



D1.7 – Comprehensive User Manual



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D1.7	Abstract / Introduction
<p>The main task of WP1 „User Inclusion“ is the identification of the different preferences and requirements of target groups. This includes the analysis of requirements and ideas regarding the user manual to allow elderly people to easily get in touch with the robot platform. Thus, task 1.5 „Development of a user manual“ consists of three stages: At first, the requirements regarding the user manual have been identified in workshops and have been published in the deliverable D1.3 after the first year of the project.</p> <p>As a result of the first step the authors recommended to develop several types of manuals (explanation of basic functions, written user manual, help function with speech dialogue). To ensure an efficient process of user manual development, the written user manual has been created at first, serving also as a basis for other types of user manuals (e.g. a short written user manual as explanation of basic functions).</p> <p>Content of D1.7 is this written user manual, consisting of eight parts, whereas the first four parts explain the robot and its functionalities.</p> <p>Besides that, two other types of manuals have been developed in ALIAS:</p> <ul style="list-style-type: none"> • A short user manual, focused on ease of use and therefore describing only the most important functions. • Two prototypes of video user manuals explaining the Emergency Call / Remote Control function and the Brain-Computer-Interface. 	

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Content

Introduction.....	6
1 Basic Information about ALIAS	7
1.1 Turning the robot platform on and off	7
1.2 “Sense organs”.....	7
1.3 Charging function and stand-by position.....	8
1.4 Description of the menu navigation.....	9
1.5 Explanation of the help function / Video User Manual	9
2 Safety Instructions	10
3 The Robot Platform – Overview.....	11
4 Explanation of functions.....	12
4.1 Communication and Information Functions	12
4.1.1 Telephone	12
4.1.2 Web Browser	15
4.1.3 Event Finder	15
4.1.4 Brain-Computer-Interface (BCI).....	16
4.2 Entertainment Functions.....	19
4.2.1 Television	19
4.2.2 Audio Books	20
4.2.3 Games	21
4.3 Health and Safety Functions.....	28
4.3.1 Ground Light at Night.....	28
4.3.2 Emergency Call.....	29
5 Glossary and Keyword Index	30
6 Frequently Asked Questions	31
7 Technical data	32
8 Contacts and Service	33

List of Images

Figure 1: Overview of ALIAS robot platform	11
Figure 2: Overview of functions of ALIAS	12
Figure 3: The telephone module's main screen. See details in Table 1.....	13
Figure 4: Video call dialogue. See details in Table 2.	14
Figure 5: Setup and channel selection of the g.MOBllab and g.GAMMAbox.....	17
Figure 6: The cap is positioned such that the Cz electrode... ..	17
Figure 7: Select "Free Spelling" to use the P300 based BCI within the Alias system.....	18
Figure 8: Robot's TV display. For details see Table 4.	19
Figure 9: The robot's audio book selection. See details in Table 5.	20
Figure 10: The chess game module. See details in Table 6.....	21
Figure 11: The Sudoku game module. See details in Table 7.....	23
Figure 12: The tic-tac-toe game module. See details in Table 8.....	24
Figure 13: The Solitaire game dialogue. See details in Table 9.....	26
Figure 14: The Wii gaming console. See details in Table 10.....	27
Figure 15: Ground Light at Night (in bathroom)	28
Figure 16: The emergency call countdown dialogue. See details in Table 11.	29

List of Tables

Table 1: Description of the telephone module's main screen, Figure 3.	13
Table 2: Description of the video call dialogue, Figure 4.	14
Table 3: Channel configuration of the g.USBamp.	16
Table 4: Description of the robot's TV display screen, Figure 8.	19
Table 5: Description of the audio book selection, Figure 9.	20
Table 6: Details of the chess game dialogue, Figure 10.	22
Table 7: Details of the Sudoku game dialogue, Figure 11.	23
Table 8: Details of the tic-tac-toe game dialogue, Figure 12.	24
Table 9: Details of the Solitaire game dialogue, Figure 13.	26
Table 10: Description of the ALIAS robot's Wii module, Figure 14.	27
Table 11: Description of the emergency call countdown dialogue, Figure 15.	29

Introduction

Before designing user manuals in the ALIAS project, workshops with users have been conducted to find out which type of a user manual is really useful with robots. Following users' recommendations, future robots will not only need a typical written user manual, since they will be designed very easy-to-use, and since they can explain things that the user wants to know by themselves. Yet, it will take several years of development to prepare a fully integrated „explanation“ function – which can only be shown in a preliminary version within the ALIAS project using video user manuals.

Today, there are already several types of user manuals which can support users effectively. The combination chosen in ALIAS consists of three modules:

- Written user manual (this deliverable document, acting also as a basis for the other types of manuals)
- Short user manual (designed for ease of use, available in the ALIAS project, will be provided together with the written user manual)
- Video user manuals (BCI and emergency function, available in the ALIAS project and integrated at the robot, also available via internet):
 - o Emergency Call video: <http://www.youtube.com/watch?v=Cw9mcRCC46g>
 - o BCI video: <http://www.youtube.com/watch?v=Ykin5JDKRec>

1 Basic Information about ALIAS

ALIAS is a robot designed to support elderly people in communication, to entertain them and to improve health and safety. Beside this user manual a short user manual has also been developed to help you getting comfortable with the robot.

1.1 Turning the robot platform on and off

The ALIAS robot has a main key switch to turn the robot platform on and off. The main switch is located next to the status display of the robot on the lower side of the robot's body (see picture on the right side).

Turn the key-operated main key clockwise: The status display illuminates. If it does not, the batteries could be totally discharged and/or there might be a defect in the power supply or the integrated battery charger. After the main key switch is turned on, the robot can be started by selecting the option "Start Robot & PC" in the status display via the button.



To turn off the robot completely, first choose "Shutdown" in the robot menu on the screen and wait until the robot has finished the shutdown procedure. Afterwards, you can turn off the robot by turning the main key counterclockwise.

Under normal circumstances it should not be necessary to turn off the robot completely. If the robot is not used, e.g. at night, it should be standing at the charging station (see below).

Note:

When the robot is turned off using the main switch, it is not possible to charge it.

1.2 "Sense organs"

ALIAS is able to sense the world around it with several sensors acting like sense organs of a human. These give ALIAS a picture of what is going on around it and allows the robot to make decisions based on the circumstances detected. The possible functions based on the sense organs of the robot are:

Speaking and understanding

The robot is able to recognize natural speech commands by means of built-in microphones. Although it might be able to hear verbal commands from everywhere in its close surroundings, the most reliable speaker position will be in front of the touchscreen display unit.

Learning

e.g. learning names; not yet available.

Viewing and showing

The robot can observe what happens around it by means of built-in cameras and sensors. It can also recognize persons and track and follow them, if wished.

With the touchscreen ALIAS can also display content of applications to you.

Brain-Computer-Interface

The BCI system allows the user to control ALIAS using a sensor hat as input. This is particularly interesting for people with palsy who are not able to control the robot by speech or via touchscreen.

