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</tr>
</thead>
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<td>48</td>
</tr>
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<td>48</td>
</tr>
<tr>
<td>AT+LORA@SX127X%MODEM</td>
<td>49</td>
</tr>
<tr>
<td>AT+LORA@SX127X%Channel</td>
<td>49</td>
</tr>
<tr>
<td>AT+LORA@SX127X#IS_CHN_FREE</td>
<td>50</td>
</tr>
<tr>
<td>AT+LORA@SX127X#IS_CHN_FREE</td>
<td>50</td>
</tr>
<tr>
<td>AT+LORA@SX127X#RX_CONFIG</td>
<td>51</td>
</tr>
<tr>
<td>AT+LORA@SX127X#TX_CONFIG</td>
<td>53</td>
</tr>
<tr>
<td>AT+LORA@SX127X#RF_FREQ</td>
<td>55</td>
</tr>
<tr>
<td>AT+LORA@SX127X#TIME_OA</td>
<td>55</td>
</tr>
<tr>
<td>AT+LORA@SX127X#SEND</td>
<td>56</td>
</tr>
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<td>AT+LORA@SX127X#RX</td>
<td>57</td>
</tr>
<tr>
<td>AT+LORA@SX127X#TX</td>
<td>58</td>
</tr>
<tr>
<td>AT+LORA@SX127X#RX_TST</td>
<td>59</td>
</tr>
<tr>
<td>AT+LORA@SX127X#TX_TST</td>
<td>61</td>
</tr>
<tr>
<td>AT+LORA@SX127X#START_CAD</td>
<td>63</td>
</tr>
<tr>
<td>AT+LORA@SX127X#RSSI</td>
<td>63</td>
</tr>
<tr>
<td>AT+LORA@SX127X%REG</td>
<td>64</td>
</tr>
<tr>
<td>AT+LORA@SX127X%MAX_PAYLOAD</td>
<td>64</td>
</tr>
</tbody>
</table>
PREFACE
This document describes the AT commands of Ethertronics LoRa module series ETH-M-LORA-AX.

DEFINITIONS
For the purposes of the present document, the following syntactical definitions are applied:

- `<CR>` "Carriage Return" character, its value is 0x0D.
- `<LF>` Linefeed character, its value is 0x0A.
- `<...>` Name enclosed in angle brackets is a syntactical element.
  Brackets themselves do not appear in the command line.
- `[…]` Optional sub-parameter of a command or a response is enclosed in square brackets. Brackets themselves do not appear in the command line.
  When sub-parameter is not given in parameter type commands, new value equals to its previous value. In action type commands, action should be done on the basis of the recommended default setting of the sub-parameter.

AT COMMAND LINE SYNTAX
The AT command line is made up of four components:

- The prefix
- The body
- The trailing
- The termination characters

NOTE: The AT command is case insensitive

AT COMMAND PREFIX
The AT command line prefix consists of the characters "AT" or "at" or, to repeat the execution of the previous command line, the characters "A/" or "a/".

PREFIX EXTENSION
"AT+" is firmly known as the AT prefix extension.

AT COMMAND BODY
The body is composed of three elements:

- Module name
- Sub-module name
- Command name

MODULE NAME
"LORA" is the AT command module's name of ETH-M-LORA-AX.

SUB-MODULE NAME
Sub-module name is used to clearly identify ETH-M-LORA-AX’s section, and is prefixed with a @ symbol.

The ETH-M-LORA-M-AX is composed of five (5) sub-modules:

- Generic
- System (SYS)
- Antenna (MCD)
- LoRaWAN (MAC)
- LoRa Radio (SX127X)
AT Command Reference Guide

COMMAND NAME
There are two types of command:
- The executable commands
  - Function command is used to identify the execution action and is prefixed with a # symbol.
- The variable commands
  - Variable command is used to identify the write/read operation and is prefixed with a % symbol.

THE TRAILING
Three trailing types are supported:
- Read operation (?)
- Write operation of Variable command or parameters of Function command (=)
- Syntax information request (=?)

NOTE: Please be aware that some commands can support all the three trailing types and some don't support any trailing type.

THE TERMINATION CHARACTERS
The AT command is terminated with a "CARRIER RETURN" character <CR>.

AT RESPONSE
The responses and process results of an AT Commands are under below format:

<CR><LF> <Response string> <CR><LF>.

Examples:
- <CR><LF>OK<CR><LF>
- <CR><LF>ERROR_NO_SUBMODULE<CR><LF>
- <CR><LF>ERROR<CR><LF>

RESULT CODES TABLE

<table>
<thead>
<tr>
<th>Status</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
<td>0</td>
<td>The operation is successful.</td>
</tr>
<tr>
<td>ERROR</td>
<td>30</td>
<td>The operation is failed.</td>
</tr>
<tr>
<td>ERROR_NOT_READY</td>
<td>31</td>
<td>The other command is processing.</td>
</tr>
<tr>
<td>ERROR_QUEUE_OVERFLOW</td>
<td>32</td>
<td>The internal command queue is overflow.</td>
</tr>
<tr>
<td>ERROR_NO_PREFIX</td>
<td>33</td>
<td>No prefix is given.</td>
</tr>
<tr>
<td>ERROR_NO_MODULE</td>
<td>34</td>
<td>No module is given.</td>
</tr>
<tr>
<td>ERROR_NO_SUB_MODULE</td>
<td>35</td>
<td>No sub-module is given.</td>
</tr>
<tr>
<td>ERROR_NO_COMMAND</td>
<td>36</td>
<td>Unknown command.</td>
</tr>
<tr>
<td>ERROR_RES_QUEUE_OVERFLOW</td>
<td>37</td>
<td>The internal result queue is overflow.</td>
</tr>
</tbody>
</table>

Table 1
AT COMMANDS OF ETH-M-LORA-AX

Historically, the AT commands are used to control MODEMs. AT is the abbreviation for Attention. These commands come from Hayes commands that were used by the Hayes smart modems. The Hayes commands started with AT to indicate the attention from the Analog MODEM.

Now a day AT commands are the convenient way to address to any kind of Hardware modules to avoid deep intrusion and issues during integration process such source code merge operation, library linkage, ...

GENERIC COMMANDS

AT - ATTENTION

Attention.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>Command to check if the module is ready</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>If the module is running and is ready to receive the AT commands.</td>
</tr>
</tbody>
</table>

Examples:

at

OK
A/ - REPEAT THE PREVIOUS COMMAND
Repeat the execution of the previous AT command.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:
None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>Depend on the previous AT command.</td>
</tr>
</tbody>
</table>

Examples:

```
Serial AT+loramac#send HelloWorld
HelloWorld
OK
a/
HelloWorld
OK
```
+++ - ESCAPE SEQUENCE

Escape Sequence to return to the command line prompt during a pending AT command.

Usually the escape sequence is used to abort a pending AT command (see AT+LORA#ABORT and AT+LORA#RESUME commands).

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>+++</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Ready for new AT command.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> The pending command is still running.</td>
</tr>
<tr>
<td></td>
<td>Use <strong>AT+LORA#ABORT</strong> to abort the pending command.</td>
</tr>
<tr>
<td></td>
<td>Use <strong>AT+LORA#RESUME</strong> to resume back to the pending command.</td>
</tr>
</tbody>
</table>

Examples:

```
at+lora@mac#join
+++ 
OK
at+lora#abort
OK
```
AT+LORA#E OR ATE - ECHO

Enable or disable the command echo.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA#E[&lt;flag&gt;]</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flag</td>
<td>None</td>
<td>Return the current echo status.</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Set echo to OFF.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Set echo to ON.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Unknown flag value.</td>
</tr>
<tr>
<td>&lt;0 .. 1&gt;</td>
<td>Current echo flag. 0 = the echo is OFF. 1 = the echo is ON.</td>
</tr>
</tbody>
</table>

Examples:

```plaintext
at+lora#e
0
OK

at+lora#e1
OK

at+lora#e
1
OK
```
AT Command Reference Guide

AT+LORA#I OR ATI - MODULE INFORMATION

Read the module Information

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA#I[&lt;flag&gt;]</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flag</td>
<td>None</td>
<td>Return the copyright of the module.</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Return the firmware version.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Return the firmware release date.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;Ethertronics LoRa Module v.1.0.0&lt;CR&gt;&lt;LF&gt;Copyright (c) 2016, 2017 Ethertronics Inc&lt;CR&gt;&lt;LF&gt;All rights reserved&lt;CR&gt;&lt;LF&gt;</td>
<td>Flag = None (1.0.0 is the current version).</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;1.0.0&lt;CR&gt;&lt;LF&gt;</td>
<td>Flag = 0.</td>
</tr>
</tbody>
</table>

Examples:

```
at+lora#i1
1.0.0
OK

at+lora#i

Ethertronics LoRa Module v.1.0.0
Copyright (c) 2016, 2017 Ethertronics Inc
All rights reserved

OK
```
AT+LORA#Q OR ATQ – QUIET RESULT CODES

Enable or disable the quiet result codes.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA#Q[&lt;flag&gt;]</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Flag       | None or 0, 1, 2 | Enables result codes (factory default)
|            |        | Every result code is replaced with a <CR>.
|            |        | Disables result codes. |

Note: After issuing either ATQ1 or ATQ2 every information text transmitted in response to commands is not affected. If parameter is omitted, the command has the same behavior as ATQ0.

