LA66 USB LoRaWAN Adapter User Manual

last modified by Xiaoling on 2022/12/29 09:45

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1. LA66 USB LoRaWAN Adapter

1.1 Overview



LA66 USB LoRaWAN Adapter is designed to fast turn USB devices to support LoRaWAN wireless features. It combines a CP2101 USB TTL Chip and LA66 LoRaWAN module which can easy to add LoRaWAN wireless feature to PC / Mobile phone or an embedded device that has USB Interface.

LA66 is a ready-to-use module that includes the **LoRaWAN v1.0.3 protocol**. The LoRaWAN stack used in LA66 is used in more than 1 million LoRaWAN End Devices deployed world widely. This mature LoRaWAN stack greatly reduces the risk to make stable LoRaWAN Sensors to support different LoRaWAN servers and different countries' standards. External MCU can use AT command to call LA66 and start to transmit data via the LoRaWAN protocol.

Each LA66 module includes a **world-unique OTAA key** for LoRaWAN registration.

Besides the support of the LoRaWAN protocol, LA66 also supports **open-source peer-to-peer LoRa Protocol** for the none-LoRaWAN application.

LA66 is equipped with TCXO crystal which ensures the module can achieve stable performance in extreme temperatures.

1.2 Features

- LoRaWAN USB adapter base on LA66 LoRaWAN module
- Ultra-long RF range
- Support LoRaWAN v1.0.4 protocol
- Support peer-to-peer protocol
- TCXO crystal to ensure RF performance on low temperature
- Spring RF antenna
- Available in different frequency LoRaWAN frequency bands.
- World-wide unique OTAA keys.
- AT Command via UART-TTL interface
- Firmware upgradable via UART interface
- Open Source Mobile App for LoRaWAN signal detect and GPS tracking.

1.3 Specification

- CPU: 32-bit 48 MHz
- Flash: 256KB
- RAM: 64KB
- Input Power Range: 5v
- Frequency Range: 150 MHz ~ 960 MHz
- Maximum Power +22 dBm constant RF output
- High sensitivity: -148 dBm
- Temperature:
 - Storage: -55 ~ +125℃
 - Operating: -40 ~ +85°C
- Humidity:
 - Storage: 5 ~ 95% (Non-Condensing)
 - Operating: 10 ~ 95% (Non-Condensing)
- LoRa Tx Current: <90 mA at +17 dBm, 108 mA at +22 dBm
- LoRa Rx current: <9 mA

1.4 Pin Mapping & LED



1.5 Example: Send & Get Messages via LoRaWAN in PC

Assume user already input the LA66 USB LoRaWAN Adapter OTAA Keys in TTN and there is already TTN network coverage.

1. Connect the LA66 USB LoRaWAN adapter to PC



Open the serial port tool



Serial Port Utility	-		×
File Edit View Tools Help			
📸 🔛 📟 🕂 — 🕨 📰 📨 🦻 📰 🌣 🛛			
Serial Port Setting Port USB Se(COM11) ▼ Baudrate 9600 ▼ Data Bits 8 ▼ Parity None ▼ Stop Bits 1 ▼ Flow Type None ▼			
Receive Setting Text Hex Auto Feed Line Display Send Display Time Send Setting			
● Text ○ Hex □ Loop 1000 ➡ ms		Send	1
COM11 OPENED, 9600, 8, NONE, 1, OFF Rx: 0 Bytes Tx: 0 Bytes			▼

2. Press the reset switch RST on the LA66 USB LoRaWAN Adapter to reset it.

The following picture appears to prove that the LA66 USB LoRaWAN Adapter successfully Join the LoRaWAN network

