

# BMS-1WIRE Quick Start Guide



Thank you for purchasing a BMS-1WIRE temperature and humidity monitoring device designed to integrate directly into a building management system (BMS). This guide outlines basic BMS-1WIRE installation and configuration. Before you install a BMS-1WIRE, check RLE's website to ensure you are using the most recent version of our documentation.

If you need further assistance, please contact RLE Technologies at support@rletech.com.



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## Installation Supplies

Included with the BMS-1WIRE BMS-1WIRE device

Available from RLE, sold separately

- 24VDC power adapter
- 1-WIRE sensors as necessary for your application

## Additional Supplies

18AWG shielded twisted pair stranded copper wire - no more than 2000ft (610m) (Modbus RTU or BACnet MS/TP communication via RS-485 port)

## Mount the Device

The BMS-1WIRE is designed to be installed in a panel, on a DIN rail, or mounted on a wall.

- If you're installing it on a DIN rail, use the DIN rail clip and secure the unit appropriately for your application.
- If you're mounting the unit on a wall, use a screwdriver to loosen the three screws and remove the DIN rail clip from the back of the unit. Then use the keyhole slots and secure the unit to the wall.

## Power the Unit

The BMS-1WIRE is designed to accept hardwired 24VDC power through the power terminal block (TB2). If hardwired power is not available, purchase and install RLE's PSWA-DC-24 power supply.

## 1-Wire Sensors

Plug in your temperature and humidity sensors. They click into place in the sensor ports on the top of the unit.

## Set the DIP Switches

The BMS-1WIRE has two sets of DIP switches. Push the numbered switch to the right to turn it on; push the switch to the left to turn it off. DIP switch 1 is used for system and communications configuration. DIP switch 2 is used to set the unit's device address.

DIP Switch 1, switches 1 through 8		
SW1 and SW2 - Set the baud rate for the RS-485 Port - 8 bit, no parity, 1 stop bit.		
1 = Off	2 = Off	9600 baud
1 = On	2 = Off	19200 baud
1 = Off	2 = On	38400 baud
1 = On	2 = On	76800 baud
SW3 - Modbus RTU or BACnet MS/TP Selection		
3 = Off		Communication via BACnet MS/TP
3 = On		Communication via Modbus RTU
SW4 - Modifiable BACnet Instance (For advanced users only)		
4 = Off		BACnet instance set via DIP switch SW2 (default)
4 = On		BACnet instance set from the command line. Refer to the BMS BACnet Instance Modification Technical Guide for complete instructions.
SW5 - Unused		
5 = Off		Unused, leave in the off position.
SW6 - Unused		
6 = Off		Unused, leave in the off position.
SW7 - Unit Type - Designate whether information is presented in metric or imperial units.		
7 = Off		Metric (Default)
7 = On		Imperial
SW8 - Unused		
8 = Off		Unused, leave in the off position.

Use DIP switch 2 to set the address of the device. This should be a number between 1 and 254. Adjust the individual switches until their sum equals the device address. Switch values are as follows:

DIP Switch 2, switches 1 through 8					
SW1 through SW8 - Set the device address for the BMS-1WIRE					
Switch number	Switch value	Switch number	Switch value	Switch number	Switch value
1	1	1	1	1	1
2	2	2	2	2	2
4	4	4	4	4	4
8	8	8	8	8	8
16	16	16	16	16	16
32	32	32	32	32	32
64	64	64	64	64	64
128	128	128	128	128	128
Off	On	Off	On	Off	On
		Example: Device address 34 SW2 and SW6 are ON		Example: Device address 226 SW2, SW6, SW7, and SW8 are ON	

## Connect the BMS-1WIRE to the Network

The BMS-1WIRE needs network connectivity to communicate with a Modbus RTU or BACnet MS/TP system, such as a BMS. Use a 2-wire RS-485 cable to connect the BMS-1WIRE to the network through the wiring connection at TB1. RLE recommends an 18AWG shielded twisted pair stranded copper wire for the connection, using

no more than 2000 feet (609.6m) of wire at this specification. If longer runs are needed, please contact RLE.

## CLI

After the BMS-1WIRE is connected to the terminal (115200 bps, 8 bit, no parity 1 stop bit) you'll see a menu that can be used to help understand the BMS-1WIRE's settings and functionality. Commands available from this menu are:

Command	Action
sdump [#]	Dump data about sensor #
slist	List all sensors
settings	Show current system settings (set by dip switches)
bid	Show BACnet device ID in use
sbid	Configure custom BACnet device ID
reboot	Reboot unit
?	Print main menu

## Modbus Communications

The BMS-1WIRE uses its RS-485 port to communicate via Modbus. The BMS-1WIRE is configured to act as a Modbus Server device on a common network and is a Server only device – it will never initiate a communications sequence.

## Read Output Registers

To read the BMS-1WIRE's parameter values, the Client must send a Read Output Registers request packet (function code 03). The following chart displays information for sensors 1 and 2. Each sensor follows the same register format, with sensor 3 information starting at register 40015, sensor 4 at register 40022, sensor 5 at register 40029, sensor 6 at register 40036, sensor 7 at register 40043, and sensor 8 at register 40050.

Sensor 1 Information			Sensor 2 Information		
Register	Name	Units	Register	Name	Units
40001	Sensor 1 device type ID	int16	40008	Sensor 2 device type ID	int16
40002	Sensor 1 value 1 temperature		40009	Sensor 2 value 1 temperature	
40003	Sensor 1 value 2 humidity		40010	Sensor 2 value 2 humidity	
40004	Sensor 1 reserved		40011	Sensor 2 reserved	
40005	Sensor 1 reserved		40012	Sensor 2 reserved	
40006	Sensor 1 reserved		40013	Sensor 2 reserved	
40007	Sensor 1 status 0 = OK 1 = Offline		40014	Sensor 2 status 0 = OK 1 = Offline	

## BACnet Communications

BACnet auto-discovery can be used to find all BACnet data points available for the 1-wire sensors.

Directions for modifying the BACnet instance, intended for advanced users, can be found in the BACnet Instance Modification Technical Guide.

## System Reference

### Front Panel LED

The lower right corner of the BMS-1WIRE houses an LED that uses different colors and blink patterns to convey device status and information.

Blink Pattern	Status Description
Green / Off - Every 2 seconds	Device operations are normal
Cyan / Off - Up to once every 10 seconds	The BMS-1WIRE is being polled by the Modbus RTU or BACnet MS/TP system
Red / Off	The BMS-1WIRE is not monitoring any 1-wire sensors

### 1-Wire Sensor LEDs

The LEDs next to the sensor connections across the top of the device will light once a sensor is detected in that port. This could take up to 10 seconds. The LED then flashes briefly while the sensor is being read.

### Front Panel Push Button

A white button in the lower right corner of the BMS-1WIRE can be used to perform a factory reset of the device:

Operation	Function
Press and hold for 20 seconds, then release the button (Red LED will turn ON after 10 seconds and then turn OFF after an additional 10 seconds)	Perform a full factory reset of the unit. Any stored BACnet settings will be deleted.

### BMS-1WIRE Physical Diagram

