



Application Note

BRTSYS_AN_079

Modbus Devices Configuration

Version 1.0

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1 Introduction

Modbus devices are widely used in industrial and automation applications due to their reliability, ease of integration, and standardized communication protocol. Configuring these devices correctly is essential for ensuring optimal performance, seamless data acquisition, and proper communication within a Modbus network. This application note provides a comprehensive guide on configuring BRTSys Modbus devices using BRTSys adapters and the BRTSys Modbus Configuration Utility.

This document is intended for system integrators, engineers, and technicians involved in industrial automation, building management systems, and IoT applications.

2 Modbus Cable Attachments

BRTSys Modbus sensors and actuators come bundled with one of two types of Modbus cable attachments. These are:

- 1) MA-0101-01A - Modbus RS485 - JST Cable (30cm) and
- 2) MA-0102-01A - Modbus RS485 - RJ11 Cable (30cm)

The following table shows which devices are bundled with which type of cable.

BRTSys Device	Cable Attachment
Modbus 4in1 Sensor	Modbus RS485 - JST Cable
Modbus Gas and TrueVOC Sensor	Modbus RS485 - JST Cable
Modbus CO2 Sensor	Modbus RS485 - JST Cable
Modbus 2CH Relay	Modbus RS485 - RJ11 Cable
Modbus 2CH Relay + iSense	Modbus RS485 - RJ11 Cable
Modbus 2CH Non-Latching Relay	Modbus RS485 - RJ11 Cable
Modbus 2CH Non-Latching Relay + iSense	Modbus RS485 - RJ11 Cable
Modbus 4CH Solid State Relay	Modbus RS485 - RJ11 Cable
Modbus Thermocouple Sensor Adapter	Modbus RS485 - RJ11 Cable
Modbus DO Sensor Adapter	Modbus RS485 - RJ11 Cable
Modbus Salinity Sensor Adapter	Modbus RS485 - RJ11 Cable
Modbus pH Sensor Adapter	Modbus RS485 - RJ11 Cable
Modbus ORP Sensor Adapter	Modbus RS485 - RJ11 Cable
Modbus EC Sensor Adapter	Modbus RS485 - RJ11 Cable
Modbus Trailing Edge Light Dimmer	Modbus RS485 - RJ11 Cable
Modbus IO Controller	Modbus RS485 - RJ11 Cable

Table 1 - BRTSys Modbus Devices and Cable Attachments

The table below provides the specification for each cable attachment:

Item	Description	MA-0101-01A Modbus RJ485 - JST Cable (30cm)	MA-0102-01A Modbus RS485 - RJ11 Cable (30cm)
Input	Ports	Screw Terminal Block	Screw Terminal Block
	Input Voltage	9V – 24V DC	9V – 24V DC
	Interface	RS485	RS485
	Wire Size AWG	24-16AWG	24-16AWG
	Protection	Reverse polarity protection	Reverse polarity protection
Output	Ports	JST Connector	RJ11 Connector
	Output Voltage	5V	5V
	Output Max. Current	1000mA	1000mA
	Cable length	30cm	30cm
Physical Characteristics	Color	Light Blue	Light Blue
	Material	ABS	ABS
	Dimension	56*26*13mm	56*26*13mm
Environmental Limits	Operating Temperature	0 °C to 70 °C	0 °C to 70 °C
	Storage Temperature	-20 °C to 85 °C	-20 °C to 85 °C
	Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)

Table 2 – Modbus Cable Specifications

2.1 MA-0101-01A: Modbus RS485 - JST Cable (30cm)

Connect the JST connector end of the cable to the device. Refer to individual device's datasheet for this connection.

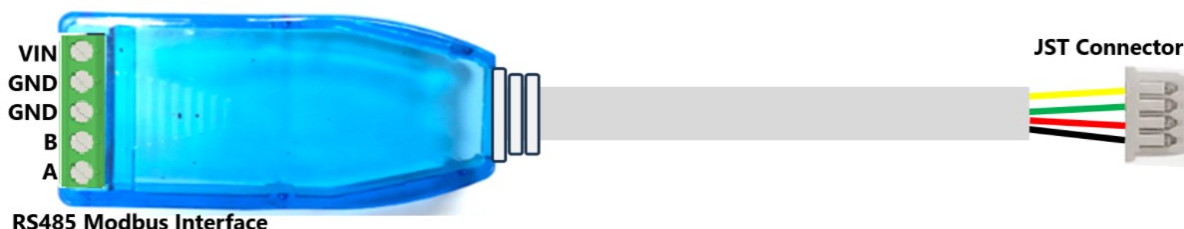


Figure 1 - MA-0101-01A - Modbus RJ485 - JST Cable (30cm)