Serial Port Utility		_		×
File Edit View Tools Help				
📷 🔛 🔚 🚥 🕂 —				
Serial Port Setting				^
Port USB Se(COM11) 💌	Dragino LA66 Device Image Version: u1.0			
Baudrate 9600 💌	LoRaWan Stack: DR-LWS-006			
Data Bits 8 🔻	Frequency Band: US915			
Parity None 🔻	DevEui= 00 00 00 00 00 77 88			
Stop Bits 1	Enter Password to Active AT Commands			
Flow Type None				
	JoinRequest NbTrials= 72			
Receive Setting	***** UpLinkCounter= 0 *****			
● Text ○ Hex	TX on freq 904.100 MHz at DR 0			
Auto Feed Line	txDone			
✓ Display Send	RX on freq 923.900 MHz at DR 10			
🔄 Display Time	rxDone			
Send Setting	KSS1= -/4 JOINED			
• Text Hex				~
Loop 1000 🔹 ms				
			Sen	d
	AL 'UTV			-
COM11 OPENED, 9600, 8, NONE, 1,	OFF Rx: 362 Bytes Tx: 0 Bytes			

3. See Uplink Command

Command format: AT+SENDB=<confirn_status>,<Fport>,<data_len>,<data> example: AT+SENDB=01,02,8,05820802581ea0a5

Serial Port Utility		_		×
File Edit View Tools Help				
🐻 📔 🔚 🚾 🕂 — 📗	N 🔢 🔤 🍾 📰 🌣			
Serial Port Setting				^
Port USB Se(COM11) 🔻	Dragino LA66 Device			
Baudrate 9600 🔻	Image Version: v1.0 LoRaWan Stack: DR-LVS-806			
Data Bits 8 🔻	Frequency Band: US915			
Paritu None 🔻	DevEni= AA AA AA AA AA AA AA 77 88			
Stop Bits 1	Enter Password to Active AT Commands			
Flow lype None 🔻	Use AT+DEBUG to see more debug info			
Receive Setting	JoinRequest NbTrials= 72 ***** UnlinkCounter= 0 *****			
◉ Text ◯ Hex				
Auto Feed Line	TX on freq 904.100 MHz at DR 0 txDone			
🗹 Display Send				
🗌 Display Time	RX on freq 923.900 MHz at DR 10 rxDone			
Send Setting	Rssi= -74			
◉ Text ◯ Hex	JOINED			*
Loop 1000 🜩 ms	AT+SENDB=01,02,8,05820802581ea0a5			
			Sen	d
	NT - 3EWD-01, 02, 0, 000200158080			•
COM11 OPENED, 9600, 8, NONE, 1,	OFF Rx: 643 Bytes Tx: 70 Bytes			

4. Check to see if TTN received the message



1.6 Example: How to join helium

1. Create a new device.

	My Devices	J New Device	CN470	US915	∎ 868 🕒 ter	t				
Flows	7 Devices	((+))	Nevices 2	Devices 1	Devices 2 Devi	ces				
	All Devices						Edit	Columns	Quick Action	
Devices < Functions	Device Name \$	Device EUI 🔅	Labels	Frame Up 😄	Frame Down 👙	Packets Transferred \doteqdot	DC Used \Diamond	Date Acti	vated \$	Last Connected \Rightarrow
Integrations	LHT65-EU868	888888888888888888888888888888888888888	868 ×	2	4	680	680	Aug 31, 2	021 8:55 AM	Sep 1, 2022 3:32 PM
CONFIGS Alerts	LHT65-US915-2 •	A84841899181A757	US915 ×	7	0	33917	33917	Jun 28, 20	021 9:23 AM	Sep 7, 2022 4:49 PM
Profiles Packets	LSN50-US915	25CE83E063C5A62E	None	0	0	3005	3005	Feb 21, 2	022 2:03 PM	Aug 11, 2022 3:46 PM
ADMIN	LT22222-CN470	675815D8AFE835A0	CN470×	709	10	400	400	Aug 31, 2	022 9:07 AM	Sep 1, 2022 3:58 PM
Coverage Organizations	TEST-65-001	88886666666669977	test ×	0	0	172	172	Aug 27, 2	021 2:54 PM	Jun 14, 2022 5:40 PM
Data Credits Users	TEST-65-002	000000000000000000000000000000000000000	$test \times$	1	0	2836	2836	Aug 27, 2	021 4:23 PM	May 5, 2022 10:16 AM
	US915-LHT65-002	582407FFFFFFFFEE	US915 ×	0	0	1851	1851	Aug 30, 2	021 8:00 PM	May 18, 2022 11:50 AM
	4								10 results	v < 1 > +