Examples:

```
AT+LORA#Q0
OK
AT+LORA#i
Ethertronics LoRa Module v.1.0.0
Copyright (c) 2016, 2017 Ethertronics Inc
All rights reserved
OK
AT+LORA#Q1
<CR>
AT+LORA#i
<CR>
Ethertronics LoRa Module v.1.0.0
Copyright (c) 2016, 2017 Ethertronics Inc
All rights reserved
<CR>
AT+LORA#Q2
AT+LORA#i
Ethertronics LoRa Module v.1.0.0
Copyright (c) 2016, 2017 Ethertronics Inc
All rights reserved
```
AT Command Reference Guide

AT+LORA#V OR ATV – RESPONSE FORMAT

Determines the contents of the header and trailer transmitted with result codes and information responses. It also determines if result codes are transmitted in a numeric form or an alphanumeric form.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA#V[&lt;flag&gt;]</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flag</td>
<td>None or 0</td>
<td>Limited headers and trailers and set the result codes to numeric format.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Full headers and trailers and verbose format of result codes (factory default).</td>
</tr>
</tbody>
</table>

Examples:

```
AT+LORA#V1
OK
AT+LORA#I1
1.0.0
OK
AT+LORA#V0
0
AT+LORA#I1
1.0.0
0
```
AT Command Reference Guide

AT+LORA#Z OR ATZ - RESET
Reset the LoRa module and loads the default profile.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA#V[&lt;flag&gt;]</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Example:

```plaintext
at
OK
at+lorav0
0
at
0
at+loraz
OK
```
AT Command Reference Guide

AT+LORA&F OR AT&F

This command is used to configure the module to:

- Boot from the factory FW (AT&F0)
- Boot from the upgrade FW (AT&F1)
- Reset the parameters of the module to the default factory. (AT&F)

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA&amp;F&lt;mod&gt;</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mod</td>
<td>NE ant</td>
<td>Limited headers and trailers and set the result</td>
</tr>
<tr>
<td></td>
<td></td>
<td>codes to numeric format.</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Full headers and trailers and verbose format of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>result codes (factory default).</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Boot the module from Upgraded Firmware</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation</td>
</tr>
<tr>
<td></td>
<td>Successful.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA&W OR AT&W

Permanently store the current configuration parameters of the device.

NOTE: The user can use the command AT&F to restore the parameters back from the factory values.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA&amp;W</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>
### AT+LORA&T OR AT&T

Module self-test.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA#RESUME</td>
<td>Execution</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

None

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Depend on the resumed AT command.</td>
</tr>
</tbody>
</table>

### AT+LORA#ABORT

Abort the last pending command after issuing +++ command.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA#ABORT</td>
<td>Execution</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

None

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

SYSTEM COMMAND

AT+LORA@SYS%REG
Registry Read/Write command.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%REG=&lt;mode, length, reg_address&gt;</td>
<td>Read/Write</td>
</tr>
<tr>
<td>AT+LORA@SYS%REG=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>Registry Read Operation.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Registry Write Operation.</td>
</tr>
<tr>
<td>length</td>
<td>1-64</td>
<td>Length in bytes</td>
</tr>
<tr>
<td>reg_address</td>
<td>0-1023</td>
<td>Registry start address</td>
</tr>
</tbody>
</table>

Examples:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>mode, length or reg_address values are incorrect.</td>
</tr>
<tr>
<td>001122334455...xx</td>
<td>Registry read values</td>
</tr>
</tbody>
</table>

AT+LORA@SYS%SN
Get the module serial number.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%SN?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Examples:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;Serial Number: 0x......&lt;CR&gt;&lt;LF&gt;</td>
<td>Return the device serial number.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td></td>
</tr>
</tbody>
</table>


AT Command Reference Guide

AT+LORA@SYS#SOFTRESET
Perform soft Reset the System.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS#SOFTRESET</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Examples:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>

AT+LORA@SYS%FWVERSION
Get the firmware version.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%FWVERSION?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Examples:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>

| Major: xx<CR><LF>          | The firmware version.     |
| Minor: xx<CR><LF>          |                           |
| Build: xx<CR><LF>          |                           |
AT+LORA@SYS%FWDATE
Get the firmware date.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%FWDATE?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Examples:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;DD/MM/YYYY&lt;CR&gt;&lt;LF&gt;</td>
<td>The firmware date.</td>
</tr>
</tbody>
</table>

AT+LORA@SYS%HOSTIFTYPE
Get the Host interface type

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%HOSTIFTYPE?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>0</td>
<td>UART interface (default)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>SPI interface</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;0 .. 1&gt;</td>
<td>Current Host interface</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SYS%HOSTIFCONFIG
Get the current Host interface speed, the configuration values of this command is depending on the type of the host interface (see AT+LORA@SYS%HOSTIFTYPE command)

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%HOSTIFCONFIG?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 .. 4</td>
<td>If the host interface has been set to SPI.</td>
</tr>
<tr>
<td>0 = 10MHz, 1 = 5MHz, 2 = 2Mhz, 3 = 1MHz, 4 = 500kHz</td>
<td></td>
</tr>
<tr>
<td>0x0100 0 00 0</td>
<td>If the host interface has been set to UART interface</td>
</tr>
<tr>
<td>Stop:</td>
<td></td>
</tr>
<tr>
<td>0 = 1bit, 1 = 2bits.</td>
<td></td>
</tr>
<tr>
<td>Parity:</td>
<td></td>
</tr>
<tr>
<td>00 = None, 01 = Even, 10 = Odd</td>
<td></td>
</tr>
<tr>
<td>Word length:</td>
<td></td>
</tr>
<tr>
<td>0 = 8bits, 1 = 9bits</td>
<td></td>
</tr>
<tr>
<td>Baud rate:</td>
<td></td>
</tr>
<tr>
<td>000 = 9600 bps</td>
<td></td>
</tr>
<tr>
<td>001 = 19200 bps</td>
<td></td>
</tr>
<tr>
<td>010 = 38400 bps</td>
<td></td>
</tr>
<tr>
<td>011 = 57600 bps</td>
<td></td>
</tr>
<tr>
<td>100 = 115200 bps (default)</td>
<td></td>
</tr>
<tr>
<td>101 = 230600 bps</td>
<td></td>
</tr>
<tr>
<td>110 = 460800 bps</td>
<td></td>
</tr>
</tbody>
</table>

<CR><LF>OK<CR><LF>Operation successful.
AT Command Reference Guide

AT+LORA@SYS%SPILORAIF
Read the LoRa chip (SX127x) SPI interface speed.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%HOSTIFCONFIG?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;0 .. 4&gt;</td>
<td>Current SPI speed interface</td>
</tr>
<tr>
<td></td>
<td>0 = 10 MHz</td>
</tr>
<tr>
<td></td>
<td>1 = 5 MHz</td>
</tr>
<tr>
<td></td>
<td>2 = 2 MHz</td>
</tr>
<tr>
<td></td>
<td>3 = 1 MHz</td>
</tr>
<tr>
<td></td>
<td>4 = 500 kHz</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SYS%LPMODE

ETH-M-LORA-M-AX module has been designed to exploit efficiently the Low Power STOP mode of the MCU, the module can wake up either by UART or via external GPIO's P11 (Refer to the pin diagram in the "Module ETH-LORA-M-AX-01 General Module Integration guide" document for the external P11 pin location).

