LSM1x0A LoRa CLI Command interface manual

Rev 1.1

SJIT

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History

Date	Contents	Version	
2022-01-28	Create	V1.0	
2024-01-23	Set Channel Mask - 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 Tx Count - AT+UNCNFRETX=<count> Change the company name Set Devnonce count - AT+DEVNONCE=<count>	V1.1	

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: 8
- Stop bits: 1
- Parity: None

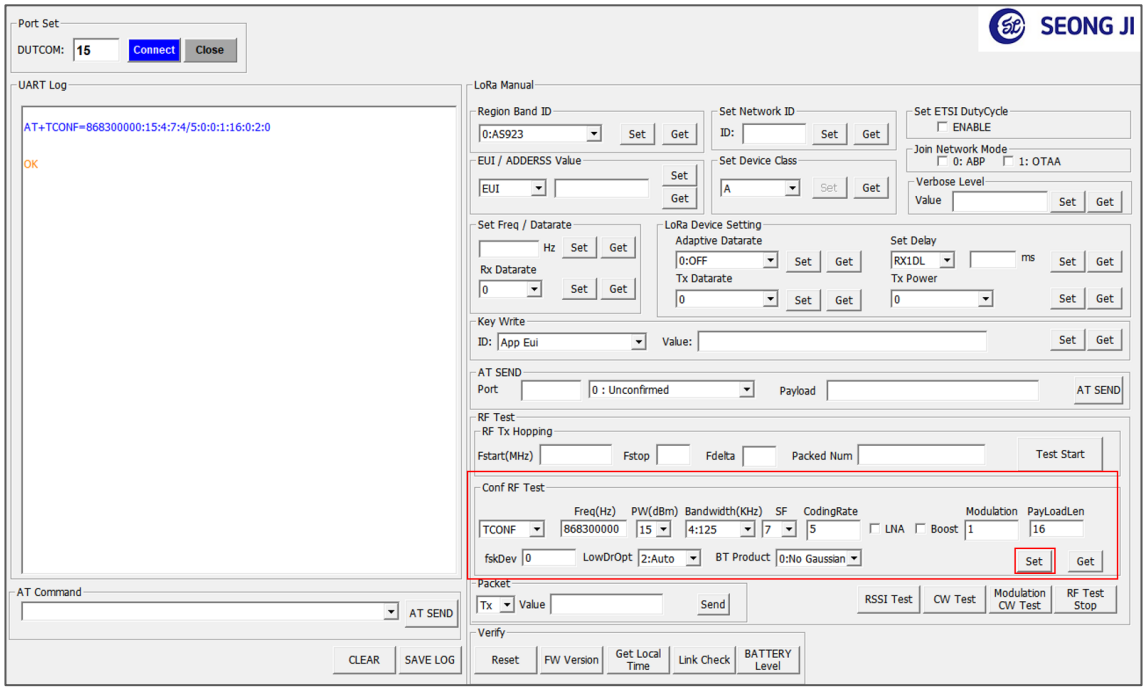
The following table gather all AT command available:

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

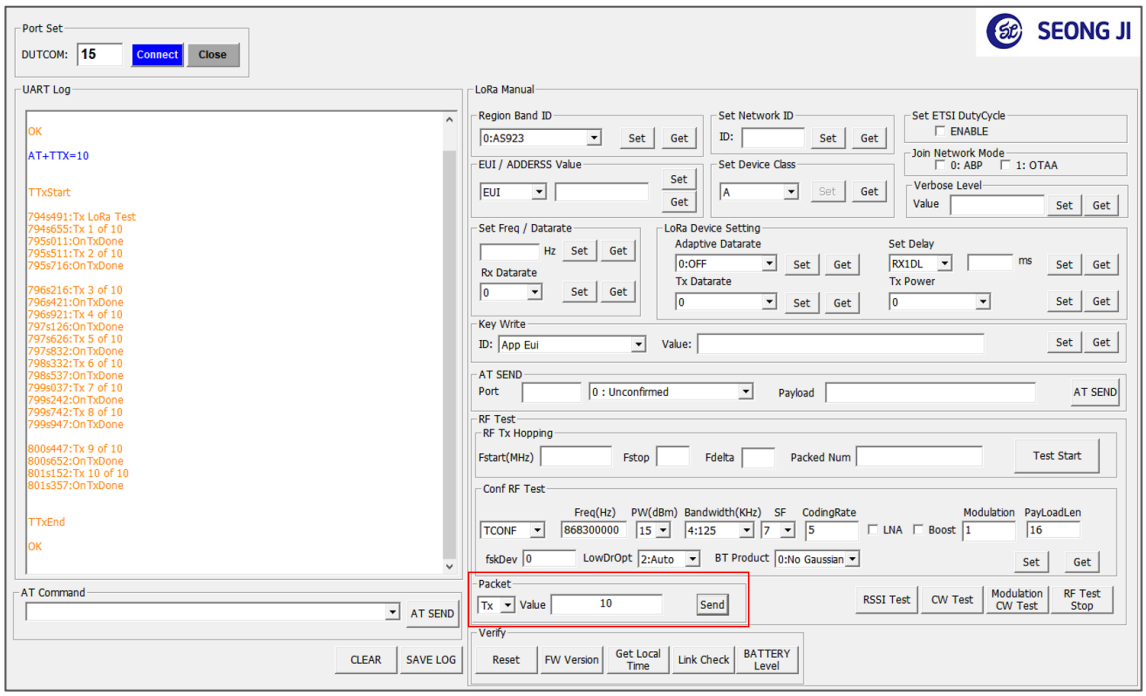
AT+TCONF=<Frequency>:<Power>:<LoRa Bandwidth>:<Lora SF>:<CodingRate>:<Lna>:<PA Boost>: <Modulation>:<PayloadLen>:<FskDeviation>:<LowDrOpt >:<BTproduct:><CR>

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



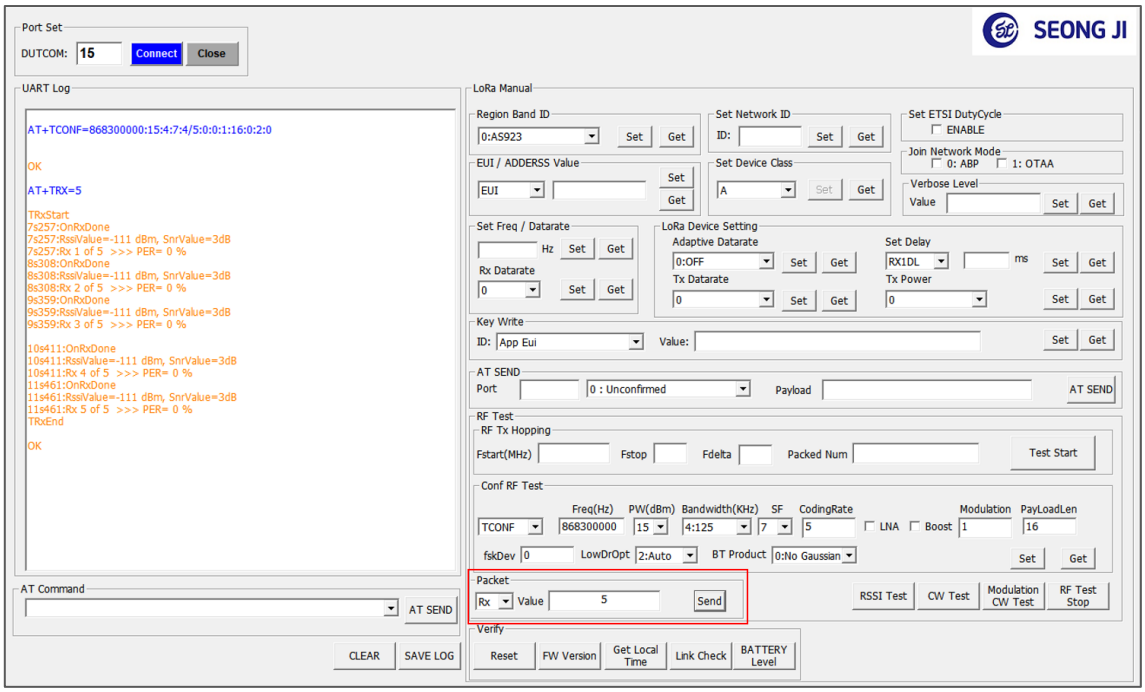
Rx Test

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"

