Dragino LoRa® AT Command Sets (For LDDS75)

Version	Describe	Time
V1.0	Release	2020-06-12

1 Introduction

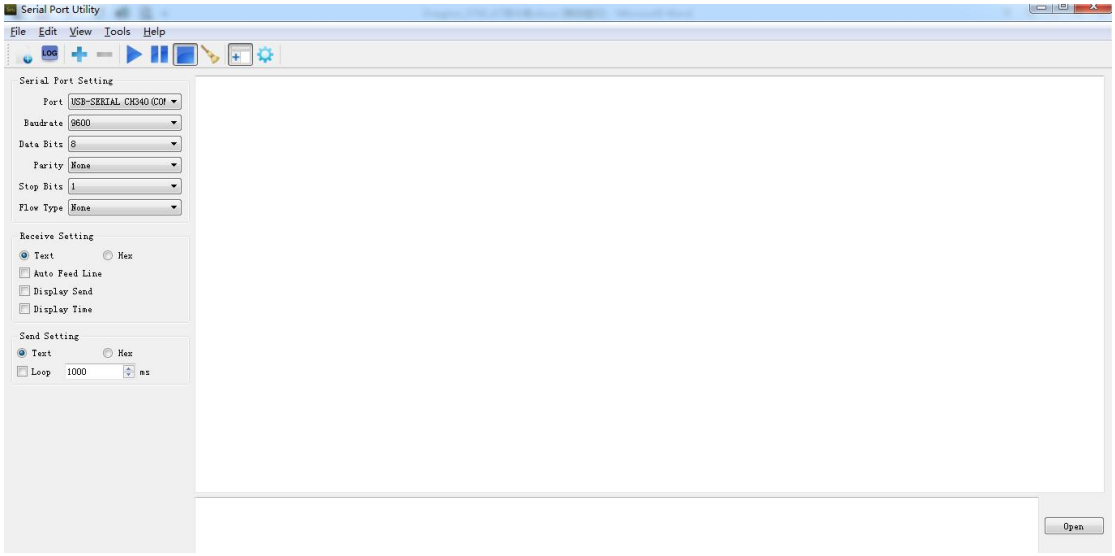
1.1 How to connect device and send AT command?

Software Setting:

An USB-TTL can be used with standard windows software such as Serial Port Utility. The chosen software should be configured with the following parameters:

• Baud rate: 9600
• Data: 8 bit
• Parity: none
• Stop: 1 bit
• Flow type: none

Figure 1 show the standard configuration for Serial Port Utility to use USB-TTL.



All the AT commands have a standard format as “AT+XXX”, with XXX denoting the command. There are four available command behaviors:

• **AT+XXX?** provides a short help of the given command, for example **AT?**
• **AT+XXX** is used to run a command, such as **AT+JOIN**
• **AT+XXX=?** is used to get the value of a given command, for example **AT+TDC=?**
• **AT+XXX=<value>** is used to provide a value to a command, for example **AT+SENDB=12:12a0ff**

The output of the commands is provided on the UART. The output format is as below:

<value><CR><LF>
<CR><LF><Status>

Note: <CR> stands for “carriage return” and <LF> stands for “line feed”

The <value><CR><LF> output is returned whenever the “help AT+XXX?” or the “get AT+XXX=?” commands are run.

When no value is returned, the <value><CR><LF> output is not returned at all.

Every command (except for ATZ used for MCU reset) returns a status string, which is

preceded and followed by <CR><LF> in a “<CR><LF><Status>” format. The possible status are:

• OK: command run correctly without error.
• AT_ERROR: generic error
• AT_PARAM_ERROR: a parameter of the command is wrong
• AT_BUSY_ERROR: the LoRa® network is busy, so the command could not completed
• AT_TEST_PARAM_OVERFLOW: the parameter is too long
• AT_NO_NETWORK_JOINED: the LoRa® network has not been joined yet
• AT_RX_ERROR: error detection during the reception of the command

More details on each command description and examples are described in the next part of this section. Note that each command preceded by # is the one provided by the host to the module. Then the return of the module is printed.

