

## Virtual markers - Explanation

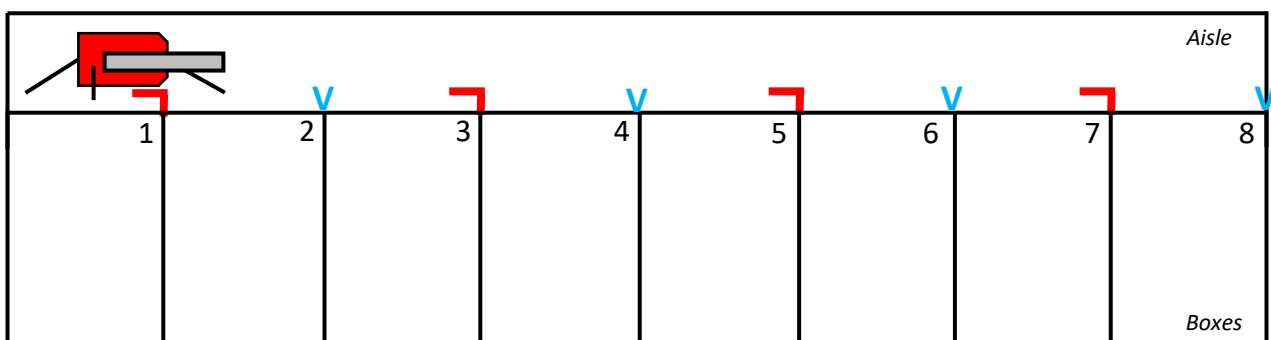
Virtual markers are a function to use in long stables with many boxes in a row. Its main purpose is to make you carry around less markers.



The function works like this. Instead of having markers at every box, you place a marker at every other box. The markers are supposed to be placed at one side of the row only, as it is without using virtual markers. The robot, after reading the physical markers during new location programming, creates the virtual markers in between the physical markers (exactly in the middle of the physical markers). The robot will also always create a virtual marker after the last physical marker with the half distance as the two last physical markers has between them (see illustrations below).

However, there are still a few things you must have in mind when using virtual markers.

- The robot can only start an automated wash from a physical marker.
- You can also only teach a program from a physical marker. This means that you temporarily must place a marker at a box during programming if you want to program for a virtual marker. Remember that the temporary marker must be placed at the same place in the inventory as the other physical markers (where the virtual marker is supposed to be).
- When creating recipe, have in mind that the last marker of the recipe is a virtual marker. This means that you might not be able to use this marker in the recipe due to the fact that it might be placed in the outer wall (see illustrations below). So, think through if you should place a program at the last marker or leave the last marker empty in the recipe.
- The last box in the row could be learned from the last physical marker.

Examples of virtual markers with an even number of boxes:

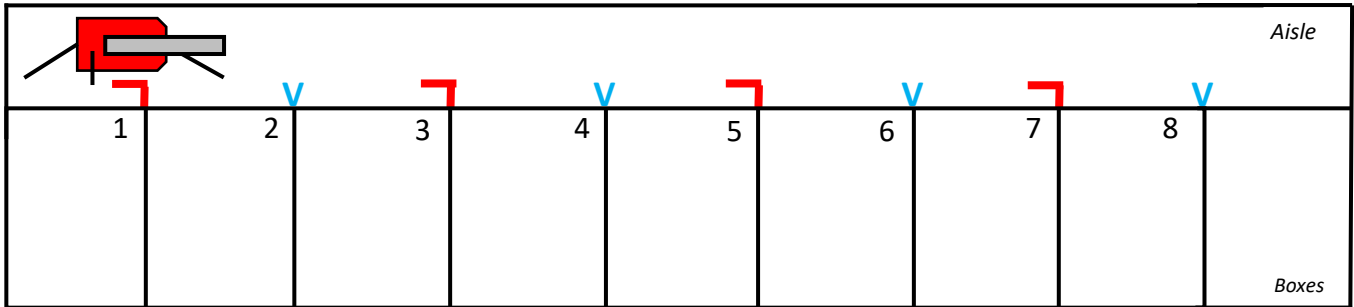


 = Physical marker       = Virtual marker

In this example, there are 4 physical markers in every other position. Between these, 3 virtual markers are created where otherwise there would have been physical markers. As mentioned in the text above, a virtual marker is also created after the last physical marker and in this example, it ends up in the wall. So, the last marker will not be used in the recipe build-up, so you shouldn't place any programs at marker 8 in this example.

The following examples illustrates the right side of a row only. But same principals are used and applied for the left side as well when programming. Markers is only placed on one side of the row.

