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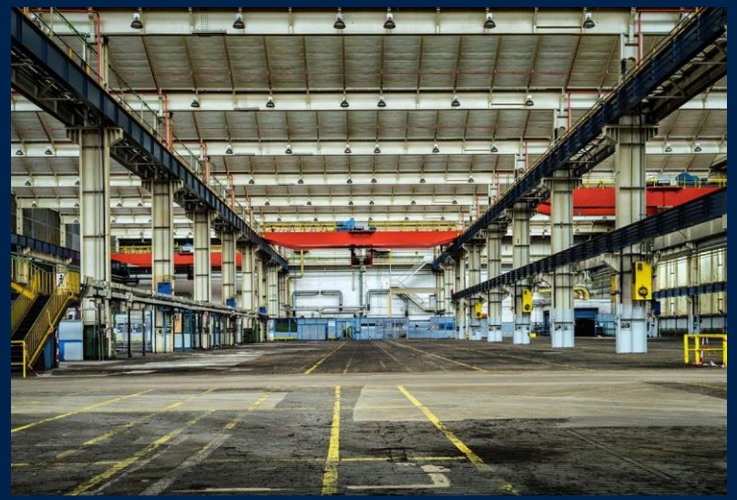
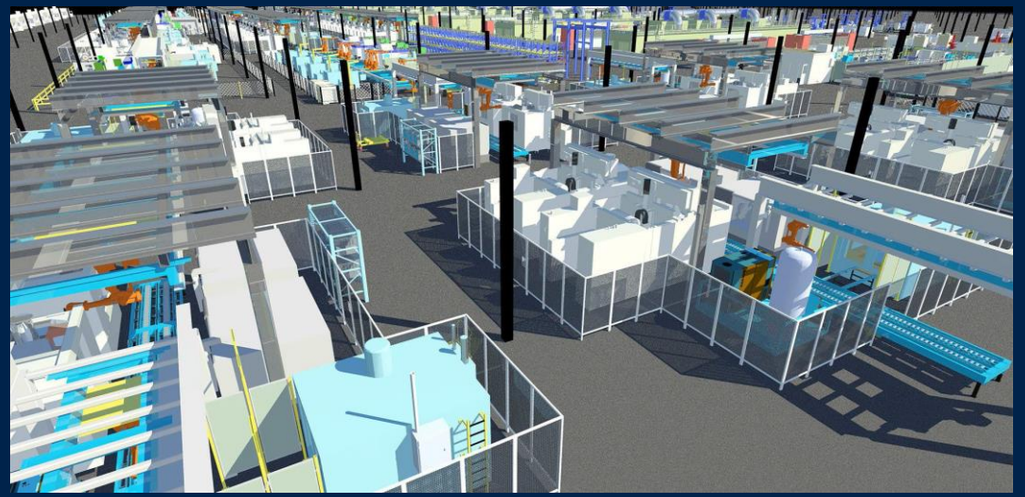
Illumination Best Practices – Industrial customers

30.05.2023 Version 1.1 (Updated 28.06.2023)

Best practices for Industrial customers

Especially for Industrial MARKETS, the Store illumination must be planed very sensitive and requires consideration of many factors.





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Gateway positioning process on Floor Plan

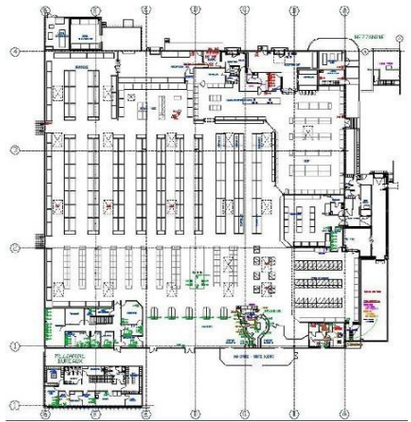
Analyze of the Floor Plan

To set-up the Gateway position plan, an understanding

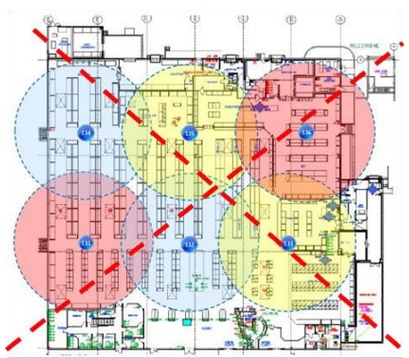
of how to “read” a floor plan is highly necessary!
If knowledge is missing, please visit a Workshop in your local region. A basic Workshop programs with 1d is generally enough.

