BRTSys

IoT Portal
Sense | Monitor | Control

USER GUIDE

Introduction
(Release. 2.3.0)

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Table of Contents

1. Introduction

1.1 About IoTPortal User Guides

The below set of user guides for the following components aims to provide necessary information for hardware setup, configuration, and operating information.

S/N	Components	Document Name
1	Portal Web Application (WMC)	BRTSYS_AN_087_IoTPortal User Guide - Portal Web Application (WMC)
2	Android Mobile App	BRTSYS_AN_088_IoTPortal User Guide - Android Mobile App
3	iOS Mobile App	BRTSYS_AN_089_ IoTPortal User Guide - iOS Mobile App

1.2 About This Guide

This guide provides an overview of the IoTPortal ecosystem, covering LoRaWAN support, general platform features, hardware and software prerequisites, and hardware setup instructions.

1.3 Intended Audience

The intended audience are System Integrators, Technical / Administrative users who will assist with the installation, realize the capabilities, functions, and the full benefits of the product.

1.4 Document References

Document Name	Document Type	Format
BRTSYS_AN_001_LDSBus Configuration Utility User Guide	Application Note/ User Guide	PDF
BRTSYS_AN_080_Modbus Configuration Utility User Guide		
BRTSYS_AN_091_IoTPortal - LoRaWAN Getting Started Guide		
BRTSYS_AN_079_Modbus Device Configuration		

2. Product Overview

BRTSYS IoTPortal is a vertically integrated IoT platform comprising of IoT cloud management software and hardware such as the IoTPortal gateways, LoRaWAN gateways and bridges, LDSBus and Modbus sensors and actuators. These hardware and software layers work together seamlessly to provide an end-to-end sensor to app solution.

The IoTPortal is application agnostic and can be widely used in a range of fields such as smart buildings, agriculture, aquaculture, data centres, and industrial environments. Featuring a Zero-Code automation environment, users can rapidly implement IoT based automation in their applications. Using various sensing and monitoring techniques, productivity, efficiency, and safety are enhanced resulting in higher revenue and security with lower maintenance costs.

The IoTPortal Mobile apps, which can be downloaded from the Play Store or App Store, provide global real-time monitoring, alert notifications, and control automation through the cloud. The system can automatically send SMS, email, or push notifications to the relevant organization or user group in case of any excursions from pre-configured parameters. External devices and appliances can be controlled automatically or manually by LDSBus actuator hardware through pre-configured events.

The IoTPortal provides a data dashboard that allows users to view live and historical data in various chart formats.

Figure 1 shows the IoTPortal ecosystem with the IoTPortal Gateway serving as a principal component connecting the LDSBus devices (Sensors/Actuators) to the cloud.

