

## **Advantech AE Technical Share Document**

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Category	■FAQ □SOP	Related OS	N/A									
Abstract	How To Connect WISE LoRa Node With WISE-6610v2											
Keyword	Connection, OTAA											
Related Product	WISE-6610v2, WISE-46	510, WISE-2410,	WISE-2200-M									

#### **Brief Description**

This document will instruct how to connect WISE LoRa node, including WISE-4610, WISE-2410, and WISE-2200-M, with WISE-6610v2, a LoRa Gateway and Network Server, by using OTAA mode.



# ADVANTECH

#### Brief Solution

In this document, we use WISE-2410 (LoRa node) as example and connect WISE-2410 to WISE-6610v2. Please follow below **8 steps** to build this LoRa scenario.

**Step1:** Please use ethernet cable (RJ-45) to connect your PC directly with WISE-6610v2 (ETH2). By default, WISE-6610v2 is DHCP server, so please set your PC as DHCP client and get IP from WISE-6610v2. (Power Input: 9V~36V)



Then, please use browser and go into WISE-6610v2 configuration website, whose IP is **"192.168.1.1"** or URL is **"https://advantech.lan"**, just like below figure.

The default username and password are "admin" and "admin" respectively.

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	Ô		🗅 WISE-66	10-NB													
	С	۲	192.168.1	.1						ଜ୍ମ	3	CD	€≣	Ð	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ø	
			Not secu	re   <del>k</del>	<del>ittps</del> ://adv	antech.	.lan/cgi-b	in/luci/	Ì.								
					Userna	me											
					Passwo	ord											
								Login									

<u>Step2:</u> On WISE-6610v2 webpage, go to LoRaWAN > Advantech LoRaWAN Service page, and click Go To Service button. Then the user can set for LoRaWAN-related service.

AD\ANTECH	WISE-6610-NB Industrial LoRaWAN Gateway		
Overview		RaWAN Service	
Interface			
LoRaWAN	Advantech LoRaWAN Service		
Advantech LoRaWAN Service	Open Service Web	Go To Service	
BasicStation	Advantech LoRaWAN Service	Enabled     Disabled	
System Management	Service Remote Management	Disable	~
Application Tools	Modbus Remote Access	Disable	~
Diagnostics Tools	Clean Service Config	Clean	
	clean Service Comig	crean	

**<u>Step3</u>**: The user has to login for Network Server and the default username and password are **"admin"** and **"admin"** respectively.

192.168.1.1:8443	× +	
443		A" 🗘 🔓
	Sign in to access this site Authorization required by https://192.168.1.1:8443 Username	
	Password Sign in Cancel	

After the user logins Advantech LoRaWAN Service, the page will be like below figure.

C     A Not secure   http://www.com/actionality.com/actio	× + lps://192.168.1.1:8443/#dashl										© ∿ @	ର ଜ	0 8		
AD\ANTECH	Advantech Advantech LoRaWAN Service		_				_	<u>^</u>	W		-1 th	<b>~o</b> (4			
I Overview															
LoRaWAN RF															
A Infrastructure												unknown_devadd			
Gateways	15:18	15:19	15:20	15:21	15:22		15:23	15:24		15:25	15:26	15	:27		
B Devices	Mon 2 October														
Backends	Server						Events								
Applcation Server				Nodes Number											
System	Version \$	Authenticate	•	0	÷		Last Occurred	Entity 🕈	Eid	:	Text	+ Args			
	1.00.06		2023-10-02 15:26:59	node	FF4E6E	BEA	unknown_devad	dr							
			2023-10-02												
	Gateways						15:10:34	gateway	0016C0	01F1D43330	connected	{{127.0	.0.1},62		
	•	IP 🛊	Duty Cycle		_		2023-10-02 15:10:31	server			VerifyChip Success				
	MAC	Address	[%]	Last Alive	Status		2023-10-02					// 407.0	0.43.50		
	0016C001F1D4333C	127.0.0.1	0	2023-10-02 15:27:12	×		14:52:02	gateway	0016C0	01F1D43330	connected	{{127.0	.0.1},52		
							2023-10-02 14:02:53	node	112233	44	unknown_devad	dr			
	Devices						2023-10-02 13:52:18	gateway	0016C0	01F1D43330	connected	{{127.0	.0.1},56		
		ile A Better	• D/I Chi	R 💠 Last RX 🜩	Clature		2023-10-02	gateway	0016C0	01E1D43330	connected	{{127.0	0 1\ 16		

<u>Step4</u>: On WISE-660v2 webpage, go to LoRaWAN RF > Radio Setting page, the user can modify configuration of RF module (chip), which is also called LoRaWAN gateway. The below is description for each field on this page.