**NOTE:** The most efficient way to avoid any communication error is systematically send a CARRIER RETURN (0x0d) and wait the module answers with a string "OK" before sending any AT command.

<table>
<thead>
<tr>
<th>LPM Mode</th>
<th>Entry</th>
<th>Wake-up</th>
<th>Effect on V$_{core}$ domain clocks</th>
<th>Effect on V$_{DD}$ domain clocks</th>
<th>Voltage regulator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Mode (0)</td>
<td>-</td>
<td>-</td>
<td>None</td>
<td>None</td>
<td>ON</td>
</tr>
<tr>
<td>LP Run (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEEPSLEEP (2)</td>
<td>After LPDelay expired</td>
<td>UART, GPIO'sP11 RTC Alarm</td>
<td>CPU CLK OFF no effect on other clocks or analog clock sources, Flash CLK OFF</td>
<td></td>
<td>In Low-Power Mode</td>
</tr>
<tr>
<td>STOP Mode (3)</td>
<td></td>
<td>GPIO'sP11 RTC Alarm</td>
<td>All Vcore domain clock OFF</td>
<td>HIS and HSE and MSI oscillators OFF</td>
<td>In Low-Power Mode</td>
</tr>
</tbody>
</table>

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%LPMODE=&lt;mode&gt;[,&lt;IM&gt;]</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@SYS%LPMODE?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@SYS%LPMODE=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>Disable Low Power mode.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Enable Low Power Run mode.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Enable Low Power DEEPSLEEP mode. (Factory Default mode)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Enable Low Power STOP mode.</td>
</tr>
<tr>
<td>IM</td>
<td>0</td>
<td>Disable (Both Internal and external IM circuit are ON)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Enable only on Internal IM circuit.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Enable only on External IM circuit.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Enable on both internal and external IM circuit.</td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Low Power mode unknown.</td>
</tr>
<tr>
<td>0..3</td>
<td>Values set (0, 1, 2 or 3)</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SYS%LPDELAY
Set/Get the delay in milli-seconds after inactivity before the module goes into Low Power STOP mode. The default and minimum delay is 30000 milli-seconds.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%LPDELAY=&lt;delay&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@SYS%LPDELAY?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@SYS%LPDELAY=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>delay</td>
<td>Delay before entering Low-Power mode in milli-second. (The factory default value is set to 30000 milli-seconds)</td>
<td></td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Delay if less than the default value.</td>
</tr>
<tr>
<td>00112334455...xx</td>
<td>Values set previously (milli-seconds)</td>
</tr>
</tbody>
</table>

AT+LORA@SYS%DATE
Set/Get the system Date.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%DATE=&lt;date&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@SYS%DATE?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@SYS%DATE=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>dd, mm, yyyy</td>
<td>dd = day of the month [1 ... 31]. mm = month of the year [1 ... 12]. yyyy = year of the century [1900 ... 2089].</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Date format unknown.</td>
</tr>
<tr>
<td>dd/mm/yyyy</td>
<td>Current date</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SYS%TIME

Set/Get the system Date.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%TIME=&lt;time&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@SYS%TIME?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@SYS%TIME=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>time</td>
<td>hh,mn,ss</td>
<td>hh = Hour of the day [0 ... 23]. mn = Minute [0 ... 59]. ss = Second [0 ... 59].</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Time format unknown.</td>
</tr>
<tr>
<td>hh:mn:ss</td>
<td>Current time</td>
</tr>
</tbody>
</table>

AT+LORA@SYS%STATUS

Read the Module status.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%STATUS?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tics:</td>
<td>Number of system tic since power up</td>
</tr>
<tr>
<td>Rx_OK:</td>
<td>Number of LoRa packets received successfully.</td>
</tr>
<tr>
<td>Rx_MIC_Error:</td>
<td>Number of LoRa packets received with MIC error.</td>
</tr>
<tr>
<td>Rx_Error:</td>
<td>Number of LoRa error other than MIC error.</td>
</tr>
<tr>
<td>Rx_Timeout:</td>
<td>Number of LoRa RX timeout error.</td>
</tr>
<tr>
<td>Tx_OK:</td>
<td>Number of LoRa packets sent successfully.</td>
</tr>
<tr>
<td>Tx_Error:</td>
<td>Number of LoRa packets sent failed.</td>
</tr>
<tr>
<td>Tx_Media_Busy:</td>
<td>Number of LoRa collision packets during sent.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Number of LoRa packets sent successfully.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SYS%LED
Set/Get the system Date.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%LED=&lt;mode&gt;</td>
<td>Write</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>Set the test LED OFF.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Set the test LED ON.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>LED is set successfully</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Set with unknown parameter.</td>
</tr>
</tbody>
</table>

AT+LORA@SYS%ALGOMETRIC
Set or get the algorithm input's metric.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS%LED=&lt;mode&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@SYS% ALGOMETRIC?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@SYS% ALGOMETRIC =?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>metric</td>
<td>0</td>
<td>SINR metric.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>RSSI metric.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Input value is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SYS%ALGOAVG
Set or get the average number of input to feed the algorithm.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SYS% ALGOAVG =&lt;avg&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@SYS% ALGOAVG?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@SYS% ALGOAVG=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>avg</td>
<td>x</td>
<td>X must be greater than 4</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Input value is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

IMPEDEANCE MATCHING RELATED COMMANDS

AT+LORA@IM#INIT
Initialize the IM algorithm.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@IM#INIT</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:
None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>

AT+LORA@IM#RESET
Reset the IM algorithm without initialized its parameters.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@IM#RESET</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:
None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@IM#RUNDEBUG
Run the IM algorithm with new input value.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@IM#RUNDEBUG=&lt;input&gt;</td>
<td>Execution</td>
</tr>
<tr>
<td>AT+LORA@IM#RUNDEBUG=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>input</td>
<td>xx</td>
<td>Input value.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Input value is expected.</td>
</tr>
</tbody>
</table>

AT+LORA@IM%THR
Set or get Threshold for IM

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@IM% THR = &lt;New MIN Th&gt;,&lt;New STEP Th&gt;,&lt;New MAX Th&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@IM% THR?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@IM% THR =?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>New MIN Th</td>
<td>xx</td>
<td>Minimum threshold</td>
</tr>
<tr>
<td>New STEP Th</td>
<td>xx</td>
<td>Threshold's Step</td>
</tr>
<tr>
<td>New MAX Th</td>
<td>xx</td>
<td>Maximum threshold</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;UNKNOWN VALUE&lt;CR&gt;&lt;LF&gt;</td>
<td>The parameters are wrong</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>The parameters are wrong</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@IM%RESULT
Get the result of the IM

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@IM%RESULT?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:
None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt; RF Selection: Xx&lt;CR&gt;&lt;LF&gt;</td>
<td>Xx = Current RF selection of the IM</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>

AT+LORA@IM%VERSION
Read the IM version.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@IM%VERSION?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:
None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>MM.mm</td>
<td>MM = Current major version value.</td>
</tr>
<tr>
<td></td>
<td>mm = Current minor version value.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@IM%CTRLFLAG
Set IM control flag.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@IM%CTRLFLAG=&lt;flag&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@IM%CTRLFLAG=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flag</td>
<td>One of the values in table below.</td>
<td>Control flag.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

IM CONTROL FLAGS TABLE

<table>
<thead>
<tr>
<th>Control Flag</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM_CTRL_REG_RESET</td>
<td>0</td>
</tr>
<tr>
<td>IM_CTRL_REG_START</td>
<td>1</td>
</tr>
<tr>
<td>IM_CTRL_REG_PAUSE</td>
<td>2</td>
</tr>
<tr>
<td>IM_CTRL_REG_RESUME</td>
<td>3</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_0</td>
<td>128</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_1</td>
<td>129</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_2</td>
<td>130</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_3</td>
<td>131</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_4</td>
<td>132</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_5</td>
<td>133</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_6</td>
<td>134</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_7</td>
<td>135</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_8</td>
<td>136</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_9</td>
<td>137</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_10</td>
<td>138</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_11</td>
<td>139</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_12</td>
<td>140</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_13</td>
<td>141</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_14</td>
<td>142</td>
</tr>
<tr>
<td>IM_CTRL_REG_BYPASS_15</td>
<td>143</td>
</tr>
</tbody>
</table>