2 General Command

2.1 AT: Attention

AT: Attention	
Test Command: **AT**	Response: **OK**

2.2 AT?: Short Help

AT?: Short Help	
Test Command: **AT?**	Response: **AT+<CMD>?:help on <CMD>** **AT+<CMD>:run <CMD>** **AT+<CMD>=<value>:set the value** **AT+<CMD>=?:get the value** **<followed by the help of all commands>** **OK**

2.3 ATZ: MCU Reset

ATZ: MCU Reset	
Test Command: **ATZ?**	Response: **ATZ: Trig a reset of the MCU** **OK**
Test Command: **ATZ**	Response: **LSN50 Device/LoRa ST Module** **Image Version: XX** **Frequency Band: XX** **DevEui= XX XX XX XX XX XX XX XX** **<followed by the Tx and Rx information>**

2.4 AT+FDR: Factory Data Reset

AT+FDR: Factory Data Reset	
Test Command:	Response:

AT+FDR	**LSN50 Device/LoRa ST Module** **Image Version: XX** **Frequency Band: XX** **DevEui= XX XX XX XX XX XX XX XX** **Please set the parameters or reset Device to apply change**
Test Command: **AT+FDR?**	Response: **AT+FDR: Reset Parameters to Factory Default, Keys Reserve** **OK**

2.5 AT+MODEL: Product Model

AT+MODEL: Get product model	
Test Command: **AT+MODEL=?**	Response: **LDDS75** **OK**
Test Command: **AT+MODEL?**	Response: **AT+MODEL: Get product model** **OK**

2.6 AT+VER: Frequency Band

AT+VER: Image Version and Frequency Band	
Test Command: **AT+VER=?**	Response: **EU868** **OK**
Test Command: **AT+VER?**	Response: **AT+VER: Get Frequency Band** **OK**

2.7 AT+CFG: Print all configurations

AT+CFG: Print all configurations	
Test Command: **AT+CFG**	Response: **AT+DEUI = XX XX XX XX XX XX XX XX** **AT+DADDR=XXXXXXXX** **……**

	AT+RX2WTO=X **AT+CHS=868100000** **OK**

2.8 AT+TDC: Application Data Transmission Interval

AT+TDC: Application Data Transmission Interval< The default TDC is 30000 ms>	
Test Command: **AT+TDC?**	Response: **AT+TDC: Get or set the application data transmission interval in ms** **OK**
AT+TDC=?	Response: **30000** **OK**
AT+TDC=60000	Response: **OK**

3 Keys, IDs and EUIs management

3.1 AT+APPEUI: Application EUI

AT+APPEUI: Application EUI <8 hex separated by >	
Test Command: **AT+APPEUI?**	Response: **AT+APPEUI: Get or Set the Application EUI** **OK**
Test Command: **AT+APPEUI=?**	Response: **00 b3 d5 7e f0 00 4d 34** **OK**

Test Command: **AT+APPEUI=01 30 48 23 54 76 53 CD**	Response: **OK**

3.2 AT+APPKEY: Application Key

AT+APPKEY: Application Key <16 hex separated by >	
Test Command: **AT+APPKEY?**	Response: **AT+APPKEY: Get or Set the Application Key** **OK**
Test Command: **AT+APPKEY=?**	Response: **00 35 55 55 22 23 55 53 43 24 23 42 34 35 35 35** **OK**
Test Command: **AT+APPKEY=00 35 55 55 22 23 55 53 43 24 23 42 34 35 35 35**	Response: **OK**

3.3 AT+APPSKEY: Application Session Key

AT+APPSKEY: Application Session Key <16 hex separated by >	
Test Command: **AT+APPSKEY?**	Response: **AT+APPSKEY: Get or Set the Application Session Key** **OK**
Test Command: **AT+APPSKEY=?**	Response: **00 7d dc 73 33 d3 eb 9e 14 38 d5 a4 3e 62 5b e2** **OK**
Test Command: **AT+APPSKEY=00 7d dc 73 33 d3 eb 9e 14 38 d5 a4 3e 62 5b e2**	Response:(**While Error in format, return AT_PARAM_ERROR)** **OK**

3.4 AT+DADDR: Device Address

AT+DADDR: Device Address <4 hex digit separate by >

Test Command: **AT+DADDR?**	Response: **AT+DADDR: Get or Set the Device Address** **OK**
Test Command: **AT+DADDR=?**	Response: (**While Error in format, return AT_PARAM_ERROR)** **A8 40 41 FF** **OK**
Test Command: **AT+DADDR=A8 40 41 FF**	Response: **OK**

