

AIW EPD Deploy Guide

Category	EPD	Date	20220106
Keyword	WISE-3610Z、WISE-1810、EPD-023、EPD-053		

■ Introduction

Because of the wireless signal is invisible, we have to do site survey before deploy the EPD system. There are many factors that affect wireless signals. The major effect is in the different field the occupy frequency is different. All objects made of metal in the field will affect the direction of radio wave reflection. This document will tell you what do you need to do in the site survey.

■ Hardware Requirement:

1. WISE-3240
2. ARK-2250 or ARK-1123
3. More than 6 EPD-230
4. Spectrum Analysis tool

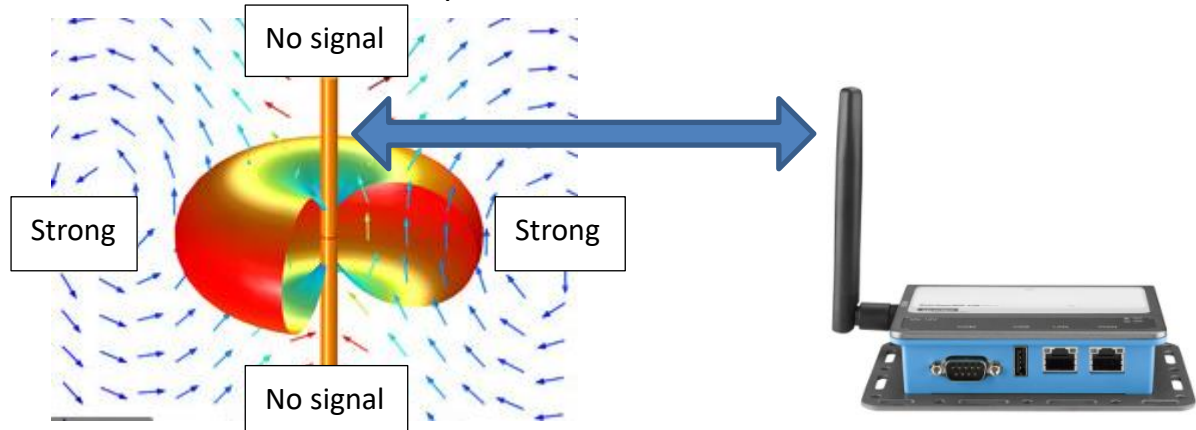
■ Instructurment

WISE-3240 field estimate.

When you want to deploy WISE-3240 in the field, you have to know below information.

Server HW	EPD Manager OS	GW	Tag	Tag Quantity	Tag Quantity
				Under one GW connection / push image at the same time	Under one server
ARK-1123	Ubuntu 16.04	WISE-3240	EPD-230	100	100
		WISE-3240	EPD-332	50	50
		WISE-3220	EPD-662	30	30
		WISE-3270 (inside of EPD)	EPD-327	1	20
ARK-2250	Ubuntu 18.04	WISE-3240	EPD-230	400	10000
		WISE-3240	EPD-332	400/75	10000
		WISE-3220	EPD-662	100/50	500
		WISE-3270(inside of EPD)	EPD-870	1	500

Three dimensional radiation pattern of the antenna



Following I will demo how to estimate the WISE-3240 and EPD-230 deployment position.

Step1. Check 2.4GHz RF environment



Channel Select
User Guide_Englisil



Channel_Select.xls
x

Open “Channel Select User” and follow the step to do configuration. By using RF Explorer tool, you will know which channel is suitable for deployment.

Example:

After you finish the configuration, you will see the analysis result as below. Please select the channel which the “Rank” is green. You can select channel 11,24,25 or 26. Normally a clean channel can deploy two GWs.

Channel	Start Step	End Step	Below -70 dBm	Rank
11	6	9	98.81%	2
13	19	22	88.54%	7
14	25	29	88.54%	7
15	32	35	95.26%	6
20	64	68	85.77%	10
21	71	75	95.65%	5
22	78	81	86.17%	9
23	84	88	82.61%	11
24	91	94	98.42%	3
25	97	101	99.21%	1
26	104	107	98.42%	3

You can change GW transmit frequency by using ePaper Manager. Please follow below steps.

