

***Envirologic***



# EVO Cleaner

 made in Sweden by Envirologic

## INTRODUCTION



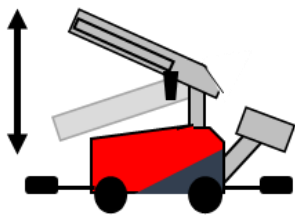
  
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CARE ABOUT PEOPLE

# RANGE OF MOTION

## Boom up/down

The boom moves about 100° from bottom (position 0) to top (position 1250). Parked position should be horizontal (about position 700).



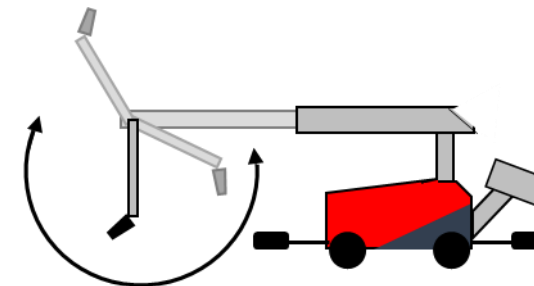
## Tower right/left

The tower can go about 200° in both directions (positions ±1000) from its parked forward position (about position 0).



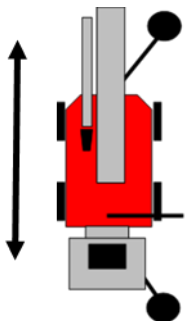
## Arm out/in

The arm starts from its parked position parallel to the boom (position about -55). The arm can go out about 315° (to position 1100), so it points towards the ceiling.



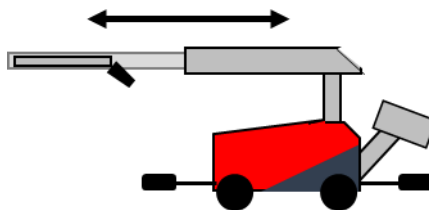
## Robot forward/backward

Travels in the aisle with the steering wheels against a wall.



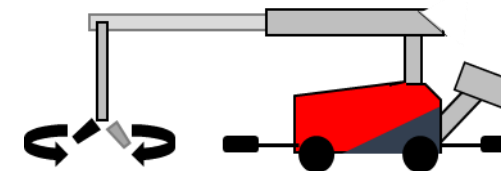
## Telescope out/in

The telescope can run out from its parked position 0 to position 425.



## Nozzle right/left

The nozzle can spin 360° in both directions. The nozzle is parked when the arm is parked and nozzle points downwards.



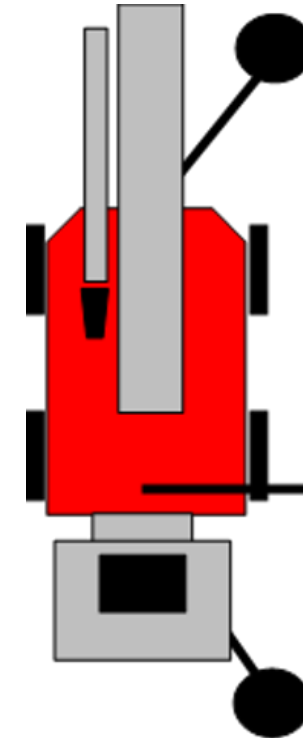
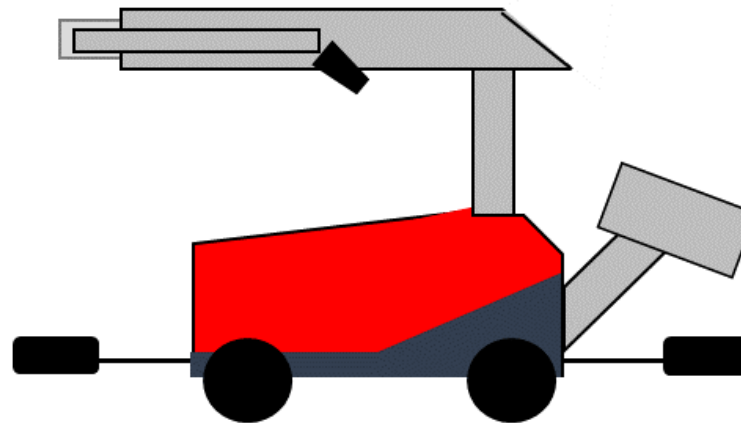
# PARKED ROBOT

The robots start positions are called parking positions. This is how the robot looks like when it's parked.

From this position the robot counts how far each function travels.

 Counts with pulses (not centimeters)

 Uses absolute positions



# GENERAL INFORMATION

## Battery:

The EVO Cleaner must be connected to the charger when not used.

How to charge:

1. Robot must be switched off to be able to charge the batteries.
2. Connect the charger to robot FIRST.
3. Then connect the power.
4. Charger shows ONLY yellow/orange light. Any other light combinations are wrong.

🔌 Open the hood during charging to prevent mice eating on cables.

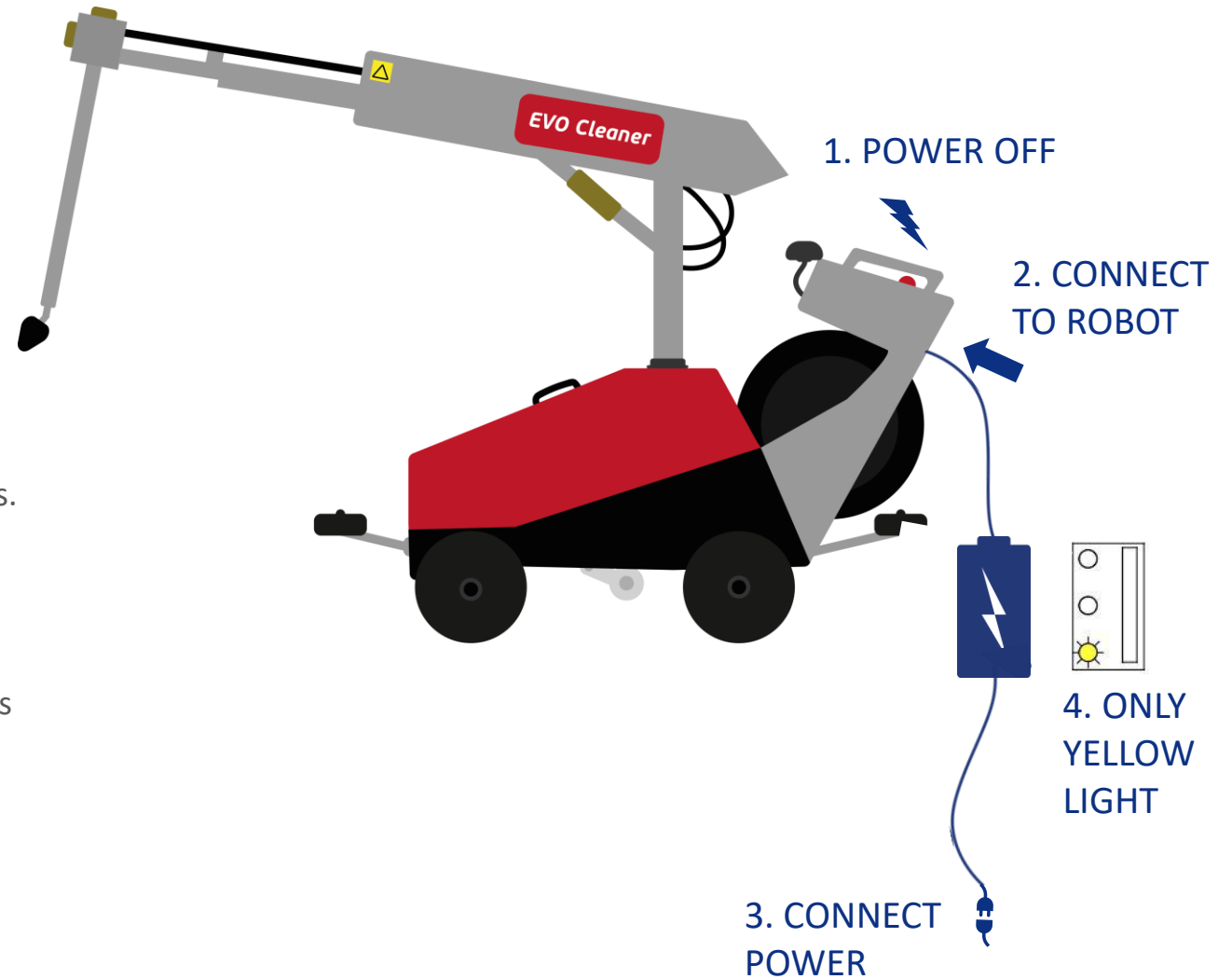
🔌 Runs on 24V (two 12V leisure and marine batteries).