3.5 AT+DEUI: Device EUI

AT+DEUI: Device EUI<8 hex separated by:>	
Test Command: **AT+DEUI?**	Response: **AT+DEUI: Get or Set the Device EUI** **OK**
Test Command: **AT+DEUI=?**	Response: **00 44 34 22 33 45 55 55** **OK**
Test Command: **AT+DEUI=A8 40 41 FF FF 12 34 56**	Response:(**System will write new value to Device EUI,**While Error in format, return **AT_PARAM_ERROR**) **OK**

3.6 AT+NWKID: Network ID(You can enter this command change only after successful network connection)

AT+NWKID: Network ID<4 hex separated by:>	
Test Command: **AT+NWKID?**	Response: **AT+NWKID: Get or Set the Network ID** **OK**
Test Command: **AT+NWKID=?**	Response: **a8 40 41 ff**

	OK
Test Command: **AT+NWKID=A8 40 41 FF**	Response: **OK**

3.7 AT+NWKSKEY: Network Session Key

AT+NWKSKEY: Network Session Key<16 hex separated by:>	
Test Command: **AT+NWKSKEY?**	Response: **AT+NWKSKEY: Get or Set the Network Session Key** **OK**
Test Command: **AT+NWKSKEY=?**	Response: **00 4f 19 25 52 ce 97 09 d7 fa 84 71 db 51 02 92** **OK**
Test Command: **AT+NWKSKEY=A8 40 41 FF FF 12 34 56 00 01 02 04 05 06 06 07**	Response: **OK**

4 Joining and sending date on LoRa® network

4.1 AT+CFM: Confirm Mode

AT+CFM: Confirm Mode	
Test Command: **AT+CFM?**	Response: **AT+CFM: Get or Set the confirmation mode (0-1)** **OK**
Test Command: **AT+CFM=?**	Response: **0** **OK**
Test Command: **AT+CFM=1**	Response: **OK**
Test Command: **AT+CFM=2**	While Error in format, return **AT_PARAM_ERROR**

4.2 AT+CFS: Confirm Status

AT+ CFS: Confirm Status	
Test Command: **AT+CFS?**	Response: **AT+CFS: Get confirmation status of the last AT+SEND (0-1)** **OK**
Test Command: **AT+CFS=?**	Response: **0** **OK**

4.3 AT+JOIN: Join LoRa® Network

AT+ JOIN: Join LoRa® Network	
Test Command: **AT+JOIN**	Response: **OK**
Test Command: **AT+ JOIN?**	Response: **AT+JOIN: Join network** **OK**
	While Error in format, return **AT_BUSY_ERROR**

4.4 AT+NJM: LoRa® Network Join Mode

AT+ NJM: LoRa® Network Join Mode	
Test Command: **AT+NJM=?**	Response: **1** **OK**
Test Command: **AT+NJM?**	Response: **AT+NJM: Get or Set the Network Join Mode. (0: ABP, 1: OTAA)** **OK**
Test Command: **AT+NJM=0**	Response:

	OK
Test Command: **AT+NJM=2**	While Error in format, return **AT_PARAM_ERROR**

4.5 AT+NJS: LoRa® Network Join Status

AT+ NJS: LoRa® Network Join Status	
Test Command: **AT+NJS=?**	Response: **0** **OK**
Test Command: **AT+NJS?**	Response: **AT+NJS: Get the join status** **OK**

4.6 AT+RECV: Print Last Received Data in Raw Format

AT+ RECV: Print Last Received Data in Raw Format<port:data>	
Test Command: **AT+RECV=?**	Response: **0:** **OK**
Test Command: **AT+RECV?**	Response: **AT+RECV: print last received data in raw format** **OK**

4.7 AT+RECVB: Print Last Received Data in Binary Format

AT+ RECVB: Print Last Received Data in Binary Format<port:data>	
Test Command: **AT+RECVB=?**	Response: **2: 0010** **OK**
Test Command: **AT+RECVB?**	Response: **AT+RECVB: print last received data in binary format (with hexadecimal values)** **OK**

