# LSM100A LoRa CLI Command interface manual

**Rev 1.0** 

SJI

JAN. 28. 2022

#### Contents

1. AT COMMAND COMPLETE SET	3
2. LORA RF TEST DESCRIPTION	4
2.1 Configure RF test	4
2.2 RF TEST – OTAA	6
3. LORA COMMAND	8

Copyright SJI | All Rights Reserved | www.seongji.co.kr

# History

Date	Contents	Version	
2022-01-28	Create	V1.0	

# 1. AT command complete set

A typical serial terminal emulator can also be used to control the EVK instead of the proposed test SW. In that case the following parameters should be used:

• Speed: 9600 bauds

Data bits: 8Stop bits: 1Parity: None

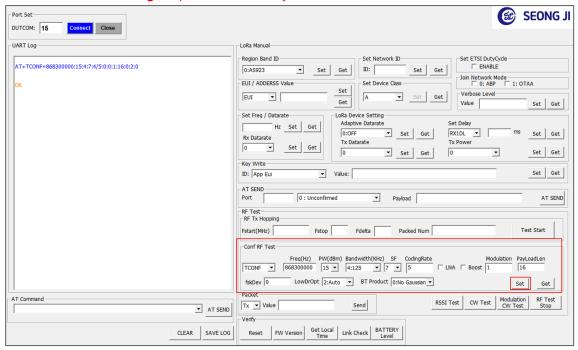
The following table gather all AT command available:

# 2. LoRa RF Test Description

# 2.1 Configure RF test

General Setting

\* Conf RF Test Setting(Required to set every device reset)



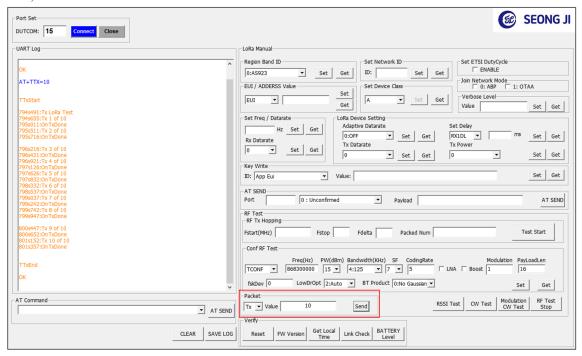
- As in the picture above, enter parameters without spaces and Set

AT+TCONF=<Frequency>:<Power>:<LoRa Bandwidth>:<Lora SF>:<CodingRate>:<PA
Boost>: <Modulation>:<PayloadLen>:<FskDeviation>:<LowDrOpt >:<BTproduct:><CR>
Ex) AT+TCONF=868300000:10:4:5:4/5:0:0:1:16:0:0:0

## Tx Test

After selecting Tx in the Packet part, set the number of times to repeat Value and Send.

## Ex) AT+TTX=10



#### **Rx Test**

After selecting Rx in the Packet part, set the number of times to repeat Value and Send.

- → if received success display "OnRxDone"
- → if received fail display "OnRxTimeout"

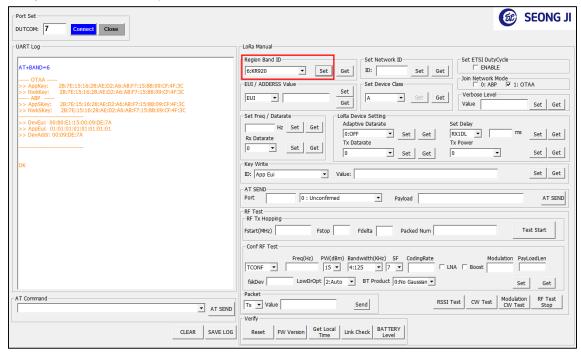
## Ex) AT+TRX=5

Port Set  DUTCOM: 15 Connect Close	€ SEONG JI
UART Log	LoRa Manual  Region Band ID  Set Network ID  Set ETSI DutyCycle
AT+TCONF=868300000:15:4:7:4/5:0:0:1:16:0:2:0  OK	O:AS923
AT+TRX=5 TRXStart 74257:OnRxDone 72527:RsxValue=111 dBm, SnrValue=3dB	EUI
74237/Rst of 5 >>> PER = 0 % 2437/Rst of 5 >>> PER = 0 % 88308/Rst of 5 >>> PER = 0 % 88308/Rst of 5 >>> PER = 0 % 88308/Rst of 5 >>> PER = 0 % 99339/Rst of 5 >>> PER = 0 %	Hz
9s359:Rx 3 of 5 >>> PER= 0 % 10411:OnRxDone 10411:RssValue=-111 dBm, SnrValue=3dB 104411:Rx of 5 >>> PER= 0 %	Key Wirte
11s461:OnRxDone 11s461:RsYshale=-11 dBm, SnrValue=3dB 11s461:RsYshale=-11 dBm, SnrValue=3dB 11s461:Rx 5 of 5 >>> PER= 0 % TRXEnd OK	Port 0 : Unconfirmed Payload AT SEND  RF Test  RF Tx Hopping
	Freq(Hz)   PW(dBm)   Bandwidth(KHz)   SF   CodingRate   Modulation   PayLoadLen     TCONF
AT Command  AT SEND	Packet    RX   Value   5   Send   RSSI Test   CW Test   Modulation   RF Test   Stop
CLEAR SAVE LOG	Verify

