FINAL08 – HIGH-PRIORITY ORDER (HPO)03

National Institute of Standards and Technology

ARIAC NIST
Agile Robotics for Industrial
Automation Competition

Trial Description

- **Task**: Build **2** shipments from 2 orders. The initial order is interrupted at a convenient time by a second order, which is of higher priority (hpo). The robot must complete hpo as fast as possible and then must resume the completion of the initial order.
  - The conveyor belt is used.
  - There are faulty products in the environment.
  - 3 pulleys must be flipped.

- **Orders**: This trial consists of 2 orders (order_0 and order_1) with 1 shipment each (order_0::shipment_0 and order_1::shipment_0).
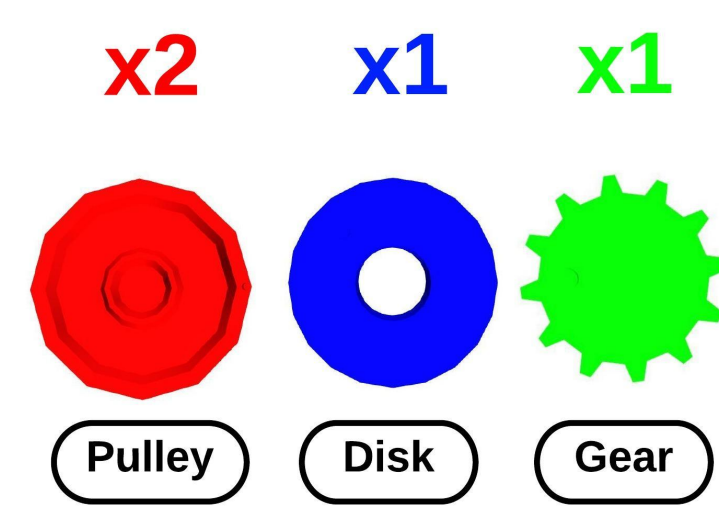 - order_0::shipment_0 consists of 4 products in total:

x2   **x1**   **x1**

Pulley   Disk   Gear

Fig. 1: Products used in order_0.

  - order_1::shipment_0 consists of 5 products in total:

x1   **x2**   **x1**   **x1**
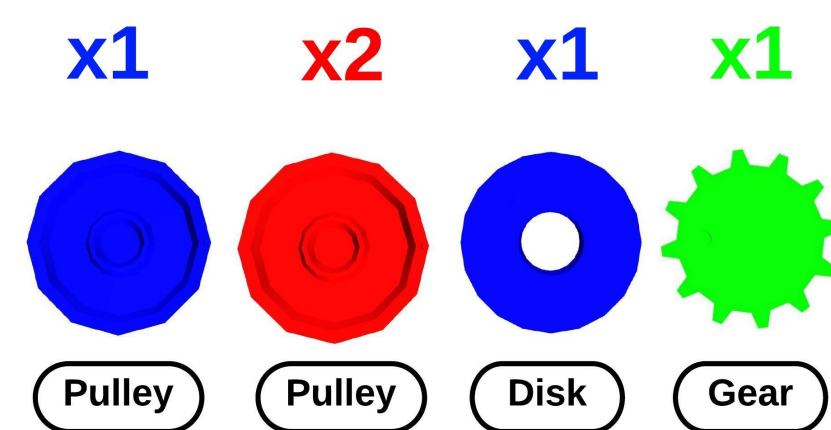
Pulley   Pulley   Disk   Gear

Fig. 2: Products used in order_1.

