Budderfly Multi-Protocol Adapter – MPA

User Manual

Date: January 10, 2025

Contents

Introduction

The Budderfly Multi-Protocol Adapter (MPA) serves as a versatile communication interface, facilitating data exchange across multiple protocols including RS485, Ethernet, BLE, Wi-Fi, and LoRa. This device operates seamlessly by interfacing with third-party devices or systems via RS485 or Ethernet connections, or a combination of both, which are then converted into wireless connections via Wi-Fi, LoRa, or both simultaneously.

The MPA functions as a bridge between traditional wired communication protocols (RS485 and Ethernet) and wireless technologies (BLE, Wi-Fi, and LoRa). It enables bidirectional communication between legacy systems and modern wireless networks, providing a seamless transition to wireless connectivity. The MPA can be powered through Ethernet or an external power source within the voltage range of 5-15 VDC, offering flexibility in deployment and integration within various environments.

In essence, the Budderfly Multi-Protocol Adapter (MPA) serves as a vital link in the communication ecosystem, facilitating interoperability between diverse communication protocols and enabling the integration of legacy systems into wireless networks with ease and efficiency.

Specifications

- **Dimensions**: H 82 mm x W 73 mm x D 45 mm
- **WI-FI:** 802.11 b/g/n (2.4G)
- **Input Voltage:** 5-15 VDC,
- **Storage Temperature:** 32 F to 150 F

Getting Started

Operation of Feature Settings

1. Introduction

Overview

The Budderfly Multi-Protocol Adapter (MPA) is a versatile and robust communication device designed to facilitate seamless data transfer across multiple communication protocols. It integrates Wi-Fi, LoRa, Ethernet, and RS485 interfaces, making it an ideal solution for a wide range of applications, including smart homes, industrial automation, and IoT deployments. This user manual provides comprehensive information on the installation, operation, and maintenance of the Budderfly Multi-Protocol Adapter (MPA) .

Key Features

Multi-Protocol Support: Wi-Fi, LoRa, Ethernet, RS485

High Performance: Powered by ESP32-WROVER-IE MCU

Flexible Power Options: Power over Ethernet (PoE) and RJ10 connector

Rugged Design: Suitable for both indoor and outdoor use with waterproof housing

User-Friendly Interface: Simple reset options and clear indicator lights

Package Contents

Budderfly Multi-Protocol Adapter (MPA)

Power Adapter (if applicable)

Mounting Brackets

Quick Start Guide

Warranty Card

2. Hardware Specifications

Device Dimensions

Size: 60mm x 60mm x 43mm (external antennas excluded)

Environmental Specifications

Operating Temperature: [Insert Temperature Range]

Waterproof Rating: [Insert Waterproof Rating]

Power Specifications

Input Voltage: 5 to 15 VDC via RJ10 or PoE

Power Consumption: [Insert Power Consumption]

Component Details

ESP32-WROVER-IE

Wi-Fi Protocols: 802.11 b/g/n

Bluetooth Protocols: Bluetooth v4.2 BR/EDR and Bluetooth LE

Flash Memory: 16 MB

PSRAM: 8 MB

Operating Voltage: 3.0 V ~ 3.6 V

Sleep Current: < 5 µA

RM1262-453-00140R LoRa Module

Frequency Range: 868/915 MHz

Modulation: LoRa, FSK, GFSK

Power Output: Up to 20 dBm

Sensitivity: -137 dBm

LAN8720 Ethernet Module

Ethernet Speed: 10/100 Mbps

Operating Voltage: 3.3V

Package: 24-pin QFN

RS485 Communication

Transceiver: ISL3178EIUZ

Connector: RJ10

Voltage Range: 5 to 15 VDC

Power Options

RJ10 Connector: Provides both communication and power

Power over Ethernet (PoE): Utilizes TPS23753A chip for PoE functionality

3. Firmware and Software

Overview

The Budderfly Multi-Protocol Adapter (MPA) comes with firmware developed by Budderfly, ensuring optimal performance and seamless integration with Budderfly's network and AWS server.

Firmware Updates

Firmware updates are delivered over-the-air (OTA) with secure, encrypted delivery. Users will be notified of updates via the Budderfly mobile app or web interface.

Network Configuration

Network configuration can be done through the Budderfly mobile app or web interface. Users can set up Wi-Fi credentials, LoRa settings, and Ethernet configurations through an intuitive interface.

