Advantech AE Technical Share Document

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Category	□FAQ ■ SOP	Related OS	N/A
Abstract	WISE-4210 Site Survey Mode Instruction		
Keyword	Site Survey		
Related Product	WISE-4210-AP, WISE-4210-S2XX		

■ **Problem Description:**

This document shows two methods to do a site survey on WISE-4210 SUB-G module.

■ **Answer:**

Site survey mode is one of the unique features for WISE-4210 series. The wireless environment is variable and different in every place. Therefore, site survey is very important and useful to help customer to know the signal strength in their environment. The mechanism of the site survey mode of WISE-4210 is:

1. End node will transmit the **Site Survey Packet** (content: MAC of the module) to AP.
2. After AP received the Site Survey Packet, it will respond **Echo Packet** including RSSI value measured by the AP to End node.

Currently, there are 2 ways for site survey testing.

Method 1, Site Survey by Membrane Button.

Site survey by membrane button allows user to do quick site survey by sending one packet when push membrane button one time. The site survey result will be shown on WISE signal LED directly.

Step1. Press the membrane button for about 3 second. The status green LED will constantly turn on which indicating that it is now in site survey mode.

Figure1. LED status when WISE-4210 in site survey mode

Step2. After pressing the button one time, it will send 1 packet to AP. You could also observe that the Tx LED turn on once.

Figure2. LED status when WISE-4210 transmitting site survey packet

Step3. The RSSI level of AP received data from end nodes will show on "signal strength" indicator.

Figure3. The result of site survey

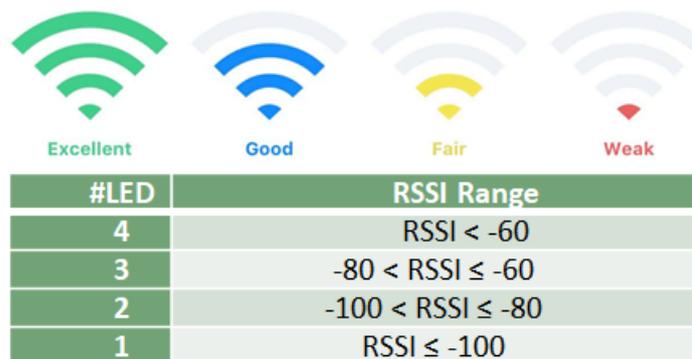| #LED	RSSI Range
4	RSSI < -60
3	-80 < RSSI ≤ -60
2	-100 < RSSI ≤ -80
1	RSSI ≤ -100

Figure4. The meaning of site survey result on LED

Step4. You could follow the flow chart to get back to normal mode. Please refer to below figure, there are multiple modes in WISE-4210 which could be changed by pressing the membrane button on WISE. Normal mode is the mode for the standard function such as data
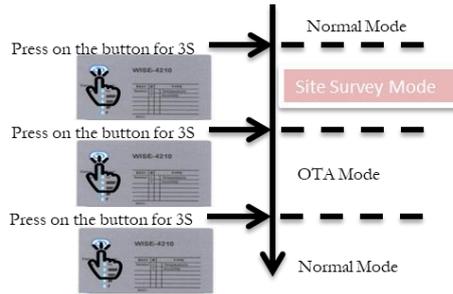
transferring.

Figure5. The flow chart of WISE-4210 membrane button

Method 2, Site Survey by WISE-Studio.

Different from method 1, site survey by WISE-Studio sends multiple packets. The number of packet is adjustable. The site survey result will be shown on utility including error rate and RSSI value of each packet.

Step1. Connect WISE-4210-S2XX to WISE-Studio by micro USB. After entering the main page of WISE, click Site Survey to enter Site Survey Mode.
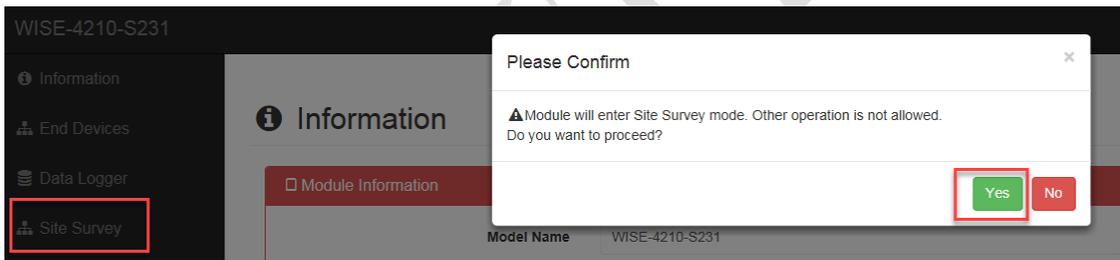

