LR70/71 Command Reference Guide

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1. AT Commands

- All AT commands should terminate with a CRLF.
- AT commands may be sent over the BLE link (typical) or the main module UART.
- Commands are non-case sensitive, except when device names or passwords/passcodes are involved.
- Command parameters use ASCII format, unless stated in ASCII hex format. ASCII hex uses 2 characters per hex byte.

1.1. FlashloaderStart

The `FlashloaderStart` command is used to execute the flash loader firmware when the application is running. Note, the "default" application selection is automatically removed when this command is used. This command is NOT allowed over the BLE link

Syntax

```
AT+AB FlashloaderStart
```

Responses

If the operation is successful, the flashloader menu will appear.

1.2. HexMode

The `HexMode` command switches from AT command interface mode, to hex command interface mode. To exit this mode, an escape sequence "`^#^$^%`" must be entered (6 characters, no CR or LF), and return back to AT command mode.

Syntax

```
AT+AB HexMode
```

1.3. GetRSSI

The `GetRSSI` command will return the signal strength received from a remote Node using the given Node address.

Syntax

```
AT+AB GetRSSI [Address]
```

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

Responses

The reply is in the format:
`AT-AB rssi [Address] [RSSI value]`

`[Address]` is the remote Node, ASCII hex format.

`[RSSI value]` is the signal strength in dBm.

1.4. LeDisconnect

The `LeDisconnect` command is used to disconnect from a remote LE device once connected.

Syntax

```
AT+AB LeDisconnect
```

Responses

If the operation is successful, the response is:

```
AT-AB -BLE-ConnectionDown
```

1.5. LeDiscovery

The `LeDiscovery` command is used to scans for remote devices.
This command is valid in central mode (ProfileRole = c).

Syntax

```
AT+AB LeDiscovery
```

Responses

If the operation is successful, the response is:

```
AT-AB lescan pending
0. P [bd address] [Remote Device Name]
1. P [bd address] [Remote Device Name]
Total 2 devices found
```

Where `[bd address]` is the remote device's address.

1.6. LoraDiscovery

The `LoraDiscovery` command is used to scans for remote devices.

Syntax

```
AT+AB LorsDiscovery [Address]
```

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

Responses

If the operation is successful, the response is:

```
AT-AB LoRaDiscoveryPending
AT-AB LoRaDivice [NodeID]
…
AT-AB LoRaDiscoveryComplete
```

1.7. Reset

The `Reset` command is used to reset the module.

Syntax

```
AT+AB Reset
```

Responses

If the operation is successful, the response is:

```
AT-AB ResetPending
```

1.8. RmtChangeBaud

The `RmtChangeBaud` command is used to change the remote device's UART baud rate remotely.

Syntax

```
AT+AB RmtChangeBaud [Pin] [Address] [Baudrate]
```

`[PIN]` is the security PIN needed to allow this command.

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

`[Baudrate]` is the new UART baudrate.

Example

```
AT+AB RmtChangeBaud [1234] [0003] [9600]
```

Responses

If the operation is successful, the response is:

```
AT-AB DevChangeBaudDone [Address]
```

1.9. RmtReset

The `RmtReset` command is used to reset destination module remotely.

Syntax

```
AT+AB RmtReset [Pin] [Address]
```

`[PIN]` is the security PIN needed to allow this command.

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

Example

```
AT+AB RmtReset [1234] [0003]
```

Responses

If the operation is successful, the response is:

```
AT-AB DevReset [Address]
```

1.10. Send

The `Send` command is used to send data from BLE or serial UART over the LoRa network using the default destination Node address: DefaultDstAddr

Syntax

```
AT+AB Send [Data]
```

`[Address]` is the address in DefaultDstAddr or AT+AB SessionDST [Addr].

`[Data]` is the hex data, ASCII hex, or ASCII data if preceded by a double-quote (“)

Example

```
AT+AB Send 31323334 (needs a CR LF to terminate)
```

1.11. SendAPIData

The `SendAPIData` command is used to send data from the serial UART over the LoRa network, and is formatted with an API style hex format (as seen on the remote destination).

Syntax

```
AT+AB SendApiData [Type] [Address] [Data]
```

`[Type]` type of message,

TX data = 01

RX data = 02

ACK = 03

ACK Timeout = 04

`[Address]` is the 4 char destination Node or Group, ASCII hex format.

`[Data]` is the Ascii hex data.

Example

```
AT+AB SendAPIData 01 0011 48656c6c6f
```

Remote device will receive: `7e000f012200000000000000001748656c6c6fxx`

HexMode Syntax

This command is supported in hex mode.

Tx Frame

Start	Length		Frame Data				Checksum
0x7E	HByte	LByte	Frame Type (1 Byte)	Frame ID (1 Byte)	DST Addr (8 Bytes)	Data (Variable)	1 Byte

Rx Frame

Start	Length		Frame Data				Checksum
0x7E	HByte	LByte	Frame Type (1 Byte)	Frame ID (1 Byte)	SRC Addr (8 Bytes)	Data (Variable)	1 Byte

HexMode Example

SRC Node 0013:

(Send) `7e000f012200000000000000001748656c6c6fxx`

DST Node 0017:

(Receive) `7e000f020800000000000000001348656c6c6fxx`

(ACK) `7e000b03220000000000000001701xx` (ACK Addr: 17, ID: 08)

1.12. SendData

The `SendData` command is used to send data from BLE or serial UART over the LoRa network.

Syntax

```
AT+AB SendData [Address][Data]
```

`[Address]` is the 4 char destination Node or Group, ASCII hex format.

