		<p>Click the <i>Upload</i> button and confirm to upload new firmware.</p>
4		<p>Wait until information on the completed update is displayed and the device is restarted. Confirm.</p>
5		<p>Then, the automatic firmware update process will start, and the device will be restarted after the update is completed.</p> <p>The firmware replacing process is signaled by the flashing red ERR LED. The whole process can take several minutes. Do not disconnect the power supply at this time. If you are updating remotely and are unable to observe the LED indicator, do not refresh the page for more than a few minutes.</p>

6		<p>After a few minutes, when green ACT LED is flashing, refresh the browser using the CTRL + F5 keys. You may also need to clear your browser's Cache by clearing your browsing history.</p>
7		<p>If the update consists of two files, repeat the procedure with the second file (eg. <i>bkt_EC335t-7.0.1-b176.bkt</i>) from point 3.</p>
8		<p>It is recommended to restore the factory settings before uploading the configuration from the backed up file, see 6.3 Restoring default settings.</p>
9		<p>Restore the previous configuration. Try to use a file with a backup copy of the system settings, see section 5.18.5 Restoring settings from a file or manually enter required settings.</p>

5.18.4 Export data to a file

	<p>Select <i>Menu_Systemu</i>→<i>Export</i> from the vertical menu.</p> <p>Export sensor data in XML – save the sensor data to an XML file. The file contains max 400 readings from each sensor: 100 readings (every second) from the last 100 seconds 100 readings (every minute) from the last 100 minutes 100 readings (every hours) from the last 100 hours 100 readings (every day) from the last 100 days</p> <p>Export sensor data in CSV – save the sensor data in a CSV file.</p> <p>Save log to disk – save system events to a TXT file.</p> <p>Export log in RSS – system events in the RSS format.</p> <p>Download current settings – save the current device settings to the settings.bkt file.</p>
--	---

5.18.5 Restoring settings from a file

The method of saving data to a file is described in 5.18.4 Export data to a file.

NOTE: The current setting will be overwritten by the settings included in the file. The IP address of the device will not be changed.

METHOD 1.

	<p>Select <i>System menu</i>→<i>Firmware</i> from the vertical menu, click <i>Browse</i> and choose a settings file <i>settings.bkt</i></p> <p>Click the <i>Upload</i> button and confirm to upload new firmware.</p> <p>Wait until the information about the file upload appears, then update and restart the device. Refresh the browser using the CTRL+F5 keys. You may also need to clear your browser's Cache by clearing your browsing history.</p>
--	---

METHOD 2.

To restore the settings:

1. Copy the settings.bkt file to a USB flash drive (pendrive).
2. Connect the flash drive (pendrive) to the mini-B USB socket of the controller using an attached cable and wait for a while.
3. Start of the setting restoration process is indicated by the ERROR light, whereas successful completion of the same is indicated by the ACT light flashing.
4. Restart is restarting.
5. Remove pendrive
6. The device settings have been restored from the file.

6 QUICK START GUIDE

6.1 Connection

1. Connect the analogue sensors to any A1-A4 socket.
2. Connect the RJ45-RJ45 patchcord to the LAN socket and the other end to the computer.
3. Connect the power adapter to the POWER socket.

6.2 Commissioning

After connecting the power supply, the device starts up for several tens of seconds. The flashing ACT LED on the front panel signals that the Linux system on device is fully booted. Before starting the configuration, make sure that the ACT diode is flashing.

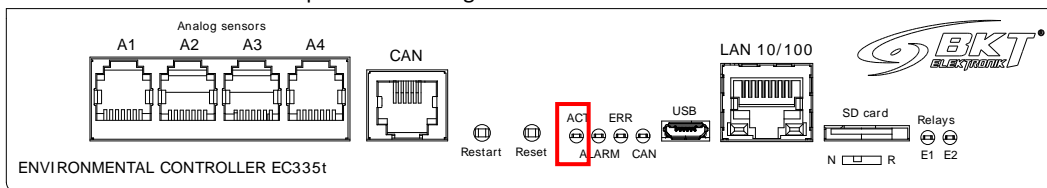
The device may require a restart during configuration, e.g. after saving the network settings. In this case, proceed with the configuration only after the ACT LED lights up.

