

User Manual

# Promobot C2

[promo-bot.ai](https://promo-bot.ai)

A humanoid service robot for business

## Dear User!

We would like to thank you for choosing and purchasing an innovative product that is highly reliable and efficient in operation. We are sure that our robot will serve you for many years.

Please note that efficient and safe operation as well as proper maintenance is possible only after you have carefully studied this User Manual.

When receiving the robot, we recommend that you check the scope of delivery and the absence of visible damage that may have occurred during shipping.

We wish you a pleasant experience!

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## TERMS AND DEFINITIONS

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1. **The robot** — Promobot C2, an autonomous humanoid service robot.
2. **A robot owner** — an organization or a person who has purchased one or more robots.
3. **Robot work area, work area** — a space up to 2.0 m above the floor level where the robot will permanently or temporarily be located.
4. **Individual Use Case (IUC), Use Case, Case** — a special robot usage scenario (accomplished by the software) to perform certain business tasks of the robot owner. Examples of use cases are: museum expert, multipurpose center worker, teaching assistant (more information about available use cases — see on the official Promobot website). The robot owner decides whether the robot will or will not have the individual use case before purchasing the robot.
5. **A robot without a Use Case, a robot without an IUC, a robot with a default Use Case** — a robot-consultant, a robot with default functionality, a robot who only has a few basic applications and can answer the questions.
6. **The linguistic database, Linguobase** — a database containing a set of rules and replicas (phrases) used as the robot's reaction to certain person phrases or events. Linguistic database is that main component which makes the robot to be able to carry on a conversation.
7. **Replication** — the process of copying parameters values from the global database (remote server) to the robot (local server).
8. **The interaction mode** — the state of the robot when a person is speaking something to the robot or is waiting for the robot's answer, or when a person is using the touchscreen display to operate the robot. It is the opposite of **standby mode**.
9. **The standby mode** — the state of the robot when it is not interacting with a person, i.e. when the robot is waiting for a question, phrase or screen touches from a person. It is the opposite of the **interaction mode**.
10. **The mode of displaying promo materials** — a type of **standby mode**, when videos or images are being played on the robot's touchscreen display.
11. **The touchscreen display** — a monitor supplied with the robot which provides graphical user interface for operating the robot via touchscreen. It is used mostly to access the **Service Menu**.

12. **The Service Menu** — a special menu which is used to configure some basic robot's parameters.
13. **A degree of freedom** — the number of possible independent directions of movements (coordinate axes).

# 1. GENERAL

Promobot C2 is an autonomous humanoid service robot.

The robot looks like a human, mimics human facial expressions, communicates within a given subject area, recognises speech and faces and memorizes information about people it met. The robot also allows to save text data in the database and to display promo materials (photo and video files) on its touchscreen display.

## 1.1. Purpose of the Robot

The Promobot C2 robot is designed:

- **to attract attention:**
  - has a hyper-realistic human appearance and facial expressions;
  - expresses emotions on its face, blinks and winks its eyes;
  - gesticulates with its hands while interacting with person;
- **to interact with people:**
  - memorizes and recognizes people's faces;
  - initiates a conversation;
  - maintains a dialogue on common topics;
  - maintains a dialogue on pre-programmed special topics;
  - provides information about the company, products and services;
  - answers questions;
- **to perform business tasks:**
  - draws attention to the business;
  - increases media coverage;
  - stands out from the competitors;
  - increases customer loyalty.

## 1.2. Technical Characteristics

Table 1. Technical Characteristics of the Promobot C2 Robot

No.	Parameter, unit of measurement	Value	
<b>BASIC</b>			
1	Robot dimensions (HxWxL), mm	1450x700x1020	
2	Transport case dimensions (HxWxL), mm	1645x920x1010	
3	Robot weight <sup>1</sup> , kg	Up to 100	
4	Robot weight including the transport case <sup>1</sup> , kg	Up to 160	
5	Input voltage, V	110/230	
6	Frequency, Hz	50–60	
7	Power consumption, W	Max: 700	
8	Material	Skeleton/Frame	Aluminium, steel, plastic
		Skin	Silicone
		Arms	Aluminium, steel, plastic, electronic components
		Legs	Plastic
9	Robot appearance	Gender	Male
		Hairstyle	Artificial hair
<b>EQUIPMENT</b>			
10	Camera	Resolution	1920x1080
		Frame rate, fps	Up to 30
		RGB lighting around the camera	Yes
11	Microphone	Omnidirectional	Yes
12	Speakers	Quantity, pcs	2
		Power, W	25
13	Touchscreen Display	Display technology	TFT IPS
		Diagonal, inch	10.1
		Resolution, pix	1280x800
		Touchscreen	Yes
<b>COMMUNICATION</b>			
14	Speech modules pronunciation	Via speech synthesis	
15	Access to the linguistic database	Yes	
16	Communication languages (default)	English, Russian	
17	Number of memorized faces <sup>2</sup>	10	

No.	Parameter, unit of measurement	Value	
<b>MOVEMENT</b>			
18	Number of degrees of freedom	Head	3
		Arms	12
		Torso	3
19	Number of servos	Head	17
		Neck	3
		Torso	3
		Arms	13*2
20	Number of points of articulation in the face	18	
21	Amplitude of eye movement <sup>3</sup>	Blinking	
		Movement up and down, left and right	
<b>ADDITIONAL SERVICES</b>			
22	Access to the linguistic database and analytics service	Yes	
23	Access to SIP telephony service <sup>1</sup>	Additional option	
24	Access to telepresence service <sup>1</sup>	Additional option	

<sup>1</sup> — Depends on the robot's configuration selected.

<sup>2</sup> — Can be further extended.

<sup>3</sup> — The eyes can move separately from each other.

## 1.3. Package Contents

When unpacking the robot, check that all of the following components are included (Table 2).

When receiving the robot, check completeness of its package contents and the absence of visible damage that may have occurred during shipping or improper storage in the seller's warehouse. In case of defects, please contact the Technical Support (see Chapter 11).

**Table 2. Package Contents**

Item	Quantity, pc.
Promobot C2 Robot	1
Promobot C2 Robot legs	2
Touch-screen display	1
Display bracket	1
Transportation case	1
Power cable	1
Power cable 12V (XLR)	1
HDMI cable	1
USB cable	1
USB cable	1
Set of fixing screws and wrenches	1
Set of clothes	1
Fixed platform	1
Set of wheels for the robot platform	1
QR code with link to the user manual	1

## 1.4. Accessing Web Services

The access to the following web services is provided with the robot:

1. **The service of Linguobase and Analytics** is a multifunctional service, the main purpose of which is to control the robot's speech and communication abilities. The service provides a functionality of filling and adjusting of the phrases to which the robot will respond and phrases which the robot will use to answer in conversation. You can also view the history of visitors' dialogues with the robot via this service. The web interface of this service provides the ability to view and change the values of the robot's parameters and the Linguobase settings. The robot owner gets a personal user profile to access this service. After authentication, the owner can view information about all purchased robots.

Website: [lingvo.promo-bot.ai](http://lingvo.promo-bot.ai)

2. **Telepresence service**<sup>1</sup> is a service designed to remotely monitor and control Promobot robots. The service allows you:

- to view the video stream from the robot's camera and receive sound from the microphones<sup>2</sup>,
- to remotely control robot's answers while conversation with user via chat interface,
- to control the robot's movement, the movement of its arms and head.

The service is optional and can be purchased additionally.

Website: [teleop-new.promo-bot.ru](http://teleop-new.promo-bot.ru)

3. **SIP telephony service**<sup>1</sup> enables audio communication with an operator (e.g. call to specific employee) or emergency call (police, ambulance). The service is optional and can be purchased additionally. Service availability is agreed at the stage of choosing the robot's configuration and its functions.

<sup>1</sup> — Depends on the configuration selected.

<sup>2</sup> — The service cannot be used for the purpose of covert data collection, including: recording video, audio or text information without prior permission. When using the service, you need to consider the legal restrictions of the country where the robot is located.

## 2. ROBOT COMPONENTS

The Promobot C2 robot consists of the following main components, shown in Figure 2.1.

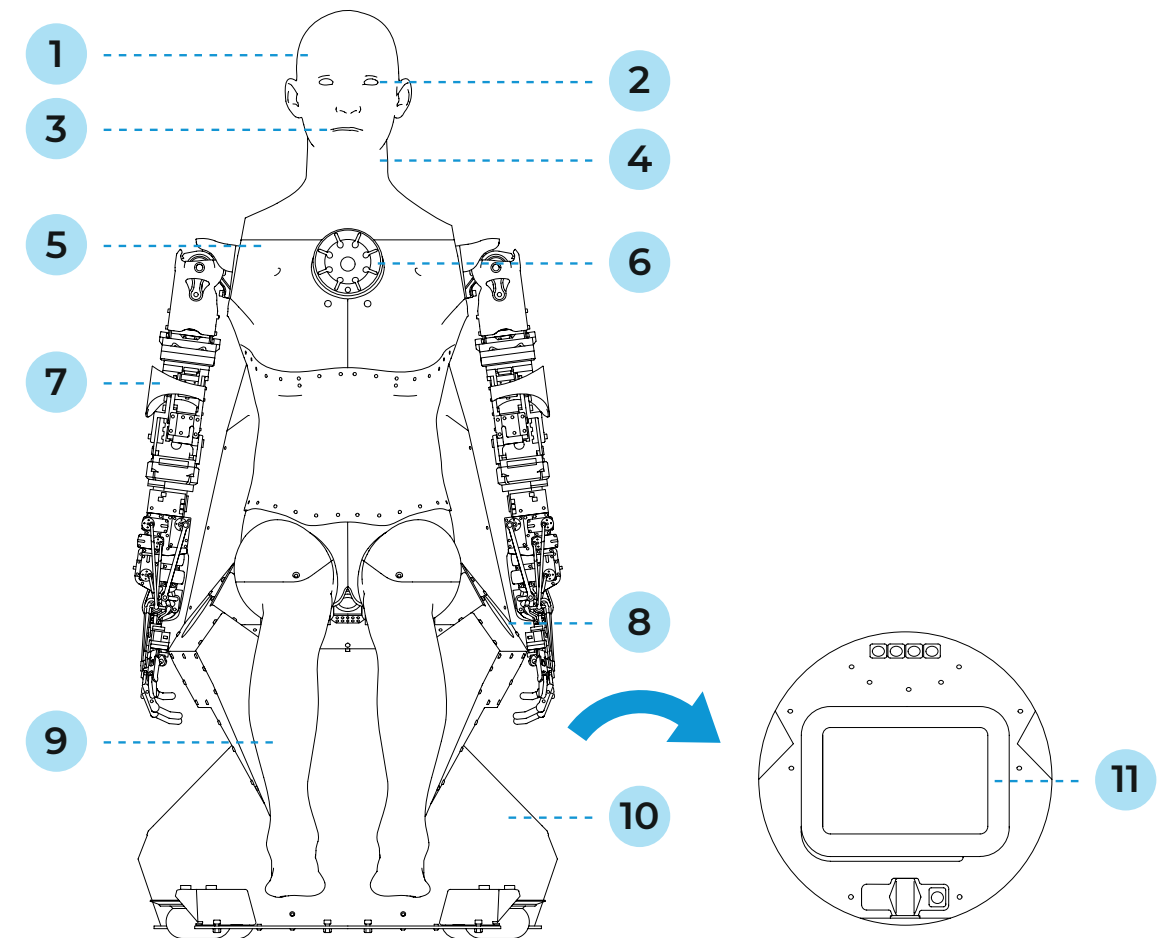


Figure 2.1. Promobot C2 robot, main components

- |                                  |                         |
|----------------------------------|-------------------------|
| 1. Moving head                   | 7. Moving arms          |
| 2. Moving eyes                   | 8. Speakers             |
| 3. Moving mouth                  | 9. Stationary legs      |
| 4. Moving neck                   | 10. Stationary platform |
| 5. Moving torso                  | 11. Touchscreen display |
| 6. Backlit camera and microphone |                         |

- **Moving head, eyes, mouth, neck, torso and arms** hyper realistically mimic the appearance of a human being, attracting visitors' attention by that.
- **The backlit camera** is used for face recognition and for tracking faces in space.
- **A microphone** is used for speech recognition and positioning a person in front of the robot.
- **Speakers** are used for playing sounds and speech synthesis.
- **A stationary platform** is used to place the robot on the floor or other flat area.
- **The touchscreen display** shows the graphical user interface for operating the robot via touchscreen and is used to display promo materials.
- **The color of the backlight on the robot's chest** varies depending on the robot's current status:
  - **White constant** — power is applied, the robot systems have not yet booted up.
  - **Blue pulse** — the robot's systems are in process of booting up, this indication is activated when the robot's power button is pressed.
  - **Green constant** — all robot's systems are booted up.
  - **Red constant** — an error has occurred while booting up the robot's systems.
  - **Purple constant** — the robot systems are shutting down.