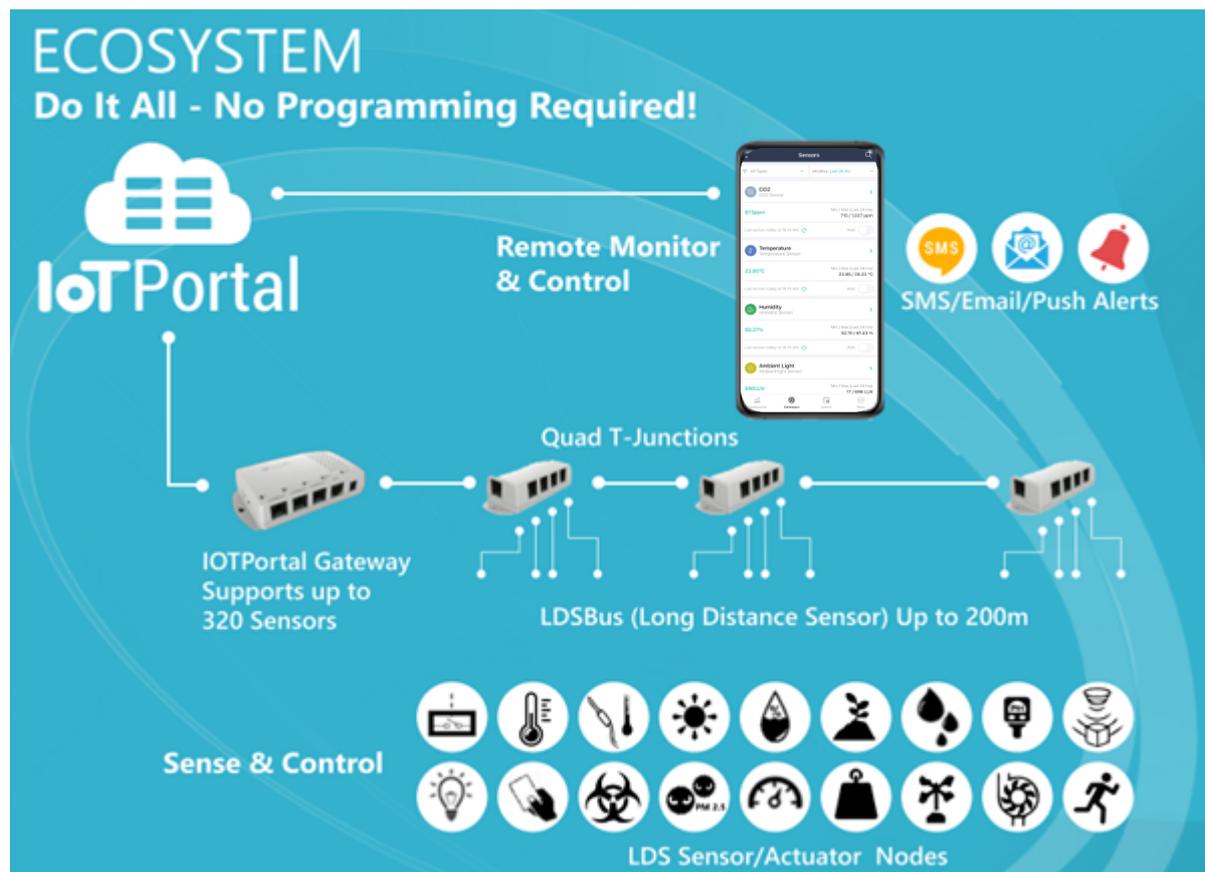**Figure 1 - IoTPortal Ecosystem**

IoTPortal gateways connect to the cloud via Ethernet or Wi-Fi. They are powered by either Power over Ethernet (PoE) or an external power source (DC Adapter). By using the IoTPortal Gateway, users can communicate from LDSBus-based devices (sensors/actuators) directly with the BRTSys IoTPortal Cloud services. The gateway is equipped with three LDSBus ports, which serve as data

communication/power interfaces to the 24V LDSBus network. Each port may be connected to a large number of sensors/actuators via LDSBus Quad T-Junctions using RJ45 cables (Cat5e); a maximum of 80 LDSBus Devices are supported per gateway. A LDSBus device can support more than one sensor or actuator. If a local network connection is lost or severed, the IoTPortal gateway continues to collect sensor data, storing the data in its on-board non-volatile storage and uploads this data to the cloud once a connection is established again.