Options of locomotion

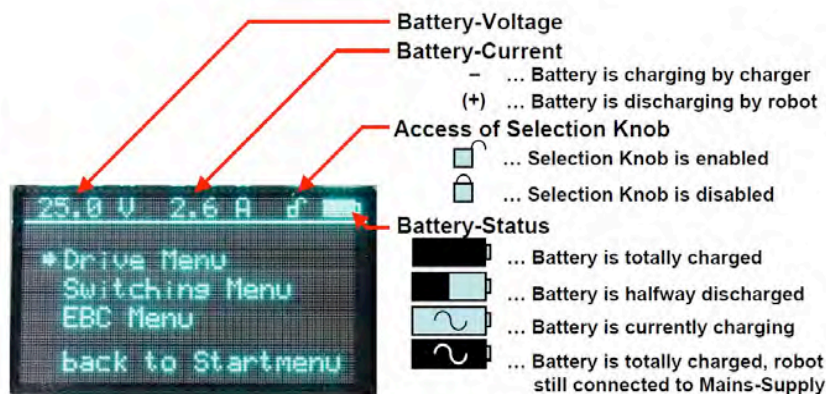
The robot is able to drive around autonomously (e.g. in emergency situations – see also chapter 4.3.2 on page 29). During the setup of the robot in the operation environment (e.g. an apartment) the robot has – supported by a technician – to record a map and the positions of the different places (kitchen, bedroom, bathroom, living room, entrance door, ...). Afterwards, the robot is able to drive to the different locations on its own.

The drive operation can be triggered by speech control (using the navigation keywords).

Furthermore, the robot can drive around autonomously in the operation environment.

1.3 Charging function and stand-by position

ALIAS needs energy for all of its operations. The power supply is provided by an integrated battery system. The battery can be used for 1000 charge-discharge cycles, which means about three years of battery life.



A charged battery will eventually lose its charge if unused. It may therefore be necessary to recharge the battery after a storage period: If the robot will not be in use for a month or longer, it is recommended that it should be stored in a cool, dry and clean place. Also a new battery has to be charged before usage.

If the robot's battery status is low, it will inform you by beeping every two seconds. To recharge it, put the IEC plug in a 230 V receptacle. If not charged in time, the robot will shut down automatically.

If you want to check the battery status, the main menu in the status display shows the basic information. This display is located on the lower side of the robots body (see picture above).

When the robot is not used, e.g. at night or in standby mode, it automatically drives to the charging station to charge the batteries. If the robot is supposed to get charged without the help of the charging station (e.g. to monitor some medical parameters or to be easy reachable at night), the standard IEC plug cable must be used (see picture on right). In this case, the robot should not be moved in order to prevent accidents.



1.4 Description of the menu navigation

The robot can be controlled by speech commands or via the touchscreen. Both ways work for most of ALIAS' functions, except some games (see picture on right).

The main menu is easy to use: Just say one of the words written (e.g. „Games“) and the robot will open the submenu „Games“. Instead, you can tap on the word via the touchscreen with the same effect.



1.5 Explanation of the help function / Video User Manual

To facilitate using the functions of ALIAS, a help function realized with short explanation videos is installed as a prototype version. This function allows users to just ask ALIAS for an explanation of a specific function, and the robot shows an adequate explanation video.

Such videos have been created in rough versions for the emergency call / remote control function as well as for the BCI function. The videos can be started by the user via speech command, e.g. „Wie funktioniert die Notruffunktion?“ (engl. „How does the emergency function work?“) or „Wie funktioniert die BCI-Funktion?“ (How does the BCI function work?“).

After receiving these commands, ALIAS shows the explanation videos on its touchscreen. The videos are also available on www.youtube.com:

- Emergency Call video: <http://www.youtube.com/watch?v=Cw9mcRCC46g>
- BCI video: <http://www.youtube.com/watch?v=Ykin5JDKRec>

2 Safety Instructions

Locomotion

- For collision avoidance the robot has got integrated range finders (a laser range finder and some ultrasonic sensors). These sensors are used for obstacle detection and collision avoidance.
- For safety the robot has a collision sensor (the black rubber ring at the bottom base around the robot). If this sensor detects a collision with an obstacle, the robot will stop immediately. As long as the collision sensor is activated, the robot will not move.
- Furthermore, the robot is equipped with an emergency button. If pressed, the robot will stop all processes and stand still. The emergency button is located directly besides the on/off key (see Figure 1)

Stability

- Do not lean against or latch onto the robot in order to prevent it from falling over.

Battery

- Do not short-circuit. A short-circuit may cause severe damage to the battery and the total robot system.
- Do not drop, hit or otherwise abuse the battery as this may result in the exposure of the cell contents, which are corrosive.
- Do not expose the battery to moisture or rain.
- Keep battery away from fire or other sources of extreme heat. Do not incinerate. Exposure of battery to extreme heat may result in an explosion.

Data Security

- When prompting personal or other confidential data to ALIAS, make sure others can not notice this data. This refers particularly to the data input via speech, since speech might be intercepted easier than inputs given via touchscreen.

3 The Robot Platform – Overview

ALIAS is an assistant with several different functions. To make you a bit more familiar with its technical details, Figure 1 shows the most important parts and explains what they are made for.

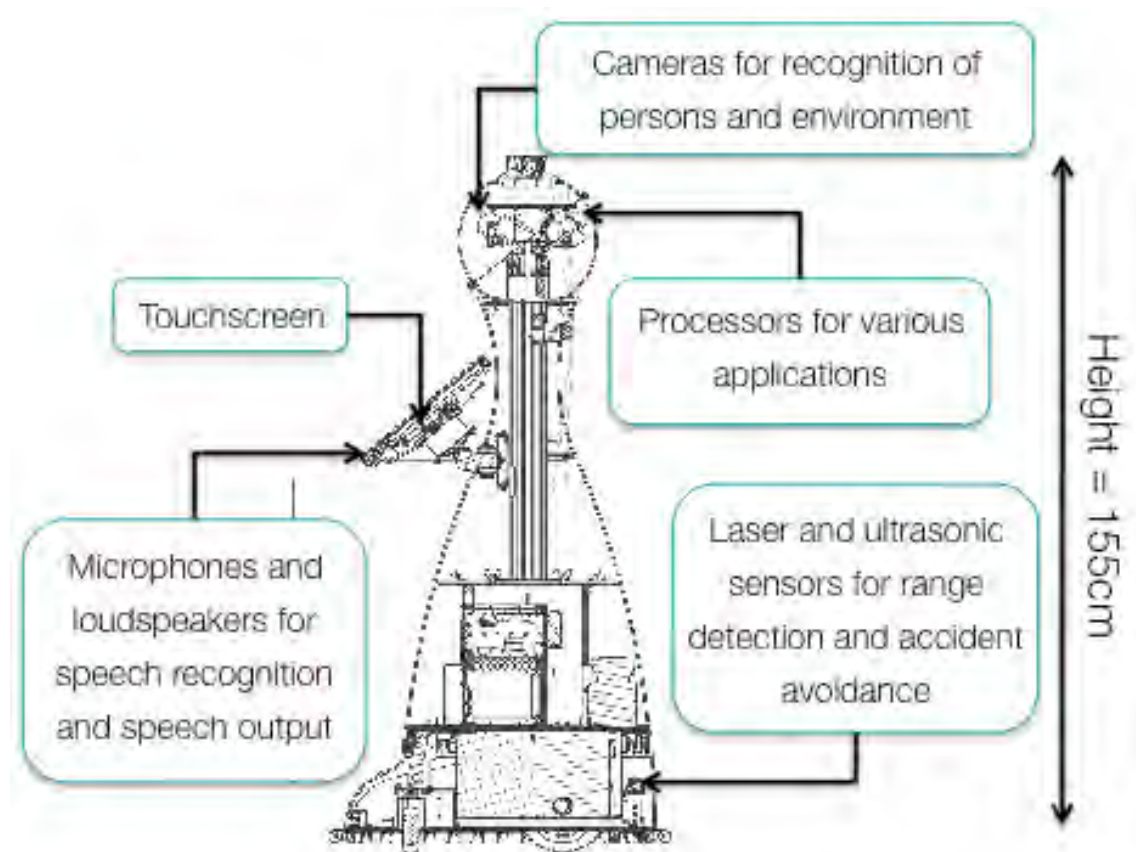


Figure 1: Overview of ALIAS robot platform

4 Explanation of functions

ALIAS is designed to support you in communication, to entertain and to improve health and safety. Figure 2 gives you an overview of the things you can do with ALIAS. Afterwards, these functions are explained in the same structure as shown in the image below..