## Battery care:

- 🔌 Avoid short periods of charging – Charge as many hours as its been used.
- 🔌 Avoid running the batteries empty.
- 🔌 Always charge the robot when not used.

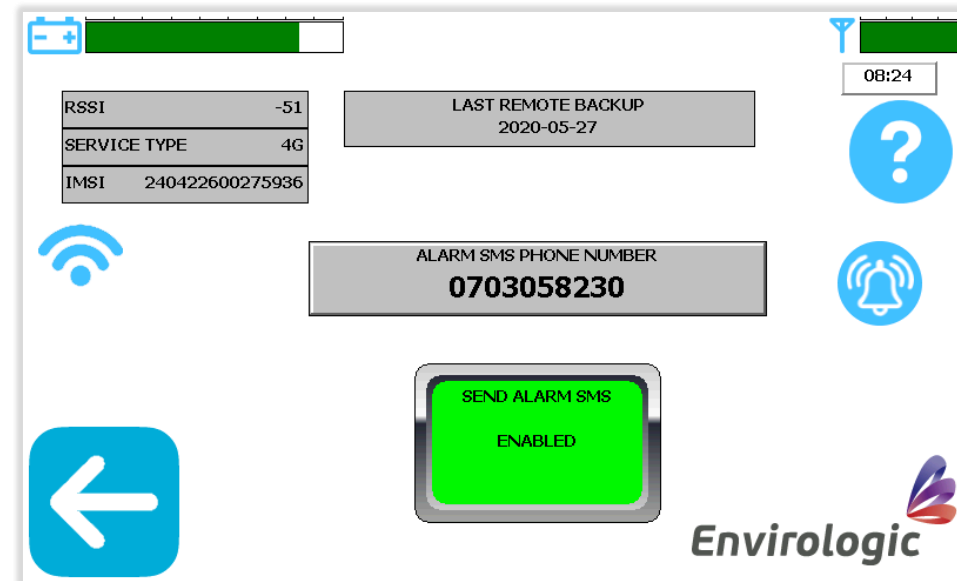
The batteries can lose capacity over time. If used without care, the capacity will decrease much faster.

- 🔌 Can normally wash **UP TO** 40 hours.



# GENERAL INFORMATION

- ✎ Clean the robot itself before charging.
  - ✎ Only use soft water on the robot, not high pressure!
  - ✎ The dirt gets easily away while still wet (recommend to clean the robot directly).
  - ✎ Clean machines perform better
  
- ✎ Keep joystick and markers in a safe place.
  
- ✎ Enter phone number via the “Internet screen”.
  - ✎ Sends text message when the automatic wash has ended.
  - ✎ Sends text message when robot stops in alarm.
  - ✎ Sends text message for too low and too high water pressure.
    - ✎ Water on – under 50 bar for 30 seconds = Alarm for low pressure.
    - ✎ Water off – Over 50 bar for 30 seconds = Alarm for high pressure.
  
- ✎ Wi-Fi (2020 years model) if the mobile signal is non-existent.



# MANUAL TRANSPORT

- ⚡ The EVO Cleaner weighs 270 kg
- ⚡ Transport wheels makes it easy to turn around corners.
- ⚡ The batteries makes it easy to transport and move between stables.
  - ⚡ Run the electric motors via the manual screen.
    - Uneven floors
    - Thresholds
    - Etc.
- ⚡ Runs easily uphill and smooth downhill.
  - Trailers
  - Level differences








# HIGH-PRESSURE WASHER

A high-pressure washer with too big pump will by-pass the extra water or in worst case constantly start and stop. Water is never completely clean, and this by-pass causes a big wear on pump and valves. Too small pump and you will not get the pressure required.

We recommend that you buy your high-pressure washer from the local dealer who can offer you the best service for your high-pressure washer.

We recommend to use a simple whole house water filter before the high-pressure cleaner (on the low pressure side).

## Pressure washer recommendations:

-  Flow about 16-18 liters/min (1000 L/hour), higher flow is only a cost.
-  Water pressure 180 – 220 bar.
-  **Pump controlled by pressure-switch** (there are also pumps controlled by a flow-switch. That, however, sometimes gives problems starting the pump since it's depending on the water pressure on the farm which mostly goes up and down due to showers, food systems and so on).
-  Automatic start/stop function.
-  High quality, it's going to work long hours.



Water filter



KRÄNZLE QUADRO 1000 TS



KÄRCHER HD 10/25-4 S PLUS



# MAGNETIC MARKERS

- ✦ Markers are used for the robot to know where it is and are placed in the aisle in the same place at each pen.
- ✦ The markers are magnetic. The robot has a magnetic sensor to read the markers.
- ✦ The sensor shall be adjusted within 10cm from the marker.
- ✦ The markers are only placed in the aisle during the wash. Brackets are mounted permanently.
- ✦ Programs starts from markers.
- ✦ Markers are the programs zero position.
- ✦ Different type of markers can be used for different stables (stables looks different)



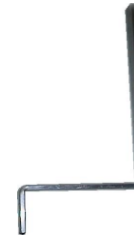
- Bracket for marker



- Universal clamp (to mount the bracket)



- Tube Clamp (to mount the bracket)