INPUT Port		OUTPUT Port	
Terminal Block	Function	JST Connector	Function
VIN	Modbus Input Voltage 9-24VDC	YELLOW	VOUT (+5VDC)
GND	Ground	GREEN	RS485-B
GND	Ground	RED	RS485-A
B	RS485-B	BLACK	Ground
A	RS485-A		

Table 3 - MA-0101-01A - Modbus RJ485 - JST Cable (30cm)

2.2 MA-0102-01A: Modbus RS485 - RJ11 Cable (30cm)

Connect the RJ11 connector end of the cable to the device.



Figure 2 - MA-0102-01A - Modbus RS485 – RJ11 Cable (30cm)

INPUT Port		OUTPUT Port	
Terminal Block	Function	RJ11 Connector	Function
VIN	Modbus Input Voltage 9-24VDC	YELLOW	VOUT (+5VDC)
GND	Ground	GREEN	RS485-B
GND	Ground	RED	RS485-A
B	RS485-B	BLACK	Ground
A	RS485-A		

Table 4 - MA-0102-01A - Modbus RS485 – RJ11 Cable (30cm)

3 Device Configuration

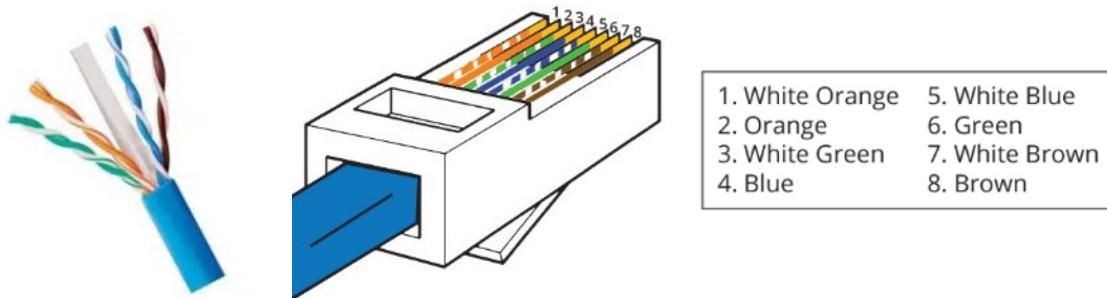
Before we can use the Modbus device, we must ensure the following are configured:

- a. A unique Modbus device address
- b. Communication Baud rate
- c. RS485 Termination (For last device in the bus)
- d. Status LED On/OFF

The following sections describe the configuration steps using the BRTSys LDSBus USB Adapter and the [BRTSys Modbus Configuration Utility](#). It is also possible to use any other Modbus host software tool and Modbus cable that meets the requirements. Refer to Table 3 and Table 4 for appropriate connections.

3.1 Hardware Setup

- a. LDSBus USB Adapter with Power Supply
- b. RJ45 network patch cord segment



1. Connect the RJ45 strands according to the table below to the Modbus terminal block.

Free Wire Color	PIN Legend	Modbus Terminal Block
1. White, Orange	B	RS485-B
2. Orange	A	RS485-A
3. White, Green	N/A	N/A
4. Blue	VIN	Modbus Input Voltage 9-24VDC
5. White, Blue	VIN	Modbus Input Voltage 9-24VDC
6. Green	N/A	N/A
7. White, Brown	GND	Ground
8. Brown	GND	Ground

