

User manual **UNIKATE-Project** **Kissenschalter**

UNIKATE - Ideas Competition for Assistive Technologies by UNIQUA Private Foundation, ÖBR and TU Vienna - WS2020



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Introduction

This document describes the design and operation of the aid, which was created as part of the UNIKATE 2020 competition (project "Pillow Switch").

Components

Hardware and accessories

- Tablet "MICROSOFT Surface Pro 7"
- Tablet protective cover
- Tablet holder (three parts)
- USB distributor
- FABI (*Flexible Assistive Button Interface*)¹ + USB cable
- Case for the FABI + USB distributor
- Button
- Cushion (blood pressure cuff)
- Infrared remote control "*IRTrans*"
- Battery breaker
- Backpack
- User manual



Figure 1, FABI



Figure 4, tablet holder



Figure 2, pushbutton



Figure 3, cushion
(blood pressure cuff)



Figure 5, Infrared remote control



Figure 7, Microsoft Surface tablet



Figure 6, battery interrupter

¹ <https://www.asterics-foundation.org/projekte-2/fabi/>

Toys

- Robot "*Robosapiens*"
- Lights "*Handy-Lux*" (x5)
- Disco light
- Bubble machine (with battery breaker)
- Massage tube (with battery breaker)

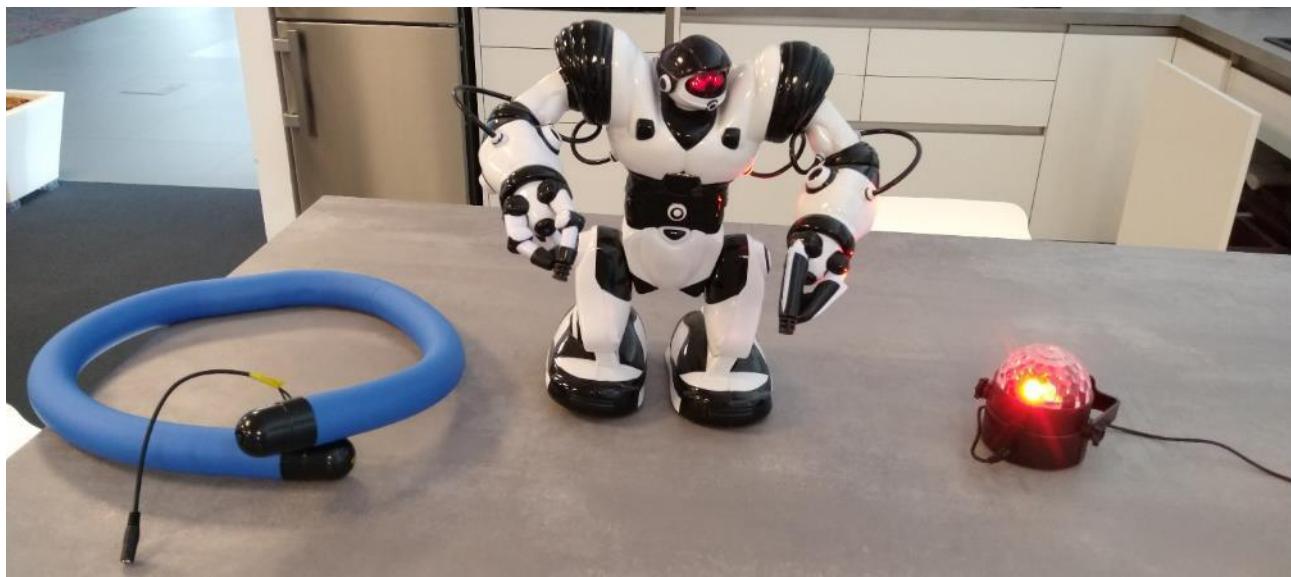


Figure 8, toys: massage tube (with battery interrupter), robot "*Robosapiens*" and disco light



Figure 9, lights "*Handy-Lux*"

Figure 10, Bubble machine with battery breaker

Backpacking plan

For carrying and protecting the components and for easy operation of the tool
the following storage in the backpack is recommended:



Structure

Figure 11 shows the assembly and mounting of the aid.



Figure 11: Assembly of the auxiliary elements

Important notes

1. Cable outlet on the side (so that the electronics are protected from rain)
2. Fix USB cable to chair
3. Position cradle (open knob to change position), place tablet in cradle.
4. Plug in USB hub
5. Attach the IRTrans remote control to the headrest. This must have a line of sight to the toy.
6. Inflate cushion (blood pressure cuff) slightly and place in headrest cover (left).
7. Mount the button on the headrest on the right.

Connections

If an application does not work, please check the connections on the FABI. These must be as follows:

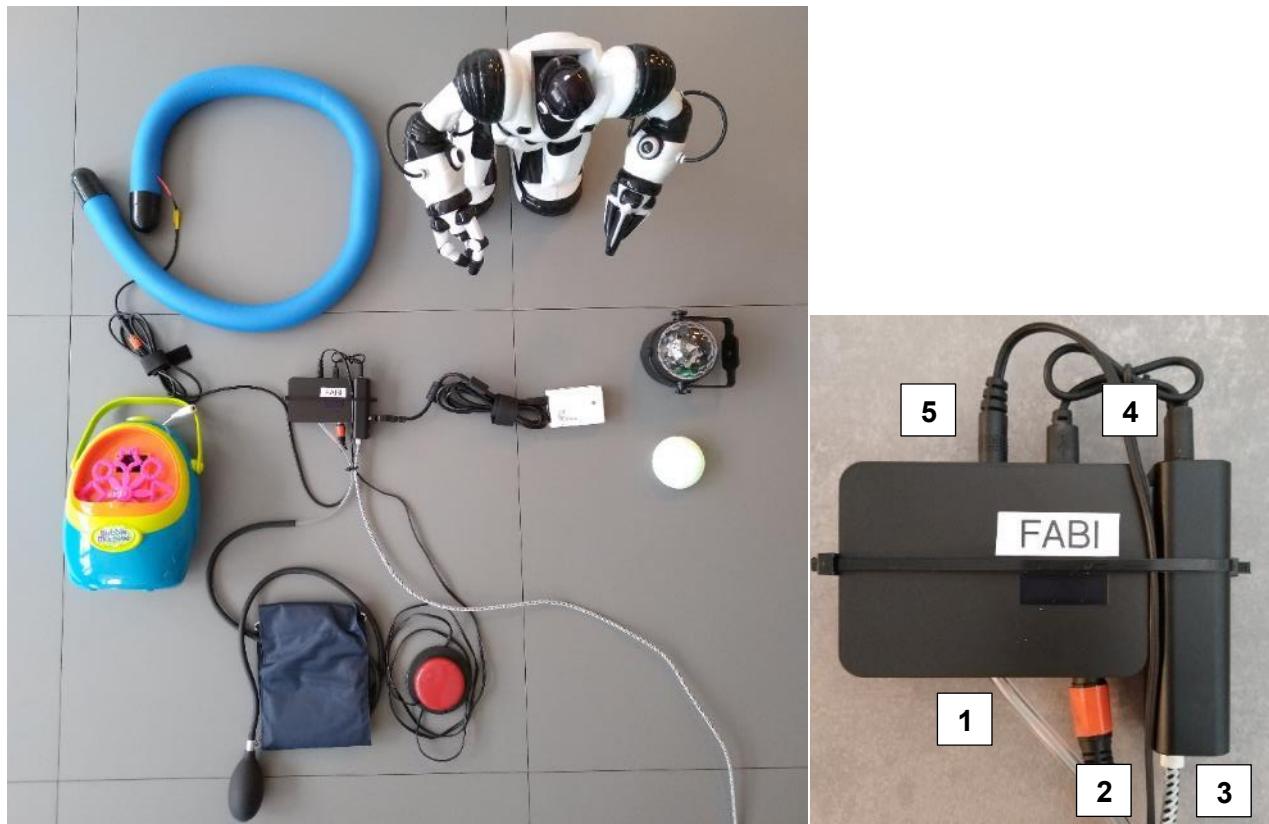


Figure 12: Overview of the connections and connected devices

Important notes

1. Hose connection for cushion
2. Cable connection for toys (currently bubble machine, massage tube).
3. USB cable of the hub: Must be plugged into tablet
4. USB cable between FABI and USB hub
5. Pushbutton for grid control. Must be plugged into socket 1.

Toy control and computer aided communication



Figure 13, controlling toys with the help of the AsTeRICS Grid application.

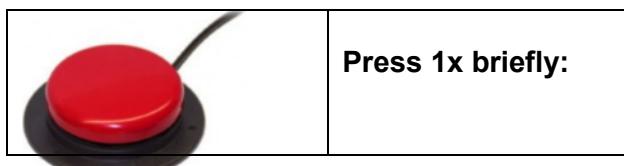
General operation of the tool

The toy control and AAC aid is operated using the **AsTeRICS-Grid** web application² and the **ARE** (*AsTeRICS Runtime Environment*) program of the *AsTeRICS framework*³.

When the tablet is turned on, all necessary programs are started automatically!

Navigating to the toy control grids is done as follows:

- A short keystroke leads to the next selection on the right. If there is no element (element = selection) left in the line, the program jumps to the next element at the bottom left. The current selection in which the program is located is marked with a red border and the element is read out. (see Figure 14)
- The current element is selected by a long keystroke (at least 2 seconds). When an element is selected, one of the following actions is triggered:
 - the name of the element is read out
 - an action is performed (e.g. switch on light or massage tube)
 - a video (from YouTube) is played, paused, etc.
 - a radio station (from web radio) is switched on
 - another grid is opened. (see Figure 15)