2. Save the device after filling in the necessary information.

NTER DEVICE DETAILS	optional	T
News Device News	Im	port Devices
Name Device Name	You can import your devices direct	y from the Things Network, or in bulk via.csv uplo
Dev FUI E2DF9B9D1E6039AB	8/88 search of Comma	nd AT+ CFG*/?
App EUI 9974737EC661D549	878Bres search of commá	nd TATH@FGetwork
App Key @ F2FDEDDFB6D812145D519A48DDB8A654	16 / 16 Byres	
	Drag.csv fi	le here or click to choose file
Select a profile v	search of comman	nd AT+CFG
onest o promo		
Attach a Label (Optional)		
Search or Add Label		

3. Use AT commands.



4. Use the serial port tool

🔜 友善串口调试助手 - 试用版	-	- 0	×
文件(F) 编辑(E) 视图(V) 工具(T) 控制(C) 帮助(H)			
Ē ∞ ▶ II ■ O + - Ē ‡			
串口设置	[15:09:47.715] AT+CFG		-
端 凵 COM3(S111CON Labs CP210X USB to ♥) 波特率 9600 ▼			
数据位 8			
校验位 None			
流 控 None			
_ 接收设置	[15:09:47.736] Stop Tx events,Please wait for the erase to compl.	ete	
▲ ASCII C Hex	[15:09:47.817] AT+APPEUI=70 B3 D5 7E D0 05 99 99 [15:09:47.856] AT+APPEVI=73 95 A0 AC 97 4E 73 C7 C5 A9 C3 76 18	72 99 9	9
□ 自动换行	[15:09:47.917] AT+DADDR=0184D650	12 55 5	<u> </u>
☞ 显示发送	[15:09:47.937] AT+APPSKEY=AB 6F 71 7D BA E4 C7 49 47 97 2E E6 AC	E9 24	B2
☞ 显示时间	[15.09:48.066] AT+ADR=1 [15:09:48.066] AT+ADR=1 [15:09:48.07] AT-TYP-0		50
	[15:09:48.086] AT+DR=0		
• ASCII C Hex	[15:09:48.097] AT+DCS=0 [15:09:48.106] AT+PNM=1		
□ 自动重发 1000 ÷ ms	[15:09:48.116] AT+RX2FQ=923300000		
	[15:09:48.146] AT+RX1DL=1000		
	[15:09:48.166] AT+RX2DL=2000		
	[15:09:48.196] AT+JN2DL=6000		-
		• •	发送
	AT+CFG		•
COM3 OPENED, 9600, 8, NONE, 1, OFF Rx: 2,289 Bytes	Tx: 18 Bytes	Alith	on //