4.8 AT+SEND: Send Text Data

AT+ SEND: Send Text Data<port:data>	
Test Command: **AT+SEND?**	Response: **AT+SEND: Send text data along with the application port** **OK**
Test Command: **AT+SEND=12:hello world**	Response: **OK**
	While Error in format, return **AT_BUSY_ERROR/AT_BUSY_ERROR/AT_NO_NETWORK_JOINED**

4.9 AT+SENB: Send Hexadecimal Data

AT+SENDB: Send Hexadecimal Data<port:data>	
Test Command: **AT+SENDB?**	Response: **AT+SENDB: Send hexadecimal data along with the application port** **OK**
Test Command: **AT+SENDB=12:abcdef0123456789**	Response: **OK**
Test Command: **AT+SENDB=abcdef0123456789**	While Error in format, return **AT_PARAM_ERROR** **AT_BUSY_ERROR/AT_NO_NETWORK_JOINED**

5 LoRa® network management

5.1 AT+ADR: Adaptive Rate

AT+ ADR: Adaptive Rate	
Test Command: **AT+ADR=?**	Response: **1** **OK**
Test Command: **AT+ADR?**	Response: **AT+ADR: Get or Set the Adaptive Data Rate setting. (0: off, 1: on)**

	OK
Test Command: **AT+ADR=0**	Response: **OK**
	While Error in format, return **AT_PARAM_ERROR**

5.2 AT+CLASS: LoRa® Class(Currently only support class A, class C)

AT+ CLASS: LoRa® Class	
Test Command: **AT+CLASS=?**	Response: **A** **OK**
Test Command: **AT+CLASS?**	Response: **AT+CLASS: Get or Set the Device Class** **OK**
Test Command: **AT+CLASS=C**	Response: **OK**
	While Error in format, return **AT_PARAM_ERROR**

5.3 AT+DCS: Duty Cycle Setting

AT+ DCS: Duty Cycle Setting	
Test Command: **AT+DCS?**	Response: **AT+DCS: Get or Set the ETSI Duty Cycle setting - 0=disable, 1=enable - Only for testing** **OK**
Test Command: **AT+DCS=?**	Response: **1** **OK**
Test Command: **AT+DCS=1**	Response: **OK**
	While Error in format, return

	AT_PARAM_ERROR

5.4 AT+DR: Data Rate (Can Only be Modified after ADR=0)

AT+DR: Data Rate	
Test Command: **AT+DR=?**	Response: **5** **OK**
Test Command: **AT+DR?**	Response: **Get or Set the Data Rate. (0-7 corresponding to DR_X)** **OK**
Test Command: **AT+DR=2**	Response: **OK**
	While Error in format, return **AT_PARAM_ERROR**

5.5 AT+FCD: Frame Counter Downlink

AT+ FCD: Frame Counter Downlink	
Test Command: **AT+FCD=?**	Response: **0** **OK**
Test Command: **AT+FCD?**	Response: **AT+FCD: Get or Set the Frame Counter Downlink** **OK**
Test Command: **AT+FCD=10**	Response:**(System will write new value to FCD)** **OK**
	While Error in format, return **AT_PARAM_ERROR**

5.6 AT+FCU: Frame Counter Uplink

AT+ FCU: Frame Counter Uplink	
Test Command: **AT+FCU=?**	Response: **0**

	OK
Test Command: **AT+FCU?**	Response: **AT+FCU: Get or Set the Frame Counter Uplink** **OK**
Test Command: **AT+FCU=10**	Response: **OK**
Test Command: **AT+ FCU=10.1**	Response: While Error in format, return **AT_PARAM_ERROR**

5.7 AT+JN1DL: Join Accept Delay1

AT+ JN1DL: Join Accept Delay1	
Test Command: **AT+JN1DL=?**	Response: **5000** **OK**
Test Command: **AT+JN1DL?**	Response: **AT+JN1DL: Get or Set the Join Accept Delay between the end of the Tx and the Join Rx Window 1 in ms** **OK**
Test Command: **AT+JN1DL=10000**	Response: **OK**
	While Error in format, return **AT_PARAM_ERROR/AT_BUSY_ERROR**

