

Phygital Youth Participation

ERASMUS+ PROJECT

KA220-YOU - Cooperation partnerships in youth

Installation Toolkit



Funded by
the European Union

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Introduction

This Installation Toolkit guides the usage of the Phygital installation 'Circles'.

This installation was developed as part of the Erasmus+ project 'KA220-YOU - Cooperation partnerships in youth'. The project was a collaboration between [Tree company](#) (Belgium,) [Levuur](#) (Belgium), the [city of Sint-Niklaas](#) (Belgium), [DYPALL Network](#) (Portugal) and [Danes Je Nov Dan](#) (Slovenia). The project ran from September 2023 to August 2025.

The phygital installation: 'Circles'

'Circles' has been designed for usage **in the context of participatory processes**. It is specifically aimed at organizations and municipalities that wish **to interact with and consult their audience to understand opinions and perceptions and gain input on specific topics or policy issues**, and who wish to do so **in an innovative, playful and accessible way**.

'Circles' has been designed with the specific purpose of **combining an educational element and a participatory element, and offers a space for dialogue**. Per topic, participants are asked a quiz question on the topic of interest, and subsequently a related opinion statement. Participants answer the question and give their opinions to the statements by positioning themselves on the playing field, effectively **creating a half circle** as an ideal context for a subsequent **conversation on the theme**.

The installation uses RFID technology. Participants grab one stick, with an RFID tag inside, which they can use to interact with the installation. To answer a question or give an opinion to a statement, they tap the stick on one of the circular answering options that represents their answer option. On the screen, participants get feedback on the registration of their answer.

Embedding 'Circles' in participatory processes

This part of the manual is dedicated to the facilitators of the Phygital testing phase 1 with the aim to support them in preparation for the testing and provide some concrete examples and tips on how to manage the activity and the group in order to ensure a

smooth and productive process in which both the participants and facilitators feel comfortable.

Context & flow

As an example, we can take the content of the first test we did with this installation regarding the European elections.

Topics: 9 topics related to the EU & the European elections. The questions for each of these topics are available in Annex to this document.

Aim: Informative, educational and pedagogical process with young people to inform them about the EU and encourage them to vote in European elections 2024.

Setting: The testing can be done in a school, a youth center or any similar environment with young people. It can be done as a part of an event or as a stand-alone activity. Duration (hours, days) can vary depending on the needs and possibilities of the municipality where the testing is taking place.

Max no. of participant per round: 8 comfortable - 12 max (increases with available space)

Below is the step-by-step explanation of the process using the phygital installation:

- Facilitator invites the participants to gather around the installation (the screen) and hands out sticks (one per person)
- Facilitator invites the participants to choose a topic out of one of the 3 themes that are displayed during the choose a theme screen
- 1st round
 - Knowledge question
 - Facilitator asks participant to position themselves according to the right answer
 - Facilitator shows the correct answer
 - Facilitator show the slide with the *Extra info - Did you know?* and reads it out
- 2nd round

- Facilitator invites the participants to continue exploring the same topic in the 2nd round. They explain that they are going to display an *Opinion statement* and that everyone should position themselves according to what they think. Facilitator explains that there is no right or wrong answer and that everyone is free to decide what they think
- Participants position themselves in one of the following answers: Agree/Not sure/Disagree
- Facilitator invites the participants for a *conversation* on the topic based on where they positioned themselves (constructive engagement of young people in the group)

Note: the duration of the second round should be decided by the facilitator based on the setting, number of participants, time available for their participation, etc.

- Participants choose a new topic and the facilitator start the process again from the beginning *or* new group of participants joins the installation

Content of the installation

The user interfacing copy is available in English, Portuguese, Slovenian and Dutch. In every project this language setting is predefined, meaning that the instructions can only be displayed in one language at a time.

The methodology

The Testing phase 1 is based on non-formal education (NFE). Some of the key characteristics of NFE that are applicable to this process are:

- a planned learning process with educational objectives
- activities are open to the input of learners to the learning process and encourage making links to real life
- based on the voluntary participation of learners (it is not a compulsory activity)
- inclusive and accessible, in other words every young person can take part and organisers actively seek ways to include persons that may experience exclusion or marginalisation
- participatory and learner-centred
- encourage people to learn from each other

- holistic, which means engaging learners' emotions, minds, and bodies.

