Co-botic™ 45 data security



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Preface

This document describes what data the co-botic™ 45 generates and saves. There will be an explanation and description of the following topics:

- Sensor data
- Server and peripheral connection
- User usage data
- I-link data
- Operational data

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1. Sensor data

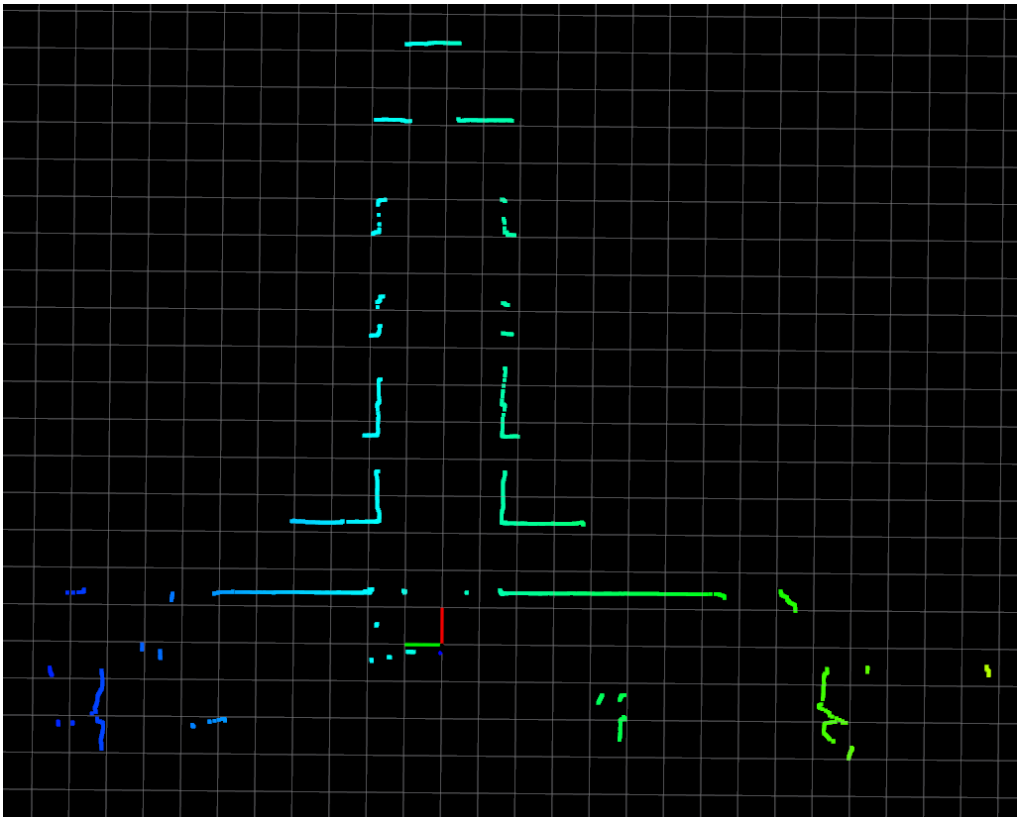
The co-botic™ 45 has 7 sensors;

- 1x 2D lidar, for navigation purposes
- 2x 3D TOF sensor, for obstacle avoidance
- 4x ultrasonic sensor, for obstacle avoidance, mainly glass or mirror objects