² <https://www.asterics-foundation.org/projekte-2/asterics-ergo-grid-2/>

³ <https://www.asterics.eu/>

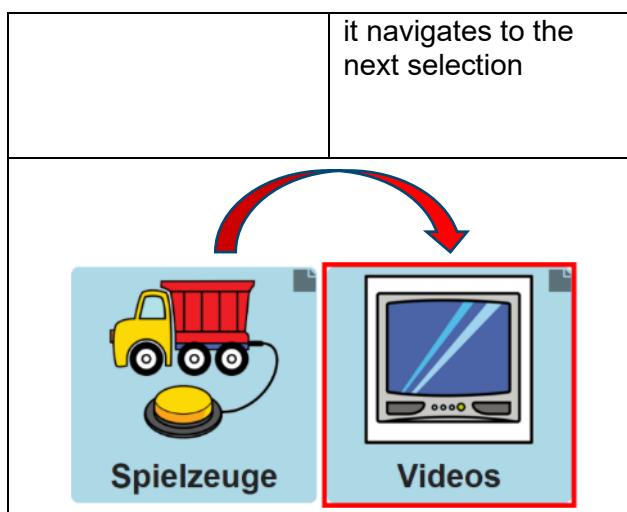


Figure 14, Operation of the button for navigating to the next selection

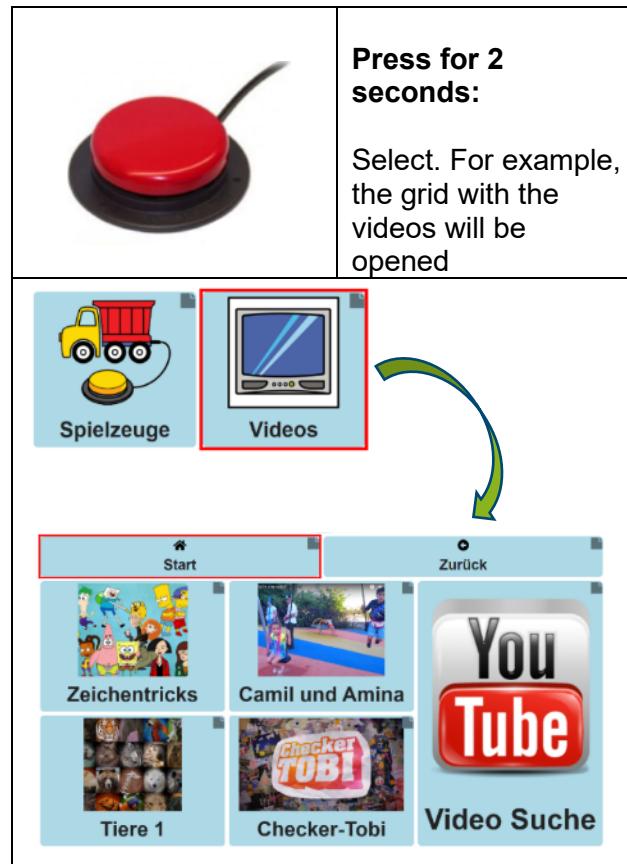


Figure 15, operation of the button for selection

Hint. If the program does not work properly:

- Disconnect the USB cable from the tablet and reconnect it, or
- Restart the tablet, Operation of the button to select or
- Check if everything is connected correctly

Personalized AsTeRICS grids

Main Grid

The main grid opens automatically when the tablet is turned on and is the starting point for navigating to the other grids.

The selection **Start** always leads to the main grid. The selection **Back** leads to the last opened grid.

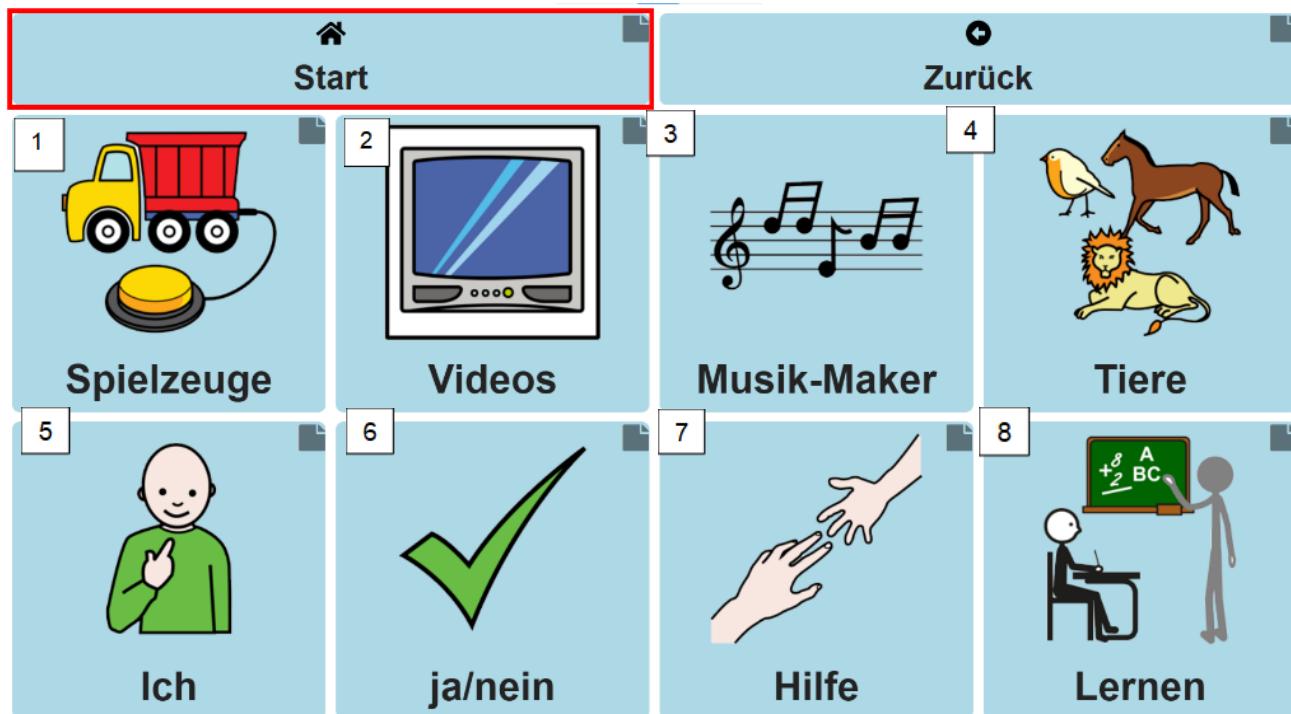


Figure 16, main grid

In the following, the grids that are necessary for the toy control and all other grids that are connected to the main grid are described. In the **AsTeRICS-Grid app**, all personalized grids as well as other standard grids are available to the patient. Select the "Manage grids" option in the navigation menu to find all available grids.