IoTPortal now supports wireless connectivity through LoRaWAN. Using the LoRaWAN Bridge and Gateway, a wide range of Modbus sensors, sensor adapters, and actuators can be connected without the need for cables. This allows for flexible deployment in both indoor and outdoor environments.
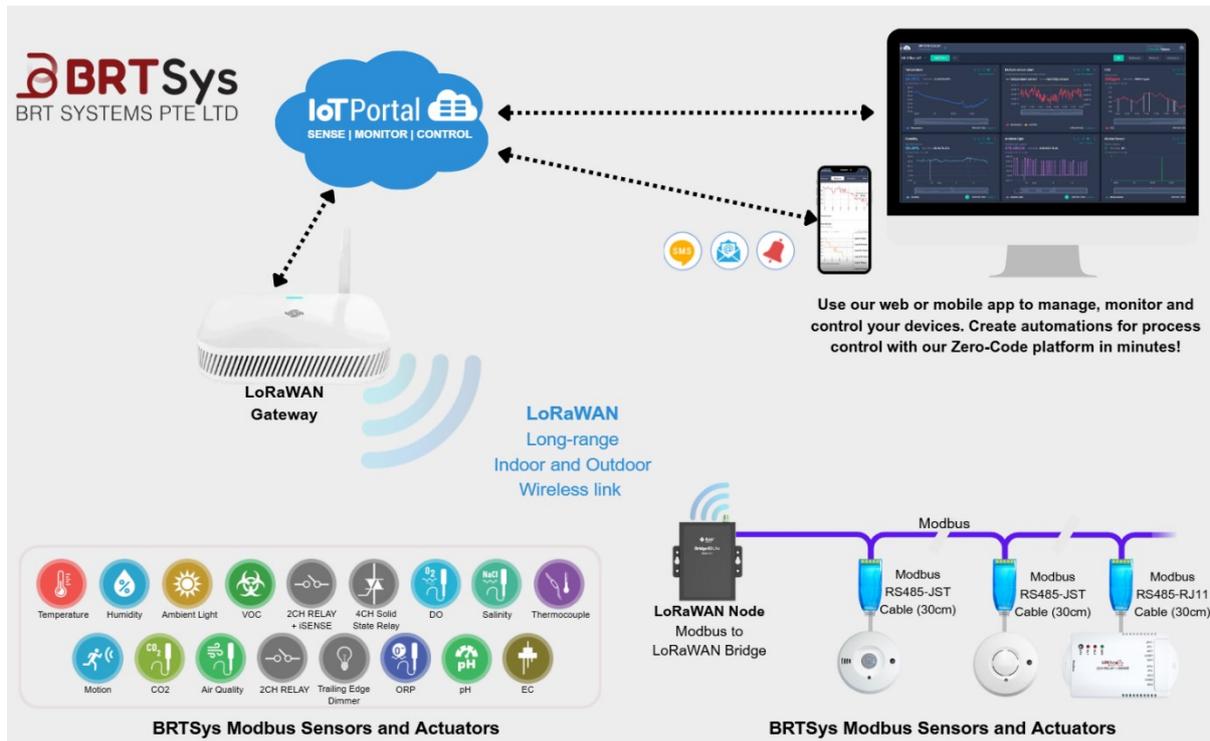

Figure 2 - IoTPortal LoRaWAN Connectivity

3. Features

IoTPortal offers the following key features –

- ❖ Turnkey sensor to cloud solution for integrating the Internet of Things into any application without requiring programming or technical expertise.

- ❖ With the IoTPortal mobile app, users can create and manage their organizations, manage user groups, configure gateways and sensors, create events, and manage subscriptions.

- ❖ The sensor-to-gateway architecture eliminates battery issues associated with wireless sensor solutions. There is no signal fallout, with inherent privacy and security benefits.

- ❖ IoTPortal Gateway supports up to 80 LDSBus devices with a reach of 200 meters (about 12 soccer fields or 12.6 hectares).

- ❖ This product family includes BRTSys LDSBus Devices (Sensors/Actuators) that sense and control a wide range of parameters (For more information on LDSBus devices, visit https://brtsys.com/components/ → LDSBus .

- ❖ With the LDSBus Quad T-Junction, sensors/actuators can be mixed and matched to fulfil any application need.

- ❖ Support for prepaid and free plan subscriptions, biometric mobile login, event variables, high-resolution charts, and time zone selections.

- ❖ Support for 4-wire motor applications, energy and water flow meters, and enhanced gateway geo-location.

- ❖ Complex automation sequences using sensor conditions, recurrence definitions and automation chaining using event variables.

- ❖ Data visualisation of sensors, actuators, LDSUs and gateway.

- ❖ IoTPortal's LoRaWAN connectivity enables long-range wireless operation with BRTSys Modbus sensors and actuators, offering flexible indoor/outdoor installation.