Adapted from [Manual for facilitators](#) of the Council of Europe

Role of the facilitator

A leader of processes, a provider of tools and techniques that can get the work accomplished quickly and effectively in a group environment. A facilitator assists participants to bring out the full potential of every individual and the entire group. *(A definition of a facilitator developed by participants from the TC for Facilitators organised by the Council of Europe).*

In the [Compass](#) manual, the word “facilitators” is used for the “people who prepare, present and co-ordinate the activities”. A facilitator is someone who “makes something happen”, who “helps”, and who encourages others to learn and develop their own potential. By facilitating, you create a safe environment in which people learn through experimentation, exploration, giving and taking. It is not a question of one person, a leader, who is an “expert”, giving knowledge to others. Everyone should grow through the sharing of experience, participants and facilitators alike.

Profile of the facilitator

As a facilitator, you should have in mind the following attitudes:

- Supportive and attentive presence
- Avoiding manipulating people and behaviours through your own feedback
- Not getting attached to certain outcomes
- Not taking sides on issues or people
- Avoiding judging comments of the group and liking some ideas better than others

A facilitator...

is a super-hero... NOT! This profile has a set of competencies, attitudes and methods. Therefore, one should pay attention to the following elements:

- create a safe space for the constructive engagement of all in the group - the ability to speak in public, even in small groups, depends from person to person. Especially while working with Youth, the experience of exchanging ideas can be uncomfortable or violent. The facilitator should be aware and empathic regarding

the possible difficulties in communicating that some participants might have while sharing ideas and values;

- understands the difference between dialogue and a debate - facilitation aims the multilateral construction of ideas and values between the participants. For this to happen, the participants should be available to listen and have different viewpoints - the facilitator should be able to create the availability and the willingness to learn with the other even if the distance of perspective is wide;
- stimulates in a non-directive manner the inputs of the participants - it's important that the participants feel comfortable and empowered to contribute to the discussion. This does not mean that the facilitator does not lead the process: the facilitator "navigates" the group in the process;
- observe empathically the group - the facilitator should pay attention to what happens during the activity. Besides the verbal communication, there are elements of the body language and the dialogue flow that happen in the activity;
- mirrors the inputs of a group and summarizes them - a facilitator should be neutral and multipartial, bringing the focus on the discussion and the learning that is happening within the group.
- motivates for future dialogues and reflections and... changes!

Final note: a facilitator is a learner - every time there is a facilitation activity, the facilitator reflects on the inputs given by the participants, the way in which the process was implemented and the outputs of the activity.

Tips & tricks for facilitating

Some common practices for facilitation:

- **Stay neutral**

Give the floor to the participant and avoid giving your own opinions on the topic. Avoid words like "good", "bad", "correct", "problem" as they may imply bias. Avoid jokes and comments that may distract or potentially offend the participants.

- **Listen actively**

Try to make eye contact with everyone in the group while you speak so that they all feel acknowledged. Use eye contact to encourage participants to talk or to signal them that they can take the floor.

- **Rephrase to clarify**

This involves repeating what the participants have said so that they can feel heard and also to make sure the others understood their key points and to clarify if needed. E.g. “Can you say more about that?” or “What do you mean by...?”. It also helps to rephrase using examples to make sure no one misunderstood what someone said or the statements presented. It is also important to use questions like “Is it clear?”, “Do you have any doubts?”

- **Summarise ideas**

During the discussion, try to get the participants to build on each other’s inputs. You can say “(name of the person), what do you have to say about what (name of the person) said?”. Summarising also helps reviving the discussion if it gets “stuck” or wrapping it up and moving on to the next topic.

- **Stay on track (and on time)**

If the discussion goes off topic, try asking a question that will direct it back to the topic. It is also important to keep track of time so that you would not end up spending too much time on one topic and have very little time for the others.

- **Engage participants**

Try to set a mood in which all participants feel comfortable speaking out but at the same time not obliged. You can say something like “Shall we start this round with someone who hasn’t spoken yet?” and try to encourage them with eye contact but making sure that they do not feel forced to speak. It is important at the same time not to make those who do want to speak (and have spoken already) feel uncomfortable and like their contribution is not important.

- **Intentional silence**

Slow down, allowing more space between thoughts, especially when much emotion is present. Be intentional about pauses or even saying, “Let’s take a moment to think about this...”

