LSM1x0A LoRa CLI Command interface manual

Rev 1.2

SJIT

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History

Date	Contents	Version	FW
			Version
2022-01-28	Create	V1.0	
2024-01-23	Set Channel Mask	V1.1	V1.0.4
	- AT+CHMASK=channel mask		
	Change Baudrate		
	- AT+BAUDRATE=baudrate		
	Add additional explanation of Rx2 Datarate		
	Maintain Uplink Count		
	- AT+DADDR=addr,1		
	Add content of Default Region		
	Add a table of Tx power for explanation		
	Set retransmission of unconfirmed test		
	- AT+UNCNFRETX= <count></count>		
	Change the company name		
	Set Devnonce count		
	- AT+DEVNONCE= <count></count>		
2024-02-28	Set retransmission of confirmed test	V1.2	V1.0.4
	- AT+CNFRETX= <count></count>		

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

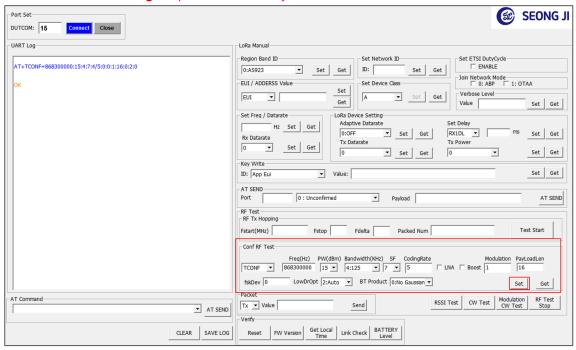
The following table gather all AT command available:

2. LoRa RF Test Description

2.1 Configure RF test

General Setting

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



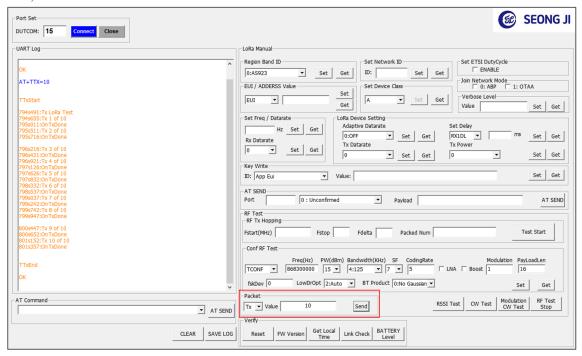
- As in the picture above, enter parameters without spaces and Set

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"

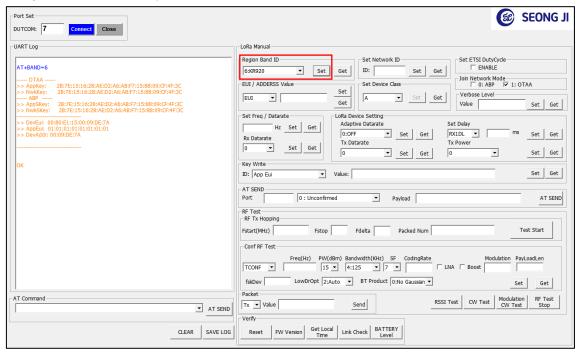
Ex) AT+TRX=5

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	O:A5923
OK	Set Set Set Verbes Level
AT+TRX=5 TRxStart	Get A Set Get Value Set Get
73257:ORXDone 73257:RsValue=111 dBm, SnrValue=3dB 73257:Rs 1 of 5 >>> PER= 0 % 8308:ORXDone 8308:StsValue=111 dBm, SnrValue=3dB 9308:ORXDone 8308:StsValue=111 dBm, SnrValue=3dB 9359:RsValue=111 dBm, SnrValue=3dB 9359:RsValue=111 dBm, SnrValue=3dB 10s411:ORXDone 10s411:RsValue=111 dBm, SnrValue=3dB 10s411:RsValue=111 dBm, SnrValue=3dB 11s461:RsValue=111 dBm, SnrValue=3dB 11s461:RsV 65 5 >> PER= 0 %	Set Freq / Datarate
TRACING ON STATE OF THE OWN OF THE OWN	RF Test RF Tx Hopping Fstart(MHz) Fstop Fdelta Packed Num Test Start
	Conf RF Test
	fskDev 0 LowDrOpt 2:Auto ▼ BT Product 0:No Gaussian ▼ Set Get
AT Command AT SEND	Packet RX
CLEAR SAVE LOG	Verify Reset FW Version Get Local Time Link Check BATTERY Level