Toys

 <p>Spielzeuge</p>	<p>The Toys selection navigates to the Grid for toy control. Five different toys can be selected on the grid (lights, disco light, robot, bubble machine, massage tube). The toy control requires either the infrared remote control "IRTrans" or the battery breaker cable, which must be connected to the FABI.</p>								
<table border="1"><tr><td> Start</td><td> Zurück</td></tr><tr><td> Lichter</td><td> Discolicht</td><td> Robby</td></tr><tr><td> Seifenblasen</td><td> Massage</td><td></td></tr></table>		 Start	 Zurück	 Lichter	 Discolicht	 Robby	 Seifenblasen	 Massage	
 Start	 Zurück								
 Lichter	 Discolicht	 Robby							
 Seifenblasen	 Massage								

Figure 17, Grid for toy control

 <p>Figure 18, IRTrans remote control</p>	 <p>Figure 19, battery breaker</p>	 <p>Figure 20, Connecting the toy to the FABI</p>
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Lights: This selection navigates to the grid for controlling the "Handy-Lux" lights. Using this grid, the five lights can be turned on/off simultaneously or different light colors can be selected. To control this toy, the **IRTrans remote control** is required (see Figure 18). The lights are battery operated.



Figure 21 Grid to the control of the "Handy-Lux" lights



Disco light: This selection navigates to the grid for controlling the "disco light". Using this grid, the disco light can be turned on, turned off, or various functions can be selected. The **IRTrans remote control** is required to control this toy (see Figure 18). The disco light must be connected to a power source.

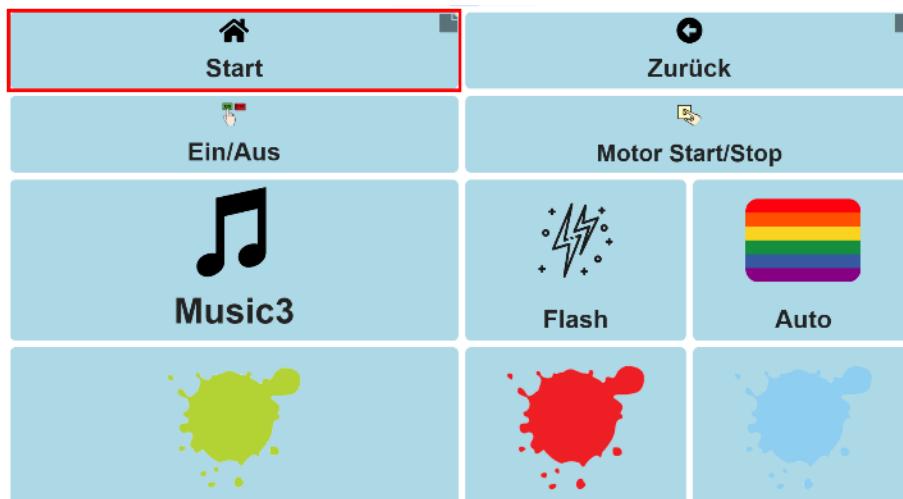
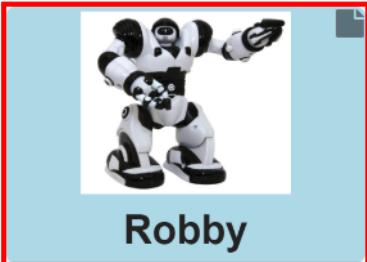


Figure 22, Grid for controlling the "disco light".



Robby: This selection navigates to the grid for controlling the robot "**Robosapiens**". Using this grid, the robot can perform three different commands: Wake Up, Say Hello, Take Steps Forward, and Burp. To control this toy, the **IRTrans remote control** is required (see Figure 18). The robot is battery powered.

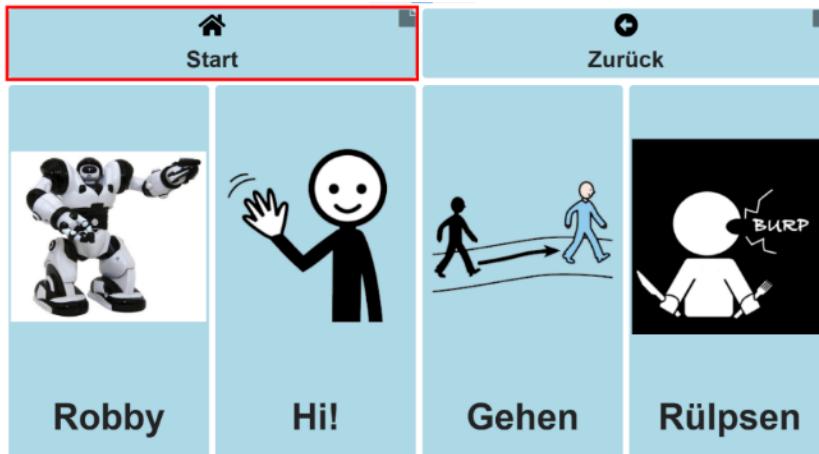


Figure 23, Grid for controlling the robot "Robosapien"



Bubbles: This selection navigates to the bubble machine control grid. This grid can be used to turn the bubble machine on and off. To control this toy, the **battery breaker** is required, which must be inserted in the battery compartment of the bubble machine and connected to the toy cable of the **FABI** (see Figure 25). This toy is battery operated.