4. Hardware / Software Pre-requisites

4.1 IoTPortal Gateway - Hardware Pre-requisites

- **IoTPortal Gateway -** There are two gateway variants available: PSU and PoE. The PSU version is powered by an external DC adapter, which also provides power to the LDSBus ports, while the PoE version is powered through a PoE-enabled switch or router.

- A package that includes LDSBus devices with cables is included.

- LDSBus Quad T-Junction(s) which connect LDSBus Devices and the gateway.

- To connect the LDSBus Quad T-Junction to the IoTPortal Gateway and to form a daisy chain with other LDSBus Quad T-Junctions, several RJ45(Cat5e) cables will be required.

As part of initial pre-configuration of LDSBus Devices (Sensors/Actuators), the following additional hardware is required –

- A windows-based PC to download the configuration utility tool for configuring LDSBus devices. For more information, visit https://brtsys.com/resources/software/brtsys-utility-tools.

- LDSBus USB Adapter

- USB C to USB A cable

4.2 LoRaWAN Node - Hardware Pre-requisites

- Any compatible LoRaWAN gateway device (e.g.: RAK7268V2, RAK7289V2)

- **LoRaWAN Node (RAK7431)** which is a Modbus RTU to LoRaWAN bridge. Refer to BRTSYS_AN_091 IoTPortal - LoRaWAN Getting Started Guide for more information on gateway and bridge setup.

- Router/Switch connected to the internet.

- Modbus devices with included cable

As part of configuration of LoRaWAN node and Modbus devices (Sensors/Actuators), the following additional hardware is required –

- A windows-based PC to download the configuration utility tool for configuring Modbus devices. For more information, visit https://brtsys.com/resources/software/brtsys-utility-tools.

- Micro-USB to USB A cable.

4.3 IoTPortal Gateway - Software Pre-requisites

- IoTPortal Mobile app (for Android / iOS) that can be downloaded from the Play Store or the App Store.

- LDSBus Configuration Utility Tool which can be downloaded from here - https://brtsys.com/resources/software/brtsys-utility-tools.

4.4 LoRaWAN Node - Software Pre-requisites

- IoTPortal Mobile app (for Android / iOS) that can be downloaded from the Play Store or the App Store.

- Modbus Configuration Utility Tool (Version 1.3.0 or above) which can be downloaded from here - https://brtsys.com/resources/software/brtsys-utility-tools.

5. Hardware Setup Instructions

5.1 Configuring LDSBus Devices (Sensors / Actuators)

LDSBus devices must be configured before they can be utilized in any application. Download the LDSBus Configuration Utility from https://brtsys.com/resources/software/brtsys-utility-tools.

1. Connect the LDSBus Device to the Windows PC with a USB-C to USB-A cable.

2. Ensure that the LDSBus Device is connected to its cable at one end.

3. Attach the other end of the cable to the LDSBus USB Adapter as shown in Figure 3.

4. For detailed instructions on configuring the device, refer to the LDSBus Configuration Utility guide at Software (Utility Tools) - BRT Systems Pte Ltd → Application Note / User Guide → LDSBus Configuration Utility.
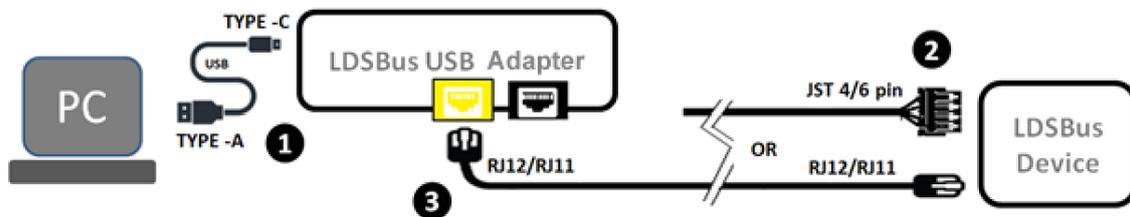
Repeat steps 1 through 4 for all the LDSBus devices.

Figure 3 - LDSBus Device Configuration - Connection Diagram

5.2 Connecting LDSBus Devices to IoTPortal Gateway

Having configured the LDSBus Devices, the IoTPortal Gateway can be used to connect them to the cloud and make them accessible.