Table 5 - Modbus Pin Configuration

2. Attach the RJ45 connector to the LDSBus USB Adapter and setup the hardware as shown below.

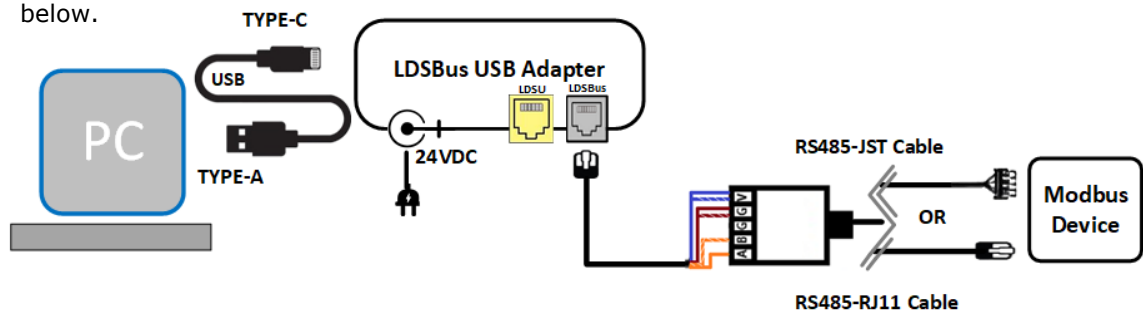


Figure 3 - Modbus Configuration Hardware Setup

3.2 Configuration

1. Download and install [Modbus Configuration Utility](#) in your PC.
2. Launch the app and set up the connection to match the factory default serial settings of the BRTSys Modbus devices.

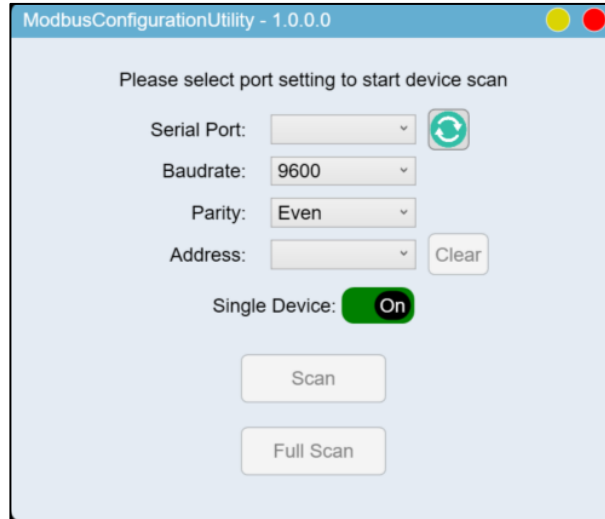


Figure 4 - Modbus Configuration Utility Startup Window

Serial Settings	Value
Serial Port	Select COM port. Use  icon to rescan and view list of available COM ports. Choose the COM port that is attached to the LDSBus USB Adapter.
Baud rate	9600bps (default)
Parity	Even Parity (default)
Address	Blank
Single Device	Set to ON (if there is only one device on the bus, else set to OFF)

Table 6 - Serial Settings

3. Once all the settings have been configured, click [**Scan**] button to start scanning.

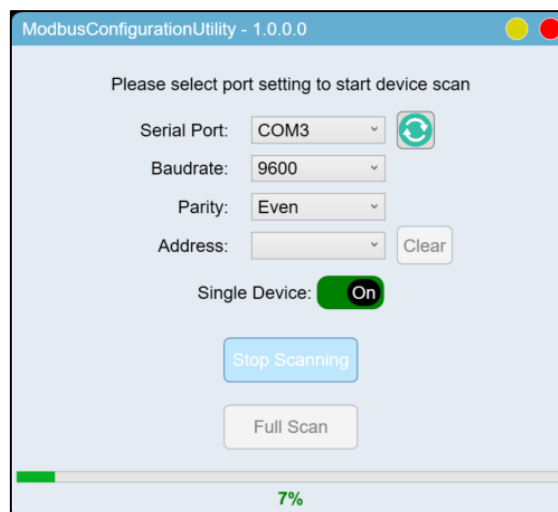


Figure 5 - Scan in Progress

Note: **Full Scan** feature will search through all possible combinations of **baud rate, parity,** and **device address**. This feature is ideal for locating devices with unknown or misconfigured communication settings.

4. Upon completion, a message box appears indicating the number of detected devices.



Figure 6 - Scan Complete

5. Once devices are detected, the Device Configuration Window will be displayed as shown below. Selecting a device in the Devices panel will display additional information in the Device Info and Parameter Settings panels and these can be ignored for now. The device in this example is a BRTSys Modbus 4in1 Sensor.