Figure 24, Grid for controlling the bubble machine

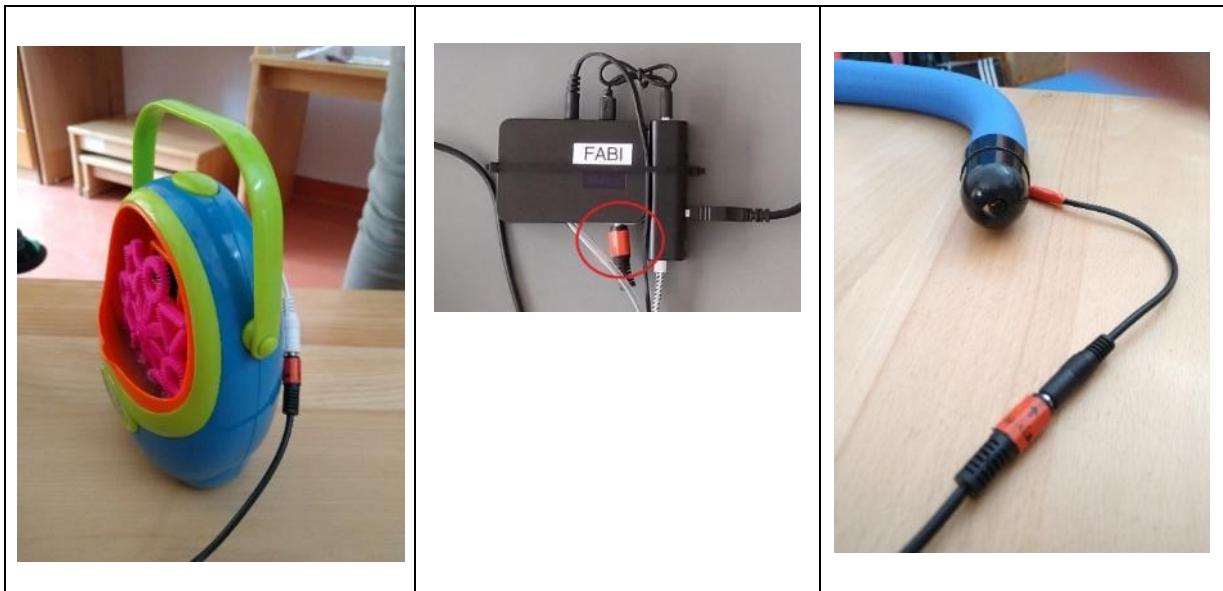


Figure 25, connections to control the bubble machine and the massage tube

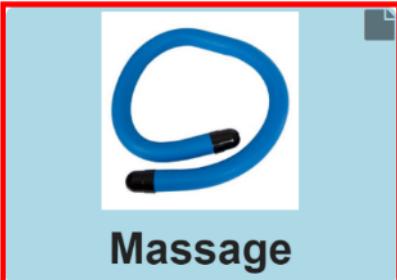
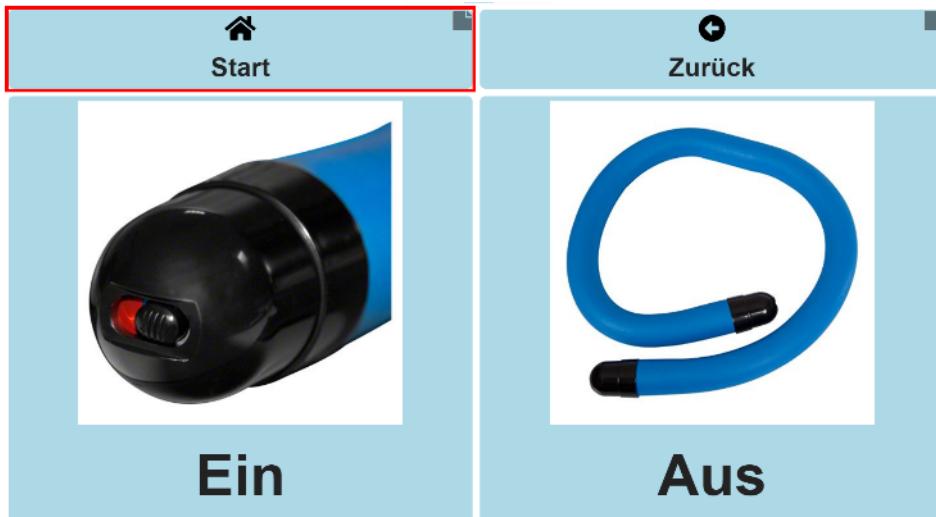
 Massage	<p>Massage: This selection navigates to the grid for controlling the massage tube. This grid can be used to turn the massage tube on and off. To control this toy, it must be connected to the toy cable of the FABI (see Figure 25). This toy is battery operated.</p>
 Ein	

