

# WiMOD LoRaWAN EndNode Modem HCI Specification (AS923)

Specification Version 0.2

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## Document Information

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## Revision History

<b>Version</b>	<b>Note</b>
0.1	Created, Initial Version Reference: WiMOD LoRaWAN EndNode Modem HCI Spec V1.22
0.2	Reference: WiMOD LoRaWAN EndNode Modem HCI Spec V1.26 Chapter 2.1.2.1 updated

## Aim of this Document

This document describes the WiMOD LoRaWAN<sup>®1</sup> EndNode Modem Host Controller Interface (HCI) protocol which is part of the WiMOD LoRaWAN EndNode Modem firmware. This firmware can be used in combination with the WiMOD LoRa radio module family.

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<sup>1</sup> LoRa is a registered trademark of Semtech Corporation. LoRaWAN is a registered trademark of the LoRa Alliance.

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# 1. Introduction

## 1.1 Overview

This document is an extension to the WiMOD LoRaWAN EndNode Modem HCI document [1], covering the changes included in the WiMOD LoRaWAN EndNode Modem firmware for AS 923 MHz ISM Band.

## 2. Appendix

### 2.1 Multi Band Support

#### 2.1.1 Radio Band Indices

Index	Band Description	Comments
10	AS 923 MHz (BN 923 MHz) - Brunei	Default setting
11	AS 923 MHz (KH 923 MHz) - Cambodia	
12	AS 923 MHz (ID 923 MHz) - Indonesia	
13	AS 923 MHz (JP 920 MHz) - Japan	
14	AS 923 MHz (LA 923 MHz) - Laos	
15	AS 923 MHz (NZ 915 MHz) - New Zealand	
16	AS 923 MHz (SG 920 MHz) - Singapore	
17	AS 923 MHz (TW 922 MHz) - Taiwan	
18	AS 923 MHz (TH 920 MHz) - Thailand	
19	AS 923 MHz (VN 920 MHz) - Vietnam	

## 2.1.2 Asia 923 MHz Band

This band comprises several countries which share the same default settings. These are:

- Brunei [923-925 MHz]
- Cambodia [923-925 MHz]
- Indonesia [923-925 MHz]
- Japan [920-928 MHz]
- Laos [923-925 MHz]
- New Zealand [915-928 MHz]
- Singapore [920-925 MHz]
- Taiwan [922-928 MHz]
- Thailand [920-925 MHz]
- Vietnam [920-925 MHz]

### 2.1.2.1 Data Rate Indices

Index	Data Rate / Spreading Factor	Bandwidth	Indicative physical bit rate [bit/s]	Comments
0	LoRa / SF12	125 kHz	250	
1	LoRa / SF11	125 kHz	440	
2	LoRa / SF10	125 kHz	980	Default setting
3	LoRa / SF9	125 kHz	1760	
4	LoRa / SF8	125 kHz	3125	
5	LoRa / SF7	125 kHz	5470	
6	LoRa / SF7	250 kHz	11000	
7	FSK / 50kbps		50000	

### 2.1.2.2 Channel Indices

Index	Frequency Channel	Comments
0	923 200 000 Hz	Data Rates 0 - 5
1	923 400 000 Hz	Data Rates 0 - 5
128	923 200 000 Hz	Default Frequency for Rx2 Default Data Rate: 2

## 2.2 List of Abbreviations

FW	Firmware
HCI	Host Controller Interface
LR	Long Range
LoRa	Long Range
RAM	Random Access Memory
RF	Radio Frequency
RSSI	Received Signal Strength Indicator
RTC	Real Time Clock
SLIP	Serial Line Internet Protocol
SNR	Signal to Noise Ratio
UART	Universal Asynchronous Receiver/Transmitter
WiMOD	Wireless Module by IMST

## 2.3 List of References

[1] WiMOD\_LoRaWAN\_EndNode\_Modem\_HCI\_Spec.pdf.

### 3. Regulatory Compliance Information

The use of radio frequencies is limited by national regulations. The radio module has been designed to comply with the European Union's R&TTE (Radio & Telecommunications Terminal Equipment) directive 1999/5/EC and can be used free of charge within the European Union. Nevertheless, restrictions in terms of maximum allowed RF power or duty cycle may apply.

The radio module has been designed to be embedded into other products (referred as "final products"). According to the R&TTE directive, the declaration of compliance with essential requirements of the R&TTE directive is within the responsibility of the manufacturer of the final product. A declaration of conformity for the radio module is available from IMST GmbH on request.

The applicable regulation requirements are subject to change. IMST GmbH does not take any responsibility for the correctness and accuracy of the aforementioned information. National laws and regulations, as well as their interpretation can vary with the country. In case of uncertainty, it is recommended to contact either IMST's accredited Test Center or to consult the local authorities of the relevant countries.



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### 4.1 Disclaimer

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