

NAO User Guide for Robotics Lab

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Turning on:

1. Press the Chest button once.
2. **The boot process takes approximately one minute(actually more: about three minutes).**
3. Progression is indicated by the blinking and the lighting of the different LEDs.
4. The boot process is completed when NAO says “OGNAK GNOUK” while its Chest button becomes white.

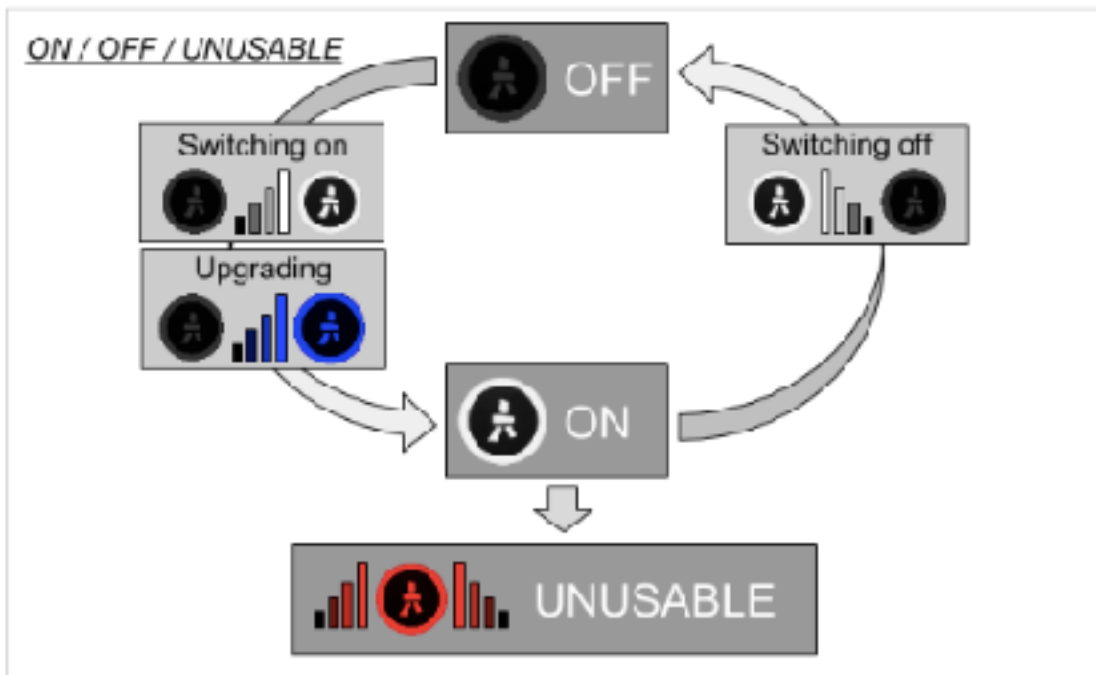
This is his initial position, from that he can easily stand up.



A progress bar is displayed on the **Ear** LEDs:

Progression bar	Means ...
0 %	NAO is in the early boot step, initializing the hardware.
25 %	Hardware is initialized.
50 %	Filesystems are ready to use.
75 %	Network and ssh are started.
100 %	NAOqi is started.

During the boot process, the colour of the **Status** LEDs lets you know if **NAO** is:



You may receive notifications from NAO system or from an application. In that case, a small sound is played and the status LEDs remain still white but blink once in a while with a colour indicating the severity of the notification.

Status LEDs is ...		Description
 Ready: White light, not by a brief blinking is	 Green	NAO gives you some feed back by an Info notification about an ongoing action.
	 Yellow	Warning notification occurs when an issue requires your attention and/or action. NAO is still usable but, it may either run in a degraded mode in which some features may be not available or it may soon become unusable if you don't solve the problem.
	 Red	Error notification occurs when one or all functionality(ies) of NAO become unusable. Try to solve the problem using the tips. If the problem persists, contact the customer support and provide them with the error ID. For further details, see: Contacting customer support for NAO .

Turning off:

1. Press and hold the Chest button for 3 seconds, until NAO says “GNUK GNUK”.
2. **The shutdown process takes approximately 18 seconds.**
3. The tactile-head LEDs fade, and the ear LEDs fade one by one, as a progress indicator.
4. The shutdown process is completed when all the LEDs are off.

Please be careful when turning off and hold him so that he does not fall.

Charging NAO:

1. Plug the adaptor into NAO's back while he's in a stable position and leave him to charge for at least 2 hours. He should not walk or lie down while charging.



