Kaiterra Sensedge Modbus User Manual

APRIL 2020

1.

Introduction

Kaiterra Sensedge is a smart air quality monitor that supports multiple communication methods, including Modbus.

Modbus is a serial communications protocol. It has become a widely used communication protocol in many industries, for its easiness of deployment and maintenance.

Modbus normally runs on EIA-485 (also known as RS-485). Ethernet cable is also used for Modbus communication.

There are two typical Modbus protocols:
- Modbus/RTU
- Modbus/IP

Sensedge provides Modbus/IP support via the Ethernet port on the device.

Sensedge provides Modbus/RTU support via an external adapter connected to the Ethernet port on the device.

Sensedge can still upload data to the cloud via Wi-Fi when Modbus is used for local communication. Read more in 3 Setting up Wi-Fi Connection on Sensedge.

Please make sure your Sensedge is running the latest firmware. Please go to Setting – Device Details and check the Firmware Version.

This manual is only applicable for Sensedge running on firmware higher than V1.5.0. For earlier versions, please contact info@kaiterra.com for more details.

2.

Setting Modbus on Sensedge

A. Turning on Modbus

By default, the Modbus feature is not turned on. Go to Setting – Device Details – Connectivity – Modbus to turn on the feature.

B. Setting Device ID

In Setting – Device Details – Connectivity – Modbus screen, the Device ID is customizable. The Device ID is used to identify the device in the system, therefore, each Sensedge should have a unique Device ID, and the Device ID should also be different from other devices in the same system.

A default Device ID is filled in the Device ID field. The default address is 1. Please customize your Device ID, and make sure each device in the same line has a unique Device ID. The range of allowed Device ID is 1-247.

It is recommended to set the Device ID on site during or after installation, so it's easier to keep track of the Device ID and installation locations.

C. Setting Connection Type

In Setting – Device Details – Connectivity – Modbus screen, the Connection Type can be toggled between two modes: TCP and RTU.

TCP is supported by using the Ethernet port on your Sensedge. RTU is supported by using the Ethernet port on your Sensedge and an external adapter*.

For using RTU connection type, please make sure that the port is set to 30000. Read more on this in 2.4 Setting Modbus Port.

Please consult your BMS admin to find out which Modbus connection type should be selected.

The external adapter for Modbus/RTU support is NOT included in the Sensedge package. Please contact info@kaiterra.com for purchasing, and installation guidelines.

D. Setting Modbus Port

In Setting – Device Details – Connectivity – Modbus screen, the port is customizable. The default UDP port is filled in as 30000.

The port could also be customized, it could be any round number in the range of 1024 – 65535. It is recommended that the UDP port stays unchanged.

This customization is only applicable for Modbus/TCP. For Modbus/RTU, the port should be fixed to 30000.

Please consult with your BMS admin before changing the port.

E. Restarting the service

In Setting – Device Details – Connectivity – Modbus screen, there is a Restart Service button. Please use this button when you need to restart the Modbus service during setup.

3.

Communication Protocol - Modbus RTU

Data type and format: Data length=8

Stop bit=1

Transmission rate=9600

Check: even

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

Default modbus address code is 0x01

Commands:

Read Input Register (0x04) command 01 04 00 00 00 05 30 09 to read all input register

Register Address

Address	Content	R/W property	Comments
Input register 0	PM2.5	R	0-999 ug/m3
Input register 1	TVOC	R	0-9999 ppb
Input register 2	Temperature	R	-30.0-50.0°C

Input register 3	Humidity	R	0.0%-100% RH
Input register 4	CO2	R	0-9999 ppm

*Temperature is in absolute temperature T(k)=273.15+t(celsius)

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