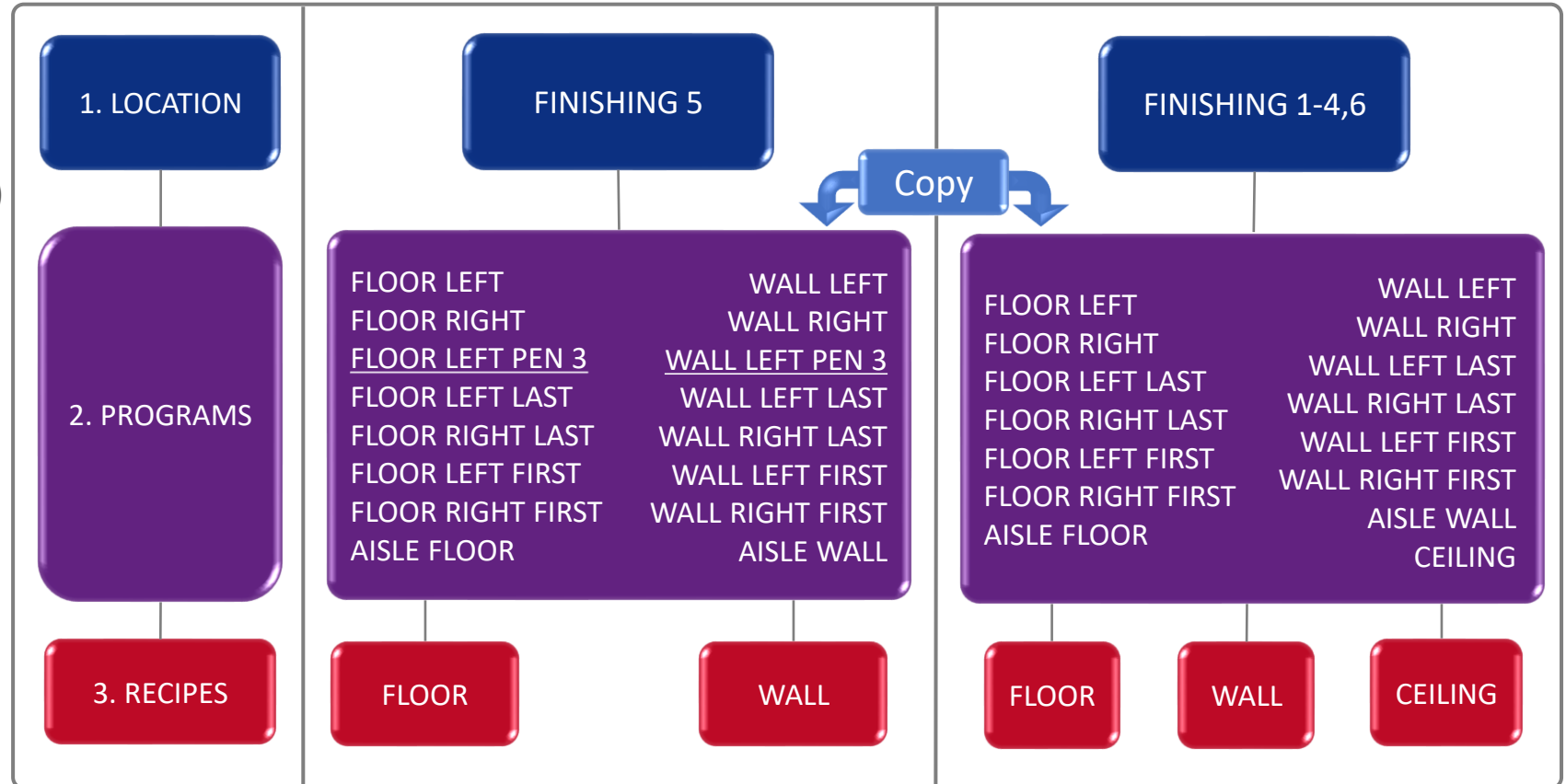
- S-Marker



- U-Marker (with bracket)

# PROGRAMMING - STRUCTURE

-  We must learn the robot three things:
  1. Location (markers exact positions)
  2. Programs (joystick movements)
  3. Recipes (compilation of programs)
  
-  Each location have their own programs and recipes separated from other locations.
  
-  It's possible to copy a program from one location to another if the pens are identical and markers have the same position in both rooms.





# PROGRAMMING - LOCATION

Location is the room you are supposed to wash. Name the location in the robot to the name you normally use for this specific room (ex. "Finishing 1"). Identical rooms use the same location (ex. "Finishing 1-4").

You only need to create a location the first time you are programming in this room. Then you re-use this location and create programs in that location.

Beside naming the location the robot must also read the positions of the markers.

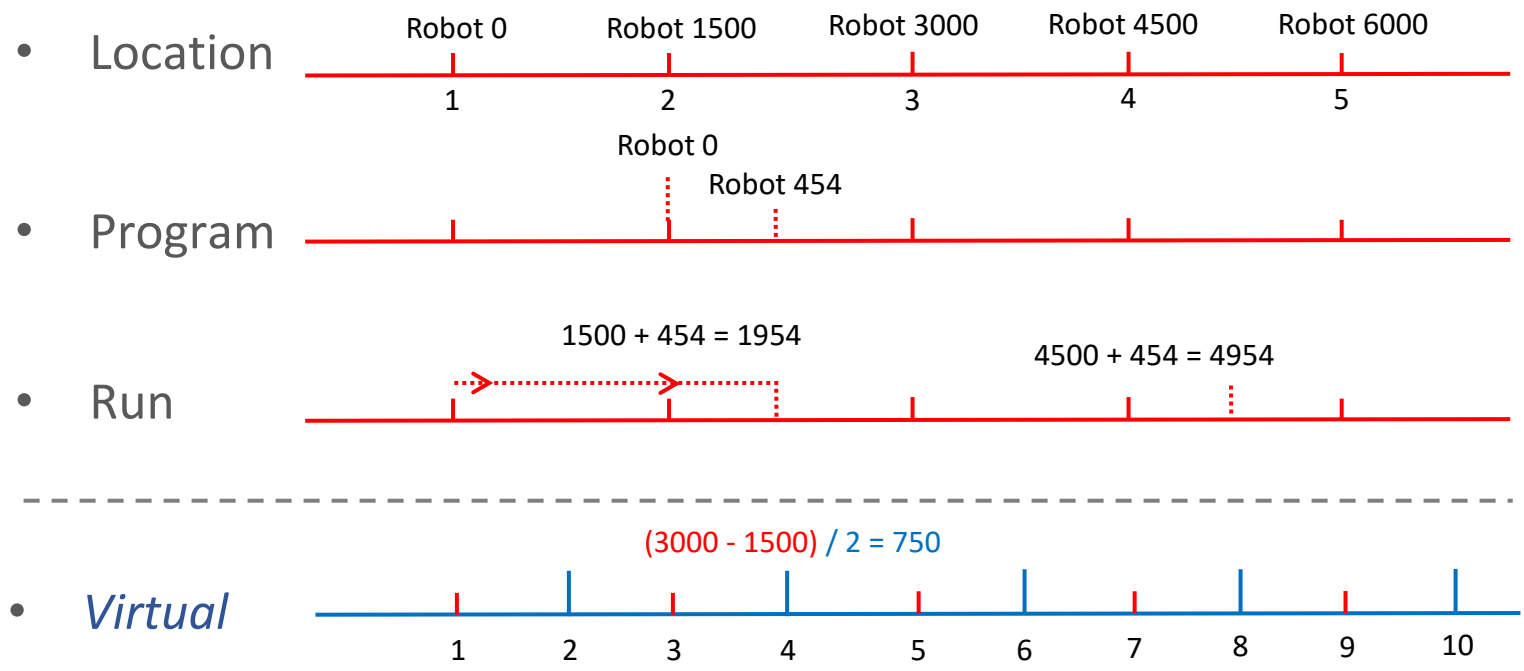
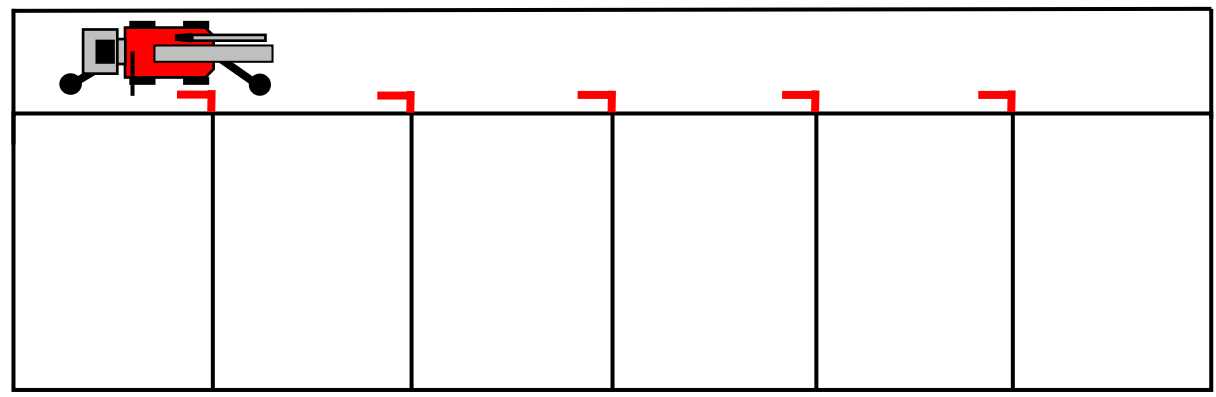
First markers is always 0.

