RAK10706 Signal Meter for LoRa

Thank you for choosing **RAK10706 Signal Meter for LoRa** in your awesome IoT project! 🎉
To help you get started, we have provided you with all the necessary documentation for your product.

- Quick Start Guide
- Datasheet

> **NOTE**
>
> The source code of RAK10706 is open-sourced.
>
> The device has to be charged first if it comes fresh from shipping. There is a possibility that the battery was drained during its transport.

Product Description

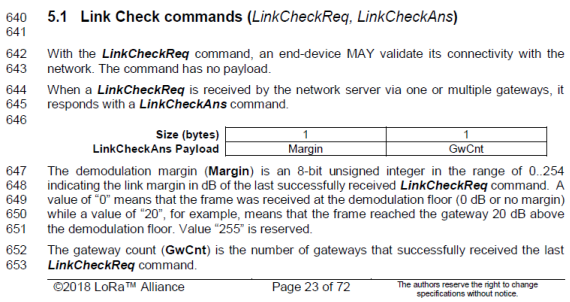
The **RAK10706 Signal Meter for LoRa** is a basic signal meter. It works in both LoRa P2P and LoRaWAN mode. It uses an OLED display and a single-button controlled UI for settings changes. In addition, it can use an SD card to log the test results in CSV files. It is powered by a rechargeable battery and can be charged via USB Type-C interface.

Difference between the RAK10706 Signal Meter and the RAK10701 Field Tester

One of the advantages of the RAK10706 Signal Meter is that it does not require any backend installations on the LoRaWAN server (like Helium, TTN and Chirpstack) if used in LinkCheck Packet mode, and it will work with any LoRaWAN server like AWS or Actility.

The RAK10706 uses LinkCheckReq to collect information about the connection to the gateway(s).
With LinkCheck, the LoRaWAN server will report the number of gateways and the

demodulation margin (calculated on the LoRaWAN server). The demodulation margin can give you information about the received signal quality (The higher the margin, the better the signal quality).
Extract from the LoRaWAN 1.0.3 Specification:



640 **5.1 Link Check commands (*LinkCheckReq*, *LinkCheckAns*)**
641
642 With the ***LinkCheckReq*** command, an end-device MAY validate its connectivity with the
643 network. The command has no payload.
644 When a ***LinkCheckReq*** is received by the network server via one or multiple gateways, it
645 responds with a ***LinkCheckAns*** command.
646

Size (bytes)	1	1
LinkCheckAns Payload	Margin	GwCnt

647 The demodulation margin (**Margin**) is an 8-bit unsigned integer in the range of 0..254
648 indicating the link margin in dB of the last successfully received ***LinkCheckReq*** command. A
649 value of "0" means that the frame was received at the demodulation floor (0 dB or no margin)
650 while a value of "20", for example, means that the frame reached the gateway 20 dB above
651 the demodulation floor. Value "255" is reserved.
652 The gateway count (**GwCnt**) is the number of gateways that successfully received the last
653 ***LinkCheckReq*** command.

Figure 1: LinkCheck explanation

Product Features

- Supports LoRaWAN regions: RU864, IN865, EU868, US915, AU915, KR920, & AS923-1/2/3/4
- Supports LoRa P2P for 830 to 960 MHz frequencies
- Compatible with LoRaWAN 1.0.3
- Offers different test modes
  - LoRaWAN LinkCheck
    - Works with any LoRaWAN server that supports LinkCheckRequest
    - Does not require any backend installation
    - Shows Number of gateways in range
    - Shows signal quality at gateways as Demodulation Margin
    - Shows RX SNR and RSSI of downlink from LNS
    - Shows sent and lost packet count
  - LoRa P2P
    - Works in any LoRa P2P setup
    - Shows received packet count
    - Can send out test packets to other LoRa P2P nodes
- Compatible with WisToolBox and allows wireless configuration via BLE
- Powered by 3,200 mAh battery

- Rechargeable over a USB Type-C connector
- 1.3" OLED display
- Single button UI and device control
- 2.3 dBi external antenna via RP-SMA connector
- Operating Temperature: -10° C ~ 60° C
- Storage Temperature: -40° C ~ 80° C

Prerequisites

To use a **RAK10706**, you need the following:

- LoRaWAN LinkCheck test mode
  - To be in a coverage of a LoRaWAN gateway registered to a supported LoRaWAN Network Server.
  - RAK10706 must registered as a device on the LoRaWAN Network Server.
  - RAK10706 must be sufficiently charged.
- LoRa P2P test mode
  - RAK10706 must be setup for same P2P frequency, SF, CR, BW, Preamble Length as other P2P nodes in the network

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