Step 1.1:

The screenshot shows a monitoring interface with a table of devices. A search bar is at the top right. A configuration menu is open on the right side, showing options for Name, Monitoring, Get/Set Data, and Status Message. The 'Get/Set Data' option is checked. Red boxes and numbers 1 through 5 highlight specific UI elements: 1 (device icon), 2 (add/edit/delete buttons), 3 (search bar), 4 (table rows), and 5 (Get/Set button in the table).

Name	Get/Set Data	Status Message
EPD-Tag-2805	Get/Set	Normal
EPD-Tag-2705	Get/Set	Normal
EPD-Router-14a8	Get/Set	Normal
EPDGW_023_053	Get/Set	Normal

Showing 1 to 4 of 4 rows

Step 1.2:

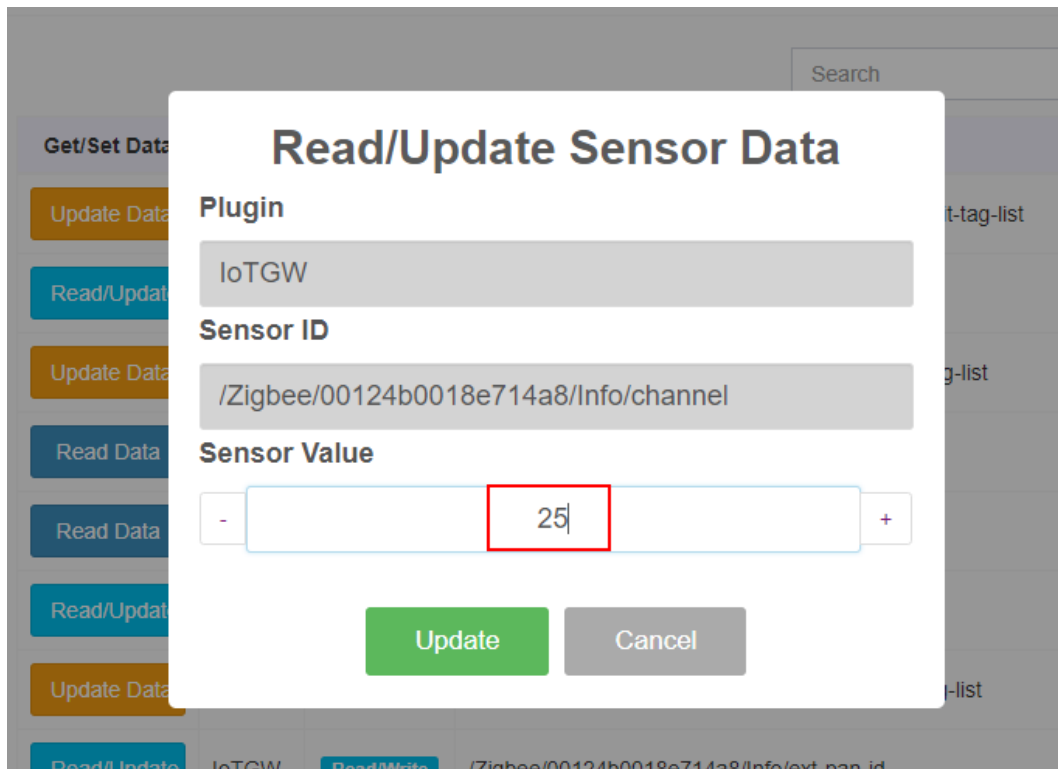
The screenshot shows the 'ePaper Manager' interface. The breadcrumb path is 'Device / Plugins'. The current view is 'Get/Set Sensor Data - EPD-Router-14a8'. A green banner displays the 'IoTGW' plugin name and a 'More info' link. A red box highlights the 'IoTGW' text.

Step 1.3:

The screenshot shows a table of configurations for the EPD-Router-14a8 device. The table has columns for Get/Set Data, Plugin, Privilege, and Sensor ID. The 'Read/Update' configuration is highlighted with a red box.