The colors indicate the categories and are also used in the short user manual. In this, the colors facilitate the navigation throughout the user manual.

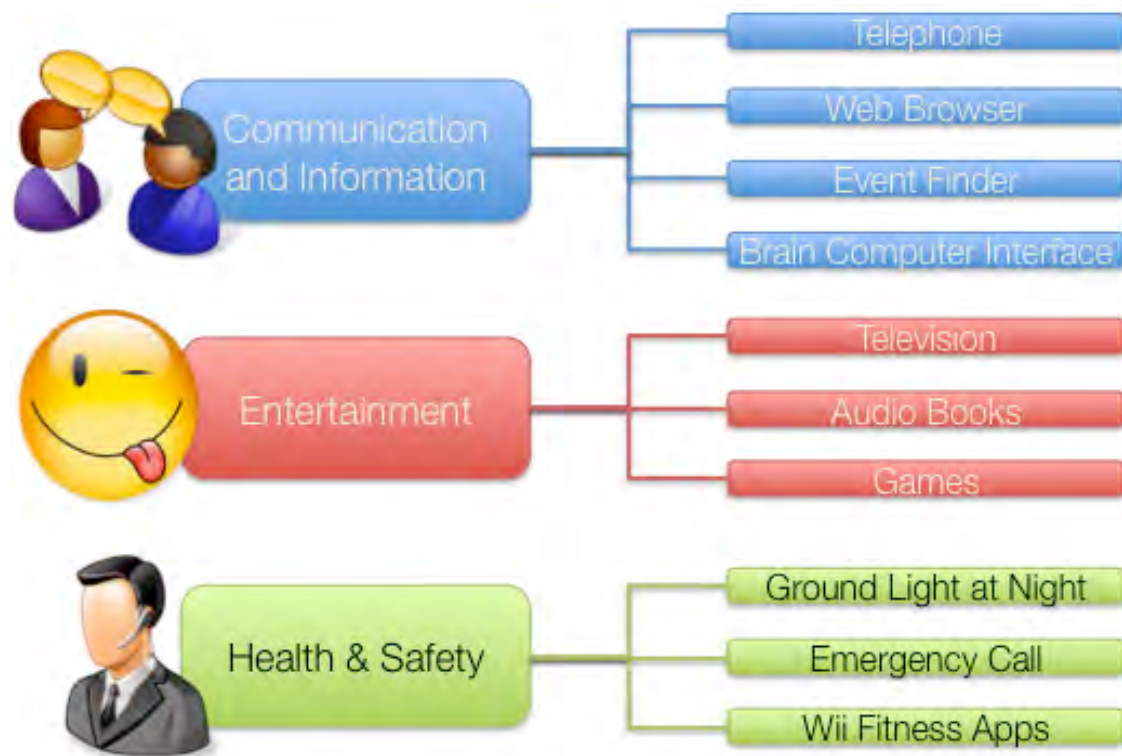


Figure 2: Overview of functions of ALIAS

4.1 Communication and Information Functions

4.1.1 Telephone

Short description: Using the telephone with ALIAS

A telephone is integrated into the robot platform via Skype. It allows getting into contact with the wider world. ALIAS has got a hand-free kit and switchable videophone.

Starting the telephone function to make a phone call

Just say you would like to make a phone call (i. e. by saying “I would like to make a phone call” or german “Ich möchte jemanden anrufen”). ALIAS will immediately help you by activating the telephone function and showing you the integrated telephone register. Then, you can choose the desired contact to make the call. Alternatively, it is also possible to just say the name of the person you would like to call (i.e. “Please call Bob!”) Remember: You can always operate ALIAS via the touchscreen as well. Therefore, please press the corresponding buttons on the screen..

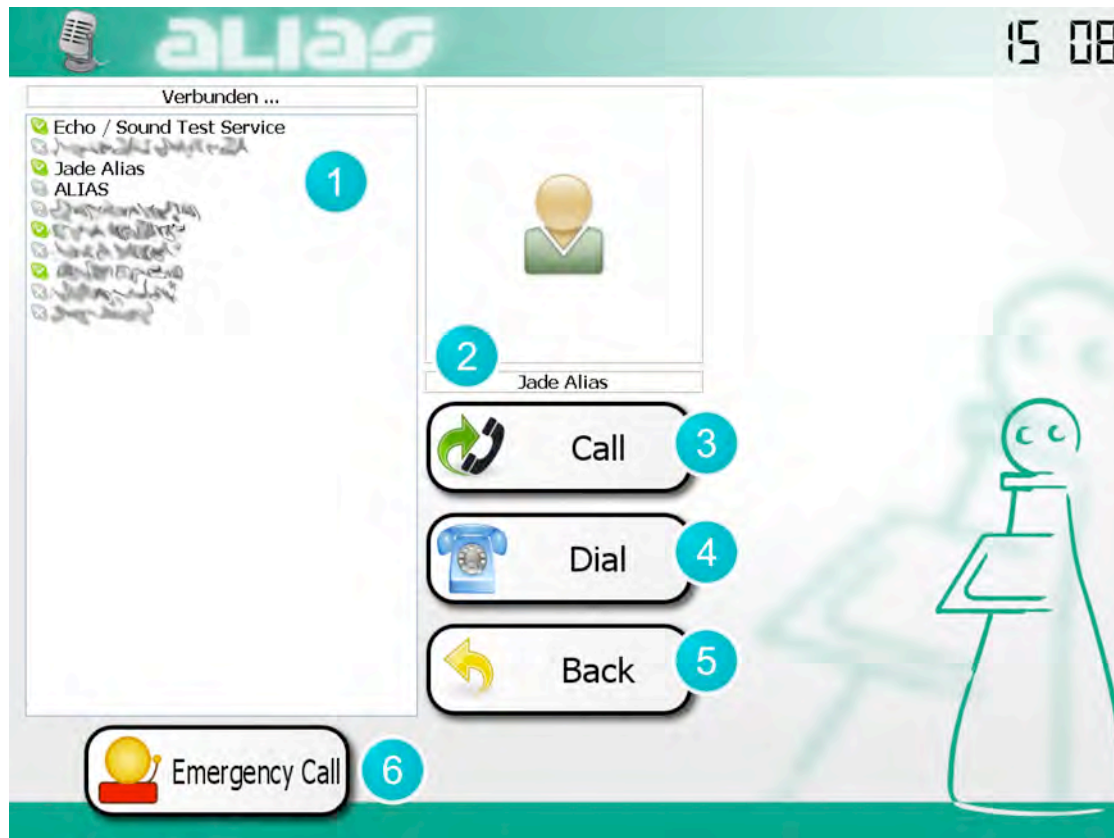


Figure 3: The telephone module's main screen. See details in Table 1.

Table 1: Description of the telephone module's main screen, Figure 3.