Figure 26, Grid for controlling the massage tube

Videos

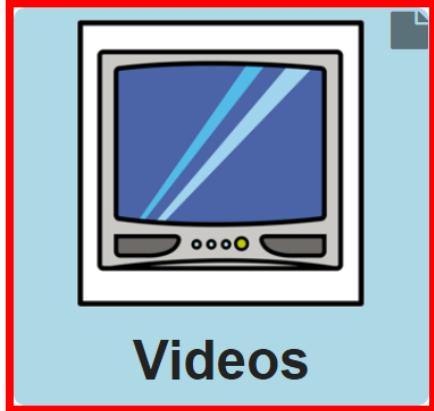
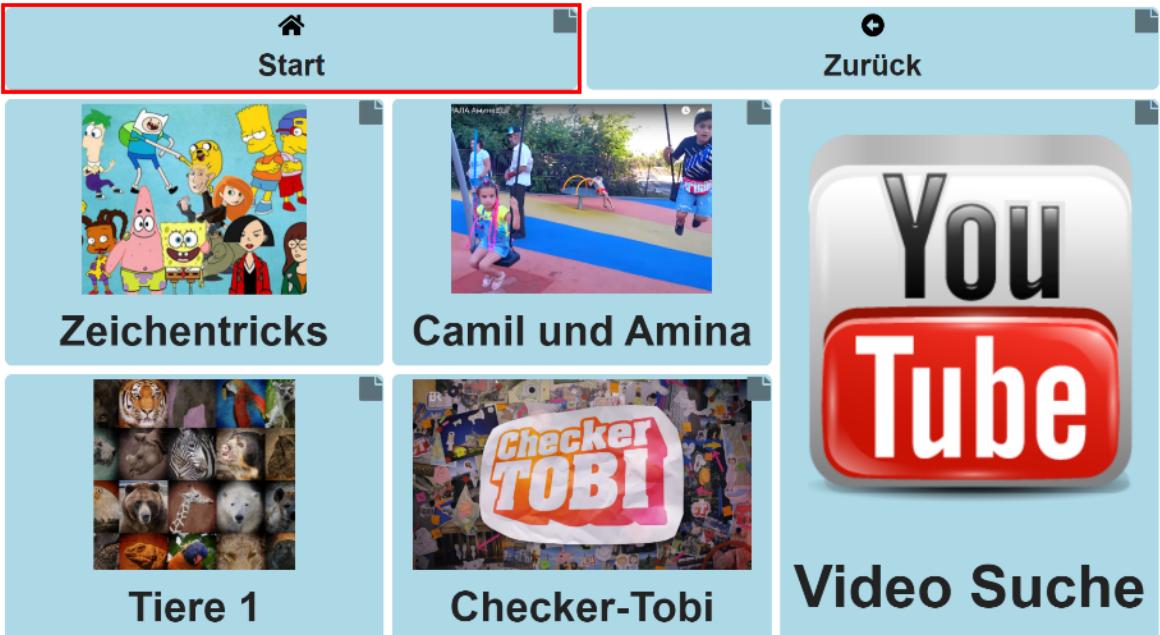
	<p>The Video selection navigates to the grids for playing videos from YouTube. This grid contains both a pre-selection of videos (cartoons, favorite series and animals) and the possibility to play any video in YouTube using the Video Search selection. An Internet connection is required for these grids.</p>
 <p>The grid for playing videos includes the following elements:</p> <ul style="list-style-type: none">Start: Top left button with a house icon.Zurück: Top right button with a back arrow icon.Zeichentrick: Video thumbnail showing characters from various cartoons.Camil und Amina: Video thumbnail showing two children playing on a swing.Tiere 1: Video thumbnail showing a collage of various animals.Checker-Tobi: Video thumbnail showing the Checker-Tobi logo.YouTube: Large YouTube logo.Video Suche: Text label for the search function.	

Figure 27, Grid for playing videos



With the **Video Search** selection it is possible to play any videos or playlists from YouTube, pause them, skip to the next video, adjust the volume, etc.
With the **Search** selection, the name of the desired video can be entered.
The use of this grid requires an **Internet connection**.