Get/Set Data	Plugin	Privilege	Sensor ID
Update Data	IoTGW	Write Only	/Zigbee/00124b0018e714a8/Action/remove-permit-tag-list
Read/Update	IoTGW	Read/Write	/Zigbee/00124b0018e714a8/Info/tx-level-r
Update Data	IoTGW	Write Only	/Zigbee/00124b0018e714a8/Action/add-permit-tag-list
Read Data	IoTGW	Read Only	/Zigbee/00124b0018e714a8/Info/FOTA-status
Read Data	IoTGW	Read Only	/Zigbee/00124b0018e714a8/Info/DeviceList
Read/Update	IoTGW	Read/Write	/Zigbee/00124b0018e714a8/Info/channel
Update Data	IoTGW	Write Only	/Zigbee/00124b0018e714a8/Action/get-permit-tag-list
Read/Update	IoTGW	Read/Write	/Zigbee/00124b0018e714a8/Info/ext-pan-id
Update Data	IoTGW	Write Only	/Zigbee/00124b0018e714a8/Action/replace-permit-tag-list

Step 1.4: Change the channel value



Step2. Deploy EPD-230 in the Field.

Normally, you can place the EPD device anywhere. But how to make all EPD devices online stably? Is our main consideration. Some people think that the stronger the signal, the better, but we have to evaluate that all EPD devices in the field are online. Therefore, the RSSI of all EPD devices need to be greater than -70 dBm. If the RSSI of an electronic paper is lower than -70 dBm, then that device will easily offline.

Before you deploy the EPD device in the field, you should have a floor plan. It will help you to know how many WISE-3240 should be in the deployment field.

Step3. Choose WISE-3240 deploy position.

After tags location are decide, you have to choose the WISE-3240 deploy position.

In the different fields, the WISE-3240 position will affect the tag receive the wireless signal. This document will show some samples as below.

Case 1:

Application field:

In the small warehouse, all tags will in the small region (Ex. More than 400 tags within a radius of 20 meters). The Shelf material is metal and it will cause serious interference. In the field, we recommend all tags are deployed around GW.

Please reference below picture. In this example, a GW connects around 400 tags.



The following picture is in the real field deployment (Floor plan).

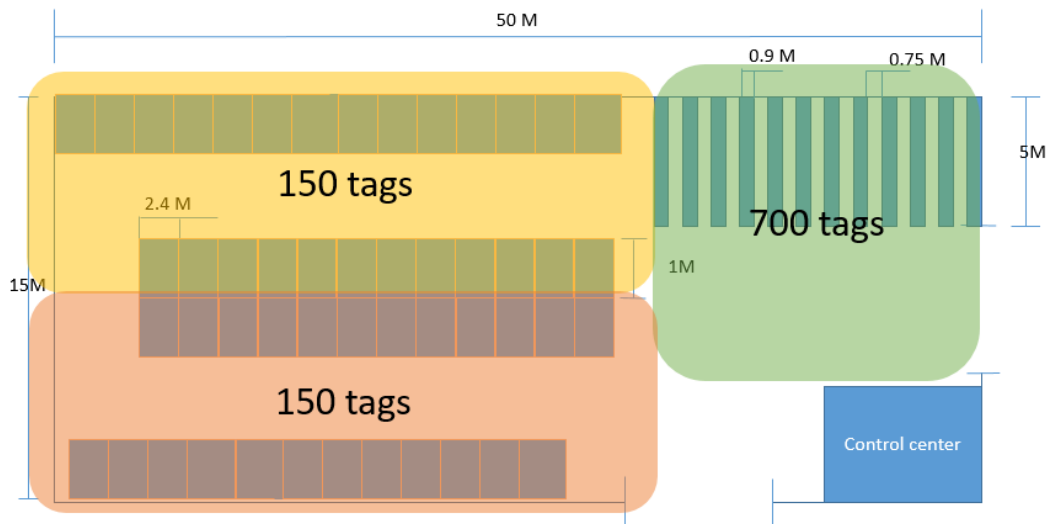


Case 2:

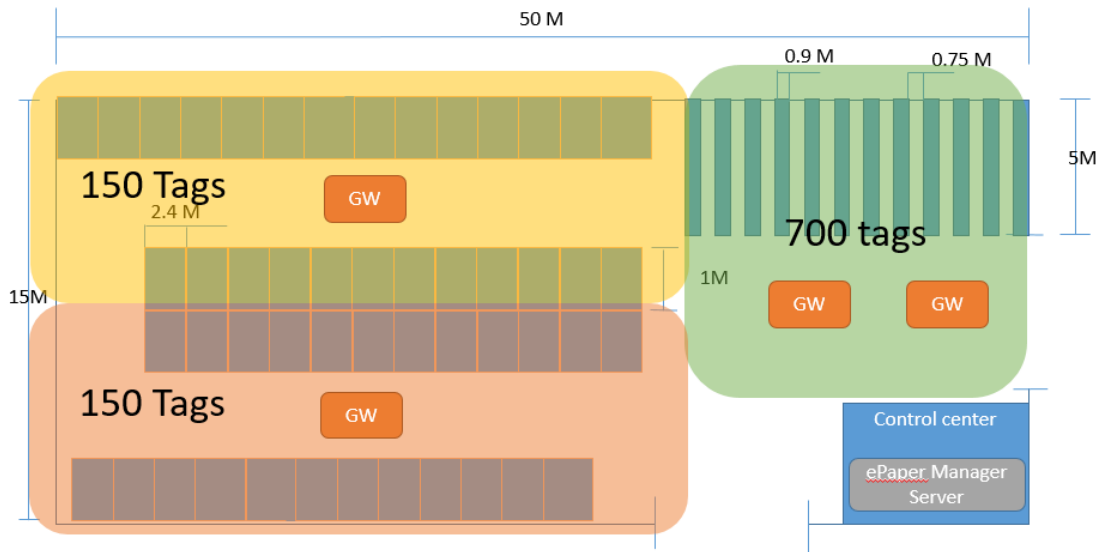
If the warehouse is wide, we have to estimate the number of connection tags and avoid across metal or cement shelters. In the following picture, I will show how to deploy in the wide warehouse.

First, we must determine the area that includes the least shadow deployment and calculate how many tags will be in that area.

In the following picture, I separate three regions and I will estimate how many GWs will deploy in each area.

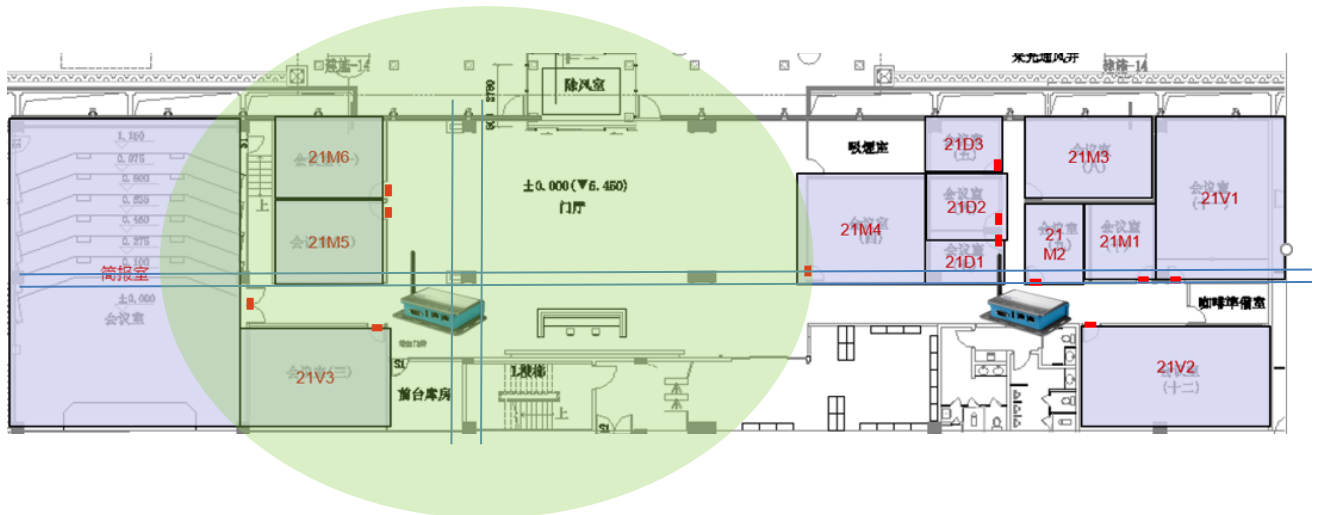


A WISE-3240 support 400 tags. If there are less than 400 tags in a field, please deploy WISE-3240 near the center of the field. You can reference yellow and orange region. In the green region, there are 700 tags in the field so we have to deploy two WISE-3240. Because of there are many metal shelters, the GW in the field will be slightly away from the metal shield. If you deploy GW between shelves, the wireless signal will have interference. Please reference below picture.