Virtual markers are used when the stables are very long with identical boxes.

The robot create its own markers in between every physical marker.

Place a marker at every other pen instead of every pen.

Always ends with a virtual marker.

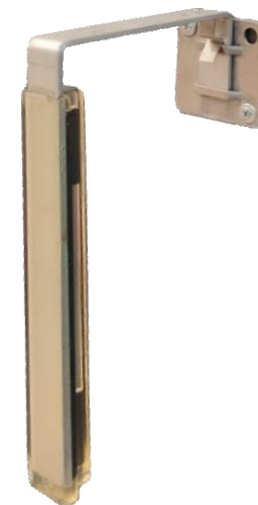
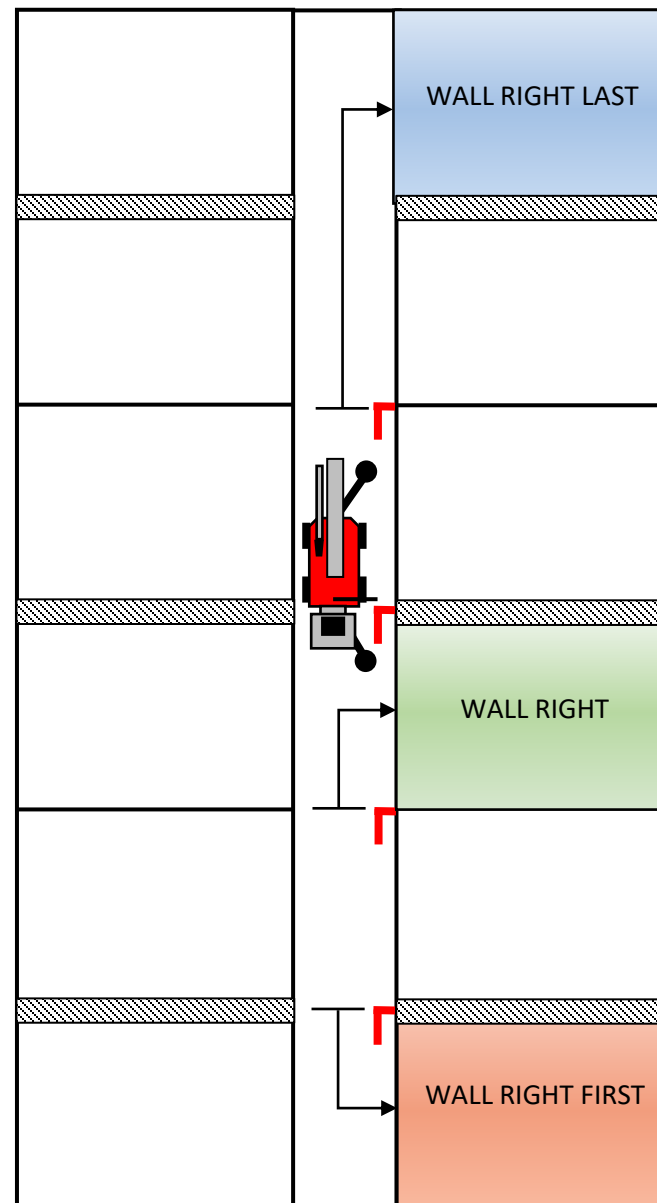




# PROGRAMMING - LOCATION

LOCATION NAME:  
WEANING 1-4

- Markers are placed in the aisle on one side at each standard pen with a mounted bracket.
- While the robot reads the markers, follow the robot to make sure it senses all markers as planned. Have also an eye on the wheels so they don't get stuck and spin.
- The EVO Cleaner resets the counter for the wheel positioning when it reads a marker during automatic wash (if wheels have spun/slipped due to obstacles/slippery floors)
- Markers makes it possible to repeat programs.