1	<p>Contact List The contact list contains all contacts that have been added to your Skype account. These are the people you are able to call. Tap on a name on the list to select the desired contact (icons indicate if a contact is currently available.)</p>
2	<p>Selected Contact Displays the name and the symbol (e.g. photo) of the currently selected contact. In case the contact didn't provide a photo, a default image is used.</p>
3	<p>Call Button Push this button to call the currently selected contact.</p>
4	<p>Dial Button Push this button in order to dial a phone via the public switched telephone network (PSTN.) You will have to provide the telephone number you want to call.</p>
5	<p>Back Button Exit the telephone application and go back to the robot's menu screen.</p>
6	<p>Emergency Call Button In case of an emergency push this button to call for help. (See section 0)</p>

Using the telephone

After the connection to your desired contact is up, you can speak freely towards the robot. You don't need a headset or something else for your call. To end the telephone call, push the "hang-up" button.

Using the video call

It is also possible to perform a video call with your conversation partner. During an active video call, the telephone module screen will look as depicted in Figure 4. To end the telephone call, push the “hang-up” button.

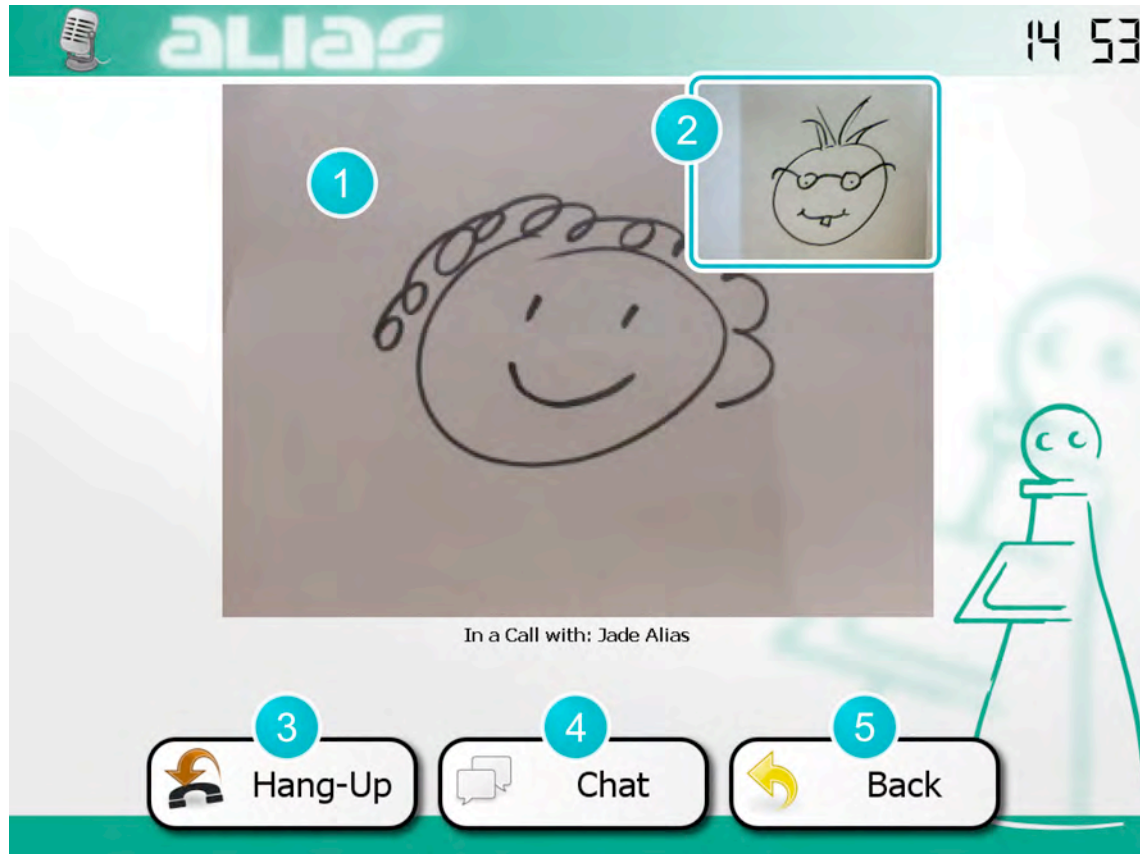


Figure 4: Video call dialogue. See details in Table 2.

Table 2: Description of the video call dialogue, Figure 4.

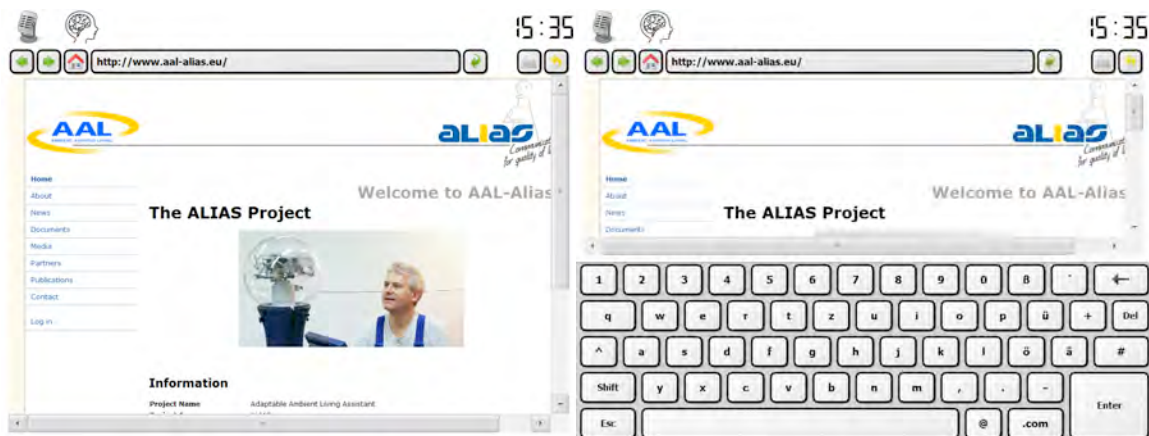
1	Incoming Video The incoming video of the far end conversation partner. In case the contact doesn't provide a video signal, a standard image is displayed.
2	Outgoing Video The outgoing video signal, recorded by your camera. This is your video that will be displayed on your conversation partner's screen.
3	Hang-Up Button Terminate the current connection and return to the Skype module's main screen.
4	Chat Button Display the chat window, i.e. write and receive instant text messages.
5	Back Button Preserve the current connection, but switch back to the robot's menu screen.

Hint:

You may also use the “back” button to switch back to the robot’s menu system while keeping the phone connection alive. This can be useful to receive support on some of the robot’s functions via the telephone.

