

TP

User Manual

Software



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1 Introduction

The TP Touch Point is a modern comfort management wall panel with two most popular open communication protocols: Modbus RTU/ASCII and BACnet MS/TP. The Touch Point is available in different configurations of sensors (temperature, CO₂, and humidity), colors, and versions with or without a display. The panel is equipped with an interactive TFT touchscreen, touch buttons, and glass panel.

The panel can be configured using the iSMA Configurator software or Modbus registers/BACnet objects. It fits most of standard junction boxes in Europe and can easily be installed using a wall back box.

1.1 Revision History

Rev.	Date	Description
1.0	20 Apr 2022	First edition

Table 1. Revision history

2 Communication Protocols

The TP panel supports Modbus RTU/ASCII and BACnet MS/TP communication protocols, using 2 RJ45 sockets and a screw terminal (one RS485 port).

Note: A communication protocol is selected by setting a second switch on the DIP switch on the back of the panel:

- **Off:** Modbus RTU/ASCII (default);
- **On:** BACnet MS/TP.

The Modbus address of a server device is set using the rotary switch.

Note: If the rotary switch is set to 0, the address is read from the ADDRESS register/object (decimal address: 22). See [Communication Parameters](#).

Other communication parameters such as baud rate, number of data/stop bits, or parity bit are set using relevant Modbus registers or BACnet objects.

2.1 RS485 Connection

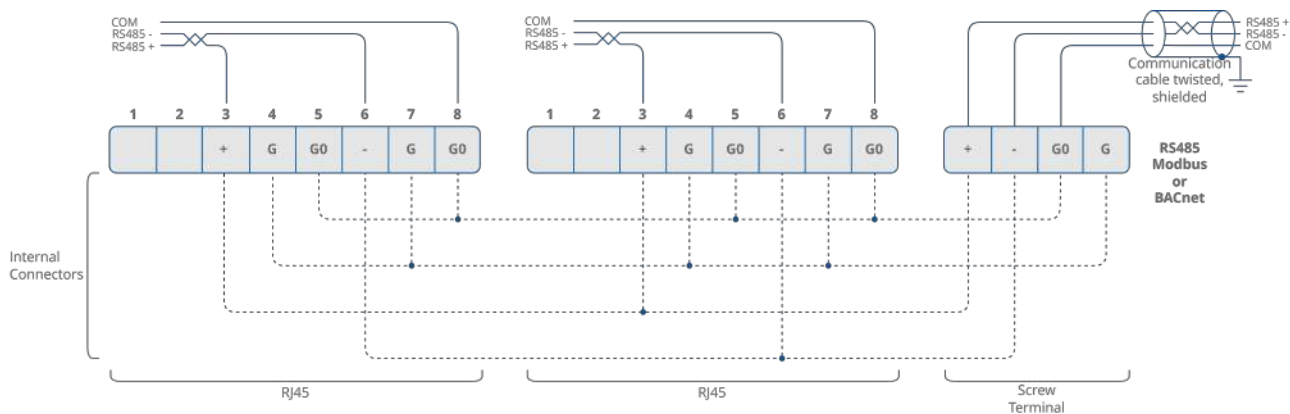


Figure 1. RS485 communication diagram

2.2 RS485 Network Termination

Transmission line effects often present a problem for data communication networks. These problems include reflections and signal attenuation. To eliminate the presence of reflections of signal from the end of the cable, the cable must be terminated at both ends with a resistor across the line adequate to its characteristic impedance. Both ends must be terminated since the propagation is bidirectional. In case of an RS485 twisted pair cable this termination is typically 120 Ω.

Note: A termination resistor can be added with a third switch on the DIP switch on the back of the panel:

- **off:** termination resistor disconnected (default);
- **on:** termination resistor added.

3 Communication Parameters

The TP panel is capable of simultaneously exchanging data on two buses, RS485 and USB.

3.1 RS485

The RS485 bus is accessible with RJ45 or 4-pin green screw connector.

There are 3 communication protocols that can be selected using the DIP switch 2 and PROTOCOL field:

	DIP Switch 2	PROTOCOL (23)
Modbus RTU	Off	0
Modbus ASCII	Off	1
BACnet MS/TP	On	N/A

Table 2. Setting communication protocol

The Modbus register reading the protocol set on the DIP switch is the following:

PROTOCOL_DIPSWITCH: reads the communication protocol set on the DIP switch;

- Modbus register: 30003;
- BACnet object: N/A.

3.1.1 Setting MAC Address

The device's MAC address can be set using one of the following methods:

- rotary switch: sets addresses from 1-9; if 0:
- ADDRESS (decimal address: 22).

The Modbus register reading the address set on the rotary switch is the following:

ADDRESS_ROTARY_SWITCH: reads the Modbus address set on the rotary switch (0 means the address is read from the ADDRESS register/object);

- Modbus register: 30002;
- BACnet object: N/A.

3.1.2 Setting Communication Parameters

BACNET_DEVICE_ID: sets the device's BACnet ID;

- Modbus register: 40015;
- BACnet object: DEVICE, property: Object Identifier;

BAUD_RATE: sets a baud rate of the panel. The baud rate is calculated according to the formula: baud rate = (register's value)·10. The default value is 11520 (115200 bps);

- Modbus register 40017;
- BACnet object: DEVICE, property: 3084.

Value	Baud Rate (bps)
480	4800
960	9600
1920	19200
3840	38400
5760	57600
7680	76800
11520	115200 (default)

Table 3. Baud rate values

STOP_BITS: determines a number of stop bits in a Modbus frame according to the following table:

Value	No. of Stop Bits
1	1 (default)
2	2

Table 4. Values of the STOP_BITS register

- Modbus register 40018;
- BACnet object: N/A;

DATA_BITS: determines a number of data bits in a Modbus frame (the Modbus ASCII protocol requires 7 bits):

Value	No. of Data Bits
7	7
8	8 (default)

Table 5. Values of the DATA_BITS register

- Modbus register 40019;
- BACnet object: N/A;

PARITY_BIT: each byte of data being transferred may have an additional protection of a parity bit added before stop bit (bits). The 16-bit register determines a number of added parity bits according to the table below:

Value	No. of Parity Bits
0	None (default)
1	Odd
2	Even

Table 6. Values of the PARITY_BITS register

- Modbus register 40020;
- BACnet object: N/A;

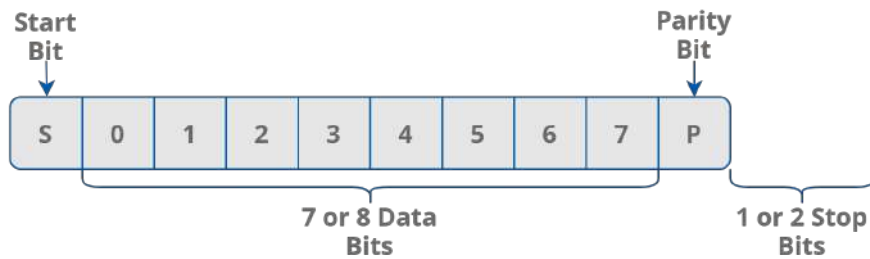


Figure 2. Modbus frame

Note: The BACnet protocol requires specific values of stop bits, data bits, and a parity bit of 1, 8, and none, respectively. Therefore, the user settings for these objects are not applicable.

REPLAY_DELAY: determines a number of milliseconds before the panel answers the request. This time is used to extend the interval between the request and response. The default value of 0 means no delay (the response is sent once during the 3,5 character required by the Modbus RTU protocol).

- Modbus register 40021;
- BACnet object: N/A.

WARNING!

The above parameters are remembered, but NOT automatically set. In order to set these parameters to the panel, it is required to perform one of the following actions after entering required values:

- restart the panel;
- send a reload settings command (0: 0x2FF, DEVICE (property: 3030): 0x2FF, iSMA Configurator, or FCU Updater).

Incoming data frames are counted and presented through the following parameters:

RECEIVED_FRAMES: shows the number of received frames. The register's value is reset at the start of the panel and at the change of transmission parameters;

- Modbus register: 30004;
- BACnet object: DEVICE, property: 5101;

ERROR_FRAMES: shows the number of error messages (shorter than 3 or with incorrect CRC value) received by the panel from the time of the last power-up. The register's value is reset at the start of the panel and at the change of transmission parameters;

- Modbus register: 30006;

- BACnet object: DEVICE, property: 5103;

TRANSMITTED_FRAMES: shows the number of sent frames. The register's value is reset at the start of the panel and at the change of transmission parameters;

- Modbus register: 30008;
- BACnet object: DEVICE, property: 5104.

