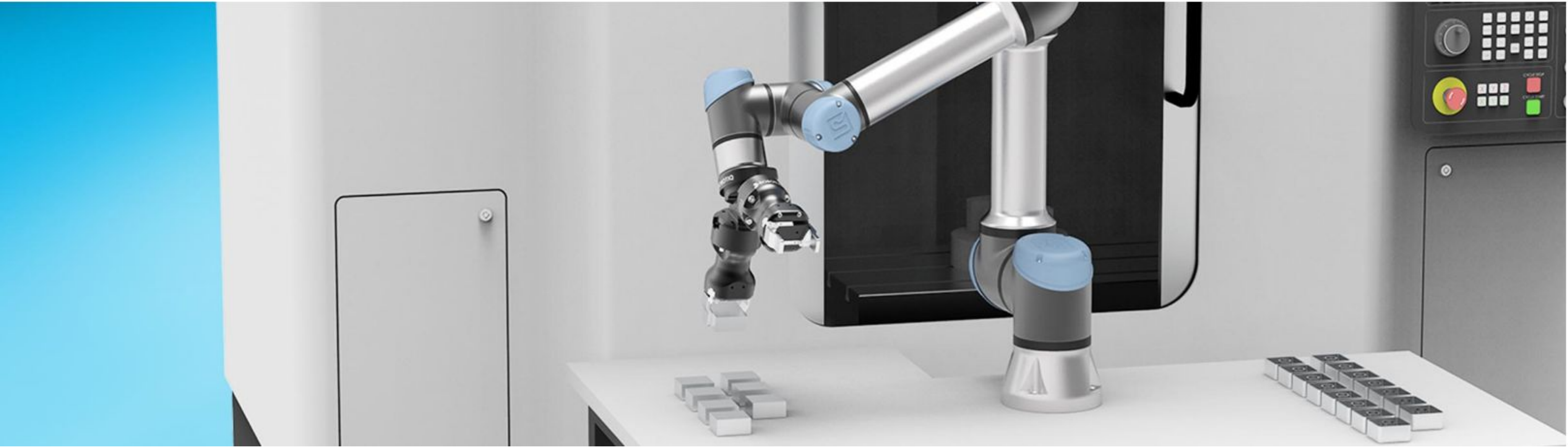
Program Template EXPLAINED

CNC Machine Tending Application



ROBOTIQ
eLearning

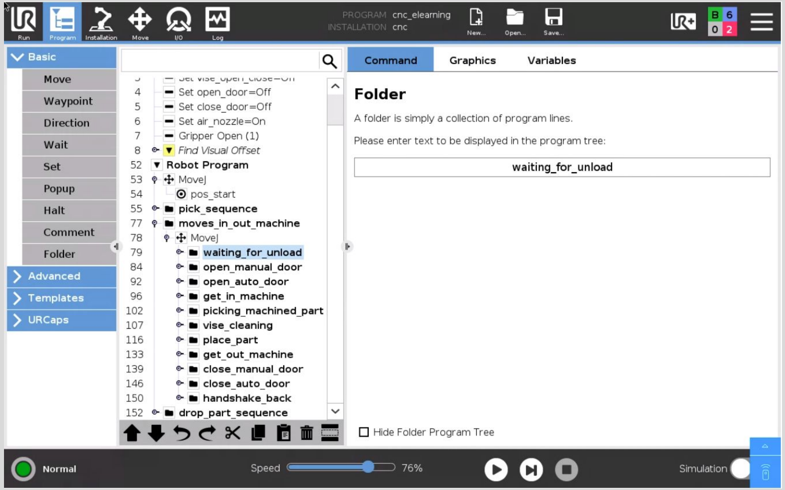
PROGRAM TEMPLATE CNC

Machine Tending Application

Description

Use this document to help you program your application using the template for the CNC Machine Tending Application. You can learn more about the steps on how to program your CNC machine tending application using the available videos for this course.

Visit ***elearning.robotiq.com*** for more details.



```
  Set vise_open_close=On
  Set open_door=Off
  Set close_door=Off
  Set air_nozzle=On
  Gripper Open (1)
  Find Visual Offset
Robot Program
  MoveJ
    pos_start
  pick_sequence
  moves_in_out_machine
    MoveJ
      waiting_for_unload
      open_manual_door
      open_auto_door
      get_in_machine
      picking_machined_part
      vise_cleaning
      place_part
      get_out_machine
      close_manual_door
      close_auto_door
      handshake_back
  drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

waiting_for_unload

□ Hide Folder Program Tree

What you will need

- Robotiq CNC Machine Tending Kit
- Latest URcap - Gripper URCapLatest URCaps
  - Gripper URCap UCG-X.X.X.X
  - Copilot URCap UCS-X.X.X
- Universal Robot UR3e, UR5e, UR10e or UR16e
- Program Template: **cnc_elearning.urp**

Folders in UR Programs

To insert a folder in your program, go to **Basic** → **Folder**. Once the folder is in the program, you can add nodes in it to build your program. In order to run only a certain part of the program, you can suppress the folders you do not want to run by selecting the folder and pressing on ☰.

Folders in UR Programs

In the UR program tree, it is possible to insert a **folder** node in the program. This allows to separate your program into smaller sections and is very useful for:

- Making the program clearer and easier to understand
- Testing smaller sections of the program
- Reusing the same code throughout your program

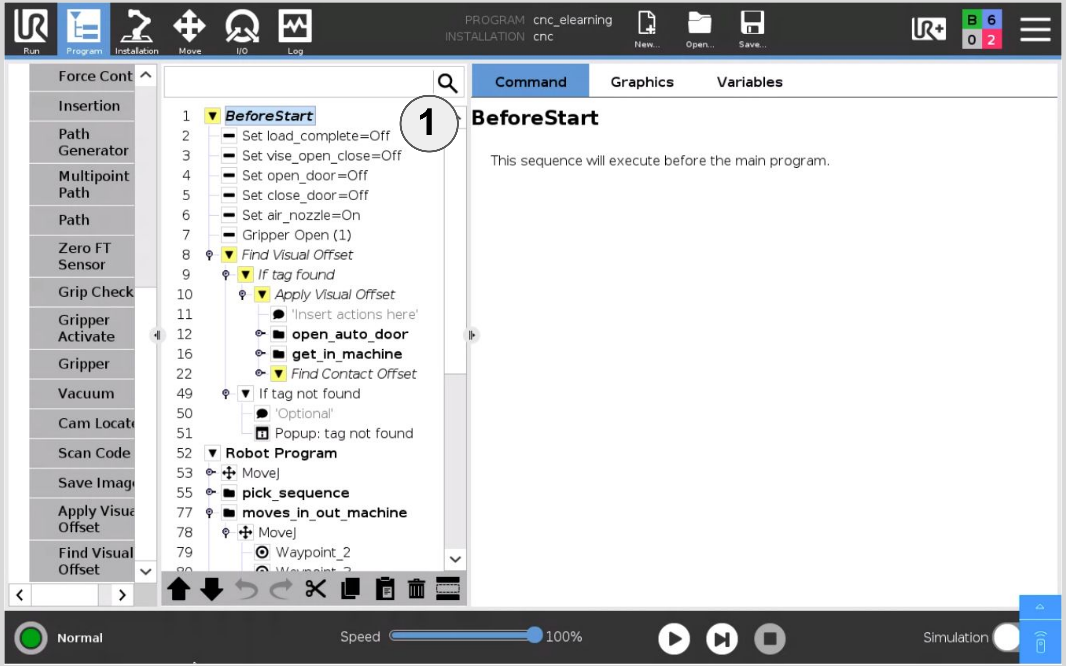
We highly recommend you use this tool since it will make your life easier when building your application.

How to use the template

This template contains all the steps and more to automate your own CNC Machine Tending application. Since your setup will most likely be very different from ours, you will need to make sure to **re-teach all the waypoints** in the program. You should also change the names and select the right I/Os to best reflect your setup. This template is mostly a guide so that you do not forget any steps.

Feel free to suppress or even delete folders or lines if you really do not need them. However, if you delete anything, really make sure you will not need it. You can also add lines if required. This is first and foremost a learning tool designed to help you automate your first application, or practice automating a CNC machine. It contains everything you need for a basic integration.

Before Start Sequence



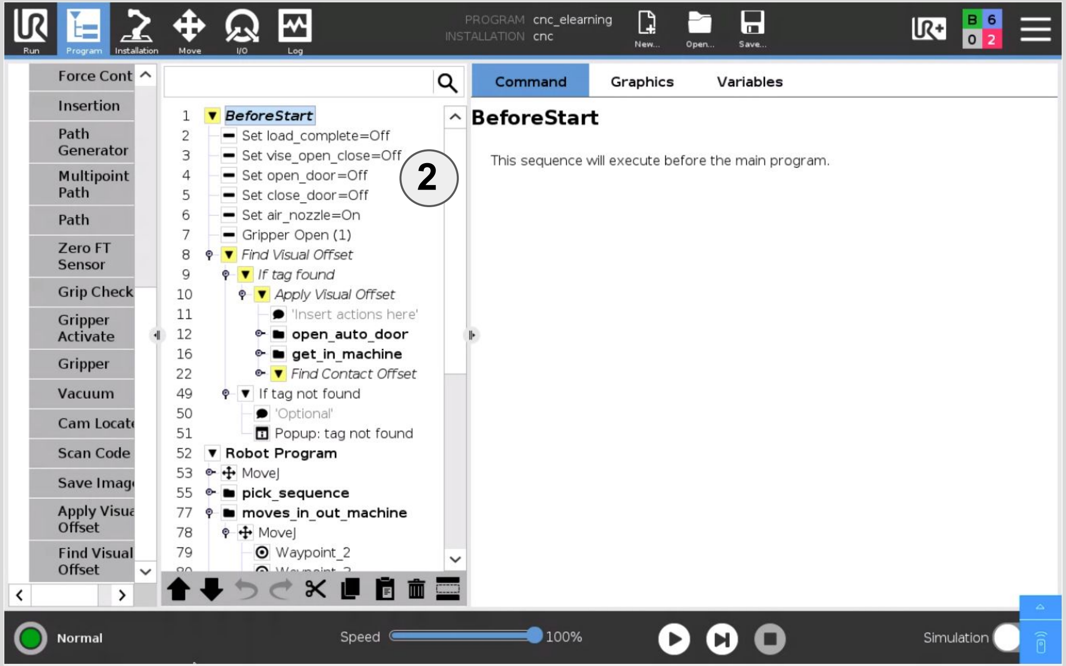
```
▼ BeforeStart
    Set load_complete=Off
    Set vise_open_close=Off
    Set open_door=Off
    Set close_door=Off
    Set air_nozzle=On
    Gripper Open (1)
  ▼ Find Visual Offset
    ▼ If tag found
      ▼ Apply Visual Offset
          'Insert actions here'
          open_auto_door
          get_in_machine
        ▼ Find Contact Offset
    ▼ If tag not found
        'Optional'
        Popup: tag not found
▼ Robot Program
    MoveJ
    pick_sequence
    moves_in_out_machine
    MoveJ
      Waypoint_2
```

BeforeStart

This sequence will execute before the main program.

1 **Before Start** is used to execute commands before starting the main loop of the program. This is where all the variables are first set and where you will find the **visual** and/or **contact offset.** This section will only be done once.

Before Start Sequence



PROGRAM cnc_elearning
INSTALLATION cnc

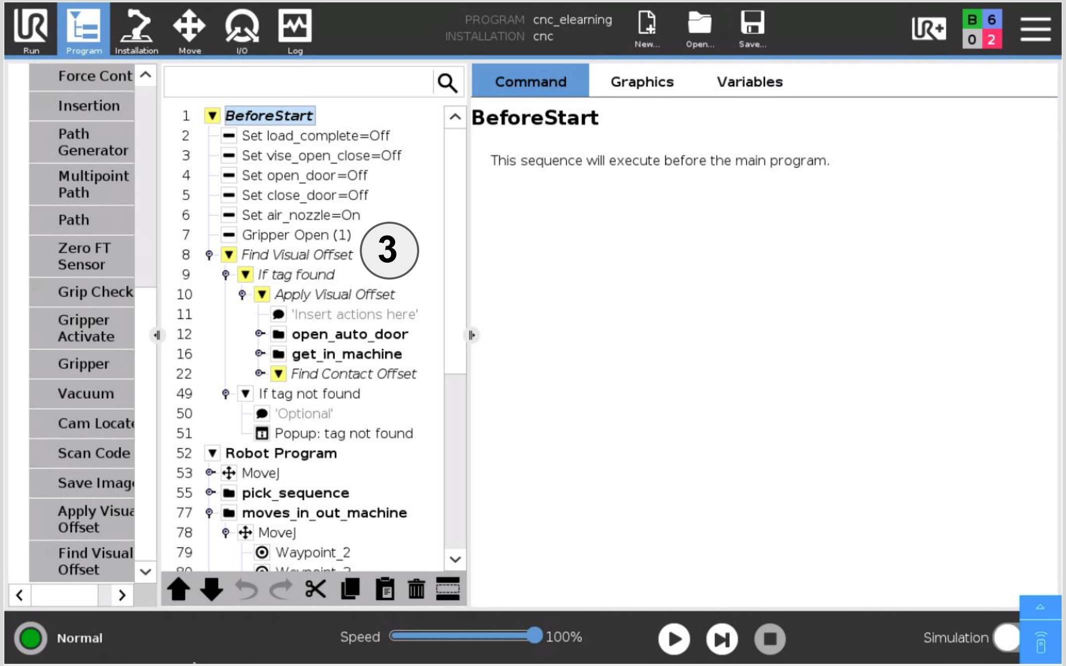
```
▼ BeforeStart
    Set load_complete=Off
    Set vise_open_close=Off
    Set open_door=Off
    Set close_door=Off
    Set air_nozzle=On
    Gripper Open (1)
  ▼ Find Visual Offset
    ▼ If tag found
      ▼ Apply Visual Offset
          'Insert actions here'
          open_auto_door
          get_in_machine
        ▼ Find Contact Offset
    ▼ If tag not found
        'Optional'
        Popup: tag not found
▼ Robot Program
    MoveJ
    pick_sequence
    moves_in_out_machine
    MoveJ
        Waypoint_2
```

BeforeStart

This sequence will execute before the main program.

2 In this section we can see all the variables related to the handshake, as well as door management and air nozzle. These **Set** functions will have to be modified to fit with your own signal exchange configuration and wiring.

Before Start Sequence



