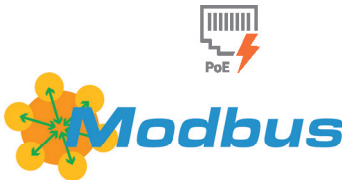


\*Modbus supported via RS485



**EXT-KA-SE200P**

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## Modbus General Notes

General information	Date	18.08.2023
	Product Name	EXT-KA-SE200P
Modbus RTU Parameterisation	Protocol	Modbus RTU over RS485
	Address	1...247 (Default: 1)
	Tool	through the configuration app



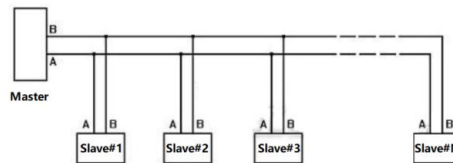
Modbus RTU is supported over RS485 network only. EXT-KA-SE200P can still upload data to the cloud via Wi-Fi or Ethernet when Modbus is used for local communication.

EXT-KA-SE200P does not support Modbus TCP/IP.

Please ensure your device is running the latest firmware.

Go to Settings / Device Details to check firmware version.

EXT-KA-SE200P can be daisy-chained using Modbus RTU.

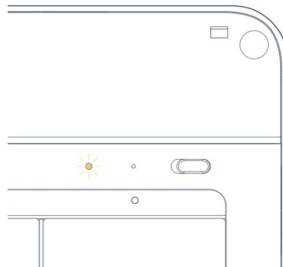


#### Setting up Modbus through RS-485 network with configuration app:

1. Set up Modbus via RS-485 To set up Modbus communication, connect your cable from the RS-485 network to a 4-pin Phoenix pin plug. Check the "A" "B" marks on the back of the device to make sure the cables are connected in the right order, and fasten the screws on the Phoenix pin plug to secure the cables. Run the cables through the opening on the plate, and plug the 4-pin Phoenix pin plug into the corresponding terminals on the back of the device. The default Modbus address is set as 1, and can be changed later via configuration app

2. Install configuration app on your smartphone. Please contact Local Sales for app file.

3. Turn on device (it will automatically enter configuration mode for 15 mins). The STATUS light will flash yellow during this time. If your device is not in configuration mode, please turn the device off and back on again.



4. Connect to the device. Open network settings on your computer or smartphone and look for the Wi-Fi network that starts with "Kaiterra". Connect to that network. Click "Identify device" to identify the device currently being configured if multiple devices are present. The STATUS light will flash yellow rapidly for about 5 seconds. On configuration app, you can enter a name for the device (e.g. the location of the device or the serial number) and a project tag. This will provide easy identification and filtering in the configuration history page later on to help you quickly connect the device to the Cloud dashboard.

Enter the Modbus settings details to the applicable fields on the Configuration Tool following the instructions below:

##### 4.1. Setting Device Address

Customize your device address in configuration tool. The device address is used to identify the device in the system, so please make sure each device is given a unique device address. Customize your device address by entering an address from 1 to 247 in the address field. It is recommended to set your device address onsite during or right after installation, so that you can keep track of the device installed and the corresponding device address.

##### 4.2. Setting Parity Type

You can configure Parity to be odd, even, or none by selecting from the drop down menu in configuration app. The default setting for Parity is "even". If your Modbus network does not use parity checking, select "none". Please consult your Modbus network admin or BMS admin to confirm the parity type of your local network. Please note that all devices in the same network should be set to the same parity type.

## Modbus Register Overview

### Setting up Modbus through RS-485 network with configuration app:

5. (Cont) Choose your AQI standard and customize AQI calculation in configuration app. AQI stands for Air Quality Index, an index calculated based on the concentration of a set of air pollutants. EXT-KA-SE200P offers AQI value in the Modbus communication so that you can integrate the information into your local system. Choose the AQI standard from the drop down menu in configuration app, and select the pollutants used for the AQI calculation. Please note that only the pollutants monitored by your device can be included in the calculation. Please consult the facility manager or other responsible personnel if the Modbus address is not clear.  
Click configure device and disconnect from the device network.

### Register implementation

Data type and format:

Data length=8

Stop bit = 1

Transmission rate = 9600

Check = even

Default Modbus address code is 0x01

Data format	Address	Function	Data	Error check
Data length	1	1	N	16 digit CRC code

\*CRC = Cyclic Redundancy Check

### Commands

1. Read Input Register (0x04) command 01 04 00 00 00 05 30 09 to read all input register
2. Write single Register (0x06) command 01 06 00 00 00 02 08 0B to set the Modbus address to 0x02
3. Read holding Register (0x03) command 01 03 00 00 00 02 C4 0B to read all holding register

Register Address:

Address	R/W Property	Content	Comments
Input Register 0	R	PM2.5	0 - 999 ug/m3
Input Register 1	R	TVOC	0 - 9999 ppb
Input Register 2	R	Temperature	243.15 - 323.15 K
Input Register 3	R	Humidity	0.0% - 100% RH
Input Register 4	R	CO2	0 - 9999 ppm
Input Register 5	R	PM10	0 - 999 ug/m3
Input Register 9	R	Reserved	
Input Register 10	R	Reserved	
Input Register 11	R	Reserved	
Input Register 12	R	Module 0 lifespan	0 - 100
Input Register 13	R	Module 1 lifespan	0 - 100
Input Register 14	R	AQI	0 - 500
Holding Register 0	R/W	Modbus address code	Min 1, Max 247

Temperature note:

243.15 - 323.15 K (Kelvin)

-30.0°C - 50.0°C (Celsius)\*\*

\* Temperature is in absolute temperature  $T(k)=273.15+t(\text{celsius})$ .

\* Temperature and humidity have resolution of 0.1, the transmitted data is 10 times of the raw data.

\*\* Since temperature readings in Modbus are provided in Kelvin, they must be converted to Celsius.

Use formula  $T(k) = 273.15+t(\text{celsius})$  or follow below procedure:

1. Take the Modbus reading (ie. 3000)
2. Minus 2732 (ie.  $3000 - 2732 = 268$ )
3. Divide it by 10 (ie.  $268 / 10 = 26.8^{\circ}\text{C}$ )