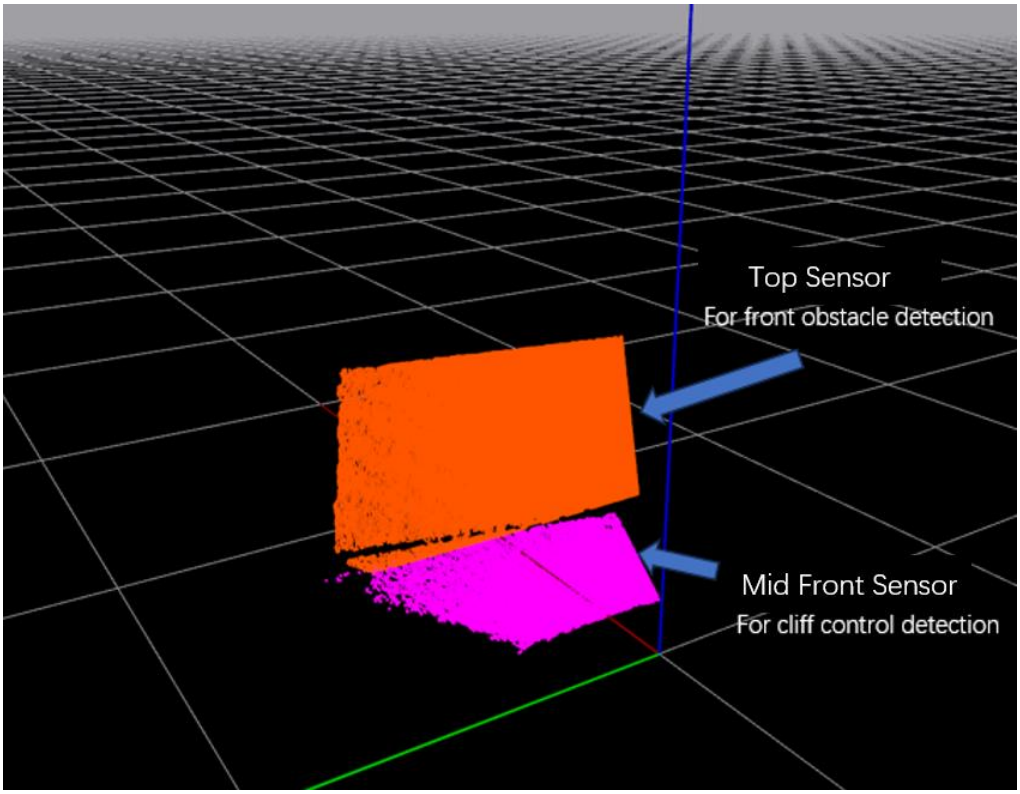
The purpose of generating this data is to navigate around in the mapped area. There are no camera based sensors which are able to generate and collect photo or video. Also there are no microphones capable of generating and saving sound data. Furthermore, this data is also not accessible remotely and is not stored either locally or on a server.

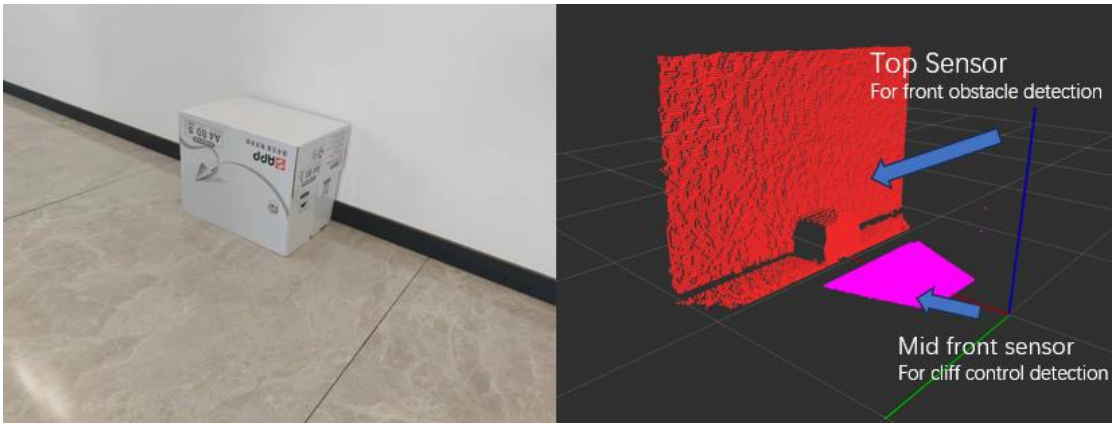
Below there are three examples of data which are generated by the 2D lidar (fig. 1), the 3D TOF sensors (fig 2.), and an example of the 3D TOF sensors with an object in front.