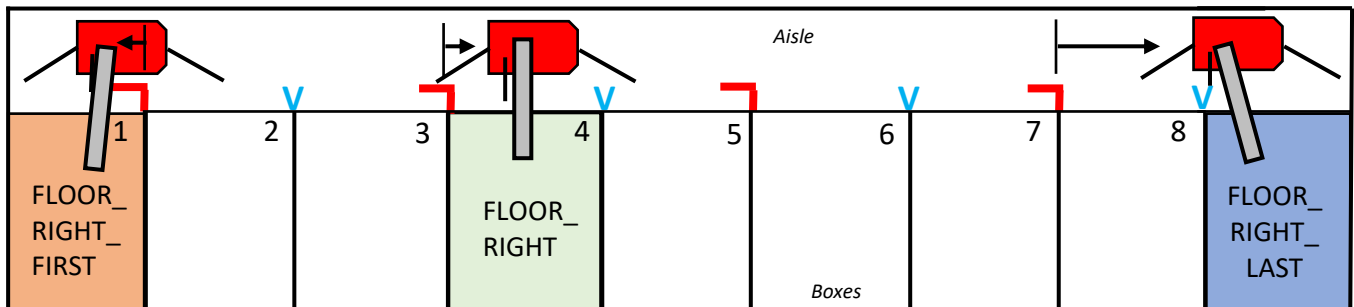
Examples of virtual markers with **uneven number of boxes**:



= Physical marker      = Virtual marker

Here we have an example where the last virtual marker (between box 8 and 9) can come to a use if it's possible to use the same program in the last box as in the rest. Otherwise, you'll have to make a new program for the last box. Note that you can only learn a program from a physical marker. So, in this case, the program for the last box (box 9) has to be learned from marker 7 which is the last physical marker. At the start of the programming for the last box, choose a start position past box 8. As you can see below.

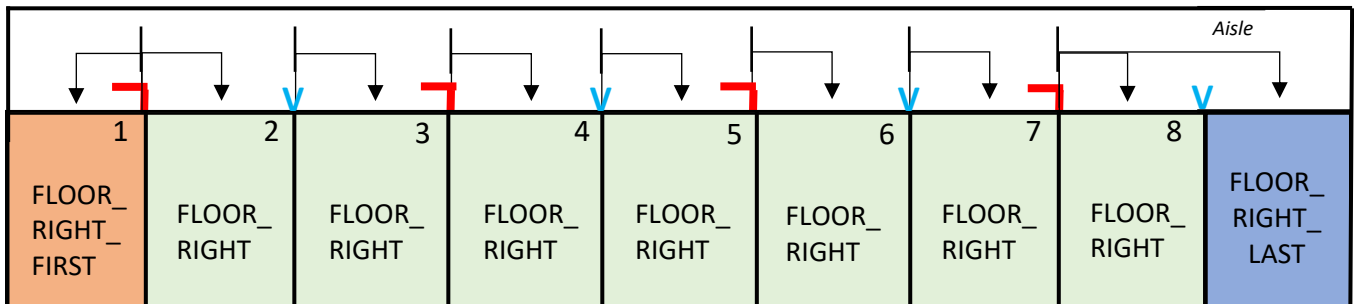
Examples of **teach-ins** with virtual markers with **uneven number of boxes**:



Since the program for the last box is learned from marker 7 (last physical marker), this program must also be placed at marker 7 in the recipe.

Examples of virtual markers with **uneven number of boxes** with placed programs:

If there are identical boxes, you can place same program for each of these markers. A program from a physical marker can also wash from a virtual marker.