```
▼ BeforeStart
    Set load_complete=Off
    Set vise_open_close=Off
    Set open_door=Off
    Set close_door=Off
    Set air_nozzle=On
    Gripper Open (1)
  ▼ Find Visual Offset
    ▼ If tag found
      ▼ Apply Visual Offset
          'Insert actions here'
          open_auto_door
          get_in_machine
        ▼ Find Contact Offset
    ▼ If tag not found
        'Optional'
        Popup: tag not found
▼ Robot Program
    MoveJ
    pick_sequence
    moves_in_out_machine
    MoveJ
      Waypoint_2
      Waypoint_3
```

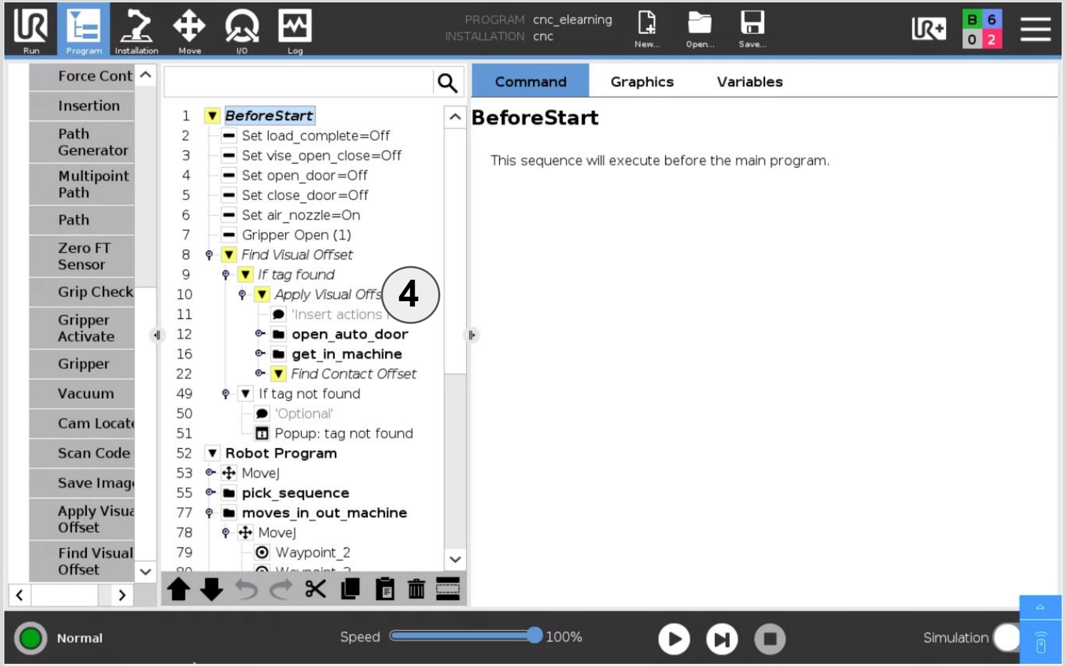
BeforeStart

This sequence will execute before the main program.

3 The first gripper is then opened and a **Find Visual Offset** node is added. This is used to position the robot with respect to the machine. A contact offset node is then used for an even more precise positioning.

The visual and contact offset can be removed if your robot is always precisely positioned relative to the rest of the cell.

Before Start Sequence



PROGRAM cnc_elearning
INSTALLATION cnc

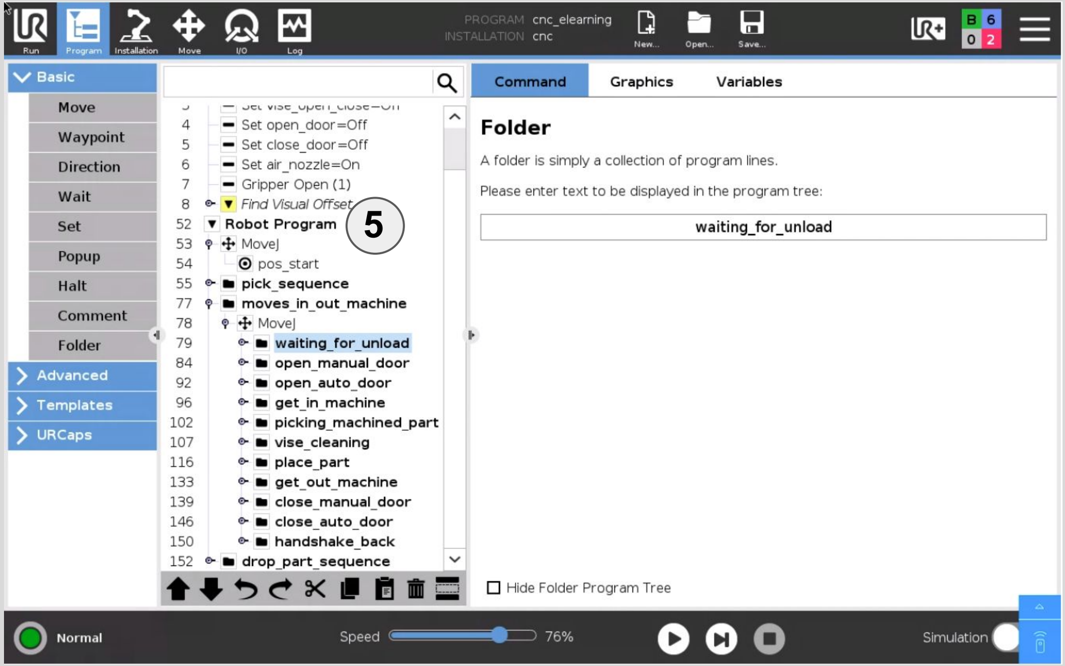
```
▼ BeforeStart
   Set load_complete=Off
   Set vise_open_close=Off
   Set open_door=Off
   Set close_door=Off
   Set air_nozzle=On
   Gripper Open (1)
   ▼ Find Visual Offset
      ▼ If tag found
         ▼ Apply Visual Offs
            'Insert actions
            open_auto_door
            get_in_machine
            ▼ Find Contact Offset
      ▼ If tag not found
         'Optional'
         Popup: tag not found
▼ Robot Program
   MoveJ
   pick_sequence
   moves_in_out_machine
      MoveJ
         Waypoint_2
```

BeforeStart

This sequence will execute before the main program.

4 There are also **folder** used for opening the door and getting in the machine. These will be covered later in the main program.

Robot Program