Every floor plan is different and can consider many relevant or very less information for you. The map could contain already many relevant factors, such as cameras, Wi-Fi AP’s, Rack formats, walls, ceiling concepts, and more…

But even a detailed floor plan never helps to consider all relevant factors! A site survey is always required for a verification of the planned Gateways positions!



WRONG



Marking location of Gateway on the Map & Fix How many GW is necessary

Even a Basic Floor plan tells you more as you may recognize in the beginning.

A precise planned Gateway positioning on the Floor plan helps you to reduce your rework in your verification progress on-site.

Any reposition of a Gateway on-site triggers a new adaptation of the other Gateways, don’t underestimate the work!

Don’t save on Gateways! If you are unsure about an correctly covered area, add always 1 more Gateway. On long-term, you save more money with avoiding BATT drain of ESL Tags!

A Floor plan could have much more information’s which we didn’t considered in our sample plan.
For example:

- Position of Cameras, AP’S, other
- electronic devices
- Ceiling height & beam constructions
- Thickness & material component of walls
- Lifts, escalators
- Roller shutters, Fire doors / walls
- And more…

A missing information on a floor plan doesn’t means that this object, (eg. Cameras) doesn’t exists in the store. It’s may just not marked. That’s also one of the reason why an on-site visit is so important.

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Gateway positioning process on Floor Plan

Marking location of Gateway on the Map & Fix How many GW is necessary

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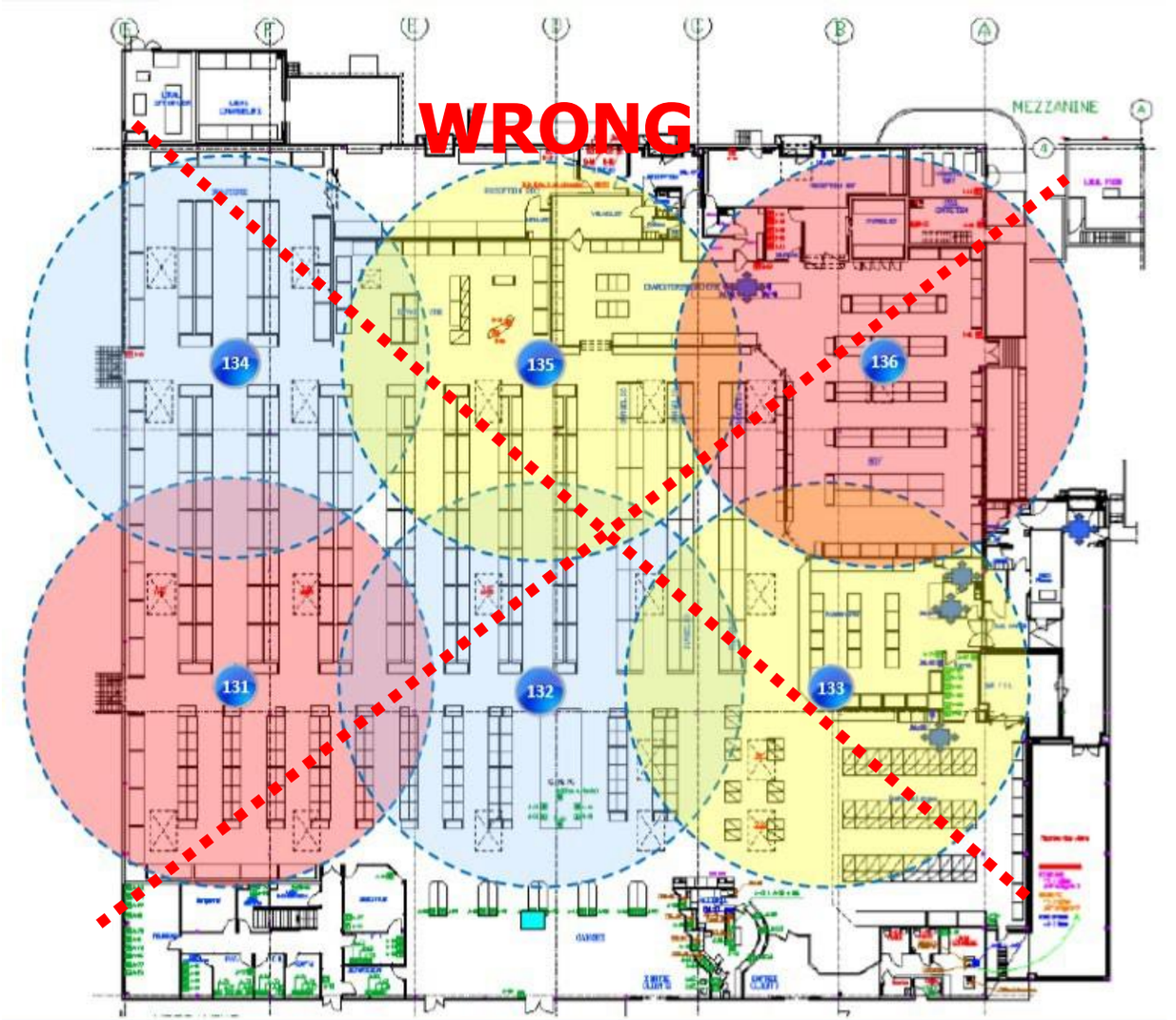