1. Connect the first LDSBus connector to the IoTPortal Gateway via the LDSBus Port.

2. As shown in Figure 4, connect the configured LDSBus device(s) to the LDSBus Quad T-Junction. Make sure the termination is set to "ON" on the last device.
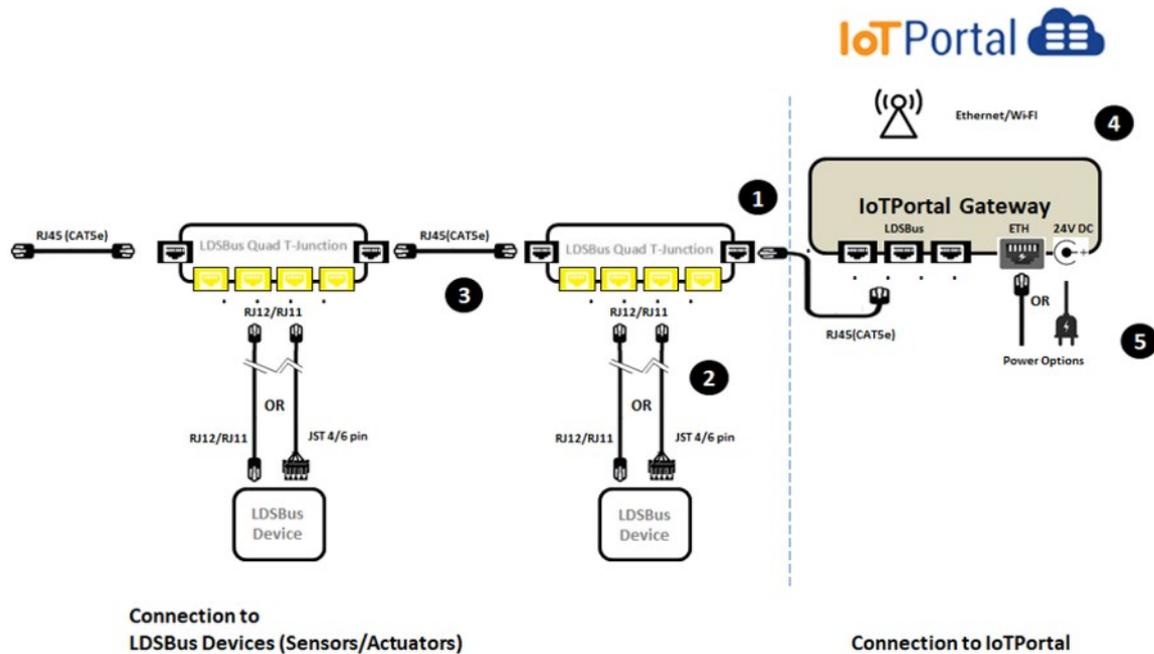

Figure 4 - LDSBus Devices – IoTPortal Gateway Connection

3. Chain the LDSBus Quad T-Junctions together (as shown in Figure 4) if there is more than one.

4. If PoE based gateways are being used, connect the gateway to the PoE router/switch via Ethernet cable. To connect to the Wi-Fi, skip to the next step.

5. Power the gateway either with PoE or DC input. The power LED will display either red (PoE -af input active) or orange (PoE-at input active/DC input active).

6. Refer to BRTSYS_AN_088_IoTPortal User Guide – Android Mobile App or BRTSYS_AN_089_IoTPortal User Guide - iOS Mobile App for further instructions.

5.3 Connecting LoRaWAN Node to PC

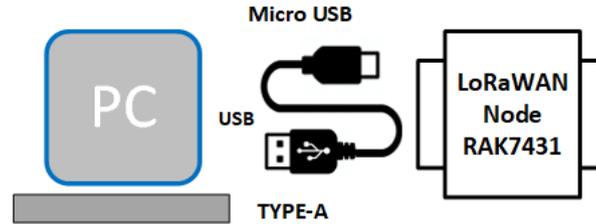Connect the LoRaWAN Node to the Windows PC using a Micro-USB to USB-A cable as shown in figure below.