## 2.2 RF test - OTAA

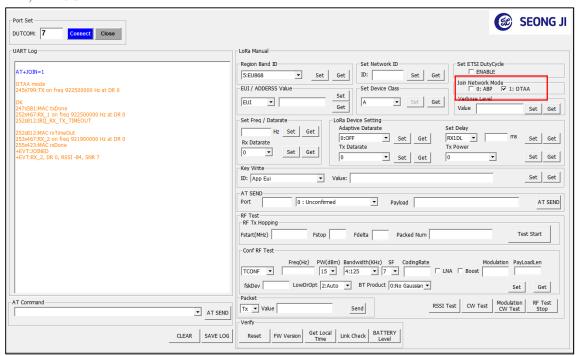
1) Select region band ID

Ex) EU- AT+BAND=5, Korea- AT+BAND=6



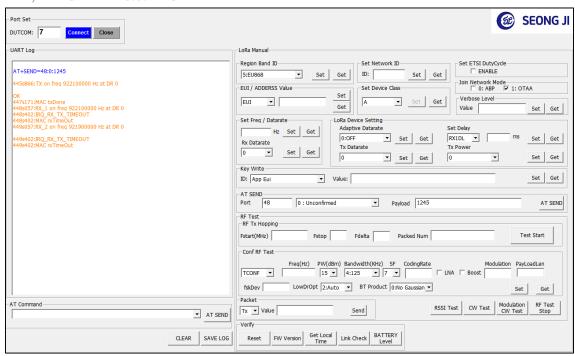
# 2) Join the basesyarion

#### Ex) AT+JOIN=1



#### 3) Send data

## Ex) AT+SEND=48:0:1245



# 3. LoRa Command

Command	Name	Description
AT?	Help on all	Help on All Commands.
	<cmd></cmd>	
AT-7		Ex) AT? (CR)
ATZ	Reset	Trig a MCU reset.
		Ex) ATZ (CR)
AT+BAT=?	Battery level	Get the battery level (in mV).
AT 1/1		Ex) AT+BAT=? (CR)
AT+VL=level	Verbose level	Set or Get the verbose level.
AT+VL=?		<li><level>: [ 0: off ~ 3: High ]</level></li>
AT MODE	14 L C	Ex) AT+VL=3 (CR)
AT+MODE=mode	Mode Change	LoRa & Sigfox Mode Change. After a MCU reset.
AT+MODE=?		<mode>: [ 0: SigFox, 1: LoRa ]</mode>
		Ex) AT+MODE=1 (CR)
AT\$SSWVER=?	Software version	Get the Software version.
		Ex) AT\$SSWVER=? (CR)
AT+VER=?	Firmware and	Get the version of firmware and libraries.
	library versions	
		Ex) AT+VER=? (CR)
AT+LTIME=?	Local time in	Get the local time in UTC format.
	UTC format	
		Ex) AT+LTIME=? (CR)
AT+LINKC?	Link Check	Piggyback a Link Check Request to the next uplink.
		Ex) AT+LINKC? (CR)
AT+APPEUI=eui	Application EUI	Set or Get the Application EUI.
AT+APPEUI=?		
		Ex) AT+APPEUI=00:00:00:00:00:00:00:07 (CR)
AT+NWKKEY=key	Network Key	Set or Get the Network Key.
AT+NWKKEY=?		
		Ex) AT+NWKKEY=00:11:22:33:44:55:66:77:88:99:AA:BB:
		CC:DD:EE:FF (CR)