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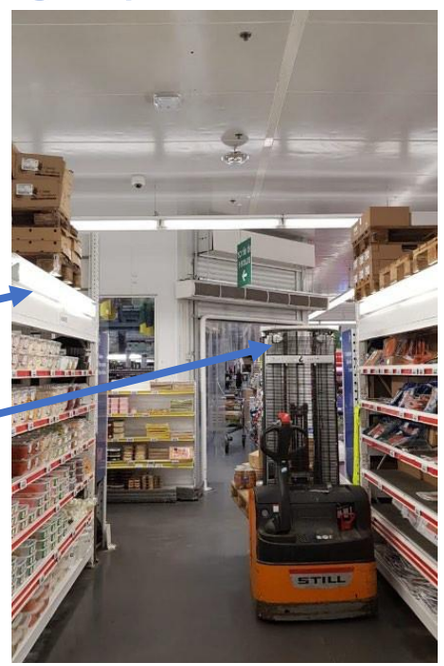
General characteristics of a Gateway Installation

Major attributes of a Gateway positioning

Terms of Gateway Installation height:

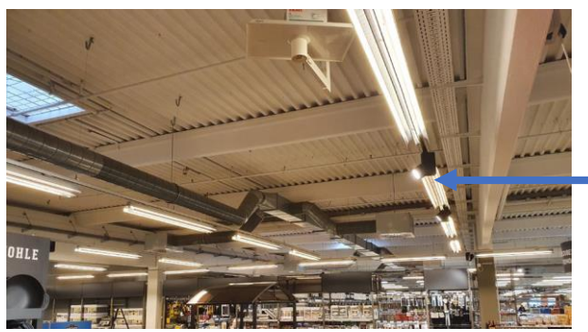
- 1,5m higher than the store shelf, based on the GW coverage area
- Min. 8cm gap between Ceiling and Gateway
- If lift truck operates in that area, the max. height of lifting must be considered too!
- Install 5 cm's lower than the Tube lights & ceiling beams around. If possible keep also 3 meters distance from them

Blue: Height parameters



Avg. Shelf height + 1,5m

Consider max. lifting height



Tube lights: Install 5 cm lower

Ceiling beams: Install 5 cm lower

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General characteristics of a Gateway Installation

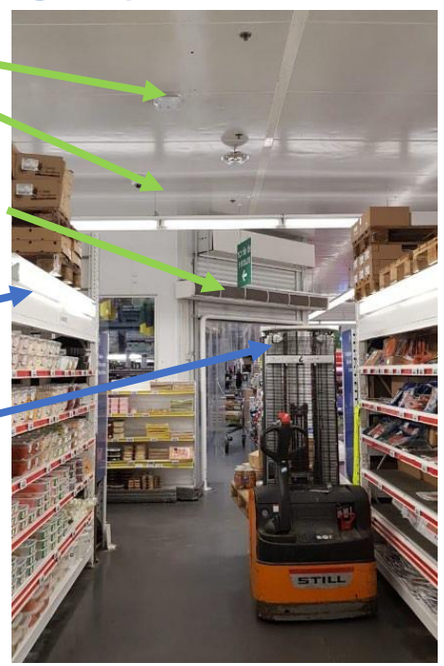
Major attributes of a Gateway positioning

Object s:

- Keep min. 3 meter distance from any electronic components, such as Camera, air conditions, (Smoke) detectors, high voltage cables, etc.
- Keep min. 3 meter distance from gas pipes, air / ventilation ducts, fire extinguisher or any other metallic objects and install 5 cm lower than these objects!
- Keep min. 3 meter distance from walls, especially steel walls. A Gateway should be generally not mounted on walls