4. Installation

Unpacking

Carefully unpack the Budderfly Multi-Protocol Adapter (MPA) and ensure that all components listed in the package contents are present. Inspect the device for any physical damage.

Mounting the Device

The device can be mounted on a wall or pole using the provided brackets. Ensure that the mounting location is within range of the network and power sources.

Connecting to Power

The device can be powered through the RJ10 connector or via PoE. If using the RJ10 connector, ensure that the power source provides 4.7 to 16.5 VDC. For PoE, connect the Ethernet cable to a PoE injector or switch.

Connecting to the Network

Connect the device to your network using the Ethernet port or configure the Wi-Fi settings through the Budderfly app. For LoRa connectivity, ensure that the antenna is securely attached and configured.

5. Operation

Understanding Indicator Lights

Wi-Fi Indicator:

Blinking Red: Not connected to Wi-Fi

Solid Red: Connected to Wi-Fi but not to the server

Solid Green: Connected to Wi-Fi and Budderfly/AWS server

Resetting the Device

Manual Reset: Press and hold the reset button for 10 seconds.

Remote Reset: Initiate a reset command through the Budderfly app or web interface.

Connecting to Devices and Networks

The device supports communication over Wi-Fi, Ethernet, and LoRa. Configure the network settings through the Budderfly app and ensure that all connected devices are within range and properly configured.

6. Troubleshooting

Common Issues and Solutions

No Power: Ensure that the power source is within the specified voltage range and that the connections are secure.

No Wi-Fi Connection: Check the Wi-Fi credentials and ensure that the device is within range of the router.

No Ethernet Connection: Verify the Ethernet cable and connection to the network.

Indicator Light Issues: Refer to the indicator light guide for troubleshooting.

Indicator Light Guide

Blinking Red: Not connected to Wi-Fi – Check Wi-Fi credentials and router settings.

Solid Red: Connected to Wi-Fi but not to server – Verify server status and network connection.

Solid Green: Fully operational – No action required.

7. Maintenance

Cleaning

Keep the device clean and free from dust. Wipe the exterior with a damp cloth. Do not use harsh chemicals or abrasive materials.

Firmware Maintenance

Regularly check for firmware updates through the Budderfly app or web interface. Ensure that the device is running the latest firmware for optimal performance and security.

8. Technical Support

For technical support, visit Budderfly Support or contact our support team at [insert contact information]. Our team is available to assist you with any issues or questions you may have.

9. Warranty Information

The Budderfly Multi-Protocol Adapter (MPA) comes with a [insert warranty period] warranty. This warranty covers manufacturing defects and device malfunctions. For more information, refer to the warranty card included in the package.

10. Regulatory

FCC Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This device has been tested and found to comply with the limits for a Class B digital device, according to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if not installed and used following the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

i. Reorient or relocate the receiving antenna.
ii. Increase the separation between the equipment and receiver.
iii. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
iv. Consult the dealer or an experienced radio/TV technician for help.

Note: The Grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. such modifications could void the user's authority to operate the equipment.

Radiation Exposure Statement

This device complies with FCC radiation exposure limits set forth for an uncontrolled rolled environment. This device should be installed and operated with a minimum distance of 20cm between the radiator and your body.

Additional Information

The Budderfly Multi-Protocol Adapter (MPA) is designed to provide robust and reliable communication across multiple protocols. Its versatile power options and rugged design make it suitable for a wide range of applications, ensuring seamless data transfer in both indoor and outdoor environments. With its user-friendly interface and comprehensive support, the Budderfly Multi-Protocol Adapter (MPA) is an ideal solution for modern communication needs.

Conclusion

The Budderfly Multi-Protocol Adapter (MPA) is a highly capable and versatile communication device designed to meet the demands of modern connectivity. Its multi-protocol support, flexible power options, and rugged design ensure reliable performance in a variety of applications. By

following the guidelines and information provided in this user manual, users can effectively install, operate, and maintain the device to achieve optimal performance.

For any additional information or support, please refer to the Budderfly Support resources or contact our support team.

This user manual provides detailed information on the Budderfly Multi-Protocol Adapter (MPA) , ensuring that users have all the necessary information to install, operate, and maintain the device effectively. If you need more detailed technical information on the individual components, please refer to the datasheets provided or consult the relevant sections of those documents.