Main usages of the Chest button

When NAO is off

You may ...	To ...
Press once	Turn on
Press and hold for 4 seconds	Update the firmware

When NAO is on

You may ...	To ...
Press once	Get IP address, and Read notifications
Press again	Skip a message
Press twice	Set the life off and on
Press and hold for 3 seconds	Shut down
Press and hold for 8 seconds	Request a Forced switch off

How to turn on/off Autonomous Life

To enable or disable **Autonomous Life** Press the Chest Button twice, then **NAO** switches its **Life** status.

From off to on, NAO:

- Pushes a happy grunt, and
- Performs a **Waking up**.

From on to off, NAO:

- Sighs,
- Stops its **Activities** and
- Performs a **Resting action**.

When requested to wake up, NAO:

Turns the **Stiffness** of its motors on,

Goes to a standing posture,

Note: this step is skipped when NAO is sitting, is lying, or has no feet.

Resumes its **life**.

When requested to rest, NAO:

Goes to its resting posture.

Note: this step is skipped when NAO is sitting, is lying, or has no feet.

Turns the **Stiffness** of its motors off.

Talking with NAO

Autonomous Life: ON - Basic Channel: ON

To chat with NAO:

- Get close enough, and make sure NAO has seen you.
- NAO will detect your presence if you approach within five feet (1.5 meter).
- Check if NAO is listening, his eyes should be navy blue.
- Say a short sentence, in one go.
- Pauses are interpreted as the end of the sentence.

List of questions you can ask NAO:

- How are you?
- Can you say goodbye?
- What can you do?
- Tell me all you can do.
- How do I install an application?
- How do I start an application?
- What did I say?
- Can you repeat please.
- What is your battery level?
- Are you charging?
- What is your IP address?
- Are you connected to Internet?
- What languages do you speak?
- You can ask NAO to change his current language.
- Speak softer.
- Speak louder.
- Can you stand up?
- Can you sit down?
- Crouch.
- Lay down

- Lay down on your back.
- Lay down on your belly.
- Can you stand on one foot?

The execution of an action depends on whether the robot knows this command or not.

Note, that Red NAO doesn't have Basic Channel, so he cannot talk to you. Blue NAO can.

You can also tell him what to do:

- Make sure NAO is listening.
- "Start" + the **Activity** name, or
- one of the Trigger sentences, if any.

To stop an **Activity** currently running:

Lay your hand on the three Head tactile sensors for 3 to 10 seconds.

Remove your hand.

If, for any reason, NAO has fallen on the floor, don't worry!

The current activity is automatically stopped and NAO tries to stand back up on his own.

How NAO detects humans

NAO tries, as much as possible, to establish and keep eye contact with people around.

Looks in the direction of any detected stimulus - sound, movement, touch.

Checks if this stimulus may correspond to a human.

If a human is detected, NAO tries to keep eye contact with him/her,

If not, NAO goes back to his previous occupation.

Limits

NAO does not react to new stimulus:

- When processing a stimulus (i.e. checking if it corresponds to a human).
- NAO does not react to other stimuli until he has finished to process the first one.
- When engaged in an Activity or a Dialog.
- When NAO is chatting with a human, he always keeps tracking the human until the human has left.

Eye LEDs feedback

When the eye LEDs are ...	NAO is ...
Navy blue, rotating	listening.
Green	not listening anymore, he is processing what the human just said.
White or pale blue	not listening, the dialog has not started.

Sound feedback

Additionally, slight "bilib" sounds can be heard when NAO starts and stops listening:

- when starting listening, the sound is ascending,
- when stopping the sound is descending.

Accessing NAO's Web page

- NAO says the four numbers of its **IP address**

IP address is hard to understand?

On the third request, NAO will slow down and spell digit by digit the address.

If NAO says “I can’t connect to the network”:

Check the availability of your local network,
Turn OFF and ON the robot,
Check the WiFi settings.

Blue NAO has such a problem, but it cannot be solved so easily.
And Red NAO has IP address: 10.91.37.70

- Open a web browser and enter this **IP address** in the address bar.
- In authentication windows complete user name and password fields.