Blue: Height parameters

Green: Distance parameters



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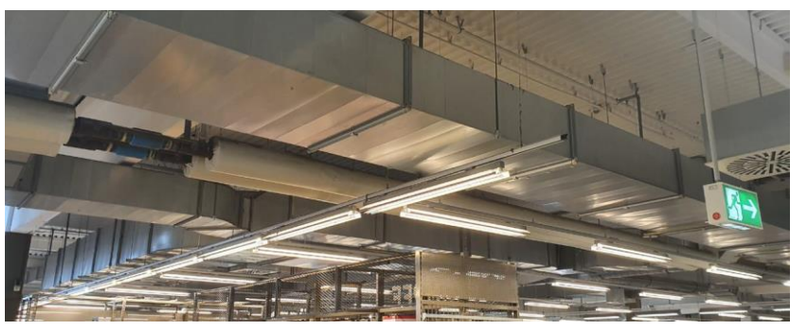
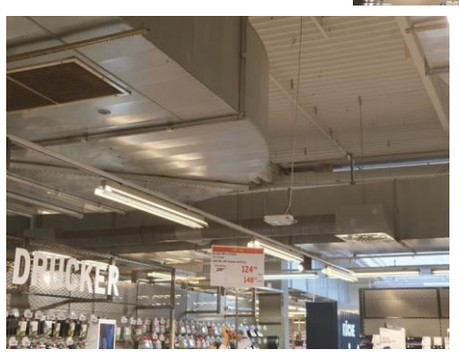
General characteristics of a Gateway Installation

Main collisions in a store environment

In the practice, not all installation factors can be considered. In this case, the best situation must be determined and a less coverage in the plan considered. For example:

3m distance from risky objects can’t be met





Use at least an install height of 5cm lower than the risky objects and at least 1m distance. Consider a less coverage in your plan.

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General characteristics of a Gateway Installation

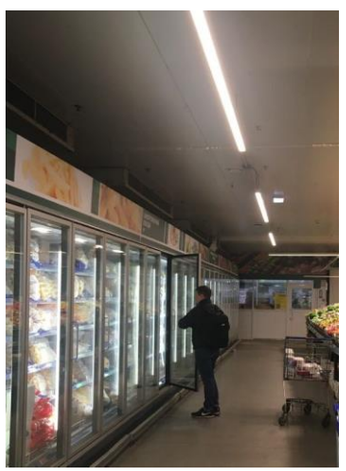
Main collisions in a store environment

In the practice, not all installation factors can be considered. In this case, the best situation must be determined and a less coverage in the plan considered. For example:

Install height of 5,5m Ceiling heigt and/or shelf height + 1,5m can't be met. It's higher

Use the height of Tube light's as reference and install 5cm lower. Generally, Lift height's don't touch Tube lights. If install height is higher than 5,5m and/or high shelve racks are installed, consider a less coverage in your plan.

Install height shelf height + 1,5m can't be met. It's lower



Use the height of Tube light's as reference and install 5cm lower. Don't install directly under a shelf. Consider a less coverage in your plan.

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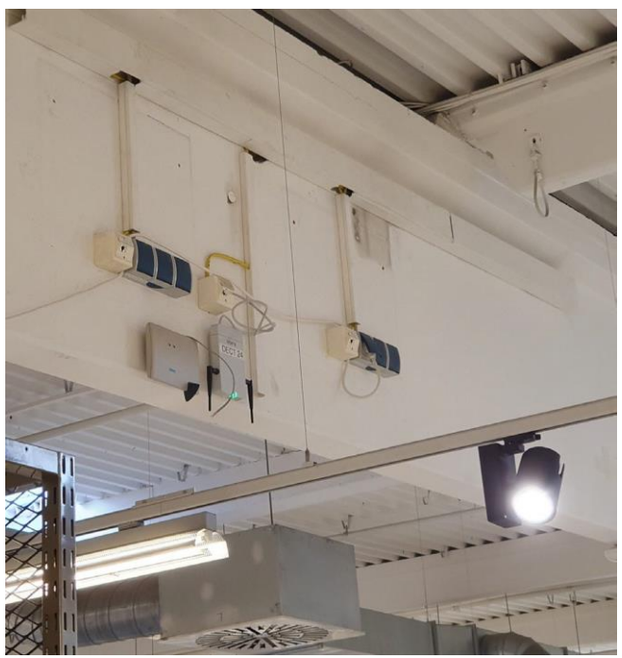
General characteristics of a Gateway Installation

Disallowed Gateway mounting places by store owners

Some installation position may seem logical and is not conflicted with the Installation Guide line of SOLUM, but it's may forbideen by store owner or by safety instructor. For example:



Drill holes and screws on ceiling beams endangers the stability of the building

It's may allowed to fix the Hardware with clips. Please check intern the restrictions

Fixing to the Cable ducts / canals may allowed, but risks to damage the cables inside of the cable ducts / canals.