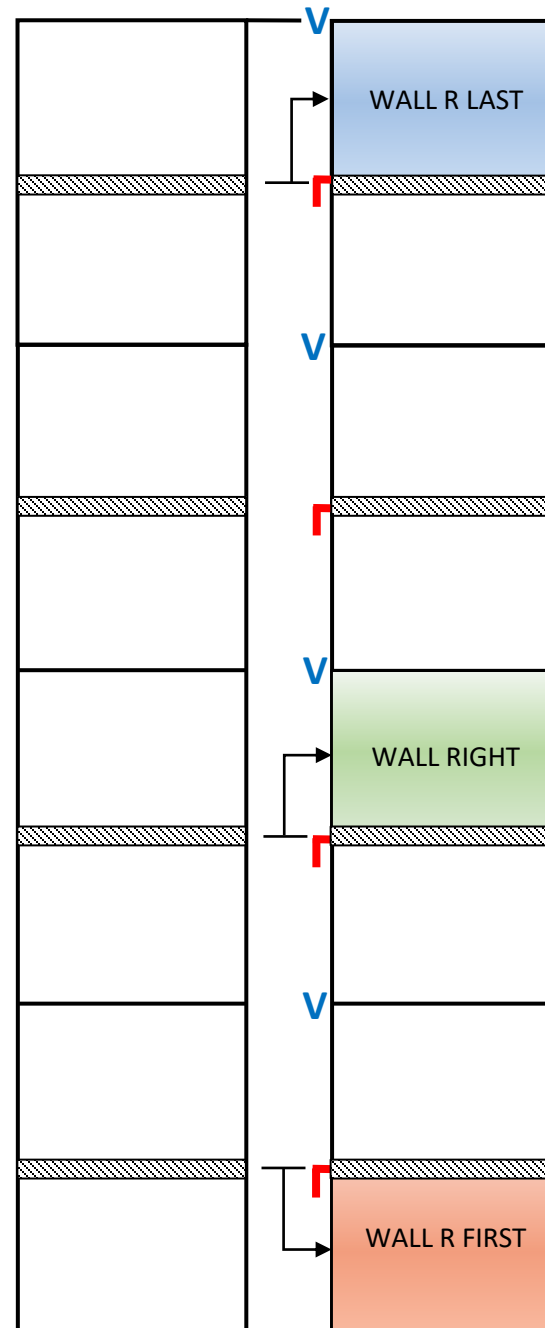


Marker with bracket

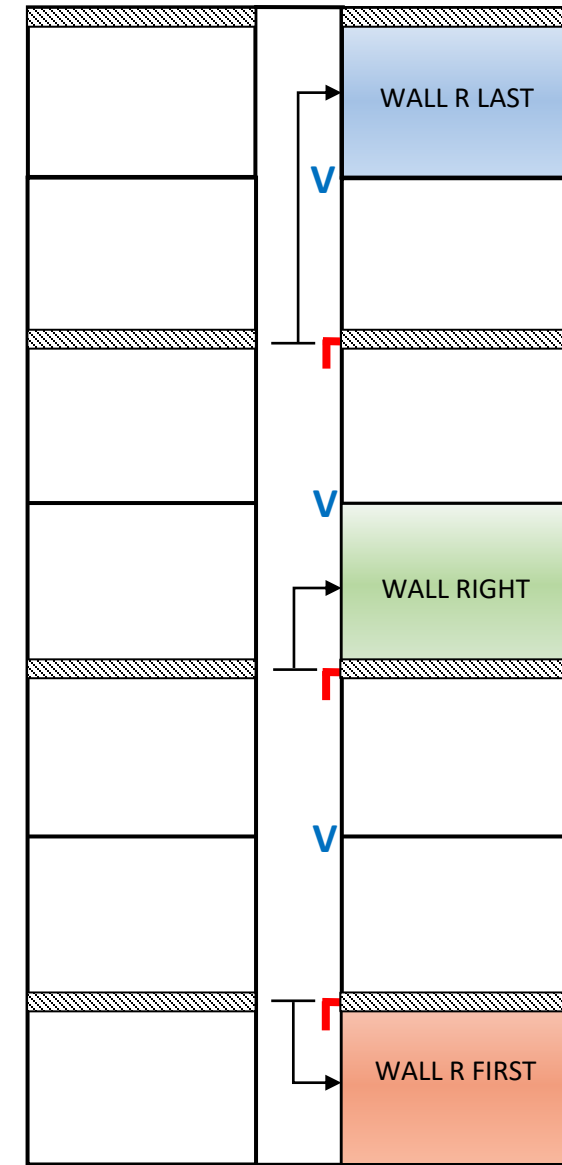
# PROGRAMMING – VIRTUAL MARKERS

- Fewer markers needed with the virtual marker feature.
- Programs can only be created from physical markers
- Virtual markers is used to repeat programs for identical pens.

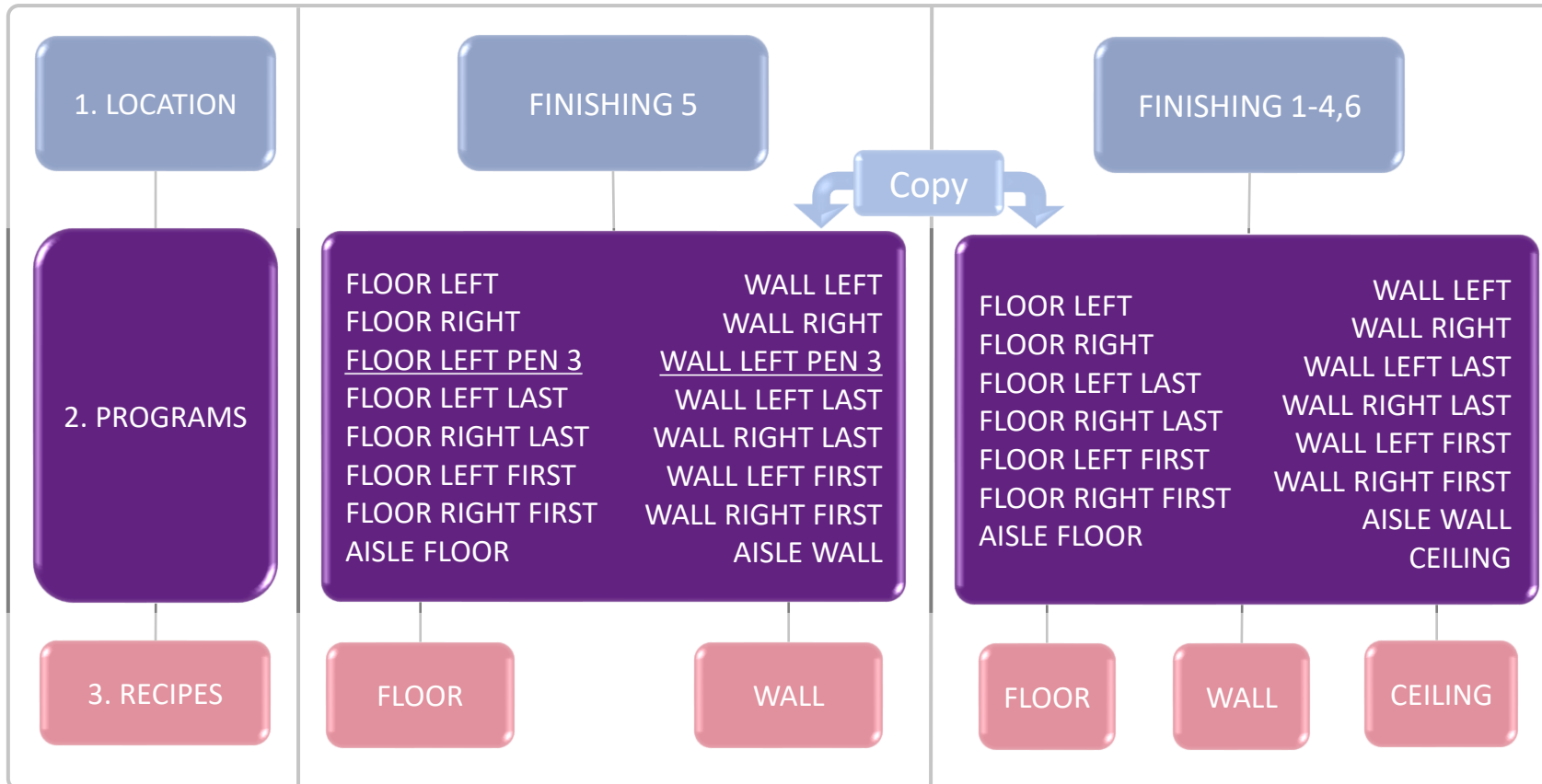
LOCATION NAME:  
WEANING 1-4



EVEN VERSUS UNEVEN  
NUMBER OF PHYSICAL  
MARKERS



# PROGRAMMING – 2. PROGRAM



# PROGRAMMING - PROGRAM

- ✎ A program are the movement patterns we teach the robot with the joystick.
- ✎ Programs can only be recorded from physical markers.
- ✎ The programs must be efficient and ergonomic for the robot.
- ✎ One pen is generally washed with two separate programs, one floor program and one wall program.
  - ✎ The floors are the dirtiest. Possible to wash the floor many times.
  - ✎ Short programs, quicker programming.
  - ✎ Works as soaking for dry dirt/pens.
- ✎ We make the programs according to this priority list:
  1. No alarms
  2. Efficiency/Speed
  3. Results
- ✎ Give the programs specific names so it's easy to separate the various programs.
  - ✎ Floor right
  - ✎ Wall left
  - ✎ Wall left last
  - ✎ Floor right first



Overview of a switch-back road. A floor program looks the same.



# PROGRAMMING - TIPS

An EVO Cleaner that washes 60% clean, efficient, is a better robot than the one who tries to wash up against 90% clean but who always ends up in alarm due to small margins to the interior. The more you program the better programmer you will be, and it'll give you better results and more efficient programs. Aim first to create programs that work efficient.

When this room is empty next time, take your time to redo a program or two. This time you make even better programs that are even more efficient and provides better results. Work gradually with this until you get programs with a result you are happy with.

- 🚩 Go through the entire room and see if any pen has any differences from the others.
- 🚩 Keep good distance to all interior with all the robot's functions.
- 🚩 Know where to start the program and where it should end. Make your plan on how to get from start to finish.
- 🚩 Create “general” programs in an average-dirty pen.
- 🚩 If possible, teach the programs in the pen where you have special pipes or so. The pen with differences could also need its own unique program.