Overview	Home / LoRaWAN RF	/ Radio Setting	
LoRaWAN RF			
Radio Setting	Radio Setti	ng	
🕍 Spectrum Analyzer	Radio Setting		^
h Infrastructure ₱ Gateways	Gateway Identifier Packet Forward	0016c001f1d4333c	
b Devices Backends	Status	On V	
Applcation Server	(b) Region	Asia	~
System	(C) Channel Selecet	JP923	
	(d) Network Server	127.0.0.1	
	(e) Upstream Port	1680	
	(f) Downstream Port	1680	

- (a) **Radio Enable**: The field is used for set enable or disable for this RF module. In this case, the field is set as **On**.
- (b) **Region**: The field is used to choose which region the RF module uses. In this case, the field is set as **Asia**.
- (c) **Channel Select**: The field is used to set specific channel plan based on certain Region. In this case, the field is set as **JP923**.
- (d) Network Server: The field should be filled in IP or URL of corresponding Network Server, then RF module will send received LoRa package to this Network Server. In this case, the field is set as "127.0.0.1" because the Network Server is WISE-6610v2 itself.
- (e) **Upstream Port**: The field stands for **UDP port** of Network Server to get uplink data from RF module (LoRaWAN gateway) to Network Server. In this case, the field is set as **"1680**".
- (f) **Downstream Port**: The field stands for **UDP port** of RF module to get downlink data from Network Server to RF module (LoRaWAN gateway). In this case, the field is set as **"1680"**.
- (g) Submit: The field is used for saving above settings.

<u>Step5</u>: On WISE-660v2 webpage, go to **Devices** > Create Device page, the user can conveniently add a new LoRa device on WISE-6610v2. The below is description for each field on this page.

Retwork Server	× +				
← C ▲ Not secure   https://192.16	8.1.1:8443/#nodes/create				
AD\ANTECH	Advantech Advantech LoRaWAN Service				
I Overview		es List			
LoRaWAN RF					
A Infrastructure	Create new	node			
🗢 Gateways	General				
& Devices	General				
+ Create Device					
Cevices List	(a)	Name *	LoRa_Device_1		~
Ø Ignored	(b)	Join Mode	ΟΤΑΑ		~
Received Frames	(c)	DevAddr *	e.g. ABC12345		
Q Transmission Frames		B		Copy from WISE-2410 Config Page	_
🛓 FUOTA Task	(d)	DevEUI *	74FE48FFFF5A5B1C	WISE-2410 Config Page	~
Markends	(e)	Devices Profile *	AS923_WISE6610_Handler		*
Application Server	(f)	Channel Sync	OFF		*
System	(g)	Model	WISE-2410		*
	(h)	App Arguments	WISE-2410		
	(3)			Copy from	
	(i)	AppEUI	000000032343130	WISE-2410 Config Page	~
	(k)	AppKey *	000000000000000000000000000000000000000	Copy from WISE-2410 Config Pag	ze✓
	(I)	FCnt Up			
	(m)	FCnt Down *	0		
		(n)	✓ Submit		

- (a) Name: The field is user defined. If the field is left blank, WISE-6610v2 will generate a Name depending on the LoRa node's device address or device EUI. In this case, the field is set as "LoRa\_Device\_1".
- (b) **Join Mode**: The field stands for which mode the LoRa node uses. The options include OTAA and ABP mode. In this case, the field is chosen as **OTAA**.
- (c) **DevAddr**: The field should be filled with device address of LoRa node. And the field can be blank when LoRa node is OTAA mode. In this case, the field is blank due to OTAA mode of this WISE-2410.
- (d) DevEUI: The field should be filled with device EUI (Extended Unique Identity) of LoRa node. However, the field is available only when LoRa node is OTAA mode. In this case, the field is set as "74FE48FFFF5A5B1C" due to setting of this WISE-2410.
  Note: Please keep in mind that the DevEUI is unique from node to node, that means

**Note:** Please keep in mind that the **DevEUI is unique** from node to node, that mean different DevEUI will be used according to LoRa node device you use.

- (e) **Devices Profile**: The field is used for making WISE-6610v2 know how to basically process header and payload of each uplink package from LoRa node. In this case, the field is chosen as **AS923\_WISE6610\_Handler**.
- (f) **Channel Sync**: The field is used for frequency synchronization when the frequency setting on LoRa node is incomplete or incorrect. In this case, the field is set as **OFF** because, in

OTAA mode, Network Server and LoRa node will originally negotiate frequency setting when LoRa node is joining into Network Server.