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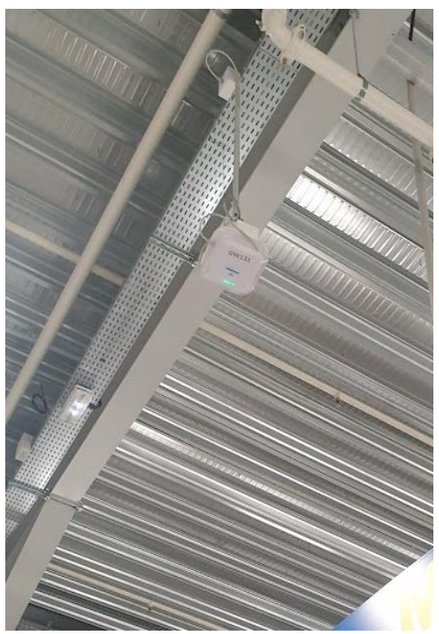
General characteristics of a Gateway Installation

Recommended Gateway mounting places.

Here are a few examples of acceptable GW mounting positions for reference.



GW is hung lower than the steel beams

GW is hung lower than the steel beams and no objects are interfering

GW is hung lower than lights, objects and steel beams

GW is hung lower than surrounding objects and is not close to wall

Good example of a hanging solution. GW is away from near wall

Another good example of a hanging solution. GW is away from near wall and pipes. GW is hung below objects.

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General characteristics of a Gateway Installation

Common overlooked aspects in a Gateway positioning plan

As mentioned before, a floor plan doesn't considers all factors to create a properly Gateway positioning plan and should be combined with a site survey. But even on-site, a well-trained eye is important to cover all required area with Gateways with good conditions. For example:

Mobile partitions. The area behind the mobile wall can be added in the future to a sales area

Consider also the products in check out area, behind the check out area, Entrance area or Exit area

These are only a kind of examples. It's in your responsibility to identify all relevant factors for the Gateway positioning plan. A direct contact to Key members, such as Store managers, facility managers, safety inspectors etc. can help you to identify all aspects efficiently.

General characteristics of a Gateway Installation

Common overlooked aspects in a Gateway positioning plan

As mentioned before, a floor plan doesn't considers all factors to create a properly Gateway positioning plan and should be combined with a site survey. But even on-site, a well-trained eye is important to cover all required area with Gateways with good conditions. For example:

Shop-in-Shop areas comes with furniture concepts which can has an interferent to the planned coverage radius!

Products stored in the escalators must be considered in the Gateway covered area

Some areas get's closed overnight with metallic roller shutters or fire walls. The covered area get's lower. Keep in mind: Price updates are processed generally overnight!

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General characteristics of a Gateway Installation

Common overlooked aspects in a Gateway positioning plan

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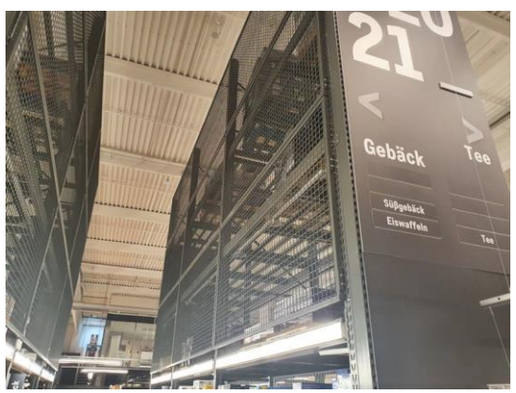