3.2 USB

A USB bus is accessible through the USB C port at the bottom of the device. Device identifies itself as a USB HID, and can be configured using the iSMA Configurator and FCU Updater software.

4 User Interface Parameters

Direct interaction with the TP device is possible via user interface (buttons and display, if available) by default. The panel can be activated or inactivated using the following parameter or in the iSMA Configurator:

DEVICE_CONFIGURATION, bit 11: PANEL_OFF

- Modbus register: 40205;
- BACnet object: BO9, property: Present Value.

4.1 Display

The TP panel is available in versions with or without an LCD display. If available, the display functions can be activated or inactivated using the following parameter or in the iSMA Configurator:

DEVICE_CONFIGURATION, bit 3: LCD_BACKLIGHT_ACTIVE

- Modbus register: 40205;
- BACnet object: BO3, property: Present Value.

In versions with a display, during a normal operation, the display shows measured values for all sensors available in the panel and a temperature setpoint (if available), with parameter's shortcut name and a proper unit.

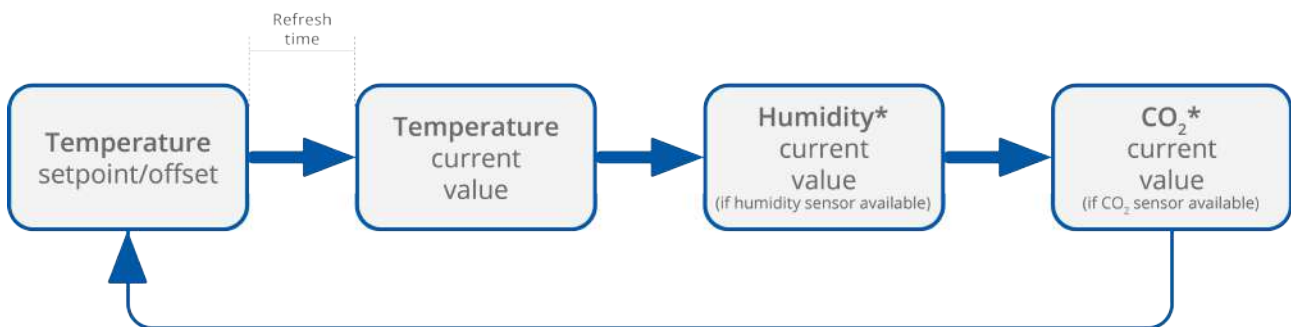


Figure 3. The display sequence

The display configuration parameters include the following (these functions can be edited directly in the parameters or in the iSMA Configurator):

REFRESH_TIME: sets the duration of the display time of particular parameters. When the refreshing time elapses, the next parameter is displayed according to the sequence of parameters display. The default value is 5 seconds (each parameter is displayed for 5 seconds). The maximum refreshing time is 60 seconds.

- Modbus register: 40217;
- BACnet object: AO13, property: Present Value;

TEMPERATURE_CONFIGURATION: allows to configure the temperature sensor with two bits:

- ACTIVE, bit 0: activates or deactivates the sensor;
 - Modbus register: 40316;
 - BACnet object: AI4, property: Out Of Service;
- THIRD_POINT_ACTIVE, bit 4: enables or disables decimal values in the sensor;
 - Modbus register: 40316;
 - BACnet object: AI4, property: 4202;

Bit	Name	0	1
0	ACTIVE	Inactive	Active (default)
4	THIRD_POINT_ACTIVE	No decimal	Decimal (default)

Table 7. Configuration of temperature sensor

HUMIDITY_CONFIGURATION: allows to configure the humidity sensor with two bits:

- ACTIVE, bit 0: activates or deactivates the sensor;
 - Modbus register: 40317;
 - BACnet object: AI5, property: Out Of Service;
- THIRD_POINT_ACTIVE, bit 4: enables or disables decimal values in the sensor;
 - Modbus register: 40317;
 - BACnet object: AI5, property: 4202;

Bit	Name	0	1
0	ACTIVE	Inactive	Active (default)
4	THIRD_POINT_ACTIVE	No decimal	Decimal (default)

Table 8. Configuration of humidity sensor

CO2_CONFIGURATION: allows to activate or deactivate the CO2 sensor:

- ACTIVE, bit 0: activates or deactivates the sensor;
 - Modbus register: 40318;
 - BACnet object: AI6, property: Out Of Service;

Bit	Name	0	1
0	ACTIVE	Inactive	Active (default)

Table 9. Activating CO2 sensor

SETPOINT_CONFIGURATION: allows to configure the temperature setpoint with five bits:

- VISIBLE, bit 0: enables or disables the temperature setpoint to be visible on the panel's display;
 - Modbus register: 41513;
 - BACnet object: AV56, property: Out Of Service;
- EDITABLE, bit 1: enables or disables editing of the temperature setpoint locally from the panel;
 - Modbus register: 41513;
 - BACnet object: AV56, property: 4200;
- OPERATING_MODE, bit 2: allows to set the operating mode of the temperature setpoint configuration;
 - Modbus register: 41513;
 - BACnet object: BO55, property: Out Of Service;
- SETPOINT_DISPLAY, bit 3: allows to configure the temperature setpoint display;
 - Modbus register: 41513;
 - BACnet object: BO56, property: Out Of Service;

- THIRD_POINT_ACTIVE, bit 4: enables or disables decimal values in the temperature setpoint;
 - Modbus register: 41513;
 - BACnet object: AV56, property: 4202;

Bit	Name	0	1
0	Visible	Not visible	Visible (default)
1	Editable	Not editable	Editable (default)
2	Operating mode	Changing offset	Changing setpoint (default)
3	Setpoint display	Show/change offset (OFFSET_SETPOINT value)	Show/change effective setpoint (EFFECTIVE_SETPOINT value)
4	ThirdPointActive	No decimal	Decimal (default)

Table 10. Temperature setpoint configuration

4.1.1 Display Brightness

Display brightness switches between three illumination modes in time:

- active mode;
- idle mode;
- standby mode.

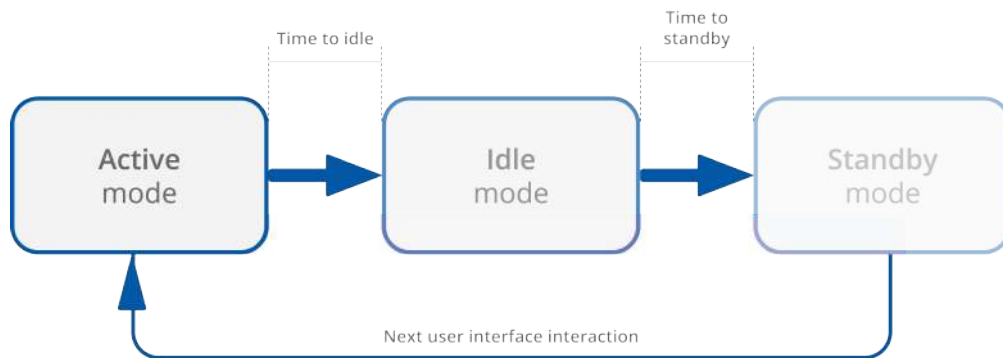


Figure 4. Brightness modes sequence

Active Mode Settings

BACKLIGHT_LCD_ACTIVE: contains a value of the LCD display brightness in the active mode (expressed in %). The default value is 60%.

- Modbus register: 40207;
- BACnet object: AO3, property: Present Value;

BACKLIGHT_LCD_TIME_TO_IDLE: allows to set the time, after which the LCD display goes from the active mode to idle (expressed in seconds). The default value is 10 seconds.

- Modbus register: 40210;
- BACnet object: AO6, property: Present Value;

Idle Mode Settings

BACKLIGHT_LCD_IDLE: contains a value of the LCD display brightness in the idle mode (expressed in %). The default value is 40%.

- Modbus register: 40208;
- BACnet object: AO4, property: Present Value.

BACKLIGHT_LCD_TIME_TO_STANDBY: allows to set the time, after which the LCD display goes from the idle mode to standby (expressed in seconds). The default value is 5 seconds.

- Modbus register: 40211;
- BACnet object: AO7, property: Present Value.

Standby Mode Settings

BACKLIGHT_LCD_STANDBY: contains a value of the LCD display brightness in the standby mode (expressed in %). The default value is 0%.

- Modbus register: 40209;
- BACnet object: AO5, property: Present Value.

The panel stays in the standby mode until next user interface interaction.

Current Display Brightness

BACKLIGHT_LCD: contains a current display illumination value.

- Modbus register: 30201;
- BACnet object: AI1, property: Present Value.