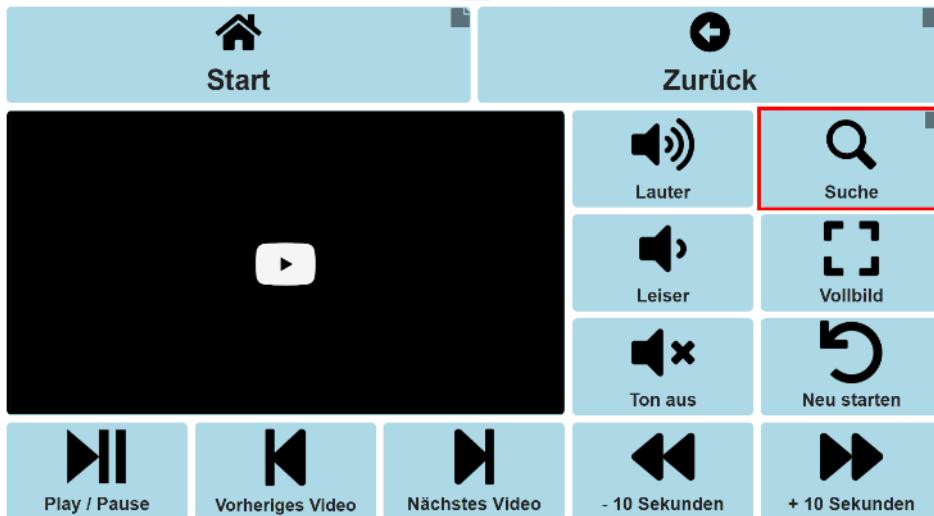


Figure 28, Grid for YouTube video control

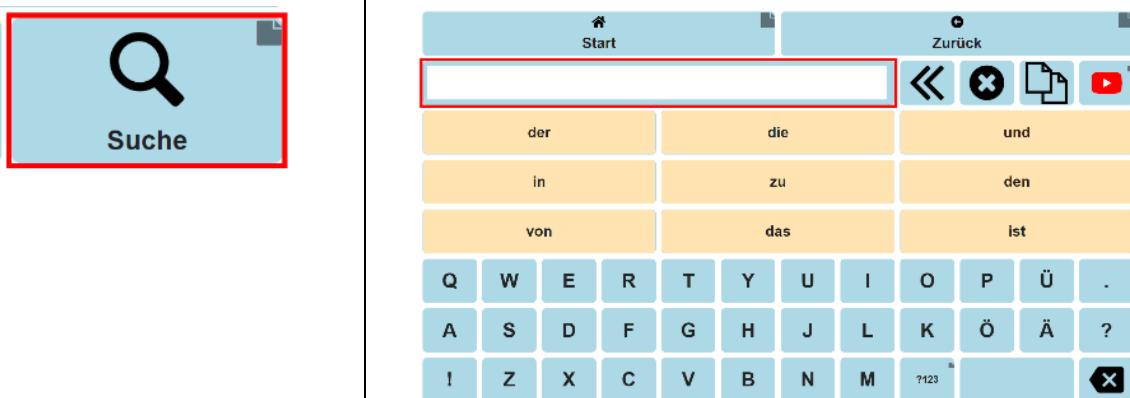


Figure 29, Grid with input field for YouTube video search

Music Maker



The **Music Maker** selection navigates to the grids for both generating sounds and listening to music via the web radio. These grids require either the **cushion switch** or an **internet connection**.



Kissenklang

Webradio

Figure 30, grid for generating sounds and listening to music.



Cushion sound: This selection navigates to the grid for generating sounds. To generate sounds, the **cushion (blood pressure cuff)** is used, which must be mounted slightly inflated in the headrest cover on the left side so that it is easily accessible with the head.

Pressing the cushion harder produces higher tones. Lighter pressing produces lower tones. There is a choice of three different instruments (bells, piano and taiko).

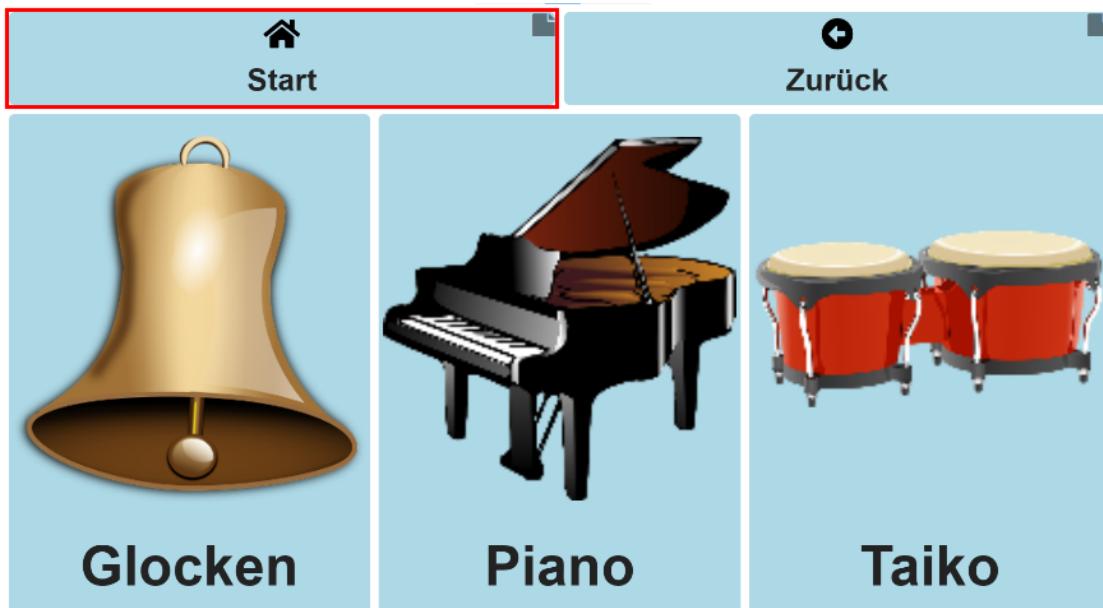


Figure 31, Grid for generating sounds



Figure 32, cushion switch



Web Radio: With this selection it is possible to listen to music from various web radio stations. **An Internet connection is required** to use this grid.

The screenshot shows a user interface for a web radio application. At the top left is a red-bordered box containing a house icon and the word "Start". To its right is a back arrow icon and the word "Zurück". Below this is a grid of 20 radio station icons arranged in four rows of five. Each icon includes the station's name below it. The stations listed are:

- Row 1: Radio ein/aus, Vorheriger Radiosender, Nächster Radiosender, Lautstärke leiser, Lautstärke lauter
- Row 2: Ö1 Austria, ORF Hitradio Ö3, FM4 ORF, ORF Radio Wien, NDR1 Welle Nord
- Row 3: SRF1 Radio, Radio Swizz Jazz, WDR1, MDR Aktuell, SWR1
- Row 4: Radio Rai 1, France Inter, Radio Nacional de España RNE 1, KEXP 90.3 Seattle, CRI Global Radio