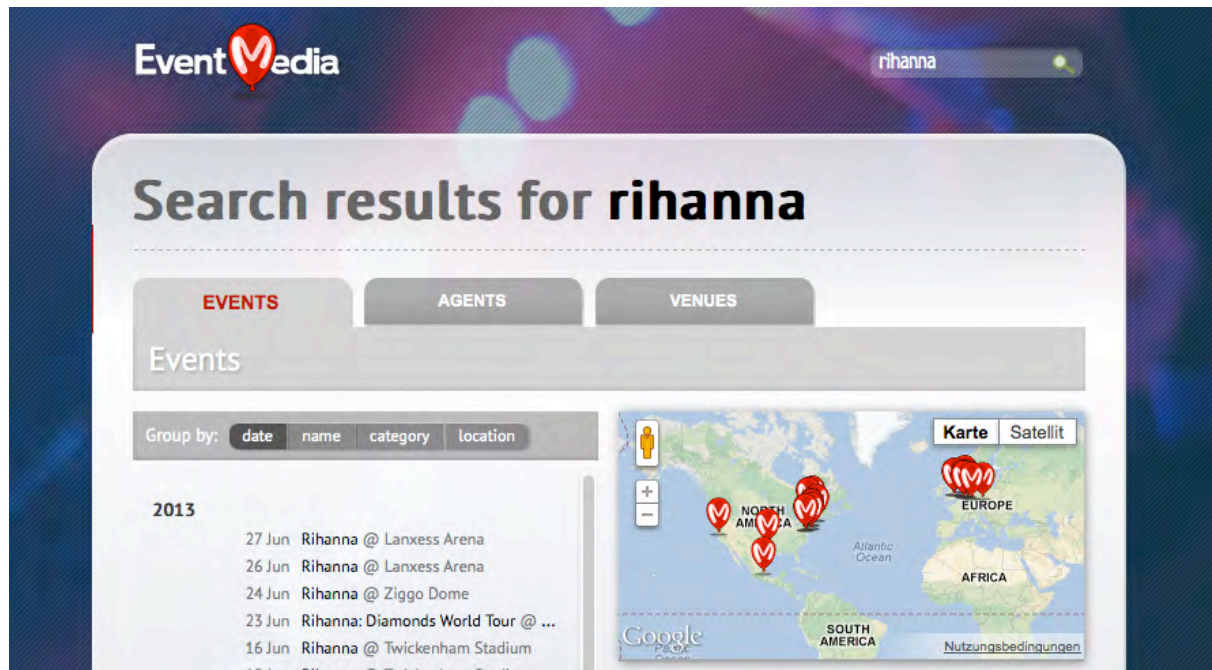
4.1.2 Web Browser

ALIAS contains an integrated web browser like a standard personal computer. You can use it by pushing the button „Web Browser“ in the main menu via the touchscreen or by giving a speech command e.g. „Please start the web browser“. The web browser can then be used with the digital keyboard.



4.1.3 Event Finder

The event finder is a function that allows the user to search for events around itself and in other places of the world. The event finder can be started via the main menu. Once using the application, you can type the city or type of event or a name of an artist in the search field in the upper right corner. With the tabs “Events”, “Agents” and “Venues” you can easy access background information and maps regarding the event you are searching for (see picture below).



4.1.4 Brain-Computer-Interface (BCI)

The BCI system allows the user to control remote devices using EEG as input method which is used to control a Matrix interface available on the ALIAS robot.

Since the system can only be installed and used with the help of experts, and since technical requirements do not yet allow an easy „plug & play“ connection between the robot and the BCI, the use is not as easy as it has to be for non-experts. Thus, the following explanations are for technical staff and are more demanding than explanations of other functions.

For data acquisition of the biosignals a g.MOBIlab including 8 EEG channels is used. The configuration of the channels is shown in Table 3. Figure 5 shows the configuration used in ALIAS. Mount the cap as shown in Figure 6. Do not forget to attach the blue reference clip to the right ear.

Table 3: Channel configuration of the g.USBamp.

Channel	Type	Comment	10/20 pos.
GND GAMMAbox1			FPZ
REF GAMMAbox1			Ear lobe
1 GAMMAbox1	EEG	P300	FZ
2 GAMMAbox1	EEG	P300	CZ
3 GAMMAbox1	EEG	P300/SSVEP	P3
4 GAMMAbox1	EEG	P300/SSVEP	PZ
5 GAMMAbox1	EEG	P300/SSVEP	P4

6 GAMMAbox1	EEG	P300/SSVEP	PO7
7 GAMMAbox1	EEG	P300/SSVEP	POZ
8 GAMMAbox1	EEG	P300/SSVEP	PO8



Figure 5: Setup and channel selection of the g.MOBilab and g.GAMMAbox.

a) Connection of g.GAMMAbox to the g.MOBilab.

b) The labels of the electrode connectors name the channel 1-8, the ground connector (G) and the reference connector (R) of the g.GAMMAbox.

c) The connected electrodes.



Figure 6: The cap is positioned such that the Cz electrode...

a) ...is located in the middle between the tips of the ears and the nasion (top most point of the nose) and the inion (point where spinal cord is connected to the skull).

b) Use the belt to secure the cap as shown, thereby the straps may be crossed.

Free run

In this mode, either a row or a column is highlighted within the Matrix interface. The order of highlighted rows or columns is random. Each row and each column have to flash 15 times, to select an item. Whenever a symbol is selected the BCI will ask the ALIAS robot to execute the corresponding command. The mask and the related commands will be updated whenever the state of the robot changes.

1. Change the mode of the Paradigm block to "Free Spelling".

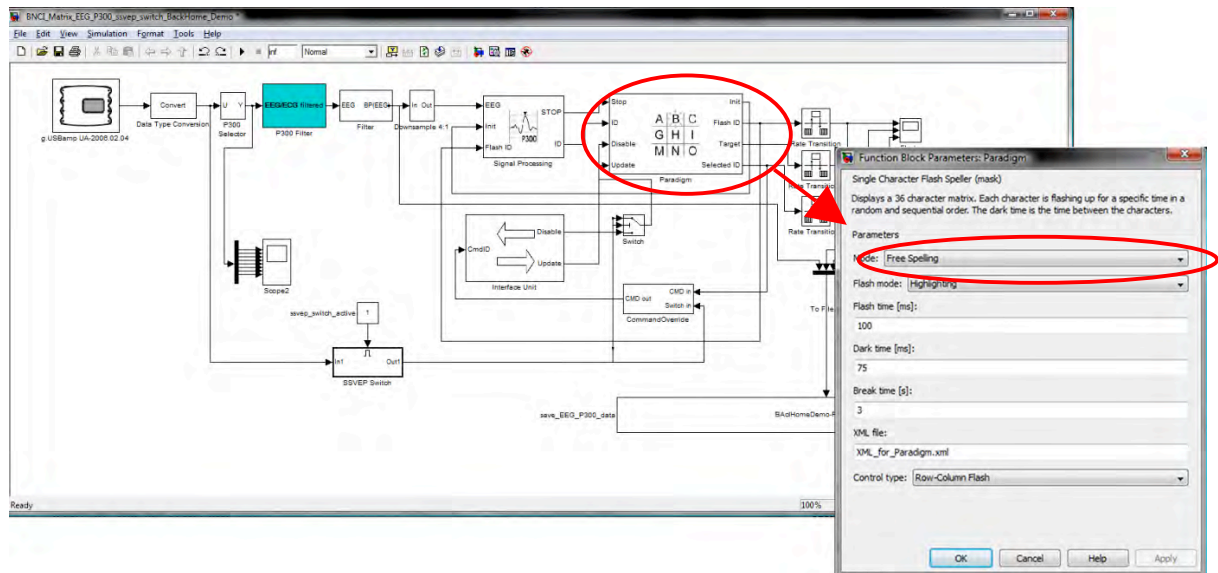


Figure 7: Select "Free Spelling" to use the P300 based BCI within the Alias system.

2. Follow the instructions from g.BCI_XML_standard\help\manual.pdf on how to run and use the Matrix interface.
3. Follow the instruction from the g.SSVEP\help\manual.pdf on how to operate SSVEP call robot function.

4.2 Entertainment Functions

4.2.1 Television

The television module enables the robot to display the current TV program. Depending on the robot's location and reception it may be able to display some selected TV channels. You may switch the channel by pushing the corresponding button or return to the robot's menu system by means of the "back" button. Figure 8 depicts the robot's TV module.



Figure 8: Robot's TV display. For details see Table 4.

Table 4: Description of the robot's TV display screen, Figure 8.

1	Television Screen The television screen displays the currently selected TV channel.
2	Channel Down Button Push this button to switch to the next lower TV channel.
3	Channel Up Button Push this button to switch to the next higher TV channel.
4	Back Button Exit the TV module and go back to the robot's menu system.

Hint:

The channel selection doesn't *cycle around*. For example, in case you're already watching the highest available channel, the channel up button won't flip back to the first channel. In that case the channel up button won't do anything and you'll have to use the channel down button instead.