4.2 Keypad

A front panel of the panel is equipped with LEDs that illuminate buttons and other symbols available on the panel's keypad. The LEDs can be activated or inactivated using the following parameter or in the iSMA Configurator:

DEVICE_CONFIGURATION, bit 4: KEYPAD_BACKLIGHT_ACTIVE

- Modbus register: 40205;
- BACnet object: BO4, property: Present Value.

Keypad brightness switches between three illumination modes in time:

- active mode;
- idle mode;
- standby mode.

4.2.1 Keypad Brightness

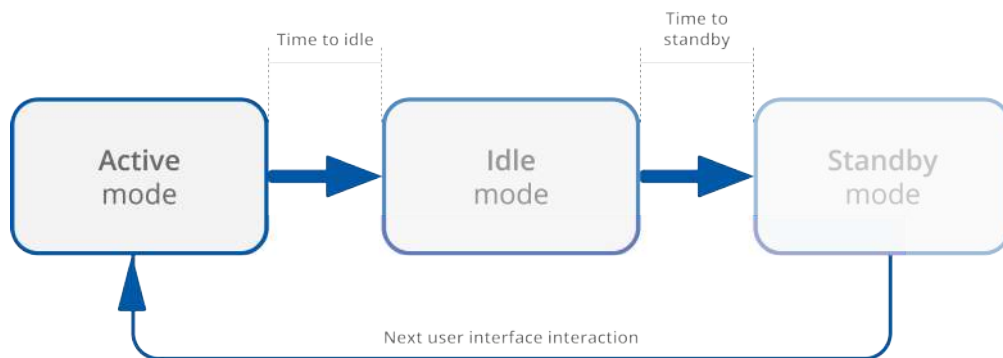


Figure 5. Brightness modes sequence

Active Mode Settings

BACKLIGHT_KEYPAD_ACTIVE: contains a value of the LCD display brightness in the active mode (expressed in %). The default value is 60%.

- Modbus register: 40212;
- BACnet object: AO8, property: Present Value;

BACKLIGHT_KEYPAD_TIME_TO_IDLE: allows to set the time, after which the LCD display goes from the active mode to idle (expressed in seconds). The default value is 10 seconds.

- Modbus register: 40215;
- BACnet object: AO11, property: Present Value;

Idle Mode Settings

BACKLIGHT_KEYPAD_IDLE: contains a value of the LCD display brightness in the idle mode (expressed in %). The default value is 40%.

- Modbus register: 40213;
- BACnet object: AO9, property: Present Value.

BACKLIGHT_KEYPAD_TIME_TO_STANDBY: allows to set the time, after which the LCD display goes from the idle mode to standby (expressed in seconds). The default value is 5 seconds.

- Modbus register: 40216;
- BACnet object: AO12, property: Present Value.

Standby Mode Settings

BACKLIGHT_KEYPAD_STANDBY: contains a value of the LCD display brightness in the standby mode (expressed in %). The default value is 0%.

- Modbus register: 40214;
- BACnet object: AO10, property: Present Value.

The panel stays in the standby mode until next user interface interaction.

Current Display Brightness

BACKLIGHT_KEYPAD: contains a current display illumination value.

- Modbus register: 30202;
- BACnet object: AI2, property: Present Value.

4.3 Touchscreen

The TP panel is equipped with a touchscreen with 5 buttons for occupancy, temperature (+/-), and fan (+/-) control. The touchscreen buttons can be activated or inactivated using the following parameter or in the iSMA Configurator:

DEVICE_CONFIGURATION, bit 12: KEYPAD_OFF

- Modbus register: 40205;
- BACnet object: BO10, property: Present Value.

Each available button operates in two modes:

- short press: minimal touch time: 70 ms, maximal touch time: 400 ms;
- long press: minimal touch time: 400 ms, maximal touch time: 11 s.

Functionality assigned to a given button can limit mentioned operation modes to any combination of the two.

4.4 Navigation LED

The TP panel is equipped with a navigation LED, which allows to locate the panel in the dark. The navigation LED can be configured using the following parameters or in the iSMA Configurator:

NAVIGATIONAL_LED_MODE: allows to set a mode of the navigational LED according to the table below:

Bit	Mode if Bit Active
0	Off
1	On (default)
2	Active on idle and standby modes
3	Active on idle mode only
4	Active on standby mode only

Table 11. Navigation LED modes

- Modbus register: 30231;
- BACnet object: MSV5, property: Present Value;

NAVIGATIONAL_LED_BRIGHTNESS: allows to set the navigational LED brightness. In the range of 0-100%, the default value is 100%;

- Modbus register: 30232;
- BACnet object: AO22, property: Present Value;

NAVIGATIONAL_LED_RED: allows to set a red component intensity is the navigational LED. In the range of 0-100%, the default value is 100%;

- Modbus register: 30233;
- BACnet object: AO23, property: Present Value;

NAVIGATIONAL_LED_GREEN: allows to set a green component intensity is the navigational LED. In the range of 0-100%, the default value is 100%;

- Modbus register: 30234;
- BACnet object: AO24, property: Present Value;

NAVIGATIONAL_LED_BLUE: allows to set a blue component intensity is the navigational LED. In the range of 0-100%, the default value is 100%;

- Modbus register: 30235;
- BACnet object: AO25, property: Present Value.

4.5 Buzzer

The TP panel is equipped with a buzzer, which informs about a detected touch with a short sound. The buzzer also provides a CO2 alarm function, which emits a sounds once the CO2 level exceeds a set alarm value. The alarm can be confirmed and muted by pressing any button. The buzzer can be activated or inactivated using the following parameter or in the iSMA Configurator:

DEVICE_CONFIGURATION, bit 0: BEEPER_ACTIVE

- Modbus register: 40205;
- BACnet object: BO0, property: Present Value.

The buzzer can be configured using the following parameters or in the iSMA Configurator:

BUZZER_VOLUME: allows to set a buzzer volume (expressed in %). The default value is 50%.

- Modbus register: 40323;
- BACnet object: AO27, property: Present Value;

BUZZER_FREQUENCY: allows to set a buzzer frequency (expressed in Hz). In the range of 20-20000 Hz, the default value is 400 Hz;

- Modbus register: 40324;
- BACnet object: AO28, property: Present Value.

4.6 Operating User Interface



Figure 6. User interface buttons and display

4.6.1 Temperature Setpoint

In order to change a temperature setpoint on a touchscreen, use plus (+) and minus (-) buttons:

- 1 press of a plus button enters the temperature setpoint editing mode;
- press a plus button (single press or long press) to increment the temperature setpoint by a step value set in the SETPOINT_STEP register/object (decimal address: 1507);
- press a minus button (single press or long press) to decrement the temperature setpoint by a step value set in the SETPOINT_STEP register/object (decimal address: 1507);
- stop pressing buttons when the required value is reached; the display will end the editing mode after a time set in the EXIT_EDIT_TIME register/object (decimal address: 223).

An unavailable action is signaled by a double beep.

4.6.2 Fan Control

In order to change a fan mode on a touchscreen, use small fan and big fan buttons. Pressing either of the buttons changes the fan mode to one of the available:

- off (no icon on a fan control panel is lit);
- 1-speed manual mode (first left circle icon on a fan control panel is lit);
- 2-speed manual mode (two circle icons on a fan control panel are lit);
- 3-speed manual mode (three circle icons on a fan control panel are lit);
- auto (AUTO icon on a fan control panel is lit).

An unavailable action is signaled by a double beep.

4.6.3 Occupancy

To change an occupancy status, use an occupancy icon in the top right corner of the panel. Pressing the icon inside the circle changes the occupancy status.

4.6.4 CO2 Alarm

If a CO₂ alarm occurs, it can be switched off by pressing any button on the touchscreen (see [CO2 Alarm](#)).

5 Sensors Parameters

The TP panel supports 4 types of sensors, all of which are equipped with configurable software filter and user offset. Values measured by sensors can be shown on the device's display (if available) or read through communication protocols.

Information about available sensors can be read from the following register or in the iSMA Configurator:

SENSORS: contains an information about the sensors built-in the panel according to the table below (if the bit is active, it means the sensor is built-in in the panel):

Bit	Built-in Sensors
0	Humidity sensor
1	CO ₂ sensor
2	NTC sensor
3	N/A

Table 12. Sensors built-in in the panel

- Modbus register: 30029;
- BACnet object: MS10, property: Present Value.