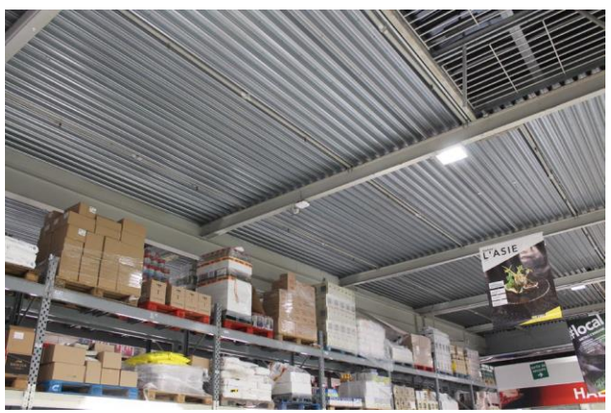

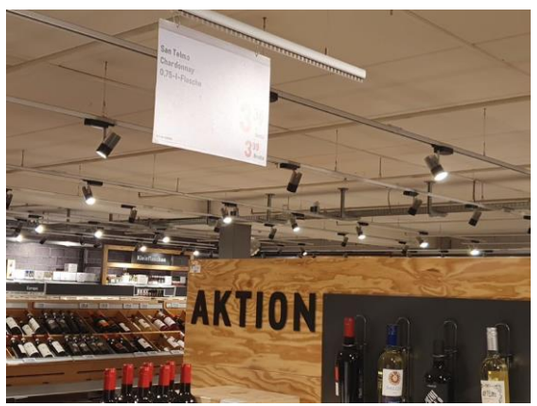

Metal Rack, High Racks, Bottles with Liquids, stored pallets and products with dense materials has a negative impact to the Signal quality. Especially the combination of all in just one area reduces the Signal strength significantly! These areas needs your high attention in the Gateway positioning and radius coverage!

These are only a kind of examples. It's in your responsibility to identify all relevant factors for the Gateway positioning plan. A direct contact to Key members, such as Store managers, facility managers, safety inspectors etc. can help you to identify all aspects efficiently.

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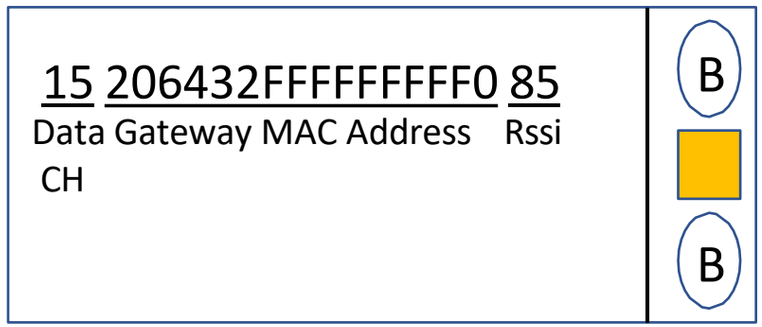
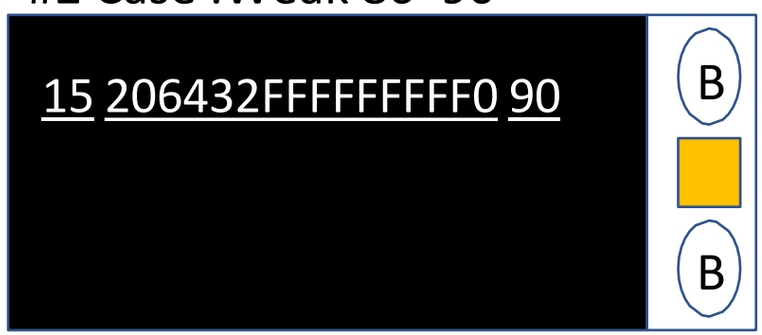
RSSI ESL Tag – General Function