Questions the facilitator could ask to kick off (or deepen) the discussion...

- How is this issue affecting your (young people’s) lives?
- What can you do about this? How can you engage in civic action to change the situation or the status quo? (connect to the European elections)

- Do you know where the parties running for European elections stand on this issue?

Questions the facilitator could ask to “ease the discussion”...

- Let's try to actively listen to what the others are saying without interrupting...
- Let's take a step back and think why do you think it is so difficult to find agreement on this statement?
- Do you think there are “right” and “wrong” answers to this statement or is it just a matter of personal opinion?
- Why do you think people hold different opinions?
- Should all opinions be tolerated in a democracy?

User manual

All info should be covered in the user manual, but when things aren't clear try to look for answers under the "Troubleshooting" header.

The components

Television screen (with power cable & HDMI input) ☐
> 40" diameter

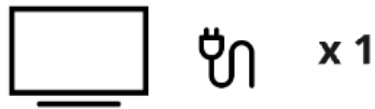


Table (for putting TV & antennas) ☐
± 1,2m x 80cm



Power plug ☐
with 3 inputs or more



Power extension cord ☐
10 meters or more



Mouse & Keyboard ☐
with USB or Bluetooth



USB-stick ☐
with 1 MB of free space



Roll of gaffer tape or duct tape ☐
to attach cables



Camera tripods with 1/4" screw ☐
optional to mount antennas



Party tent/weather protection ☐
optional in case of outdoor usage



RFID Reader and power brick ☐



x 1

RFID Antennas ☐



x 3

Antenna cables ☐



x 3

Raspberry Pi 5 - mini pc and
USB-C power brick, mini HDMI cable ☐



x 1

Controller and cable ☐



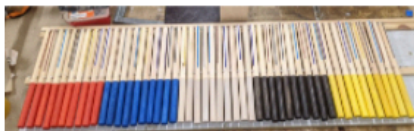
x 1

Ethernet Cable ☐



x 1

Sticks with RFID tags ☐



x 25

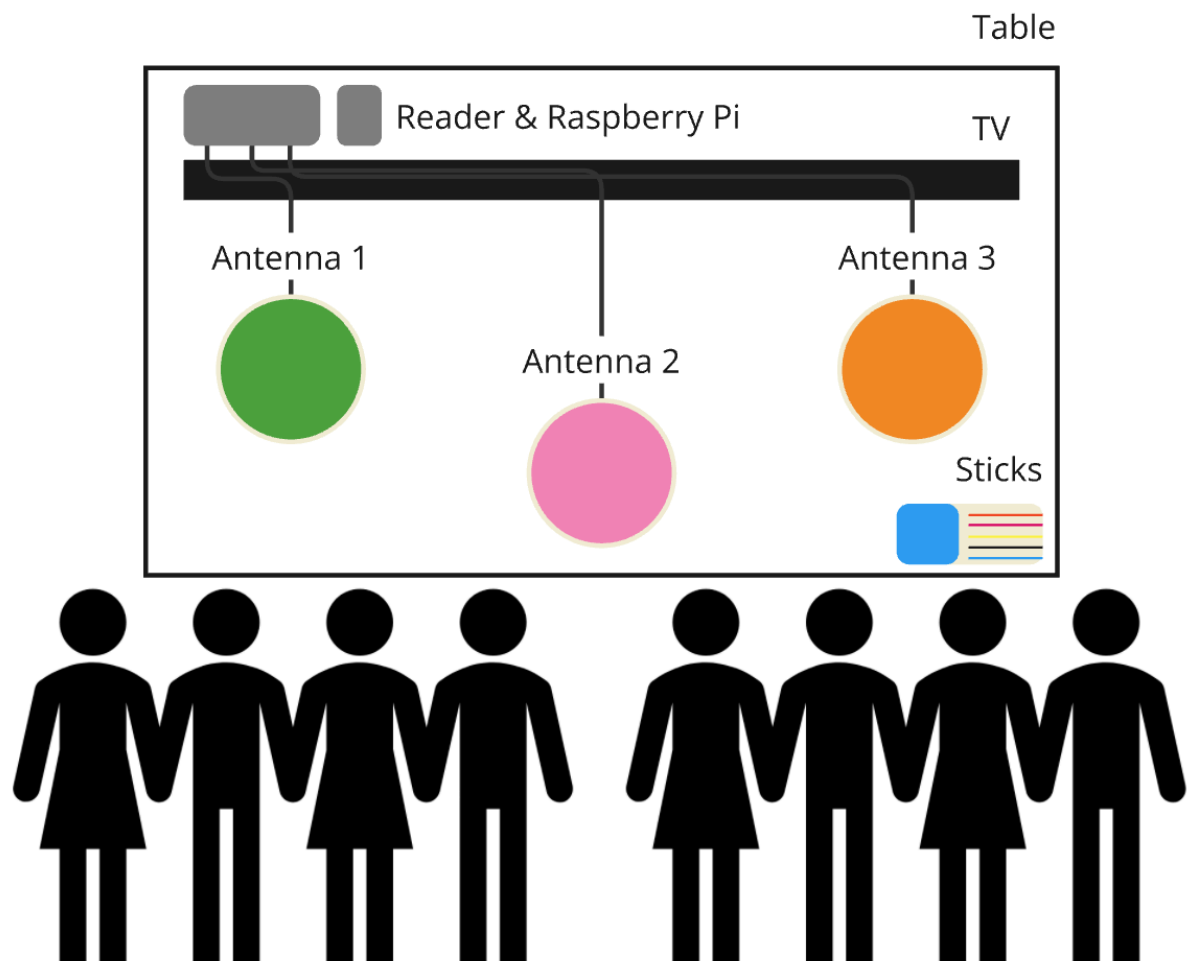
Antenna Covers ☐



x 3

Setting up the installation

A birds'-eye view of a setup:



You will need to provide a space from 3 to 6 square meters for the installation. You have to imagine 6 to 8 potential strangers have to be able to stand close enough to each other while respecting some personal space and while not being too close to another group or another antenna.