5.1 Temperature Sensor

A temperature sensor is a standard equipment in the TP panel. The temperature sensor's configuration data is available in the following parameters or in the iSMA Configurator:

TEMPERATURE_SENSOR: indicates a current temperature value with offset;

- Modbus register: 30301;
- BACnet object: AI4, property: Present Value;

TEMPERATURE_SENSOR_OFFSET: allows to set an offset value for the temperature sensor (correction to the temperature sensor's value). The default value is 0;

- Modbus register: 40304;
- BACnet object: AI4, property: 4205;

TEMPERATURE_FILTER: allows to set a filtering value for the temperature sensor (expressed in seconds). The default value is 2 seconds;

- Modbus register: 40307;
- BACnet object: AI4, property: 4003.

5.2 Humidity Sensor (Optional)

A humidity sensor is an optional equipment in the TP panel. It is marked with a letter H in a product code, for example: TP-H (means the panel is equipped with a temperature sensor and humidity sensor). The humidity sensor's configuration data is available in the following parameters or in the iSMA Configurator:

HUMIDITY_SENSOR: indicates a current humidity value with offset;

- Modbus register: 30302;
- BACnet object: AI5, property: Present Value;

HUMIDITY_SENSOR_OFFSET: allows to set an offset value for the humidity sensor (correction to the humidity sensor's value). The default value is 0;

- Modbus register: 40305;
- BACnet object: AI5, property: 4205;

HUMIDITY_FILTER: allows to set a filtering value for the humidity sensor (expressed in seconds). The default value is 2 seconds.

- Modbus register: 40308;
- BACnet object: AI5, property: 4205.

5.3 CO2 Sensor (Optional)

A CO2 sensor is an optional equipment in the TP panel. It is marked with a letter C in a product code, for example: TP-C (means the panel is equipped with a temperature sensor and CO2 sensor). The CO2 sensor's configuration data is available in the following parameters or in the iSMA Configurator:

CO2_SENSOR: indicates a current CO2 value with offset;

- Modbus register: 30303;
- BACnet object: AI6, property: Present Value;

CO2_OFFSET: allows to set an offset value for the CO2 sensor (correction to the CO2 sensor's value). The default value is 0;

- Modbus register: 40306;
- BACnet object: AI6, property: 4205;

CO2_FILTER: allows to set a filtering value for the CO2 sensor (expressed in seconds). The default value is 2 seconds;

- Modbus register: 40309;
- BACnet object: AI6, property: 4003.

5.4 Temperature Setpoint

The TP panel has a feature of setting a temperature setpoint and sending it through communication protocols to any temperature control device. The temperature setpoint value is configurable through the following parameters or in the iSMA Configurator:

EFFECTIVE_SETPOINT: indicates a sum of the temperature actual setpoint value and offset. The register contains a value multiplied by 10;

- Modbus register: 41502;
- BACnet object: AI3, property: Present Value;

SETPOINT_VALUE: allows to set an actual temperature setpoint value. After reset, the DEFAULT_SETPOINT register's value is set to the SETPOINT_VALUE register. The register contains a value multiplied by 10. The value range is 0-500 (0-50°C);

- Modbus register: 41501;

- BACnet object: AV56, property: Present Value;

DEFAULT_SETPOINT: contains a temperature default setpoint value. The default setpoint is set as a setpoint value after the panel's restart or power supply reconnection (the value of the DEFAULT_SETPOINT register is written to the SETPOINT_VALUE register). The register contains a value multiplied by 10. In the range of 0-500 (0-50°C), the default value is 210 (21°C);

- Modbus register: 41503;
- BACnet object: AV57, property: Present Value;

OFFSET_SETPOINT: allows to set an offset value to the temperature setpoint (correction to the setpoint's value). The register contains a value multiplied by 10. In the range of 0-500 (0-50°C), the default value is 0 (0°C);

- Modbus register: 41504;
- BACnet object: AV58, property: Present Value.

Above parameters are limited to certain values stored in the following parameters:

SETPOINT_LOW_LIMIT: allows to set a minimum temperature setpoint value, which can be set by user. The register contains a value multiplied by 10. The default value is 180 (18°C);

- Modbus register: 41505;
- BACnet object: AV56, property: Low Limit;

SETPOINT_HIGH_LIMIT: allows to set a maximum temperature setpoint value, which can be set by user. The register contains a value multiplied by 10. The default value is 240 (24°C);

- Modbus register: 41506;
- BACnet object: AV56, property: High Limit;

OFFSET_RANGE: allows to set a limit for temperature offset value. The register contains a value multiplied by 10. In the range of 0-500 (0-50°C), the default value is 30 (3°C);

- Modbus register: 41507;
- BACnet object: AV59, property: Present Value.

5.4.1 User Interface for Temperature Setpoint

In the TP panel, the temperature setpoint can also be configured using a touchscreen (see [Operating User Interface](#)). This way, it is possible to change either the SETPOINT_VALUE or OFFSET_SETPOINT depending on the configuration of bits 1 and 2 of the SETPOINT_CONFIGURATION and the SETPOINT_STEP and EXIT_EDIT_TIME parameters:

SETPOINT_CONFIGURATION, bit 1: EDITABLE: enables or disables editing of the temperature setpoint locally from the panel;

- Modbus register: 41513;
- BACnet object: AV56, property: 4200;

SETPOINT_CONFIGURATION, bit 2: OPERATING_MODE: allows to set the operating mode of the temperature setpoint configuration;

- Modbus register: 41513;
- BACnet object: BO55, property: Out Of Service;

Bit	Name	0	1
1	Editable	Not editable	Editable (default)
2	Operating mode	Changing offset	Changing setpoint (default)

Table 13. Temperature setpoint configuration

For description of all bits of the SETPOINT_CONFIGURATION parameter see [User Interface Parameters](#).

SETPOINT_STEP: allows to set a temperature's setpoint step value. If the setpoint is changed locally from the panel (using +/- buttons), a single press of a button causes a setpoint change with the step value stored in this register. The setpoint can be changed in the range determined by setpoint limits stored in the SETPOINT_LOW_LIMIT and SETPOINT_HIGH_LIMIT parameters.

The setpoint's step value is also automatically adjusted to the setpoint display precision. If the bit 4 of the SETPOINT_CONFIGURATION register is true, the setpoint value is displayed with one decimal place. In such case, the setpoint's step value is also adjusted to one decimal place. The register contains a value multiplied by 10. The default value is 10 (1°C);

- Modbus register: 41508
- BACnet object: AV56, property: 4206;

EXIT_EDIT_TIME: allows to set the time after which edition of any editable parameter is finished. The parameter is set in seconds. The default value is set to 5 seconds;

- Modbus register: 40224
- BACnet object: AO17, property: Present Value.

How to Change the Temperature Setpoint on the Touchscreen?

- Short press + or - button to enter an edit mode (display should start blinking with a current value);
- Change the temperature setpoint value by steps set in the SETPOINT_STEP:
 - - button decreases the value (multiple times for long press);
 - + button increases the value (multiple times for long press).
- Reaching a limit value will be signaled with a double beep.
- Device will automatically exit the edit mode after the time set in the EXIT_EDIT_TIME expires from a last interaction.

LEDs

The device shows a difference between the EFFECTIVE_SETPOINT and TEMPERATURE_SENSOR values on an LEDs ladder, which indicates the following:

- no LEDs light up: a temperature in the room is near the EFFECTIVE_SETPOINT value;
- blue LEDs light up: a temperature in the room is higher than the EFFECTIVE_SETPOINT value, cooling;
- red LEDs light up: a temperature in the room is lower than the EFFECTIVE_SETPOINT value, heating.

Number and brightness of LEDs indicate exact difference of the values:

- every 0.5 degree of difference lights up a next LED half way up;
- every 1 degree of difference lights up a next LED to maximum;
- a difference greater than 3 degrees lights up all 3 LEDs and does not change further;
- changes are controlled with 0.2 degrees hysteresis to prevent LEDs flashing.

5.5 CO2 Alarm

Devices equipped with the CO2 sensor can monitor a CO2 concentration and alarm user in case of too high values. An alarm state is presented in the following parameter or in the iSMA Configurator:

ALARM_STATUS: indicates a current status of the CO2 alarm;

- Modbus register: 30230;
- BACnet object: BI0, property: Present Value.

The CO2 alarm can be configured using the following parameters:

CO2_SETPOINT_FOR_ALARM: allows to set a tipping point for CO2 alarm. The default value is set to 1500 ppm;

- Modbus register: 40226;
- BACnet object: AO19, property: Present Value;

CO2_HYSTERESIS_FOR_ALARM: allows to set a hysteresis value for launching the CO2 alarm. The default value is set to 100 ppm;

- Modbus register: 40227;
- BACnet object: AO20, property: Present Value.

5.5.1 User Interface for CO2 Alarm

When the alarm triggers (the ALARM_STATUS register's value is 1), it can be confirmed by pressing any touchscreen button. It stops a visualization of the alarm status, but does not affect the ALARM_STATUS parameter.