Here is what you should get:



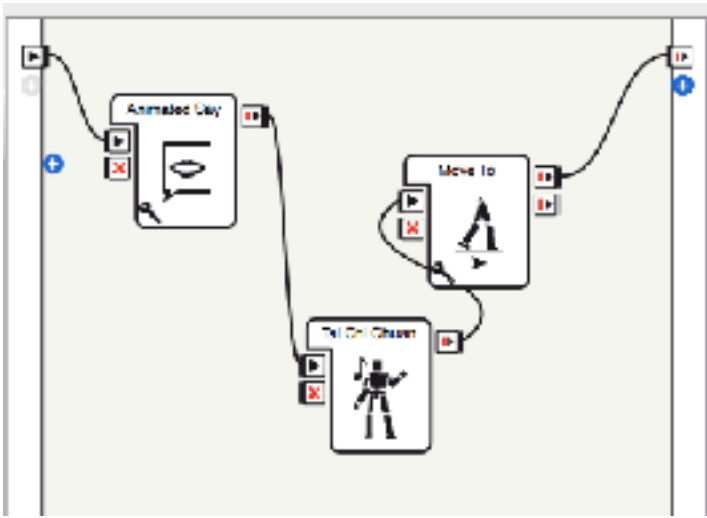
Working in Choregraphe

As you are not working with robot, it is logical to assume, that you are not advanced user of Choregraphe tool.

So you only need to know some basic functionality.

First of all download and install this application.

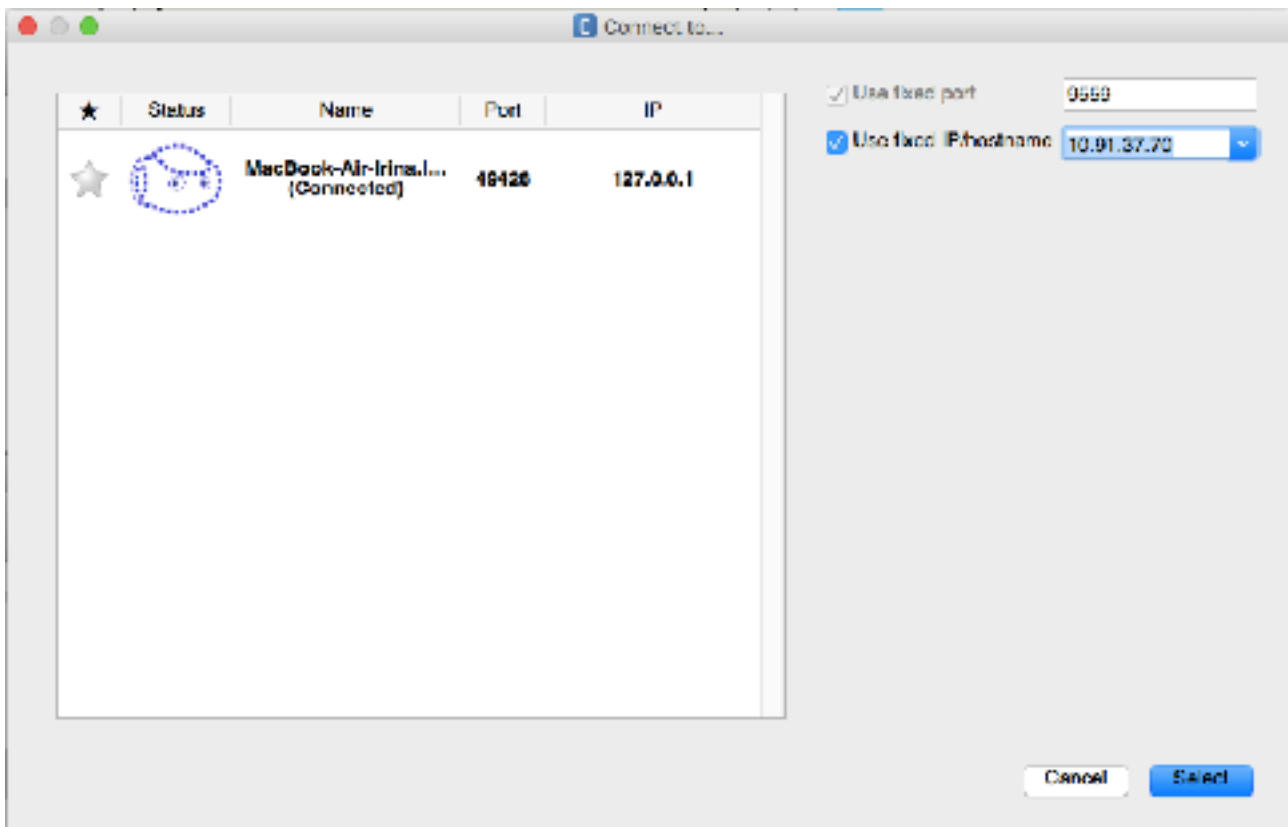
After you loaded it you will be asked to create new or open some project. Creating new project you can develop sequence of movements yourself: you need just to put boxes with movements in some order you need, as it is shown on the picture:



Connection: press the green button to choose robot and connect, the red one - to disconnect.