**NOTE**

The manufacturer reserves the right to modify the robot's construction, design, configuration or technology without prior notice in order to improve its performance.

## 2.1. Moving Head

The robot head is a complex object that contains the following components:

- metal skeleton/frame;
- servos;
- plastic parts;
- silicone skin;
- artificial hair.

**The metal skeleton/frame** and **plastic parts** create the shape of a skull.

**Servos** are responsible for the facial expressions.

**Silicone skin** mimics real human skin.

**Artificial hair** mimics a real human hairstyle.

The robot can move its head in three degrees of freedom, this allows the robot to turn towards a person during a conversation.

There are 18 points of articulation on the robot's face, controlled by 17 servos. Thanks to them, the robot mimics the appearance and facial expression of a human in the smallest details, namely:

- displays human emotions;
- moves the pupils of the eye;
- winks;
- blinks;
- frowns;
- moves its lips during speech synthesis.

**WARNING:**

It is prohibited:

- to allow moisture or foreign objects to enter the holes in the skin;
- to manually alter (stretch, pull, shift etc.) the robot's silicone skin;
- to try to manually turn the robot's head;
- to try to manually change the robot's facial expression;
- to try to manually change the position of the robot's eyes;
- to try to open, repair or modify the robot yourself without the assistance of the Promobot specialists.



## 2.2. Moving Torso

A moving torso, as well as the neck, allows the robot to turn towards a person during a conversation. The torso also allows you to put a jacket or other clothing on the robot. The torso consists of the following components:

- metal skeleton/frame;
- servos;
- rubber parts;
- plastic parts.

The **metal skeleton/frame** creates the shape of the robot's body.

**Servos** implement the torso movement.

The **rubber parts** lend flexibility to the torso, mimicking the human body, allowing the robot to turn towards a person during a conversation.

The torso is equipped with a backlit camera and microphone. The camera can find and recognise people's faces and it is used in the telepresence service to make it possible for the operator to see the video stream. A microphone is used for speech recognition.



### WARNING!

It is prohibited:

- to touch a video camera;
- to allow moisture or foreign objects to enter the holes of the microphone and video camera;
- to try to open, repair or modify the robot yourself without the assistance of the Promobot specialists.

## 2.3. Moving Arms

Robotic arms allow the robot to gesticulate during the conversation. The arms move in 12 degrees of freedom, so the movements look very human-like.

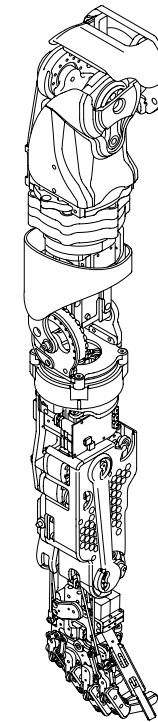


Figure 2.2. Robotic arm



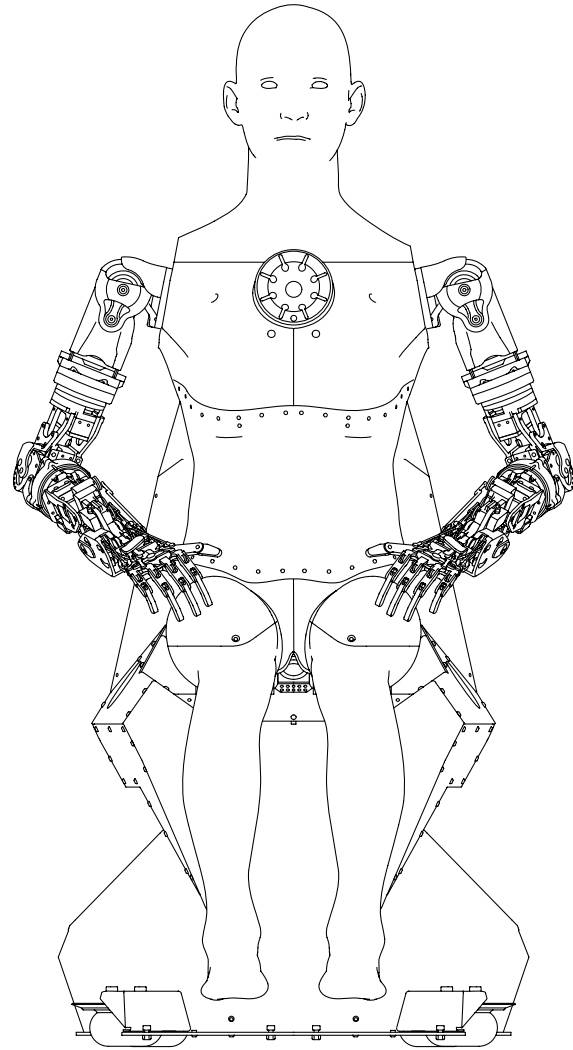
### WARNING!

It is prohibited:

- to allow moisture or foreign objects to enter the gaps in the movable parts of the arm;
- to allow excessive pressure on the arm;
- to try to manually move arm joints;
- to try to open, repair or modify the robot yourself without the assistance of the Promobot specialists.

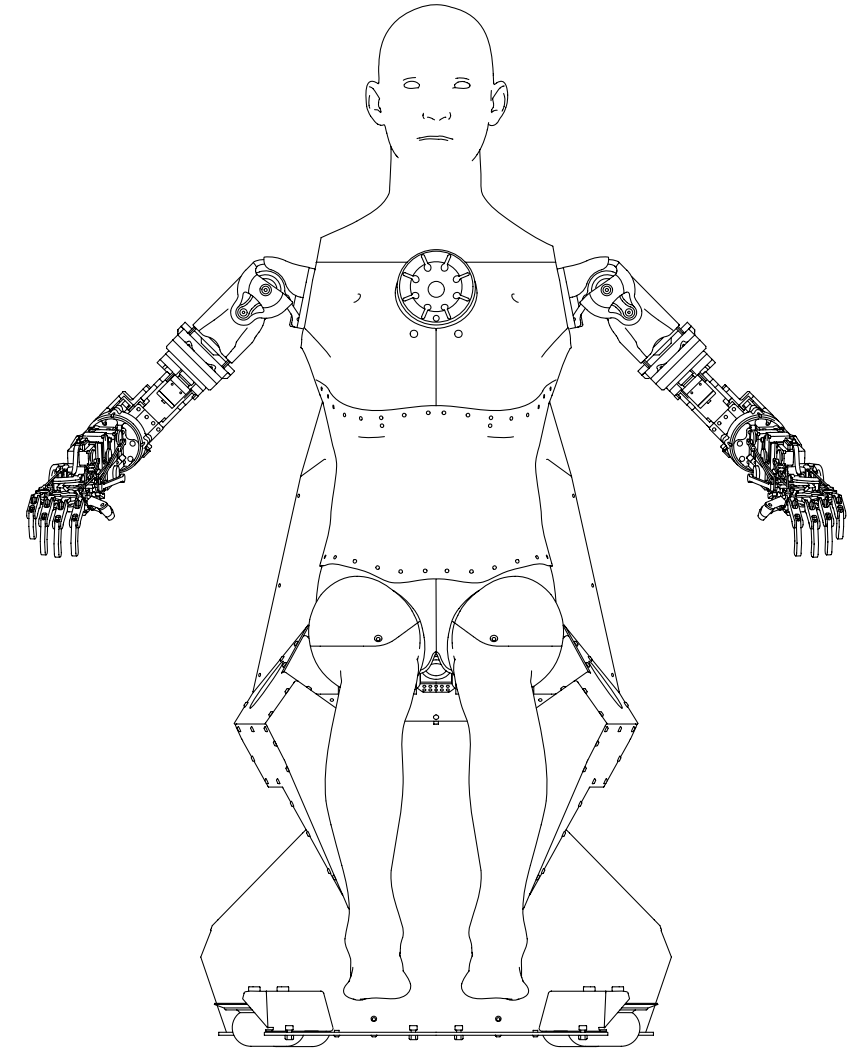
The robotic arms are a mechanical device, so each time the robot is turned on, the calibration starts, and the arms are automatically being set to zero position. The position of the arms in the zero position depends on whether the Play button is pressed or not (see para. 5.3).

If the software application of the robot's use case is started (the Play button on the touchscreen display is pressed), the zero position of the robot's arms will look like in Figure 2.3.



*Figure 2.3. Robot's arms at zero position when the robot's use case is started (Play button is pressed)*

If the software application of the robot's use case is not started (the Play button on the touchscreen display is not pressed), the zero position of the robot's arms will look like in Figure 2.4.



*Figure 2.4. Robot's arms at zero position when the robot's use case is not started (Play button is not pressed)*

## 2.4. Stationary Platform

The stationary platform is a strong steel frame that holds the entire robot. It is used to place the robot on the floor or other flat area. The components of the platform are shown in Figure 2.5.

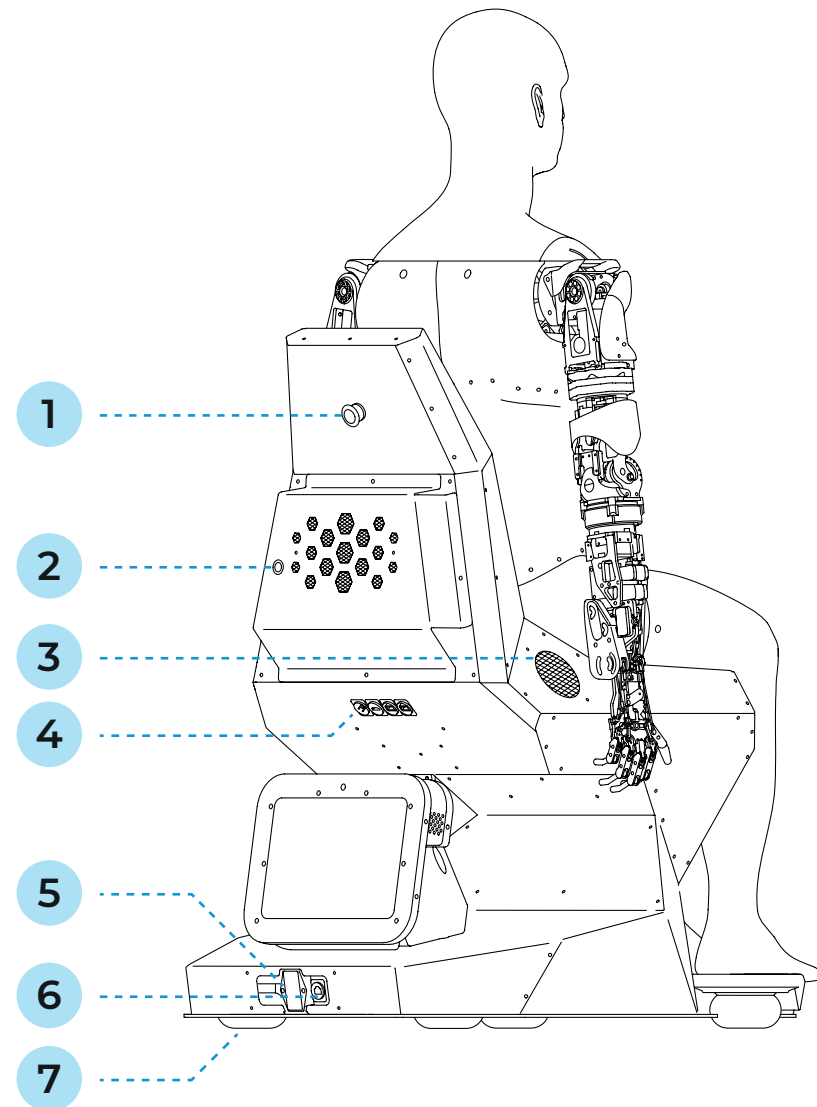


Figure 2.5. Platform components.

- |   |                               |
|---|-------------------------------|
| 1. Emergency stop button                    | 5. Power circuit break button |
| 2. Power button                             | 6. Power cable port           |
| 3. Speakers                                 | 7. Wheels                     |
| 4. Ports for connection cables and USB-port |                               |

- **The emergency stop button** is used to urgently stop the robot's movement.
- **The power button** is used to turn on and off the computer module of the robot.
- The computer module is located inside the platform, it performs the technical functions which implement the whole robot's work.
- **Speakers** are used for playing sounds and speech synthesis.
- **Ports for connection cables** are used to connect the touchscreen display to the robot.
- **The USB-port** is used to load promo materials (see para. 6.4).
- **The power cable port** is used to connect the robot to the mains using the power cable supplied.
- **The power circuit break button** allows you to de-energise the robot during transport.
- **Wheels** help in transporting the robot.