The alarm confirmation can be configured in the following parameter:

DEVICE_CONFIGURATION, bit 8: CO2_ALARM_CONFIRM: allows to enable confirmation of the CO2 alarm with any button of the panel;

- Modbus register: 40205;
- BACnet object: BO63, property: Present Value.

After the CO2 alarm triggers, the feature takes control over the display and illumination and starts blinking. The control is returned to normal after the alarm is confirmed or after the CO2 value decreases below the CO2_SETPOINT_FOR_ALARM level (taking the CO2_HYSTERESIS_FOR_ALARM value into account).

This feature is active by default and cannot be turned off. However, a user can decide if the alarm status should be visible through user interface:

DEVICE_CONFIGURATION, bit 5: CO2_ALARM_LCD: switches on the function of LCD background illumination flashing when the CO2 alarm occurs. If the bit 5 is true, the CO2 alarm is indicated by the LCD display flashing;

- Modbus register: 40205;
- BACnet object: BO5, property: Present Value;

DEVICE_CONFIGURATION, bit 6: CO2_ALARM_BUZZER: switches a buzzer on when the CO2 alarm occurs. If the bit 6 is true, the CO2 alarm is indicated by the buzzer, which emits sounds with 1 Hz frequency;

- Modbus register: 40205;
- BACnet object: BO6, property: Present Value.

6 Fan Control

This feature allows a user to control ventilation devices through the following parameters or in the iSMA Configurator:

FAN_MODE: allows to select a fan mode. There are up to 5 different fan modes, which can be selected locally from the panel.

Register Value	Fan Mode
0	Off (default)
1	Manual, speed 1
2	Manual, speed 2
3	Manual, speed 3
4	Auto

Table 14. Fan modes

- Modbus register: 41602;
- BACnet object: MSV1, property: Present Value;

FAN_CURRENT_SPEED: allows to set the fan operating speed and mode according to the table below:

Register Value	Fan Mode	Description
0	Off (default)	Fan is off
1	Manual speed 1	Fan works in speed 1, manual mode
2	Manual speed 2	Fan works in speed 2, manual mode
3	Manual speed 3	Fan works in speed 3, manual mode
4	Auto speed 1	Fan works in speed 1, auto mode
5	Auto speed 2	Fan works in speed 2, auto mode
6	Auto speed 3	Fan works in speed 3, auto mode

Table 15. The FAN_CURRENT_SPEED register values

- Modbus register: 41601;
- BACnet object: MSV0, property: Present Value.

This value can be updated in two ways depending on the FAN_CONFIG_LOCAL_MODE parameter:

FAN_CONFIGURATION, bit 6: FAN_CONFIG_LOCAL_MODE: allows to set the fan to work either in the local mode or BMS mode:

Local Mode: the panel's fan setting works in a local mode (the value of the FAN_CURRENT_SPEED register is determined by the value of the FAN_MODE register and

so the value of the FAN_CURRENT_SPEED register cannot be overwritten by the higher level system);

BMS Mode: the panel's fan setting works in the BMS mode. The FAN_MODE register works separately from the FAN_CURRENT_STATUS register.

The default value is the BMS mode.

- Modbus register: 41614;
- BACnet object: BO60, property: Present Value.

6.1 User Interface for Fan Control

Fan control can also be performed using the panel's touchscreen (see [Operating User Interface](#)). It is possible to change the fan mode depending on the configurations:

FAN_CONFIGURATION, bit 1: EDITABLE: enables or disables the fan to be edited locally from the panel;

- Modbus register: 41614;
- BACnet object: MSV1, property: 4200;

FAN_CONFIGURATION, bit 2: FAN_PART_EDITABLE: allows to set the fan to be fully editable (all modes stored in the FAN_MODE register available) or partly editable (selection between the auto mode and off);

- Modbus register: 41614;
- BACnet object: BO58, property: Present Value.

FAN_TYPE: allows to select a fan type. The fan type selection determines, which fan modes are available in the FAN_MODE register.

Register Value	Fan Type
0	0-10 V
1	1-speed fan
2	2-speed fan
3	3-speed fan
4	1-speed, no auto mode
5	2-speed, no auto mode
6	3-speed, no auto mode

Table 16. Fan types

- Modbus register: 41603;
- BACnet object: MSV2, property: Present Value.

How to Change the Fan Mode on the Touchscreen?

- Use a small fan button to decrease the value by one.
- Use a big fan button to increase the value by one.
- Reached limit is signaled by a double beep.
- A long press is not available for this feature.

6.1.1 LEDs

Value of the FAN_CURRENT_SPEED parameter is presented on the LEDs ladder as follows:

- fan speeds from 1 to 3 lights up a single led for each level (same for manual and auto);
- auto settings light up an Auto LED.

7 Occupancy Control

This feature allows a user to control occupancy through the following parameters or in the iSMA Configurator:

OCCUPANCY_MODE: allows to set an occupancy mode in the panel according to the table below:

Register Value	Occupancy Mode
0	Unoccupied
1	Occupied

Table 17. Occupancy modes

- Modbus register: 41702;
- BACnet object: MSV4, property: Present Value;

OCCUPANCY_CURRENT_STATUS: allows to set a current occupancy status. The current occupancy status is displayed on the panel's top right corner icon (illuminated inside the circle – occupied, outside the circle – unoccupied);

Register Value	Occupancy Status
0	Unoccupied
1	Occupied
2	Standby
3	Forced occupied

Table 18. Occupancy statuses

- Modbus register: 41701;
- BACnet object: MSV3, property: Present Value.

This value can be updated in two ways depending on the OCCUPIED_CONFIG_LOCAL_MODE parameter:

OCCUPANCY_CONFIGURATION, bit 6: OCCUPIED_CONFIG_LOCAL_MODE: allows to set the occupancy to the local mode or BMS mode:

Local Mode: the panel's occupancy setting is set to a local mode (the value of the OCCUPANCY_CURRENT_STATUS register is determined by the value of the OCCUPANCY_MODE register and so the value of the OCCUPANCY_CURRENT_STATUS register cannot be overwritten by the higher level system);

BMS Mode: the panel's occupancy setting is set to the BMS mode. The OCCUPANCY_MODE register works separately from the OCCUPANCY_CURRENT_STATUS register.

The default value is the BMS mode.

- Modbus register: 41707;
- BACnet object: BO62, property: Present Value.

7.1 User Interface for Occupancy Control

Occupancy control can also be performed using the panel's touchscreen (see [Operating User Interface](#)). It is possible to change the occupancy mode depending on the configurations:

OCCUPANCY_CONFIGURATION, bit 1: EDITABLE: enables or disables the occupancy to be edited locally from the panel;;

- Modbus register: 41707;
- BACnet object: MSV4, property: 4200.

How to Change the Occupancy on the Touchscreen?

- Use a house button to toggle between occupied and unoccupied statuses.
- A long press is not available for this feature.

7.1.1 LEDs

Value of the OCCUPANCY_CURRENT_STATUS parameter is presented on a house LEDs ladder as follows:

- value 0 (unoccupied): "in house" LED is off, "outside" is on;
- value 1 (occupied): "in house" LED is on, "outside" is off;
- value 2 (standby): "in house" LED is off, "outside" is blinking;
- value 3 (forced occupied): "in house" LED is blinking, "outside" is off.

8 ECO

The ECO feature allows a user to light up an ECO LED on the TP panel (useful, for example, if the TP panel is connected to a controller with an eco application).

ICON DISPLAY, bit 8: ECO: allows to activate or inactivate an ECO icon (green LED);

- Modbus register: 40219;
- BACnet object: BO22, property: Present Value.