```
  Set vise_open_close=Off
  Set open_door=Off
  Set close_door=Off
  Set air_nozzle=On
  Gripper Open (1)
  Find Visual Offset
Robot Program
  MoveJ
    pos_start
  pick_sequence
  moves_in_out_machine
    MoveJ
      waiting_for_unload
      open_manual_door
      open_auto_door
      get_in_machine
      picking_machined_part
      vise_cleaning
      place_part
      get_out_machine
      close_manual_door
      close_auto_door
      handshake_back
  drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

waiting_for_unload

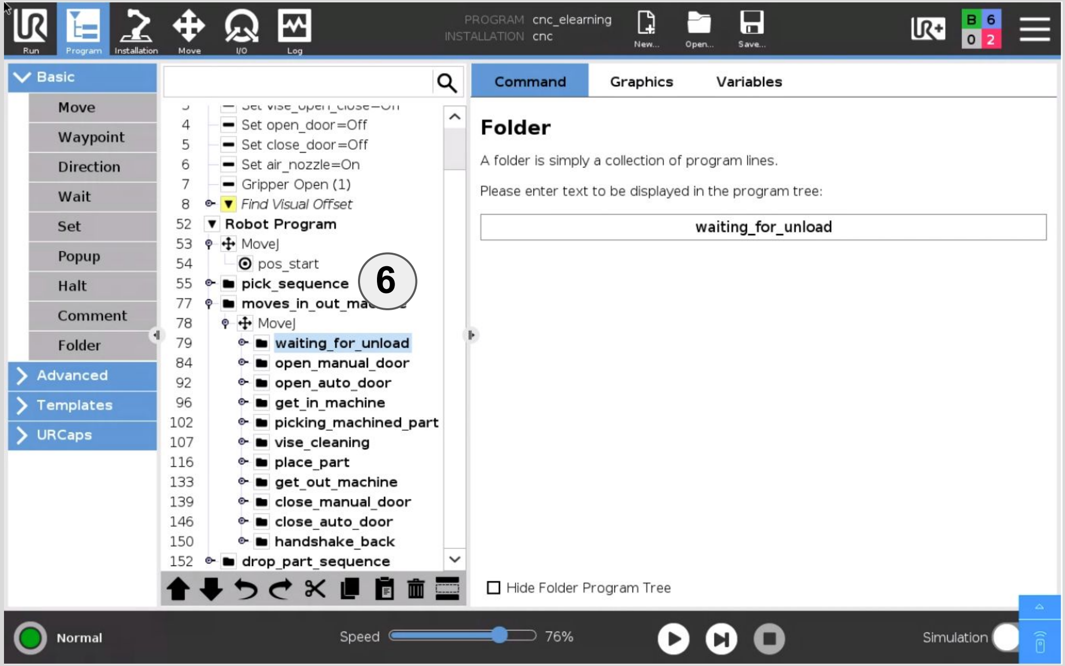
□ Hide Folder Program Tree

5 The **Robot Program** is where all the main actions are programmed. It is divided in three main sequences:

- Pick a raw part
- Move in and out of the machine
- Drop the machined part

The second sequence is then further divided in different smaller sequences.

Robot Program



```
4    Set open_door=Off
5    Set close_door=Off
6    Set air_nozzle=On
7    Gripper Open (1)
8    Find Visual Offset
52   Robot Program
53     MoveJ
54       pos_start
55     pick_sequence
77     moves_in_out_machine
78       MoveJ
79         waiting_for_unload
84         open_manual_door
92         open_auto_door
96         get_in_machine
102        picking_machined_part
107        vise_cleaning
116        place_part
133        get_out_machine
139        close_manual_door
146        close_auto_door
150        handshake_back
152    drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

waiting_for_unload

□ Hide Folder Program Tree

6

The **pick sequence** picks object from the tray using the **Gripper 1**. This sequence uses a UR palletizing node to loop on each part in the tray.

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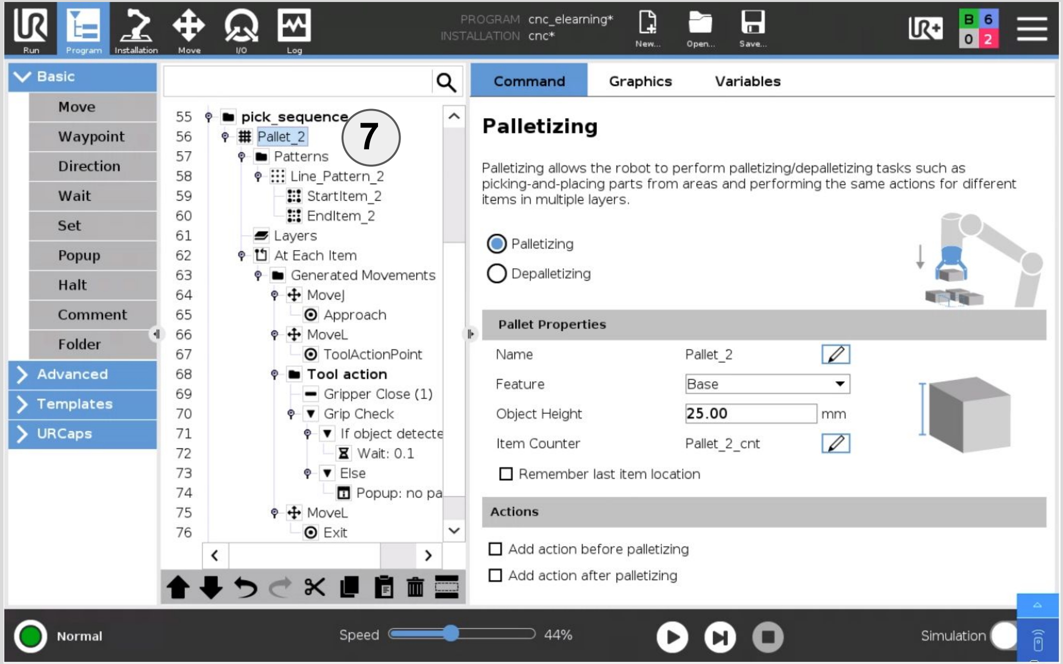
Pick sequence



```
pick_sequence
  Pallet_2
    Patterns
      Line_Pattern_2
        StartItem_2
        EndItem_2
    Layers
    At Each Item
      Generated Movements
        MoveJ
          Approach
        MoveL
          ToolActionPoint
        Tool action
          Gripper Close (1)
          Grip Check
            If object detecte
              Wait: 0.1
            Else
              Popup: no pa
        MoveL
          Exit
```

Palletizing

Palletizing allows the robot to perform palletizing/depalletizing tasks such as picking-and-placing parts from areas and performing the same actions for different items in multiple layers.

● Palletizing
○ Depalletizing

Pallet Properties

Name	Pallet_2
Feature	Base
Object Height	25.00 mm
Item Counter	Pallet_2_cnt

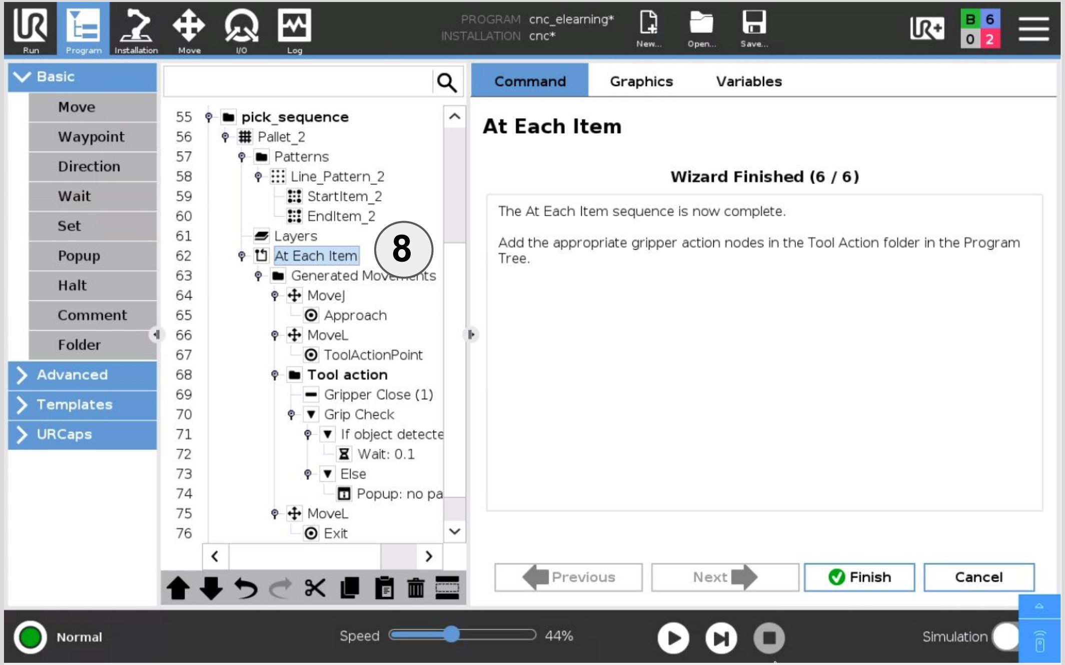
□ Remember last item location

Actions

□ Add action before palletizing
□ Add action after palletizing

7 The only node in the **folder** is a **Pallet** node. If you parts are on a tray and evenly separated, using a pallet allows to easily loop on each part without too much effort. Here we use a line pattern, but feel free to modify this node to fit your own tray.

Pick sequence