Abbreviated version of user manual

For a more extensive installation manual, please refer to the text below this frame.

Connect devices to electricity

- Plug TV into power socket
- Plug Raspberry Pi into power socket
- Plug reader into power socket

Turn connection 90 degrees on the reader side to secure properly

Connect devices with each other

- Ethernet cable with Raspberry Pi and reader
- HDMI with Raspberry Pi and TV
- Mouse and keyboard with Raspberry Pi
- Controller with Raspberry Pi

Connect the antennas

- Connect the cables with the reader (ports 1, 2 and 3)
- Put loose end of cables through antenna boxes and tighten
 - Port 1 green (position antenna to participants' left)
 - Port 2 pink (position antenna in the middle)
 - Port 3 orange (position antenna to participants' right)

Start up

- Switch on TV, if necessary switch to the correct HDMI input (check where Raspberry Pi is connected)
- Switch on Raspberry Pi if this did not happen automatically (normally this happens automatically)
- You will now see the log-in/boot screen on the TV → enter credentials if necessary (this is rarely necessary, normally this happens automatically)
Username: erasmus Password: erasmus2024
- Open Circles app
- If necessary, turn off fullscreen via ALT + F
- Select start on your project, verify hostname and start flow
Hostname: start with an f (see sticker on the reader - check if this is the correct one)
- If testing outside, best to uncheck dark mode
- If necessary, adjust screen resolution (if the circles do not move smoothly on the screen)
 - Switch off fullscreen
 - Open menu - Preferences - at the bottom: Screen configuration
 - Choose HDMI
 - We advise 2560 x 1440 for large screens or 1920 x 1080 for smaller screens → apply
 - Close

Shutting down

- Quit full screen mode (ALT + F)
- Start → Shutdown
- ONLY THEN disconnect power

Extensive installation manual:

☐ Connecting and placing the components

☐ TV

- ☐ Connect it to power
- ☐ Plug in the HDMI cable and connect it to the Raspberry Pi (mini computer).

Note: The Raspberry Pi uses a Micro-HDMI connection, so make sure to use a direct connection from the display to the Raspberry Pi with a compatible cable.