Table 2
AT+LORA@IM%STATUS
Read the IM status.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@IM%STATUS?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>Xx, Yy</td>
<td>Xx = Status value. Yy = RF vector value.</td>
</tr>
</tbody>
</table>

AT+LORA@IM%ACTIVATE
Set or get IM activation

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@IM%ACTIVATE = &lt;activation&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@IM%ACTIVATE?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@IM%ACTIVATE =?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>activation</td>
<td>0</td>
<td>IM is disabled</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>IM is enabled</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;UNKNOWN VALUE&lt;CR&gt;&lt;LF&gt;</td>
<td>The parameters are wrong</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td></td>
</tr>
</tbody>
</table>

AT Command Reference Guide
STEERING ANTENNA RELATED COMMANDS

AT+LORA@MCD#INIT
Initialize the MCD algorithm.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD#INIT=[&lt;mode&gt;]</td>
<td>Execution</td>
</tr>
<tr>
<td>AT+LORA@MCD#INIT=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>0</td>
<td>IM is disabled</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>IM is enabled</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;UNKNOWN VALUE&lt;CR&gt;&lt;LF&gt;</td>
<td>The parameters are wrong</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td></td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@MCD#RESET
Reset the MCD algorithm without initialized its parameters.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD#RESET</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;OK&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>

AT+LORA@MCD#RUNDEBUG
Run the MCD algorithm with new input value.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD#RUNDEBUG=&lt;input&gt;</td>
<td>Execution</td>
</tr>
</tbody>
</table>

AT+LORA@MCD#RUNDEBUG=?
Test

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>input</td>
<td>xx</td>
<td>Input value.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;OK&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;ERROR&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>Input value is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@MCD%RFMAPCODE
Set or get the RF map code to be used by the MCD algorithm.

Syntax:

```
Command | Command Type
-----------------|-------------
AT+LORA@MCD%RFMAPCODE=<m1>, <m2>, <m3>, <m4> | Write
AT+LORA@MCD%RFMAPCODE? | Read
AT+LORA@MCD%RFMAPCODE=? | Test
```

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>m1</td>
<td>xx</td>
<td>Mode 1 input.</td>
</tr>
<tr>
<td>m2</td>
<td>xx</td>
<td>Mode 2 input.</td>
</tr>
<tr>
<td>m3</td>
<td>xx</td>
<td>Mode 3 input.</td>
</tr>
<tr>
<td>m4</td>
<td>xx</td>
<td>Mode 4 input.</td>
</tr>
</tbody>
</table>

Return:

```
Status | Comments
--------|---------
<CR><LF><CR><CR> | Operation successful.
<CR><LF><ERROR><CR><LF> | Protected area.
```

AT+LORA@MCD%PROTECTMODE
Set or get the protection mode of MCD parameters.

Syntax:

```
Command | Command Type
-----------------|-------------
AT+LORA@MCD%PROTECTMODE=<mode> | Write
AT+LORA@MCD%PROTECTMODE? | Read
AT+LORA@MCD%PROTECTMODE=? | Test
```

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>Protected mode.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Unprotected mode.</td>
</tr>
</tbody>
</table>

Return:

```
Status | Comments
--------|---------
<CR><LF><CR><CR> | Operation successful.
<CR><LF><ERROR><CR><LF> | Protected area.
```
AT Command Reference Guide

AT+LORA@MCD%CTRLFLAG
Set MCD control flag.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD%CTRLFLAG=&lt;flag&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MCD%CTRLFLAG=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flag</td>
<td>One of the values in table 2 below</td>
<td>Control Flag</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Protected area.</td>
</tr>
</tbody>
</table>

MCD CONTROL FLAGS TABLE

<table>
<thead>
<tr>
<th>Control Flag</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCD_CTRL_REG_RESET</td>
<td>0</td>
</tr>
<tr>
<td>MCD_CTRL_REG_START</td>
<td>1</td>
</tr>
<tr>
<td>MCD_CTRL_REG_PAUSE</td>
<td>2</td>
</tr>
<tr>
<td>MCD_CTRL_REG_RESUME</td>
<td>3</td>
</tr>
<tr>
<td>MCD_CTRL_REG_FORCE_MODE1</td>
<td>17</td>
</tr>
<tr>
<td>MCD_CTRL_REG_FORCE_MODE2</td>
<td>18</td>
</tr>
<tr>
<td>MCD_CTRL_REG_FORCE_MODE3</td>
<td>19</td>
</tr>
<tr>
<td>MCD_CTRL_REG_FORCE_MODE4</td>
<td>20</td>
</tr>
<tr>
<td>MCD_CTRL_REG_PAUSE_MCD_FORCE_MODE1</td>
<td>33</td>
</tr>
<tr>
<td>MCD_CTRL_REG_PAUSE_MCD_FORCE_MODE2</td>
<td>34</td>
</tr>
<tr>
<td>MCD_CTRL_REG_PAUSE_MCD_FORCE_MODE3</td>
<td>35</td>
</tr>
<tr>
<td>MCD_CTRL_REG_PAUSE_MCD_FORCE_MODE4</td>
<td>36</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_0</td>
<td>128</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_1</td>
<td>129</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_2</td>
<td>130</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_3</td>
<td>131</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_4</td>
<td>132</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_5</td>
<td>133</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_6</td>
<td>134</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_7</td>
<td>135</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_8</td>
<td>136</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_9</td>
<td>137</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_10</td>
<td>138</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_11</td>
<td>139</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_12</td>
<td>140</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_13</td>
<td>141</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_14</td>
<td>142</td>
</tr>
<tr>
<td>MCD_CTRL_REG_BYPASS_15</td>
<td>143</td>
</tr>
</tbody>
</table>

Table 3
AT Command Reference Guide

AT+LORA@MCD%STATUS
Read the MCD status.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD%STATUS?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>Xx, Yy</td>
<td>Xx = Status value. Yy = RF vector value.</td>
</tr>
</tbody>
</table>

AT+LORA@MCD%MODE
Get the selected mode of the MCD.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD%MODE?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>Xx</td>
<td>Xx = Current mode value.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@MCD%VERSION
Read the MCD status.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD%VERSION?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>MM.mm</td>
<td>MM = Current major version value. mm = Current minor version value.</td>
</tr>
</tbody>
</table>

AT+LORA@MCD%MCDTYPE
Set or get MCD type used.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD%MCDTYPE=&lt;type&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MCD%MCDTYPE?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MCD%MCDTYPE=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>0</td>
<td>Normal mode. (Not Available anymore)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Slow Motion mode (SMD).</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Protected area.</td>
</tr>
<tr>
<td>&lt;0 .. 1&gt;</td>
<td>Current MCD mode. 0 = Normal mode. 1 = Slow Motion mode.</td>
</tr>
</tbody>
</table>
AT LORA@MCD%FLUCT

Set or get MCD SMD Fluctuation to go back to scooting/training Mode, in dB.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD%FLUCT=&lt;fluctuation&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MCD%FLUCT=?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MCD%FLUCT=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>fluctuation</td>
<td>xx</td>
<td>New fluctuation value in dB.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;xx&gt;</td>
<td>Current fluctuation in dB.</td>
</tr>
</tbody>
</table>

AT LORA@MCD%ACTIVATE

Set or get MCD activation

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD%ACTIVATE=&lt;activation&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MCD%ACTIVATE=?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MCD%ACTIVATE=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>activation</td>
<td>0</td>
<td>MCD is disabled</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>MCD is enabled</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;UNKNOWN VALUE&lt;CR&gt;&lt;LF&gt;</td>
<td>The parameters are wrong</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td></td>
</tr>
</tbody>
</table>
LORAWAN RELATED COMMANDS

AT+LORA@MAC%PN

Set or get MCD SMD Fluctuation to go back to scooting/training Mode, in dB.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MCD%PN=&lt;mode&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MCD%PN?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MCD%PN=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>Set to private Network mode.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Set to public Network mode.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;0 .. 1&gt;</td>
<td>Current LoRa Network mode. 0 = Private Network mode. 1 = Public Network mode.</td>
</tr>
</tbody>
</table>

AT+LORA@MAC%NJM

Set or get the Network Join Mode.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%NJM=&lt;mode&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%NJM?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>Manual configuration mode, known as &quot;Activation By Personalization&quot; (ABP) in LoRaWAN specification document.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Over The Air Activation, known as OTAA in LoRaWAN specification document.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@MAC%DI
Write or read LoRa Device Identification EUI-64 (MSB) (unique, set at factory) (8 bytes).

