

LR270 Datasheet

Amp'ed RF Technology, Inc.

LR270 Product Specification

Description

The LR270 LoRA USB Adaptor is an evaluation platform for the LR70 module series.

This adaptor allows a developer to quickly utilize the embedded AT command features of the LoRA/Bluetooth module, without further platform support or development. The commands and profiles come preloaded, for easy startup.

Customized firmware for mesh networking, power optimization, security, and other proprietary features may be supported and can be ordered pre-loaded and configured.

Software

BLE Stack

- Bluetooth v5.1 BLE
- ATT/GATT LE layers
- BLE Mesh, Relay, Proxy, and Friend nodes.
- Authentication and encryption

LoRa Software

- Mesh over LoRa media bearer
- LoRa protocol stack

General Features

- On module LoRa Protocol Stack
- Bluetooth v5.1
- Range: up to 8 km

RF Features

- Long range transceiver, 866Mhz or 915Mhz bands
- Bluetooth 2.4Ghz transceiver
- RX sensitivity: -146 dBm
- TX power: 28 dBm
- FSK/GFSK LoRa modulations: 0.3 to 37.5 kbps

MCU Features

- 1M bytes RAM, 2M byte Flash memory
- UART/I2S/I2C/SPI
- 8 GPIO
- Analog ADC and DAC audio

Firmware Features

- LoRa and Bluetooth Low Energy protocols
- Mesh support for both LoRa and BLE networks (LoRa Mesh)
- Firmware upgrade over UART

Applications

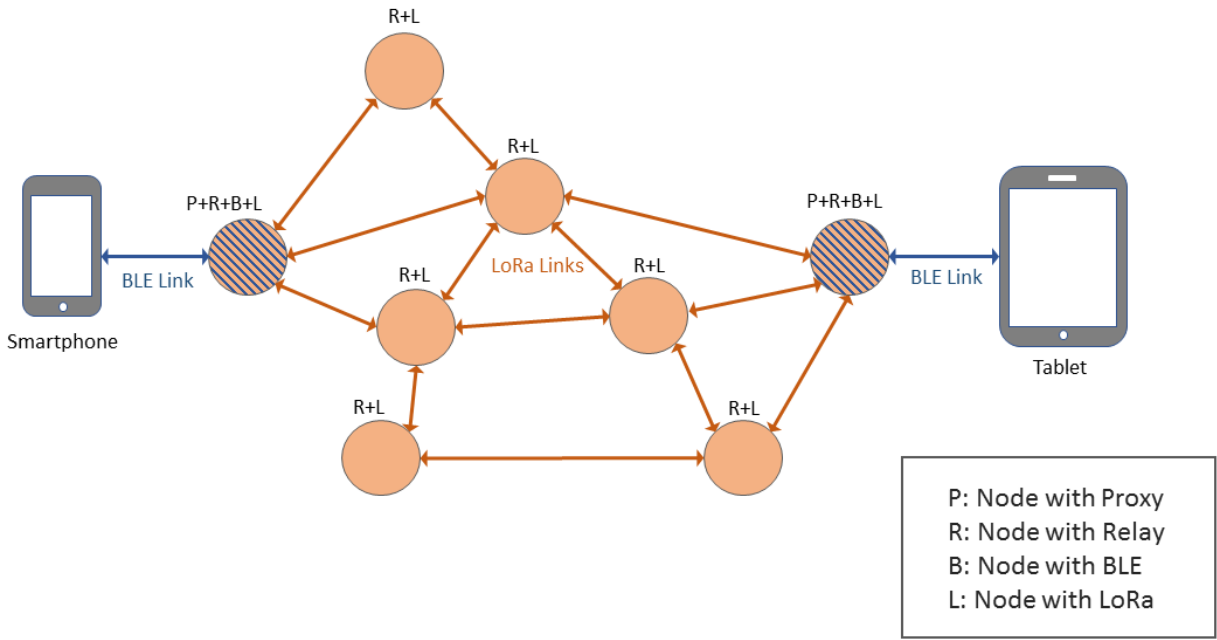
- Remote metering
- Building automation
- Smart city
- Internet of Things (IoT)

1. Mesh Network

Software Architecture

AT Serial Command Set	
Mesh	LE Profiles & Mesh
LoRa Protocol Stack	ATT/GATT LE
LoRa Radio	Bluetooth Radio
GPIO/Serial/Audio/Flash	

Mesh Example



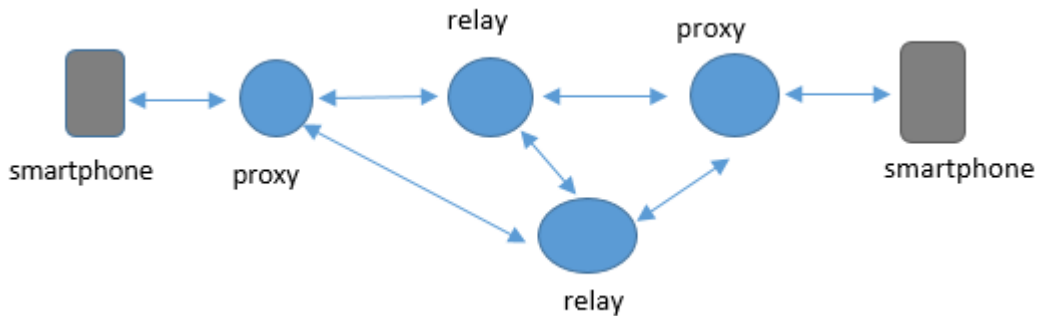
- Proxy Nodes communicate over BLE to standard BLE enabled devices
- Relay Nodes utilize LoRa connectivity to send data over long distances

2. Quick Start Instructions

The LR270 evaluation platform is intended to quickly startup and exchange data over a LoRA mesh network. Data exchange may be presented using two different interfaces: 1) RF interface using BLE over common mobile applications, 2) serial COM port to a PC. Each of these is detailed below.