- (g) **Model**: The field is a dropdown menu to let user conveniently choose which LoRa node model of Advantech. In this case, the field is chosen as **WISE-2410**.
- (h) **App Arguments**: The field will be changed based on Model field. In this case, the field is automatically set as **"WISE-2410"** by system because the Model is chosen as WISE-2410.
- (i) AppEUI: The field should be filled with application EUI (Extended Unique Identity) of LoRa node. However, the field is available only when LoRa node is OTAA mode. In this case, the field is set as "000000032343130" due to OTAA mode of this WISE-2410.
   Note: Please keep in mind that the <u>AppEUI is usually unique</u> from node to node, that means different DevEUI will be used according to LoRa node device you use.
- (k) **FCnt Up**: The field stands for first uplink frame count of the LoRa node. In this case, the field is **blank**.
- (1) **FCnt Down**: The field stands for first downlink frame count of the LoRa node. In this case, the field is set as "0" by default.
- (m)**Submit**: The field is used for saving above settings.

**Note**: If the LoRa node is in ABP mode, the user should fill in **DevAddr**, **Network Session Key**, **Application Session Key** instead of **DevEUI**, **AppEUI**, and **AppKey**.

**Step6:** After adding a new LoRa node on WISE-6610v2, the user can check whether, on **Devices** > **Devices List** page, the page will display what LoRa node the user adds.

î     î     Network Server																				o ×
← C	. <b>168.1.1</b> :8443																			··· 🜔
ADIANTECH		Advantech ch LoRaWAN Sen	vice																	
Cverview																				
LoRaWAN RF																				
A Infrastructure	De	vices	List																	
💎 Gateways	DevAddr Profile				🛪 Clear All 🛛 🍸 Filter											⊙ Ir	nport 💿 I	ixport 1	8 Create	
& Devices	0	Name	Mode \$	DevAddr \$	¢	Profile	App Arguments	FCnt Up	¢ FC Do	nt	D/L SNR	+ Las	st 🛊	Packet Loss	÷	Duplicated Packet	¢	Bad Signal	÷	ŧatus 🗘
+ Create Device		LoRa_Device_		Devidui		AS923 WISE6610 Handler	-	op	0	WII	JAR	RA.		LUSS		FRENEL		อเลา	31	latus
Devices List	1-10		Oliva		7472407777040010	A3923_WI3E0010_Halluler	WI3E-2410		0											
Ø Ignored																		Previ	ous 1	Next
Received Frames																				
Q Transmission Frames																				
📥 FUOTA Task																				
Mackends																				
Application Server																				
System																				

<u>Step7</u>: On the LoRa node side, please use WISE Studio to set configuration for LoRa Node. The user must plug USB directly from PC to WISE LoRa node in advance. In this case, we use WISE-2410 as an example. Then, WISE Studio will show like below picture, please go to Go To Configuration > Connect > Configuration > RF Module page for RF setting of LoRa node.

Advantech WISE Studio (Win3	2) Version 1.02.01 (B12)
Welcome, Danny.Lu	сомз(усом)
Intel(R) Core(TM) i7-105 i00 CPU @ 1.80GHz	Reconnect Modbus/RTU Search RS-485
15.76G RAM	Device Info - 🐧 Open In Browser 📕 Query Data
Serial Port	Information     Configuration
Available Serial Ports: 1	Configuration     Information     RF Module     Time & Date Scheduling Control General Firmware
	Lint I/O Status RF Module
Go To Configuration	A Site Survey
Intel(R) Wi-Fi 6 AX201 160MHz	Ø\$ Advanced •   Operation Region
IP Address: 172.16.16.226 MAC Address : 845CF3964466	ISM Band AS923MHz
Connect AP : Advantecher	RF Operation Mode LoRaWAN V Device Class Class A
Go To Configuration	Activation Mode OTAA ~

On this page of WISE LoRa node in OTTA mode, there are many parameters, including (1) Activation Mode, (2) Device EUI, (3) Application EUI, and (4) Application Key. Please check whether the setting is same with setting of <u>Create Device page of WISE-6610v2 Network Server</u>.