9 Other Parameters

Other parameters of the TP panel can be retrieved from the following registers and objects, or in the iSMA Configurator:

LIVE_TIME: shows uptime of the device since the last reset;

- Modbus register: 30012;
- BACnet object: AI0, property: Present Value;

VERSION_TYPE: allows to read version and type of the panel and enable 1 of 4 available actions. The first byte of the register indicates a version of the device, and the second one—type of the device;

- Modbus register: 40001;
- BACnet object: DEVICE, property: 3030;

Value		Bits 0-7	Bits 8-15
Type	Panel's version		112 ₁₀ (0x70 ₁₆)
	Panel in bootloader		239 ₁₀ (0xEF ₁₆)
Version	Firmware version multiplied by 10	10 ₁₀ (0x0A ₁₆) means 1.0 firmware version	

Table 19. The VERSION_TYPE register values

The VERSION_TYPE register also allows to enable 1 of 4 available actions: reset panel, reload settings, reset settings, enter bootloader. If the register receives one of the following values, it invokes a relevant action and resumes its regular values afterwards (type and version):

Decimal Value	Hex Value	Action
511	0x01FF	Reset panel
767	0x02FF	Reload settings
1023	0x03FF	Reset settings
1279	0x04FF	Enter bootloader

Table 20. The VERSION_TYPE register actions

FLASH_DEVICE_TYPE: indicates the panel's version and type;

- Modbus register: 31301;
- BACnet object: N/A;

Bit	Name	Description
0-7	VERSION_TYPE	Copy of the 40001 register's value
8-15	DEVICE_TYPE	0: TP, 1: not available

Bit	Name	Description
31	LCD_PRESENT	0: with display, 1: without display

Table 21. FLASH_DEVICE_TYPE values

FLASH_HW_VERSION: indicates the panel's hardware version;

- Modbus register 31303;
- BACnet object: DEVICE, property: 3020;

FLASH_BOOT_VERSION: indicates the panel's bootloader version;

- Modbus register: 31304;
- BACnet object: N/A;

FW_VERSION: indicates the panel's firmware version separated from the VERSION_TYPE register's value;

- Modbus register: 31305;
- BACnet object: N/A;

FLASH_SERIAL_NUMBER: indicates the panel's serial number;

- Modbus registers 31306-31309;
- BACnet object: N/A.

10 List of Modbus Registers

Modbus Address	Decimal Address	Hex	Register Name	Access	Default Value	Value Range	Description
40001	0	0x00	VERSION_TYPE	Read/write			Shows a firmware version and type of the panel and enables 1 of 4 available actions (reset device, reload settings, reset settings, enter bootloader)
30002	1	0x01	ADDRESS_ROTARY_SWITCH	Read-only		0-9	Address set on a rotary switch
30003	2	0x02	PROTOCOL_DIPSWITCH	Read-only		0-1	Protocol set on a DIP switch
30004	3	0x03	RECEIVED_FRAMES_COUNTER	Read-only	0		The number of received Modbus frames reset at the start of the panel and at the change of transmission parameters
30006	5	0x05	ERROR_FRAMES_COUNTER	Read-only	0		The number of received error Modbus frames reset at the start of the panel and at the change of transmission parameters
30008	7	0x07	TRANSMITTED_FRAME_COUNTER	Read-only	0		The number of transmitted Modbus frames reset at the start of the panel and at the change of transmission parameters
30012	11	0x0B	LIVE_TIME	Read-only			Uptime of the panel in seconds
40015	14	0x0E	BACNET_DEVICE_ID	Read/write	0xFFFFFFFF		Device's BACnet ID
40017	16	0x10	BAUD_RATE	Read/write	11520		Sets the baud rate
40018	17	0x11	STOP_BITS	Read/write	1	1-2	Sets the number of stop bits
40019	18	0x12	DATA_BITS	Read/write	8	7-8	Sets the number of data bits (Modbus ASCII requires 7 bits)

Modbus Address	Decimal Address	Hex	Register Name	Access	Default Value	Value Range	Description
40020	19	0x13	PARITY_BIT	Read/write	0	0-2	Determines the parity bit
40021	20	0x14	REPLY_DELAY	Read/write	0		Sets the delay time in ms before sending response
40023	22	0x16	ADDRESS	Read/write	1		Modbus address of the device
40024	23	0x17	PROTOCOL	Read/write	0	0-2	Sets the type of Modbus protocol (Modbus RTU (0), Modbus ASCII (1))
30029	28	0x1C	SENSORS	Read-only			Informs about built-in sensors
30201	200	0xC8	BACKLIGHT_LCD	Read-only			Actual display illumination value
30202	201	0xC9	BACKLIGHT_KEYPAD	Read-only			Actual keypad illumination value
40205	204	0xCC	DEVICE_CONFIGURATION	Read/write	105		
Bit			Name	0	1		
0			BUZZER	Not active	Active (def)		Activates/inactivates a buzzer
3			BACKLIGHT_LCD	Not active	Active (def)		Switches on/off display's backlight
4			BACKLIGHT_KEYPAD	Not active	Active (def)		Switches on/off keypad's backlight
5			CO2_ALARM_LCD	Not active	Active		Shows CO2 alarm on a display
6			CO2_ALARM_BUZZER	Not active	Active		Switches on/off CO2 alarm's buzzer on alarm
8			CO2_ALARM_CONFIRM	Not active	Active (def)		Switches on/off CO2 alarm confirmation by any button
11			PANEL_OFF	Panel on (def)	Panel off		Switches on/off the panel
12			KEYPAD_OFF	Keypad on (def)	Keypad off		Switches on/off the keypad

Modbus Address	Decimal Address	Hex	Register Name	Access	Default Value	Value Range	Description
40207	206	0xCE	BACKLIGHT_LCD_ACTIVE	Read/write	60		Contains a value of the LCD display illumination in the active mode (expressed in %)
40208	207	0xCF	BACKLIGHT_LCD_IDLE	Read/write	40		Contains a value of the LCD display illumination in the idle mode (expressed in %)
40209	208	0xD0	BACKLIGHT_LCD_STANDBY	Read/write	0		Contains a value of the LCD display illumination in the standby mode (expressed in %)
40210	209	0xD1	BACKLIGHT_LCD_TIME_TO_IDLE	Read/write	10		Sets the time, after which the LCD display goes from the active mode to idle (expressed in seconds)
40211	210	0xD2	BACKLIGHT_LCD_TIME_TO_STANDBY	Read/write	5		Sets the time, after which the LCD display goes from the idle mode to standby (expressed in seconds)
40212	211	0xD3	BACKLIGHT_KEYPAD_ACTIVE	Read/write	10		Contains a value of the keypad illumination in the active mode (expressed in %)
40213	212	0xD4	BACKLIGHT_KEYPAD_IDLE	Read/write	40		Contains a value of the keypad illumination in the idle mode (expressed in %)
40214	213	0xD5	BACKLIGHT_KEYPAD_STANDBY	Read/write	60		Contains a value of the keypad illumination in the standby mode (expressed in %)
40215	214	0xD6	BACKLIGHT_KEYPAD_TIME_TO_IDLE	Read/write	10		Sets the time, after which the keypad goes from the active mode to idle (expressed in seconds)
40216	215	0xD7	BACKLIGHT_KEYPAD_TIME_TO_STANDBY	Read/write	5		Sets the time, after which the keypad goes from the idle mode to standby (expressed in seconds)

Modbus Address	Decimal Address	Hex	Register Name	Access	Default Value	Value Range	Description
40217	216	0xD8	REFRESH_TIME		5	1-60	Sets the duration of the display time of particular parameters
40219	218	0xDA	ICON_DISPLAY	Read/write			
Bit			Name	0	1		
8			ECO	Not active		Active	Switches on/off an ECO LED
40226	225	0xE1	CO2_SETPOINT_FOR_ALARM	Read/write	1500		CO2 alarm setpoint
40227	226	0xE2	CO2_HYSTERESIS_FOR_ALARM	Read/write	100		CO2 alarm hysteresis
30230	229	0xE5	ALARM_STATUS	Read-only			CO2 current alarm status
30231	230	0xE6	NAVIGATIONAL_LED_MODE	Read/write	1	0-4	Sets a mode of the navigational LED
Bit			Name	0	1		
0			OFF	Not active		Active	
1			ON (default)	Not active		Active	
2			Active on IDLE and STANDBY	Not active		Active	
3			Active on IDLE only	Not active		Active	
4			Active on STANDBY only	Not active		Active	
30232	231	0xE7	NAVIGATIONAL_LED_BRIGHTNESS	Read/write	100	0-100	Navigational LED brightness
30233	232	0xE8	NAVIGATIONAL_LED_RED	Read/write	100	0-100	Navigational LED color - red component intensity
30234	233	0xE9	NAVIGATIONAL_LED_GREEN	Read/write	100	0-100	Navigational LED color - green component intensity
30235	234	0xE10	NAVIGATIONAL_LED_BLUE	Read/write	100	0-100	Navigational LED color - blue component intensity