Command	Name	Description
AT+APPKEY=key	Application Key	Set or Get the Application Key.
AT+APPKEY=?		
		Ex) AT+APPKEY=00:11:22:33:44:55:66:77:88:99:AA:BB:
		CC:DD:EE:FF (CR)
AT+NWKSKEY=key	Network Session	Set or Get the Network Session Key.
AT+NWKSKEY=?	Key	
		Ex) AT+NWKSKEY=00:11:22:33:44:55:66:77:88:99:AA:BB:
		CC:DD:EE:FF (CR)
AT+APPSKEY=key	Application	Set or Get the Application Session Key.
AT+APPSKEY=?	Session Key	
		Ex) AT+APPSKEY=00:11:22:33:44:55:66:77:88:99:AA:BB:
		CC:DD:EE:FF (CR)
AT+DADDR=address	Device address	Set or Get the Device address.
AT+DADDR=?		
		Ex) AT+DADDR=00:11:22:33 (CR)
AT+DEUI=?	Device EUI	Get the Device EUI.
		Ex) AT+DEUI=? (CR)
AT+NWKID=id	Network ID	Set or Get the Network ID.
AT+NWKID=?		<id>: [ 0 ~ 127 ].</id>
		Ex) AT+NWKID=100 (CR)
AT+JOIN=mode	Join network	Join network with Mode.
AT+JOIN=?	with Mode	<mode> [ 0: ABP, 1: OTAA ]</mode>
		Ex) AT+JOIN=1 (CR)
AT+SEND=port:ack:data	Send binary	Send binary data with the application
	data	<port> [ 1 ~ 199 ]</port>
		<ack> [ 0: unconfirmed, 1: confirmed ]</ack>
		Ex) AT+SEND=1:1:123456789012345678901234567890
		123456789012345678901234567890123456 (CR)
AT+ADR=mode	Adaptive	Set or Get the Adaptive DataRate setting.
AT+ADR=?	DataRate	<mode>: [ 0: Off, 1: On ]</mode>
		Ex) AT+ADR=0 (CR)

Command	Name	Description
AT+DR=datarate	Tx DataRate	Set or Get the Tx DataRate.
AT+DR=?		Activation when ADR off Only
		<datarate>: [ 0 ~ 7 ]</datarate>
		[ EU868 ]
		0: LoRa - SF12 / 125 kHz, bit rate – 250 bit/s
		1: LoRa - SF11 / 125 kHz, bit rate - 440 bit/s
		2: LoRa - SF10 / 125 kHz, bit rate - 980 bit/s
		3: LoRa - SF9 / 125 kHz, bit rate - 1760 bit/s
		4: LoRa - SF8 / 125 kHz, bit rate - 3125 bit/s
		5: LoRa - SF7 / 125 kHz, bit rate - 5470 bit/s
		6: LoRa - SF7 / 250 kHz, bit rate - 11000 bit/s
		7: FSK - 50 kbps, bit rate - 5000 bit/s
		Ex) AT+DR=0 (CR)
AT+TXP=power	Transmit Power	Set or Get the Transmit Power.
AT+TXP=?		(valid range according to region)
		<pre><power>: [ 0 ~ 15 ]</power></pre>
		AS923: [ 0~7 ] AU915: [ 0~14 ] CN779: [ 0~5 ]
		EU868: [ 0~7 ] KR920: [ 0~7 ] IN865: [ 0~10 ]
		US915: [ 0~14 ] RU864: [ 0~7 ]
		Ex) AT+TXP=0 (CR) ( in KR920 0: MAX ERP )
AT+BAND=band	Active Region	Set or Get the Active Region Band ID. [ 0 ~ 9 ]
AT+BAND=?	Band ID	 <band>: [0: AS923, 1: AU915, 2: CN470, 3: CN779,</band>
		4: EU433, 5: EU868, 6: KR920, 7: IN865, 8: US915, 9:
		RU864]
		Ex) AT+BAND=0 (CR)