6.3 Restoring default settings

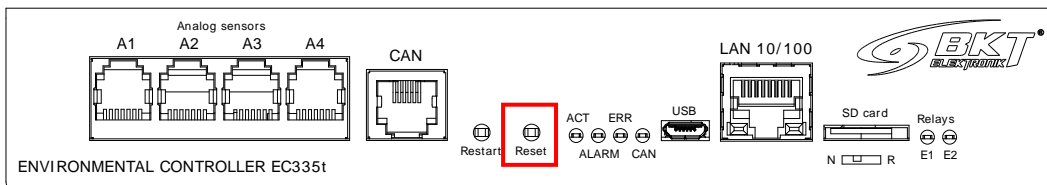
In order to make sure that all settings have default values, it is recommended to reset the default setting before the first start-up.

NOTE: All current settings will be deleted.

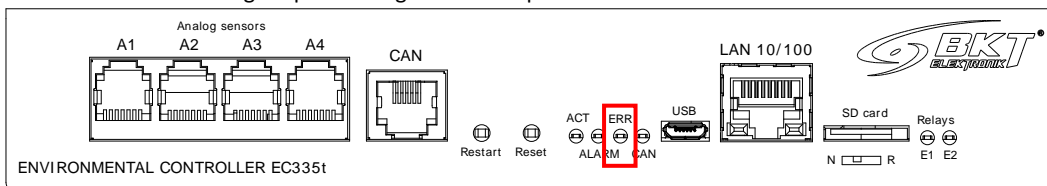
1. Connect the device to the power supply and make sure that the controller has fully started up (the ACT LED is blinking). It may take several tens of seconds to complete the booting.



2. Press and hold for 5 seconds the *Reset* button.



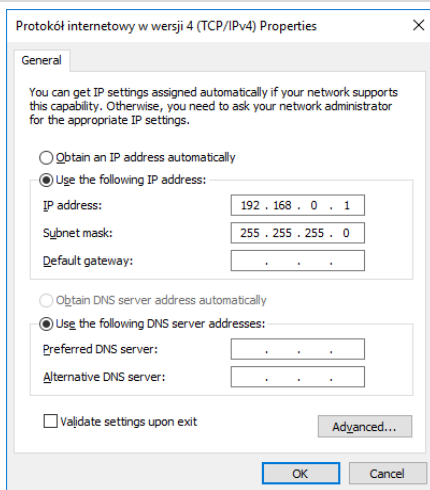
3. The ERROR LED should light up indicating the restore procedure.



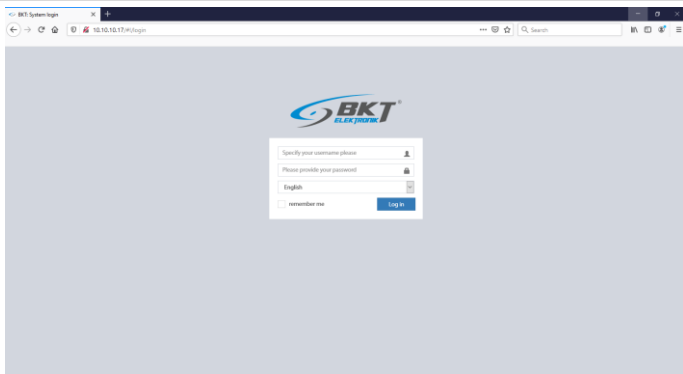
4. When all the LEDs are off, wait for the device to restart.
5. The default settings have been restored. Start configuring the device when the ACT LED starts blinking.

Default settings	
IP address	192.168.0.101
Network mask	255.255.255.0
Network gate	192.168.0.1
DNS server	192.168.0.1
DHCP client	Disabled
Passwords	User: guest; password: guest

6.4 Initial configuration



Configure the computer network card for operation in the same network as EC335t. For example, you can use settings as shown in the figure.

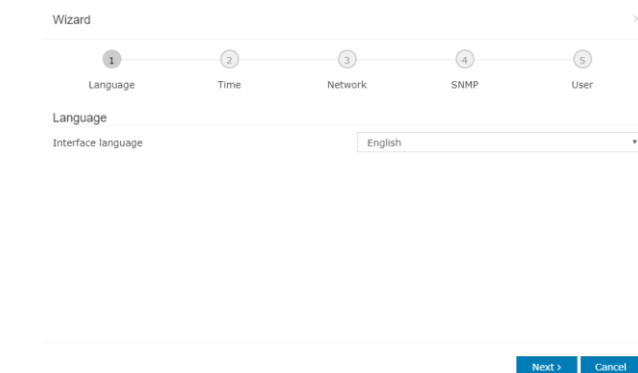


Run the browser and enter `http://192.168.0.101` in the address bar. Enter the following in the login window:

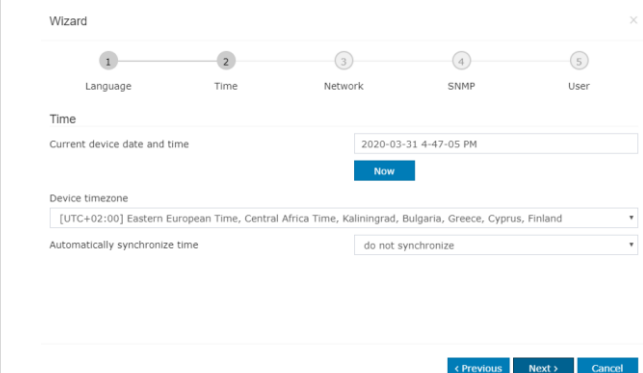
user: guest

password: guest.

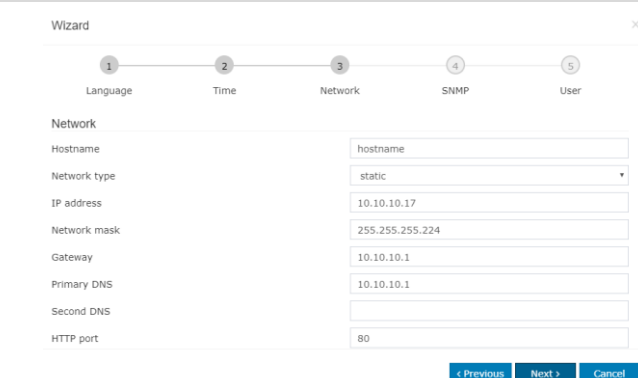
Use the displayed wizard for initial configuration.



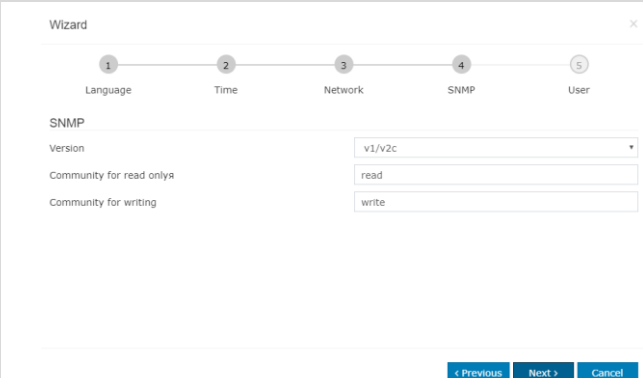
Choose the interface language.



Set the date and time.



If necessary, change the network settings.



If necessary, change the SNMP protocol communication settings.

Wizard

1 Language 2 Time 3 Network 4 SNMP 5 User

Add admin user

Login

Password

User "guest" is not safe and this account will be deleted, because anyone can use it. This step will create a new user with highest access rights (all rights for view/write). Keep your new username and password secure.

Create a new user. Click *Finish* and wait until the configuration is saved and controller rebooted.

6.5 Identification of the controller IP address

```
#
# Date and Time: "Tue Oct 18 10:35:41 2022"
#
# Device type: "EC3351", Firmware version: "5.0.1 b176", Kernel: ""
# Hostname: "hostname", IP: "192.168.0.101", MAC: "7E:FB:FE:87:D8:05"
# LTE IP: "no LTE connection"
#
```

Wiersz 7, kolumna 2 100% Windows (CRLF) UTF-8

It is possible to check the current IP address of the controller, if it has been forgotten. Connect the FAT32 formatted USB flash drive to the powered controller using the attached cable "mini USB B plug - USB A socket". Wait until the ERROR LED flashes once. Disconnect the flash drive and read its contents. There should be a file *system_report.info* containing the data as in the picture on the right.

6.6 User Logging out

Overall stats

Logout

You can log out when you click on the *Logout* button from horizontal menu.

6.7 Configuration of sensor status email notifications

The following procedure allows you to quickly configure email notifications about changes in the status of sensors installed in the system.