5. Use command AT+CFG to get device configuration

```
[16:34:48.480] RX on freq 923.300 MHz at DR 8
  [16:34:48.517] rxTimeout
  [17:02:39.776] AT+CFG
  [17:02:39.819] Stop Tx events, Please wait for the erase to complete
  AT+DEUI=A8 40 41 00 01 81 A7 57
  [17:02:39.888] AT+APPEUI=25 B9 75 24 5F 87 1C 56
  [17:02:39.927] AT+APPKEY=15 E8 77 3C 5C 46 28 A9 A3 F1 23 57 9A 11 61 48
  [17:02:39.987] AT+DADDR=0184E9BF
  [17:02:40.027] AT+APPSKEY=82 54 64 A4 6D 5E 99 FA 3D 6C 8B E8 42 67 87 C4
  [17:02:40.087] AT+NWKSKEY=F6 B7 38 CD 6C A8 EE BE 55 9F D6 8A 6E EA B4 15
  [17:02:40.128] AT+ADR=1
  [17:02:40.158] AT+TXP=0
  [17:02:40.158] AT+DR=0
  [17:02:40.158] AT+DCS=0
  [17:02:40.187] AT+PNM=1
  [17:02:40.187] AT+RX2FQ=923300000
  [17:02:40.227] AT+RX2DR=8
  [17:02:40.227] AT+RX1DL=1000
  [17:02:40.227] AT+RX2DL=2000
                                                                                        -
                                                                             •
  AT+CFG
                                                                                   发送
                                                                              -
  AT+CFG
                                                                                        Ŧ
                     Tx: 1,264 Bytes
9,592 Bytes
                                                                               Alithon
```

6. Network successfully.

	[[16:28:22.114]	
	[16:28:22.121]	Dragino LA66 Device
	[16:28:22.121]	Image Version: v1.0
	[16:28:22.151]	LoRaWan Stack: DR-LWS-007
	[16:28:22.181]	Frequency Band: US915
	[16:28:22.181]	DevEui= A8 40 41 00 01 81 A7 57
	[16:28:22.293]	JoinRequest NbTrials= 72
	[16:28:22.301]	
	[16:28:22.301]	***** UpLinkCounter= 0 *****
	[16:28:22.332]	TX on freq 904.300 MHz at DR 0
	[16:28:22.656]	txDone
	[16:28:27.670]	RX on freq 924.500 MHz at DR 10
	[16:28:27.758]	rxDone
	[16:28:27.761]	Rssi= -77
	JOINED	
1		

7. Send uplink using command

16:34:11.017] AT+SENDB=1,1,4,12345678

16:34:11.079]	***** UpLinkCounter= 0	****
16:34:11.088]	TX on freq 904.500 MHz	at DR 0
16:34:11.117]		
16:34:11.118]	OK	
16:34:11.395]	txDone	
16:34:12.407]	RX on freq 925.100 MHz	at DR 10
16:34:12.410]		
16:34:12.422]	rxTimeout	
16:34:13.418]	RX on freq 923.300 MHz	at DR 8
16:34:13.454]	rxTimeout	
16:34:17.085]	***** UpLinkCounter= 0	****
16:34:17.088]	TX on freq 904.900 MHz	at DR 0
16:34:17.400]	txDone	
16:34:18.415]	RX on freq 926.300 MHz	at DR 10
16:34:18.428]	rxTimeout	
16:34:19.423]	RX on freq 923.300 MHz	at DR 8
16:34:19.459]	rxTimeout	
16:34:21.093]	***** UpLinkCounter= 0	****

Ev	ent Log Expand All Filter	Events w/ Commands Show Droppe	ed Uplinks: Late Inactive Device		Exp
	Event	Туре	No. of Hotspots	Time	
+	47	Uplink *	1	Sep 7, 2022 4:49:51.361 PM	
+	46 (0)	Uplink a [#]	1	Sep 7, 2022 4:29:52.778 PM	
+	•••	Downlink	1	Sep 7, 2022 4:29:51.758 PM	
+	4 5	Uplink *	1	Sep 7, 2022 4:29:51.358 PM	
+	V 0	Join Accept	1	Sep 7, 2022 4:28:24.445 PM	
+	•••	Join Request	1	Sep 7, 2022 4:28:22.444 PM	

1.7 Example: Send PC's CPU/RAM usage to TTN via python

Use python as an example: <u>https://github.com/dragino/LA66/blob/main/</u> Send_information_to_TTN_WindosPC.py

(Raspberry Pi example: <u>https://github.com/dragino/LA66/blob/main/Send_information_to_TTN_Raspberry</u> %20Pi.py)

Preconditions:

- 1. LA66 USB LoRaWAN Adapter works fine
- 2. LA66 USB LoRaWAN Adapter is registered with TTN

Steps for usage:

- 1. Press the reset switch RESET on the LA66 USB LoRaWAN Adapter
- 2. Add <u>decoder</u> on TTN
- 3. Run the python script in PC and see the TTN

11 1466		4	pplications > LA66 > End devices > LA66_example > Live data	
			LAG6_example	
. Overwew			ID: eui-0000000007788	
🙏 End devices			1 ↓ 1 * Last activity 22 seconds ago ③	
1. Live data			Overview Live data Messaging Location Payload formatters Claiming General settings	
<> Payload formatters ~	Time	Туре	Data preview Verbose stream (🗴 🛓 Export as JSON 🔢 Pause 📱 Clear
犬 Integrations ~	↓ 11:58:00	Schedule data downlink for transmissi.	Rxi Delay: 5	
2 Collaborators	↑ 11:58:00	Forward uplink data message	Payload: { CPU_utilization: 73.09, Memory_size: 8, Memory_utilization: 79, Remaining_memory: 1.64, Used_memory: 6.1 }	2 Data rate: SF9BW125 SNR: 7.2 RSSI: -99
	↑ 11:58:00	Successfully processed data message		
Ov API keys	↓ 11:56:57	Schedule data downlink for transmissi.	Ref. Delay: 5	
General settings	↑ 11:56:57	Forward uplink data message	Payload: { CPU_utilization: 66.3, Memory_size: 8, Memory_utilization: 79.3, Remaining_memory: 1.69, Used_memory: 5.95 } 19 E6 08 02 E3 1E FA A9 💠 🐞 FPor	:: 2 Data rate: SF108M125 SNR: 6.2 RSSI: -93
	↑ 11:56:57	Successfully processed data message	■ 命令揭示符 - python Send_information_to_TTN.py	- 🗆 ×
	↑ 11:53:15	Forward join-accept message	Wicrosoft Windows [版本 10.0.19043.1706] (c) Wicrosoft Corporation。保留所有权利。	^
	GD 11:53:13	Accept join-request	C:\Users\45955>cd F:\PyCharm Community Edition 2021.2.3	
	# 11:45:58	Console: Events cleared	The events list has been cleared C:\Ugers\45955>f:	
			F:UPyCharm Community Addition 2012.3 Sypthem Send_information_to_TTN py b'Af=SENDE0010.28, }eeBoodSisterafor b'Af=SENDE=01,02,8,1e8d0800021edc9a\m'	

1.8 Example: Send & Get Messages via LoRaWAN in RPi

Assume user already input the LA66 USB LoRaWAN Adapter OTAA Keys in TTN and there is already TTN network coverage.

1. Connect the LA66 USB LoRaWAN Adapter to the Raspberry Pi



2. Install Minicom in RPi.

Enter the following command in the RPi terminal

apt update

apt install minicom

Use minicom to connect to the RPI's terminal

🔚 10.130.2.	253 - SecureCRT	_		×
File Edit	View Options Transfer Script Tools Window Help			
- 4 🗲 🛱	εν² Enter host <alt+r> 🛛 🛱 💾 🖨 🛱 🛱 😭 ? 🕅</alt+r>			•
్ణ 🗸 10.130	J.2.253 🔀			< ⊳
g welcome	e to minicom 2.7.1			^
Menege OPTIONS Port /d	5: dev/ttyUSB0, 06:16:40			
Press (CTRL-A Z for help on special keys			
CTRL-A	z for help 9600 8N1 NOR Minicom 2.7.1 VT102 Offli	ne t	tyUSB	• •
Ready	ssh2: AES-256-CTR 9, 1 36 Rows, 80 Cols Xterm		CAP	IUM .

3. Press the reset switch RST on the LA66 USB LoRaWAN Adapter.

The following picture appears to prove that the LA66 USB LoRaWAN Adapter successfully entered the network.