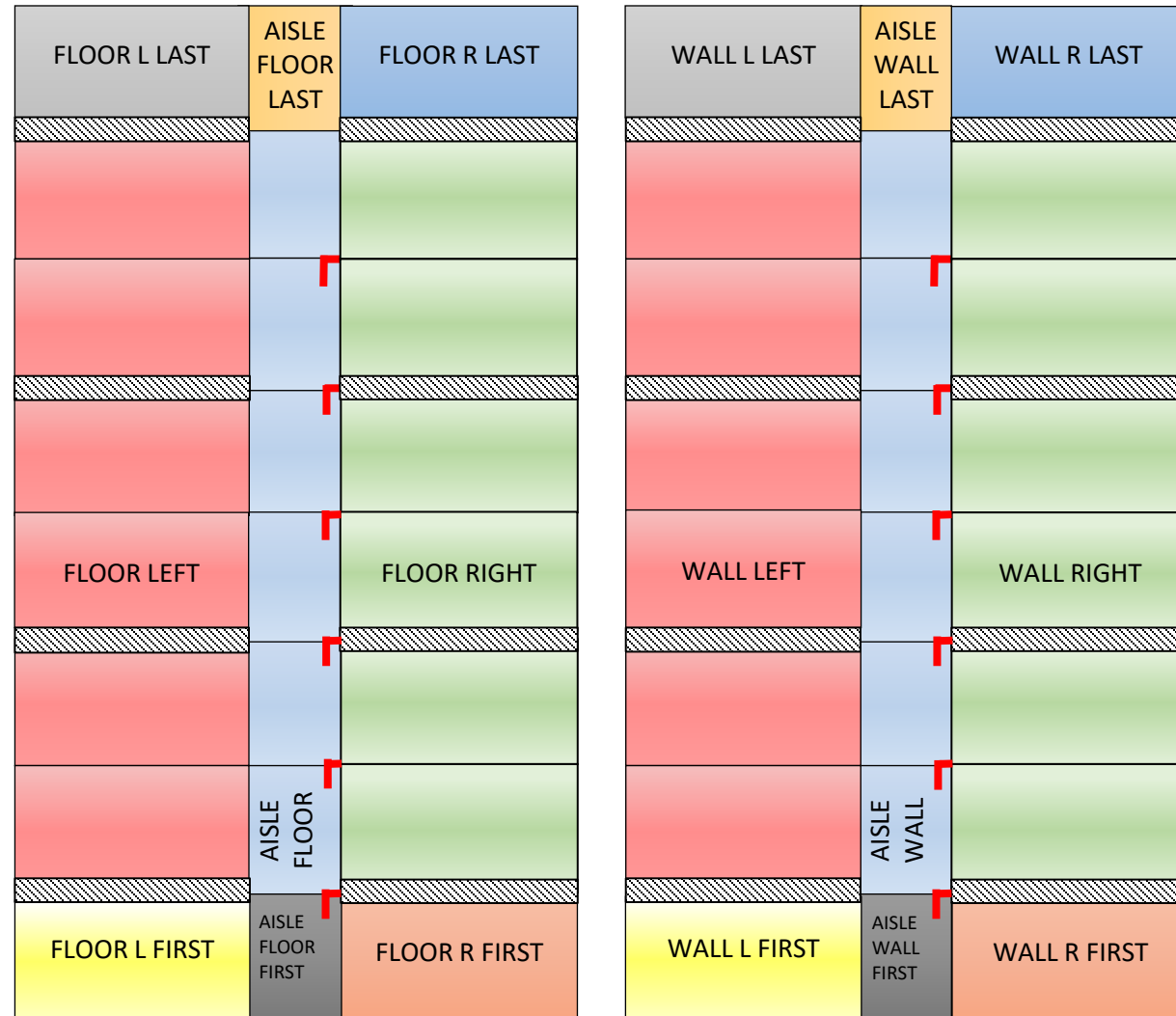
# PROGRAMMING - PROGRAM

**At start-up, put the time and energy on the programs you can use in many pens.**

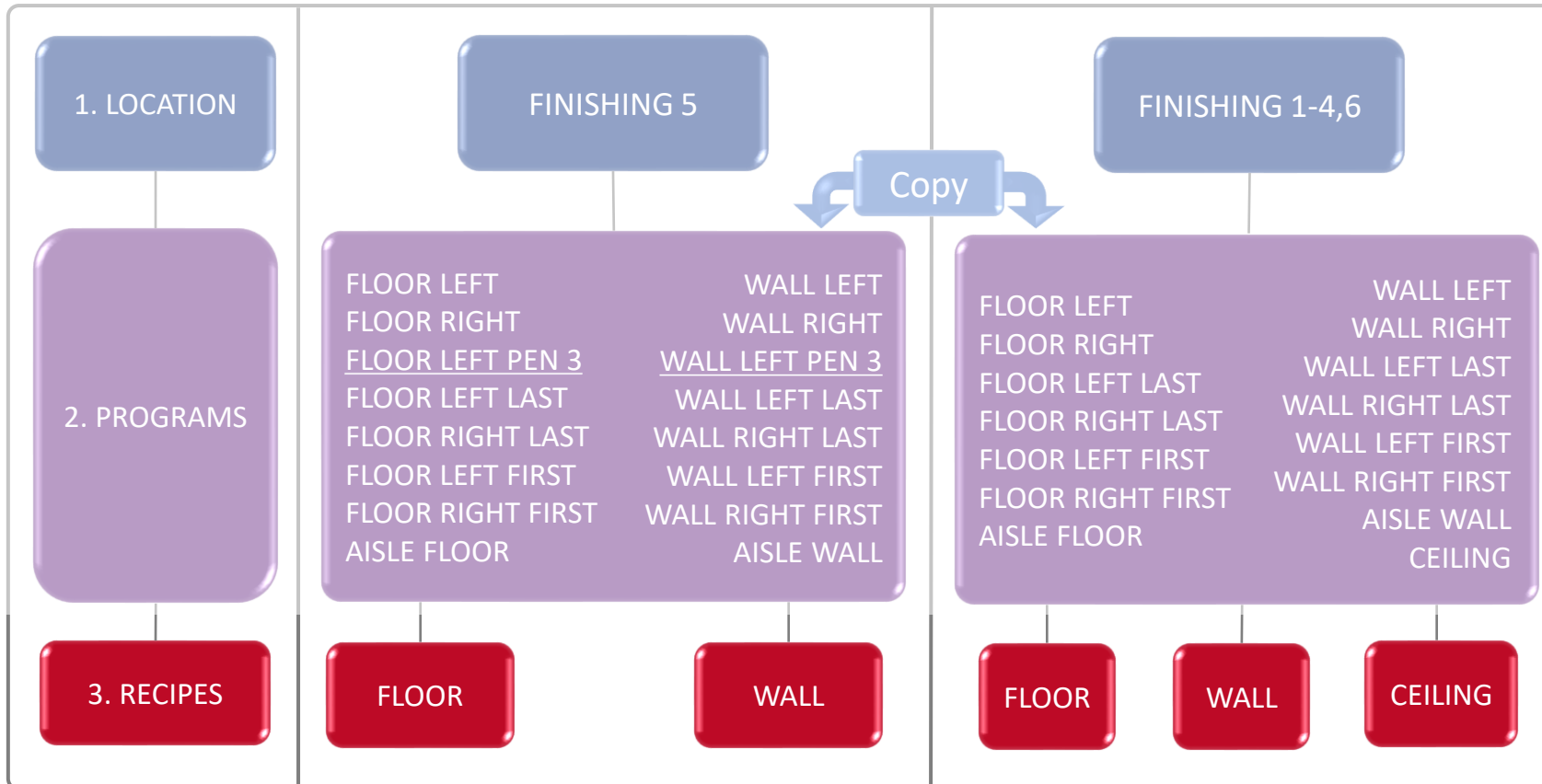
The first and last pens in a row are most often unique, meaning those programs can only be used in one pen due to the outer walls or different size of the pen.