- **Maximum completion score**: 36 pts.
- **Agility challenges**:
  - Faulty products.
  - Flipped products.
- **Product vessels**: bin × 4, shelf × 2, conveyor belt is used.
- **Shipment deliveries**:
  - order_0::shipment_0: AGV2.
  - order_1::shipment_0: AGV1.
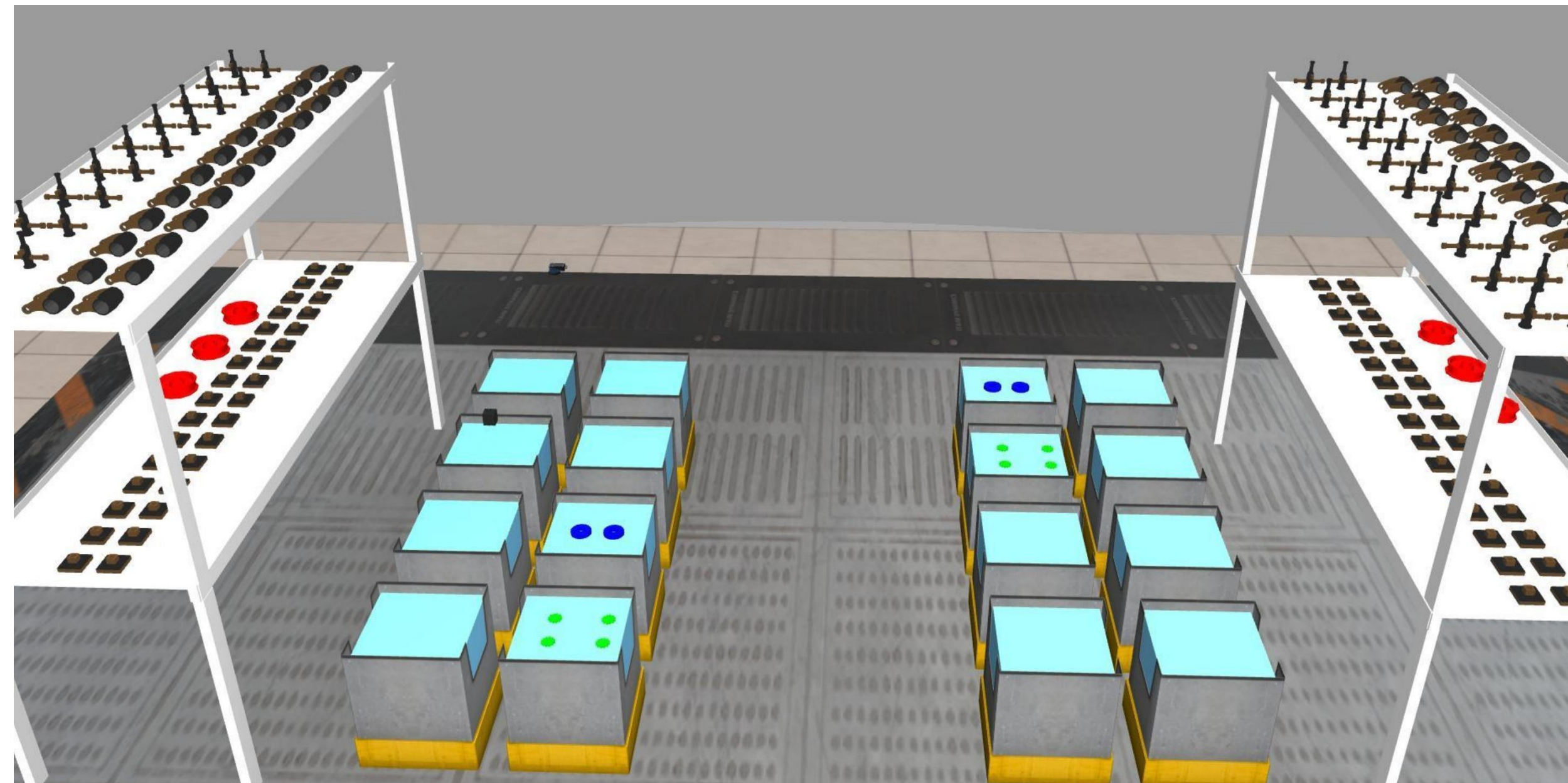- **Time limit**: 500 sim seconds.