☐ Raspberry Pi

- ☐ Connect it to power with the USB-C power adapter
- ☐ Check the connection of the HDMI cable to the TV
- ☐ Connect the Ethernet cable to the Ethernet port of the Raspberry Pi and connect it to the Ethernet port of the Zebra FX9600 RFID Reader
- ☐ Connect a mouse and keyboard to the USB ports
- ☐ Connect the controller to the USB port with the USB-C to USB-A cable

☐ Zebra FX9600 RFID Reader

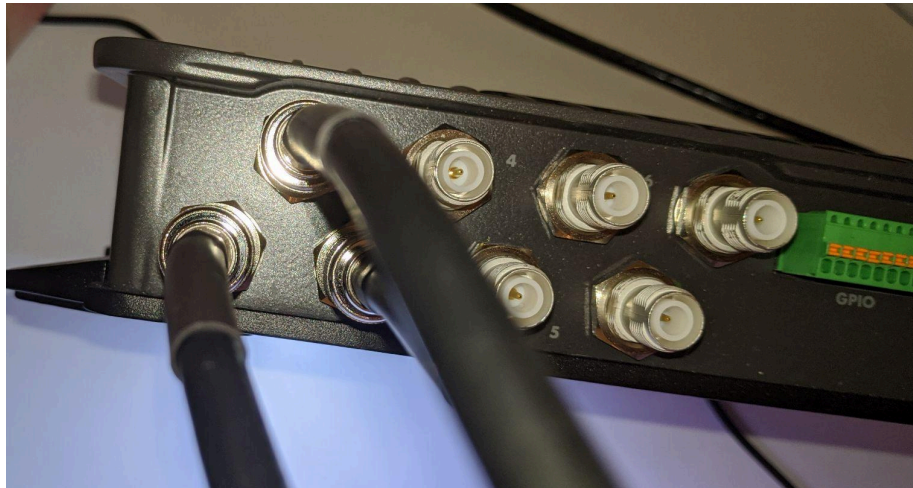


- ☐ Connect the power brick with the round plug. Rotate it so the barrel aligns with the insert on the reader and twist it 90 degrees to secure the power cable. The LED lights should start showing different colors.
- ☐ Check the Ethernet connection to the Raspberry Pi (the cable with the orange and green light on the picture)



- ☐ Connect the antenna cables to the left ports 1, 2 and 3 of the Zebra FX9600 RFID Reader. First push the socket straight to the antenna

connection and then twist them onto the thread.



☐ RFID Antennas

- ☐ Put the loose side of the antenna cables through the hole of the antenna covers



- ☐ Connect the 3 antenna cables with the 3 antennas. Make sure that you put them in the right order (facing the screen):
 - ☐ port 1 is connected to the **left** antenna with the **green** lid
 - ☐ port 2 to the **middle** one with the **pink** lid
 - ☐ port 3 to the antenna on the **right** with the **orange** lid

To connect the cables: first firmly push the socket straight to the antenna connection and then twist them onto the thread.

- ☐ Choose the right colored lid and put it on the antenna. It might happen that the lid doesn't go on immediately, in this case rotate the lid so it fits snugly on the antenna box.



- ☐ You can now put the antennas on a table or mount them on a tripod with a ¼" (standard size) mounting screw. If the cables are on the ground, secure them with gaffer tape if possible

☐ **Make sure everything is turned on**

☐ TV

- ☐ The TV should have a little LED light indicating it's receiving power. Turn it on with the button on the TV or the remote. If necessary switch to the correct HDMI input where you connect the Raspberry Pi.

☐ Raspberry Pi

- ☐ The Raspberry Pi should boot up once it receives power. If not you can press the little power button. The log-in or boot screen should now be displayed on the TV.

☐ Zebra FX9600 RFID Reader

- ☐ The Zebra FX9600 RFID Reader should show a few different LED lights. Once it's booted up it should show 1 green LED light meaning the reader is started.



☐ Controller

- ☐ Turn on the controller by connecting it to the Raspberry Pi through USB.

☐ **Start the application**

- ☐ Once the Raspberry Pi is booted it will show the desktop OR a log-in screen.