**Do not focus on them.**

Always do separate programs for the floor and for the wall. Then always put them into two different recipes.



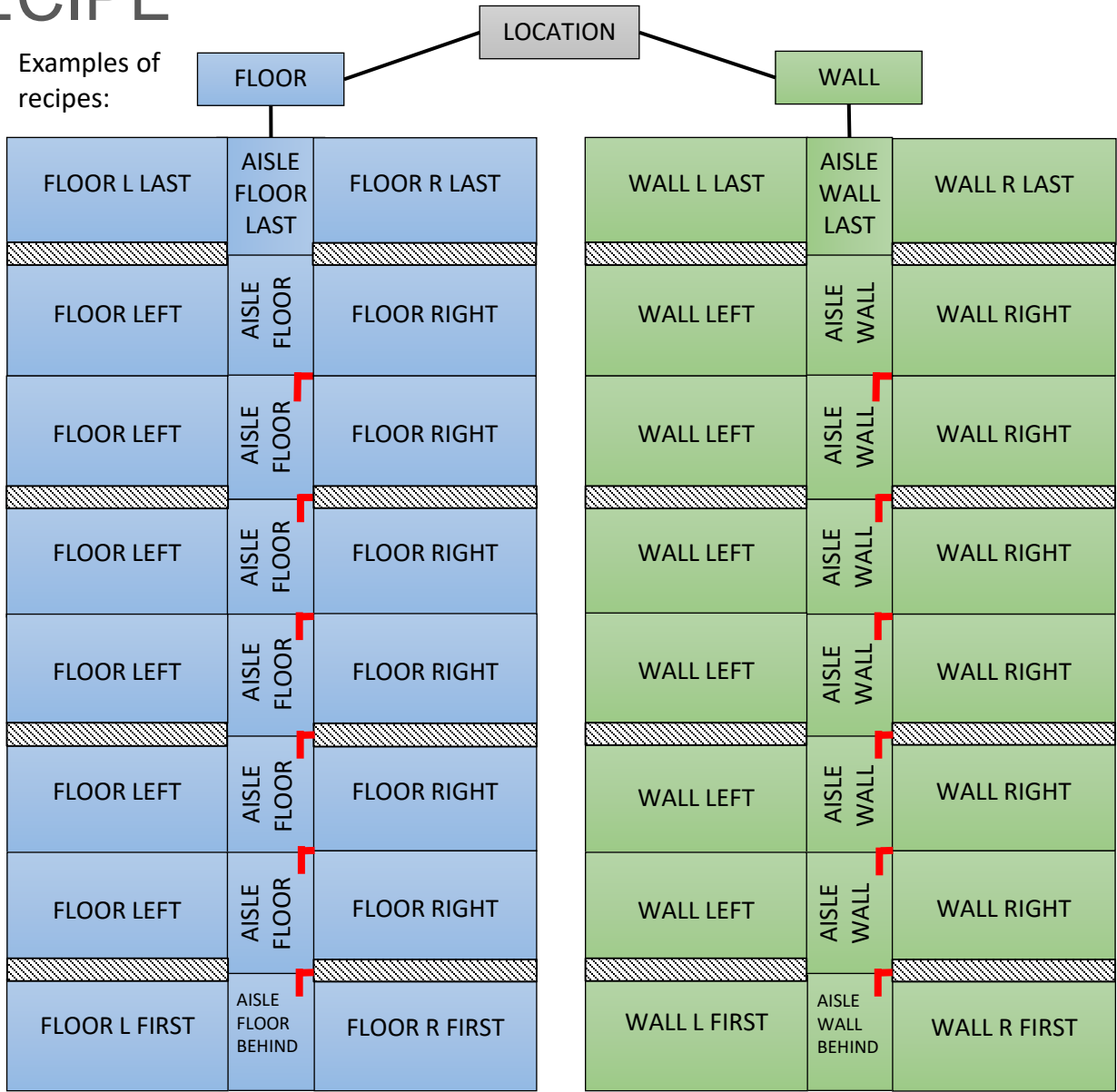
# PROGRAMMING – 3. RECIPE





# PROGRAMMING - RECIPE

- Recipes is a compilation/mix of different programs.
- The recipes tells the robot which programs to run at which marker.
- Separate the floor- and wall programs into two different recipes.
- You can tell the robot to run same recipes multiple times. For example:
  - Floor
  - Floor
  - Wall
  - Up to 10 recipes in a queue
- Recipes are named for the general washing area/task.



FLOOR RECIPE

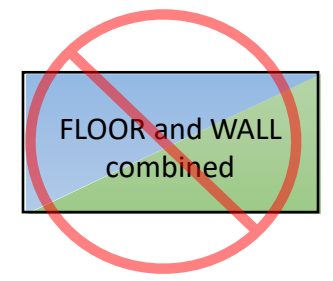
THEN

WALL RECIPE

= CORRECT

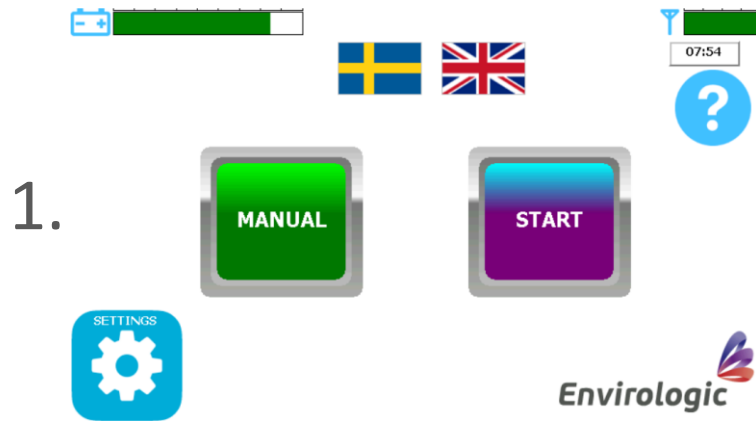
To wash floor and walls in the same recipe is NOT more efficient and doesn't give a better result.

**We want the soaking process!**



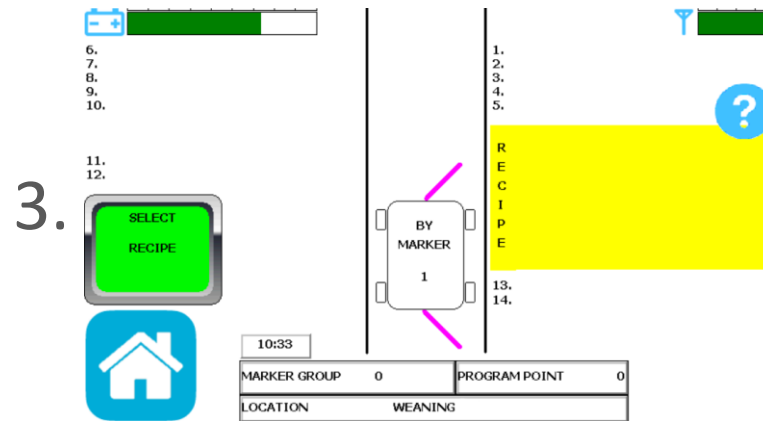
# START AUTOMATIC WASH

1.



