

TONNERDRONES —
COUNTBOT®
introduction



SUMMARY

1. **General system**
2. **Important information**
3. **Mast setup**
4. **System restrictions**
5. **How it works**
 - a. Map creation
 - b. Aisles generation
 - c. Rack generation
 - d. Mission
 - e. Review

General system

Automatic system handling inventory and stock control work:

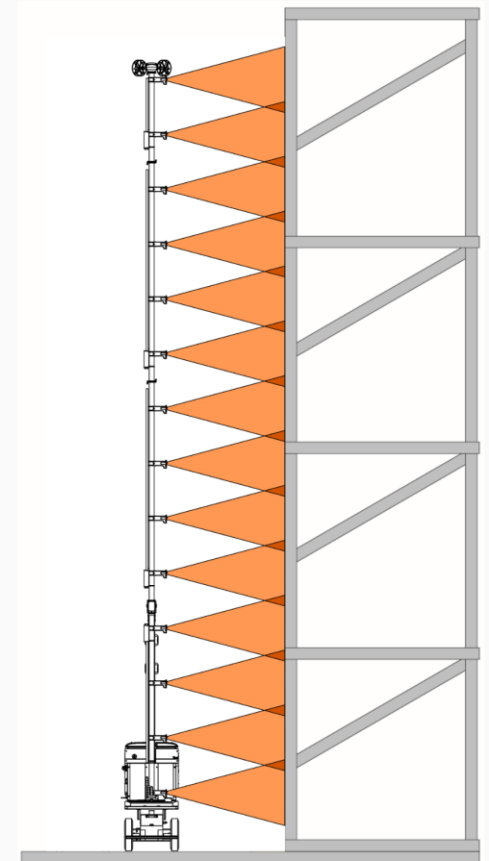
- Real-time inventories
- No human intervention other than a supervisory operator
- Decodes pallet barcodes (Code-128) and detects any stock anomalies

System composition:

- Payload (AMR "Effibot" robot and structure with computer)
- Mast (up to 10 m high with a drone on top)
- Up to 14 high resolution cameras (quality of the images collected by the drone)

Autonomy of the system:

- Direction in the aisles (complete mapping of the site beforehand)
- Automatically customized trajectory / inventory circuit



Important information

Decodes **95%** of locations before post processing

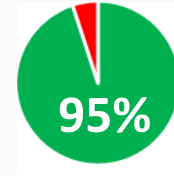
Robot inventory time of **3 hours and 25 min** for **10,000m²**
(1 feet/sec robot speed)*

User-friendly HMI (Human-Machine Interface) :