```
pick_sequence
  Pallet_2
    Patterns
      Line_Pattern_2
        StartItem_2
        EndItem_2
    Layers
    At Each Item
      Generated Movements
        MoveJ
          Approach
        MoveL
          ToolActionPoint
        Tool action
          Gripper Close (1)
          Grip Check
            If object detecte
              Wait: 0.1
            Else
              Popup: no pa
        MoveL
          Exit
```

At Each Item

Wizard Finished (6 / 6)

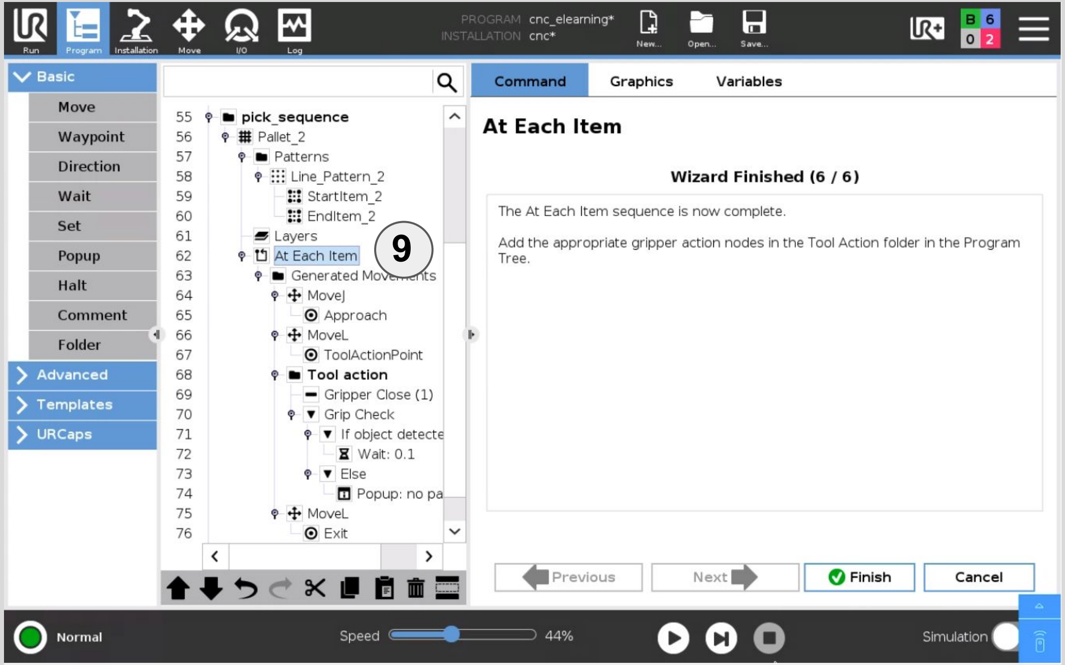
The At Each Item sequence is now complete.

Add the appropriate gripper action nodes in the Tool Action folder in the Program Tree.

8 Once the **Patterns** are set for the pallet, it is time to teach how each item of the pallet will be treated.

First in the **Generated Movements** folder, we teach the approach and pick position with the gripper 1. Once at the pick point, a **Tool Action** folder is inserted where all the gripper actions are called. Here we close the **Gripper 1** and we do a **grip check** to make sure a part has been picked.

Pick sequence



```
pick_sequence
  Pallet_2
    Patterns
      Line_Pattern_2
        StartItem_2
        EndItem_2
    Layers
    At Each Item
      Generated Movements
        MoveJ
          Approach
        MoveL
          ToolActionPoint
        Tool action
          Gripper Close (1)
          Grip Check
            If object detecte
              Wait: 0.1
            Else
              Popup: no pa
        MoveL
          Exit
```

At Each Item

Wizard Finished (6 / 6)

The At Each Item sequence is now complete.

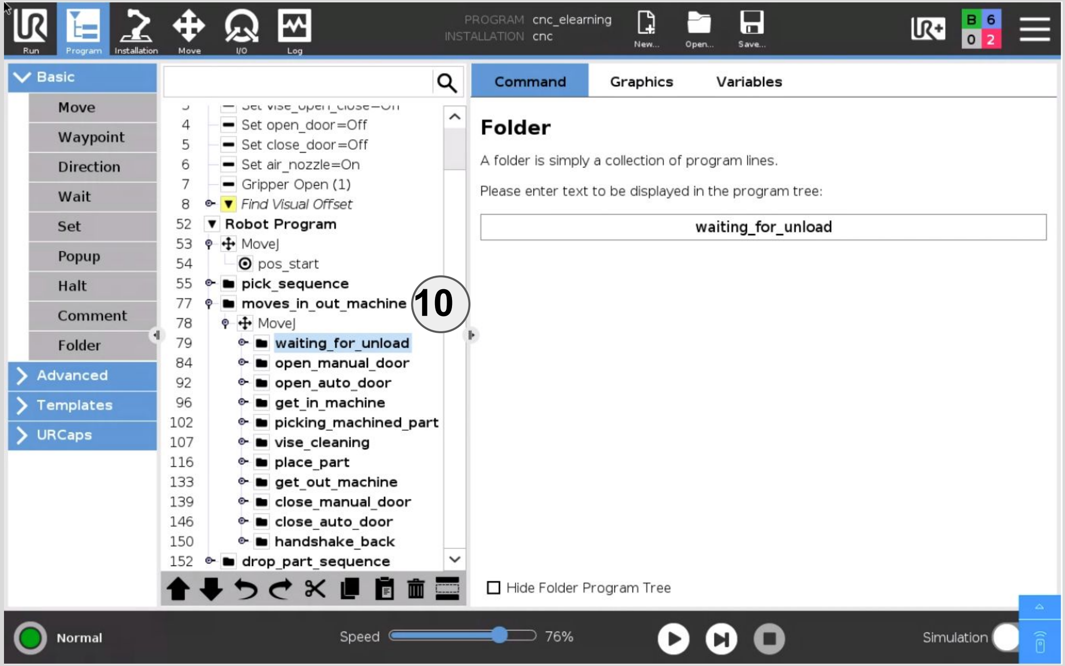
Add the appropriate gripper action nodes in the Tool Action folder in the Program Tree.

9 Once the tool action is complete, the next move is an exit point.

When building your application, simply re-teach the points corresponding to your own application.

The **ToolActionPoint** should be the point where the gripper picks the part. The **Approach** and **Exit** should be a few centimeters above the part to be picked.

Move in and out of the machine



```
Set vise_open_close=On
Set open_door=Off
Set close_door=Off
Set air_nozzle=On
Gripper Open (1)
Find Visual Offset
Robot Program
  MoveJ
    pos_start
  pick_sequence
  moves_in_out_machine
    MoveJ
      waiting_for_unload
      open_manual_door
      open_auto_door
      get_in_machine
      picking_machined_part
      vise_cleaning
      place_part
      get_out_machine
      close_manual_door
      close_auto_door
      handshake_back
  drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

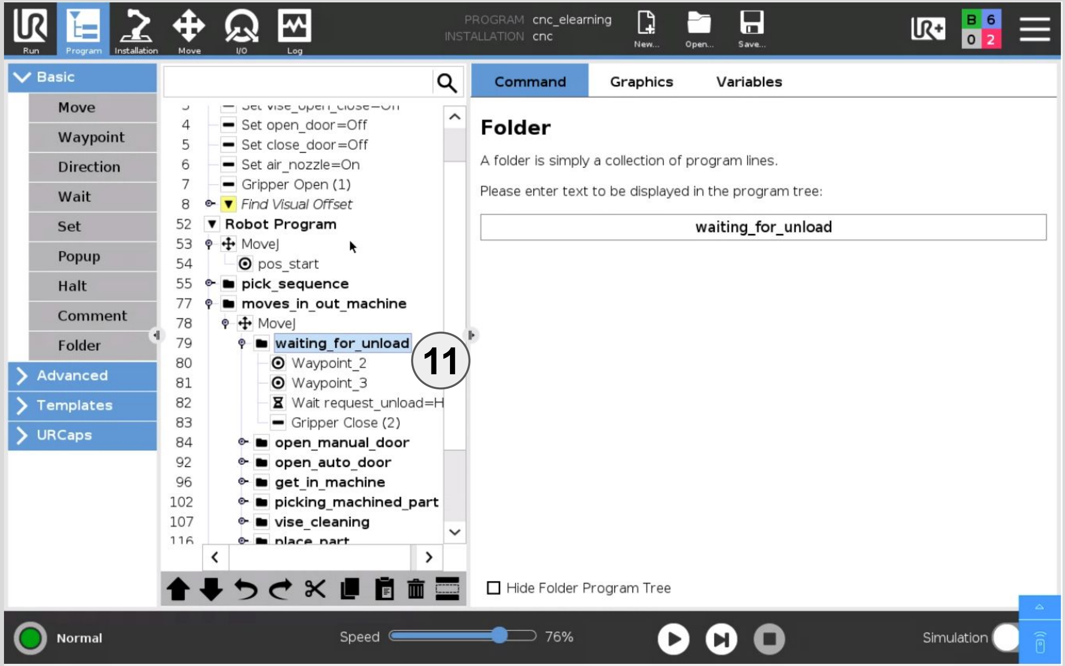
Please enter text to be displayed in the program tree:

waiting_for_unload

□ Hide Folder Program Tree

10 The **folder** called **move_in_out_machine** is the most complex part of the program. This involves all the communication with other items of the cell and a lot of movement. It is why it has been split in different folders.

Move in and out of the machine



PROGRAM cnc_elearning
INSTALLATION cnc

```
Set vise_open_close=On
Set open_door=Off
Set close_door=Off
Set air_nozzle=On
Gripper Open (1)
Find Visual Offset
Robot Program
  MoveJ
    pos_start
  pick_sequence
  moves_in_out_machine
    MoveJ
      waiting_for_unload
        Waypoint_2
        Waypoint_3
        Wait request_unload=H
        Gripper Close (2)
      open_manual_door
      open_auto_door
      get_in_machine
      picking_machined_part
      vise_cleaning
      place_part
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

waiting_for_unload

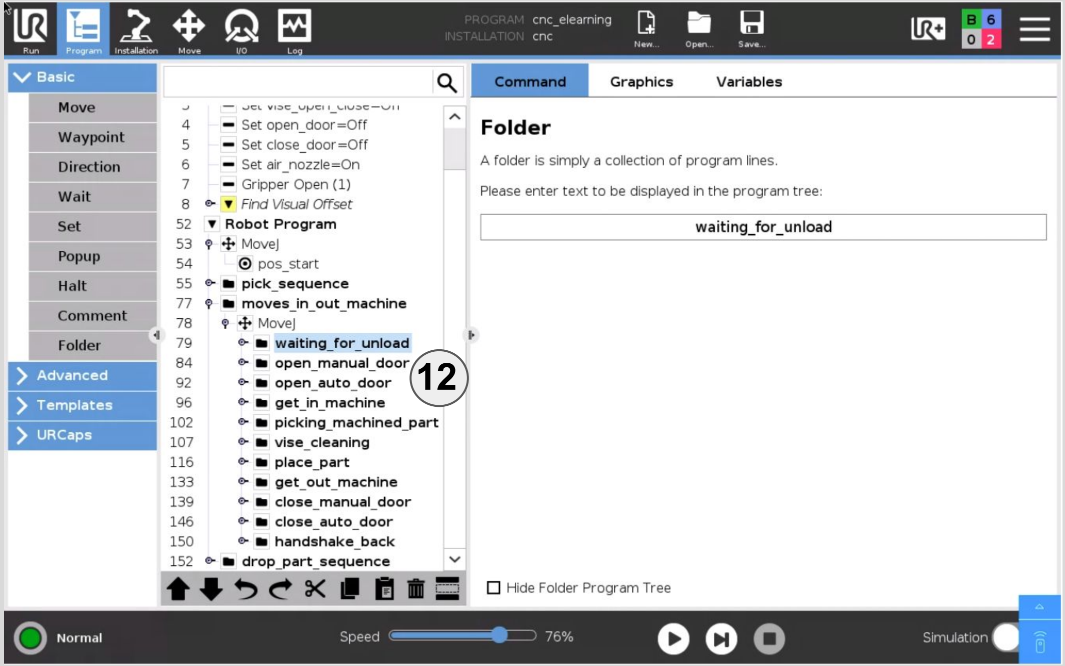
□ Hide Folder Program Tree

11 The first **folder** contains the movements required to position the robot in front of the CNC.

Then a **Wait** command is used. This command wait for the CNC to send the request to unload the machine.

The **Gripper 2** is then closed. This part is only useful when opening and closing the door manually.

Move in and out of the machine



PROGRAM cnc_elearning
INSTALLATION cnc