1.1. 2D lidar data



1.2. 3D TOF sensor data





2. Server and peripheral connection

2.1. Server

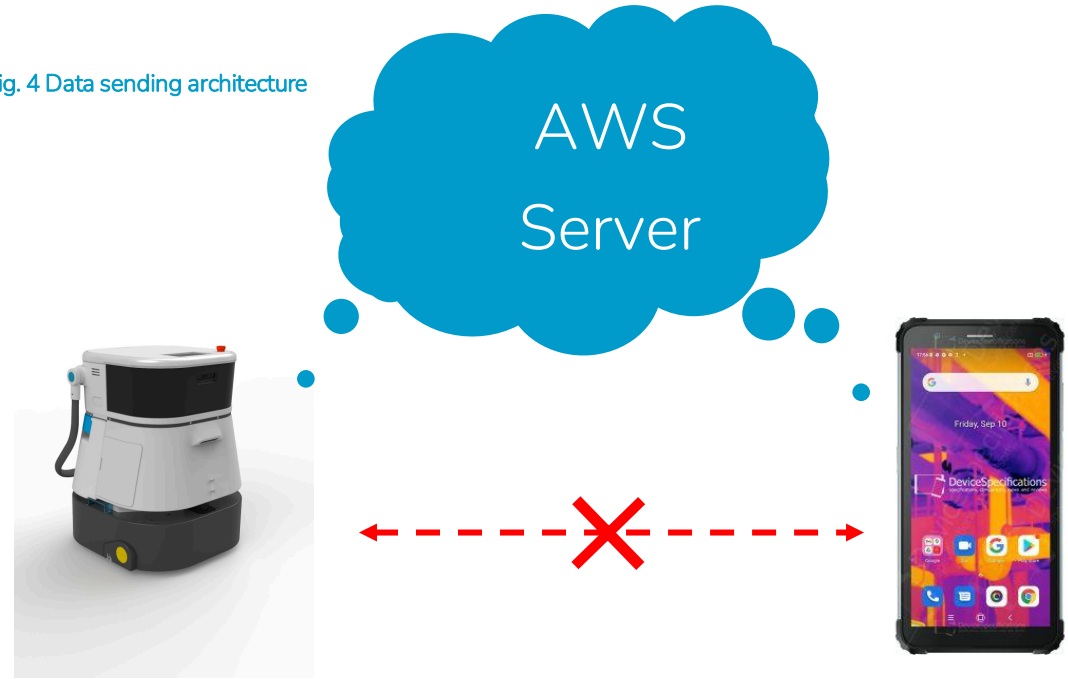
For normal operation on the there is a connection from the co-botic™ 45 to a server. This server is from AWS (Amazon Web Services) and is located in Frankfurt, Germany. There is no second server and also no server where data is stored outside of Europe. For more information about AWS data security and how this is handled:

- https://aws.amazon.com/compliance/gdpr-center/
- https://aws.amazon.com/compliance/data-privacy-faq/

2.2. Peripheral

For mapping, map commissioning, creating and adjusting cleaning tasks, cleaning records and notifications there is a network connection required from both the co-botic™ 45 and the operator phone. When the tasks are created, and synchronized with the co-botic™ 45 it is not mandatory to have a network connection for operation. If there is no network connection there will be no notifications to the phone, cleaning records cannot be seen from the phone and no real-time data can be seen from the unit. There is also no direct link between the operator phone and the co-botic™ 45. Find below in fig 4 what the architecture is for sending data.

fig. 4 Data sending architecture



2.3. Supplied operator phone

The supplied operator phone is the Blackview BV6600. This phone is locked to specific apps by i-team via a phone locking software called Esper. Furthermore Esper also allows i-team to look remotely on the screen of the operator phone. i-team can only access the phone remotely if the operator, who has the phone accepts this request. The only time this is used, is for remote assistance when this is required. There is no way to access the cameras to make photos or videos remotely via the Esper software.

Furthermore the operator phone uses a Vodafone sim card supplied by i-team. This sim card is whitelisted to specific ip-addresses for our co-botic™ 45 server and i-link servers. This sim card cannot be used to reach other websites or ip-addresses.

3. User usage data

There is data stored from the device where the apk (Android Package Kit) file is installed on. This will include, cookies, tokens, robot data such as; serial number, cleaning mode setting, map planning, editing, task information, cleaning record data, etc. This data is generated on all devices the apk is installed on.

