HT MICRON SEMICONDUTORES S.A.



Av. Unisinos, 1550 | 93022-750 | São Leopoldo | RS | Brasil

www.htmicron.com.br

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| Crypto Provisioner |
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# DOCUMENT INFO

This document provides information about the specifications of all blocks that will compose the system in package.

# REVISION

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# APPROVAL

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# Introduction

This document has the objective of instructing the use of the Key Provisioner Firmware, meant to be run on the first contact with a HTLBL32L chip. If you have not opted for the hardware secure module version or do not intend to use it, you can skip this document.

By using this firmware, you will be able to set all the required LoRaWAN keys (both OTAA or ABP) through serial AT commands. These keys will then stay safely stored within our secure module, not being able to be read by anyone except HTLRBL32L’s crypto library. Note: You can overwrite any of the LoRaWAN keys written on the device, but you cannot retrieve them.

## **Flashing the Firmware**

To be able to run the firmware, the binary file “HTLRBL32L\_Provisioner.bin” must be flashed to the device. Please refer to document “HTLRBL32L\_Flashing”, which will instruct you on how to flash firmware to the chip.

## **Serial Terminal Setup**

The UART interface can be used by connecting the pins TX(PA9) and RX(PA8) to a USB-Serial converter and connecting to a computer or simply connecting it to another microcontroller with a UART interface.

UART configuration required to connect:

* Baud rate: 115200
* Data bits: 8
* Stop bits: 1
* Parity: none
* Flow Control: none
* Transmitted text: Append LF

## **Termite Setup**

**One of the most widely used software for UART communication using a computer is** [Termite](https://www.compuphase.com/software_termite.htm)**.** Figure 1 – Termite setup **displays the configuration required to connect to the HTLRBL32L.**

Graphical user interface

Description automatically generated

Figure – Termite setup

# Command List

You can run these commands in any order and rewrite them if needed. It is mandatory to enter the DevEui command and the keys referred to your chosen activation type (ABP or OTAA). You don’t need to enter keys for the activation mode you’re not planning to use.

## **General Command**

|  |  |  |
| --- | --- | --- |
| **Command** | **Parameter** | **Description** |
| AT+DEVEUI=<param> | 16 charactere hexadecimal | [Sets the unique DevEUI](https://lora-developers.semtech.com/documentation/tech-papers-and-guides/the-book/deveui/) |

Eg.: AT+DEVEUI=1122334455AABBCC

## **ABP Keys Commands**

ABP keys configuration is not required when using OTAA activation mode.

|  |  |  |
| --- | --- | --- |
| **Command** | **Parameter** | **Description** |
| AT+ABP\_DEVADDR=<param> | 8 charactere hexadecimal | Sets the DevAddr |
| AT+ABP\_APPSKEY=<param> | 32 charactere hexadecimal | Sets the AppSKey |
| AT+ABP\_NWKSKEY=<param> | 32 charactere hexadecimal | Sets the NwkSKey |

Eg.: AT+ABP\_DEVADDR=A1B2C3D4

Eg.: AT+ABP\_APPSKEY=AABBCCDDEEFF11223344556677881122

Eg.: AT+ABP\_NWKSKEY=AABBCCDDEEFF11223344556677881122

## **OTAA Keys Commands**

OTAAkeys configuration is not required when using ABP activation mode.

|  |  |  |
| --- | --- | --- |
| **Command** | **Parameter** | **Description** |
| AT+OTAA\_JOINEUI=<param> | 16 charactere hexadecimal | Sets the AppEUI |
| AT+OTAA\_APPKEY=<param> | 32 charactere hexadecimal | Sets the AppKey |

Eg.: AT+OTAA\_JOINEUI=11223344667788

Eg.: AT+OTAA\_APPKEY=AABBCCDDEEFF11223344556677881122

# Return codes

Every command returns a 4 byte code, the first two bytes are represented by the tables below. Bytes 3 and 4 are unused.

## **Command Error codes**

The first byte is related to command syntax and parameter validations.

|  |  |
| --- | --- |
| **Code** | **Description** |
| 0x00 | No errors |
| 0x01 | Invalid command |
| 0x02 | Parameter missing |
| 0x03 | Parameter overflow |
| 0x04 | Invalid command header |
| 0x05 | Expected hexadecimal value |

Table – Command error codes

## **UART Error codes**

The second byte is related to possible UART errors.

|  |  |
| --- | --- |
| **Code** | **Description** |
| 0x00 | No errors |
| 0x01 | Command max size violated |
| 0x02 | Empty command |

Table – UART error codes