```
Set vise_open_close=On
Set open_door=Off
Set close_door=Off
Set air_nozzle=On
Gripper Open (1)
Find Visual Offset
Robot Program
  MoveJ
    pos_start
  pick_sequence
  moves_in_out_machine
    MoveJ
      waiting_for_unload
      open_manual_door
      open_auto_door
      get_in_machine
      picking_machined_part
      vise_cleaning
      place_part
      get_out_machine
      close_manual_door
      close_auto_door
      handshake_back
  drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

waiting_for_unload

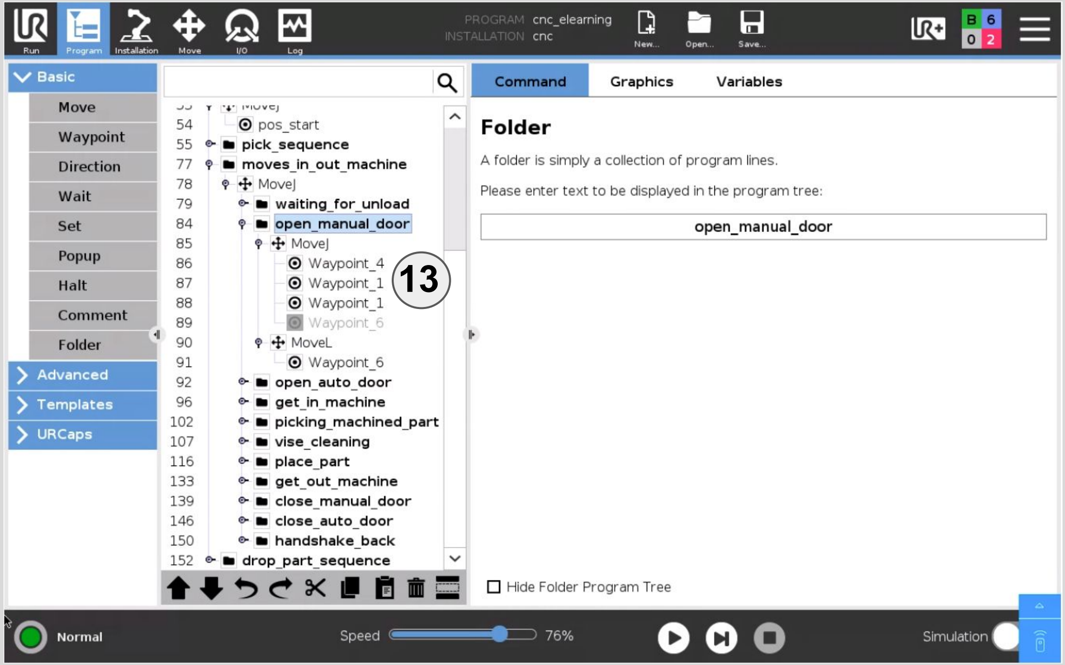
□ Hide Folder Program Tree

Normal — Speed 76% — Simulation

12 Opening the door can be done two different ways: **manually** or with an **automatic door**.

In the template, both options are programmed, so make sure to **suppress** the one you will not be using.

Move in and out of the machine



```
MoveJ
  pos_start
pick_sequence
moves_in_out_machine
  MoveJ
    waiting_for_unload
    open_manual_door
      MoveJ
        Waypoint_4
        Waypoint_1
        Waypoint_1
        Waypoint_6
      MoveL
        Waypoint_6
    open_auto_door
    get_in_machine
    picking_machined_part
    vise_cleaning
    place_part
    get_out_machine
    close_manual_door
    close_auto_door
    handshake_back
drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

open_manual_door

☐ Hide Folder Program Tree

13 To open the door manually, first move the closed gripper near the door handle. Then use a **MoveL** to open the door.

Make sure to move back in a position ready to enter the CNC.

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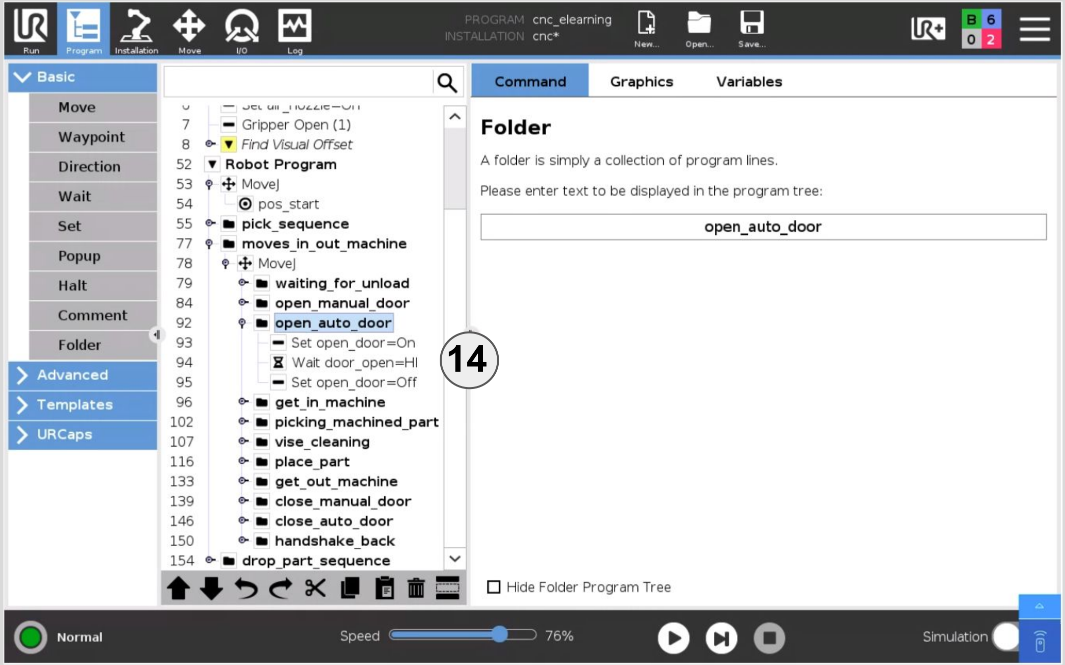
Move in and out of the machine



```
7   Gripper Open (1)
8   Find Visual Offset
52  Robot Program
53    MoveJ
54      pos_start
55    pick_sequence
77    moves_in_out_machine
78      MoveJ
79        waiting_for_unload
84        open_manual_door
92        open_auto_door
93          Set open_door=On
94          Wait door_open=HI
95          Set open_door=Off
96        get_in_machine
102       picking_machined_part
107       vise_cleaning
116       place_part
133       get_out_machine
139       close_manual_door
146       close_auto_door
150       handshake_back
154   drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

open_auto_door

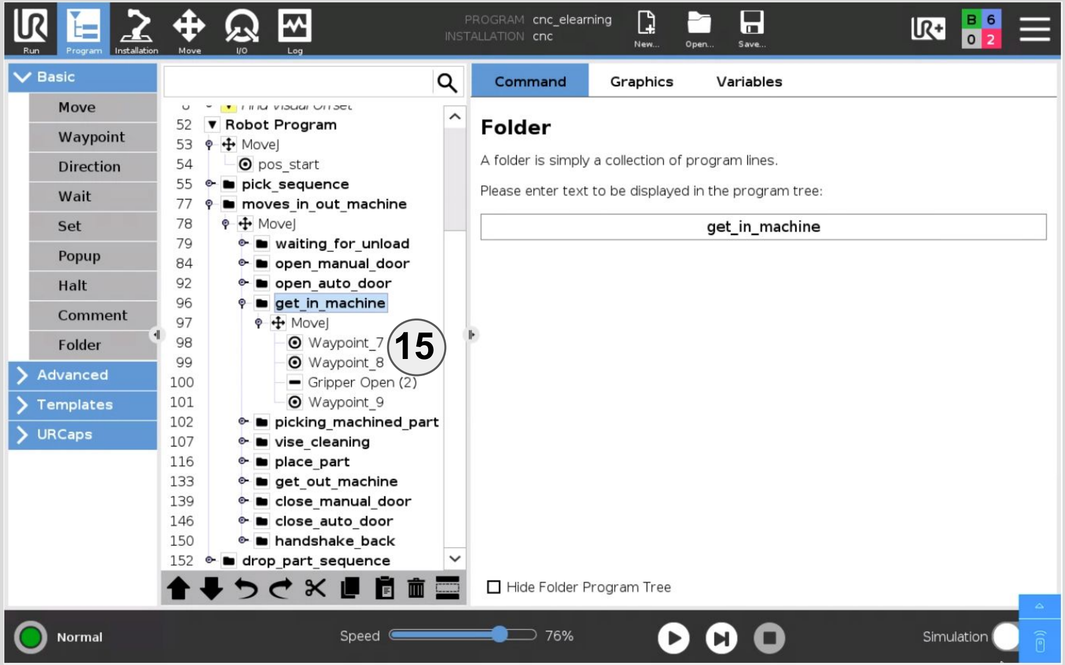
□ Hide Folder Program Tree

14 To open the door with an automated system, you simply need to send the signal to open the door via the proper **digital output**.

Then a **Wait** command is inserted where the robot waits for the door to be fully open.

Finally, the **open_door** signal is set to off.