The ports are described below (Figure 2.6).

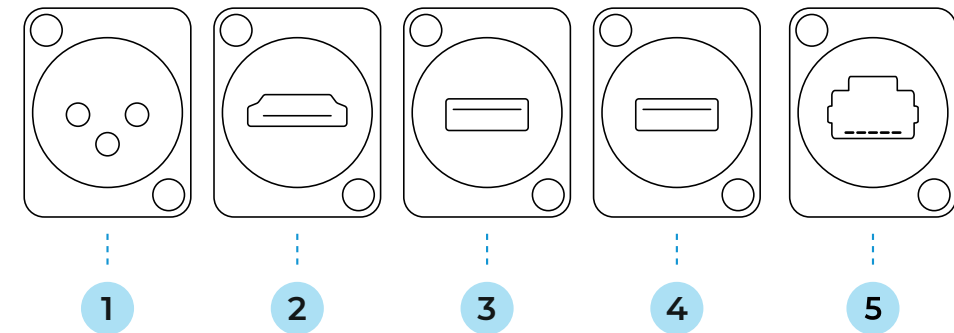


Figure 2.6. Ports for connection cables

- |  |   |
|--|---|
| 1. Port for 12V power cable (XLR) for touchscreen display.       | 4. USB-port for connecting a USB flash drive for loading promo materials. |
| 2. Port for HDMI cable.  | 5. RJ45 connector is for Internet connection via an Ethernet cable.       |
| 3. USB-port for connecting the touchscreen display to the robot. |   |



### WARNING!

It is prohibited:

- to allow moisture or foreign objects to enter the ports;
- to allow foreign objects to be in the way of the wheels and disturb their rotation.

## 3. WORK AREA REQUIREMENTS

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There are some special requirements for the room in which the Promobot C2 robot will be placed.

First of all, the work area should be a room, which means that the robot is not designed for outdoor use, as it is a technologically complex electrical product that requires protection against moisture. Second reason, why the robot shouldn't be used outdoors, is that the direct sunlight could damage parts of the robot's body and 'blind' the robot's cameras (interferes with the face recognition function). And the final reason is that the wind makes a lot of noise (interferes with the speech recognition function).

Also please consider that the robot needs a stable Internet connection for the speech recognition system to work.

Meeting these requirements will affect the efficiency and longevity of the robot's work.

**The room or place where the Promobot C2 robot will be used should meet the following requirements:**

- air temperature from +10° to +35°C;
- air humidity not more than 70%;
- an average lighting level is 50 lux and more.

**You should make sure that there are no such sources of disturbances next to the Promobot C2 robot:**

- high voltage;
- bright blinding light (including directional spotlights);
- loud noise or loud music.

**The Promobot C2 robot needs access to the Internet, so the following requirements apply to the room:**

1. Availability of seamless Wi-Fi (802.11n) coverage with a frequency of 2.4 or 5.0 GHz with a guaranteed two-way transmission of at least 4 Mbps throughout the entire work area. Ping to the address 8.8.8.8 is no more than 50 milliseconds.
2. Radio transparency (absence of thick walls, large columns and obstacles) in the path of propagation of Wi-Fi waves from the access point to the robot.
3. Low level of interference on Wi-Fi frequencies (no other working access points and Wi-Fi routers of 802.11 ac standards indoors in the robot's work area).
4. Ports 80, 443, 8080, 22105, 22111 are open in the router settings. For more information see para. 6.2 of this Manual.

When organizing access to the Internet, keep in mind that **the robot does not connect to hidden networks.**

## 4. SAFETY PRECAUTIONS

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### 4.1. General Safety Rules

1. Use the Promobot C2 robot only for its intended purpose as specified in the User Manual.
2. Place the Promobot C2 robot only in rooms that meet the requirements described in Chapter 3.
3. Do not use the Promobot C2 robot outdoors or in rooms with high humidity.
4. If the robot was transported in sub-zero temperatures, be sure to let the robot stand powered-off in a heated room for at least two hours before turning it on.
5. Please read the User Manual before unpacking the robot.
6. The Promobot C2 robotic arms can cause an injury while the robot is operating, so do not touch the robot's arms while they are moving.

## 4.2. Electrical Safety Rules

1. When operating the Promobot C2 robot, follow the general safety rules for the use of electrical appliances.
2. Before handing over for repair or storing the Promobot C2 robot, turn off the power of the robot, switch the power circuit break button to the "Off" position, unplug the power cable from the electric outlet and disconnect the power cable from the robot.
3. The parameters of the mains should correspond to a voltage of 220V and a frequency of 50–60 Hz. Voltages above or below 220V could damage the batteries and cause the robot to malfunction.
4. Regularly inspect the power cable for damage and wearout. You should use the power cable only if it is completely undamaged.
5. If the power cable is damaged or ruptured, unplug it immediately from the electric outlet. Replace the power cable with a new one.
6. Do not pull the power cable from the electric outlet holding it on the cable, please hold it on the plug while pulling.
7. Do not step on the power cable.
8. The electric outlet should correspond exactly to the plug of the power cable.
9. It is recommended not to use adapters.
10. You should use only grounded electric outlets to connect the robot. Using ungrounded electric outlets could cause the robot to malfunction.
11. If you need to use an extension cable, then you should use only standard industrial ones. The cross section of the extension cables should not be smaller than the cross section of the power cable of the robot. If the length of the extension cable is 20 m and smaller, then use extension cables with a cross section of 1.5 mm<sup>2</sup> and more. If the length of the extension cable is from 20 to 50 m, then use extension cables with a cross section of 2.5 mm<sup>2</sup> and more.
12. When using an extension cable wound around a spool, pull the cable out to its full length.
13. If necessary, consult a qualified electrician.

## 4.3. Safety Rules during the Display Cleaning

1. Clean the robot's display only when the power is off.
2. It is recommended to use a soft cloth to clean the robot.
3. Use glass cleaner only. Do not use abrasives, benzene and carbon tetrachloride as these substances can damage the glass. Do not use isopropyl alcohol, because it may leave streaks on the glass.
4. Do not spray the glass cleaner directly on the glass, spray it on cloth. If too much cleaner is applied to the glass, the liquid may get past the edges of the glass or into any technological gaps and cause the robot damage.

## 5. PREPARING THE PROMOBOT C2 FOR USE

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First of all you need to unpack the robot from its transport case, verify the absence of physical damage and organize the work area for the robot according to para. 3.



### ATTENTION!

If the robot was transported in sub-zero temperatures, be sure to let the robot stand powered-off in a heated room for at least two hours before turning it on.

## 5.1. Unpacking the Robot

### 5.1.1. General Packaging Information

The Promobot C2 robot is supplied in a special transport case (Figure 5.1). Inside the transport case, the robot is placed in a polyethylene foam logement that protects the robot from damage during transport.

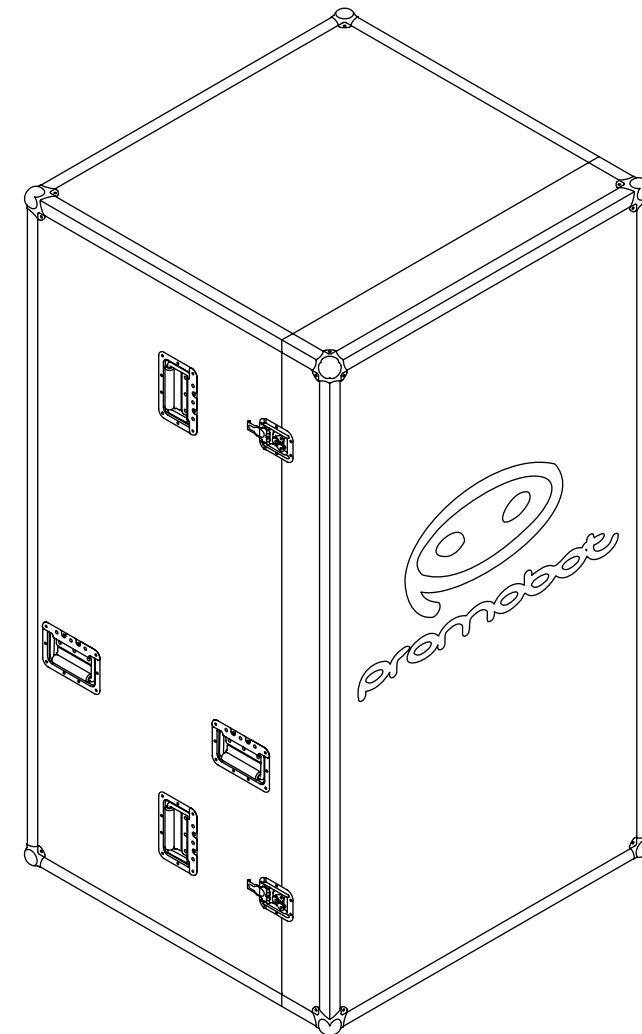


Figure 5.1. Transport case for the robot

The transport case is equipped with wheels (Figure 5.2), locks (Figure 5.3) and handles. The robot can be moved either vertically, according to the label (Figure 5.4), or horizontally on the wheels.

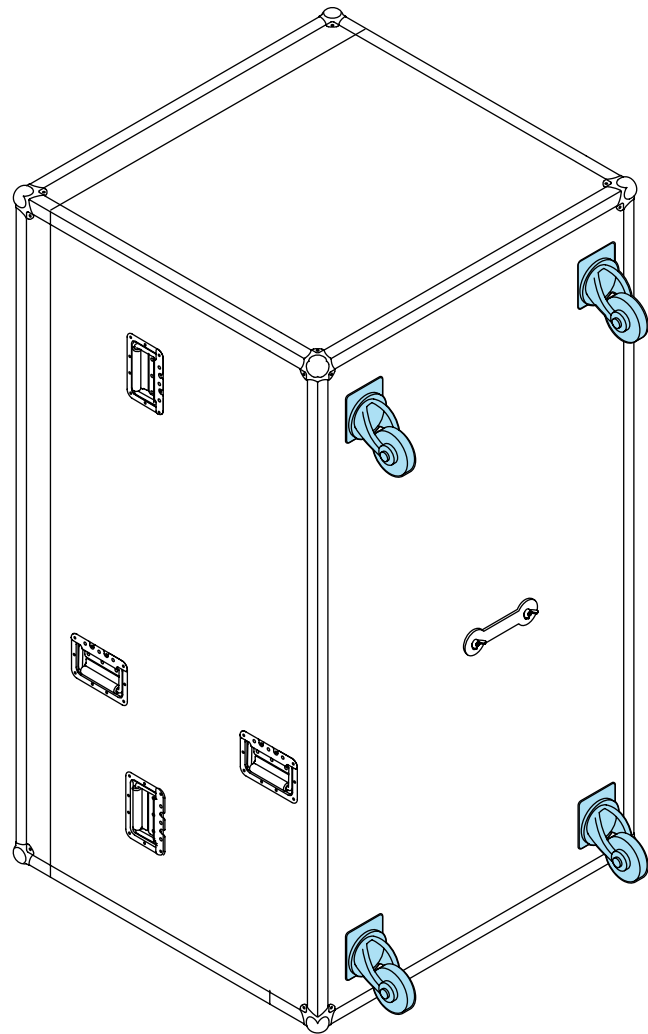


Figure 5.2. Bottom of the transport case with wheels

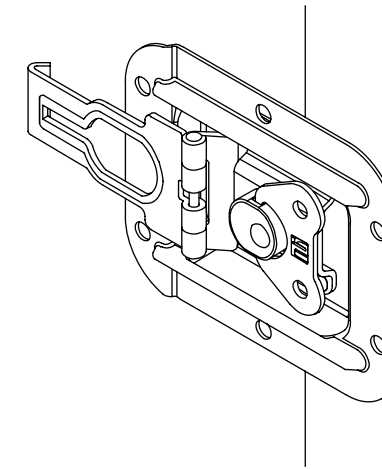


Figure 5.3. Transport case lock

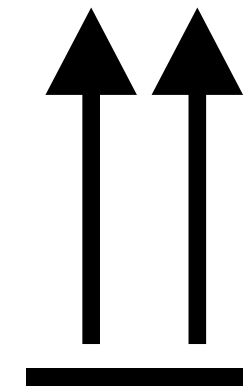


Figure 5.4. "Do not overturn!" label on the transport case

## 5.1.2. Unpacking the Robot from the Transport Case



### ATTENTION!

The robot is heavy, so unpacking should be done with an assistant!  
Do not turn the robot on until it is completely assembled!