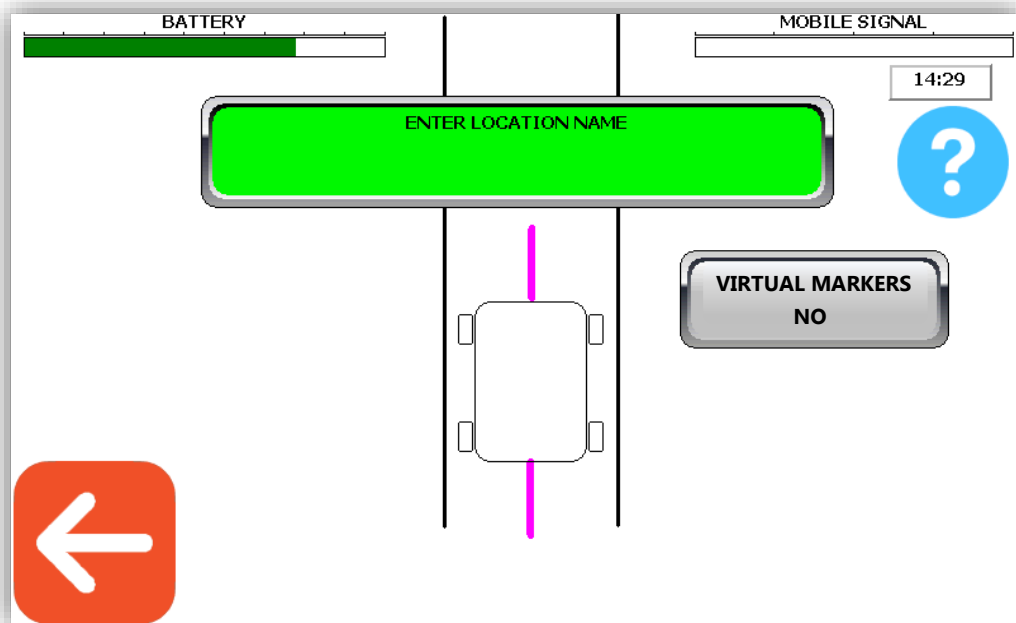


From the example above, the programs are placed at marker:

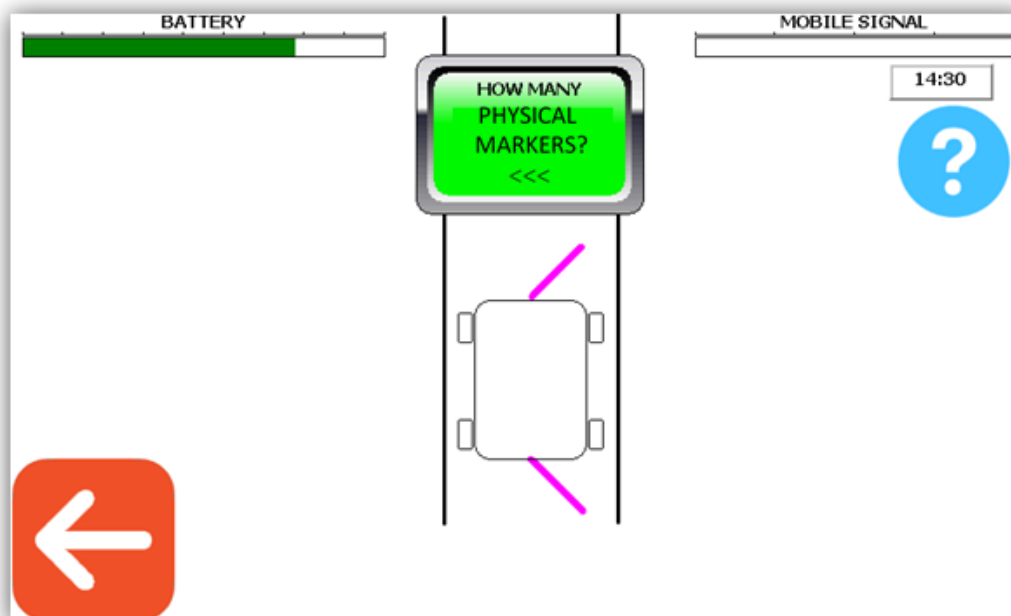
- Marker 1 (Physical): FLOOR\_RIGHT\_FIRST and FLOOR\_RIGHT
- Marker 2 (Virtual): FLOOR\_RIGHT
- Marker 3 (Physical): FLOOR\_RIGHT
- Marker 4 (Virtual): FLOOR\_RIGHT
- Marker 5 (Physical): FLOOR\_RIGHT
- Marker 6 (Virtual): FLOOR\_RIGHT
- Marker 7 (Physical): FLOOR\_RIGHT and FLOOR\_RIGHT\_LAST
- **Marker 8 (Virtual): -**

Where do you activate so your new location uses the virtual marker-function?

1. At the step where you are supposed to give your location a name, you'll see a grey button on the right side of the screen saying, "Virtual markers".
2. Press this button once to activate virtual markers for this location.
3. Name your new location.



When the robot asks for how many markers you've put up in the aisle, you enter the number of physical markers you've placed.



The robot will then go forward to sense where the physical markers is located. The robot then creates virtual markers exactly in the middle, in between, every physical marker. The robot will also always end with a virtual marker after the last physical marker.

If you want an existing location to use virtual markers you can name a new location to the same name you used before. The robot will ask if you want to overwrite this location. Press YES. Rewriting an existing location means you have your programs left (but you can always copy a program from one location to another). You need to create new recipes for the programs for it to work with virtual markers.