Move in and out of the machine



PROGRAM cnc_elearning
INSTALLATION cnc

```
52  Robot Program
53    MoveJ
54      pos_start
55    pick_sequence
77    moves_in_out_machine
78      MoveJ
79        waiting_for_unload
84        open_manual_door
92        open_auto_door
96        get_in_machine
97          MoveJ
98            Waypoint_7
99            Waypoint_8
100           Gripper Open (2)
101           Waypoint_9
102       picking_machined_part
107       vise_cleaning
116       place_part
133       get_out_machine
139       close_manual_door
146       close_auto_door
150       handshake_back
152   drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

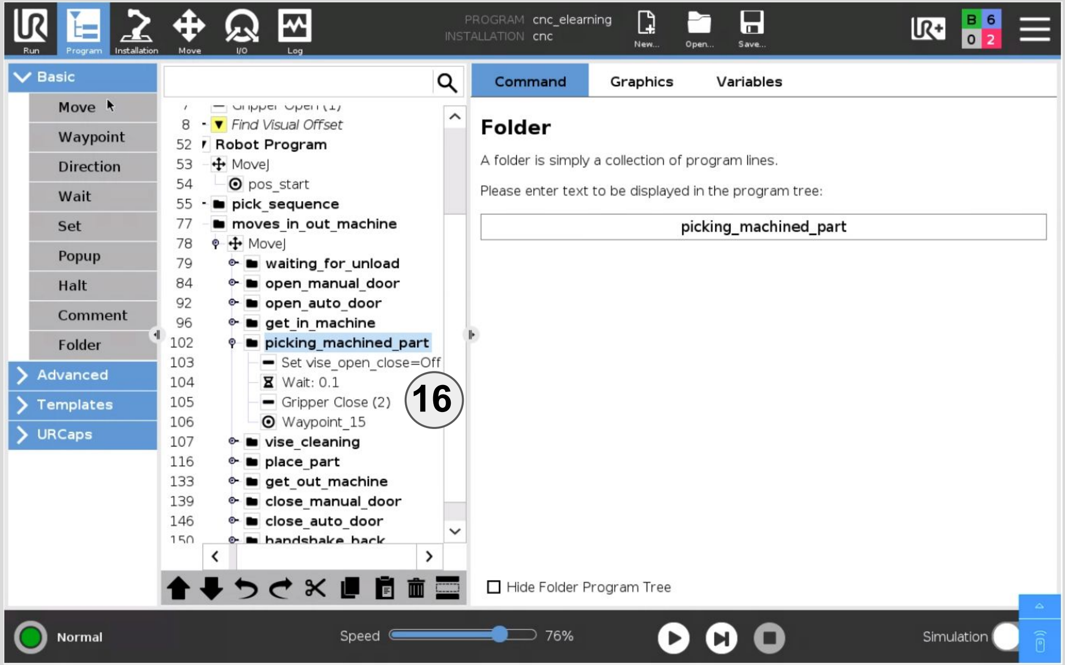
get_in_machine

☐ Hide Folder Program Tree

15 The next **folder** is used to get the robot in position for picking the completed part. The first two points are used to get over the part with the second gripper.

Then the **Gripper 2** is opened and moved down to the part.

Move in and out of the machine



PROGRAM cnc_elearning
INSTALLATION cnc

```
Find Visual Offset
Robot Program
  MoveJ
    pos_start
  pick_sequence
  moves_in_out_machine
  MoveJ
    waiting_for_unload
    open_manual_door
    open_auto_door
    get_in_machine
    picking_machined_part
      Set vise_open_close=Off
      Wait: 0.1
      Gripper Close (2)
      Waypoint_15
    vise_cleaning
    place_part
    get_out_machine
    close_manual_door
    close_auto_door
    handshake_back
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

picking_machined_part

□ Hide Folder Program Tree

16 After moving the **Gripper 2** in position, the robot sends the signal to open the vise. After a **0.1 Sec Wait time**, the **Gripper 2** closes on the part to pick it and move away from the vise.

The signal sent to open or close the vise depends on your setup and should be adjusted accordingly.

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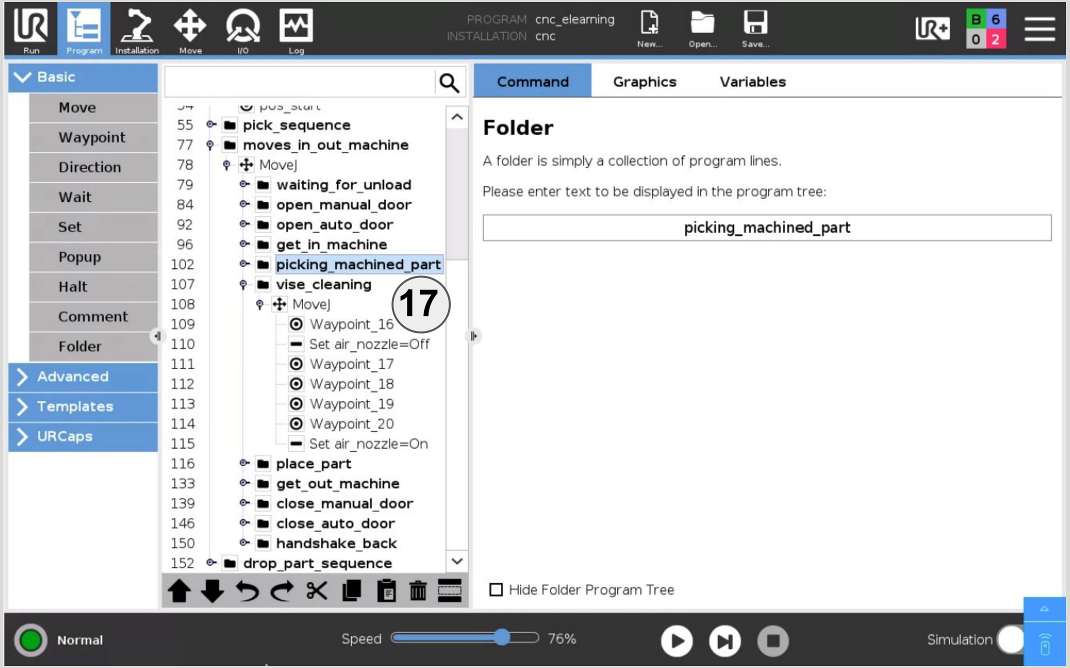
Move in and out of the machine



PROGRAM cnc_elearning
INSTALLATION cnc

```
pos_start
pick_sequence
moves_in_out_machine
  MoveJ
    waiting_for_unload
    open_manual_door
    open_auto_door
    get_in_machine
    picking_machined_part
    vise_cleaning
      MoveJ
        Waypoint_16
        Set air_nozzle=Off
        Waypoint_17
        Waypoint_18
        Waypoint_19
        Waypoint_20
        Set air_nozzle=On
    place_part
    get_out_machine
    close_manual_door
    close_auto_door
    handshake_back
drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

picking_machined_part

□ Hide Folder Program Tree

17 After picking the machined part, it is important to clean the vise before putting a new blank part.

To do this, simply orient the **air nozzle** toward the vise and activate it. After that move the robot around to make sure it really cleans the vise properly. Then simply turn off the air nozzle.

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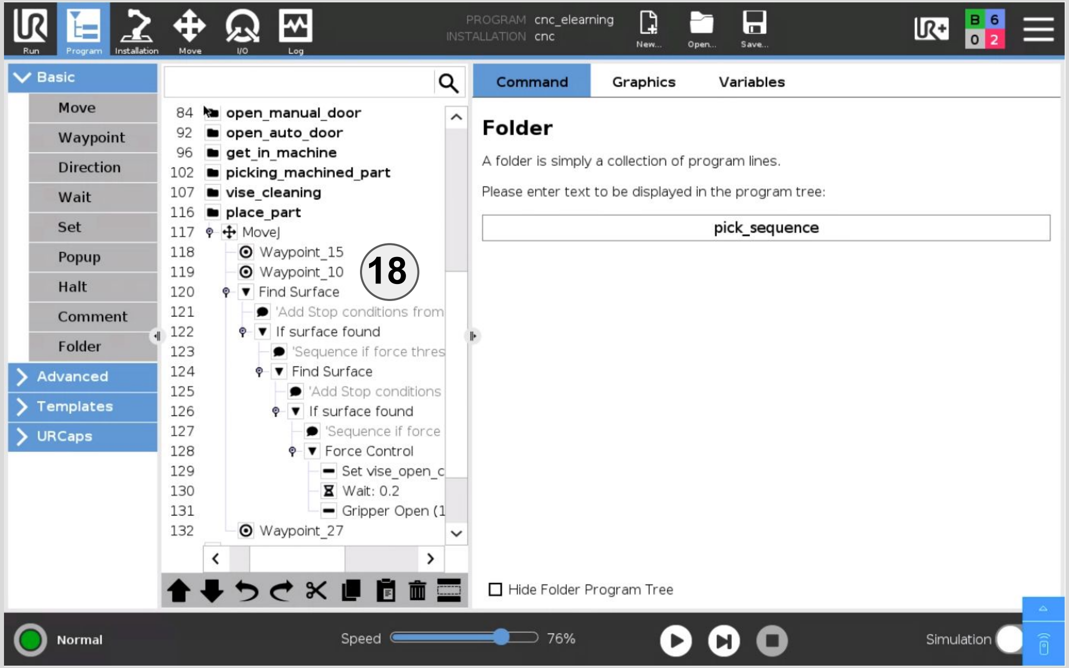
Move in and out of the machine



PROGRAM cnc_elearning
INSTALLATION cnc

```
open_manual_door
open_auto_door
get_in_machine
picking_machined_part
vise_cleaning
place_part
MoveJ
  Waypoint_15
  Waypoint_10
  Find Surface
    'Add Stop conditions from
    If surface found
      'Sequence if force thres
      Find Surface
        'Add Stop conditions
        If surface found
          'Sequence if force
          Force Control
            Set vise_open_c
            Wait: 0.2
            Gripper Open (1
  Waypoint_27
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

pick_sequence

☐ Hide Folder Program Tree

18 Placing the part in the vise can be done using a few different methods. Here we use the **find surface** feature as well as the **force control** feature of the Robotiq copilot.

First the part is moved over the vise and the **find surface** command is used to find the bottom and sides of the vise.