System tree

- SNMPGET sensors
- Vital sensors
- Mail messages
- Modbus sensors
- Chart tasks
- Onboard
- Alarm LED
- Alarm sensor power reset
- Onboard Temperature **28.56 °C**
- Voltage 1 11.90 V
- Voltage 2 0 V
- Autodetect
- Dry Contacts
- Dry1
- Dry2
- Dry3
- Dry4

Select *System tree* in the vertical menu.

Click on individual sensors visible in the system that require renaming or adjusting the default assigned alarm thresholds.

Temperature

Settings Charts All data

Name: Onboard Temperature

ID: 201999

Type: temperature

Class: analog

Current state: Normal

Current value: 28.6 °C

Low alarm level: 0

Low warning level: 5

High warning level: 50

High alarm level: 55

Buttons: OK Apply Cancel

Enter corrections to the names of sensors and alarm thresholds. Confirm the changes.

For more information, see section 5.6.1 *Setting the sensor parameters*.

BKT System tree

192.168.0.101/M/system

System tree

- SNMPGET sensors
- Virtual sensors
- Web messages
- Modbus sensors
- Dial tasks
- Onboard
- Alarm LED
- Analog sensor power no
- Onboard Temperature
- Voltage 1
- Voltage 2
- Autodetect
- Dry Contacts
- Dry 1
- Dry 2
- Dry 3
- Dry 4

Add a new element

- Group
- E-Mail
- SNMP Trap
- SMS
- Web-SMS
- SMS-Gate
- Dial Task
- HTTP request

Buttons: Cancel

Add email notification.

E-Mail

Name: alarm-email

ID: -

Type: mailer

Class: notifier

SMTP server: smtp.mail.pl

SMTP port: 587

Enable TLS:

Enable STARTTLS:

Login: alert@mail.pl

Password:

Mail from address: alert@mail.pl

Mail to address: admin@mail.pl

Message subject: sensor alarm

Message text: Logic %4\n--\nDefinition\n%1\nCurrent sensor state\n%2\n--\nSystem time: %3

Legend:

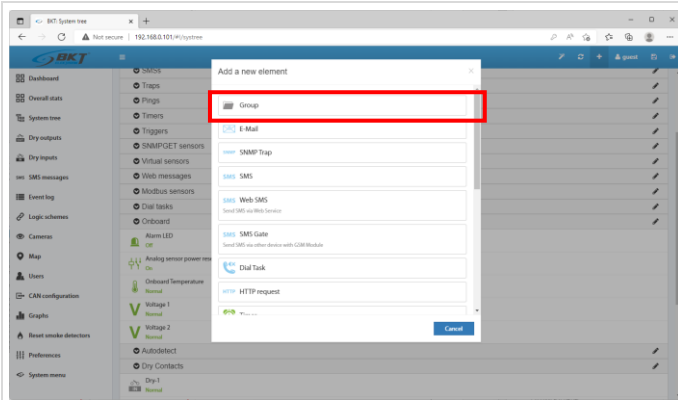
- %1 - logic definition
- %2 - state of sensors
- %3 - date and time
- %4 - logic name
- %5[id] - sensor name (by identifier or %8)
- %6[id] - sensor state (by identifier or %8)
- %7[id] - sensor value (by identifier or %8)
- %8 - last modified sensor id
- \n - new line

Buttons: OK Test Cancel

Configure the email notification. Enter the details of the email account from which the messages will be sent. Enter the subject of the message and recipients (up to 10 in one notification). The text of the message does not need to be changed, it can remain the default.

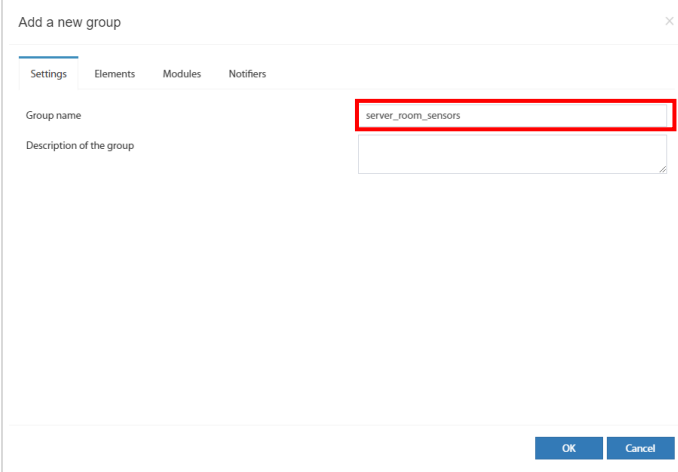
Confirm the changes.