- Map editor
- Mission
- Review

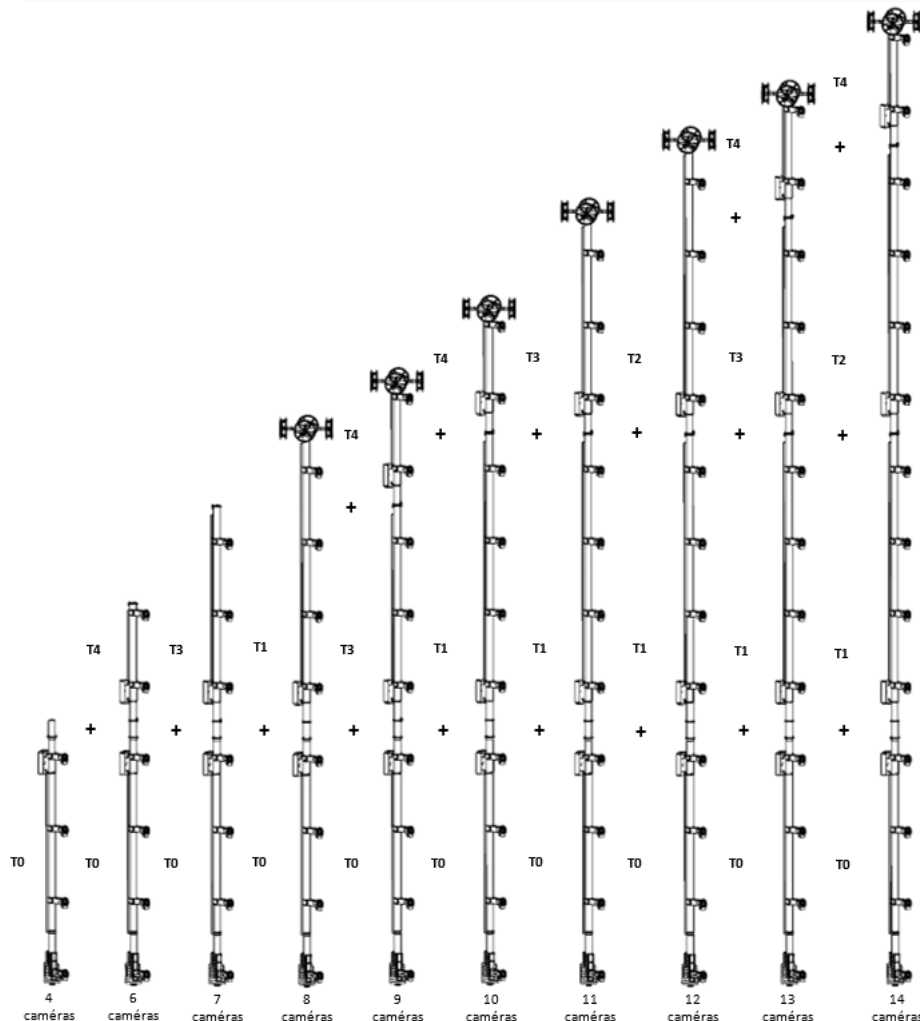
Inter-compatibility between systems

Certification in progress for data eligibility for auditors



Mast setup

Number of cameras	Mast height	Decoding height
14	9,8 m (32,15ft)	9,95 m (32,64ft)
13	9,12 m (29,92ft)	9,27 m (30,41ft)
12	8,69 m (28,51ft)	8,59 m (28,18ft)
11	8,01 m (26,27ft)	7,91 m (25,95ft)
10	7,09 m (23,26ft)	7,23 m (23,72ft)
9	6,41 m (21,03ft)	6,55 m (21,48ft)
8	5,97 m (19,58ft)	5,87 m (19,25ft)
7	5,28 m (17,32ft)	5,19 m (17,02ft)
6	4,21 m (13,81ft)	4,51 m (14,79ft)
4	3,1 m (10,17ft)	3,15 m (10,33ft)



System restrictions

Crossbars at the beginning and end of the aisle



Crossbars between aisles



Safety devices for pallet trucks



Inter-aisle stocks



Picking area



Aisles width minimal : 2,8m (6,56ft) in the current version

How it works

Map creation

Installation of diopters (fixed recognition points)

Recording of the warehouse area (AMR only with LIDAR)