Command	Name	Description
AT+CLASS=class	Device Class	Set or Get the Device Class.
AT+CLASS=?		<class>: [A, C]</class>
		Class B to be update
		Ex) AT+CLASS=? (CR)
AT+DCS=mode	ETSI DutyCycle	Set or Get the ETSI DutyCycle.
AT+DCS=?		<mode>: [ 0: disable, 1: enable ] - Only for testing</mode>
		Ex) AT+DCS=0 (CR) ( for KR920, AS923, AU915, )
AT+RX2FQ=freq	Rx2 window	Set or Get the Rx2 window.
AT+RX2FQ=?	Freq	<freq>: Frequency (in Hz)</freq>
		Ex) AT+RX2FQ=869525000 (CR)
AT+RX2DR=datarate	Rx2 window	Set or Get the Rx2 window DataRate.
AT+RX2DR=?	DataRate	<datarate>: [ 0 ~ 7 ]</datarate>
		Ex) AT+RX2DR=0 (CR)
AT+RX1DL=delay	Delay between	Set or Get the delay between the end of the Tx and the
AT+RX1DL=?	end of Tx and Rx	Rx Window 1.
	Window 1	<delay>: delay (in ms)</delay>
		Ex) AT+RX1DL=1000 (CR)
AT+RX2DL=delay	Delay between	Set or Get the delay between the end of the Tx and the
AT+RX2DL=?	end of Tx and Rx	Rx Window 2 in ms.
	Window 2	<delay>: delay (in ms)</delay>
		Ex) AT+RX2DL=2000 (CR)
AT+JN1DL=delay	Join Accept	Set or Get the Join Accept Delay between the end of the
AT+JN1DL=?	Delay between	Tx and the Join Rx Window 1 in ms.
	end of Tx and	<delay>: delay (in ms)</delay>
	Join Rx Window	
	1	Ex) AT+JN1DL=5000 (CR)
AT+JN2DL=delay	Join Accept	Set or Get the Join Accept Delay between the end of the
AT+JN2DL=?	Delay between	Tx and the Join Rx Window 2 in ms.
	end of Tx and	<delay>: delay (in ms)</delay>
	Join Rx Window	
	2	Ex) AT+JN2DL=6000 (CR)

Command	Name	Description
AT+TTH=fstart:fstop:fdel	Test Tx Hopping	Starts RF Tx hopping test from Fstart to Fstop in Hz or
ta:packetnb		MHz, Fdelta in Hz. Class B test.
		<fstart>: frequency (in Hz or MHz)</fstart>
		<fstop>: frequency (in Hz or MHz)</fstop>
		<fdelta>: frequency (in Hz)</fdelta>
		Ex) AT+TTH=867:869:500000:10 (CR)
AT+TCONF=frequency:p	Configure RF	Configure RF test.
ower:bandwidth:sf:coding		
rate:lna:paboost:modulati		<pre><frequency>: [ ex: 868300000 ]Hz</frequency></pre>
on:payloadlen:fskdeviatio		<pre><power>: [ -9 ~ 22 ]dBm</power></pre>
n:lowdropt:btproduct		<pre><bandwidth>: Lora [ 4: 125, 5: 250, 6: 500 ]kHz,</bandwidth></pre>
		or FSK: [ 4800Hz : 467000 ]Hz
		<sf>: [ 7 ~ 12 ] or <fsk>: [ 600 ~ 300000 ]</fsk></sf>
		<codingrate>: [ 4/5, 4/6, 4/7, 4/8 ]</codingrate>
		<lna>: [ 0: Off, 1: On ]</lna>
		<pre><pa boost="">: [ 0: Off, 1: On ]</pa></pre>
		<modulation>: [ 0: FSK, 1: LoRa, 2: BPSK ]</modulation>
		<pre><payloadlen>: [ 1 ~ 256 ] <fskdev>: FSK Only [ 600 ~ 20000 ]</fskdev></payloadlen></pre>
		<pre></pre> <pre><lowdropt>: Lora Only [ 0: off, 1: On, 2: Auto ]</lowdropt></pre>
		<btproduct>: [ 0: no Gaussian Filter Applied, 1: BT=0,3, 2:</btproduct>
		BT=0,5, 3: BT=0,7, 4: BT=1 ]
		B1-0,3, 3. B1-0,1, 1. B1-1 ]
		Ex) AT+TCONF=922300000:14:4:12:4/5:1:0:1:16:0:2:3 (CR)
AT+TTONE	RF Tx Tone test	Starts RF Tx Tone test (CW Test Mode)
		Ex)AT+TTONE (CR)
AT+TRSSI	RF Rx RSSI test	Starts RF Rx RSSI test.
		Ex) AT+TRSSI (CR)
AT+TTX=packetnb	Test RF Tx	Starts RF Tx test: Nb of packets sent.
		Ex) AT+TTX=16 (CR)
AT+TRX=packetnb	Test RF Rx	Starts RF Rx test: Nb of packets expected.
		Stop by input 'X'
		Ex) AT+TRX=16 (CR)

Command	Name	Description
AT+MTX	Test RF	Starts RF Tx test: Modulation Continuous Wave
	Modulation wave	
		Ex) AT+MTX (CR)
AT+MRX	Test RF	Starts RF Rx test: Continuous receive
	Continuous Rx	Stop by input 'X'
		Ex) AT+MRX (CR)
AT+TOFF	Stop RF test	Stops on-going RF test.
		Ex) AT+TOFF (CR)