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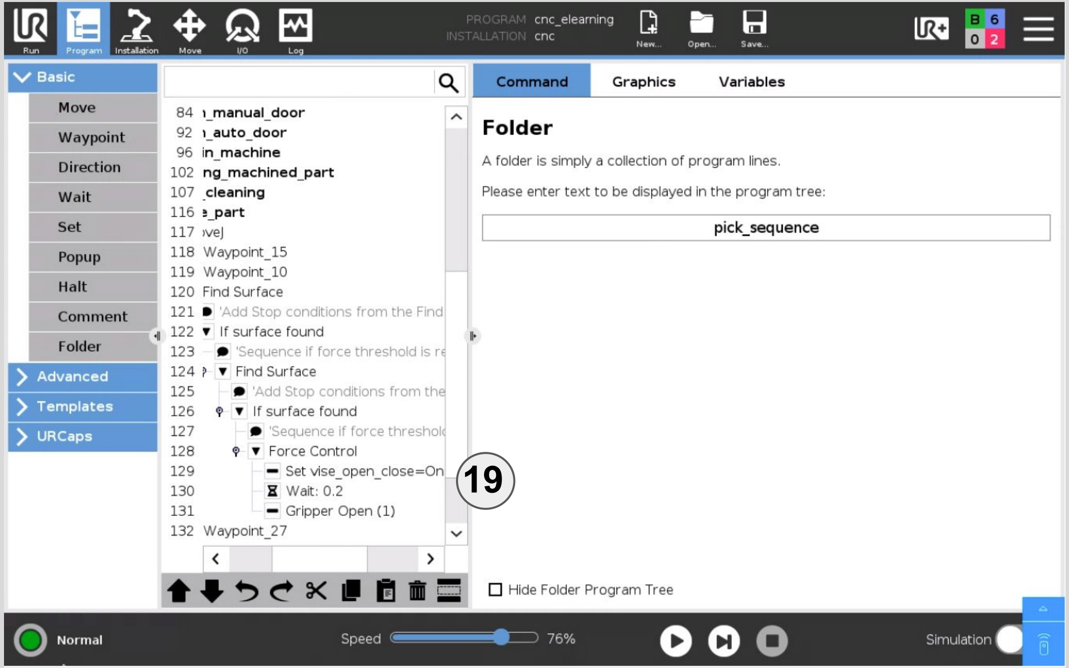
Move in and out of the machine



PROGRAM cnc_elearning
INSTALLATION cnc

```
ı_manual_door
ı_auto_door
in_machine
ng_machined_part
_cleaning
ɜ_part
ɔveJ
Waypoint_15
Waypoint_10
Find Surface
  'Add Stop conditions from the Find
  ▼ If surface found
     'Sequence if force threshold is re
     ▼ Find Surface
        'Add Stop conditions from the
        ▼ If surface found
           'Sequence if force threshol
           ▼ Force Control
              Set vise_open_close=On
              Wait: 0.2
              Gripper Open (1)
Waypoint_27
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

pick_sequence

☐ Hide Folder Program Tree

19 A **force control** node is then inserted to make the robot compliant when closing the vise. This allows the robot to move with the part when the vise is closing, preventing any protective stop due to a misalignment of the part in the vise.

After the vise is closed, the gripper releases the part and moves away from it.

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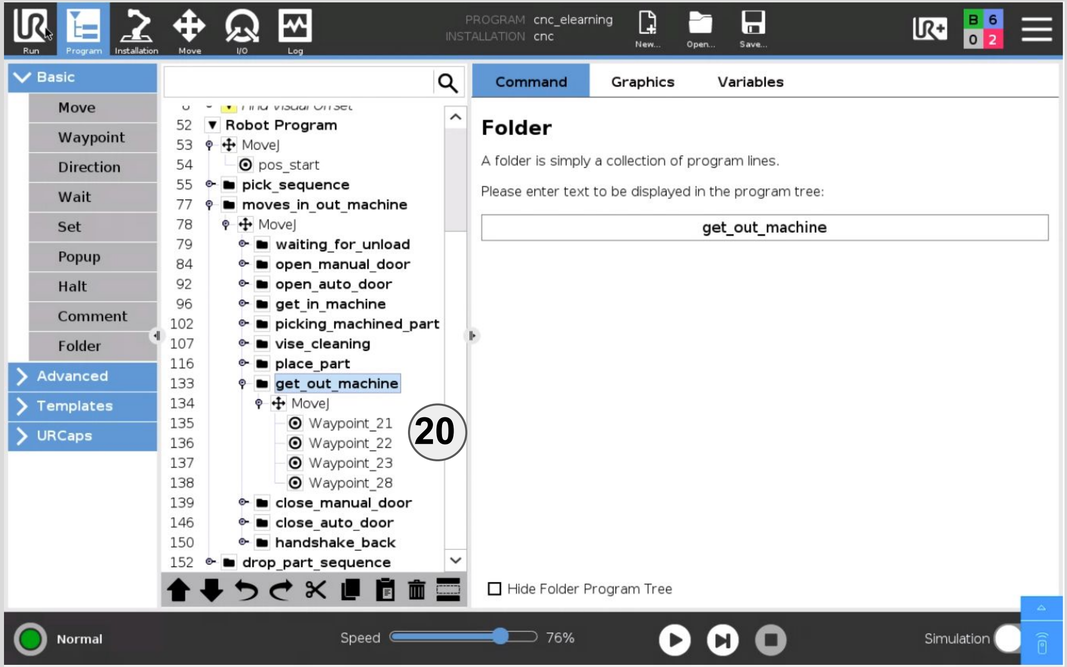
Move in and out of the machine



```
52  Robot Program
53    MoveJ
54      pos_start
55    pick_sequence
77    moves_in_out_machine
78      MoveJ
79        waiting_for_unload
84        open_manual_door
92        open_auto_door
96        get_in_machine
102       picking_machined_part
107       vise_cleaning
116       place_part
133       get_out_machine
134         MoveJ
135           Waypoint_21
136           Waypoint_22
137           Waypoint_23
138           Waypoint_28
139       close_manual_door
146       close_auto_door
150       handshake_back
152   drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

get_out_machine

□ Hide Folder Program Tree

20 This **folder** simply contains the movements required to get out of the machine. It is important to be completely out and leave enough space for the door to close.

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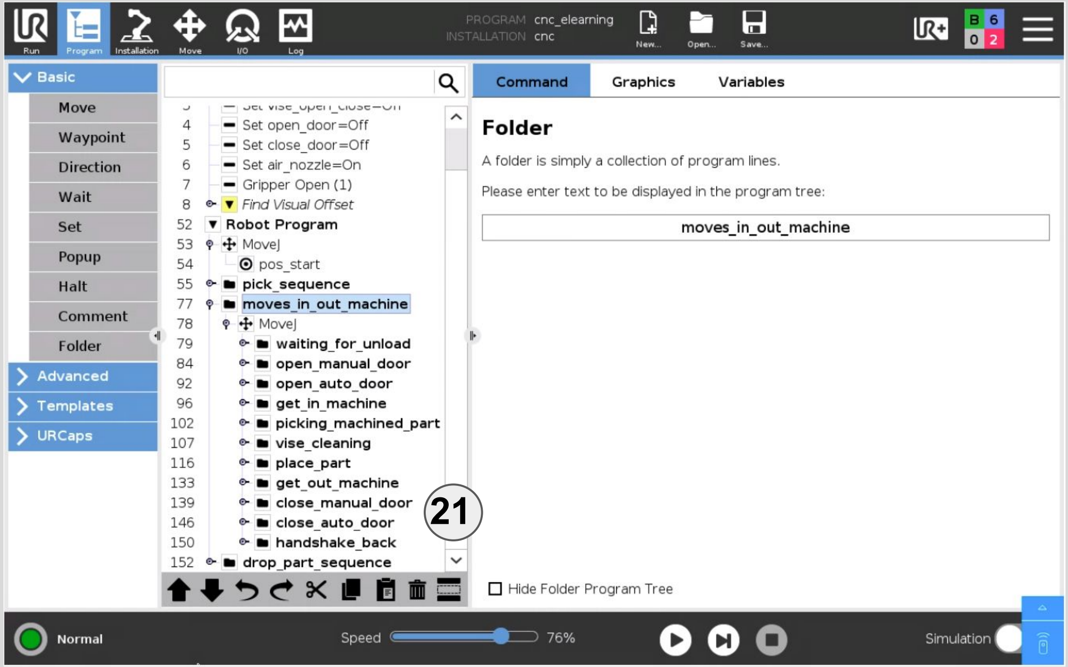
Move in and out of the machine



```
Set vise_open_close=On
Set open_door=Off
Set close_door=Off
Set air_nozzle=On
Gripper Open (1)
Find Visual Offset
Robot Program
  MoveJ
    pos_start
  pick_sequence
  moves_in_out_machine
    MoveJ
      waiting_for_unload
      open_manual_door
      open_auto_door
      get_in_machine
      picking_machined_part
      vise_cleaning
      place_part
      get_out_machine
      close_manual_door
      close_auto_door
      handshake_back
  drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

moves_in_out_machine

□ Hide Folder Program Tree

21 Here are included the two methods to close the door. **Make sure to suppress the one you are not using.**

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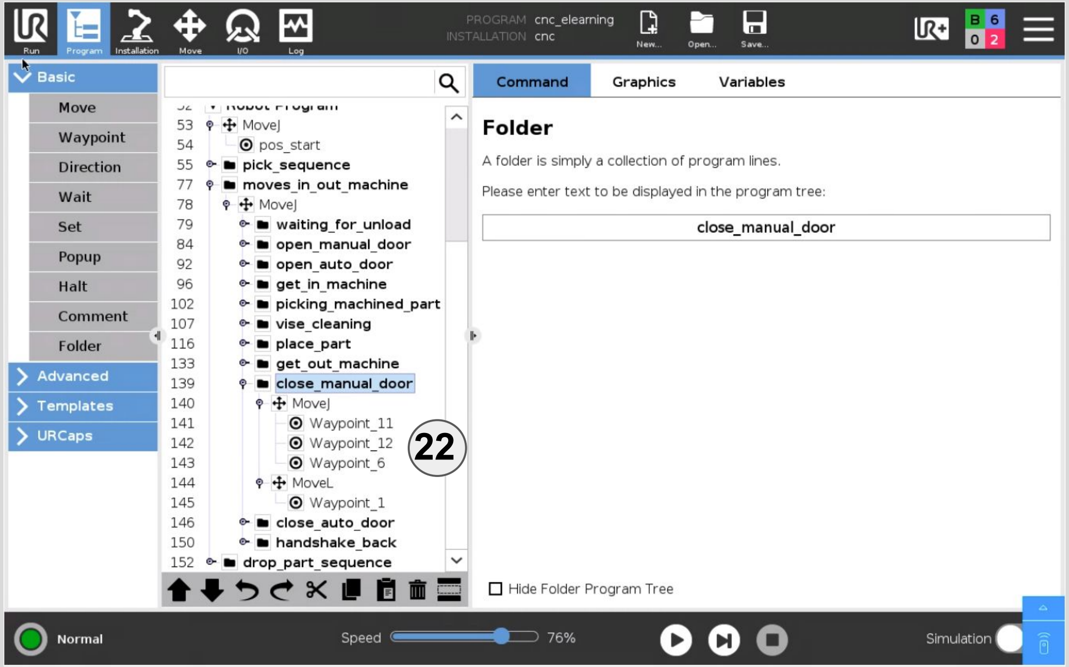
Move in and out of the machine



```
Robot Program
  MoveJ
    pos_start
  pick_sequence
  moves_in_out_machine
    MoveJ
      waiting_for_unload
      open_manual_door
      open_auto_door
      get_in_machine
      picking_machined_part
      vise_cleaning
      place_part
      get_out_machine
      close_manual_door
        MoveJ
          Waypoint_11
          Waypoint_12
          Waypoint_6
        MoveL
          Waypoint_1
      close_auto_door
      handshake_back
  drop_part_sequence
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

close_manual_door

□ Hide Folder Program Tree

22 The manual closing works the same way as the manual opening. The first movements position the gripper next to the handle and the last linear movement closes the door.