5.8 AT+JN2DL: Join Accept Delay2

AT+ JN2DL: Join Accept Delay2	
Test Command: **AT+JN2DL=?**	Response: **6000** **OK**
Test Command:	Response:

AT+JN2DL?	**AT+JN2DL: Get or Set the Join Accept Delay between the end of the Tx and the Join Rx Window 2 in ms** **OK**
Test Command: **AT+JN2DL=20000**	Response: **OK**
	While Error in format, return **AT_PARAM_ERROR/AT_BUSY_ERROR**

5.9 AT+PNM: Public Network Mode

AT+ PNM: Public Network Mode	
Test Command: **AT+PNM=?**	Response: **1** **OK**
Test Command: **AT+PNM?**	Response: **AT+PNM: Get or Set the public network mode. (0: off, 1: on)** **OK**
Test Command: **AT+PNM=1**	Response:(**System will write new value to PNM)** **OK**
	While Error in format, return **AT_PARAM_ERROR/AT_BUSY_ERROR**

5.10 AT+RX1DL: Receive Delay1

AT+ RX1DL: Receive Delay1	
Test Command: **AT+RX1DL=?**	Response: **1000** **OK**
Test Command: **AT+RX1DL?**	Response: **AT+RX1DL: Get or Set the delay between the end of the Tx and the Rx Window 1 in ms** **OK**
Test Command:	Response:

AT+RX1DL=1500	**OK**
	While Error in format, return **AT_BUSY_ERROR/AT_PARAM_ERROR**

5.11 AT+RX2DL: Receive Delay2

AT+ RX2DL: Receive Delay2	
Test Command: **AT+RX2DL=?**	Response: **2000** **OK**
Test Command: **AT+RX2DL?**	Response: **AT+RX2DL: Get or Set the delay between the end of the Tx and the Rx Window 2 in ms** **OK**
Test Command: **AT+RX2DL=2500**	Response: **OK**
	While Error in format, return **AT_BUSY_ERROR/AT_PARAM_ERROR**

5.12 AT+RX2DR: Rx2 Window Data Rate

AT+ RX2DR: Rx2 Window Data Rate	
Test Command: **AT+RX2DR=?**	Response: **OK**
Test Command: **AT+RX2DR?**	Response: **AT+RX2DR: Get or Set the Rx2 window data rate (0-7 corresponding to DR_X)** **OK**
Test Command: **AT+RX2DR=6**	Response: **OK**
	Response: While Error in format, return **AT_PARAM_ERROR**

5.13 AT+RX2FQ: Rx2 Window Frequency

AT+ RX2FQ: Rx2 Window Frequency	
Test Command: **AT+RX2FQ=?**	Response: **434665000** **OK**
Test Command: **AT+RX2FQ?**	Response: **AT+RX2FQ: Get or Set the Rx2 window frequency** **OK**
Test Command: **AT+RX2FQ=434665000**	Response: **OK**
	While Error in format, return **AT_BUSY_ERROR / AT_BUSY_ERROR**

5.14 AT+TXP: Transmit Power

AT+ TXP: Transmit Power	
Test Command: **AT+TXP=?**	Response: **0** **OK**
Test Command: **AT+TXP?**	Response: **AT+TXP: Get or Set the Transmit Power (0-5, MAX:0, MIN:5, according to LoRaWAN Spec, or 40=10dB, 41 = 11dB, …, 50 = 20dB which is out of LoRaWAN spec.)** **OK**
Test Command: **AT+ TXP=1**	Response: **OK**
	While Error in format, return **AT_PARAM_ERROR**

5.15 AT+RSSI: RSSI of the Last Received Packet

AT+ RSSI: RSSI of the Last Received Packet	
Test Command: **AT+RSSI=?**	Response: **0** **OK**

Test Command: **AT+RSSI?**	Response: **AT+RSSI: Get the RSSI of the last received packet** **OK**

5.16 AT+SNR: SNR of the Last Received Packet

AT+ SNR: SNR of the Last Received Packet	
Test Command: **AT+SNR=?**	Response: **0** **OK**
Test Command: **AT+SNR?**	Response: **AT+SNR: Get the SNR of the last received packet** **OK**