You can connect to the real robot and also to simulated one, to check the correctness of the behaviour first.

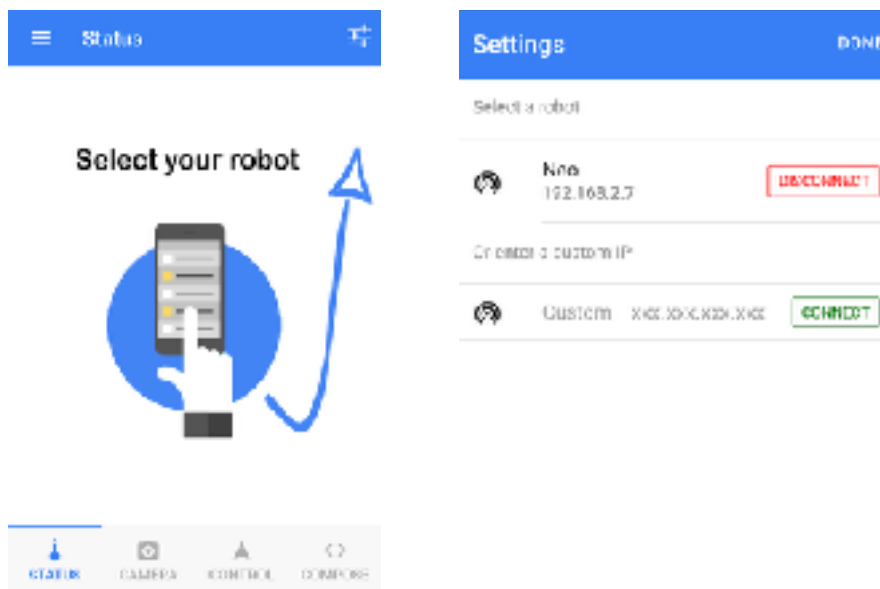


Even more easier with existing behaviour, you should just run the behaviour and enjoy.

Working with Mobile application

There are several application in play store, but it is better to use *NAO Robot Controller* as it has better user interface and more features, Lab's tablet already has it.

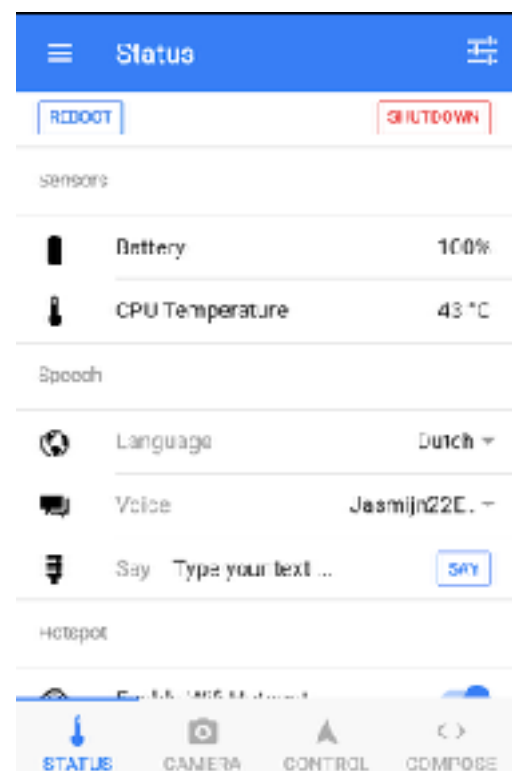
To connect your robot to mobile application, make sure, that they are connected to the same Wi-Fi network. These robots are connected to InnopolisU. Enter IP Address.



When you are connected, you have access to the rest of functionalities in application, but NAOs cannot do everything, implemented there. So here is the list of commands you can make him do:

- Reboot
- Shutdown
- Check his camera view
- Make him go different directions
- Sit down/ stand up
- Dance Tai Chi
- Make him say something

Also you can see main information about your robot:



If this document was not enough for you and you want to

get deeper knowledge in this field follow the link: http://doc.aldebaran.com/2-1/home_nao.html

Detected Problems

Blue NAO:

1. Cannot connect to network, cannot connect to cloud services.
2. Sometimes has problems with motors in left leg.
3. Suddenly falls, it must be held.

Red NAO:

1. Doesn't interact with people.
2. Problems with charger