Recovery of the data file recorded by the LIDAR

Detectable areas



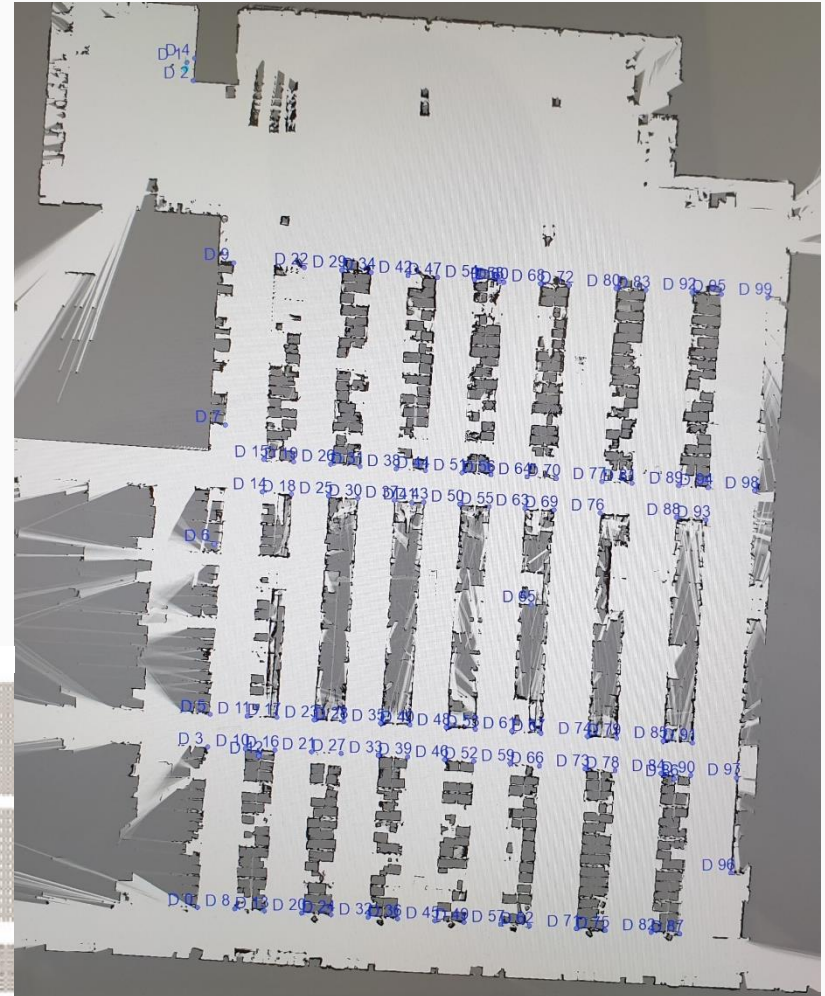
500 mm



100 mm



Non-detectable areas

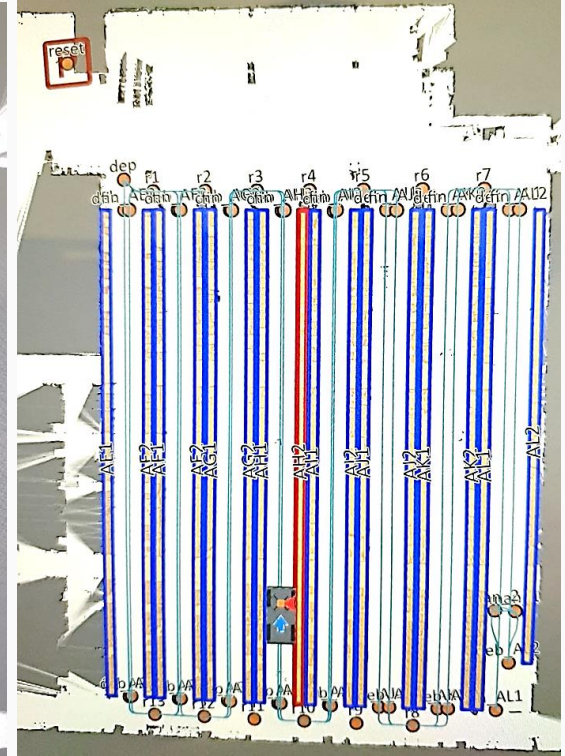
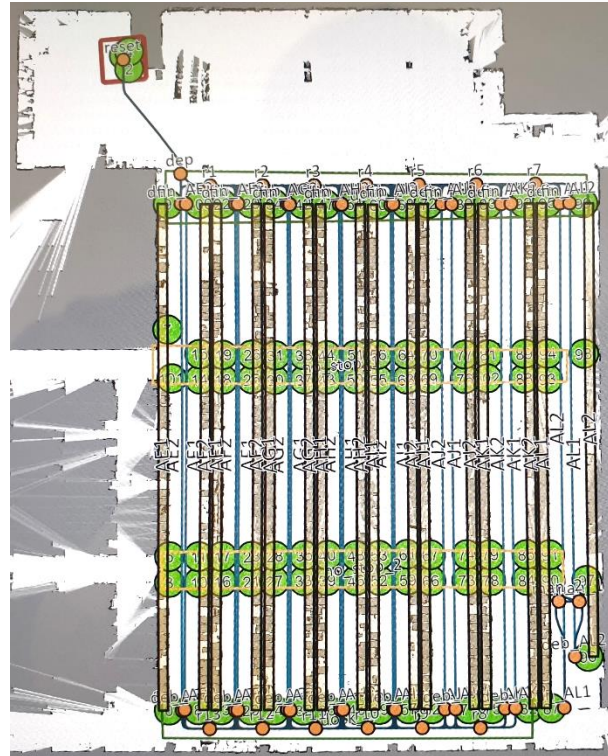


How it works

Aisles generation

Processing of the generated map :