- ☐ If you're using a display with a high resolution (4K or something similar), change the resolution through the steps described at "Set-up tips and tricks/points of attention".
- ☐ Once you've logged in and waited for the computer to load the desktop
 - ☐ Download the Arm64-Linux release from Github: <https://github.com/points-of-view/circles/tags>
 - ☐ Set the Ethernet ipv4 settings from DHCP to Local-Link
 - ☐ In file manager 'Preferences' > 'General' > Uncheck 'Don't ask options on launch executable file'
 - ☐ Install the package through an ApplImage Launcher (example)
 - ☐ Open the application

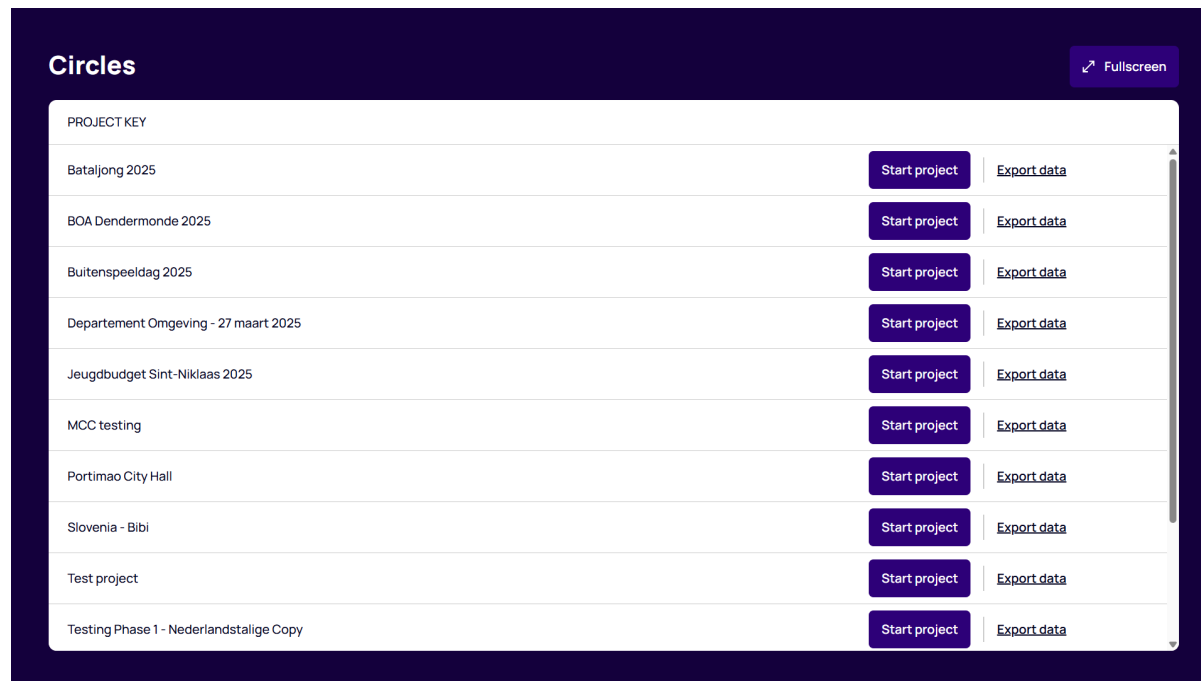
The application will start in fullscreen, if you want to turn fullscreen off make sure you have the window focused (by clicking anywhere on the screen) and pressing the keyboard combination ALT + F (by holding the ALT key usually located left of the spacebar and pressing F once).

You can also toggle this by clicking on the button on the screen.



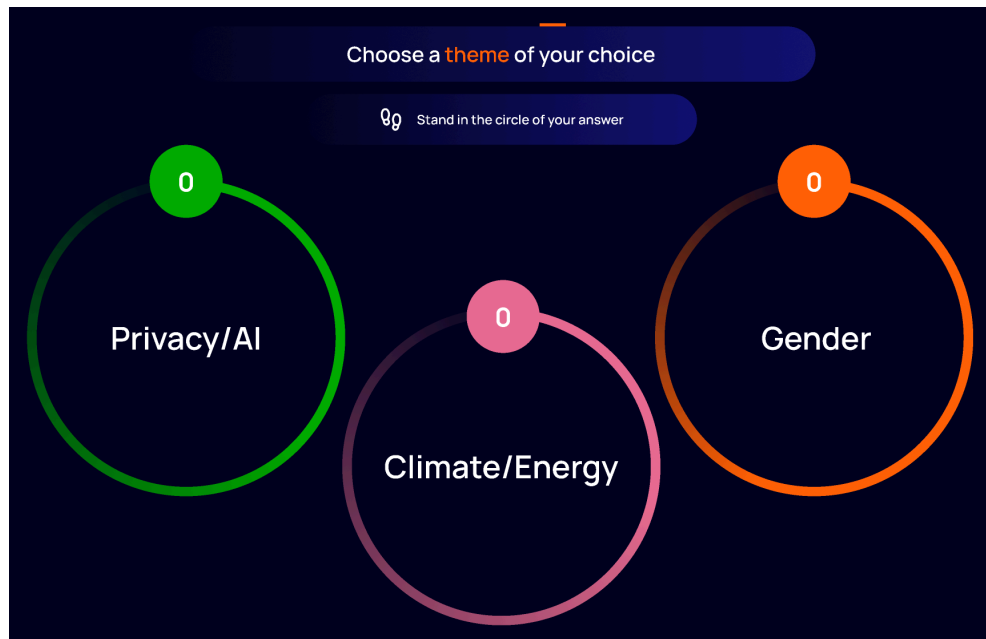
- ☐ **Start your session and do a first check**