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%DI=</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%DI?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>deviceID</td>
<td>112234455667788</td>
<td>Eight digits of the device ID EUI-64 (MSB).</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

AT+LORA@MAC%DC
Read or write LoRa Device class (A, B, C)

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%DC=&lt;class&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%DC?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>class</td>
<td>'A', 'B', 'C'</td>
<td>The device class 'A' or 'B' or 'C'.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@MAC%AP
Set or get LoRa Port used for application data (1 - 223)

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%AP=&lt;port&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%AP?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>port</td>
<td>1 - 223</td>
<td>The device application port.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

AT+LORA@MAC%NA
Set or get LoRa Network address. The Network address is known as "devAddr" in LoRaWAN specification.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%NA=&lt;addr&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%NA?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>addr</td>
<td>11223344</td>
<td>4 digits of the Network address.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

**AT+LORA@MAC%NI**

Set or get LoRa Network EUI/Name. ETH-M-LORA-AX supports 2 types of Network ID:
- Network EUI
- Network Name

**NOTE:** LoRaWAN supports only 8 digits Network EUI. The Network EUI is known as "AppEUI" in LoRaWAN specification document.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%NI=&lt;type&gt;, &lt;id&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%NI?</td>
<td>Read</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>type id</td>
<td>0, 1122334455667788</td>
<td>Use 8 digits as Network ID.</td>
</tr>
<tr>
<td>type id</td>
<td>1, TextString</td>
<td>Use text string as Network ID.</td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@MAC%NK
Set or get LoRa Network Key/passphrase. **ETH-M-LORA-AX** supports 2 types of Network Key:
- Network Key
- Network passphrase

**NOTE:** LoRaWAN supports only 16 digits Network Key. The Network Key is known as “AppKey” in LoRaWAN specification document.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%NK=&lt;type&gt;, &lt;key&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%NK?</td>
<td>Read</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>0</td>
<td>Use 16 digits as Network Key.</td>
</tr>
<tr>
<td>key</td>
<td>1122334455.. ccddeeff</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>1</td>
<td>Use text string as Network key.</td>
</tr>
<tr>
<td>key</td>
<td>TextString</td>
<td></td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

AT+LORA@MAC%NSK
Set or get Network Session Key.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%NSK=&lt;key&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%NSK?</td>
<td>Read</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>key</td>
<td>1122334455..ccddeeff</td>
<td>16 bytes of the Network Session Key.</td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@MAC%DSK

Set or get LoRa Data Session Encryption Key (16 bytes). The Data Session Key is known as “Application Session Key” in LoRaWAN specification document.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%DSK=&lt;key&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%DSK?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>key</td>
<td>112234455..ccddeff</td>
<td>16 bytes of the Data Session Key.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

AT+LORA@MAC%DTC

Set or Get LoRa Duty cycle mode.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%DTC=&lt;mode&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%DTC?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>Duty cycle mode OFF.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Duty cycle mode ON.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

**AT+LORA@MAC%JRX1D**

Set or Get LoRaWAN class A Join delay for Window1.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%JRX1D=&lt;delay&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%JRX1D?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MAC%JRX1D=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>delay</td>
<td>1000 - 15000</td>
<td>From 1000 to 15000 milli-seconds.</td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt; &lt;delay&gt;</td>
<td>Operation successful. Delay value previously set.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

**AT+LORA@MAC%JRX2D**

Set or Get LoRaWAN class A Join delay for Window2.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%JRX2D=&lt;delay&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%JRX2D?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MAC%JRX2D=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>delay</td>
<td>1000 - 15000</td>
<td>From 1000 to 15000 milli-seconds.</td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt; &lt;delay&gt;</td>
<td>Operation successful. Delay value previously set.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

**AT+LORA@MAC%RX1D**

Set or Get LoRaWAN class A Rx delay for Window1.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%RX1D=&lt;delay&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%RX1D?=</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MAC%RX1D=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>delay</td>
<td>1000 - 15000</td>
<td>From 1000 to 15000 milli-seconds.</td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;delay&gt;</td>
<td>Delay value previously set.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

**AT+LORA@MAC%RX2D**

Set or Get LoRaWAN class A RX delay for Window2.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%RX2D=&lt;delay&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%RX2D?=</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MAC%RX2D=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>delay</td>
<td>1000 - 15000</td>
<td>From 1000 to 15000 milli-seconds.</td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;delay&gt;</td>
<td>Delay value previously set.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
### AT Command Reference Guide

#### AT+LORA@MAC%RXD
Set or Get LoRaWAN class A RX Window duration.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%RXD=&lt;delay&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%RXD?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MAC%RXD=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>delay</td>
<td>1000 - 15000</td>
<td>From 1000 to 15000 milli-seconds.</td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;&lt;duration&gt;</td>
<td>Operation successful. Duration value previously set.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

#### AT+LORA@MAC#JOIN
OTAA to join LoRa network (acquire network address and session keys).

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC#JOIN=&lt;force&gt;</td>
<td>Execution</td>
</tr>
<tr>
<td>AT+LORA@MAC#JOIN?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MAC#JOIN=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>force</td>
<td>none or 0</td>
<td>From 1000 to 15000 milli-seconds. Force OTAA join procedure.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;0&lt;CR&gt;&lt;LF&gt;</td>
<td>Device has not joined the network.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;1&lt;CR&gt;&lt;LF&gt;</td>
<td>Device has joined the network.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;Successfully join LoRa Network&lt;CR&gt;&lt;LF&gt;</td>
<td>Join status</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;Failed to join LoRa network&lt;CR&gt;&lt;LF&gt;</td>
<td></td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;Please wait until duty cycle expired&lt;CR&gt;&lt;LF&gt;</td>
<td></td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@MAC#SEND

Sends data to LoRaWAN gateway and returns the gateway response.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC#SEND=[&lt;data&gt;,[&lt;ack&gt;,&lt;iter&gt;,&lt;interval&gt;]]</td>
<td>Execution</td>
</tr>
<tr>
<td>AT+LORA@MAC#SEND=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>data</td>
<td></td>
<td>Data to send to the gateway.</td>
</tr>
<tr>
<td>ack</td>
<td>0..1</td>
<td>Acknowledge requested.</td>
</tr>
<tr>
<td>inter</td>
<td>1..xx</td>
<td>Number of send iterations (-1 indefinite loop)</td>
</tr>
<tr>
<td>interval</td>
<td>15000 .. xxxx</td>
<td>Interval duration (must be higher than 15000 ms)</td>
</tr>
</tbody>
</table>

NOTE: issue the SEND command without parameters to stop the previous SEND loop.