Initial Product Placement

Fig. 3: Initial product placements.

- Conveyor belt will spawn a total of 10 blue pulleys.

Agility Challenges

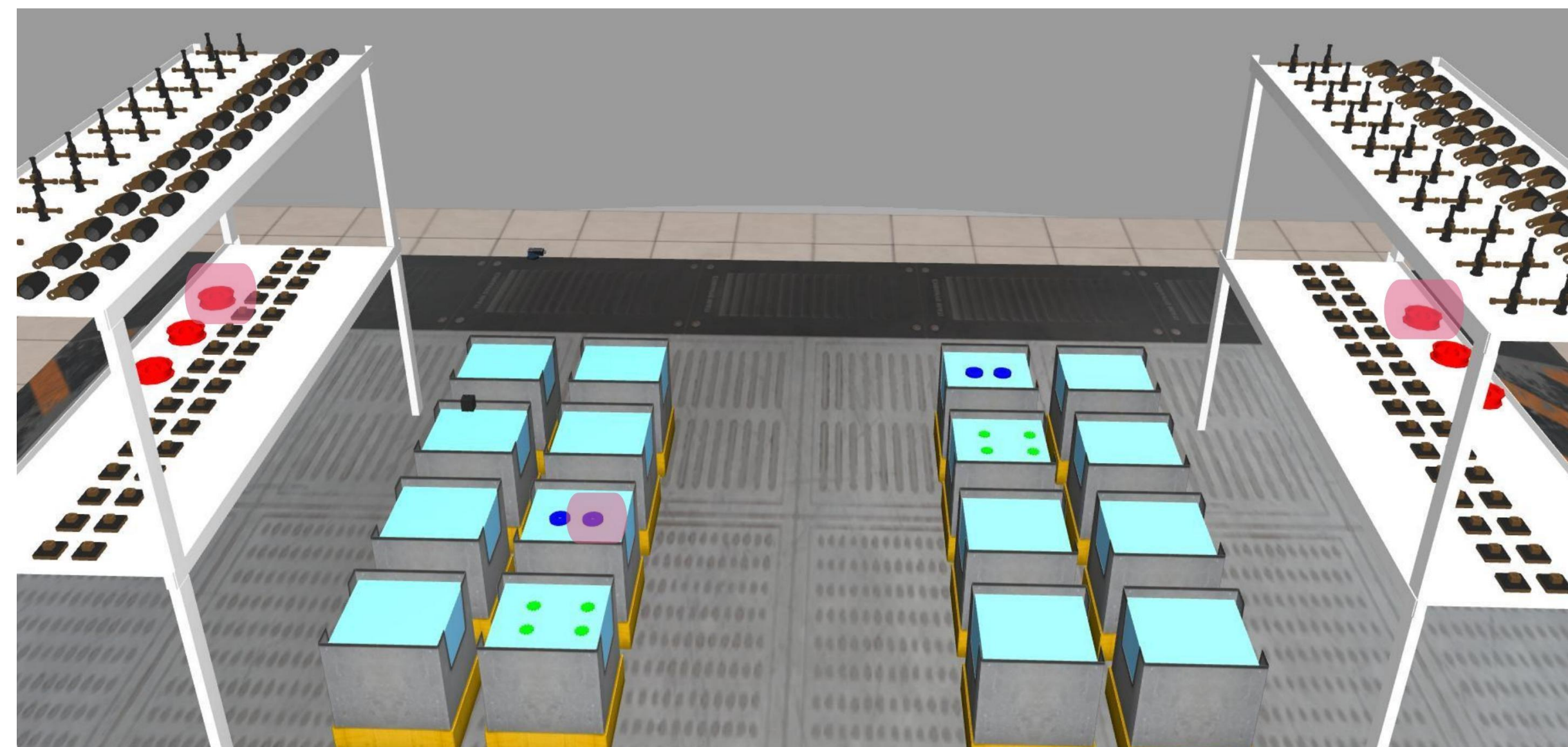- Faulty products: There are 3 faulty products in the environment.