When purchased for evaluation, the LR270 will typically be sent pre-configured on a mesh group. They network will be established when powered on automatically.

A typical network setup:



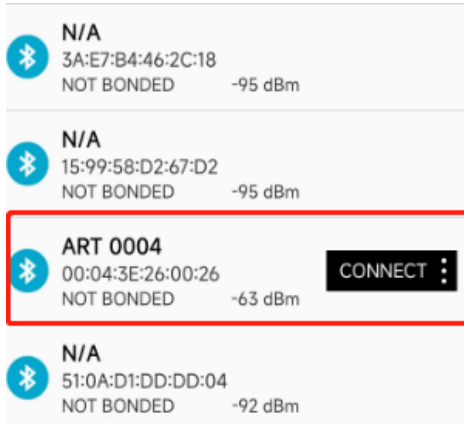
The proxy nodes may connect to a mobile device or to a serial COM port on a PC. The relay nodes do not need data exchange connections.

2.1. General setup

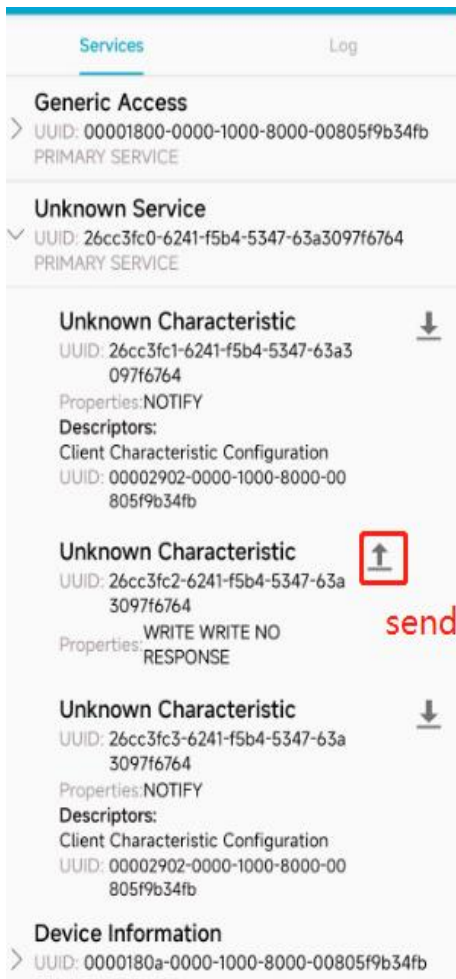
- Serial COM port settings: 115200/N/8/1
- All AT commands must terminate with a CRLF.
- AT commands may be sent over the BLE link or the COM port/module UART.
- Commands are non-case sensitive, except device names and passwords/passcodes.
- Command parameters use ASCII format, unless stated in ASCII hex format. ASCII hex uses 2 characters per hex byte.

2.2. Data exchange using BLE

2.2.1. Establish a BLE connection using a common mobile device application. The device name is ART XXXX



2.2.2. Once connected, data can be sent from the BLE application using the Write Characteristic:



2.2.3. Send data command

Syntax

AT+AB BLESend [Address][Value][Length]

[Address] is the destination Node or Group, ASCII hex format.

[Value] is the hex data, ASCII hex format.

[Length] from 1 to 100 bytes

Example

AT+AB BLESend C001 31323334 4 (end needs to add CR LF)

```
at+ab ble send c001 31323334 4
```

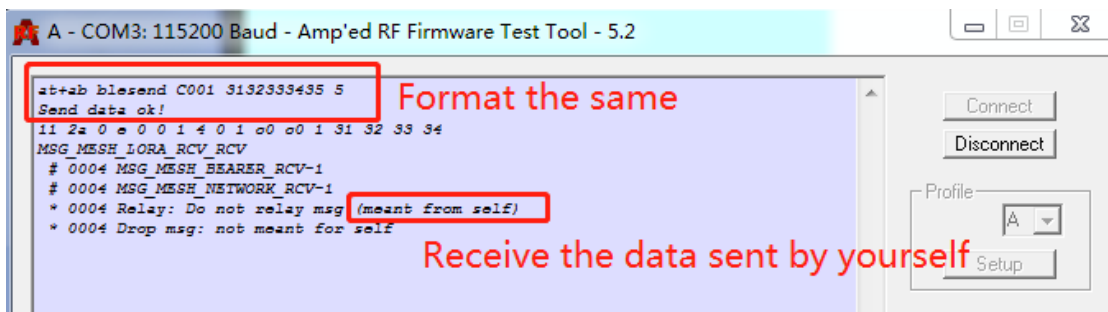
- Write Default
- Write No Response

2.3. Data exchange using COM port

Without a mobile BLE application, data may also be exchanged using a serial COM port from a PC. Our serial terminal application is located here (for downloading onto a PC):

http://www.ampedrftech.com/download/utilities/Term_5.2.zip

The same BLESend command (without BLE link) is used in this case, with the same formatting as above:



3. Ordering Information

Part Name	Description
LR270	Long Range Mesh USB adaptor

4. Revision History

Date	Revision	Description
21, June 2023	1.0	Initial version