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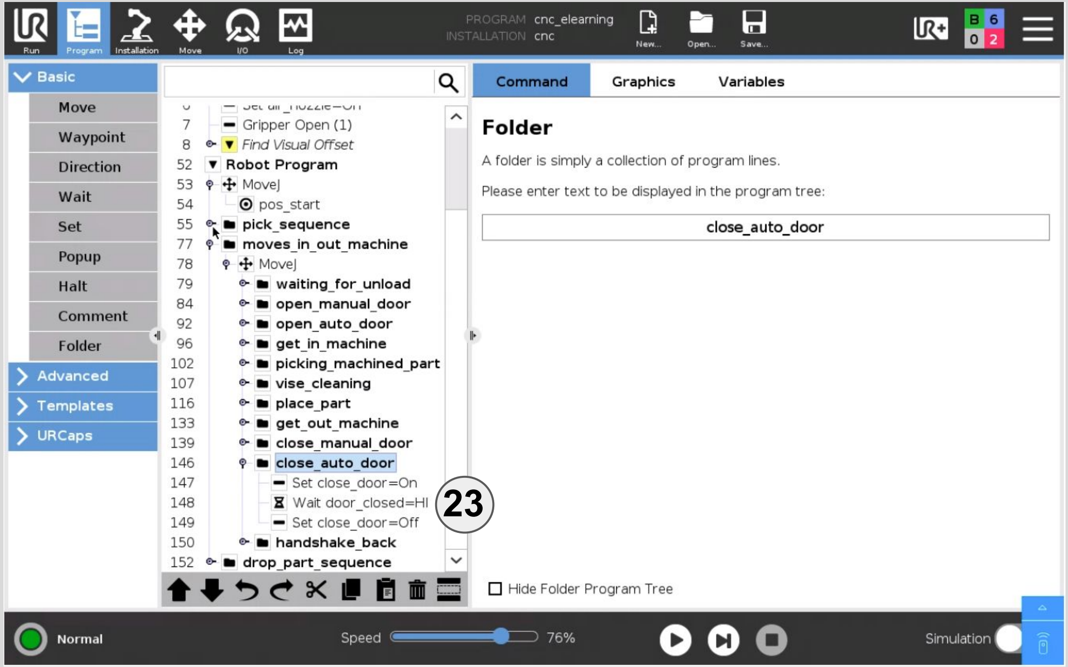
Move in and out of the machine



```
7    Gripper Open (1)
8    Find Visual Offset
52   Robot Program
53     MoveJ
54       pos_start
55     pick_sequence
77     moves_in_out_machine
78       MoveJ
79         waiting_for_unload
84         open_manual_door
92         open_auto_door
96         get_in_machine
102        picking_machined_part
107        vise_cleaning
116        place_part
133        get_out_machine
139        close_manual_door
146        close_auto_door
147          Set close_door=On
148          Wait door_closed=HI
149          Set close_door=Off
150        handshake_back
152    drop_part_sequence
```

23

Folder

A folder is simply a collection of program lines.

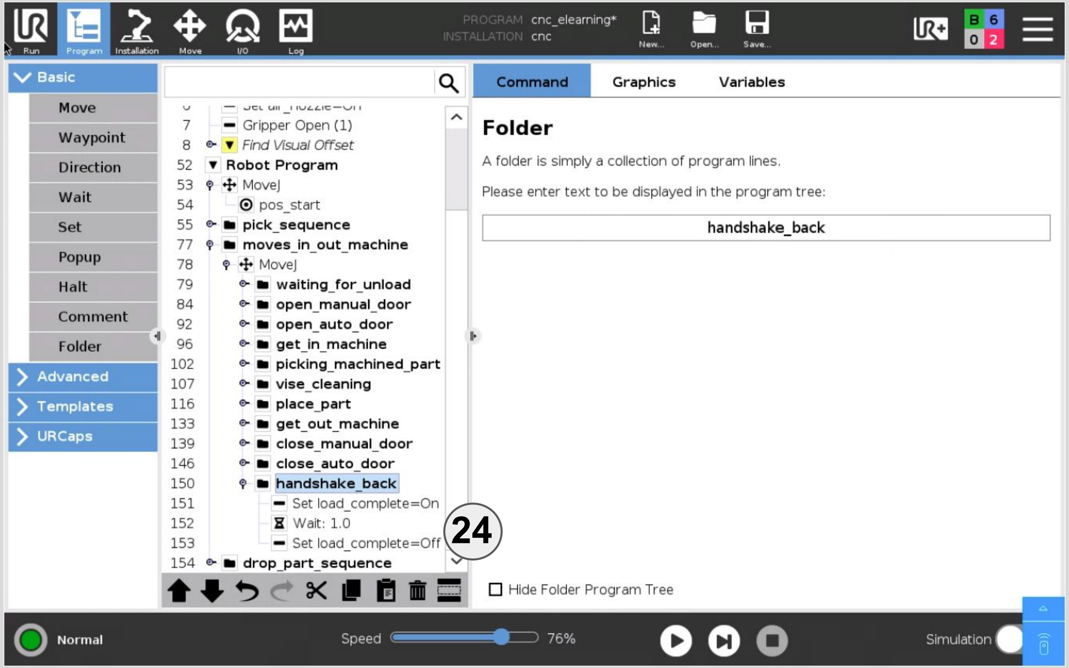
Please enter text to be displayed in the program tree:

close_auto_door

□ Hide Folder Program Tree

23 The automatic closing also works similarly to the automatic opening. We send a signal to close the door through the right digital output. We then wait for the sensor to tell us that the door has been closed. Then we turn of the closing signal.

Move in and out of the machine



```
7    Gripper Open (1)
8    Find Visual Offset
52   Robot Program
53     MoveJ
54       pos_start
55     pick_sequence
77     moves_in_out_machine
78       MoveJ
79         waiting_for_unload
84         open_manual_door
92         open_auto_door
96         get_in_machine
102        picking_machined_part
107        vise_cleaning
116        place_part
133        get_out_machine
139        close_manual_door
146        close_auto_door
150        handshake_back
151          Set load_complete=On
152          Wait: 1.0
153          Set load_complete=Off
154    drop_part_sequence
```

24

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

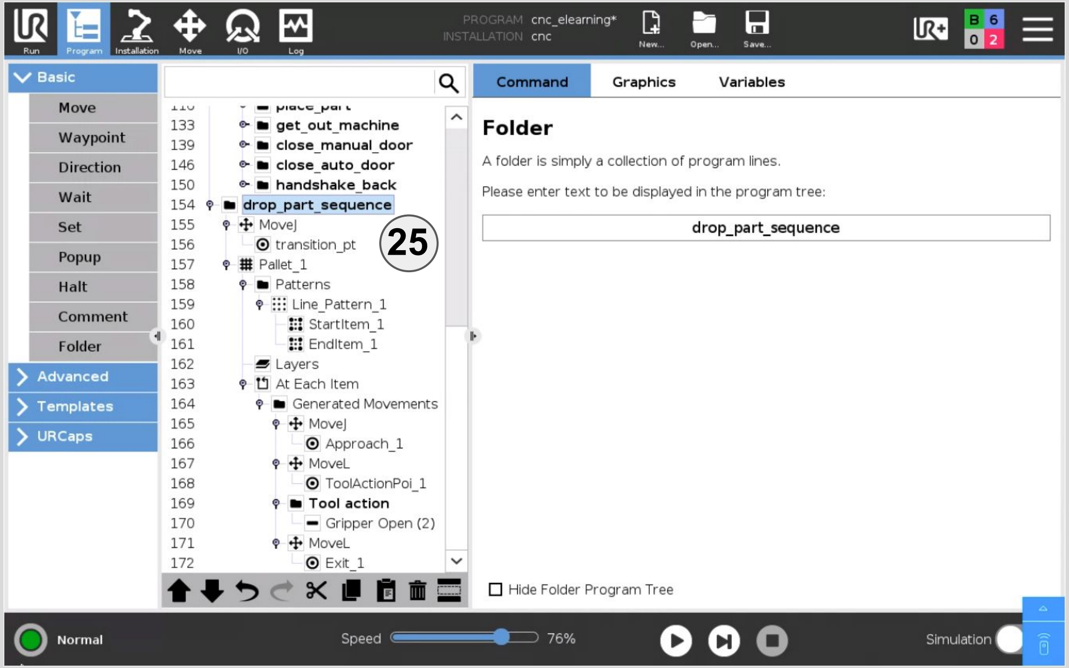
handshake_back

□ Hide Folder Program Tree

24 When everything is done, the robot sends the signal to the machine to start it’s machining process.

After that a wait command is added to make sure the machine starts its process before resetting the signal.

Move in and out of the machine



```
place_part
get_out_machine
close_manual_door
close_auto_door
handshake_back
drop_part_sequence
  MoveJ
    transition_pt
  Pallet_1
    Patterns
      Line_Pattern_1
        StartItem_1
        EndItem_1
    Layers
    At Each Item
      Generated Movements
        MoveJ
          Approach_1
        MoveL
          ToolActionPoi_1
        Tool action
          Gripper Open (2)
        MoveL
          Exit_1
```

Folder

A folder is simply a collection of program lines.

Please enter text to be displayed in the program tree:

drop_part_sequence

□ Hide Folder Program Tree

25 The **drop_part_sequence** folder works similarly to the one used to pick the part in the tray.

A **Pallet** node is used to make sure the emplacement of the part is always correct.

You can put the machine part in the same tray as the blank or a different one, but the program will remain similar, only the points will change.

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Other Subprograms Called

In the program template, other programs are called in the program tree. These programs are not presented in this template and not provided. They are used to pick and place the part after the process. These can easily be program based on **Gripper Product Lessons**.

For more details about the types of insertions used (linear, spiral), please refer to the **Insertion Feature lesson** in the **Copilot Product Lessons**.

More Templates Available!

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