- Aisles
- Areas
- Path
- Specific point
- Planning

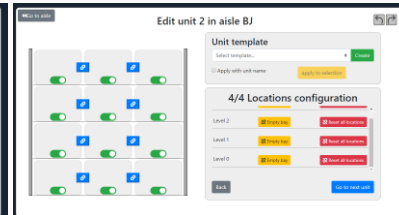
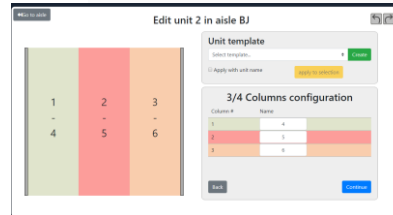
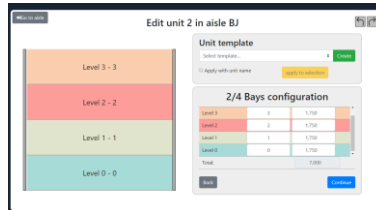
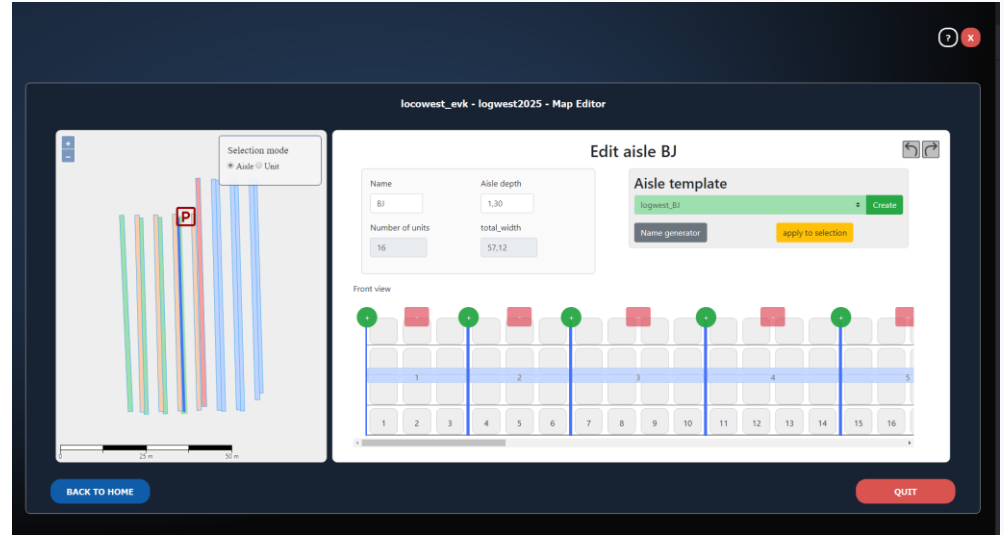


How it works

Rack generation

Pallet rack settings:

- Height of beams
- Width of the compartments
- Span
- Pallet location
- Customized numbering (cells, aisles, bays, levels, compartments, etc.)
- Zone to be flashed or not
- Template creation



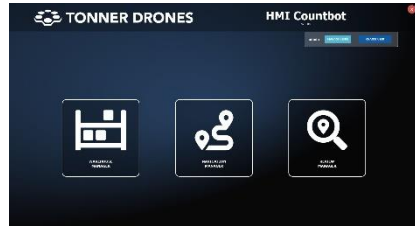
How it works

Mission

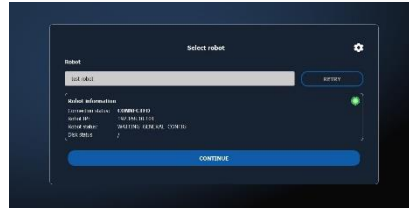
1- login



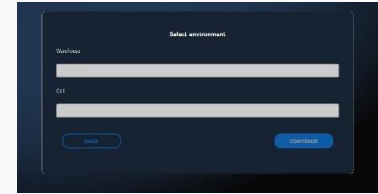
2- Selection navigation mode



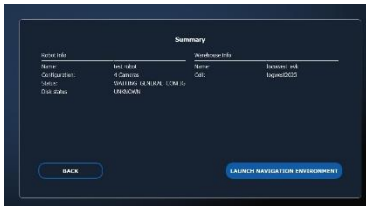
3- Selection the robot



4- Select the cell and mast configuration



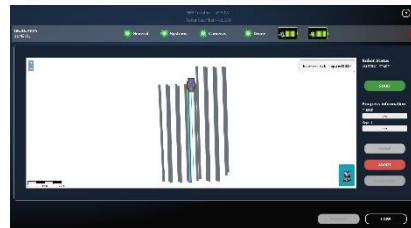
5- check before the mission



6- wait the robot is initialized and ready



7- supervise the mission



How it works

Review


Implementation of the customer WMS file (Warehouse Management System)