Case 3.

In meeting room applications, since the number of tags is mostly less than 400, only the communication distance of the router needs to be considered. The evaluation method is the maximum number of tags that can be included in the transmission distance. In addition, there will be steel beams indoors, which should be avoided when deployment WISE-3240.

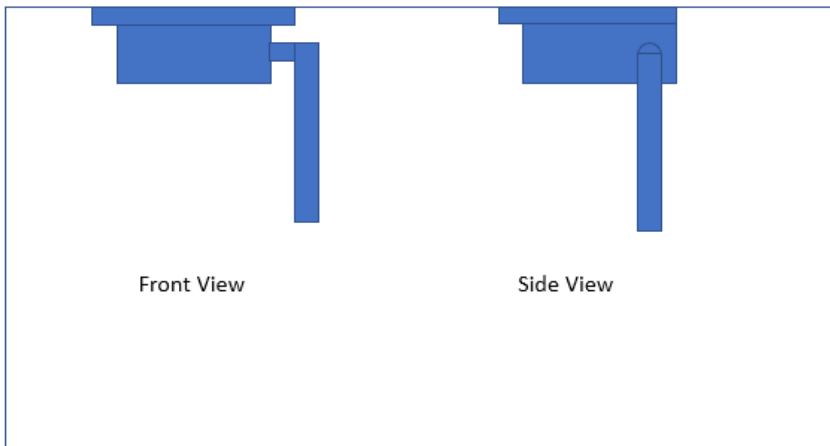


Step4. Check the tags RSSI and test flash image. If the transition image is successful, we can know the interference is weak. If the transition image is fail, we have to change WISE-3240 deployment position or modify the direction of WISE-3240 antenna.

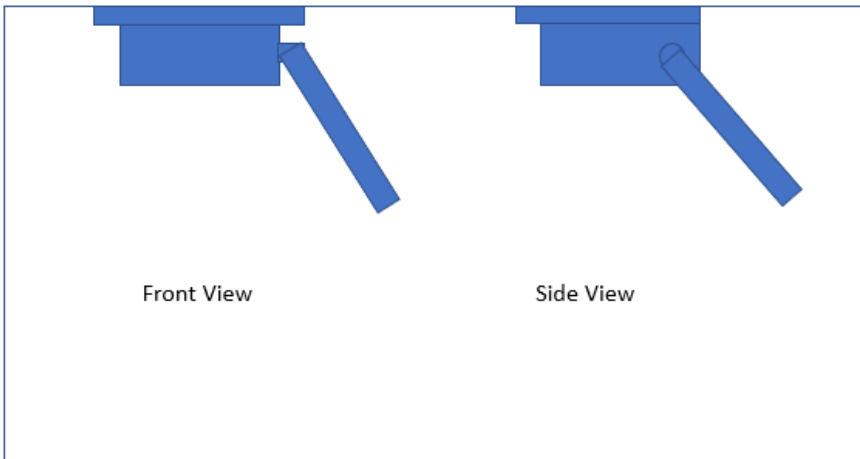
Status	Power	RSSI	Tag Name	Item & Template	Action	Schedule	Update Time
Success	91%	-36dBm	EPD-053R EPD-Tag-2805 00000001-0000- 0000-0012- 4b0016562805	206(EPD-053-DEMO) EPD-053-DEMO	Preview Refresh Transmit Cancel	0 List	2020/5/22 17:47:33

Step5. Check WISE-3240 antenna direction.

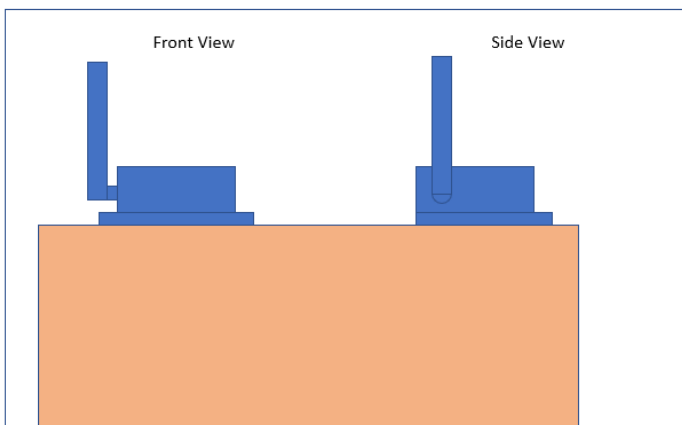
Position 1. WISE-3240 is on the ceiling.