To unpack the robot from the transport case, proceed as follows:

1. Place the transport case in an upright position according to the shipping label (Figure 5.4).
2. Unscrew the wing screws (Figure 5.3) on the four lid locks, release the locks, remove the lid by pulling it forward and put it aside.
3. Visually inspect the robot and its accessories after transportation. In case of damage, contact Technical Support (see Chapter 11).
4. Take the robot and its logement out from the transport case.
5. Release the robot from the logement.
6. Take the robot out of the protective bag.
7. Take the accessories out from the logement.
8. Take the jacket out of the package, undo all the buttons and rivets. Put the jacket on the robot (the jacket has special cut-outs for all the robot's protruding parts).
9. Put the logement back in the transport case and close the transport case with the lid.
10. Connect the touchscreen display to the robot with special cables supplied.
11. Connect the robot to the 220V mains using the special power cable supplied.



### NOTE

Save the transport case and its accessories/components as they may be required if you need to transport or store the robot.

## 5.2. Turning the Robot On



### ATTENTION!

Do not turn the robot on until it is completely assembled!

The robot has several launch buttons (Figure 5.5) to start the various robot systems.

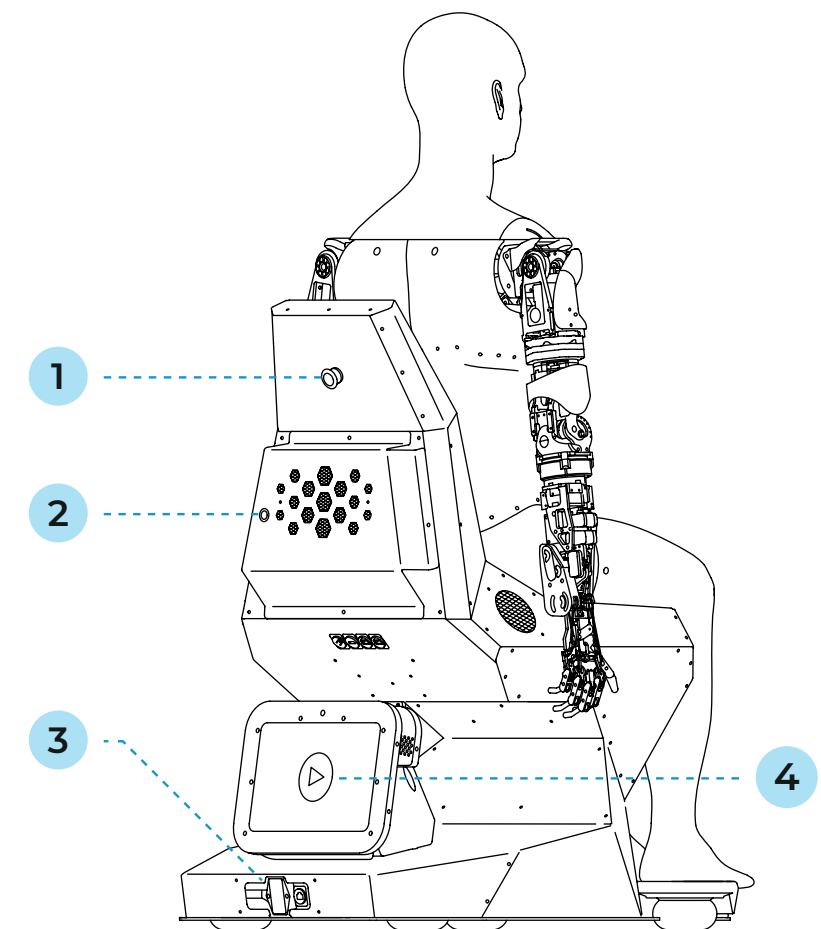


Figure 5.5. Launch buttons of the robot

- |                          |                               |
|--------------------------|-------------------------------|
| 1. Emergency stop button | 3. Power circuit break button |
| 2. Power button          | 4. Play button                |



The Emergency Stop button allows you to immediately stop the movement of the robot's head, arms and torso. This button is a latching push button. This means that when pressed once, it remains pressed until the user returns it to its original position. When transporting, the button must be pressed (i.e. the robot's movements are blocked) to prevent accidental movements of the robot's servos for any reason.

**To turn the robot on for the first time, proceed as follows:**

1. Connect the touchscreen display to the robot using special cables supplied.
2. Connect the robot to the 220V mains using the special power cable supplied.
3. Switch the power circuit break button to position 1.
4. Put the emergency stop button to the closed circuit position (i.e. when the button is depressed instead of pressed). You will see that the backlight on the robot's chest starts to glow white.
5. Press the power button and wait for the robot's systems to load. The loading process will be shown on the display. You will also see that the backlight on the robot's chest will start to glow pulsed blue. When the loading is over, the backlight will change to a steady green color.
6. Press the Play button on the touchscreen display.

**To turn the robot on if it has previously been turned off in the usual manner\*, proceed as follows:**

1. Press the power button and wait for the robot's systems to load. The loading process will be shown on the display (see para. 5.3). You will also see that the backlight on the robot's chest will start to glow pulsed blue. When the loading is over, the backlight will change to a steady green color.
2. Press the Play button on the touchscreen display.

**To turn the robot on if it has previously been turned off using an emergency stop button, proceed as follows:**

1. Put the emergency stop button to the closed circuit position (i.e. when the button is depressed instead of pressed). You will see that the backlight on the robot's chest starts to glow white.
2. Press the power button and wait for the robot's systems to load. The loading process will be shown on the display. You will also see that the backlight on the robot's chest will start to glow pulsed blue. When the loading is over, the backlight will change to a steady green color.
3. Restart the robot from the Service menu (see para. 6.1).

\* — "turned off in the usual manner" means without using an emergency stop button.

## 5.3. Start Screen Overview

After pressing the power button and a short beep, all the robot's systems will start to load (Figure 5.6).

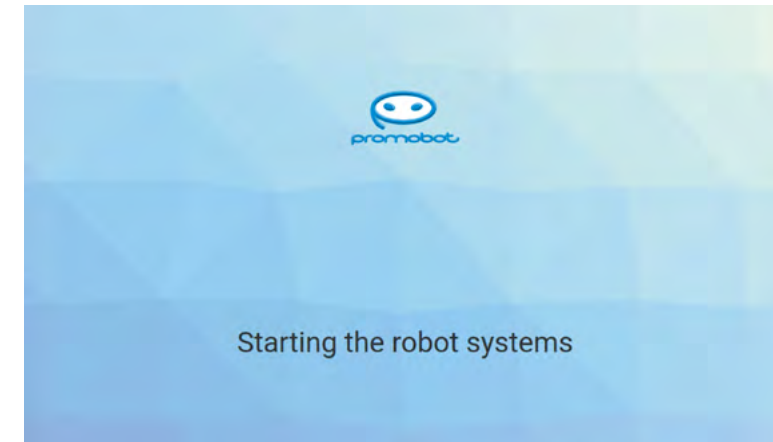


Figure 5.6. Robot's systems loading screen

When all robot systems have been loaded, the robot's start screen will appear (Figure 5.7).

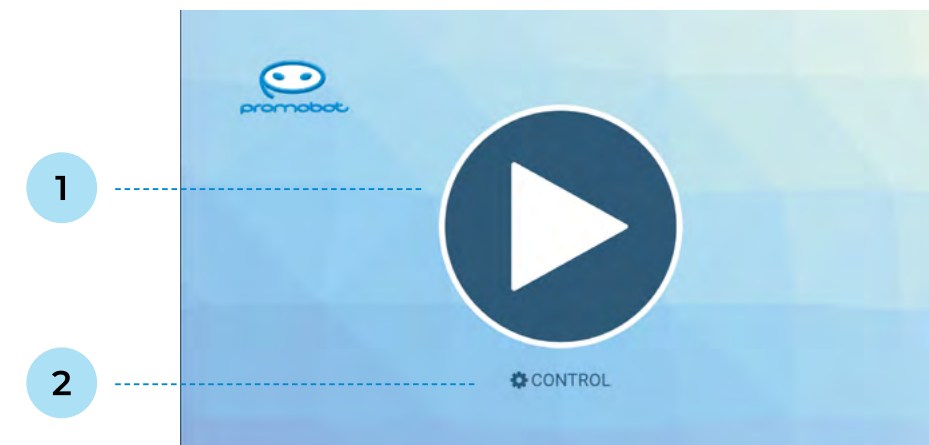


Figure 5.7. Start screen

1. Play button
2. Control button

1. **The Play button** starts the robot's use case (see para. 7.1).
2. **The Control button** takes you to the Service menu of the robot (see Chapter 6 for more information about the Service menu).

The calibration of the robot's moving parts will begin simultaneously with the robot's launch. The calibration is a necessary process for proper robot movement. The calibration will be performed each time the robot was shutdown and each time the emergency stop button was pressed.

For information on intended use of the robot, see Chapter 7 of this Manual.

**ATTENTION!**

The movements of the robot during the calibration should not be restricted by foreign objects. Make sure there are no obstacles in the path of the robot's arms movement. Be careful, the calibration starts automatically!

## 5.4. Turning the Robot Off

**To turn the robot off in the usual manner**, press the power button once. The light on the robot's chest will turn purple.

**To stop the robot urgently**, press the emergency stop button: the head, arms and torso will immediately stop moving.

**To turn off the robot for further transportation, proceed as follows:**

1. Press the power button once, the light on the robot's chest will turn purple.
2. Press the emergency stop button.
3. Switch the power circuit break button to position 0.
4. Disconnect all the cables.

## 6. SERVICE MENU

The Service Menu allows to configure some basic robot's parameters. You can open this menu by pressing the **Control** button on the start screen (Figure 5.7).

### 6.1. General

To enter the Service Menu you need to enter the password (Figure 6.1). By default, all robots have a standard password, which can be obtained by contacting technical support. The password can be changed after entering the menu.

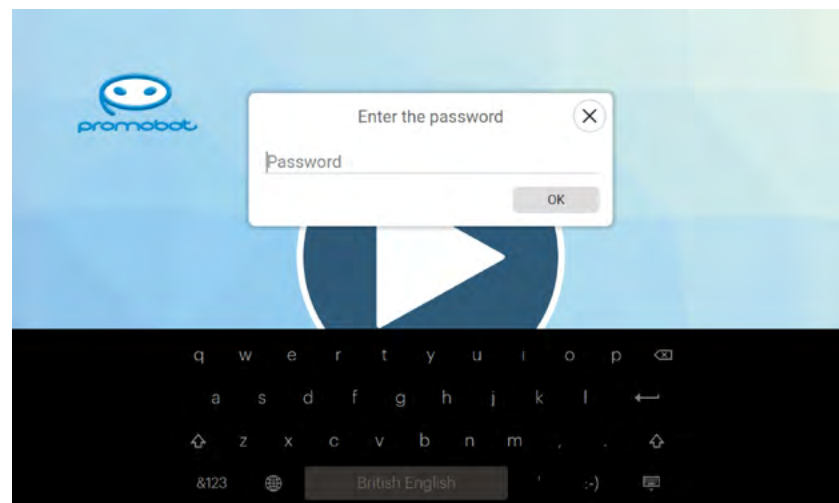


Figure 6.1. Password entry window for access to the Service Menu

The Service Menu (Figure 6.2) provides quick access to the controls, which include:

- **Speaker Volume and Microphone Sensitivity controls.** These controls override the values of the parameters until the next robot restart. The controls on the screen of the started use case act the same way.
- **The Answers Log switch.** This control defines whether the phrases of the conversation will or will not be displayed on the screen. When this switch is activated, then recognised user phrases and robot generated response phrases will be displayed on the screen.

- **The Hide button** allows to collapse the robot's interface window. This control may be required when you need direct access to the robot's operating system.
- **The Restart button** re-launches the robot's software systems. The robot restart will be required any time the value of any parameter has been changed.