F	10.130.2.253 - SecureCRT	_		×
F	ile Edit View Options Transfer Script Tools Window Help			
-{	🗄 🗲 🛱 🕫 Enter host <alt+r> 🛛 🗗 💾 🖨 🖨 🛱 😭 🖀 🚼 🔗 🜃</alt+r>			-
ŝ	✓ 10.130.2.253 X			۹ ۵
SSIOI	welcome to minicom 2.7.1			^
1 Manage	OPTIONS: Port /dev/ttyUSB0, 06:16:40			
ř	Press CTRL-A Z for help on special keys			
	Dragino LA66 Device Image Version: v1.0 LoRawan Stack: DR-LWS-006 Frequency Band: US915 DevEui= 00 00 00 00 00 77 88 Enter Password to Active AT Commands			
	Use AT+DEBUG to see more debug info JoinRequest NbTrials= 72			
	***** UpLinkCounter= 0 ***** TX on freq 905.100 MHz at DR 0			
	RX on freq 926.900 MHz at DR 10 rxDone JOINED-73			
	CTRL-A Z for help 9600 8N1 NOR Minicom 2.7.1 VT102 Off	line t	tyUSB	
Rea	ady ssh2: AES-256-CTR 27, 1 36 Rows, 80 Cols Xterm		CAP N	IUM

4. Send Uplink message

Format: AT+SENDB=<confirn_status>,<Fport>,<data_len>,<data> example: AT+SENDB=01,02,8,05820802581ea0a5

न 10	0.130.2.253 - SecureCRT – 🗆 🗙	
File	Edit View Options Transfer Script Tools Window Help	
-{	🗲 🚍 🕫 Enter host <alt+r> 🛛 🖸 💾 🖨 🗱 📾 🕄 🤗 🖾</alt+r>	•
v 🗸	10.130.2.253 🛛	>
й P	ort /dev/ttyUSB0, 07:56:02	5
on Mana	ress CTRL-A Z for help on special keys	
	ragino LA66 Device mage Version: v1.0 oRawan Stack: DR-LWS-006 requency Band: US915 evEui= 00 00 00 00 00 07 88 nter Password to Active AT Commands	
0:	se AT+DEBUG to see more debug info oinRequest NbTrials= 72	
** T) T) R) r) J(** T)	**** UpLinkCounter= 0 ***** X on freq 904.700 MHz at DR 0 xDone X on freq 925.700 MHz at DR 10 xDone OINED-72 **** UpLinkCounter= 0 *****ea0a5 X on freq 904.900 MHz at DR 0	
OI t: R	K xDone X on freq 926.300 MHz at DR 10	
R	eceived: ADR Message	
r: A A	xDone T+SENDB=01,02,8,05820802581ea0a5AT+SENDB=01,02,8,05820802581ea0a5 T PARAM ERROR T+SENDB=01,02,8,05820802581ea0a5	
Ready	v ssh2: AFS-256-CTR 35 34 36 Rows 80 Cols Xterm CAP NUM	2