Comparative analysis of the different inventory files

Detailed analysis of the warehouse statement:

- **Green** = Correct in relation to the WMS
- **Orange** = Needs manual verification: Different from WMS or Full without CAB
- **Red** = Manually validated: Different WMS, Warehouse problem, System problem

Generation of the ".csv" file for reintegration into the customer's WMS with identification of the differences



	A	B	C	D	E	F	G	
	Emplacement Countbot	Emplacement Client	Code_barre Countbot	Code-barre WMS	Statut	Lien orthophoto	Lien photo du code-barre	
1	010_OBB_00_001	710-001-00		'00136001506411426590	NOK	../ortho/1.jpg		
2	010_OBB_00_002	710-002-00	'00208918571001603410	'00208918571001603410	Probleme etiquette	../ortho/2.jpg	../keyimages/t0_c2_006969.jpg	
3	010_OBB_00_002	710-002-00	'00080560937200067863		Probleme etiquette	../ortho/2.jpg	../keyimages/t0_c2_006971.jpg	
4	010_OBB_00_002	710-002-00	'00376130335155423814	'00376130335155423814	Probleme etiquette	../ortho/3.jpg	../keyimages/t0_c1_006990.jpg	
5	010_OBB_00_003	710-003-00	'00003370030966909595	'00136001506419941903	Probleme etiquette	../ortho/4.jpg	../keyimages/t1_c1_006980.jpg	
6	010_OBB_10_001	710-001-10		'00376130339750745395	NOK	../ortho/5.jpg		
7	010_OBB_10_002	710-002-10		'00376130339752057878	OK	../ortho/6.jpg	../keyimages/t0_c4_006992.jpg	
8	010_OBB_10_003	710-003-10	'00376130339752031502	'00376130339752031502	OK	../ortho/7.jpg	../keyimages/t1_c3_006981.jpg	
9	010_OBB_20_001	710-001-20	'00376130339750970544	'00376130339750970544	OK	../ortho/8.jpg	../keyimages/t1_c3_006988.jpg	
10	010_OBB_20_002	710-002-20	'00376130339752030765	'00376130339752030765	OK	../ortho/9.jpg	../keyimages/t1_c3_006994.jpg	
11	010_OBB_20_003	710-003-20	'00376130339751611101	'00376130339751611101	OK	../ortho/10.jpg	../keyimages/t3_c2_006967.jpg	
12	010_OBB_30_001	710-001-30		'00376130339751730765	NOK	../ortho/11.jpg		
13	010_OBB_30_002	710-002-30		'00340055001810811760	'00340055001810811760	OK	../ortho/12.jpg	../keyimages/t3_c1_006987.jpg
14	010_OBB_30_003	710-003-30	'00376130339751110925	'00376130339751110925	OK	../ortho/13.jpg	../keyimages/t4_c1_006973.jpg	
15	010_OBB_40_001	710-001-40		'00376130339750762811	NOK	../ortho/14.jpg		
16	010_OBB_40_002	710-002-40		'00376130339751626471	OK	../ortho/15.jpg	../keyimages/t4_c1_006988.jpg	
17	010_OBB_40_003	710-003-40	'00376130339751626471	'00376130339751626471	OK	../ortho/15.jpg	../keyimages/t4_c1_006988.jpg	
18	010_OBC_00_001	710-001-00		'00376130339747932395	KO WMS	../ortho/16.jpg		
19	010_OBC_00_002	710-002-00	'00208918571001616410	'00208918571001616410	Probleme etiquette	../ortho/17.jpg	../keyimages/t0_c2_006992.jpg	
20	010_OBC_00_003	710-003-00		'00376130339751430054	KO WMS	../ortho/18.jpg		
21	010_OBC_10_001	710-001-10	'00376130339751096632	'00376130339751096632	OK	../ortho/19.jpg	../keyimages/t0_c4_007000.jpg	