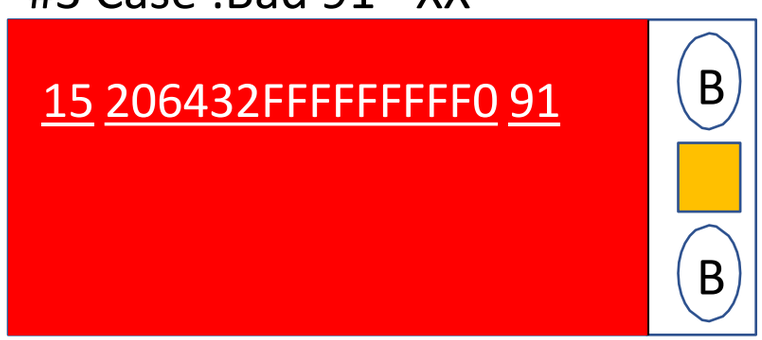
#1 Case :Good 0 ~ 85



#2 Case :Weak 86~90



#3 Case :Bad 91~ XX



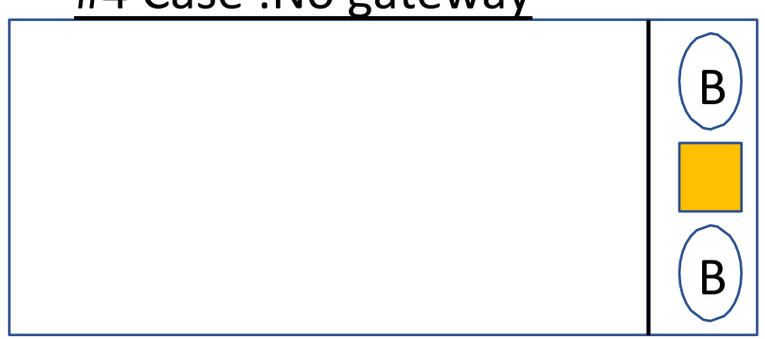
Display information on the RSSI ESL Tag

:Tag shows best RSSI gateway information, data channel, MAC address, and RSSI whenever 'B'(button) is pressed or beeper signal detected.

- Good Signal (Case #1, White)
- Weak Signal (Case #2, Black)
- Bad Signal (Case #3, Red)
- No Signal found (Case #4, White & empty)

NOTE: The in-Store infrastructure comes with higher complexity, disturbing objects and the store concept / product places changes very often. Please achieve a Signal strength quality of 79 or lower to be safe!

#4 Case :No gateway



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In Store Activities

Verification of the GW locations in store

Please check for Obstacles near to the Gateways locations which we have decided on the map and confirm the right position / height. Remember:

Blue: Height parameters

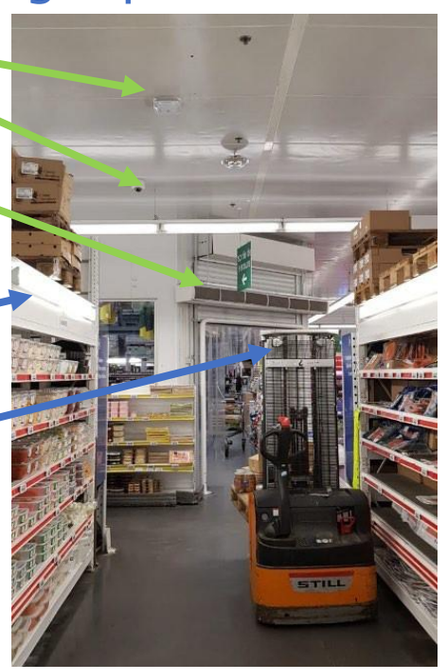
Wi-fi AP: 3m distance

Camera: 3m distance

Air condition: 3m distance

Avg. Shelf height + 1,5m

Consider max. lifting height



Green: Distance parameters

Metallic object: 3m distance

Tube lights: Install 5 cm lower

High voltage cable: 3m distance and 5 cm lower

Fire extinguisher : 3m distance and 5 cm lower

Air / ventilation duct: 3m distance and 5 cm lower

Ceiling beams: Install 5 cm lower

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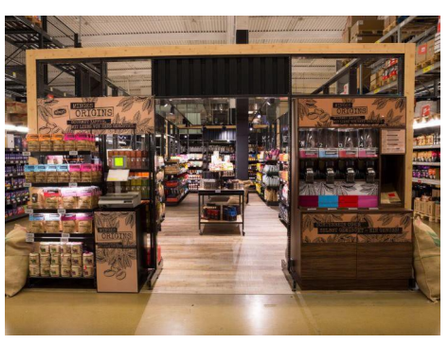
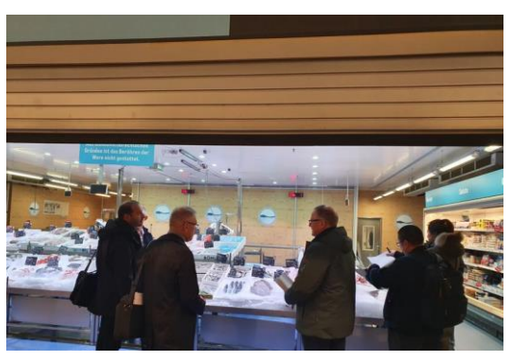
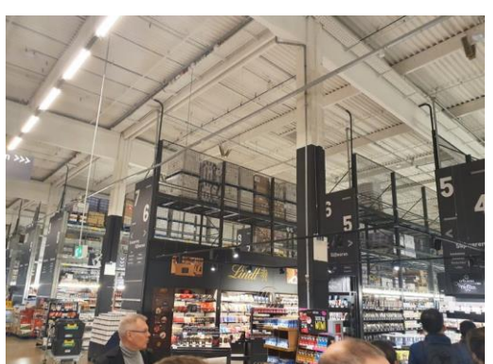
In Store Activities

Verification of the GW locations in store

Please make sure, that you took all relevant factors into your account, such as mobile partition, products in checkout area or Entrance area, Shop in Shop areas, Roller shutter, Fire Walls, Rack concept and materials, Max listed Products in a Gateway area, etc.







