Advantech AE Technical Share Document

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Category	gory FAQ SOP Related OS N/A						
Abstract	Troubleshooting steps for the connection between WISE 2410 and WISE 6610						
ADSITACI	and how to improve signal reception.						
Keyword	LoRaWAN, Gateway, Signal delicate						
Related	WISE ((10 WISE 2410						
Product	WISE-6610, WISE-2410						

Problem Description:

When installing WISE-2410 and WISE-6610, there are obstacles blocking the inevitable environment, because the shielded environment may delicate a signal and cause to drop the packet. Or a user is able to connect a node and a gateway, but have some doubt for the signal strength.



Answer:

Please following the steps.

- 1 · LoRaWAN Radio Frequency(RF) Setting.
- 2 · ADR (Adaptive Data Rate) Setting.
- 3 Site Survey of WISE-2410.
- 4 · Change Frequency Band Setting.
- 5 Adjust the Antenna Angle.
- $6 \cdot$ Replace the Antenna.

1 . LoRaWAN Radio Frequency(RF) Setting Step:

Check LoRaWAN radio frequency setting on both modules. The channels must follow the frequency (KHz) of WISE-6610, and mapping the LoRaWAN radio frequency setting in WISE-2410.

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For example, if the radio 0 of WISE-6610 is set as 923M Hz. The offset of channel 0 is 200k Hz. The main frequency plus offset equals to 923.2M Hz. This value is matching with the channel 0 on WISE-2410. Other 7 channels need to follow the same rule.

	WI	SE-6610 radi	o frequency	setting:		١	NISE-2410 radio frequ	ency setting:
				LoRaWAN Gateway Set	tings			
				LoRaWAN Radio Sett	ing			
Model Name	WISE-6610-N100-A					· · · · · · · · · · · · · · · · · · ·		
Radio Enable	On	·		22000.	00-00000	Application Information		
Flow on MQTT	Off	•		123000+	200=923200	Application Session Key	000000000000000000000000000000000000000	
Radio 0 Main Frequency(KHz)	923000			×		Application Bost		
Radio 1 Main Frequency(KHz)	922000					Application For		
	Enable	Radio Select	Offset(KHz)			Message ACK	2	
Channel 00	On •	Radio 0	• 200	ľ		Frequency (KHz)	923200	Frequency Range: 920000 ~ 925000, 0: Disabled.
Channel 01	On	Radio 0	400				923400	
Channel 02	On	Radio 1	• 200					
Channel 03	On •	Radio 1	400				922200	
Channel 04	On	Radio 0	-400				922400	
Channel 05	On	Radio 0	-200				922600	
Channel 06	On	Radio 0	• 0				322000	
Channel 07	On	Radio 1	• 0				922800	
	Enable	Radio Select	Bandwidth	SF	Offset(KHz)		923000	
Channel STD	On	Radio 1	250Khz	7 *	100			
	Enable	Radio Select	Bandwidth	Datarate (bps)	Offset(KHz)		922000	
Channel FSK	Un	Radio 1	125Khz	50000	-200		0	
Quick Setup Quick	setting LoRaWAN Radio.						0	

2 · ADR (Adaptive Data Rate) Setting Step:

ADR is a mechanism for optimizing data rates, airtime, and energy consumption in the network.

Step 1. WISE-6610 configuration: Device \rightarrow Profiles \rightarrow ADR \rightarrow ADR Mode \rightarrow "Auto-Adjust".

Step 2. WISE-2410 configuration: Configuration \rightarrow RF Module \rightarrow "Adaptive Data Rate ". WISE-6610 ADR setting: WISE-2410 ADR setting:

Server Admin		
Infrastructure Gateways Networks	~	Edit profile #AS923_WISE6610_Handler
♥ ³ Multicast Channels ▲ Events		ADR Mode Auto-Adjust
& Devices	~	Set Power Filter values
Of Profiles		Set Data Rate Filter values
Commissioned		Max Data Rate Filter values
Activated (Nodes)		Set Channels e.g. 0-2
Backends	~	Set RX1 DR Offset

nformation RF Module	Time & Date Schedu	ling Control Firmware
RF Module		
Operation Region	TW	V
RF Operation Mode	LoRaWAN	
Activation Mode	ABP	×
Adaptive Data Rate		

Step 3.

ADR support: ON (Refer to WISE-2410)

Set power: Keep it blank. Which stands for auto-negotiation.

Set data rate: Keep it blank. Which stands for auto-negotiation.

Set channel: Refer to all frequency bands of WISE-6610

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WISE-6610 ADR SETTING:

Edit node #FE449684										
General	ADR	Status	Status							
		ADR Support	ON							
		Set Power	Filter values	•						
		Set Data Rate	Filter values	•						
		Set Channels	0-7	~						
		Used Channels	0-15							

3 • Site Survey of WISE-2410:

Before the fixed installation of WISE-2410, use the Advantech WISE Studio site survey function to confirm whether the signal is good. Please enable "retry".