Check to see if TTN received the message

User Manual for LoRaWAN End Nodes - LA66 USB LoRaWAN Adapter User Manual

ul	LA66				Applications > LA66 > End devices > LA66_example > Live data						
	Overview				🧊 🚺	466_exampl	e 7788				
x	End devices				↑1 ↓1	 Last activity 22 s 	econd	s ago 🕲			
ıl.	Live data				Ourview	Live data M	essagir	ng Location Payload formatters Claiming General settings			
$\langle \rangle$	Payload formatters	~	Time	Туре	Dataurev	iew			Verbose str	ream 💽 🛓 Export as JSON 🛛 II Pause	ie 📱 Clear
¢.	Integrations	•	↓ 16:04:44	Schedule data downlink for transmiss	i. Rx1 Del	: 5					
	Collaborators		↑ 16:04:43	Forward uplink data message	Payload:	{ PU_utilizet	ion: 1	14.1, Memory_size: 8, Memory_utilization: 78.4, Remaining_memory: 1.65, Used_memory: 6 } 05 82 08 02 58 1E AO AS	0 🖥 F	Port: 2 Data rate: SF78W125 SNR: -6.8	RSSI: -87
-			↑ 16:04:43	Successfully processed data message			C F	ille Edit View Options Transfer Script Tools Window Help			
04	API keys		↓ 15:58:46	Schedule data downlink for transmiss	i. Rx1 Dela	y: 6		E 🗲 🚍 c² Enter host «Alt+R» D 📋 🛱 🚭 🗱 🖨 🔽 ? 🖾			
\$	General settings		↑ 15:58:46	Forward uplink data message	Payload:	{ CPU_utiliz t	10 10	◆ 10.130.2253 LoRawan Stack: DR-LWS-006	0 🚡 R	Port: 2 Data rate: SF106W125 SNR: 10.2	2 RSSI: -84
			↑ 15:58:46	Successfully processed data message			100	Frequency Band: US915 DevEui= 00 000 00 00 00 77 88 Enter Password to Active AT Commands			
			↑ 15:58:25	Forward join-accept message			ager.				
			GD 15:58:23	Accept join-request			Γ	JoinRequest NbTrials= 72			
			# 15:56:25	Console: Events cleared	The even	ts list has bee	n	TX OD Freq 904.700 MHz at DR 0			
								RX on freq 925.700 MHz at DR 10 rxDone JOINED-2			
								TX on freq 904.900 MHz at DR 0			
								OK Expone BX on Frag 020 200 MHz at DR 10			
								Received: ADR Message			
								rxDone AT+SENDB=01,02,8,09820802581ea0a5AT+SENDB=01,02,8,05820802581ea0a5			
								AT_PARAW_ERROR ***** UpLinkCounter= 1 *****eaOa5 TX on freq 904.100 MHz at DR 3			
< Hid	e sidebar							OK TXDONE RX ON freq 923.900 MHz at DR 13			
	h - Thronso Physics In The Thronso Ma			an ha de adat an				RSS1= -68	A ru		

1.9 Example: Use of LA66 USB LoRaWAN Adapter and mobile APP

1.9.1 Hardware and Software Connection

Overview:

DRAGINO-LA66-APP is an Open Source mobile APP for LA66 USB LoRaWAN Adapter. DRAGINO-LA66-APP has below features:

- Send real-time location information of mobile phone to LoRaWAN network.
- Check LoRaWAN network signal strengh.
- Manually send messages to LoRaWAN network.

Hardware Connection:

A USB to Type-C adapter is needed to connect to a Mobile phone.

Note: The package of LA66 USB adapter already includes this USB Type-C adapter.



Download and Install App:

Download Link for Android apk . (Android Version Only)



Use of APP:

Function and page introduction



Block Explain:

- 1. Display LA66 USB LoRaWAN Module connection status
- 2. Check and reconnect
- 3. Turn send timestamps on or off
- 4. Display LoRaWan connection status
- 5. Check LoRaWan connection status
- 6. The RSSI value of the node when the ACK is received
- 7. Node's Signal Strength Icon
- 8. Configure Location Uplink Interval
- 9. AT command input box
- 10. Send Button: Send input box info to LA66 USB Adapter
- 11. Output Log from LA66 USB adapter
- 12. clear log button
- 13. exit button