Figure 33, Grid for listening to music from web radio stations

Animals

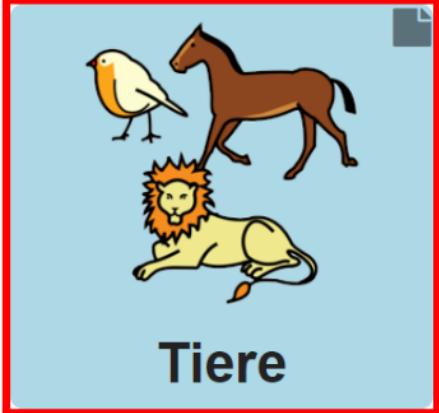
 <p>Tiere</p>	<p>Animals: This selection navigates you to the different grids, which contain pictures and names of different animals. The purpose of this grid is to entertain and educate the child.</p>
<p> Start</p>  <p>Wald und Bergtiere</p>	<p> Zurück</p>  <p>Tiere auf dem Bauernhof</p>
 <p>Wassertiere</p>	 <p>Tiere im Zoo</p>

Figure 34Grids to learn about animals



Me: With the help of this grid, the patient can communicate with others and tell something about himself. This grid must be completed with the patient's personal data. *

Start		Zurück	
 ich heiße	 ich bin .. Jahre alt	 ich wohne	 meine Familie
 meine Freunde	 meine Haustiere	 meine Freizeit	 meine Lieblingsfarbe
 mag ich	 Davor habe ich Angst	 mag ich nicht	

Figure 35, Grid with which the patient can tell information about himself/herself

* Help for editing grids can be found in the **AsTeRICS Grid app**. In the navigation menu, select *Help > Appearance Layout > Edit Grid Elements*⁴.

4

https://translate.google.com/translate?hl=&sl=en&tl=de&u=https%3A%2F%2Fwww.asterics.eu%2Fmanuals%2Fasterics-grid%2F03_appearance_layout.html

Yes/No

 <p>ja/nein</p>	<p>yes/no: With the help of this grid the patient can communicate with others, as he can answer closed questions with yes, no or "I don't know".</p>
<p>Start</p>  <p>Ja</p>	<p>Zurück</p>  <p>Nein</p>
<p>?</p> <p>Weiß nicht</p>	

Figure 36, grid to answer yes/no questions

Help

 <p>Hilfe</p>	<p>Help: With the help of this grid, the patient can communicate with others and ask for help in different situations or navigate to another grid in order to experience different feelings.</p> <p>to be able to express.</p>
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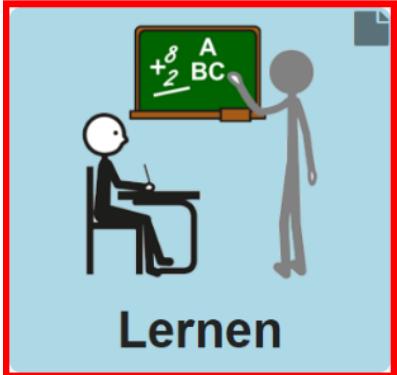


Figure 37, Grid, ask for help

 <p>Gefühle</p>	<table border="1"> <thead> <tr> <th colspan="2" style="text-align: center;">Start</th> <th colspan="2" style="text-align: center;">Zurück</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>aufgereggt</td> <td>fröhlich</td> <td>wütend</td> <td>besorgt</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>gelangweilt</td> <td>ängstlich</td> <td>traurig</td> <td>verwirrt</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>müde</td> <td>es tut weh</td> <td></td> <td>eifersüchtig</td> </tr> </tbody> </table>				Start		Zurück						aufgereggt	fröhlich	wütend	besorgt					gelangweilt	ängstlich	traurig	verwirrt					müde	es tut weh		eifersüchtig
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Figure 38, grid to express feelings

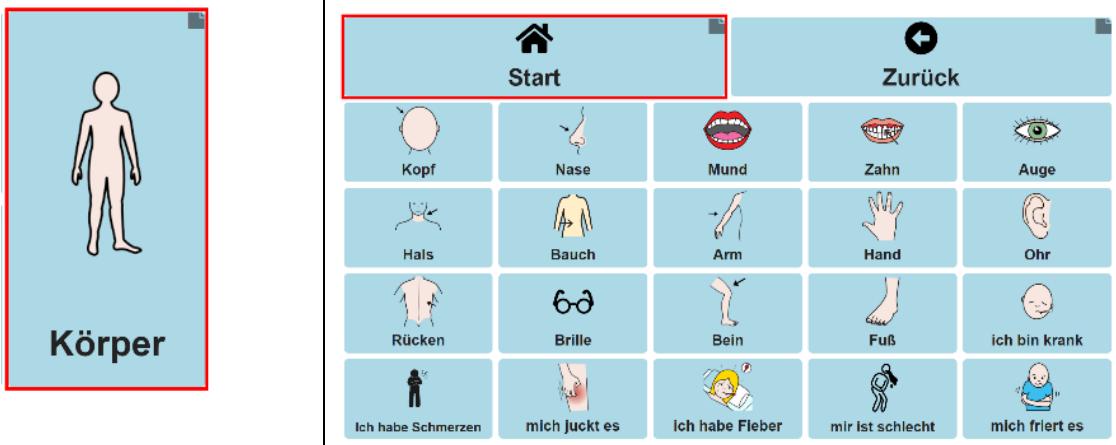
Learning



Learning: This grid navigates to other grids that deal with different topics (the ABC, numbers, colors, fruits, clothes, animals and body parts). These grids serve mainly to the education of the child.



Figure 39, grid to learn different topics



Körper

Figure 40, Grid to learn the body parts