- Step 1. Go to the site survey function page of WISE-2410
- Step 2. Enable retry function.
- Step 3. Set the total amount of the packets (The default is 100 packages) to send.
- Step 4. Click on start.
- Step 5. Check the LED on WISE-2410.

The LED will blink once when the WISE received an "ack" package from WISE-6610. There will be 2 items showing on the result page, packet error rate and fail status.

WISE-2410-TA			Site Survey	
WISE-2410-1A			Amount of network packets to send	100
 Information 			Retry	2
🖋 Configuration	Information		Sending Packet: #100	✓ Start
Ltd U/O Status			Failed Packets: 0	
IIII I/O Status	Module Information			Packet Error Rate
🚓 Site Survey	Model Name	WISE-2410-TA		0.0 %
🌣 Advanced 👻	Customized Name	WISE-2410		Tel Date
				No Ack: 0
	UUD	WISE-2410_FE449684		✓ Leave Site Sorvey Made

Figure captured from WISE-2410

- ✓ Packet Error Rate: The packet error rate will be affected by the transmission channel noise, interference, distortion, attenuation, wireless multipath fading, etc.
- ✓ Fail Status: The receiving sends packet back a corresponding confirmation message (ACK) to the successfully received packet.

4 • Change Frequency Band Setting Step:

When there are multiple nodes in the same frequency band, the received signal may be dropped. The user could try to adjust other channels.

There is a "quick setup" bottom and select the frequency band according to your country.

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					LoRaWAN Radio Setting
Model Name	WISE-6610-N100-A]		
Radio Enable	On	٠			
Flow on MQTT	Off	٠			
Radio O Main Frequency(KHz)	923000]		US902-0(902.3Mhz-903 V Select
Radio 1 Main Frequency(KHz)	922000		1		US902-0(902.3Mhz-903.7Mhz std:903.0Mhz)
	Enable		Radio Select	Offset(KHz)	US902-1(903.9Mhz-905.3Mhz std:904.6Mhz)
Channel 00	On	,	Radio 0 •	200	US902-2(905.5Mnz-906.9Mnz std:906.2Mnz) US902-3(907.1Mhz-908.5Mhz std:907.8Mhz)
hannel 01	On	٠	Radio 0 •	400	L US902-4(908.7Mhz-910.1Mhz std:909.4Mhz)
Channel 02	On	٠	Radio 1 •	200	US902-5(910.3Mhz-911.7Mhz std:911.0Mhz) UUS902-6(911.9Mhz-913.3Mhz std:912.6Mhz)
Channel 03	On	٠	Radio 1 •	400	US902-7(913.5Mhz-914.9Mhz std:914.2Mhz)
Channel 04	On	٠	Radio 0 •	-400	C AS923-1(922 0Mhz-923 4Mhz std 922 1Mhz) AS923-2(923 2Mhz-924 6Mhz std 924 5Mhz)
Channel 05	On	٠	Radio 0 •	-200	L AU915-0(915.2Mhz-916.6Mhz std:915.9Mhz)
Channel 06	On	٠	Radio 0		AU915-1(916.8Mhz-918.2Mhz std:917.5Mhz) AU915-2(918.4Mhz-919.8Mhz std:919.1Mhz)
Channel 07	On	•	Radio 1	0	AU915-3(920.0Mhz-921.4Mhz std.920.7Mhz)
	Enable		Radio Select	Bandwidth	AU915-4(921.6Mhz-923.0Mhz std:922.3Mhz)
Channel STD	On	٠	Radio 1	250Khz	U AU915-5(923.2Mhz-924.6Mhz std:923.9Mhz)
	Enable		Radio Select	Bandwidth	AU915-0(924.0Minz-926.2Minz std.925.5Minz)
Channel FSK	On		Radio 1 •	125Khz	KR920(922 1Mhz-923 3Mhz std Disabled)

Figure captured from WISE-6610

5 • Antenna Angle:

The WISE-6610 antenna and WISE-2410 should be placed in parallel as much as possible. If the relationship is vertical, please move the antenna to the best angle. The WISE-6610 antenna and WISE-2410 should be placed in parallel as much as possible. For example, if the gateway and the node are on the same plant. Set the antenna angle of WISE-6610 as the illustration on the left. Or if the relationship of modules are vertical, like the illustration on the right side, please adjust the antenna to the best angle. Let the WISE-2410 in the best coverage antenna angle of WISE-6610.



Figure captured from Wikipedia

6 • Replace the Antenna:

A user can use a stronger antenna gain of the antenna to replace the original antenna. There are lots of types of the antenna from different manufacturers. Suggest to select an omnidirectional antenna.