Modbus Address	Decimal Address	Hex	Register Name	Access	Default Value	Value Range	Description
30301	300	0x12C	TEMPERATURE_SENSOR	Read-only			Actual temperature sensor value with offset
30302	301	0x12D	HUMIDITY_SENSOR	Read-only			Actual humidity sensor value with offset
30303	302	0x12E	CO2_SENSOR	Read-only			Actual CO2 sensor value with offset
40304	303	0x12F	TEMPERATURE_SENSOR_OFFSET	Read/write	0		Temperature sensor offset
40305	304	0x130	HUMIDITY_SENSOR_OFFSET	Read/write	0		Humidity sensor offset
40306	305	0x131	CO2_SENSOR_OFFSET	Read/write	0		CO2 sensor offset
40307	306	0x132	TEMPERATURE_FILTER	Read/write	60		Filtering time for the temperature sensor (seconds)
40308	307	0x133	HUMIDITY_FILTER	Read/write	60		Filtering time for the humidity sensor (seconds)
40309	308	0x134	CO2_FILTER	Read/write	60		Filtering time for the CO2 sensor (seconds)
40316	315	0x13B	TEMPERATURE_CONFIGURATION	Read/write	17		
Bit			Name	0		1	
0			ACTIVE	Not active		Active (def)	Activates/deactivates the sensor
4			THIRD_POINT_ACTIVE	No decimal		Decimal (def)	Sets decimal places
40317	316	0x13C	HUMIDITY_CONFIGURATION	Read/write	17		
Bit			Name	0		1	
0			ACTIVE	Not active		Active (def)	Activates/deactivates the sensor
4			THIRD_POINT_ACTIVE	No decimal		Decimal (def)	Sets decimal places
40318	317	0x13D	CO2_CONFIGURATION	Read/write	1		

Modbus Address	Decimal Address	Hex	Register Name	Access	Default Value	Value Range	Description
Bit			Name	0		1	
0			ACTIVE	Not active		Active	Activates/deactivates the sensor
40323	322	0x142	BUZZER_VOLUME	Read/write	50	0-100	Buzzer volume (%)
40324	323	0x143	BUZZER_FREQUENCY	Read/write	400	20-20000	Buzzer frequency (Hz)
31301	1300	0x514	FLASH_DEVICE_TYPE	Read-only			Version and type of device
31302	1301	0x515	FLASH_HW_VERSION	Read-only			HW version
31303	1302	0x516	FLASH_BOOT_VERSION	Read-only			Bootloader version
31304	1303	0x517	FW_VERSION	Read-only			FW version separated from the VERSION_TYPE register
31305	1304	0x518	FLASH_SERIAL_NUMBER_1	Read-only			Serial number
31306	1305	0x519	FLASH_SERIAL_NUMBER_2	Read-only			Serial number
31307	1306	0x51A	FLASH_SERIAL_NUMBER_3	Read-only			Serial number
31308	1307	0x51B	FLASH_SERIAL_NUMBER_4	Read-only			Serial number
41501	1500	0x5DC	SETPOINT_VALUE	Read/write		0-500	Temperature setpoint value
41502	1501	0x5DD	EFFECTIVE_SETPOINT	Read-only			Sum of setpoint and offset values
41503	1502	0x5DE	DEFAULT_SETPOINT	Read/write	210	0-500	Default temperature setpoint
41504	1503	0x5DF	OFFSET_SETPOINT	Read/write	0	0-500	Temperature offset for setpoint
41505	1504	0x5E0	SETPOINT_LOW_LIMIT	Read/write	180		Min. available setpoint value
41506	1505	0x5E1	SETPOINT_HIGH_LIMIT	Read/write	240		Max. available setpoint value

Modbus Address	Decimal Address	Hex	Register Name	Access	Default Value	Value Range	Description
41507	1506	0x5E2	OFFSET_RANGE	Read/write	30	0-500	Limit offset value
41508	1507	0x5E3	SETPOINT_STEP	Read/write	10		Setpoint step value
41513	1512	0x5E8	SETPOINT_CONFIGURATION	Read/write	31		Setpoint configuration of parameters: Visible, Editable, Operating mode, Setpoint display, ThirdPointActive
Bit			Name	0		1	
0			VISIBLE	Not visible		Visible (def)	Switches on/off a temperature setpoint visibility on a display
1			EDITABLE	Not editable		Editable (def)	Activates/inactivates editing of a temperature setpoint locally on the panel
2			OPERATING_MODE	Changing offset		Changing setpoint (def)	Switches between changing offset or setpoint
3			SETPOINT_DISPLAY	Show/change offset		Show/change effective setpoint (def)	Switches between changing offset or setpoint
4			THIRD_POINT_ACTIVE	No decimal		Decimal (def)	Activates/inactivates decimal points
41601	1600	0x640	FAN_CURRENT_SPEED	Read/write	0		Fan speed
41602	1601	0x641	FAN_MODE	Read/write	1		Fan mode
41603	1602	0x642	FAN_TYPE	Read/write			Fan type
41614	1613	0x64D	FAN_CONFIGURATION	Read/write	2		
Bit			Name	0		1	
1			EDITABLE	Not editable		Editable (def)	Switches on/off editing fan modes locally

Modbus Address	Decimal Address	Hex	Register Name	Access	Default Value	Value Range	Description
2			PART_EDITABLE	Fully editable		Auto_Of f_Mode	Switches editability of fan modes
6			FAN_CONFIG_LOCAL_MODE	BMS (def)		Local	Switches between BMS/ local modes
41701	1700	0x6A4	OCCUPANCY_CURRENT_STATUS	Read/ write			Occupancy status
41702	1701	0x6A5	OCCUPANCY_MODE	Read/ write			Occupancy mode
41707	1706	0x6AA	OCCUPANCY_CONFIGURATION	Read/ write	2		
Bit			Name	0		1	
1			EDITABLE	Not editable		Editable (def)	Switches on/off editing occupancy statuses locally
6			OCCUPIED_CONFIG_LOCAL_MODE	BMS (def)		Local	Switches between BMS/ local modes

Table 22. List of Modbus registers

11 List of BACnet Objects

BACnet Type & ID	BACnet Property	Decimal Address	Hex	Object Name	Access	Default Value	Value Range	Description
Device	3030	0	0x00	VERSION_TYPE	Read/write			Shows version and type of the panel and enables 1 of 4 available actions
Device	5101	3	0x03	RECEIVED_FRAMES_COUNTER	Read-only	0		The number of received Modbus frames reset at the start of the panel and at the change of transmission parameters
Device	5103	5	0x05	ERROR_FRAME_COUNTER	Read-only	0		The number of received error Modbus frames reset at the start of the panel and at the change of transmission parameters
Device	5104	7	0x07	TRANSMITTED_FRAME_COUNTER	Read-only	0		The number of transmitted Modbus frames reset at the start of the panel and at the change of transmission parameters
AIO	Present Value	11	0x0B	LIVE_TIME	Read-only			Uptime of the panel in seconds
Device	Object Identifier	14	0x0E	BACNET_DEVICE_ID	Read/write	0xFFFFFFFF		Device's BACnet ID
Device	3084	16	0x10	BAUD_RATE	Read/write	11520		Sets the baud rate

BACnet Type & ID	BACnet Property	Decimal Address	Hex	Object Name	Access	Default Value	Value Range	Description
MS11	Present Value	28	0x1C	SENSORS	Read-only			Informs about built-in sensors
AI1	Present Value	200	0xC8	BACKLIGHT_LCD	Read-only			Actual display illumination value
AI2	Present Value	201	0xC9	BACKLIGHT_KEYPAD	Read-only			Actual keypad illumination value
		204	0xCC	DEVICE_CONFIGURATION	Read/write			
BO0	Present Value			BUZZER_ACTIVE		1		Activates (1) or deactivates (0) a buzzer
BO3	Present Value			LCD_BACKGROUND_ACTIVE		1		Switches the LCD background illumination on (1)
BO4	Present Value			KEYPAD_BACKGROUND_ACTIVE		1		Switches the keypad background illumination on (1)
BO5	Present Value			CO2_ALARM_FLASHING				Switches on the function of LCD background illumination flashing when CO2 alarm occurs
BO6	Present Value			CO2_ALARM_BUZZER				Switches on a buzzer when the CO2 alarm occurs
BO63	Present Value			CO2_ALARM_CONFIRM		1		Allows to enable confirmation of the CO2 alarm with any button of the panel

BACnet Type & ID	BACnet Property	Decimal Address	Hex	Object Name	Access	Default Value	Value Range	Description
BO11	Present Value			PANEL_OFF		0		Switches the panel off (1)
BO12	Present Value			KEYPAD_OFF		0		Switches the panel keypad off (1)
AO3	Present Value	206	0xCE	BACKLIGHT_LCD_ACTIVE	Read/write	60		Contains a value of the LCD display illumination in the active mode (expressed in %)
AO4	Present Value	207	0xCF	BACKLIGHT_LCD_IDLE	Read/write	40		Contains a value of the LCD display illumination in the idle mode (expressed in %)
AO5	Present Value	208	0xD0	BACKLIGHT_LCD_STANDBY	Read/write	0		Contains a value of the LCD display illumination in the standby mode (expressed in %)
AO6	Present Value	209	0xD1	BACKLIGHT_LCD_TIME_TO_IDLE	Read/write	10		Sets the time after which the LCD display goes from the active mode to idle (expressed in seconds)
AO7	Present Value	210	0xD2	BACKLIGHT_LCD_TIME_TO_STANDBY	Read/write	5		Sets the time after which the LCD display goes from the idle mode to standby (expressed in seconds)