`[Data]` is the hex data, ASCII hex, or ASCII data if preceded by a double-quote (“)

Example

```
AT+AB SendData C001 31323334 (needs a CR LF to terminate)
```

1.13. SessionDST

The `SessionDST` command is used to set the destination Node address. Which may be a Node or Group address. In Group address usage cases, ACK will not be received unless the node’s Subscribe address is configured as well.

Syntax

```
AT+AB SessionDST [Address]
```

Where `[Address]` is the 4 character Node or Group address to be used by the AT+AB Send command, ASCII hex format.

1.14. SetBdAddress

The `SetBdAddress` command is used to change the Bluetooth Address.
The BD Address may only be changed one time from it’s default setting.

Syntax

```
AT+AB SetBdAddress [mac address]
```

Where `[mac address]` is the new 6 byte MAC Address which will be set, ASCII hex format.

Responses

If the operation is successful, the response is:

```
AT-AB ResetPending
AT-AB -CommandMode-
AT-AB MACAddress [mac address]
```

1.15. Sleep

The `Sleep` command is used to switch a device from normal mode to low power mode.

Syntax

```
AT+AB Sleep  [When HostDeepSleepEn = 1]
```

Responses

No response

1.16. Unprovision

The `Unprovision` command is used to remove a Node from the mesh network.

Syntax

```
AT+AB Unprovision [Node ID]
```

Where `[Node ID]` is the Node to be removed from the mesh network.

Responses

```
AT-AB Node [ID] removed
```

2. Configuration Commands

The section describes the system configuration variables of with their defaults and ranges. These values are stored in the non-volatile memory of the module. A reset is necessary for any new parameters to take effect.

2.1. Set/update

To set a configuration variable enter:

```
at+ab config xxxx = yyyy
```

Where "xxxx" is the variable name and "yyyy" is the value to set. A variable name may also be specified as "varzz". Where zz is the sequence number of the variable.

2.2. Inquiry

An inquiry may be made using:

```
at+ab config xxxx
```

Where “xxxx” is the variable name. The reply will be the current setting.

2.3. Configuration Parameters

Name	Default	Description
BuildVersion	250123A	Date code of the firmware (read only).
DeviceName	ART[node address]	Bluetooth name, up to 15 characters are allowed (case sensitive).
BDADDR	00043e261122	Device BD address (read only).
MeshName	Amp'ed LoRa!	Name of the mesh node
MeshKey	12345678	Code used for secure connection.Up to 20 characters are allowed (case sensitive).
AuthType	0	0=NONE, 1=AES-128
UartBaudrate	115200	Main UART baudrate: 1200 to 921,600 baud.
UartParity	none	Enable/disable parity on the main UART.
UartDataBits	8	Main UART data bits per character.
UartStopBits	1	Main UART number of stop bits.
UartFlowControl	false	Enabled use RTS/CTS flow control, disabled does not uses flow control.
MeshRelay	false	true: enables Relay feature False: disables Relay feature
MeshProxy	true	true: enables Proxy feature False: disables Proxy feature
MeshBle	true	true: enables BLE feature False: disables BLE feature
MeshFriend	false	true: enables Friend feature False: disables Friend feature
MeshLPN	false	true: enables LPN feature False: disables LPN feature
ProvisionStatus	false	true: provisioned false: unprovisioned
BLETxPower	0	dBm
LoraTxPower	6	1-10, this is not in dBm. 10 is max power, about 28 dBm
LoraChannel	45	0-60, sets operating frequency at 780 MHz + N * 3 MHz A value of 45 is 780 + 45*3 = 915 MHz
LoraCADInterval	500	100 -5000ms, CAD interval.
LoraLoraBand	915	Operating frequency, MHz (read only).
LoraAirDataRate	4800	1200, 2400, 4800, 9600, 19200, 38400
HostEvents	true	All host events are sent when True.
HardwareType	LR70	Module part number (read only).
BLEChannel	1	BLE channel 1-7
MaxTTL	4	Time-to-live, maximum number of mesh node hops, 0-10.
HostDeepSleepEn	false	Enables deep sleep mode.
NodeAddr	0001	Unique unicast address. Value is 0001 – 7FFF (ASCII hex format, 4 characters each, zero padded).
PublishAddr	C001	Publish address. Value is C000 – FFEF, (ASCII hex format, 4 characters each, zero padded).

SubscribeAddr	C001	Subscribe addresses. Value is 0xC000 – FFEF, up to 8 addresses, comma separated, may be entered: C001,C002,C003,etc… (ASCII hex format, 4 characters each, zero padded).
DefaultDSTAddr	0001	Unique unicast address value is 0001 – 7FFF. Publish address value is C000 – FFEF, (ASCII hex format, 4 characters each, zero padded).
AckTimeout	auto	Timeout for ACKs, in seconds. Automatically set.
LoraTxRpt	1	Number of times a packet is sent, 1-5 (1 means it's not repeated).
LoraTxInt	auto	Allows spacing between repeated packets, in ms. Automatically set. Hidden config.
LoraTxGuard	auto	Allows time to listen for ACK, in ms. Automatically set. Hidden config.
GrpAckWindow	4	Number of time frames allowed for Group Acks, range 1-8.
AckEn	True	Acks are send from this node when enabled. Each node much set this as desired.
MeshEn	False	Mesh networking mode is supported when enabled. Each node mush have this set while in a mesh network.
LoRaRmtPin	123456	Security pin needed to enable remote parameter changes and resets. 6 digits.
TermChar	126	The character used to signify the termination of a data sequence. Default is the tild "~" character. Displayed in decimal.
EscSeq	^#^$^%	This is the sequence needed to escape from bypass mode, into command mode.
BypassMode	false	When true, the device will send data transparently over the RF network. No commands are allowed in bypass mode.
BypassDST	0000	The destination of data when using bypass mode. May be a node ID, group ID, or broadcast.