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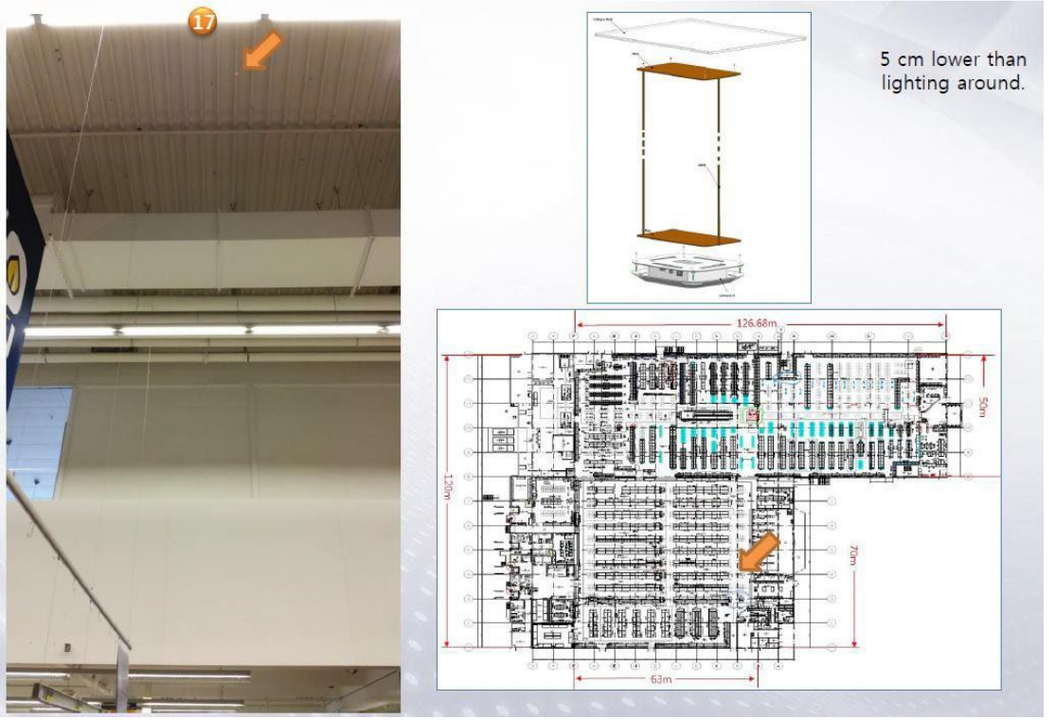
Gateway Positions and Install Documentation



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Gateway installation Docu for your Mounting Team

After your Site Survey, a Mounting Team will do the installation of the Gateways. It's highly recommended to prepare a detailed Documentation for the Mounting Team about the exact Installation position, Height and Installation type.

The measurement & documentation of the excact height for each Gateway is very difficult. Therefore use objects around as references, eg. Install 5cm lower than the Light Tubes around.

If you don't prepare a detailed documentation, you are going to risk that the Gateways are not installed on the right position as you expected.

In case of wrong installation of your Mounting Team, it helps you to prove the error and to claim, too.

Troubleshooting Points

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Critical issue in case of wrong Gateway Set-up

If the max. manageable ESL Tags of 3k exceeds per Gateway, wrong configured RF Channels or the Gateway illumination is very poor planned:

- ESL Tags can’t receive the image updates or only with delayed time
- If the Data receive interrupts too often, the ESL Tags starts the Scan interval period to find a new Gateway; This procedure increases the BATT consume
- ESL Tags may connects to the Gateway. But the Data Transfer quality get’s poor. During an image update receive, the Data Transfer failure rate increases or the DATA Transfer time takes longer. Both cases increases significantly the BATT consumption
- After several connection fails to the Gateway, the ESL Tag or the Update process will be marked as NOK in the system. But the ESL Tags will process continuing in the background to find a Gateway or to complete the Data Receivement. So BATT drain still goes on.
- Just one poor planned Gateway area or exceedance of manageable ESL Tags can cause a chain reaction to neighbor areas which were generally working properly before. Because the effected ESL Tags in a poor area tries to connect to the Neighbor Gateways. With this, the Neighbor Gateways exceeds the max manageable ESL Tags and can’t operate properly in their own area anymore and the BATT’s of Neighbor ESL Tags drains faster, too.

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