Figure6. The site survey function on the webpage of WISE-4210

Step2. Different from membrane button, the user could choose how many packets to send at one time.
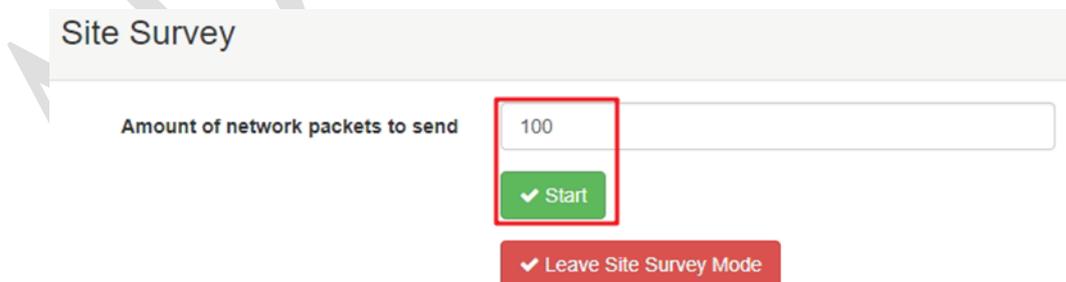

Figure7. The setting of numbers of packets to send

Step3. The result will show the Packet Error Rate, RSSI Level, Backoff Number and Fail Status. You could also check the site survey result by each packet and even save the result into CSV File.

Sending Packet: #100

Success Packets: 99

Failed Packets: 1

Packet Error Rate
1.0 %

RSSI ❶		
Max: -19	Min: -20	Average: -19.1

Backoff Number ❶	
Max: 20	Average: 0.4

Fail Status	
No Ack: 0	Channel Busy: 1

#	Result	RSSI	Backoff Number	Fail Status
1	Success	-19	0	none
2	Success	-19	0	none
3	Success	-19	0	none
4	Success	-19	0	none
5	Success	-19	0	none
6	Success	-19	0	none
7	Success	-19	0	none

⬇ Save

Figure8. The result of site survey on the WISE-Studio

Note: What is back off number?

Before WISE-4210 endnode transmit the data to AP, it will detect if any other device is using the same frequency. If so, it will back off one time and listen again. If back off 20 times, endnode will give up to transmit this packet and mark it as channel busy.
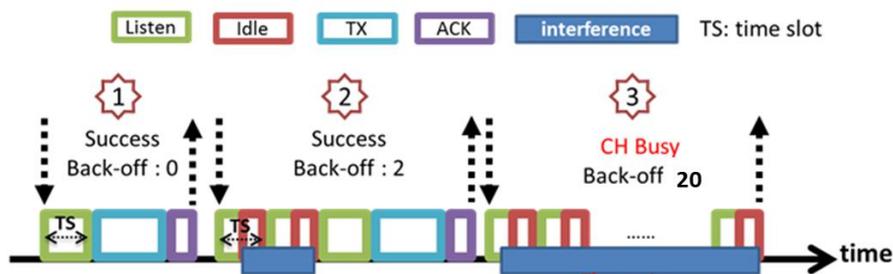

Figure9. Listen before talk mechanism on WISE-4210

Note: How to trouble shooting by site survey?

1. RSSI Level

   If the RSSI Level is very poor, there are multiple points that could be checked:

   ✓ Metal obstacle: Metal obstacle such as equipment will have an influence on the signal.

   ✓ Angle of antenna: The radiation pattern of antenna is usually doughnut-shaped. Please make sure the angel of antenna fits the radiation pattern of antenna for better signal strength.

   ✓ Transmission distance: Shorten the distance between AP and node for appropriate RSSI level.

   ✓ Tx power AP and Node: Enhance the Tx power of AP and node.

2. Failed Status:

   There are two kinds of failed status that indicates different status:

   ✓ Channel Busy: There may be other device using the same frequency with WISE-4210. The user could use a spectrum analyzer to check the RF environment and choose the frequency with less interference for WISE-4210.

Figure 10. Screenshot from spectrum analyzer

   ✓ No Ack: No ack means the node does not receive the reply from AP. The user could check the RF setting of WISE-4210 is correct or not and try to improve the RSSI level.