2.2 RF test - OTAA

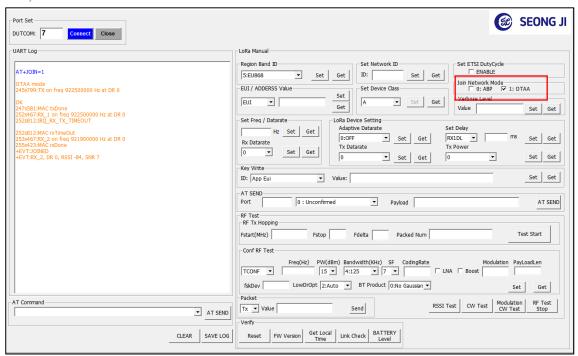
1) Select region band ID

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



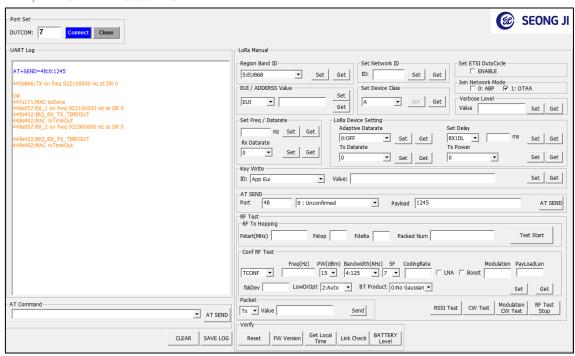
2) Join the basesyarion

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>	
AT7		Ex) AT? (CR)
ATZ	Reset	Trig a MCU reset.
		Ex) ATZ (CR)
AT+BAT=?	Battery level	Get the battery level (in mV).
AT . M. I I	W. L L I	Ex) AT+BAT=? (CR)
AT+VL=level	Verbose level	Set or Get the verbose level.
AT+VL=?		<level>: [0: off ~ 3: High]</level>
AT 14005	NA 1 CI	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	F.) AT. ITIME 2.46D)
		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=?		If use 'AT+DADDR=address,1', Uplink count is maintained
		Ex) AT+DADDR=00:11:22:33 (CR)
AT DEL	5 . 5	Ex) AT+DADDR=00:11:22:33,1 (CR)
AT+DEUI=?	Device EUI	Get the Device EUI.
		Ev) AT - DELII-2 (CD)
AT+NWKID=id	Network ID	Ex) AT+DEUI=? (CR) Set or Get the Network ID.
AT+NWKID=Id AT+NWKID=?	Network ID	<id><id>: [0 ~ 127].</id></id>
AITINVIKID-:		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
		Ex) AT+NWKID=100 (CR)
AT+JOIN=mode	Join network	Join network with Mode.
AT+JOIN=?	with Mode	<pre><mode> [0: ABP, 1: OTAA]</mode></pre>
711750114	With Mode	imades [d. Abi, i. dirut]
		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)
		<power>: [0 ~ 15]</power>
		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)
		TXPower Configuration (EIRP)
		0 Max EIRP
		1 Max EIRP – 2dB 2 Max EIRP – 4dB
		3 Max EIRP – 6dB
		4 Max EIRP – 8dB 5 Max EIRP – 10dB
		6 Max EIRP – 12dB
		7 Max EIRP – 14dB 814 RFU
		15 Defined in [TS001]Error!
		Bookmark not defined. Table 71: KR920-923 TXPower
AT+DEVNONCE=count	Devnonce count	Set or Get Devnonce count
AT+DEVNONCE=?		
		Ex) AT+DEVNONCE=0
		Ex) AT+DEVNONCE=?
	<u> </u>	

Command	Name	Description
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(default
		band), 9: RU864]
		Note: Bands are not saved when rebooting
		Ex) AT+BAND=0 (CR)
AT+UNCNFRETX=retxnb	Unconfirmed	Set or Get Number for the Unconfirmed Uplink
AT+UNCNFRETX=?	Uplink	Retransmission <retxnb>: [1 ~ 15]</retxnb>
	Retransmission	
		Ex) AT+UNCNFRETX=1 (CR)
AT+CNFRETX=?	Confirmed	Set or Get Number for the Confirmed Uplink
AT+CNFRETX= retxnb	Uplink	Retransmission <retxnb>: [1 ~ 15]</retxnb>
	Retransmission	
		Ex) AT+CNFRETX=1 (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	After setting DR of Rx2, also RxC will be set
		<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	After setting DR of Rx2, also RxC will be set
		<pre><datarate>: [0 ~ 13]</datarate></pre>
		AS923: [0~7] AU915: [2~13] CN779: [0~7]
		EU868: [0~7] KR920: [0~5] IN865: [0~5]
		US915: [8~13] RU864: [0~7]
		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		<frequency>: [ex: 868300000]Hz</frequency>
on:payloadlen:fskdeviatio		<power>: [-9 ~ 22]dBm Max 15dBm at Low Power</power>
n:lowdropt:btproduct		<bandwidth>: Lora [4: 125, 5: 250, 6: 500]kHz,</bandwidth>
		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>
		<pa boost="">: [0: Off, 1: On]</pa>
		<modulation>: [0: FSK, 1: LoRa, 2: BPSK]</modulation>
		<payloadlen>: [1 ~ 256]</payloadlen>
		<fskdev>: FSK Only [600 ~ 20000]</fskdev>
		<lowdropt>: Lora Only [0: off, 1: On, 2: Auto]</lowdropt>
		<pre><btproduct>: [0: no Gaussian Filter Applied, 1: BT=0,3, 2:</btproduct></pre>
		BT=0,5, 3: BT=0,7, 4: BT=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)
ATTORE	THE TATION COST	Starts in in ione test (CTT lest induc)
		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)
AT+CHMASK=mask	Channel Mask	Set Region Channel Mask
AT+CHMASK=?		
		Configurable mask
		Dynamic Channel(AS923, EU868, etc) – Channel mask[0]
		Fixed Channel(US915, AU915) – Channel mask[0:5]
		Ex) Dynamic channel:
		AT+CHMASK=0x7F (CR)
		Ex) Fixed channel:
		AT+CHMASK=0x7F,0000,0000,001F,0000,0000 (CR)
AT+BAUDRATE=baudrate	Set Baudrate	Set Baudrate
AT+BAUDRATE=?		Set baudrate to '9600' before setting 'Sigfox Mode'
		<baudrate> [9600, 115200]</baudrate>
		EX) AT+BAUDRATE=9600 (CR)