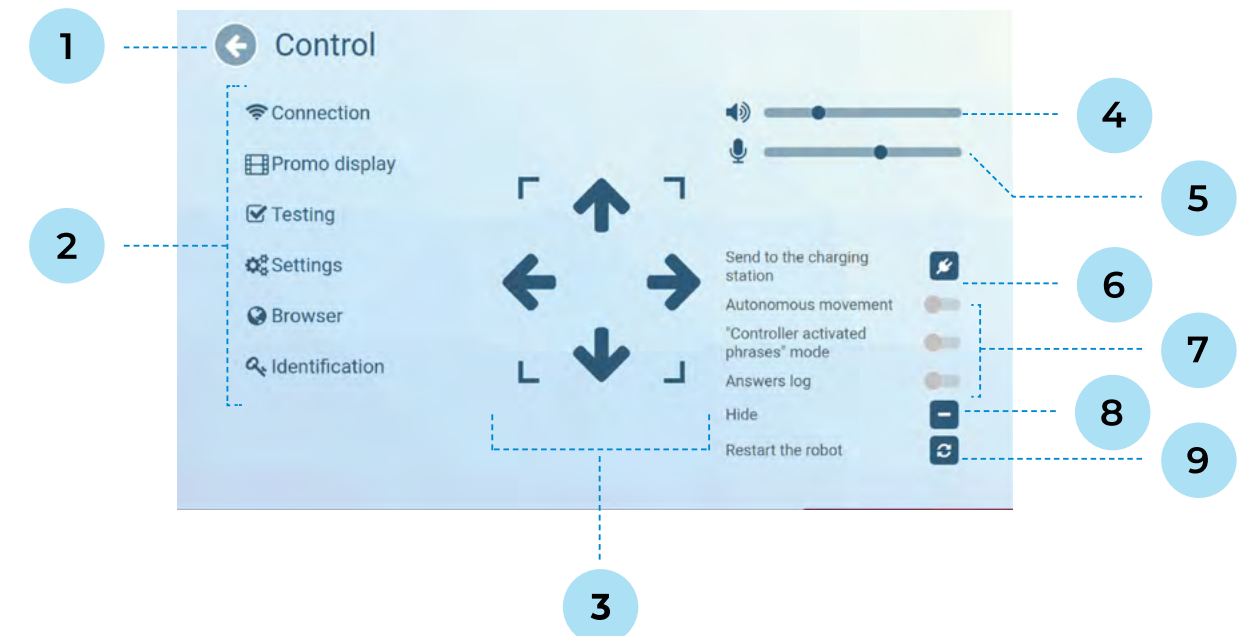


Figure 6.2. Service Menu screen

1. Button to exit the service menu
2. List of Service Menu sections
3. Buttons to control the robot's driving\*
4. Speaker Volume control
5. Microphone Sensitivity control
6. Send to the charging station button\*
7. Special modes switches\*
8. Hide button
9. Restart the robot button

\* — these settings are only relevant to the Promobot V.4 robot and have no effect on the Promobot C2 robot.

## 6.2. Internet Connection

This section of the Service Menu provides information (Figure 6.3) about Wi-Fi networks available and displays the signal level of each of them.

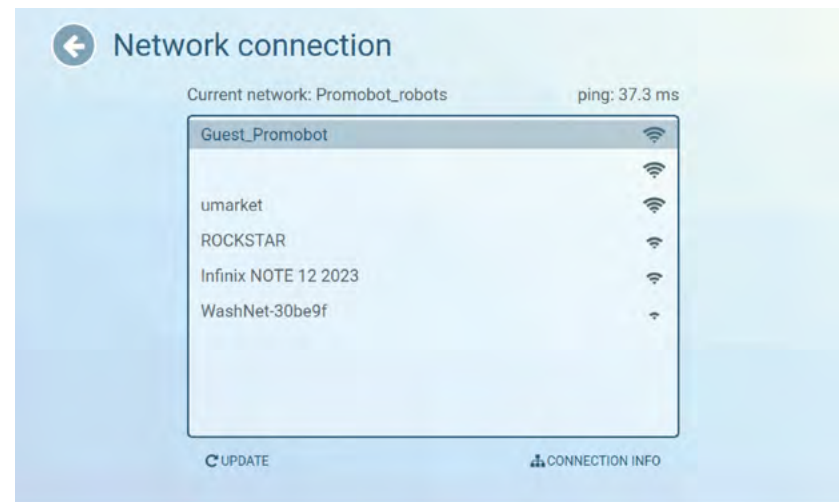


Figure 6.3. Network connection screen



### NOTE

Before connecting to the network, ensure that the ports listed in Table 3 are open in the router settings.

Table 3. List of ports and protocols of Internet resources required for robot operation

No.	Remote resource	Ports	Protocol	Function
1	google.com	80, 443	TCP/UDP	Speech recognition
2	lingvo.promo-bot.ai	80, 443	TCP/UDP	Web interface of the linguistic base
3	lingvo-edu.promo-bot.ai	80, 443	TCP	Web interface of the linguistic base
4	vpn-v4.promo-bot.ai	22111	TCP	VPN connection for remote monitoring and configuration
5	vpn-edu.promo-bot.ai	22105	TCP, UDP	VPN connection for remote monitoring and configuration

No.	Remote resource	Ports	Protocol	Function
6	46.4.94.90	80, 443	TCP/UDP	STUN / TURN for the service of telepresence
7	update.promo-bot.ai	80, 443	TCP/UDP	Software update
8	teleop.promo-bot.ai	80, 443, 8080	TCP/UDP	Service of telepresence
9	teleop-new.promo-bot.ai	80, 443, 8080	TCP/UDP	Service of telepresence (new)
10	archive.ubuntu.com	80	TCP/UDP	Software update
11	ru.archive.ubuntu.com	80	TCP/UDP	Software update
12	security.ubuntu.com	80	TCP/UDP	Software update
13	archive.canonical.com	80	TCP/UDP	Software update
14	extras.ubuntu.com	80	TCP/UDP	Software update
15	ppa.launchpad.net	80	TCP/UDP	Software update
16	dl.google.com	80	TCP/UDP	Software update
17	apt.postgresql.org	80	TCP/UDP	Software update
18	repo.zabbix.com	80	TCP/UDP	Software update
19	apt-archive.postgresql.org	80, 443	TCP	Software update
20	download.docker.com	80, 443, 5000	TCP	Software update
21	registry.promo-bot.ai	80, 443, 5000	TCP	Software update



### NOTE

The list of ports can be expanded depending on the services or resources used. It is recommended to choose a network with the maximum signal level. The robot does not connect to hidden networks.

You can see the ping value and Wi-Fi signal level of each network right here. And also you can see IP address and other network information by tapping **Connection info** (Figure 6.4) at the bottom of the screen. For proper robot operation, the ping value should be **above 0 and below 80 ms**. A ping value of 0 means that there is no Internet access.

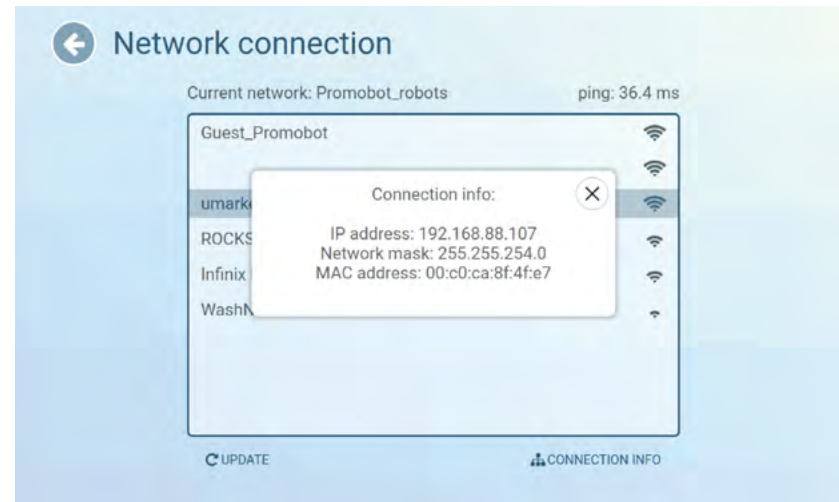


Figure 6.4. Connection information window

To close the connection information window tap the cross in its top right corner.

To connect to a network, tap on it in the list of available networks. In the modal window enter the network password and tap OK. If the desired network is not displayed in the list, click the **Update** button.

If the connection is successful, the name of the network to which the connection has been made will appear in the **Current network** field. You can check the connection status by using the built-in browser of the Service Menu. To do so go back to the first screen of the Service Menu and tap **Browser**, then open any website (if the webpage is loaded, that means that the Internet connection is available).

While the **Network connection** screen is open, the connection icon in the status bar may periodically indicate that there is no Internet connection (while the current network is still displayed in the **Current network** field). This happens due to the fact that at this moment the search for available networks is being performed, so no need to worry about that.

## 6.3. Display of Promo Materials

The **display of promo** is a robot function that allows one or more images/videos to be displayed on the robot's touchscreen display. The promo materials are played in alphabetical order and are repeated cyclically. The display of promo is implemented in two versions (can operate simultaneously):

- **Slideshow** — the promo materials are displayed on the screen all the time (this mode only works on a robot without an individual use case);
- **Promo while printing** — the promo materials are displayed on the screen while the "Photo from Promobot" application is running (for more information about the application, see Chapter 7 of this Manual).



### NOTE

This paragraph describes the process of **selecting** the promo material of the list of **already loaded ones in the robot's file system**. The loading process is described in the **Loading of Promo Materials** section (para. 6.4).

The supported extensions of the promo material files are listed in the **Loading of Promo** section (para. 6.4). Files with another extension are not guaranteed to be displayed. The resolution of the slideshow window is 1180x568 pixels.

Figure 6.5 shows a screenshot of the window of settings of the promo displaying.

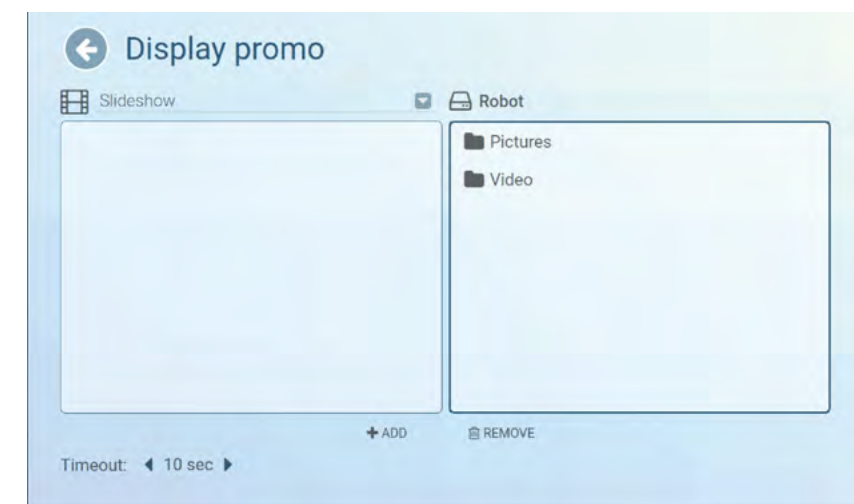


Figure 6.5. The screen of settings of the promo displaying (file manager)



To add promo materials to the display, select the required images and/or videos on the right side of the screen and click on the **Add** button at the bottom of the screen. Confirm the action by clicking **Yes** (Figure 6.6).



Figure 6.6. Confirmation window for adding promo material to the display

After confirmation, the added file will be displayed on the left side of the screen (Figure 6.7).

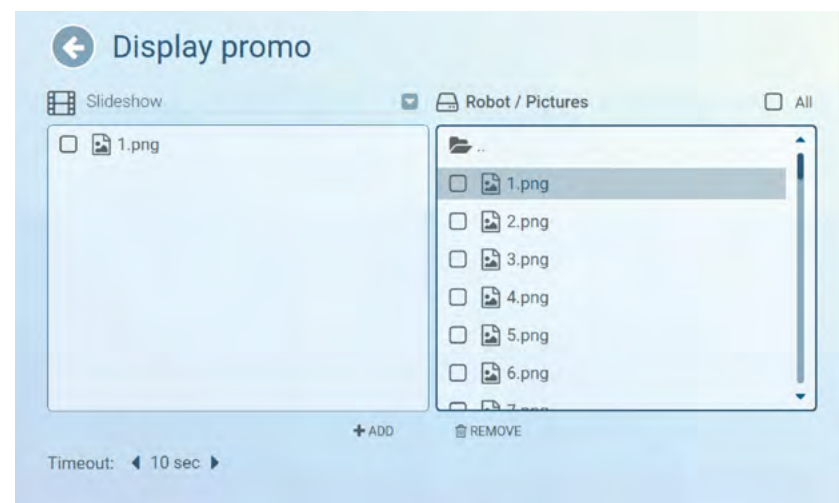


Figure 6.7. The screen of settings of the promo displaying (image selected for display)

To remove the promo material from the selected for display, select the file from the list on the left side of the screen and click the **Remove** button at the bottom of the screen, then confirm the file deletion by clicking **Yes** (Figure 6.8).



Figure 6.8. Confirmation window for deleting promo material

The frequency of switching promo material to the next one can be set with the **Timeout** (time in seconds) parameter. This parameter affects both modes: **Slideshow** and **Promo while printing**.

To switch between **Slideshow** and **Promo while printing**, use the drop-down list at the top left of the screen (Figure 6.9). Promo materials selection for display in **Promo while printing** is similar to promo materials selection for **Slideshow**.