Fig. 4: Faulty products in the environment.

- Flipped products: 1 red pulley must be flipped for order_0::shipment_0. 1 red pulley and 1 blue pulley must be flipped for order_1::shipment_0. Figure 5 and 6 highlight the flipped pulleys.
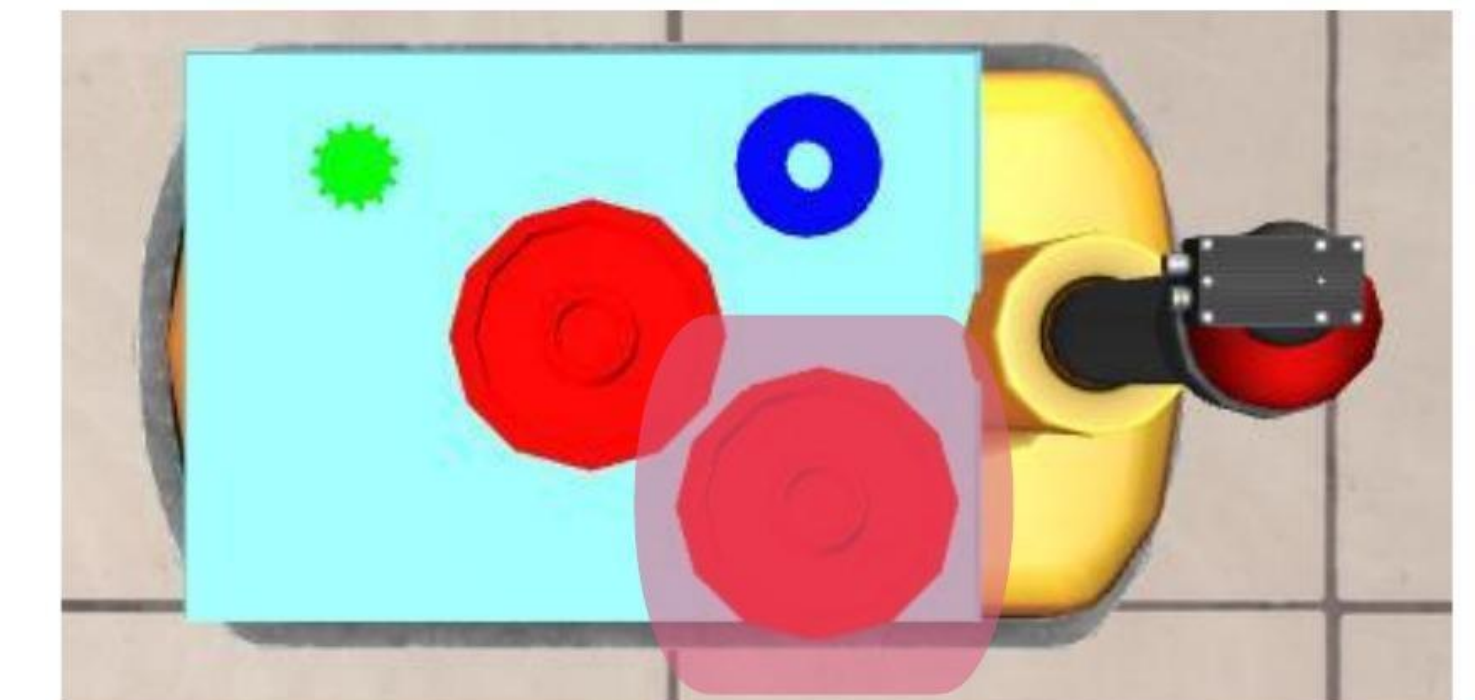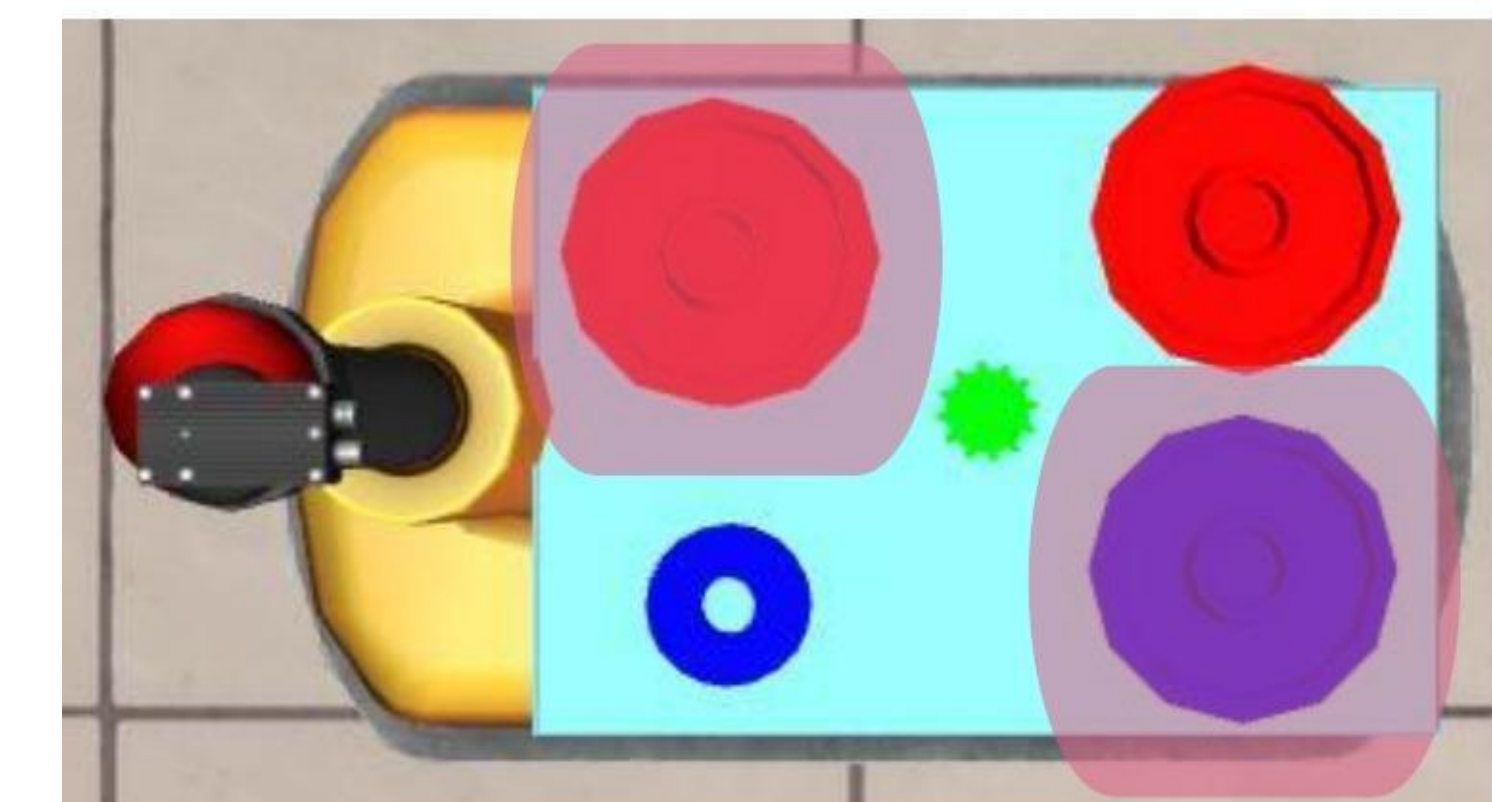
Orders

Fig. 5: order_0::shipment_0 configuration on AGV2.

Fig. 6: order_1::shipment_0 configuration on AGV1.