For more information, see 5.6.3 *Adding an email notification*.

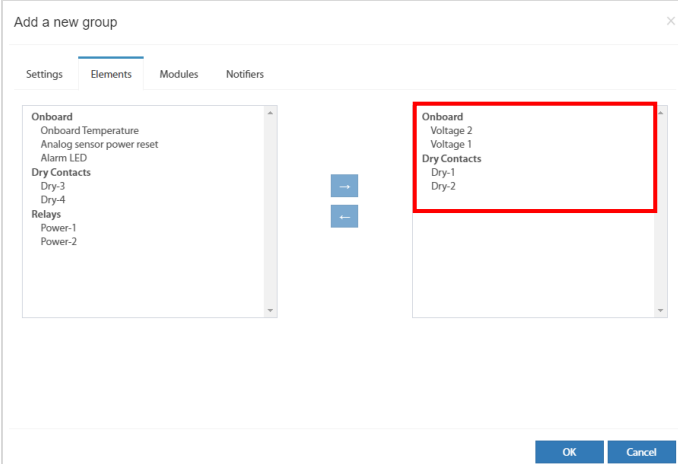


Add group of elements.

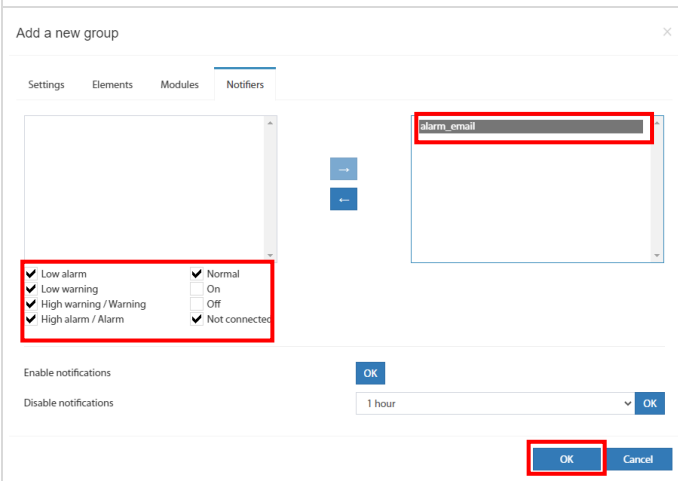
For more information, see 5.6.2 *Adding a new group*.



In the Settings tab, name the group of elements. This name will appear in the email notification.



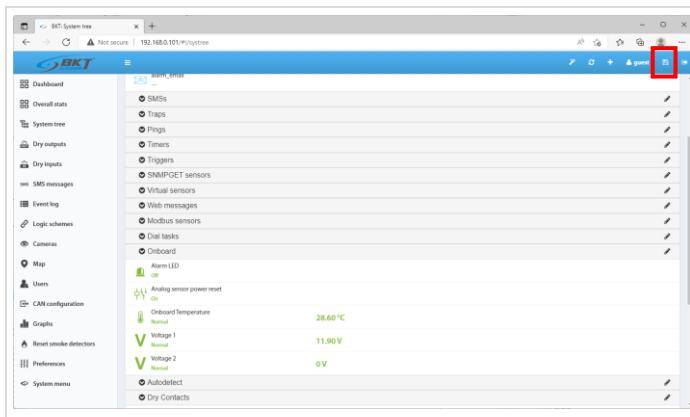
In the Elements tab, move all sensors that are to send notifications to the right pane.



From the Notifications tab, move the previously configured email notification to the right window.

Check the types of sensor status changes you want to be informed about.

Confirm the changes.



Save changes to non-volatile memory.

Notifications of changes to the selected sensors have been configured.

7 DOCUMENT REVISIONS

Version	Changes	Date
1	Initial version	May 2017
2	Updated with hardware modifications	January 2018
3	System structure section. General update	June 2018
4	EC335 controller in a new housing. Hardware part has been extended - assembly and connection of devices	February 2019
5	The device configuration description has been extended	May 2019
6	Updated with new software functionalities 2.8.2b177	September 2020
7	New controller version EC335i	October 2022
8	Corrected power backup information	March 2023
9	New version of the extension module - EE321t	September 2023
10	New controller version EC335t	November 2023
11	New version of point leak sensor ES359	February 2024