5.17 AT+PORT: Application Port

AT+PORT: Application Port	
Test Command: **AT+PORT=21**	Response: **OK**
Test Command: **AT+PORT?**	Response: **AT+PORT: Get or set the application port** **OK**
Test Command: **AT+PORT=?**	Response: **21** **OK**

5.18 AT+ CHS: Single Channel Mode

AT+ CHS: Single Channel Mode	
Test Command: **AT+ CHS =?**	Response: **0** **OK**
Test Command: **AT+ CHS?**	Response: **AT+CHS: Get or Set Frequency (Unit: Hz) for Single Channel Mode**

	OK
Test Command: **AT+ CHS =868100000**	Response: **OK**

5.19 AT+ CHE: Eight Channel Mode

AT+ CHE: Eight Channel Mode	
Test Command: **AT+ CHE =?**	Response: **1** **902.3 902.5 902.7 902.9 903.1 903.3 903.5 903.7** **OK**
Test Command: **AT+ CHE?**	Response: **AT+CHE: Get or Set eight channels mode,Only for US915,AU915,CN470** **OK**
Test Command: **AT+ CHE =1**	Response: **OK**

CHE	CN470 Uplink Channels(125KHz,4/5,Unit:MHz,CHS=0)								
0	ENABLE Channel 80-95								
1	486.3	486.5	486.7	486.9	487.1	487.3	487.5	487.7	Channel 80-87
2	487.9	488.1	488.3	488.5	488.7	488.9	489.1	489.3	Channel 88-95

CHE	US915 Uplink Channels(125KHz,4/5,Unit:MHz,CHS=0)								
0	ENABLE Channel 0-63								
1	902.3	902.5	902.7	902.9	903.1	903.3	903.5	903.7	Channel 0-7
2	903.9	904.1	904.3	904.5	904.7	904.9	905.1	905.3	Channel 8-15
3	905.5	905.7	905.9	906.1	906.3	906.5	906.7	906.9	Channel 16-23
4	907.1	907.3	907.5	907.7	907.9	908.1	908.3	908.5	Channel 24-31

5	908.7	908.9	909.1	909.3	909.5	909.7	909.9	910.1	Channel 32-39
6	910.3	910.5	910.7	910.9	911.1	911.3	911.5	911.7	Channel 40-47
7	911.9	912.1	912.3	912.5	912.7	912.9	913.1	913.3	Channel 48-55
8	913.5	913.7	913.9	914.1	914.3	914.5	914.7	914.9	Channel 56-63

CHE	AU915 Uplink Channels(125KHz,4/5,Unit:MHz, CHS=0)								
0	ENABLE Channel 0-63								
1	915.2	915.4	915.6	915.8	916	916.2	916.4	916.6	Channel 0-7
2	916.8	917	917.2	917.4	917.6	917.8	918	918.2	Channel 8-15
3	918.4	918.6	918.8	919	919.2	919.4	919.6	919.8	Channel 16-23
4	920	920.2	920.4	920.6	920.8	921	921.2	921.4	Channel 24-31
5	921.6	921.8	922	922.2	922.4	922.6	922.8	923	Channel 32-39
6	923.2	923.4	923.6	923.8	924	924.2	924.4	924.6	Channel 40-47
7	924.8	925	925.2	925.4	925.6	925.8	926	926.2	Channel 48-55
8	926.4	926.6	926.8	927	927.2	927.4	927.6	927.8	Channel 56-63

5.20 AT+RX1WTO: Get or Set RXwindows1 timeout

AT+RX1WTO: Get or Set RXwindows1 timeout	
Test Command: **AT+ RX1WTO =?**	Response: **14** **OK**
Test Command: **AT+ RX1WTO?**	Response: **Get or Set the number of symbols to detect and timeout from RXwindow1(0 to 255).** **OK**
Test Command: **AT+ RX1WTO =60**	Response: **OK**

5.21 AT+RX2WTO: Get or Set Rxwindows2 timeout

AT+RX2WTO: Get or Set Rxwindows2 timeout	
Test Command: **AT+ RX2WTO =?**	Response: **7** **OK**
Test Command: **AT+ RX2WTO?**	Response: **Get or Set the number of symbols to detect and timeout from RXwindow2(0 to 255).** **OK**
Test Command: **AT+ RX2WTO =20**	Response: **OK**