When using the supplied operator phone there is no end user data that needs to be put in. Therefore there is no data from the end user that can be taken from the co-botic™ 45. The only data that is sent, is general data which does not bind the end user to a specific machine or peripheral. because this is a user account and phone generated and provided by i-team. Email and telephone number are not required from the end user for operation of the co-botic™ 45.

An example of data that is being sent for operation of the co-botic™ 45 can be found below in fig 5.

tb_user

	Field	Type	Extra
P	USER_ID	varchar(32) COMMENT	
	ORG_ID	varchar(32) COMMENT	Allow Null
	ACCOUNT	varchar(32) COMMENT	
	USERNAME	varchar(32) COMMENT	Allow Null
	PASSWORD	varchar(32) COMMENT	Allow Null
	AVATAR	varchar(64) COMMENT	Allow Null
	ROLE_ID	varchar(32) COMMENT	Allow Null
	EMAIL	varchar(32) COMMENT	Allow Null
	TEL_NUM	varchar(32) COMMENT	Allow Null
	LEADER_ID	varchar(32) COMMENT	Allow Null
	REGISTER_TIME	timestamp COMMENT	Allow Null
	LAST_ONLINE	timestamp COMMENT	Allow Null
	DELETED	tinyint COMMENT	Allow Null
	LOCKED	tinyint COMMENT	Allow Null
	EFFECT_TIME	timestamp COMMENT	Allow Null
	FAILURE_TIME	timestamp COMMENT	Allow Null

fig. 5 Example of user data

4. i-link data

Every co-botic™ 45 has an i-link board built into the unit. For data security regarding i-link please see the i-link “Security Policies” document. There are no data transmissions between the i-link module and the internal components of the co-botic™ 45, the i-link board only measures runtime and determines its location by itself. Therefore this is a standalone module built into the co-botic™ 45.

Only the built in i-link board is able to determine the estimated position of the unit. There is no way for the co-botic™ 45 itself to determine it’s position. For data security regarding i-link please see the i-link “Security Policies” document.

5. Third party SDK data collection

When using the supplied operator phone and not using the apk on a private device, the following is not of interest.

1. Crash data

The operator phone and installed apk collects crash data for statistical analysis of abnormal and error data during app operation.

2. Cellphone information

The operator phone and installed apk will collect cellphone information such as android ID, IMSI, SD, IMEI, ICCID, SIM, IP address. This is not of interest if the apk is installed on the supplied operator phone only.

5.1. User and machine data

An example of co-botic™ 45 data that is being sent to the server for normal operation can be found in fig 6 and fig 7. The coordinates and location are being determined by the domestic IoT sim card supplier.

tb_robot

	Field	Type	Extra
P	ROBOT_ID	varchar(32) COMMENT	
	ROBOT_NAME	varchar(64) COMMENT	Allow Null
	ROBOT_ALIAS	varchar(32) COMMENT	Allow Null
	ROBOT_TYPE	tinyint(1) COMMENT	Allow Null
	SUPPLIER	varchar(32) COMMENT	Allow Null
	ROBOT_BATCH	varchar(32) COMMENT	Allow Null
	ALIVE_STATUS	tinyint(1) COMMENT	Allow Null
	LIFECYCLE_STATUS	tinyint COMMENT	Allow Null
	SIZE_LENGTH	float(3,2) COMMENT	Allow Null
	SIZE_WIDTH	float(3,2) COMMENT	Allow Null
	SIZE_HEIGHT	float(3,2) COMMENT	Allow Null
	LOG_PATH	varchar(64) COMMENT	Allow Null
	LAST_ONLINE	timestamp COMMENT	Allow Null
	ORG_ID	varchar(32) COMMENT	Allow Null
	PROJECT_ID	varchar(32) COMMENT	Allow Null
	MAP_ID	varchar(32) COMMENT	Allow Null
	DELETED	tinyint(1) COMMENT	Allow Null