4.2.2 Audio Books

The robot's audio book selection contains audio books that may be played by tapping on their covers, respectively. Pushing the "stop" button will terminate the playback, while the "back" button returns to the robot's menu system (while the player is still running?).

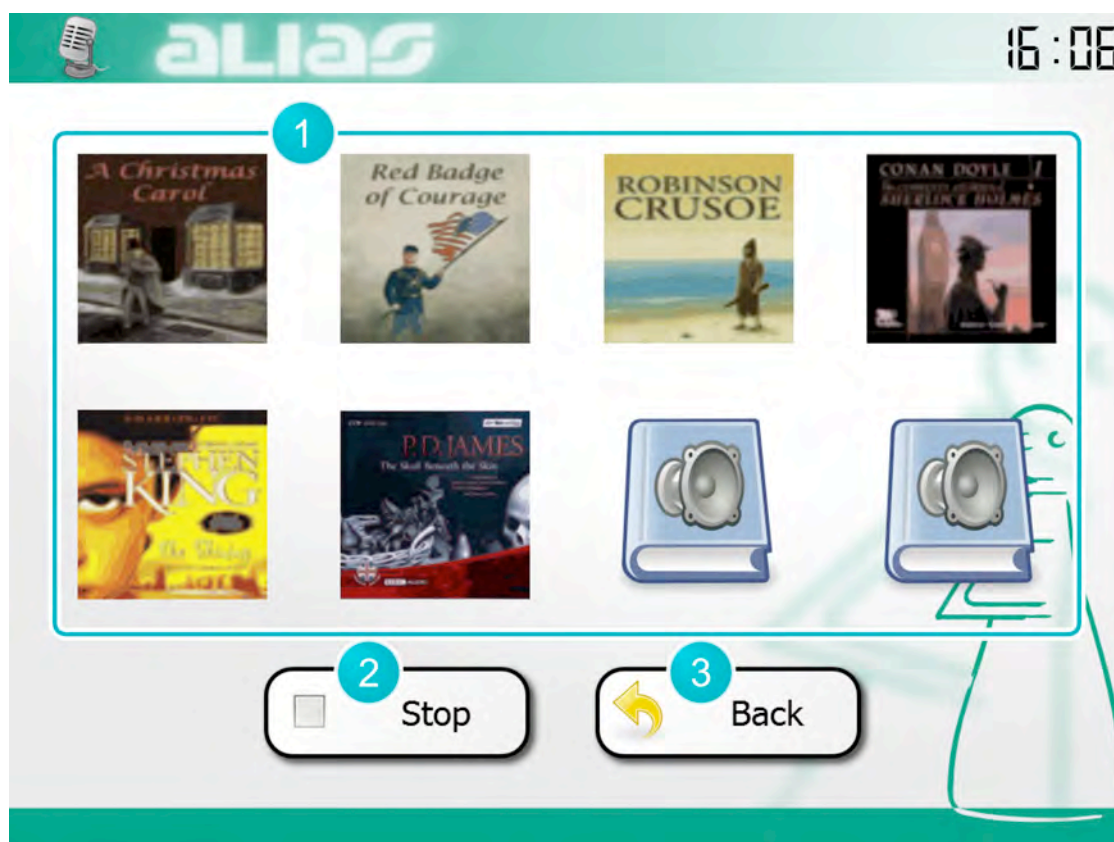


Figure 9: The robot's audio book selection. See details in Table 5.

Table 5: Description of the audio book selection, Figure 9.

1	Audio Books This display shows the available audio books by means of their covers. Tap on the audio book you'd like to hear.
2	Stop Button Push this button to stop the audio book playback.
3	Back Button Exit the audio book selection and go back to the robot's menu system.

4.2.3 Games

The robot offers a game collection that can be accessed via the touchscreen or by speech command, e.g. “I want to play a game.” or “What games do you have?” The following section shows a list of available games.

Chess

The ALIAS robot features an integrated chess game, which can be accessed via the touchscreen or by speech command (e.g. “I want to play chess!”). In case you’re not already familiar with the rules, please have a look at http://en.wikipedia.org/wiki/Rules_of_chess.

Figure 10 shows a picture of the robot’s chess module. You’ll be playing against the robot. In order to start a new game, push the “Restart” button. Since you’re playing white, you’ll have the first move. To do so, tap on the game pawn you want to move, hold your finger down and drag the pawn to its destination and let go off the screen. Valid destinations will be highlighted.

Another method of move a pawn is by tapping on the pawn to be moved, first. After it has been highlighted, you may tap on its destination.



Figure 10: The chess game module. See details in Table 6.

Table 6: Details of the chess game dialogue, Figure 10.

1	Game Board This area of the screen displays the actual game board. You may tap on a game pawn you'd like to move and push it to its destination, or tap on the destination.
2	Restart Button Pushing this button will clear the game board and start a new game.
3	Back Button Exit the chess game and go back to the robot's menu system. The current game state will be preserved.

Sudoku

Sudoku is a very popular logic-based number-placement puzzle game. It may be accessed via the touchscreen menu or by speech command, e.g. "I want to play Sudoku!"

The game itself (as depicted in Figure 11) consists of a 9-by-9 grid of squares, some of which contain numbers already, while others are still empty. The goal of the game is to fill empty squares with single-digit numbers ranging from 1 to 9, following a set of rules. The rules are as follows:

- Every row must contain the numbers 1 to 9 in an arbitrary order, whereas every single number must occur exactly once. So no number should be absent or occur more than once.
- The board may be divided into nine 3-by-3 segments. Yet again, every single one of these segments must contain the numbers 1 to 9 in an arbitrary order, whereas every single number must occur exactly once. So no number should be absent or occur more than once.