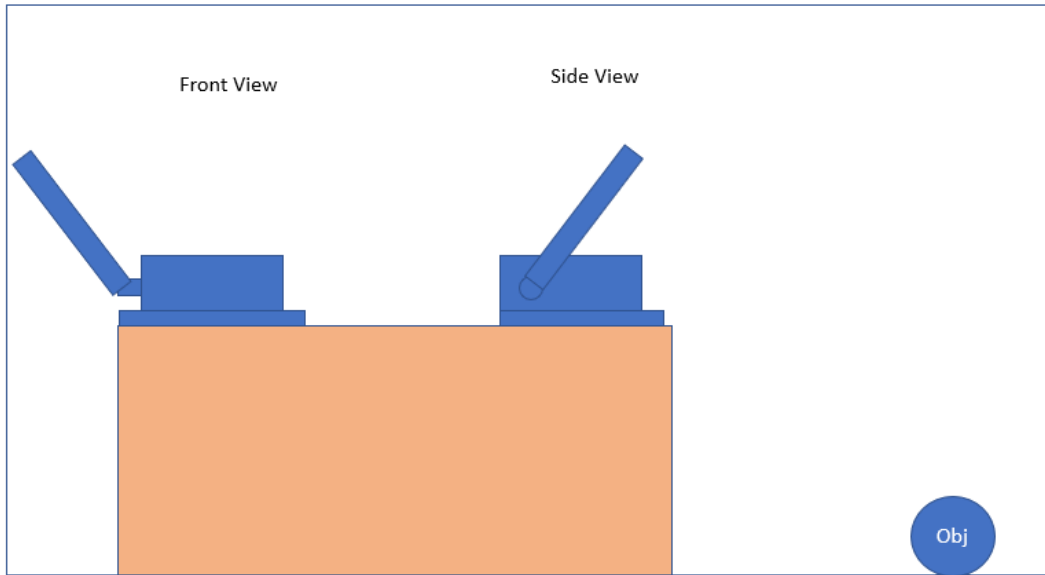
If the signal RSSI is still not good, please modify the antenna as below.



Position 2. WISE-3240 is on the high platform



If the signal RSSI is still not good, please modify the antenna as below.



Appendix:

Item Data design

In the DeviceOn/ePaper, item data has some rule. When you design the item data, the first column has to be unique in every table.

Normally, the customer only put the data which show on the EPD device. We recommend the customer can add more information in the table. For example, the customer can add the tag mac and location in the table. It will easier to find the tag location.

DeviceOn/ePaper

Item Data Management

test MeetingRoom MeetingRoomList Hospital bedside card BusDemo InterruptTest AdvBusDemo P2L + Add

Storage_Bin	mac	Indicator	Part_Number	Description	Status	Cost	Storage	Request_Qty	Storage_Qty	Template_ID	QR_Code_Del
CSB0201	00124B001DAE20A8	PC	1410023670-01	IC N14M-GS-B-A1 GPU's SMD BGA 908P	DD	100	R010	4	103	RMA_P2L_0	
CSB0202	00124B001DAE1CCD	PC	14MPPM-1.6-2M11A	PENTIUM N3710 2M 1.6G SR2KL	QQ	10	R010	5	104	RMA_P2L_1	
CSB0203	00124B001DAE2085	PC	1420038597	FLASH ROM-5420 AT mcu V1.10 CS:0043140B	WW	1000	R010	6	105	RMA_P2L_0	
CSB0204	00124B001DAE1CC3	PC	1420045239	uCTRL ADAM-3600-C-JO 01010188 CS:D1ED S	EE	100	R010	7	106	RMA_P2L_0	
CSB0205	00124B001DAE21C1	PC	14MPI5M-1.6-	CORE I5-4402E 3M 1.6G	RR	10	R010	8	107	RMA_P2L_1	

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