fig. 7 Data from the app that is sent to the server

tb_robot_iot

	Field	Type	Extra
P	ROBOT_ID	char(32) COMMENT	
	ICCID	char(20) COMMENT	Allow Null
	IMEI	char(15) COMMENT	Allow Null
	IMSI	char(15) COMMENT	Allow Null
	LONGITUDE	decimal(9,6) COMMENT	Allow Null
	LATITUDE	decimal(9,6) COMMENT	Allow Null
	COORDINATE	varchar(255) COMMENT	Allow Null
	LOCATION	varchar(255) COMMENT	Allow Null
	SUPPLIER	varchar(255) COMMENT	Allow Null
	TIMEZONE	varchar(128) COMMENT	Allow Null

fig. 6 IoT data that is sent to the server

5.2. Task and operation data

The co-botic™ 45 sends task and operational data to the server. This is for task synchronization but also for cleaning reports and notifications to the operator phone. Find what data is being send in fig 8 and fig 9.

tb_job

	Field	Type	Extra
P	JOB_ID	varchar(32) COMMENT	
	JOB_CODE	varchar(32) COMMENT	
	REPORT_ID	varchar(32) COMMENT	Allow Null
	TASK_ID	varchar(32) COMMENT	
	SERIAL_NUM	int COMMENT	Allow Null
	PLAN_ID	varchar(32) COMMENT	Allow Null
	PLAN_NAME	varchar(32) COMMENT	Allow Null
	MAP_ID	varchar(32) COMMENT	Allow Null
	MAP_NAME	varchar(32) COMMENT	Allow Null
	ROBOT_ID	varchar(32) COMMENT	Allow Null
	JOB_TYPE	tinyint(1) COMMENT	Allow Null
	ISSUED_BY	varchar(32) COMMENT	Allow Null
	START_TIME	timestamp COMMENT	Allow Null
	END_TIME	timestamp COMMENT	Allow Null
	REPETITION	int COMMENT	Allow Null
	FINISHED_CYCLES	int COMMENT	Allow Null
	JOB_POINTS	longtext COMMENT	Allow Null
	JOB_DESC	varchar(64) COMMENT	Allow Null
	STATUS	tinyint(1) COMMENT	Allow Null
	DELETED	tinyint(1) COMMENT	Allow Null
	REMAINING_REGION	varchar(8192) COMMENT	Allow Null
	JOB_AREA	float(10,2) COMMENT	Allow Null
	COVER_AREA	float(10,2) COMMENT	Allow Null
	UNCOVERED_AREA	float(10,2) COMMENT	Allow Null
	PERCENT_COVER_AREA	float(5,2) COMMENT	Allow Null
	PERCENT_COMPLETE	float(5,2) COMMENT	Allow Null
	RESERVED_FIELD	varchar(32) COMMENT	Allow Null

fig. 8 Operational data

tb_task

	Field	Type	Extra
P	TASK_ID	varchar(32)	
	TASK_CODE	varchar(64)	Allow Null
	PROJECT_ID	varchar(32)	Allow Null
	EXEC_CRON	varchar(64)	Allow Null
	TASK_MODE	tinyint COMMENT	Allow Null
	AUTO_CONTINUE	tinyint(1) COMMENT	Allow Null
	AUTO_RETURN	tinyint(1) COMMENT	Allow Null
	CREATED_TIME	timestamp COMMENT	Allow Null
	CREATED_BY	varchar(32) COMMENT	Allow Null
	START_TIME	varchar(10) COMMENT	Allow Null
	END_TIME	varchar(10) COMMENT	Allow Null
	REPETITION	smallint COMMENT	Allow Null
	SCHEDULE_STATUS	tinyint(1) COMMENT	Allow Null
	TASK_DESC	varchar(255) COMMENT	Allow Null
	ACTIVATED	tinyint(1) COMMENT	Allow Null
	DELETED	tinyint(1) COMMENT	Allow Null
	ARRANGE_CODE	tinyint(1) COMMENT	Allow Null
	ARRANGE_TIME	varchar(255) COMMENT	Allow Null
	CLEAN_INTENSITY	tinyint COMMENT	Allow Null
	ROBOT_ID	varchar(32) COMMENT	Allow Null

fig. 9 Task data