Information RF Module Time & D	ate Scheduling Control General Firmware			
RF Module				
Operation Region	JP v			
ISM Band	AS923MHz			
RF Operation Mode	LoRaWAN	Device Class	Class A	~
Activation Mode	OTAA (1) should be same with setting of WISE-6610v2 Network Server			
Adaptive Data Rate				
Device EUI	74FE48FFFF5A5B1C (2) Copy and paste to WISE-6610v2 Network Server			
Application Information				
Application EUI	0000000032343130 (3) Copy and paste to WISE-6610v2 Net	work Server		
Application Key	00000000000000000000000000000000000000	SE-6610v2 Network S	Server	
Application Port	1			
Message ACK				

Finally, please scroll down on this LoRa node webpage, please make sure the frequency setting of LoRa node is same with the setting of WISE-6610v2 RF module.

		WISE	-2410	Confi	gurat	ion Pa	ge					
		WISE	E-2410-J	4								
VISE-6610 Configuratio	n Page					- Network Se	ssion Key	0000000	00000000000	10000000000011		Τ
C     C     A Not secure   https://192.1	× + 168.1.1:8443/#radio	Lint I/O			App	blication In	formation					
AD\ANTECH	Advantech Advantech LoRaWAN Ser	og Ad			Ap	plication Se	ssion Key	0000000	0000000000	00000000000011		
8 Overview		N				Applic	ation Port	1				
LoRaWAN RF						Mes	sage ACK	2				
Radio Setting	Radio Se	8				Freque	ncy (KHz)	923200		Frequency Ran	1ge: 920000 ~ 928000, 0: Disabled.	
🖿 Spectrum Analyzer	Radio Setting							923400				
A Infrastructure	Gateway	,						922200				
Gateways	Packet Forwa											
🗞 Devices	Radi							922400				
Mackends	Radi							922600			Please must click Submit butto	n
E Application Server								922800			to save setting	
System	Chann							923000				
	Netwo	01						922000				
	Upst	tri						-				
	Downst	tr							Make :	sure if frequency s	ettings is matched	
								/				_
		L					_/	·		Version : A1.01B07, Copyrig	ght © 2023 By Advantech	
		Channel F	requency(M	Hz)			/					
	Name	Ch 0	Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	Ch 6	Ch 7	Ch STD	Ch FSK	
	AS923-1	923.2	923.4	922.2	922.4	922.6	922.8	923	922	922.1MHz Bandwidth:250Khz	921.8MHz Bandwidth:125Khz	
	AS923-2	923.2	923.4	923.6	923.8	92	924.2	924.4	924.6	924.5MHz Bandwidth:250Khz	924.8MHz Bandwidth: 125Khz	
	KR920	922.1	922.3	922.5	922.7	922.9	923.1	923.3	NaN	Disable	Disable	
	JP923	923.2	923.4	922.2	922.4	922.6	922.8	923	922	922.1MHz Bandwidth:250Khz	921.8MHz Bandwidth:125Khz	

<u>Step8 (Result)</u>: The user can check whether LoRa node sends uplink data to WISE-6610v2 successfully. Please go to Application Server > Advantech Nodes Status > {0151ABE0} page, and check whether the vibration value is shown like as below picture.

😫 🖗 🗈 🔹 Network Server	× +												- 0 ×		
← C ▲ Not secure   https://192.16	58.1.1:8443/#no	destatus/list								<b>.</b>	3 Ф 🕼	©e %	le 🚺		
AD\ANTECH	Advar Advantech LoR													î	
Overview	Home /		er / Nodes Status												
a LoRaWAN RF															
A Infrastructure	Node	Nodes Status													
🗢 Gateways	DevAddr	DevAddr T rised T Filter													
🗞 Devices	0	DevAddr		Battery	Model	¢	Received		¢	Font	¢	Rssi	¢		
M Backends	Image: Distable of the power         Wise2410         2023-10-02T10:23:29Z											-47			
Application Server	1 - 1 of 1			-/-								Previous	a 1 Next		
M Advantech Nodes Status						-				-		PTGTIOU	THE REAL		-
Modbus Mapping Table		Status	s #015 <sup>-</sup>	1ABE0											
of Application Server Settings															
System	-	General	Acceleromete	r TempHumi	Settings										
		O Accelerometer												^	•
				Log Index	0										
				Log macx	0										
															_
	- 15	Status												~	•
		Sensor	SenEvent	Velocity RMS	Acceleration Peak	Acce	leration RMS	Kurtosis	CrestFactor		Skewness	Deviatio	on Disp	lacement	
		X-Axis	0	0.23 mm/s	0.22 m/s2	0.16	m/s2	0.22	4.97		0.27	0.2	6 µr	ı	
		Y-Axis	0	0.18 mm/s	0.25 m/s2	0.18	m/s2	0	0		0	0	0 µr	ı	
		Z-Axis	0	0.39 mm/s	0.29 m/s2	0.21	m/s2	0	0		0	0	0 µr	ı	
															-