Figure 5 - LoRaWAN Connection Diagram

Refer to the application note BRTSYS_AN_091 IoTPortal - LoRaWAN Getting Started Guide for more information on setting up LoRaWAN node.

5.4 Connecting LoRaWAN Node to Modbus Devices

Follow these steps to connect the devices:

1. Connect the Modbus adapter cable to the device. Some devices require the Modbus RS485-JST cable, while others use the Modbus RS485-RJ11 cable.

2. Daisy-chain the Modbus adapters into the Modbus backbone.
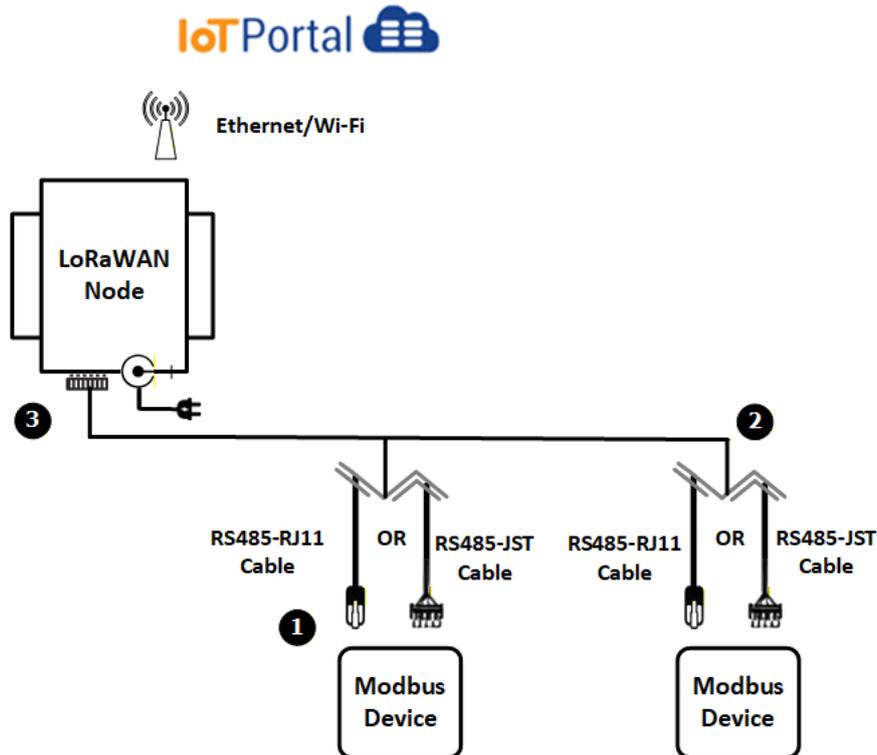
3. Connect the Modbus backbone to the LoRaWAN Node.

Figure 6 - LoRaWAN Node to Modbus Devices - Connection Diagram

Appendix

Glossary of Terms, Acronyms & Abbreviations

Term or Acronym	Definition or Meaning
DC	Direct Current is one-directional flow of electric charge.
IoT	The Internet of Things is a network of interrelated devices that connect and exchange data with other IoT devices and the cloud.
LED	Light Emitting Diode is a semiconductor device that emits light when current flows through it.
PoE	Power over Ethernet is a technology for implementing wired Ethernet local area networks (LANs) that enables the electrical current necessary for operating each device to be carried by Ethernet data cables instead of standard electrical power cords and wiring.
PSU	Power Supply Unit
SMS	Short Message or Messaging Service is a text messaging service that allows the exchange of short text messages between mobile devices.
USB	Universal Serial Bus is an industry standard that allows data exchange and delivery of power between many several types of such electronics.

List of Figures

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Document Feedback   :   Send Feedback

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Ver. 2.0	Initial release for IoTPortal V2.0.1	12-08-2024
Ver. 2.1	Updated release for IoTPortal V2.3.0	23-10-2025