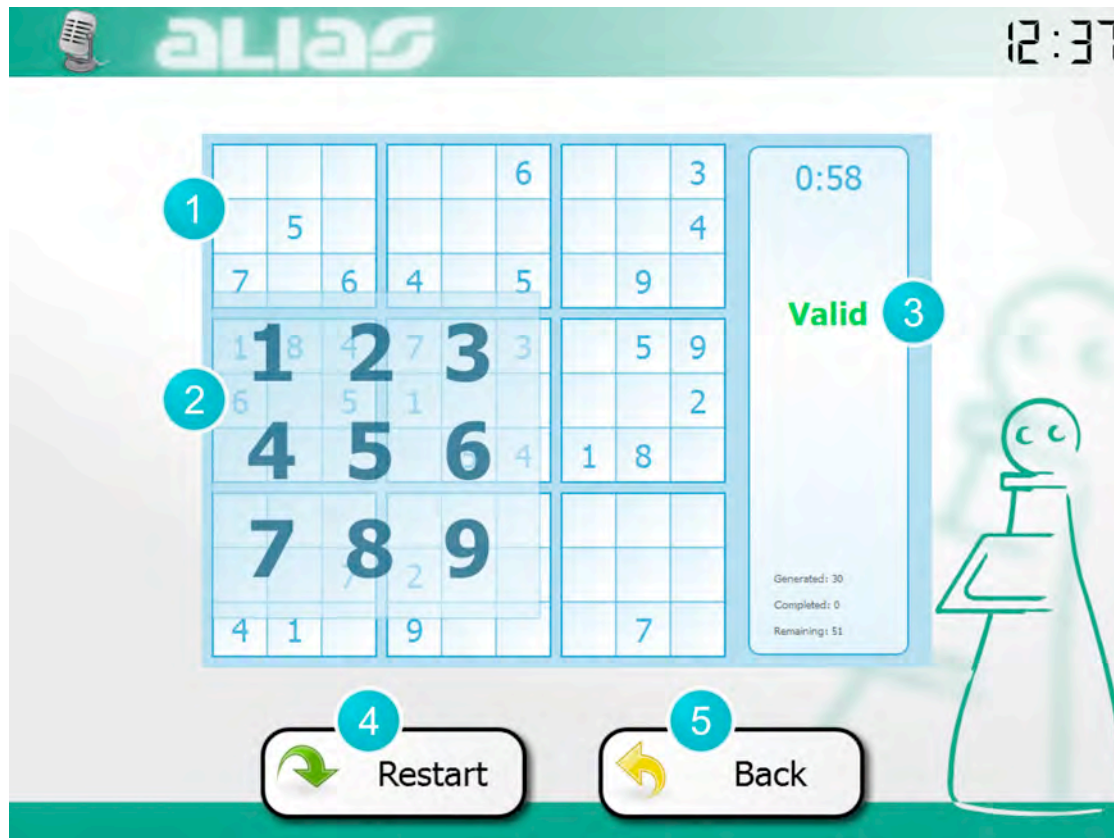


Figure 11: The Sudoku game module. See details in Table 7.

Table 7: Details of the Sudoku game dialogue, Figure 11.

1	<p>Game Board</p> <p>The game board contains some nine by nine squares to be filled with numbers, whereas blue numbers were generated by the program and are already part of the correct solution. You may enter additional black numbers by tapping on an empty field. To delete a black number double-tap on the number to be removed.</p>
2	<p>Input Dialogue</p> <p>Tapping on an empty square causes the input dialogue to pop up, which allows you to select the number to be placed in the selected square.</p>
3	<p>Status Display</p> <p>This display shows the elapsed time since the game has been started and an assessment on the validity of the current solution.</p>
4	<p>Restart Button</p> <p>Pushing this button will clear the game board and start a new game.</p>
5	<p>Back Button</p> <p>Exit the Sudoku game and go back to the robot's menu system. The current game state will be preserved.</p>

Tic-Tac-Toe

The Tic-Tac-Toe module provides a quick strategy game for two human players. It may be accessed via the touchscreen menu or by speech command (e.g. “I want to play Tic-Tac-Toe!”).

The game board, as depicted in Figure 12, contains nine empty squares. Both players take alternating turns in placing their symbol, either X or O. The goal of the game is to get three symbols in a non interrupted line, horizontally, vertically, or diagonally. The player who achieves this first wins the game. In case all squares are taken but no player has managed to win, the game ends draw.

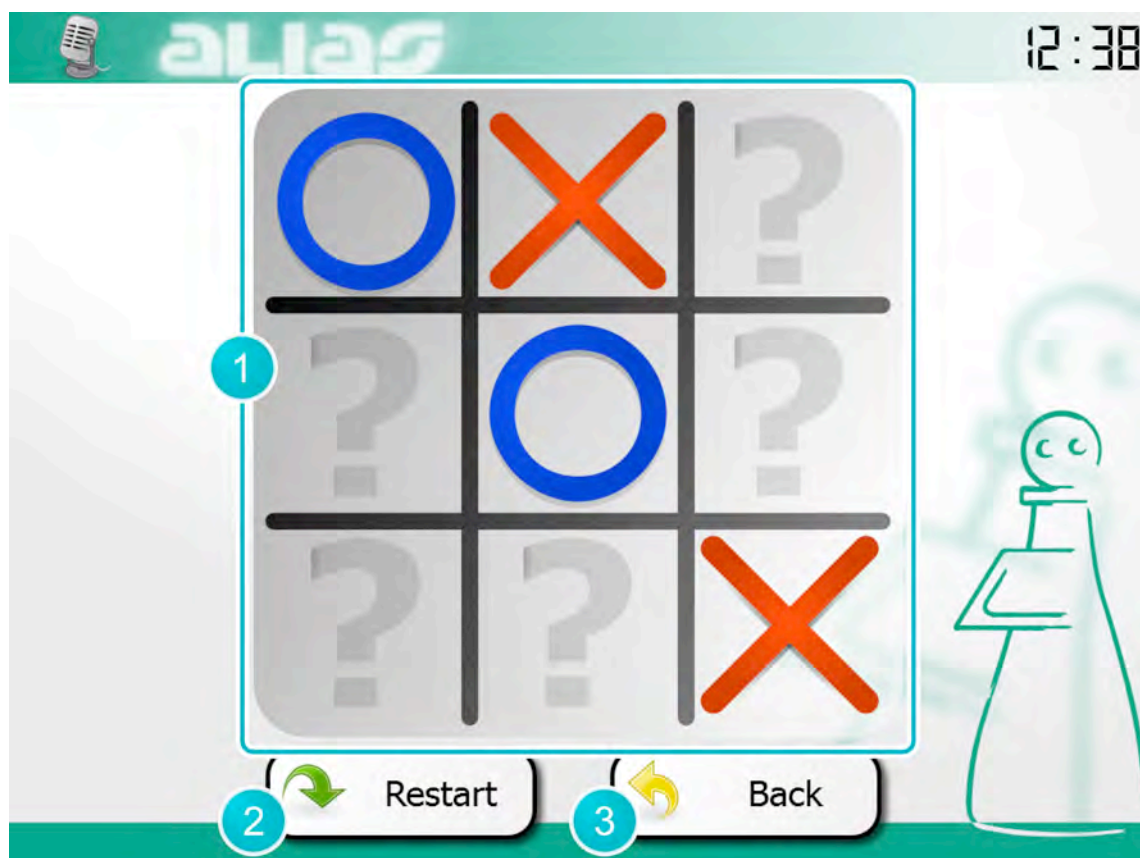


Figure 12: The tic-tac-toe game module. See details in Table 8.

Table 8: Details of the tic-tac-toe game dialogue, Figure 12.

1	Game Board This area of the screen displays the actual game board. You may tap on an empty square, indicated by a question mark, to place your symbol.
2	Restart Button Pushing this button will clear the game board and start a new game.
3	Back Button Exit the tic-tac-toe game and go back to the robot’s menu system. The current game state will be lost.

Solitaire

The Solitaire module offers the possibility to play a single player patience card game, which is also known under the name *Klondike*. It could be also started by using the touchscreen or talk to the robot (e.g. "I want to play Solitaire."). The game board, as depicted in Figure 13, consists of three main areas:

- **Building Stacks**

The building stacks occupy the lower three quarters of the game board. The leftmost stack contains one card, while each subsequent stack contains one additional card. Only the top card of each stack is face up. In case the top card is removed, the next lower face down card becomes accessible. Cards may be stacked in alternating colours, in order of decreasing value, i.e. from King (bottom) to Ace (top). The visible card will be the foundation of the stack, this can be any card. However, when starting a new stack on an empty field, the founding card must be a King.

- **Deck**

The deck is located in the top-left corner of the board and contains the cards which are not found in the source stacks. Tapping on the deck will flip and reveal new cards that may be used to construct the stacks. If there are no more cards to go through in the deck, clicking on the outline of the deck will begin another pass through the deck.

- **Suit Stacks**

The suit stacks are located in the top-right corner of the board and are initially unoccupied.

Cards may be stacked in matching suits, in order of increasing value, i.e. from Ace (bottom) to King (top).

The goal of the game is to move all cards from the deck and the building stacks to the suit stacks. Cards may be moved from one stack to another, single cards or multiple cards at once.



Figure 13: The Solitaire game dialogue. See details in Table 9.

Table 9: Details of the Solitaire game dialogue, Figure 13.