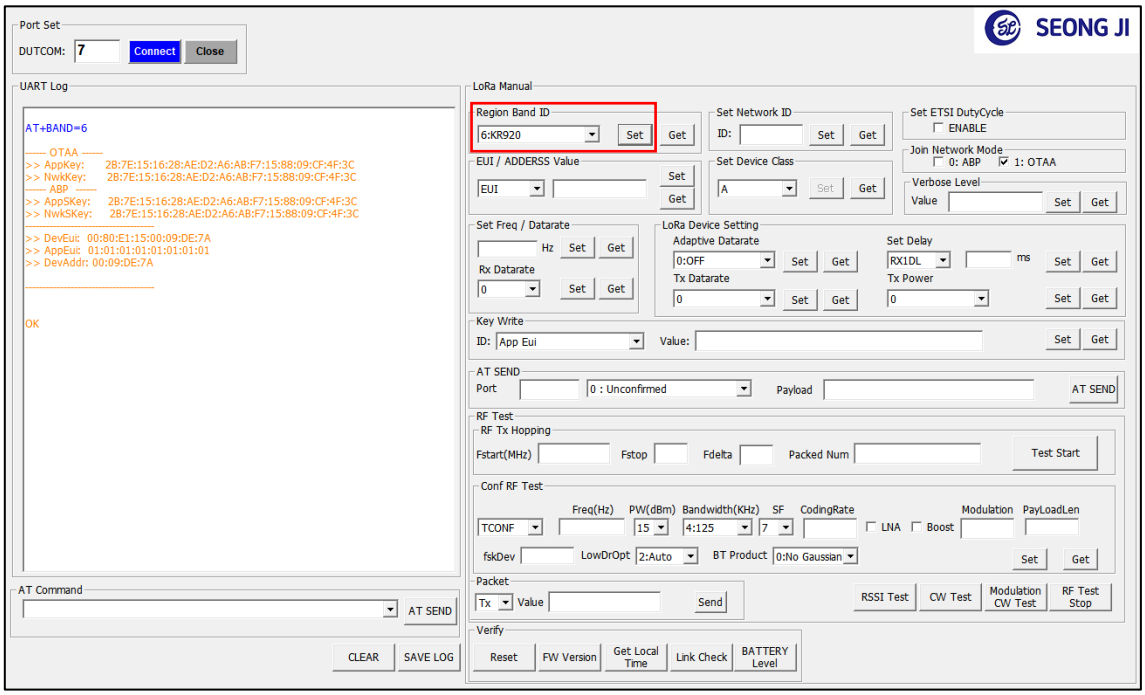
Ex) AT+TRX=5



2.2 RF test – OTAA

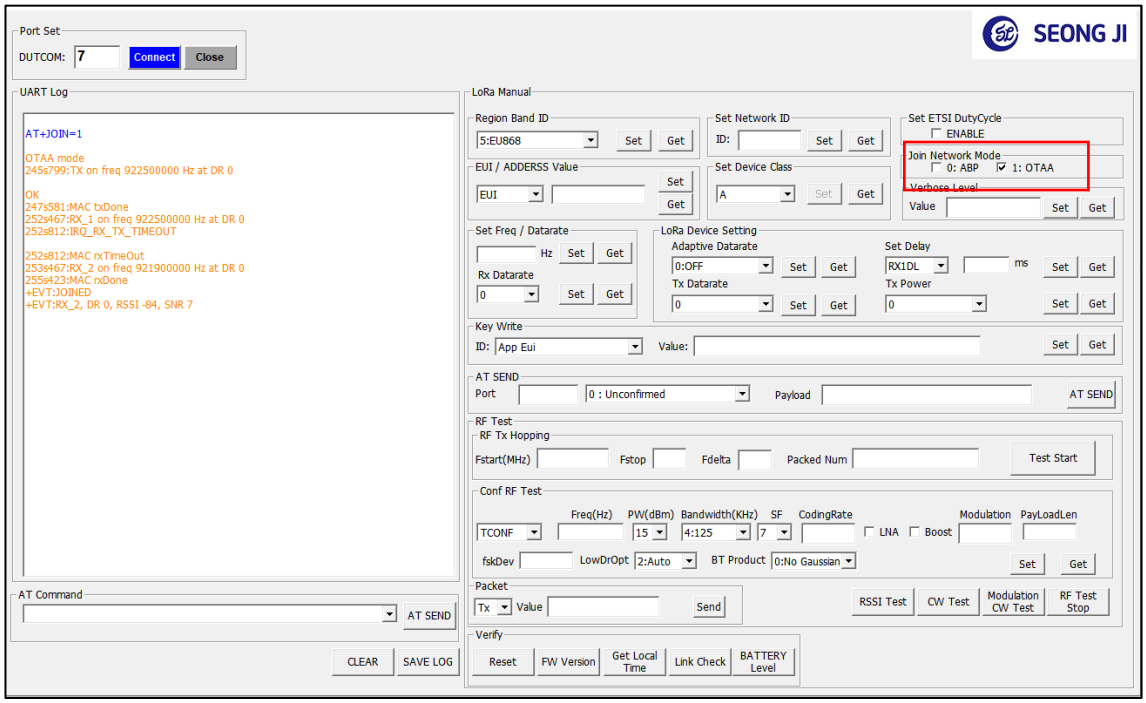
1) Select region band ID

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



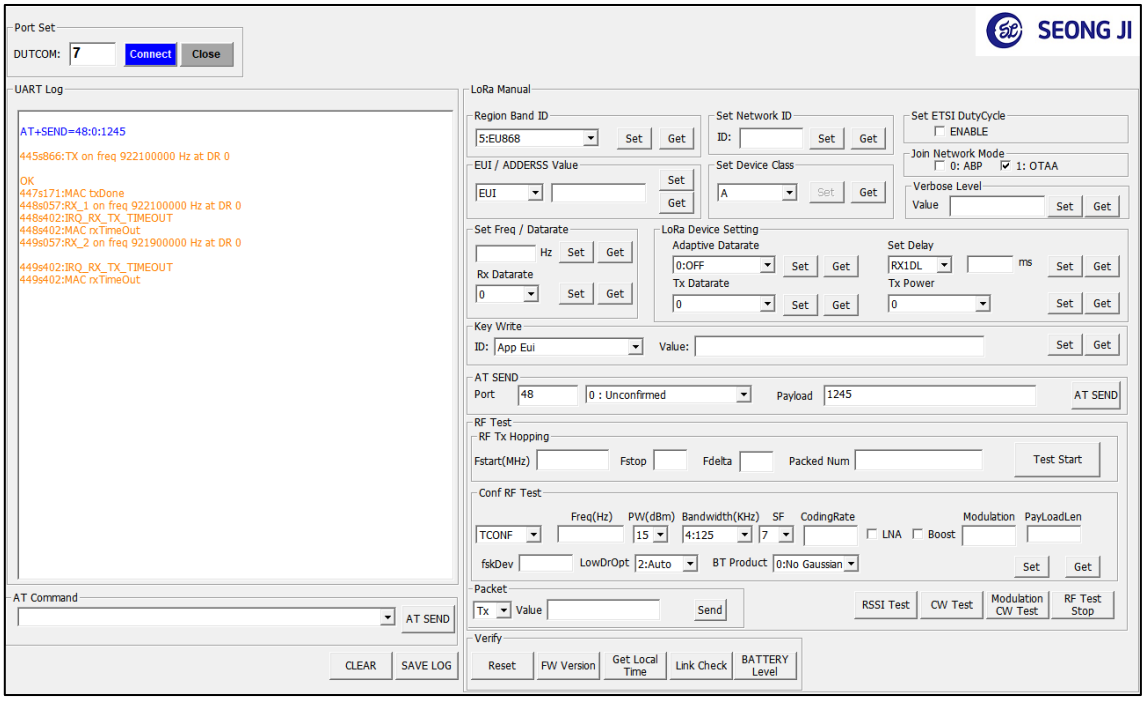
2) Join the basesyarion

Ex) AT+JOIN=1



3) Send data

Ex) AT+SEND=48:0:1245



3. LoRa Command

Command	Name	Description
AT?	Help on all <CMD>	Help on All Commands. Ex) AT? (CR)
ATZ	Reset	Trig a MCU reset. Ex) ATZ (CR)
AT+BAT=?	Battery level	Get the battery level (in mV). Ex) AT+BAT=? (CR)
AT+VL=level AT+VL=?	Verbose level	Set or Get the verbose level. <level>: [0: off ~ 3: High] Ex) AT+VL=3 (CR)
AT+MODE=mode AT+MODE=?	Mode Change	LoRa & Sigfox Mode Change. After a MCU reset. <mode>: [0: SigFox, 1: LoRa] Ex) AT+MODE=1 (CR)
AT$SSWVER=?	Software version	Get the Software version. Ex) AT$SSWVER=? (CR)
AT+VER=?	Firmware and library versions	Get the version of firmware and libraries. Ex) AT+VER=? (CR)
AT+LTIME=?	Local time in UTC format	Get the local time in 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 AT+APPEUI=?	Application EUI	Set or Get the Application EUI. Ex) AT+APPEUI=00:00:00:00:00:00:00:07 (CR)
