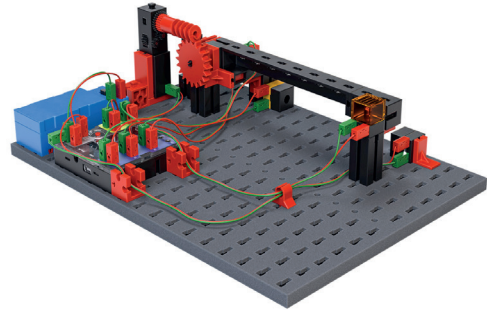


Model 4: Barrier

Objectives and classification

Overview

Using the example of an (articulated arm) barrier, the model introduces the control of end positions. End position switching is taken up again in models 5 and 6. The light barrier from model 3 is used as a demand switch. The model is supplemented by a voice output in the experimental task.



Topics

Motor control and end position stop, voice output.

Learning objectives

- Design and programming of an end position stop
- Use of the light barrier as a demand switch
- Introduction of logical operators („Not“)
- Programming a voice output in Scratch

Time required

Setting up and programming the barrier for the first time takes about two lessons. The other tasks build directly on each other and take about one lesson.

It makes sense to repeat the programming of the alarm system from model 3 to process the programming tasks for the demand barrier with warning light. The experimental task enables individualization of the barrier program; it is not required for the following task sheets, but is well suited as a final task.

Note: The voice output in the experiment output requires the computer to be connected to the Internet.

Tips and hints

If the students still have no idea, it can help if they first try out the commands with simple commands with a partner.

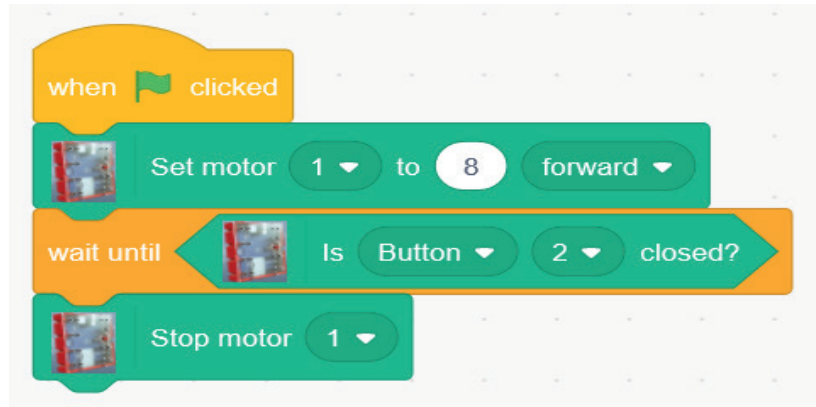
You can use this work order for this purpose:

First describe the program with simple commands for your partner and test whether your commands are executed correctly by your „human computer“.

Solutions Programming tasks

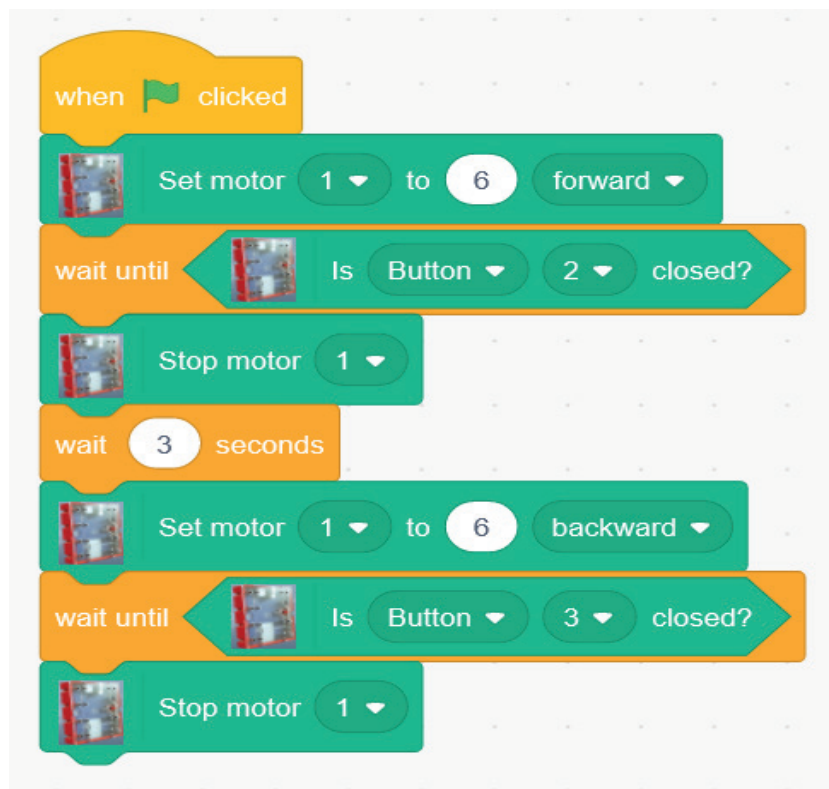
Model 4: Barrier

Solutions Open barrier:



Open barrier.sb3

Solution Open and close the barrier:

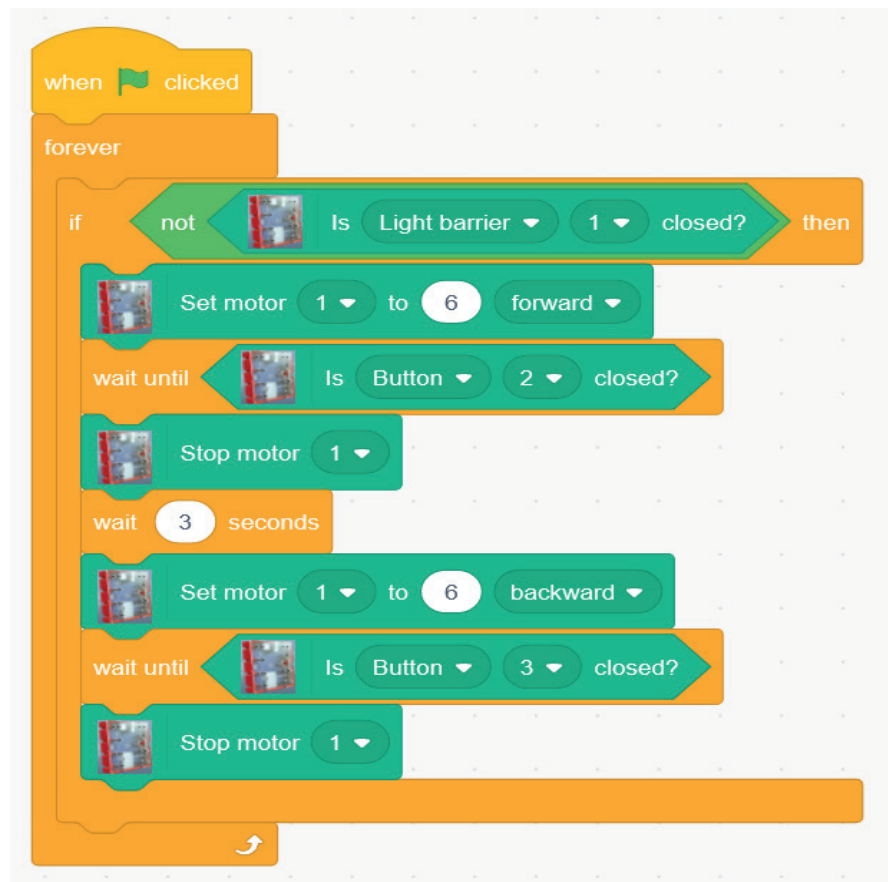


Open and close barrier.sb3

Solutions Programming tasks

Model 4: Barrier

Solution Demand barrier:



Demand barrier.sb3

Solutions Programming tasks

Model 4: Barrier

Solution Demand barrier with warning light:

```

when clicked
  forever
    if not Is Light barrier 1 closed? then
      Set lamp 2 to 8
      Set motor 1 to 6 forward
      wait until Is Button 2 closed?
      Stop motor 1
      Set lamp 2 to 0
      wait 3 seconds
      Set lamp 2 to 8
      Set motor 1 to 6 backward
      wait until Is Button 3 closed?
      Stop motor 1
      Set lamp 2 to 0
  
```

Demand barrier with warning light.sb3

Solutions Programming tasks

Model 4: Barrier

Solution Demand barrier with voice warning:

```

when green flag clicked
  forever loop
    if not light barrier 1 closed? then
      speak "Attention, barrier opens."
      set lamp 2 to 8
      set motor 1 to 6 forward
      wait until button 2 closed?
      stop motor 1
      set lamp 2 to 0
      wait 3 seconds
      speak "Attention, barrier closes."
      set lamp 2 to 8
      set motor 1 to 6 backward
      wait until button 3 closed?
      stop motor 1
      set lamp 2 to 0
  
```

Demand barrier with voice warning.sb3