LA66 USB LoRaWAN Module not connected



Connect LA66 USB LoRaWAN Module



1.9.2 Send data to TTNv3 and plot location info in Node-Red

1. Register LA66 USB LoRaWAN Module to TTNV3

Applications > LA66 > End	devices > eui-a840415e7184e9c0		
eui-a840415 ID: eui-a840415e71 A 4 3 • Last activity 2 Overview Live data	ie7184e9c0 84e9c0 hours ago ⑦ Messaging Location Payload formatters Claiming	General settings	
General information		Live data	See all activity \rightarrow
End device ID	eui-a840415e7184e9c0	↑ 11:26:27 F	orward join-accept message
Francisco alas	Heitad States 002-028 MHz ESR 2 /used by	⊕ 11:26:26 A	ccept join-request
Frequency plan	United States 902-920 Milz, TSD 2 (Used by	↓ 11:24:44 S	chedule data downlink for transmission on Gateway Server
LoRaWAN version	LoRaWAN Specification 1.0.3	↑ 11:24:43 F	orward location solved message
Regional Parameters version	RP001 Regional Parameters 1.0.3 revision A	✓ 11:24:43 U	pdate end device
Created at	Jul 15, 2022 09:40:08	↑ 11:24:43 F	orward uplink data message
		Location	Change location settings
Activation information			
AppEUI	A8 40 41 00 00 00 01 01 <>	3	街道 公明街道 特别街道 20
DevEUI	A8 40 41 5E 71 84 E9 C0 <> 🚡	松岗街道	光明街道 20 44 44
АррКеу	••••••	新桥街道-9-14	光明区 33 39
		2240	744 20 22 Harding 20
Session information		2244	龙华区。
Session start	Jul 23, 2022 11:23:13	福永街道	4 石岩街道 2890 大浪街道 2883 42881 2893 3 2897 7 2876 1
Device address	26 0B A6 4F <>		2898-2898 基本 基华街道 高华街道
NwkSKey	••••••	深圳宝安 航城街道	A WAY A HADRON
SNwkSIntKey	••••••	国标机场	12.7013日 Retting 148 Lealiet © OpenStractMan contributor
NwkSEncKey	••••••		12-24-34 A2-3
AppSKey	····· b		

2. Open Node-RED, And import the JSON file to generate the flow

Sample JSON file please go to this link to download.

For the usage of Node-RED, please refer to: http://wiki.dragino.com/xwiki/bin/view/Main/Node-RED/

After see LoRaWAN Online, walk around and the APP will keep sending location info to LoRaWAN server and then to the Node Red.

 $LA66 - node - red - decoder: \underline{dragino-end-node-decoder/Node-RED \ at \ main \ \cdot \ dragino/dragino-end-node-decoder \ \cdot \ \underline{GitHub}$

Example output in NodeRed is as below:



1.10 Upgrade Firmware of LA66 USB LoRaWAN Adapter

The LA66 USB LoRaWAN Adapter is the same as the LA66 LoRaWAN Shield update method.

Just use the yellow jumper cap to short the BOOT corner and the RX corner, and then press the RESET button (without the jumper cap, you can directly short the BOOT corner and the RX corner with a wire to achieve the same effect).

Notice: If upgrade via USB hub is not sucessful. try to connect to PC directly.



2. FAQ

2.1 How to Compile Source Code for LA66?

Compile and Upload Code to ASR6601 Platform : Instruction

2.2 Where to find Peer-to-Peer firmware of LA66?

Instruction for LA66 Peer to Peer firmware : Instruction

3. Order Info

Part Number: LA66-USB-LoRaWAN-Adapter-XXX

XXX: The default frequency band

- AS923: LoRaWAN AS923 band
- AU915: LoRaWAN AU915 band
- EU433: LoRaWAN EU433 band
- EU868: LoRaWAN EU868 band
- KR920: LoRaWAN KR920 band
- US915: LoRaWAN US915 band
- IN865: LoRaWAN IN865 band
- CN470: LoRaWAN CN470 band
- PP: Peer to Peer LoRa Protocol

4. Reference

- Hardware Design File for LA66 USB LoRaWAN Adapter : Download
- Mobile Phone App Source Code: <u>Download</u>.

5. FCC Statement

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- -Reorient or relocate the receiving antenna.
- -Increase the separation between the equipment and receiver.
- -Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- -Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.