AT+NWKKEY=key AT+NWKKEY=?	Network Key	Set or Get the Network Key. 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 AT+APPKEY=?	Application Key	Set or Get the Application Key. Ex) AT+APPKEY=00:11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF (CR)
AT+NWKSKEY=key AT+NWKSKEY=?	Network Session Key	Set or Get the Network Session Key. Ex) AT+NWKSKEY=00:11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF (CR)
AT+APPSKEY=key AT+APPSKEY=?	Application Session Key	Set or Get the Application 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 AT+DADDR=?	Device address	Set or Get the Device address. If use 'AT+DADDR=address,1', Uplink count is maintained Ex) AT+DADDR=00:11:22:33 (CR) Ex) AT+DADDR=00:11:22:33,1 (CR)
AT+DEUI=?	Device EUI	Get the Device EUI. Ex) AT+DEUI=? (CR)
AT+NWKID=id AT+NWKID=?	Network ID	Set or Get the Network ID. <id>: [0 ~ 127]. Ex) AT+NWKID=100 (CR)
AT+JOIN=mode AT+JOIN=?	Join network with Mode	Join network with Mode. <mode> [0: ABP, 1: OTAA] Ex) AT+JOIN=1 (CR)
AT+SEND=port:ack:data	Send binary data	Send binary data with the application <Port> [1 ~ 199] <Ack> [0: unconfirmed, 1: confirmed] Ex) AT+SEND=1:1:12345678901234567890123456789012345678901234567890123456789012345678901234567890123456 (CR)
AT+ADR=mode AT+ADR=?	Adaptive DataRate	Set or Get the Adaptive DataRate setting. <mode>: [0: Off, 1: On] Ex) AT+ADR=0 (CR)

<table>
<tr><th>Command</th><th>Name</th><th>Description</th></tr>
<tr><td>AT+DR=datarate
AT+DR=?</td><td>Tx DataRate</td><td>Set or Get the Tx DataRate.
Activation when ADR off Only
<datarate>: [0 ~ 7]

[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)</td></tr>
<tr><td>AT+TXP=power
AT+TXP=?</td><td>Transmit Power</td><td>Set or Get the Transmit Power.
(valid range according to region)
<power>: [0 ~ 15]
AS923: [0~7] AU915: [0~14] CN779: [0~5]
EU868: [0~7] KR920: [0~7] IN865: [0~10]
US915: [0~14] RU864: [0~7]

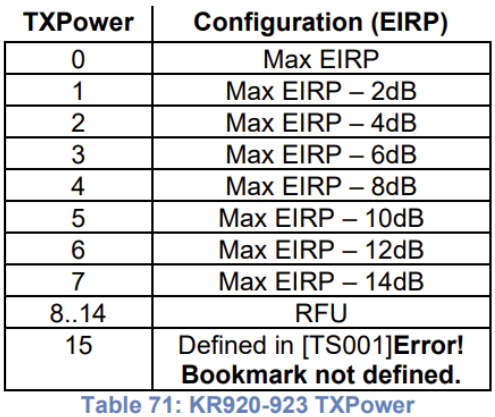
Ex) AT+TXP=0 (CR) (in KR920 0: MAX ERP)
 

Table 71: KR920-923 TXPower</td></tr>
<tr><td>AT+DEVNONCE=count
AT+DEVNONCE=?</td><td>Devnonce count</td><td>Set or Get Devnonce count