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter are expected.</td>
</tr>
</tbody>
</table>
**AT Command Reference Guide**

**AT+LORA@MAC#DUMP**

Start/Stop dumping Lora packet.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC#DUMP= [&lt;mode&gt;]</td>
<td>Execution</td>
</tr>
<tr>
<td>AT+LORA@MAC#DUMP?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@MAC#DUMP=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>Stop dumping data.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Dump only TX data.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Dump only RX data.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Dump both TX and RX (default: when no mode parameter is given).</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter are expected.</td>
</tr>
</tbody>
</table>

**AT+LORA@MAC%RFSB (AVAILABLE ONLY FOR US915)**

Set/Read the Radio Frequency Sub-Band.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%RFSB= [&lt;sub-band&gt;]</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%RFSB?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>sub-band</td>
<td>0</td>
<td>ALL 64 channels.</td>
</tr>
<tr>
<td></td>
<td>1 – 8</td>
<td>Sub-band 0-7.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;duration&gt;</td>
<td></td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@MAC%CHN (AVAILABLE ONLY FOR US915)
Read the current Radio channels selected.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%CHN?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Return the sub-band selected channels.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>

AT+LORA@MAC%RX1DROFS (AVAILABLE ONLY FOR US915)
Set/Read the RX1 data rate offset.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@MAC%RX1DROFS= [&lt;ofs&gt;]</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@MAC%RX1DROFS?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 - 3</td>
<td>Return the current RX1 Offset value.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>

LORA RADIO COMMANDS

AT+LORA@SX127X#INIT
Initialize LoRa Radio Chip.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#INIT=[&lt;mode&gt;]</td>
<td>Execution</td>
</tr>
<tr>
<td>AT+LORA@SX127X#INIT?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@SX127X#INIT=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>Uninitialized LoRa Radio.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Initialized LoRa Radio.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;OK&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;ERROR&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

AT+LORA@SX127X%STATUS
Read LoRa Radio status.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X%STATUS?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;OK&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>0 = IDLE</td>
<td>LoRa Radio Status.</td>
</tr>
<tr>
<td>1 = RX_RUNNING,</td>
<td></td>
</tr>
<tr>
<td>2 = TX_RUNNING,</td>
<td></td>
</tr>
<tr>
<td>3 = Channel Activity Detection</td>
<td></td>
</tr>
</tbody>
</table>
AT Command Reference Guide

**AT+LORA@SX127X%MODEM**

Set or get LoRa Radio modulation mode.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X%MODEM={&lt;mode&gt;}</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@SX127X%MODEM?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@SX127X%MODEM=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>FSK Modulation.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>LoRa modulation</td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

**AT+LORA@SX127X%CHANNEL**

Set or get LoRa radio channel.

**Syntax:**

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X%CHANNEL={&lt;chn&gt;}</td>
<td>Execution</td>
</tr>
<tr>
<td>AT+LORA@SX127X%CHANNEL?</td>
<td>Read</td>
</tr>
<tr>
<td>AT+LORA@SX127X%CHANNEL=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

**Parameters and Values:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>chn</td>
<td>686100000</td>
<td>The LoRa channel can be one of the values beside. (686.1MHz, 686.3MHz or 686.5MHz)</td>
</tr>
<tr>
<td></td>
<td>686300000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>686500000</td>
<td></td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SX127X#IS_CHN_FREE
Check if the given LoRa channel is free.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#IS_CHN_FREE=&lt;mod, chn, rssi_thresh&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@SX127X%MODEM?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mode</td>
<td>0</td>
<td>FSK Modulation.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>LoRa modulation</td>
</tr>
<tr>
<td>chn</td>
<td>686100000</td>
<td>The LoRa channel (686.1MHz, 686.3MHz or 686.5MHz).</td>
</tr>
<tr>
<td></td>
<td>686300000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>686500000</td>
<td></td>
</tr>
<tr>
<td>rssi_thresh</td>
<td></td>
<td>Rssi threshold value.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
<tr>
<td>0 .. 1</td>
<td>0 = the given channel is not free. 1 = the given channel is free.</td>
</tr>
</tbody>
</table>

AT+LORA@SX127X#IS_CHN_FREE
Check if the given LoRa channel is free.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#IS_CHN_FREE=&lt;mod, chn, rssi_thresh&gt;</td>
<td>Write</td>
</tr>
<tr>
<td>AT+LORA@SX127X%MODEM?</td>
<td>Read</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
<tr>
<td>xxxxx</td>
<td>Random value.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SX127X#RX_CONFIG
Configure LoRa Radio RX parameters.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#RX_CONFIG=</td>
<td>Execution</td>
</tr>
<tr>
<td>AT+LORA@SX127X%MODEM?</td>
<td>Execution</td>
</tr>
</tbody>
</table>

<mod>, <bw>, <dr>, <cr>, <bw_AFC>, <preamble_len>, <sym_timeout>, <fix_len>, <payload_len>, <crcON>, <freq_hopeON>, <hop_period>, <iq_inverted>, <rx_continuous>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mod</td>
<td>0</td>
<td>FSK modulation.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>LoRa modulation.</td>
</tr>
<tr>
<td>bw</td>
<td>[2600 .. 250000]</td>
<td>FSK: Bandwidth in Hz.</td>
</tr>
<tr>
<td></td>
<td>0 = 125KHz</td>
<td>LoRa: Bandwidth range.</td>
</tr>
<tr>
<td></td>
<td>1 = 250KHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 = 500KHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = reserved</td>
<td></td>
</tr>
<tr>
<td>dr</td>
<td>[600 .. 30000]</td>
<td>FSK: Data rate in bit/s.</td>
</tr>
<tr>
<td></td>
<td>6 = 64</td>
<td>LoRa: Data rate in chip symbol.</td>
</tr>
<tr>
<td></td>
<td>7 = 128</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 = 256</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 = 512</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 = 1024</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 = 2048</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 = 4096</td>
<td></td>
</tr>
<tr>
<td>cr</td>
<td>0</td>
<td>FSK: Not used, set to 0.</td>
</tr>
<tr>
<td></td>
<td>1 = 4/5</td>
<td>LoRa: Code Rate range.</td>
</tr>
<tr>
<td></td>
<td>2 = 4/6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = 4/7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 = 4/8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>LoRa: Not used, set to 0.</td>
</tr>
<tr>
<td>preamble_len</td>
<td>xx</td>
<td>FSK: Number of bytes.</td>
</tr>
</tbody>
</table>
### Parameters Values Comments

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>xx + 4</td>
<td>LoRa: Length in symbols + 4 more symbols by the Hardware.</td>
<td></td>
</tr>
<tr>
<td>sym_timeout</td>
<td>0</td>
<td>FSK: Not used, set to 0.</td>
</tr>
<tr>
<td>xxx</td>
<td>LoRa: Timeout in symbols.</td>
<td></td>
</tr>
<tr>
<td>fix_len</td>
<td>0</td>
<td>The length is variable.</td>
</tr>
<tr>
<td>1</td>
<td>The length is fixed.</td>
<td></td>
</tr>
<tr>
<td>payload_len</td>
<td>xxxx</td>
<td>Set the payload length when fixed length is used.</td>
</tr>
<tr>
<td>crcON</td>
<td>0</td>
<td>crc OFF</td>
</tr>
<tr>
<td>1</td>
<td>crc ON</td>
<td></td>
</tr>
<tr>
<td>freq_hopeON</td>
<td>0</td>
<td>FSK: Not used set to 0.</td>
</tr>
<tr>
<td>1</td>
<td>LoRa: 0 = OFF, 1 = ON</td>
<td></td>
</tr>
<tr>
<td>hop_period</td>
<td>0</td>
<td>FSK: Not used, set to 0.</td>
</tr>
<tr>
<td>xx</td>
<td>LoRa: Number of symbols between each hop.</td>
<td></td>
</tr>
<tr>
<td>iq_inverted</td>
<td>0</td>
<td>FSK: Not used, set to 0.</td>
</tr>
<tr>
<td>1</td>
<td>LoRa: Inverts IQ signal, 0 = Not inverted, 1 = Inverted.</td>
<td></td>
</tr>
<tr>
<td>rx_continuous</td>
<td>0</td>
<td>Single mode.</td>
</tr>
<tr>
<td>1</td>
<td>Continuous mode.</td>
<td></td>
</tr>
</tbody>
</table>

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameters are expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SX127X#TX_CONFIG
Configure LoRa Radio TX parameters.