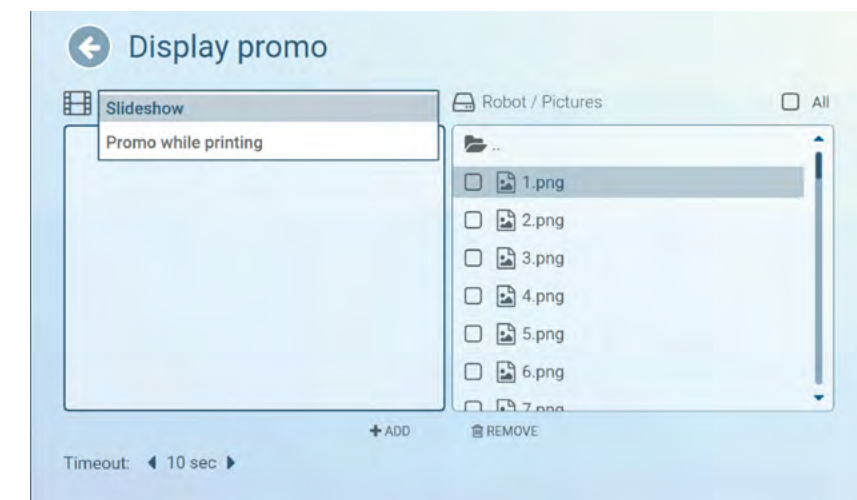


Figure 6.9. The screen of settings of the promo displaying (drop-down list: Slideshow and Promo while printing)

## 6.4. Loading of Promo Materials



### ATTENTION!

This section is only available when a USB flash drive is plugged into the USB-port.

This section of the Service Menu helps you to load promo materials and photo frames from a USB flash drive into the robot's file system (Figure 6.10).

Follow the steps below to load a new promo material or photo frame from USB flash drive into the robot's file system:

1. On the left side of the screen (External device), select the required images and/or videos;
2. On the right side of the screen (robot's file system), open the folder in which you'd like to put the files (for photo frames to be displayed in the **Photo from Promobot** application, select the **Photo frames** folder);
3. Click the **Copy** button at the bottom of the screen. The chosen files will be displayed on the right side of the screen meaning that they are now in the robot's file system.

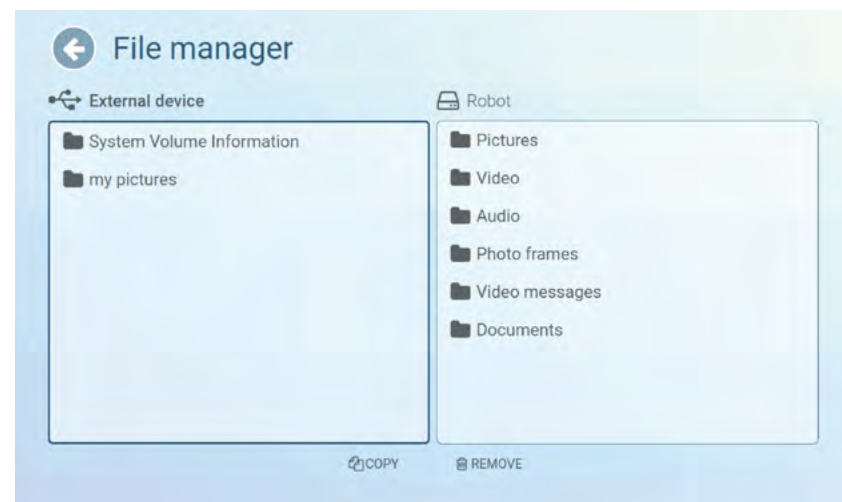


Figure 6.10. Promo materials and photo frames loading screen (file manager)

This section of the Service menu is also used to load photo frames that should be available in the **Photo from Promobot** application (for more information about this application, see para. 7.2). The photo frame

is an image with an alpha channel (transparent layer) as the background. To load photo frames use the same algorithm described above.

The recommended resolution for the promo materials is shown in Table 4.



### ATTENTION!

Do not use spare punctuation marks in file names! Only one dot separating the file extension from the file name is allowed. Otherwise the robot's software will fail.

Table 4. Recommended resolutions for promo materials

Promo type	Recommended resolution
Promo materials in the Slideshow	1180x568
Promo materials in Promo while printing*	1260x665
Photo frames	1208x810

\* — only applies to the Promobot V.4 robot because the Promobot C2 robot does not have a printer.

Supported file formats are listed in table 5.

Table 5. Supported file formats

File type	Supported file extensions
Video	*.mp4, *.avi, *.mkv
Images	*.jpg, *.jpeg, *.png, *.gif
Audio	*.mp3
Documents	*.pdf, *.doc, *.docx, *.xls, *.xlsx, *.ppt, *.pptx, *.txt, *.csv
Photo frames	*.png



### ATTENTION!

The **Document** type is used for files sent via email. The robot **does not have** browsing tools for files of this type.

## 6.5. Testing

This section of the Service Menu contains an interface for testing that allows you to check the functioning of the robot's main systems (Figure 6.11).



### ATTENTION!

Full functionality of testing is only available after the robot has been started (see para. 7. for more details).

Take a note, that some of the menu items are valid only for Promobot V.4. The menu items which are valid for Promobot C2 are:

- Face recognition video stream
- Sound recording
- Speech recognition



Figure 6.11. Testing screen

## 6.6. Settings

This section of the Service Menu provides the interface to configure some basic robot's parameters (Figure 6.12). It is divided to several submenus for convenience:

- **System** contains the basic settings of the Promobot C2 robot.
- **Applications** contains settings for the applications and widgets installed on the Promobot C2 robot.
- **Face recognition** contains the face database management interface and settings for the Promobot C2 face recognition system.
- **Navigation\*** contains parameters of the movement system.
- **Linguistic base** contains settings of using the Promobot C2 linguobase.
- **Language settings** contains settings for the Promobot C2 language packs for speech recognition and speech synthesis.
- **Online Services** contains settings for Internet services used by the Promobot C2 robot, such as an email client.
- **Update** contains an interface to check the availability of Promobot C2 updates and downloading them.



### ATTENTION!

The **Face recognition** and **Navigation\*** sections are for advanced users only.

\* — The **Navigation** settings are only relevant to the Promobot V.4 robot and have no effect on the Promobot C2 robot.



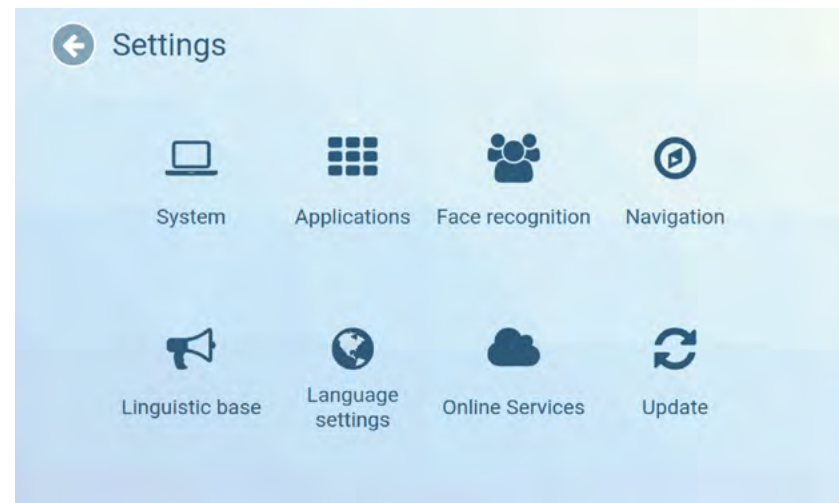


Figure 6.12. Settings screen

## 6.7. Browser

This section of the Service Menu allows you to open an Internet browser window. It allows you to access any website. Also the browser would be useful while connecting to some Wi-Fi network which requires passing the authorization. The default home page is the Promobot website (Figure 6.13).

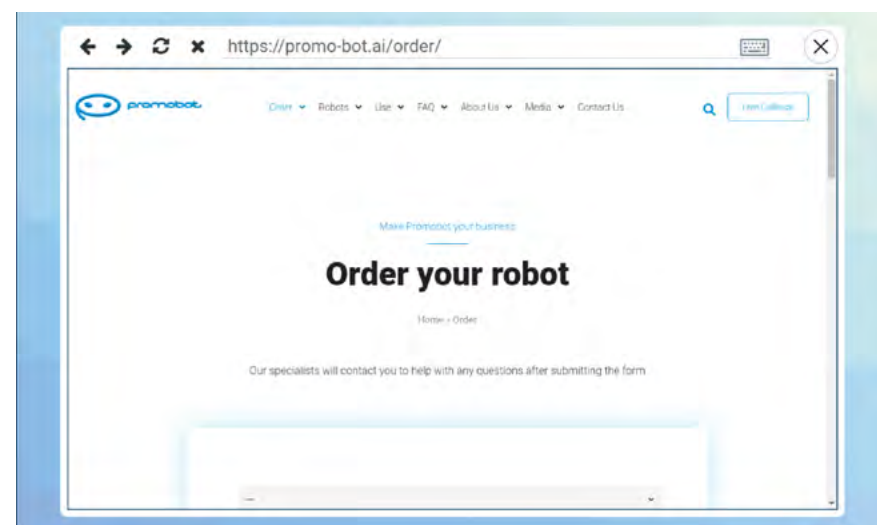


Figure 6.13. Browser screen

## 6.8. Identification

In this section you can change the Service menu access password. To change the password, enter a new password and then re-enter the new password to confirm that it is correct (Figure 6.14).

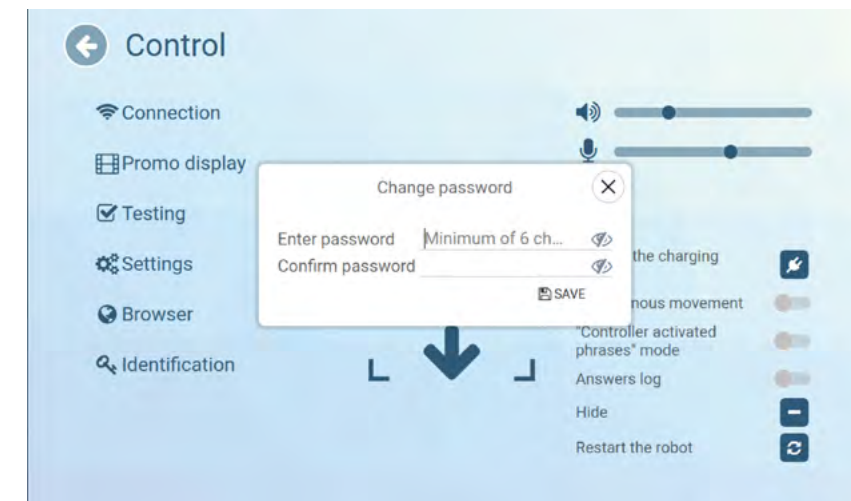


Figure 6.14. Service menu password change window



### NOTE

It is recommended to change the password when you turn the robot on for the first time.

It is recommended to change the password every 120 days.

The password should meet the following requirements:

- password length of at least 6 characters;
- the password should consist of valid characters, namely: Latin upper and lower case letters, Arabic numerals, and special characters.

The password is not subject to disclosure or unauthorized access.

If it is suspected that the password has been compromised, you should change the password as soon as possible, but no later than 24 hours after becoming aware of the incident.

## 6.9. Face Recognition

The robot has a camera that is used to recognise faces. Thanks to that camera the robot can determine if it is a new user in front of it or an acquainted one. When the robot see a new user it offers to go through an acquaintance procedure, which allows the user to be greeted by name the next time he/she comes to the robot. Also you can set special individual greeting for acquainted person via Linguobase.

### 6.9.1. Settings



#### ATTENTION!

The settings in this section have been selected by Promobot experts. It is not recommended to change them without consulting our Technical Support.

The face recognition settings can be found in the Service menu, in **Settings** submenu, in the **Face recognition** section (Figure 6.15).

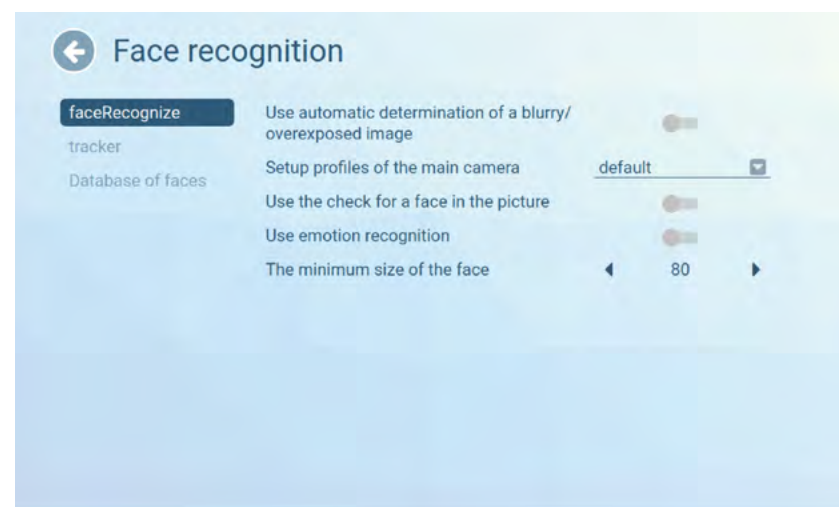


Figure 6.15. Face recognition settings

**Use automatic determination of a blurry/overexposed image** — when the switch is activated, the face recognition camera will determine whether the face is blurred/overexposed or not. If the blurring/overexposing value of the current picture is above a certain threshold, recognition will only start when the blurring/overexposing value becomes below the threshold.