Ex) AT+DEVNONCE=0
Ex) AT+DEVNONCE=?</td></tr>
</table>

Command	Name	Description
AT+BAND=band AT+BAND=?	Active Region Band ID	Set or Get the Active Region Band ID. [0 ~ 9] <band>: [0: AS923, 1: AU915, 2: CN470, 3: CN779, 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 AT+UNCNFRETX=?	Unconfirmed Uplink Retransmission	Set or Get Number for the Unconfirmed Uplink Retransmission <retxnb>: [1 ~ 15] Ex) AT+UNCNFRETX=1 (CR)

Command	Name	Description
AT+CLASS=class AT+CLASS=?	Device Class	Set or Get the Device Class. <Class>: [A, C] Class B to be update Ex) AT+CLASS=? (CR)
AT+DCS=mode AT+DCS=?	ETSI DutyCycle	Set or Get the ETSI DutyCycle. <mode>: [0: disable, 1: enable] - Only for testing Ex) AT+DCS=0 (CR) (for KR920, AS923, AU915,..)
AT+RX2FQ=freq AT+RX2FQ=?	Rx2 window Freq	Set or Get the Rx2 window. After setting DR of Rx2, also RxC will be set <freq>: Frequency (in Hz) Ex) AT+RX2FQ=869525000 (CR)
AT+RX2DR=datarate AT+RX2DR=?	Rx2 window DataRate	Set or Get the Rx2 window DataRate. After setting DR of Rx2, also RxC will be set <datarate>: [0 ~ 13] 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 AT+RX1DL=?	Delay between end of Tx and Rx Window 1	Set or Get the delay between the end of the Tx and the Rx Window 1. <delay>: delay (in ms) Ex) AT+RX1DL=1000 (CR)
AT+RX2DL=delay AT+RX2DL=?	Delay between end of Tx and Rx Window 2	Set or Get the delay between the end of the Tx and the Rx Window 2 in ms. <delay>: delay (in ms) Ex) AT+RX2DL=2000 (CR)
AT+JN1DL=delay AT+JN1DL=?	Join Accept Delay between end of Tx and Join Rx Window 1	Set or Get the Join Accept Delay between the end of the Tx and the Join Rx Window 1 in ms. <delay>: delay (in ms) Ex) AT+JN1DL=5000 (CR)

AT+JN2DL=delay AT+JN2DL=?	Join Accept Delay between end of Tx and Join Rx Window 2	Set or Get the Join Accept Delay between the end of the Tx and the Join Rx Window 2 in ms. <delay>: delay (in ms) Ex) AT+JN2DL=6000 (CR)

Command	Name	Description
AT+TTH=fstart:fstop:fdelta:packetnb	Test Tx Hopping	Starts RF Tx hopping test from Fstart to Fstop in Hz or MHz, Fdelta in Hz. Class B test. <fstart>: frequency (in Hz or MHz) <fstop>: frequency (in Hz or MHz) <fdelta>: frequency (in Hz) Ex) AT+TTH=867:869:500000:10 (CR)
AT+TCONF=frequency:power:bandwidth:sf:codingrate:lna:paboost:modulation:payloadlen:fskdeviation:lowdropt:btproduct	Configure RF	Configure RF test. <Frequency>: [ex: 868300000]Hz <Power>: [-9 ~ 22]dBm Max 15dBm at Low Power <Bandwidth>: Lora [4: 125, 5: 250, 6: 500]kHz, or FSK: [4800Hz : 467000]Hz <SF>: [7 ~ 12] or <FSK>: [600 ~ 300000] <CodingRate>: [4/5, 4/6, 4/7, 4/8] <Lna>: [0: Off, 1: On] <PA Boost>: [0: Off, 1: On] <Modulation>: [0: FSK, 1: LoRa, 2: BPSK] <PayloadLen>: [1 ~ 256] <FskDev>: FSK Only [600 ~ 20000] <LowDrOpt>: Lora Only [0: off, 1: On, 2: Auto] <BTproduct>: [0: no Gaussian Filter Applied, 1: BT=0,3, 2: 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)** 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 Modulation wave	Starts RF Tx test: Modulation Continuous Wave Ex) AT+MTX (CR)
AT+MRX	Test RF Continuous Rx	Starts RF Rx test: Continuous receive 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 AT+CHMASK=?	Channel Mask	Set Region Channel Mask 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 AT+BAUDRATE=?	Set Baudrate	Set Baudrate Set baudrate to '9600' before setting 'Sigfox Mode' <Baudrate> [9600, 115200] EX) AT+BAUDRATE=9600 (CR)