Syntax:

```
AT+LORA@SX127X#TX_CONFIG=
  <mod>, <pwr>, <fdev>, <bw>,
  <dr>, <cr>, <preamble_len>, <fixlen>,
  <freq_hopeON>, <hop_period>,
  <iq_inverted>, <rx_continuous>
```

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mod</td>
<td>0</td>
<td>FSK modulation.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>LoRa modulation.</td>
</tr>
<tr>
<td>pwr</td>
<td>Xx dBm</td>
<td>Set output power [dBm]</td>
</tr>
<tr>
<td>fdev</td>
<td>xx</td>
<td>FSK: Sets frequency deviation in Hz. LoRa: Not used, set to 0.</td>
</tr>
<tr>
<td>bw</td>
<td>0 = 125KHz</td>
<td>FSK: Not used, set to 0.</td>
</tr>
<tr>
<td></td>
<td>1 = 250KHz</td>
<td>LoRa: Bandwidth range.</td>
</tr>
<tr>
<td></td>
<td>2 = 500KHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = reserved</td>
<td></td>
</tr>
<tr>
<td>dr</td>
<td>[600 .. 30000]</td>
<td>FSK: Data rate in bit/s</td>
</tr>
<tr>
<td></td>
<td>6 = 64</td>
<td>LoRa: Data rate in chip symbol.</td>
</tr>
<tr>
<td></td>
<td>7 = 128</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 = 256</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 = 512</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 = 1024</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 = 2048</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 = 4096</td>
<td></td>
</tr>
<tr>
<td>cr</td>
<td>1 = 4/5</td>
<td>FSK: Not used, set to 0.</td>
</tr>
<tr>
<td></td>
<td>2 = 4/6</td>
<td>LoRa: Code Rate range.</td>
</tr>
<tr>
<td></td>
<td>3 = 4/7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 = 4/8</td>
<td></td>
</tr>
</tbody>
</table>
### AT Command Reference Guide

#### Parameters, Values, Comments

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>preamble_len</td>
<td>xx</td>
<td>FSK: Number of bytes.</td>
</tr>
<tr>
<td></td>
<td>xx + 4</td>
<td>LoRa: Length in symbols + 4 more symbols by the Hardware.</td>
</tr>
<tr>
<td>fix_len</td>
<td>0</td>
<td>The length is variable.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>The length is fixed.</td>
</tr>
<tr>
<td>crcON</td>
<td>0</td>
<td>crc OFF</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>crc ON</td>
</tr>
<tr>
<td>freq_hopeON</td>
<td>0</td>
<td>FSK: Not used set to 0.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>LoRa: 0 = OFF, 1 = ON</td>
</tr>
<tr>
<td>hop_period</td>
<td>0</td>
<td>FSK: Not used, set to 0.</td>
</tr>
<tr>
<td></td>
<td>xx</td>
<td>LoRa: Number of symbols between each hop.</td>
</tr>
<tr>
<td>iq_inverted</td>
<td>0</td>
<td>FSK: Not used, set to 0.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>LoRa: Inverts IQ signal, 0 = Not inverted, 1 = Inverted.</td>
</tr>
<tr>
<td>rx_continuous</td>
<td>0</td>
<td>Single mode.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Continuous mode.</td>
</tr>
</tbody>
</table>

#### Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameters are expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SX127X#RF_FREQ
Checks if the given RF frequency is supported by the hardware.

Syntax:
```
AT+LORA@SX127X#RF_FREQ=<freq>
```

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>freq</td>
<td>xxxx</td>
<td>Frequency to be checked in Hz.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>
| 0 .. 1       | 0 = the given frequency is not supported.  
                1 = the given frequency is supported. |

AT+LORA@SX127X#TIME_OA
Computes the packet time on air in us for the given payload.

Syntax:
```
AT+LORA@SX127X#TIME_OA=<mod>, <pktlen>
```

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mod</td>
<td>0</td>
<td>FSK modulation.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>LoRa modulation.</td>
</tr>
<tr>
<td>pktlen</td>
<td>xx</td>
<td>Packet payload length.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameters are expected.</td>
</tr>
<tr>
<td>xxxxx</td>
<td>Computed air time (us) of the given packet payload length.</td>
</tr>
</tbody>
</table>

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AT+LORA@SX127X#SEND
Send a given data over the air.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#SEND=&lt;buffer&gt;, &lt;size&gt;</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>freq</td>
<td>xxxx</td>
<td>Frequency to be checked in Hz.</td>
</tr>
<tr>
<td>size</td>
<td>xx</td>
<td>Length of the payload buffer.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

AT+LORA@SX127X#SLEEP
Put the Radio into Sleep mode.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#SLEEP</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>
AT+LORA@SX127X#STANDBY
Put the Radio into Standby mode.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#STANDBY</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>

AT+LORA@SX127X#RX
Activate Radio RX mode for a given time duration.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#RX</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SX127X#TX
Activate Radio TX mode for a given time duration.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#TX</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:
None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SX127X#RX_TST
Activate Radio RX mode for a given modem mode, frequency, data rate and duration.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#RX_TST=&lt;modem, freq, datarate, duration&gt;</td>
<td>Execution</td>
</tr>
<tr>
<td>AT+LORA@SX127X#RX_TST=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>modem:</td>
<td>FSK or LORA</td>
<td>Type of modem mode</td>
</tr>
</tbody>
</table>

freq: Frequency of the Channel

**EU868**: from 863100000Hz to 869900000Hz incremented by 200kHz.
  - BW 125kHz, 250kHz for LORA mode. (depend on the datarate parameter)
  - BW 50kHz for FSK mode.

**US915**: Only LORA mode with full 72 channels.
  - Divided into 8 sub-band, Full band can take any of these frequencies.
    1: 902300000, 902500000, 902700000, 902900000, 903000000, 903100000, 903300000, 903500000, 903700000
    2: 903900000, 904100000, 904300000, 904500000, 904700000, 904900000, 905100000, 905300000, 904600000
    3: 905500000, 905700000, 905900000, 906100000, 906200000, 906400000, 906600000, 906700000, 906900000
    4: 907100000, 907300000, 907500000, 907700000, 907800000, 907900000, 908100000, 908200000, 908500000
    5: 908700000, 908900000, 909100000, 909300000, 909400000, 909500000, 909700000, 909900000, 910100000
    6: 910300000, 910500000, 910700000, 910900000, 911000000, 911100000, 911300000, 911500000, 911700000
    7: 911900000, 912100000, 912300000, 912500000, 912600000, 912700000, 912900000, 913100000, 913300000
    8: 913500000, 913700000, 913900000, 914100000, 914200000, 914300000, 914500000, 914700000, 914900000

xxxxxxxxxxxx: 125 kHz BW
xxxxxxxxxxxx: 500kHz BW / DR4 only
**datarate**: Data rate

### EU868:

<table>
<thead>
<tr>
<th>DR</th>
<th>Configuration</th>
<th>Bite Rate [bit/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>LoRa: SF12 / 125kHz</td>
<td>250</td>
</tr>
<tr>
<td>1</td>
<td>LoRa: SF11 / 125kHz</td>
<td>440</td>
</tr>
<tr>
<td>2</td>
<td>LoRa: SF10 / 125kHz</td>
<td>980</td>
</tr>
<tr>
<td>3</td>
<td>LoRa: SF9 / 125kHz</td>
<td>1760</td>
</tr>
<tr>
<td>4</td>
<td>LoRa: SF8 / 125kHz</td>
<td>3125</td>
</tr>
<tr>
<td>5</td>
<td>LoRa: SF7 / 125kHz</td>
<td>5470</td>
</tr>
<tr>
<td>6</td>
<td>LoRa: SF7 / 250kHz</td>
<td>11000</td>
</tr>
<tr>
<td>7</td>
<td>FSK: 50kbps</td>
<td>50000</td>
</tr>
<tr>
<td>8..15</td>
<td>RFU</td>
<td></td>
</tr>
</tbody>
</table>

### US915:

<table>
<thead>
<tr>
<th>DR</th>
<th>Configuration</th>
<th>Bite Rate [bit/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>LoRa: SF10 / 125kHz</td>
<td>980</td>
</tr>
<tr>
<td>1</td>
<td>LoRa: SF9 / 125kHz</td>
<td>1760</td>
</tr>
<tr>
<td>2</td>
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<td>3125</td>
</tr>
<tr>
<td>3</td>
<td>LoRa: SF7 / 125kHz</td>
<td>5470</td>
</tr>
<tr>
<td>4</td>
<td>LoRa: SF8 / 500kHz</td>
<td>12500</td>
</tr>
<tr>
<td>5:7</td>
<td>RFU</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>LoRa: SF12 / 500kHz</td>
<td>980</td>
</tr>
<tr>
<td>9</td>
<td>LoRa: SF11 / 500kHz</td>
<td>1760</td>
</tr>
<tr>
<td>10</td>
<td>LoRa: SF10 / 500kHz</td>
<td>3900</td>
</tr>
<tr>
<td>11</td>
<td>LoRa: SF9 / 500kHz</td>
<td>7000</td>
</tr>
<tr>
<td>12</td>
<td>LoRa: SF8 / 500kHz</td>
<td>12500</td>
</tr>
<tr>
<td>13</td>
<td>LoRa: SF7 / 500kHz</td>
<td>21900</td>
</tr>
<tr>
<td>14:15</td>
<td>RFU</td>
<td></td>
</tr>
</tbody>
</table>