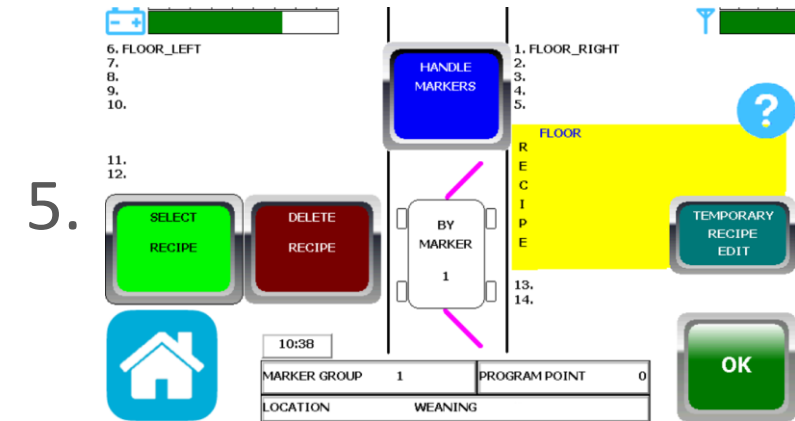
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3.



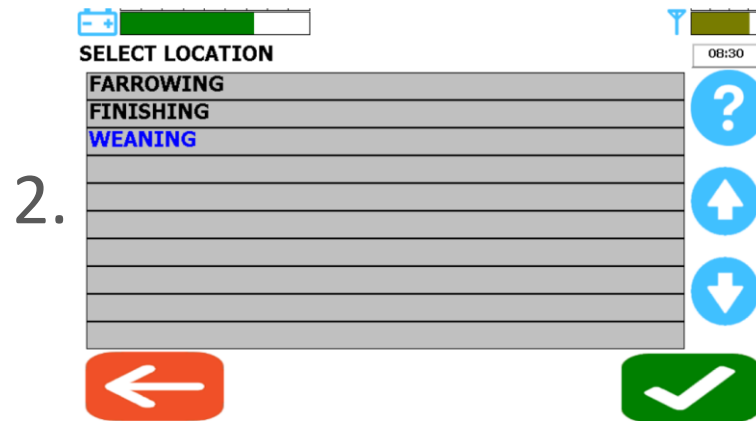
MARKER GROUP	0	PROGRAM POINT	0
LOCATION	WEANING		

5.




MARKER GROUP	1	PROGRAM POINT	0
LOCATION	WEANING		

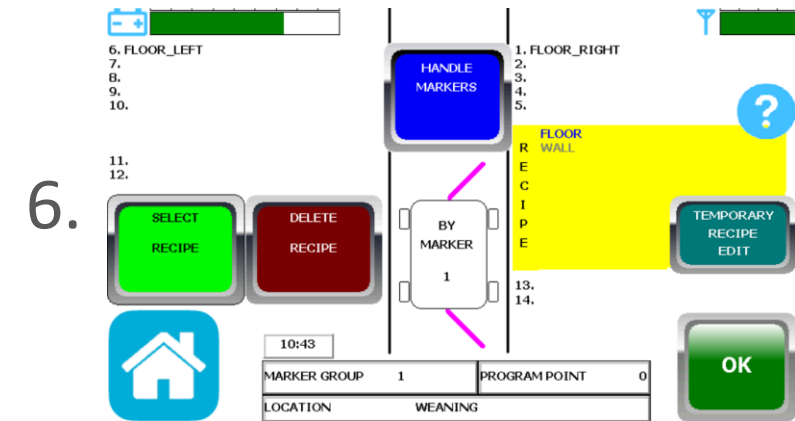
2.



4.



6.



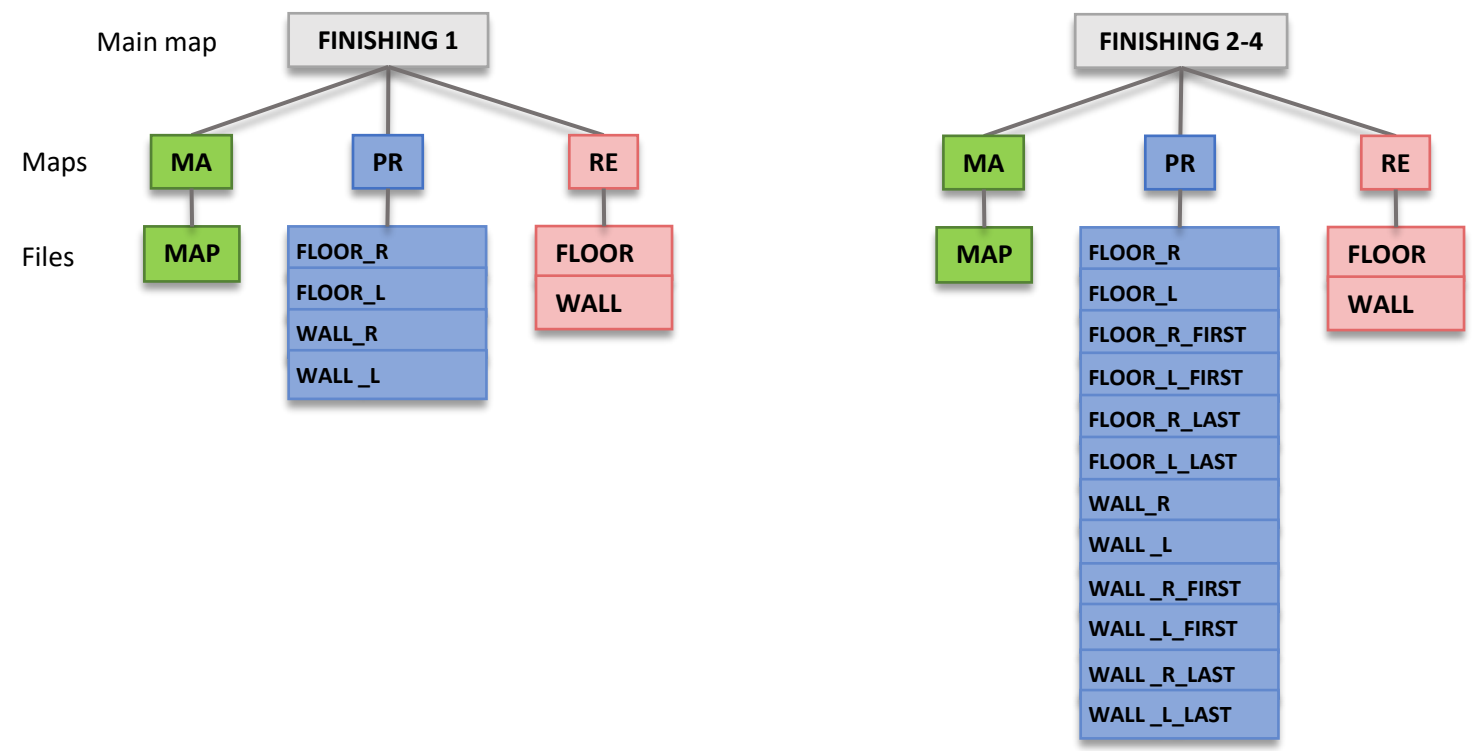
MARKER GROUP	1	PROGRAM POINT	0
LOCATION	WEANING		



# DATA STORAGE - MAP STRUCTURE

This is how the robot stores the information.

- The location name is the main map
- Each location are unique
- MA** > MAP: File with the exact distance of the markers.
- PR** > PROGRAMS: All programs are stored here. Notice that each location has their own programs
- RE** > RECIPES: These recipes are a compilation/mix from the PR-map.



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