1	<p>Game Board This area of the screen displays the actual game board. You may tap on a card pawn you'd like to move and push it to its destination.</p>
2	<p>Restart Button Pushing this button will clear the game board and start a new game.</p>
3	<p>Back Button Exit the chess game and go back to the robot's menu system. The current game state will be preserved.</p>

Wii

The ALIAS robot is equipped with a Nintendo Wii gaming console. It may be accessed via the games menu or by speech command, e.g. "Let's play Wii." The Wii shows up on the robot's display unit, Figure 14. To play a game you will need the white remote control provided with the robot. In case the screen remains black, press the power button on your Wii Remote Plus controller for duration of 1 second.



Figure 14: The Wii gaming console. See details in Table 10.

Table 10: Description of the ALIAS robot's Wii module, Figure 14.

1	<p>The Wii Gaming Console Screen</p> <p>This is the screen of the Wii gaming console. The cursor may be controlled by use of the Wii remote control. For details see the Wii software manual.</p>
2	<p>Back Button</p> <p>Push this button to return to the ALIAS menu system. Whereas the current game state will not be harmed nor saved. In order to switch off the Wii gaming console, actually, press the power button on the Wii Remote for duration of 1 second.</p>

4.3 Health and Safety Functions

4.3.1 Ground Light at Night

The ALIAS robot is equipped with some small LED's that can illuminate the floor in darkness. The LED's are turned on/off by the robot automatically when needed.

Thus, you can order ALIAS to accompany you e.g. when going to the bathroom at night. Just call ALIAS and tell him where you want to go. ALIAS will adapt his speed and the ground illumination automatically. Nonetheless you can ask him to go slower or faster or to switch the lights on and off.



Figure 15: Ground Light at Night (in bathroom)

4.3.2 Emergency Call

In case of an emergency, simply call out for “help”. The robot will understand your request and initiate an emergency call. To ensure that the emergency calls aren’t issued by mistake, it’ll wait for 20 seconds. During that time you may cancel the process by pushing an abort button. After the countdown expired, the actual emergency call will be placed, using the robot’s video telephone. An example of the emergency call dialogue is depicted in Figure 16.



Figure 16: The emergency call countdown dialogue. See details in Table 11.

Table 11: Description of the emergency call countdown dialogue, Figure 16.

1	<p>Countdown</p> <p>The robot will wait for 20 seconds before the actual emergency call is issued, providing you with a chance to cancel an emergency call that has been activated by mistake. The clock displays the number of seconds still remaining.</p>
2	<p>Abort Button</p> <p>In case the emergency call has been activated by mistake, it may be cancelled by pushing this button before the countdown has expired.</p>

5 Glossary and Keyword Index

BCI:	Brain-Computer-Interface
Double-Tap:	Tapping twice on the same position on the touchscreen within a short interval
EEG:	Electroencephalography (EEG) is the recording of electrical activity along the scalp.
GAMMAbox:	Little box used for the processing of EEG signals.
g.MOBIIlab:	Little box used for the processing of EEG signals.
PSTN:	Public switched telephone network, i.e. the common public telephone network
Remote Control:	Special external controller for using the Wii-function
Skype:	Skype is a proprietary voice-over-Internet Protocol service and software application. The service allows users to communicate with peers by voice, video, and instant messaging over the Internet. Phone calls may be placed to recipients on the traditional telephone networks. Calls to other users within the Skype service are free of charge, while calls to landline telephones and mobile phones are charged via a debit-based user account system.
Status Display:	The status display gives basic information on the actual status of the robot and on the battery status. It is located on the lower side of the robots body.
Wii:	Game console which can be controlled by gestures. Part of the ALIAS robot.

6 Frequently Asked Questions

Question: What personal data is stored in the robot or cloud?

Answer: The same data that you can store in a computer when using functions that are also available on the robot. This applies e.g. to e-mails and appointments, or to audio books and other files. With the actual setup, no medical data or image data are stored in the robot.

Question: Who can I call when problems with ALIAS occur?

Answer: See chapter 8 for contacts and service.

Question: What happens, if I destroy something using ALIAS? What about insurance issues?

Answer: This has not completely been solved yet. When using ALIAS within its defined areas of usage, such problems will probably be covered by an insurance or by the manufacturer.

Question: How can I set up basic information with ALIAS? Is that only possible with an supervisor?

Answer: Yes, so far this is only possible with technical staff. Better routines for an automated setup will be developed.

Question: What should I do if ALIAS does not react at all?

Answer: Try to restart the robot completely. If this does not solve the problem, get in touch with the technical service (see chapter 8).

Question: What should I do if the Wii doesn't start or the connection to the remote control doesn't work?

Answer: Try to restart the robot completely. If this does not solve the problem, get in touch with the technical service (see chapter 8).

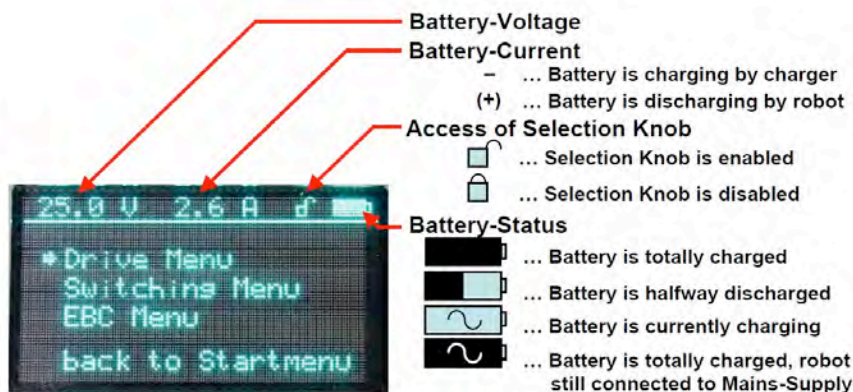
Question: Who gets my emergency call? A relative or friend or the ambulance?

Answer: This can be set up together with the technical staff when using ALIAS for the first time. E.g. it is possible to define a list of contacts who will be called consecutively.

7 Technical data

Battery system

The applied battery-system consists of two 12 Volts, 42 Ampere-hours lead-acid cells which are connected in series. The total charge accumulates to nominal 1008 Watt-hours. The open-circuit (quiescent) voltage at full charge is approximately 25.2–25.8 Volts, and at typical charging around 26.4 – 28.8 Volts.



The main menu in the status display shows the basic information about the battery: voltage, current and status:

Lifetime: The life of a rechargeable battery operating under normal conditions is generally around 1000 charge-discharge cycles. This translates into at least three years of battery life for average usage. Actual battery run-time depends upon the power demands of the equipment. As the rechargeable battery begins to die the user will notice a decline in the running time of the robot.

Storage Period: A charged battery will eventually lose its charge if unused. It may therefore be necessary to recharge the battery after a storage period: If the robot will not be in use for a month or longer, it is recommended that it should be stored in a cool, dry, clean place. Also a new battery has to be charged before use.

In case of discharged batteries: If the voltage of the batteries drops below 22 V, ALIAS will automatically start a shut down procedure. At first it beeps every two seconds and the charge-scale on the Status Display flashes. After 8 minutes, the embedded PC shuts down and the charge-scale flashes more frequently. After 10 minutes, the robot shuts down completely. Put the IEC plug in the 230 V Receptacle for battery recharge. *Warning:* Lead acid batteries are not designed for deep discharge and can easily be damaged by deep discharge. Repeated deep discharges will result in capacity loss and ultimately in premature failure, as the electrodes disintegrate due to mechanical stresses that arise from cycling.

8 Contacts and Service

Questions regarding the robot and service

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