**duration**: xxxxxx
- Duration in millisecond.

**Return:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameters are expected.</td>
</tr>
</tbody>
</table>
AT Command Reference Guide

AT+LORA@SX127X#TX_TST
Activate Radio TX mode for a given modem mode, frequency, power and time duration.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#TX_TST=&lt;modem, frequency, datarate, modulation, power, duration, [alternate, alt_duration], [alternate, alt_duration], [fcc_test_mode]&gt;</td>
<td>Execution</td>
</tr>
<tr>
<td>AT+LORA@SX127X#TX_TST=?</td>
<td>Test</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>modem:</td>
<td>FSK or LORA</td>
<td>Type of modem mode</td>
</tr>
<tr>
<td>freq:</td>
<td>Frequency of the Channel</td>
<td>EU868: from 863100000Hz to 869900000Hz incremented by 200kHz. BW 125kHz, 250kHz for LORA mode. (depend on the datarate parameter) BW 50kHz for FSK mode. US915: Only LORA mode with full 72 channels. Divided into 8 sub-band, Full band can take any of these frequencies. 1: 902300000, 902500000, 902700000, 902900000, 903000000, 903100000, 903300000, 903500000, 903700000 2: 903900000, 904100000, 904300000, 903450000, 903470000, 903490000, 903510000, 903530000, 904600000 3: 905500000, 905700000, 905900000, 906100000, 906200000, 906300000, 906500000, 906700000, 906900000 4: 907100000, 907300000, 907500000, 907700000, 907800000, 907900000, 908100000, 908300000, 908500000 5: 908700000, 908900000, 909100000, 909300000, 909400000, 909500000, 909700000, 909900000, 910100000 6: 910300000, 910500000, 910700000, 910900000, 911000000, 911100000, 911300000, 911500000, 911700000 7: 911900000, 912100000, 912300000, 912500000, 912600000, 912700000, 912900000, 913100000, 913300000 8: 913500000, 913700000, 913900000, 914100000, 914200000, 914300000, 914500000, 914700000, 914900000 xxxxxxxxxx: 125 kHz BW xxxxxxxxxx: 500kHz BW / DR4 only</td>
</tr>
</tbody>
</table>
### datarate: Data rate

**EU868:**

<table>
<thead>
<tr>
<th>DR</th>
<th>Configuration</th>
<th>Bite Rate [bit/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>LoRa: SF12 / 125kHz</td>
<td>250</td>
</tr>
<tr>
<td>1</td>
<td>LoRa: SF11 / 125kHz</td>
<td>440</td>
</tr>
<tr>
<td>2</td>
<td>LoRa: SF10 / 125kHz</td>
<td>980</td>
</tr>
<tr>
<td>3</td>
<td>LoRa: SF9 / 125kHz</td>
<td>1760</td>
</tr>
<tr>
<td>4</td>
<td>LoRa: SF8 / 125kHz</td>
<td>3125</td>
</tr>
<tr>
<td>5</td>
<td>LoRa: SF7 / 125kHz</td>
<td>5470</td>
</tr>
<tr>
<td>6</td>
<td>LoRa: SF7 / 250kHz</td>
<td>11000</td>
</tr>
<tr>
<td>7</td>
<td>FSK: 50kbps</td>
<td>50000</td>
</tr>
<tr>
<td>8..15</td>
<td>RFU</td>
<td></td>
</tr>
</tbody>
</table>

**US915:**

<table>
<thead>
<tr>
<th>DR</th>
<th>Configuration</th>
<th>Bite Rate [bit/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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</tr>
<tr>
<td>4</td>
<td>LoRa: SF8 / 500kHz</td>
<td>12500</td>
</tr>
<tr>
<td>5.7</td>
<td>RFU</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>LoRa: SF12 / 500kHz</td>
<td>980</td>
</tr>
<tr>
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</tr>
<tr>
<td>13</td>
<td>LoRa: SF7 / 500kHz</td>
<td>21900</td>
</tr>
<tr>
<td>14..15</td>
<td>RFU</td>
<td></td>
</tr>
</tbody>
</table>

### modulation: 0 or 1

W/o or with Data modulation required.

### power:

**EU868**

<table>
<thead>
<tr>
<th>DR</th>
<th>Configuration (ERP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20 dBm</td>
</tr>
<tr>
<td>1</td>
<td>14 dBm</td>
</tr>
<tr>
<td>2</td>
<td>11 dBm</td>
</tr>
<tr>
<td>3</td>
<td>8 dBm</td>
</tr>
<tr>
<td>4</td>
<td>5 dBm</td>
</tr>
<tr>
<td>5</td>
<td>2 dBm</td>
</tr>
<tr>
<td>6..15</td>
<td>RFU</td>
</tr>
</tbody>
</table>

**US915**

<table>
<thead>
<tr>
<th>DR</th>
<th>Configuration (ERP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>30 dBm – 2*PWR</td>
</tr>
<tr>
<td>1</td>
<td>28 dBm</td>
</tr>
<tr>
<td>2</td>
<td>26 dBm</td>
</tr>
<tr>
<td>3.8</td>
<td>...</td>
</tr>
<tr>
<td>9</td>
<td>12 dBm</td>
</tr>
<tr>
<td>10</td>
<td>10 dBm</td>
</tr>
<tr>
<td>11..15</td>
<td>RFU</td>
</tr>
</tbody>
</table>

### duration: 0 = infinite continuous, 1 – 3600000 seconds.

Whole TX continuous duration.

### alternate: 0 or 1

TX mode alternatively ON/OFF.

### alt_duration: 1 to 60000 seconds

Duration of TX alternative ON/OFF phases. Should be at MAX duration/2.

### fcc_test_mode: CC125

125Khz BW channel count test (64 channels).

CC500

500Khz BW channel count test (8 channels).

DW125

125Khz BW DWELL test (64 channels).

DW500

500Khz BW DWELL test (8 channels).
AT Command Reference Guide

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameters are expected.</td>
</tr>
</tbody>
</table>

AT+LORA@SX127X#START_CAD
Start a Channel Activity Detection.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X#START_CAD</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

None

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
</tbody>
</table>

AT+LORA@SX127X%RSSI
Read the Radio RSSI value of a given modulation.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X%RSSI=&lt;mod&gt;</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mod</td>
<td>0</td>
<td>FSK modulation.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>LoRa modulation.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
<tr>
<td>xxxx dBm</td>
<td>Return the current RSSI value in dBm.</td>
</tr>
</tbody>
</table>

Parameters and Values Comments

% RSSI Return the current RSSI value in dBm.
AT Command Reference Guide

AT+LORA@SX127X%REG

Set/Read Radio registers.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X%REG=&lt;size&gt;</td>
<td>Execution</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>size</td>
<td>xx</td>
<td>Number of registers to be read.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>

AT+LORA@SX127X%MAX_PAYLOAD

Set Radio maximum length for a given modulation.

Syntax:

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+LORA@SX127X%MAX_PAYLOAD=&lt;mod&gt;, &lt;max&gt;</td>
<td>Write</td>
</tr>
</tbody>
</table>

Parameters and Values:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>mod</td>
<td>0</td>
<td>FSK modulation.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>LoRa modulation</td>
</tr>
<tr>
<td>max</td>
<td>xxxx</td>
<td>Max payload length in bytes.</td>
</tr>
</tbody>
</table>

Return:

<table>
<thead>
<tr>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
<td>Operation successful.</td>
</tr>
<tr>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</td>
<td>Parameter is expected.</td>
</tr>
</tbody>
</table>