**Setup profiles of the main camera** is a drop-down list with the following options: **default**, **custom**, **wdr**, **lowillumination**. In most cases the face recognition camera is customized by Promobot specialists individually for each robot depending on the light level in the room where the robot will be placed. This mode is called **custom** (the same — **default**). The **wdr** variant is used for rooms with high contrast lighting. The **lowillumination** variant is used for dimly lit rooms.

**Use the check for a face in the picture** — when the switch is activated, the face recognition camera will determine whether the face in the camera is a photo, a drawing, a mannequin or a real person. If this switch is activated and the recognised face is "fake", then the robot will not start the interaction.

**Use emotion recognition** — the emotion recognition feature is used in the **Promobot FaceEmotions** application (in this application the robot recognises the user's emotion and names it on the screen).

**The minimum size of the face** — determines how distant could the face be to the robot to start tracking it. This value depends on other internal settings and the software version installed on the robot. By default, a person's face is recognised and started tracking at a distance of up to 1.5 meters.

## 6.9.2. Face Database

You can manage the saved faces in the same section, in the **Database of faces** tab (Figure 6.16). Faces are saved to make the robot possible to greet a visitor by name.

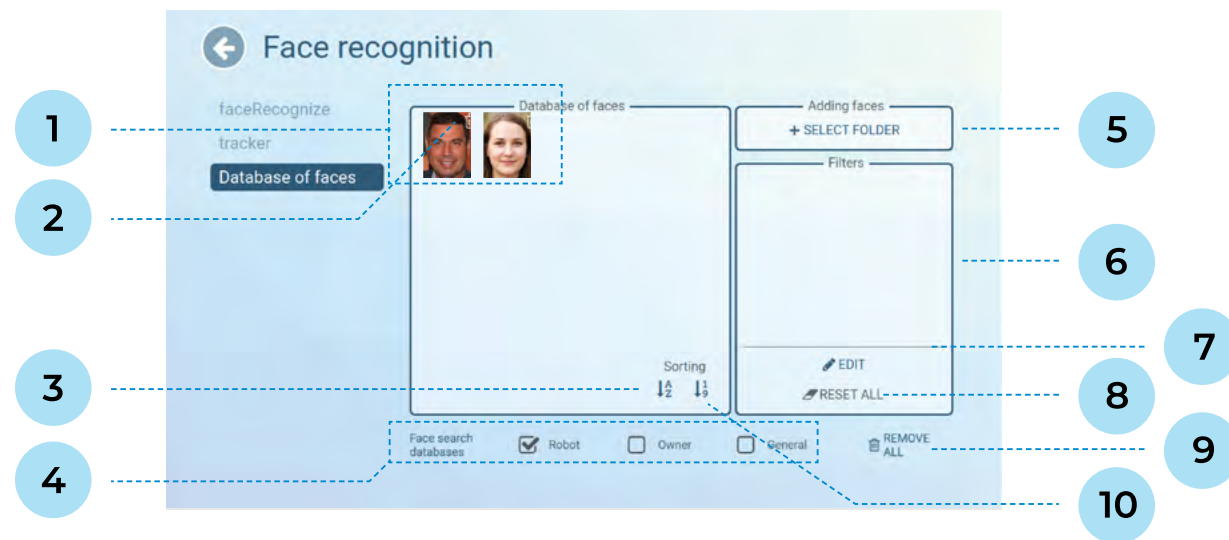


Figure 6.16. Face recognition settings, Database of faces tab

- The area of the saved faces in the database** — the photos with names, by clicking on the photo you can see the date of acquaintance and the date of the last meeting.
- The Delete face button** allows you to delete this particular user. When pressed, a confirmation window will be displayed to confirm deletion.
- User sorting by name** — you can sort users in ascending or descending order (alphabetically).
- Face search databases.** After determining that there is some face in front of the robot, the robot scans the face database to check if the user with this face is acquainted with the robot. At the bottom of the screen you can select (one or several) **face search databases**:
  - The **robot** — the face database of this particular robot.
  - The **owner** — the face database which is shared by all the robots of the owner. If you choose this option, the user will be able to get acquainted with one of the owner's robots, but all of the owner's robots will recognise this user and greet him/her by name.
  - **General** — database of celebrity faces.
- Select folder** — here you can upload photos of people so that the robot knows them in advance, and the person does not have to go through the procedure of acquaintance when meeting the robot (Figure 6.17).
- Area of applied filters** — you can filter users by name, date of acquaintance and last meeting date to make it easier to search through the face database.

- Edit** — button for editing filters (Figure 6.18).
- Reset all** — button to reset all filters.
- Remove all** — button to delete all the faces.
- User sorting by date of acquaintance** — you can sort users ascending (from old to new) or descending order.

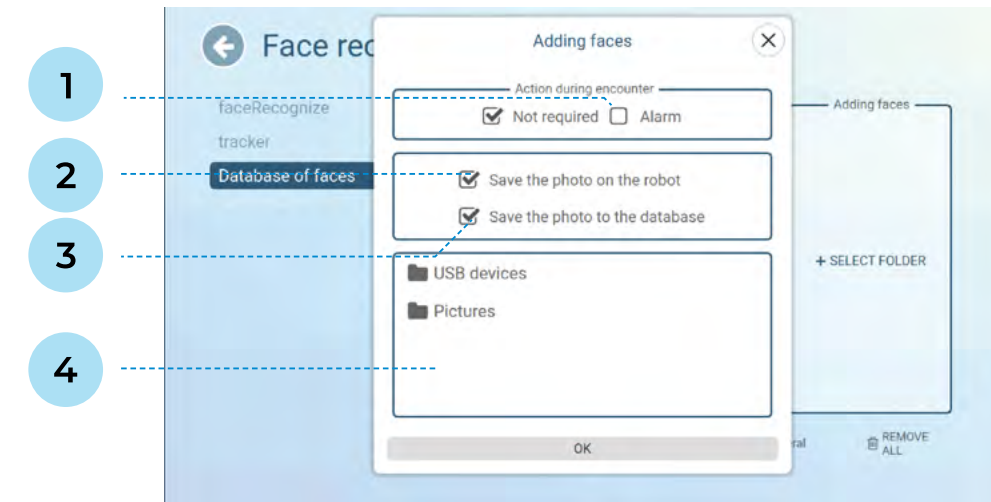


Figure 6.17. Adding a photo of the person to the face database

- Action during encounter: Alarm** — used only for police use case. For a photo which was uploaded with this option selected, when the person from this photo comes to the robot, the robot initiates a SIP-telephony call to the specified number (e.g. administrator, security officer etc).\*
- Save the photo on the robot** — if this option is enabled, then this photo will be displayed in the area of the saved faces in the database (item 1 on Figure 6.16). It is recommended to enable this option.
- Save the photo to the database** — if this option is enabled, the photo will be displayed in the web interface of the face database.
- File manager area** — used to access images in the robot's file system (including if the image needs to be downloaded from a USB flash drive).

\* — These setting is only relevant to the Promobot V.4 robot and have no effect on the Promobot C2 robot.

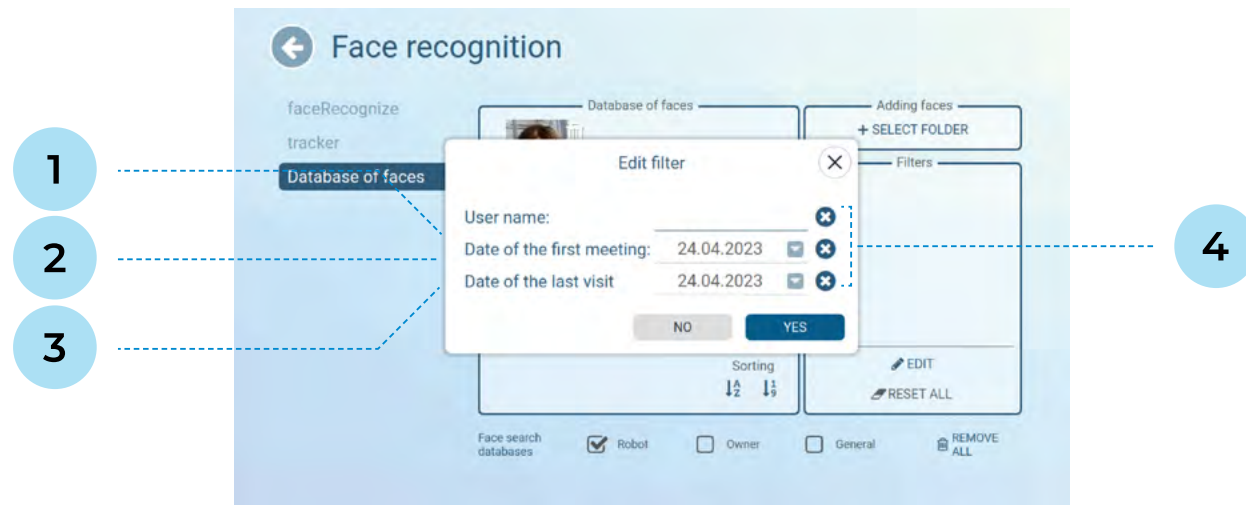


Figure 6.18. Editing the face display filter

1. **The user name** is entered via keypad. You can enter a full name or filter users by a part of the name, e.g. by the first letter.
2. **The date of the first meeting** — the date of acquaintance, the date when the person was entered into the database.
3. **The date of the last visit** — the date when this user was last recognised by the robot.
4. **Field reset buttons** — these buttons allow you to quickly erase a value from a field.

## 7. INTENDED USE OF PROMOBOT C2

The robot can be supplied with an individual use case or with a default use case (robot-consultant). An individual use case is customized for a particular customer, it can have an individual graphics user interface and contain a unique set of functions. The robot owner decides whether the robot will or will not have the individual use case before purchasing the robot. You can request details of existing use cases by contacting the technical support.

This User Manual describes the interface of the Promobot C2 robot with its default use case (robot consultant).

### 7.1. User Interface Overview

To start the robot, press the **Play** button on the start screen (Figure 7.1).

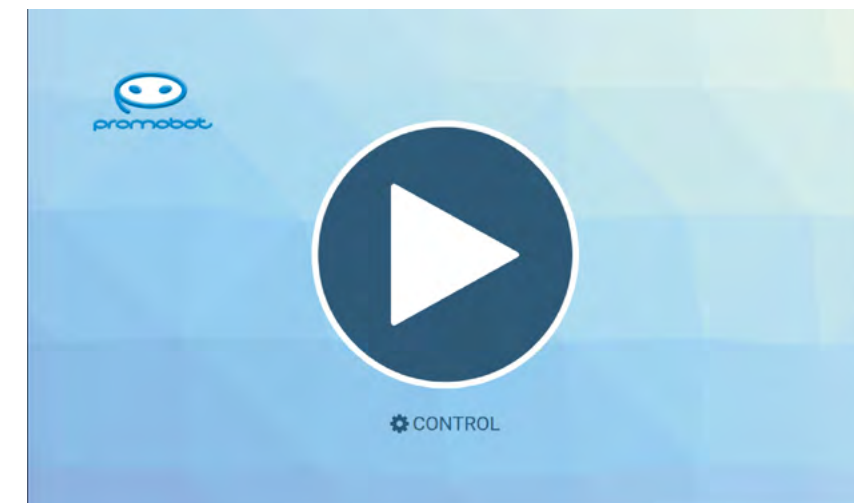


Figure 7.1. Play button on the start screen

After pressing the button the user interface will be displayed (Figure 7.2). The appearance of the interface depends on the use case installed on the robot. Figure 7.2 shows the appearance of the interface of the robot-consultant.