BACnet Type & ID	BACnet Property	Decimal Address	Hex	Object Name	Access	Default Value	Value Range	Description
AO8	Present Value	211	0xD3	BACKLIGHT_KEYPAD_ACTIVE	Read/write	10		Contains a value of the keypad illumination in the active mode (expressed in %)
AO9	Present Value	212	0xD4	BACKLIGHT_KEYPAD_IDLE	Read/write	40		Contains a value of the keypad illumination in the idle mode (expressed in %)
AO10	Present Value	213	0xD5	BACKLIGHT_KEYPAD_STANDBY	Read/write	60		Contains a value of the keypad illumination in the standby mode (expressed in %)
AO11	Present Value	214	0xD6	BACKLIGHT_KEYPAD_TIME_TO_IDLE	Read/write	10		Sets the time after which the keypad goes from the active mode to idle (expressed in seconds)
AO12	Present Value	215	0xD7	BACKLIGHT_KEYPAD_TIME_TO_STANDBY	Read/write	5		Sets the time after which the keypad goes from the idle mode to standby (expressed in seconds)
AO13	Present Value	216	0xD8	REFRESH_TIME		5	1-60	Sets the duration of the display time of particular parameters
		218	0xDA	ICON_DISPLAY	Read/write			

BACnet Type & ID	BACnet Property	Decimal Address	Hex	Object Name	Access	Default Value	Value Range	Description
BO22	Present Value			ECO				Switches on an ECO LED
AO17	Present Value	223	0xDF	EXIT_EDIT_TIME	Read/write			Sets the time after which edition of any editable parameter is finished
AO19	Present Value	225	0xE1	CO2_SETPOINT_FOR_ALARM	Read/write	1500		CO2 alarm setpoint
AO20	Present Value	226	0xE2	CO2_HYSTERESIS_FOR_ALARM	Read/write	100		CO2 alarm hysteresis
BI0	Present Value	229	0xE5	ALARM_STATUS	Read-only			CO2 current alarm status
MSV5	Present Value	230	0xE6	NAVIGATIONAL_LED_MODE	Read/write	1	0-4	Sets a mode of the navigational LED
AO22	Present Value	231	0xE7	NAVIGATIONAL_LED_BRIGHTNESS	Read/write	100	0-100	Navigational LED brightness
AO23	Present Value	232	0xE8	NAVIGATIONAL_LED_RED	Read/write	100	0-100	Navigational LED color - red component intensity
AO24	Present Value	233	0xE9	NAVIGATIONAL_LED_GREEN	Read/write	100	0-100	Navigational LED color - green component intensity
AO25	Present Value	234	0xE10	NAVIGATIONAL_LED_BLUE	Read/write	100	0-100	Navigational LED color - blue component intensity
AI4	Present Value	300	0x12C	TEMPERATURE_SENSOR	Read-only			Actual temperature sensor value with offset
AI5	Present Value	301	0x12D	HUMIDITY_SENSOR	Read-only			Actual humidity

BACnet Type & ID	BACnet Property	Decimal Address	Hex	Object Name	Access	Default Value	Value Range	Description
								sensor value with offset
AI6	Present Value	302	0x12E	CO2_SENSOR	Read-only			Actual CO2 sensor value with offset
AI4	4205	303	0x12F	TEMPERATURE_SENSOR_OFFSET	Read/write	0		Temperature sensor offset
AI5	4205	304	0x130	HUMIDITY_SENSOR_OFFSET	Read/write	0		Humidity sensor offset
AI6	4205	305	0x131	CO2_SENSOR_OFFSET	Read/write	0		CO2 sensor offset
AI4	4003	306	0x132	TEMPERATURE_FILTER	Read/write	60		Filtering time for the temperature sensor (seconds)
AI5	4003	307	0x133	HUMIDITY_FILTER	Read/write	60		Filtering time for the humidity sensor (seconds)
AI6	4003	308	0x134	CO2_FILTER	Read/write	60		Filtering time for the CO2 sensor (seconds)
		315	0x13B	TEMPERATURE_CONFIGURATION	Read/write			
AI4	Out Of Service			ACTIVE		1		Activates/deactivates the sensor
AI4	4202			THIRD_POINT_ACTIVE				Sets decimal places
		316	0x13C	HUMIDITY_CONFIGURATION	Read/write			
AI5	Out Of Service			ACTIVE		1		Activates/deactivates the sensor
AI5	4202			THIRD_POINT_ACTIVE				Sets decimal places

BACnet Type & ID	BACnet Property	Decimal Address	Hex	Object Name	Access	Default Value	Value Range	Description
		317	0x13D	CO2_CONFIGURATION	Read/write			
AI6	Out Of Service			ACTIVE		1		Activates/deactivates the sensor
AO27	Present Value	322	0x142	BUZZER_VOLUME	Read/write	50	0-100	Buzzer volume (%)
AO28	Present Value	323	0x143	BUZZER_FREQUENCY	Read/write	400	20-20000	Buzzer frequency (Hz)
Device	3020	1301	0x515	FLASH_HW_VERSION	Read-only			HW version
AV56	Present Value	1500	0x5DC	SETPOINT_VALUE	Read/write		0-500	Temperature setpoint value
AI 3	Present Value	1501	0x5DD	EFFECTIVE_SETPOINT	Read-only			Sum of setpoint and offset values
AV 57	Present Value	1502	0x5DE	DEFAULT_SETPOINT	Read/write	210	0-500	Default temperature setpoint
AV 58	Present Value	1503	0x5DF	OFFSET_SETPOINT	Read/write	0	0-500	Temperature offset for setpoint
AV 56	Low Limit	1504	0x5E0	SETPOINT_LOW_LIMIT	Read/write	180		Min. available setpoint value
AV 56	High Limit	1505	0x5E1	SETPOINT_HIGH_LIMIT	Read/write	240		Max. available setpoint value
AV 59	Present Value	1506	0x5E2	OFFSET_RANGE	Read/write	30	0-500	Limits offset value
AV 56	4206	1507	0x5E3	SETPOINT_STEP	Read/write	10		Setpoint step value
		1512	0x5E8	SETPOINT_CONFIGURATION	Read/write			Setpoint configuration of parameters: Visible, Editable, Operating

BACnet Type & ID	BACnet Property	Decimal Address	Hex	Object Name	Access	Default Value	Value Range	Description
								mode, Setpoint display, ThirdPointActive
AV56	Out Of Service			VISIBLE				Enables or disables the temperature setpoint to be visible on the panel's display
AV56	4200			EDITABLE				Enables or disables editing of the temperature setpoint locally from the panel
BO55	Present Value			OPERATING_MODE				Sets the operating mode of the temperature setpoint configuration
BO56	Present Value			SETPOINT_DISPLAY				Configures the temperature setpoint display
AV56	4202			THIRD_POINT_ACTIVE				Enables or disables decimal values in the temperature setpoint
MSV0	Present Value	1600	0x640	FAN_CURRENT_SPEED	Read/write	0		Fan speed
MSV1	Present Value	1601	0x641	FAN_MODE	Read/write	1		Fan mode
MSV2	Present Value	1602	0x642	FAN_TYPE	Read/write			Fan type
41614		1613	0x64D	FAN_CONFIGURATION	Read/write	2		

BACnet Type & ID	BACnet Property	Decimal Address	Hex	Object Name	Access	Default Value	Value Range	Description
MSV1	Editable			EDITABLE				Activates or inactivated editing fan modes locally in the panel
BO58	Present Value			FAN_PART_EDITABLE				Configures editing of fan modes
BO60	Present Value			FAN_CONFIG_LOCAL_MODE				Local/BMS mode
MSV3	Present Value	1700	0x6A4	OCCUPANCY_CURRENT_STATUS	Read/write			Occupancy status
MSV4	Present Value	1701	0x6A5	OCCUPANCY_MODE	Read/write			Occupancy mode
		1706	0x6AA	OCCUPANCY_CONFIGURATION	Read/write	2		
MSV4	4200			EDITABLE				Activates or inactivated editing occupancy statutes locally in the panel
BO62	Present Value			OCCUPANCY_CONFIG_LOCAL_MODE				Local/BMS mode

Table 23. List of BACnet objects