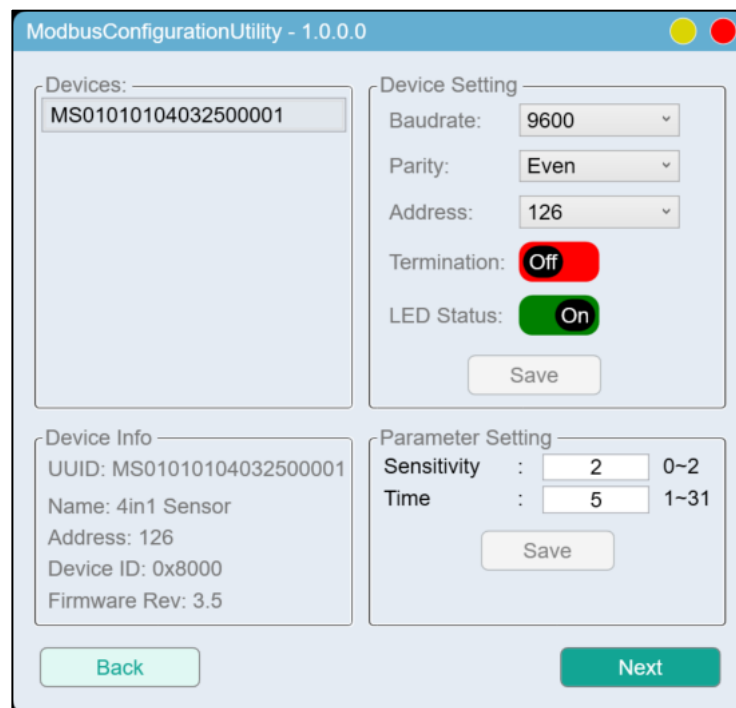


Figure 7 - Device Setting Window

Click **[Next]** to proceed to the control interface for the selected Modbus device. For example, if the connected Modbus device is a 4in1 sensor, the window displays live sensor data and data logging preferences may be set.

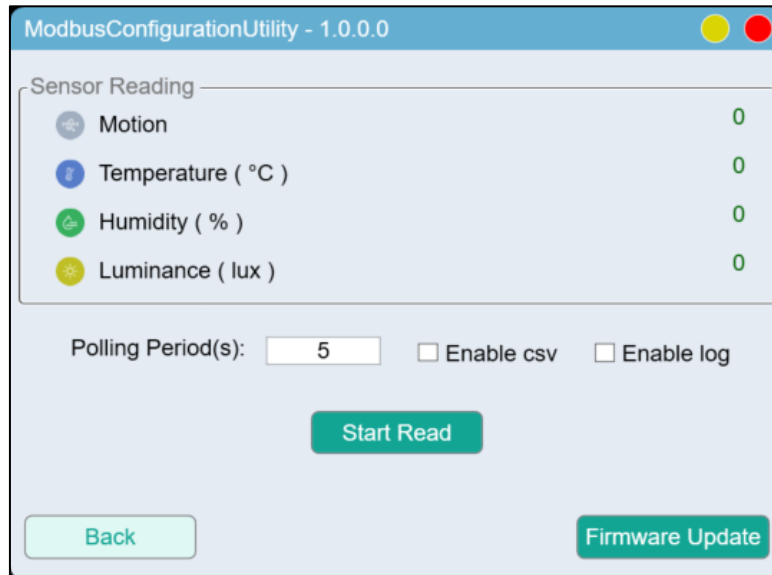


Figure 8 - 4in1 Sensor Reading Display Window

Click **[Back]** to return to the previous screen (Figure 7). The Baudrate, Parity, Address, Termination and LED Status settings may now be altered to match your Modbus settings for deployment. Click on **[Save]** to update the settings to the device. These settings are persistent and need to be done once only.

6. Click **[Back]** again to return to Figure 5 (Device Scan page). Change the Baud Rate, Parity and Address settings on the page to match the device settings. Repeat the scan. If the device can be found with the updated settings, then the updated settings have taken effect and device configuration is complete. The device may now be deployed into its production environment.

4 Contact Information

Refer to <https://brtsys.com/contact-us/> for contact information.

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Appendix A – References

Document References

NA

Acronyms and Abbreviations

Terms	Description
DO	Dissolved Oxygen
EC	Electrical Conductivity
IoT	Internet of Things
LDSEBus	Long Distance Sensor Bus
LED	Light Emitting Diode
ORP	Oxidation Reduction Potential
USB	Universal Serial Bus

Appendix B – List of Tables & Figures

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Appendix C – Revision History

Document Title: BRTSYS_AN_079 Modbus Devices Configuration
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Document Feedback: [Send Feedback](#)

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1.0	Initial Release	13-05-2025