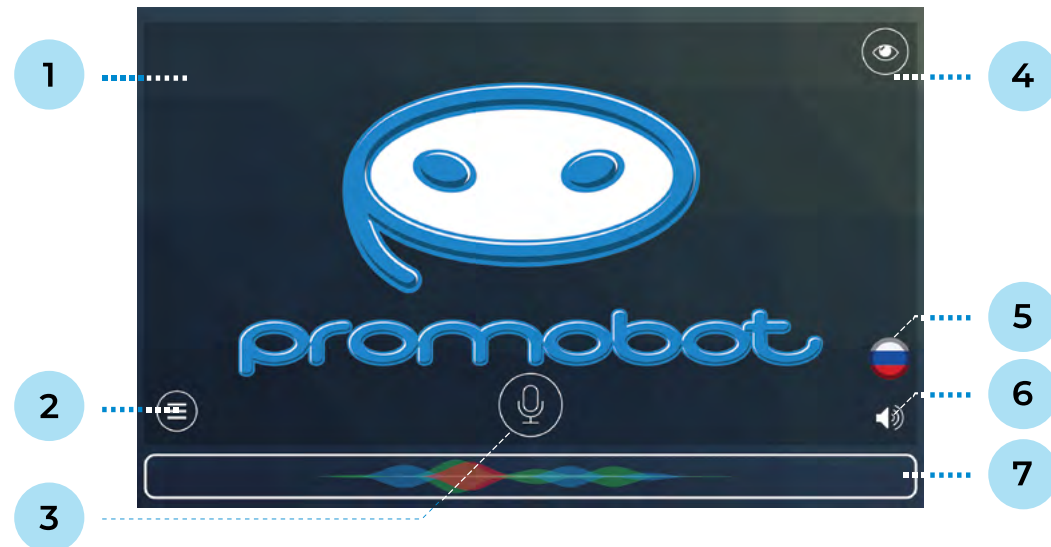


Figure 7.2. Main screen

- |                                     |  |
|-------------------------------------|--|
| 1. Service menu call area           | 5. Language selection widget                 |
| 2. Applications menu                | 6. Audio settings widget                     |
| 3. Robot speech interruption button | 7. Recognised/synthesized speech output area |
| 4. Video stream from the camera     |  |

At any time from the start screen you can access the **Service menu** to configure the robot's parameters. To do so, quickly tap on the screen four times in the area shown in Figure 7.2. To open the **Service Menu** you need to enter the password. By default, all robots have a standard password, which can be obtained by contacting technical support. The password can be changed after entering the menu (see para. 6.8).

Clicking the **Applications Menu** button shows the robot's applications and widgets (Figure 7.3). The list of applications and widgets displayed on this screen can be configured in the Service menu. To read the description of the applications see para. 7.2.



Figure 7.3. Applications and widgets screen

Pressing the button with the eye icon in the top right corner opens the interface to view the live video stream from the camera (Figure 7.4).

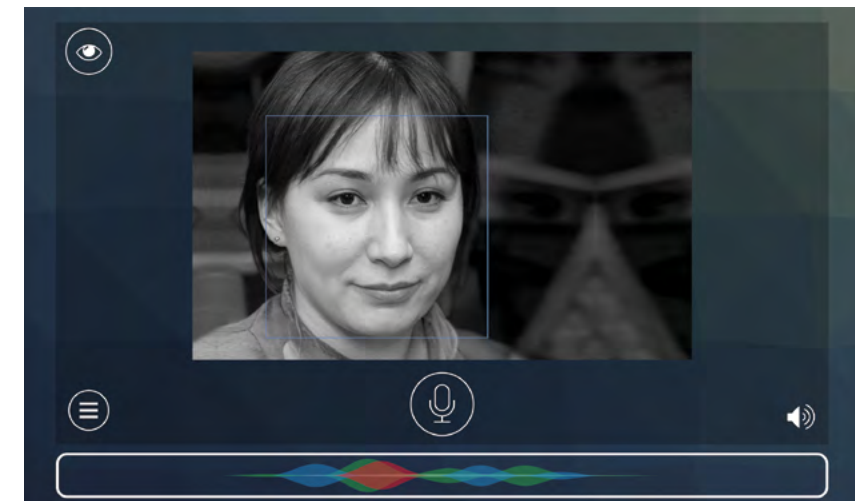


Figure 7.4. Viewing video stream from the camera

Clicking the **Audio settings** button in the bottom right corner allows you to temporarily (until rebooting) change the robot's speech synthesis rate and speaker volume (Figure 7.5).

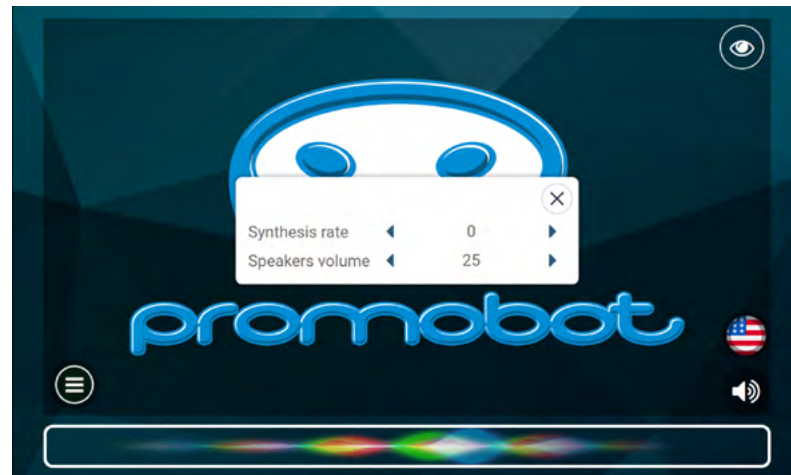


Figure 7.5. Robot speech synthesis rate and speaker volume settings

There is the status bar at the top of the screen (Figure 7.6). Decryptions to its elements are given below.

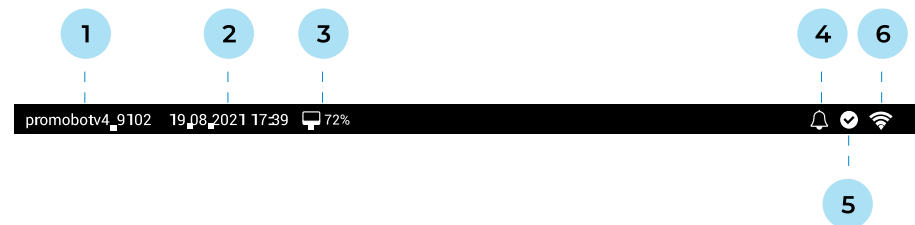


Figure 7.6. Robot status bar

- |                              |                            |
|------------------------------|----------------------------|
| 1. Robot ID                  | 4. Push notifications      |
| 2. Current date and time     | 5. Replication status      |
| 3. CPU usage as a percentage | 6. Wi-Fi connection status |

### Replication statuses:

- ✓ Success
- ✗ Fail
- ↻ In progress
- ⊛ Undefined

### Displaying push notifications:

- 🔔 Absence of notifications
- 🔔<sup>87</sup> Presence of notifications (with its quantity)

## 7.2. Applications Overview

The **Application menu** can contain up to fifteen applications at the same time. The choosing what the applications will be displayed in the **Application menu** is decided in the Service Menu. See the list of available applications below:



**Promobot Acquaintance** — in this application the robot saves information (face, name, age) about the user to the database (with the user's consent) in order to greet this person by name next time.



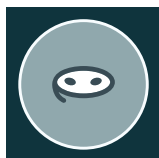
**Photo from Promobot** — in this application the robot takes a picture of the user. After that the user can add a photo frame (if the robot owner has added some frames via the Service Menu) and get the photo by email.



**Promobot Browser** — is an application that allows the user to access websites. The home page can be set in the Service Menu.



**Video recorder** — allows the user to record a short (up to 30 seconds) video message to leave feedback about the company (robot owner).



**Promobot Loyalty** — by default, this application asks the visitor for contact details and starts recording a video message to receive feedback. You can add a questionnaire to this application using the rules of the Linguobase. To get more information please contact the Technical Support (see Chapter 11).



**Surprise me** — this is an entertainment application, which offers a game where a robot will guess a number or a symbol which the user is thinking of.



**Promobot FaceEmotions** — in this entertainment application, the robot will recognise an emotion on the user's face and repeat it on the face matrix\*.



**Change Language** — allows the user to select another language. It displays a window with a list of languages available for selection.



**Info widget** — this application displays information about the company (address, phone number, email). You can set the information to display in the Service menu.



**Promobot FaceRecognize** — in this application, the robot speaks and displays the name and age of the user if the acquaintance procedure has already been accomplished with this user. If the user is unacquainted to the robot, the robot in this application will offer the user to go through the procedure of acquaintance.



**Five minutes of silence (Promobot shutdown)** — can be used to keep the robot silent for five minutes.

\* — only applies to the Promobot V.4 robot.

## 8. TRANSPORT AND STORAGE CONDITIONS

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### 8.1. Transport Conditions

1. The robot should only be transported in the specially designed transport case in which it is supplied.
2. The robot in its transport case can be transported by all types of enclosed transport. It is recommended to transport at air temperatures between +10°C and +35°C and a relative humidity of up to 70%.
3. If transporting the robot in sub-zero temperatures, it is necessary to leave the robot to warm up to at least +10°C. Let the robot stand powered-off in a heated room for at least two hours before turning it on.
4. The robot and other accessories must be firmly attached inside the transport case to avoid hits of the robot and accessories against each other and against the sides of the transport case.
5. The robot and other accessories should be placed inside the transport case in special slots of logement which were designed to match the robot's and accessories' shape.
6. Before transporting, make sure that there are no foreign objects inside the transport case. The presence of foreign objects can damage the robot's components.
7. Ensure that the robot transport case is not subject to any impact or movement inside the vehicle during transportation.
8. The robot's neck and torso must be in the zero position (must be straightened, not crouched) during transportation.
9. The robot transport case is a fragile cargo. Ensure appropriate transport and storage conditions (as specified on the transport/shipping label) for the entire transportation.

### 8.2. Storage Conditions

1. The storage area shall be kept clean and tidy. Clutter can cause robot damage or human injury.
2. Dampness, water evaporation, presence of combustible liquids and gasses are not allowed in the storage area.
3. The robot must be stored in a heated and ventilated room away from direct sunlight, at a temperature between 0°C and +40°C (+25°C recommended) and a relative humidity of 65%.
4. To avoid undesirable consequences, unauthorized persons or children should not be allowed in the storage area.



## 9. WARRANTY TERMS AND CONDITIONS

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1. If you encounter any difficulties while using the Promobot C2 robot, please contact Technical Support (see Chapter 11).
2. When receiving the robot, check completeness of its package contents and operability.
3. Carefully read this User Manual before starting work.
4. The legal basis for these warranty conditions is the existing Legislation.
5. The warranty period for this product is 12 months from the date of delivery.
6. The service life of the robot directly depends on the operating conditions.
7. The warranty does not cover malfunctions of the robot resulting from:
  - failure by the user to comply with the instructions for use of the robot;
  - mechanical damage caused by external hit impact or any other impact;
  - use of the product for purposes other than those for which it was intended;
  - natural disaster;
  - adverse weather or other external influences on the robot, such as rain, snow, high humidity, heating, aggressive environments;
  - the use of accessories, consumables and spare parts which were not approved by the manufacturer;
  - the penetration of foreign objects, insects, animals, materials or substances into the robot;
  - overload that caused the failure of motors, servos, switches, monitors and other components. Unconditional signs of robot overload include, but are not limited to: destruction of the touchscreen display matrix, deformation or melting of parts and components, darkening or charring of the insulation of wires due to high temperatures.
8. The warranty does not apply to:
  - the robots that have been opened, repaired or modified without the assistance of the Promobot specialists;
  - the accessories and spare parts that have failed due to normal wearout, such as body parts and consumables, including servos, LEDs and bolted joints.

9. The manufacturer undertakes to repair the defects of the robot free of charge or to replace it during the warranty period, provided that the defects were not caused by the failure of the user to comply with the instructions for use or storage of the robot.

## 10. PROBLEM SOLVING TIPS

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This section describes the situations that users have ever encountered and the steps to resolve them. If the solutions mentioned here did not help, please contact Technical Support (para. 11).

### 1. The robot cannot hear.

- Make sure the robot is connected to a Wi-Fi network and has Internet access (see para. 6.2). You can use the browser in the robot's Service Menu to check Internet access (see para. 6.7).

### 2. It seems like changes made in the Linguobase have not been applied to the robot.

- Make sure the replication was successful. To do so check the corresponding icon in the upper right corner next to the battery icon, it should display correct status and its timestamp should be later than the time of your changes in the linguistic database (see para. 7.1).
- If the rule does not work, make sure that the phrase recognised by the robot corresponds to what is indicated in the "robot hears" field.

### 3. The robot doesn't connect to the network.

- Make sure that the network you'd like to connect to meets the requirements (see para. 6.2).
- Ensure that the correct password was entered when attempted to connect.

## 11. TECHNICAL SUPPORT

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If you need help understanding how the robot works, troubleshooting technical issues, navigating the interface, or any other related questions, you can contact Promobot technical support on the website [promo-bot.ai](http://promo-bot.ai).

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