- ☐ You should see a start screen where you can select a project by pressing Start project:



- ☐ Check and correct the hostname. This value should be equal to the text that is written on a sticker on the side of the Zebra FX9600 RFID Reader. Copy over the letters and numbers of the sticker in lower-case letters.
Example hostname: fx9600739c72
- ☐ Choose whether you want to start the application in dark mode (default) or in light mode (recommended in brightly lit environments) by checking or unchecking the checkbox.
- ☐ Press "START" to start the application.

- ☐ After a few seconds you should see a screen like this:



- ☐ To test the installation you can tap your stick on one of the antennas with to check if the colors match with the antenna you've tapped.
If you see the numbers of recognized tags change on all the three circles on the screen, the installation is ready to go.
- ☐ You can control the installation by pressing the top right > button on the controller to go forward and the top left < button to go back 1 step.

Final notes:

- The installation works completely offline. There is no need for an internet/WiFi connection. Only to update the software you should connect to an internet/WiFi connection.
- There is no need to bring a laptop. The mouse and keyboard are plugged into the Raspberry Pi mini computer.

Set-up tips and tricks/points of attention

- **Make sure the antennas are distant enough from each other.**

30 centimeters should be respected in order to avoid overlap.

- **Make sure to secure the objects in space (antennas, cables and covers) with tape.**

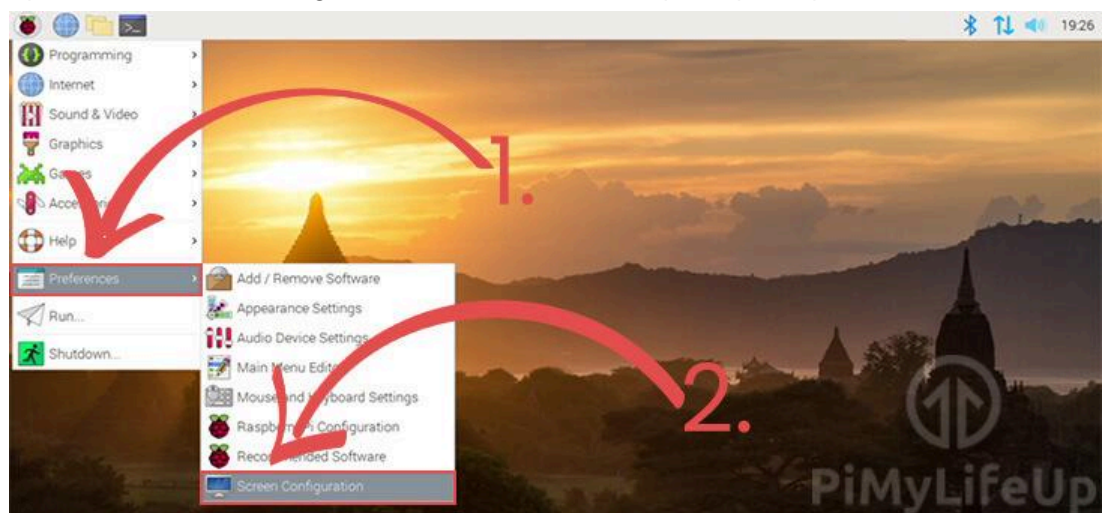
This will ensure the safety of the participants.

- **Ideally, avoid direct sunlight on the tv screen.**

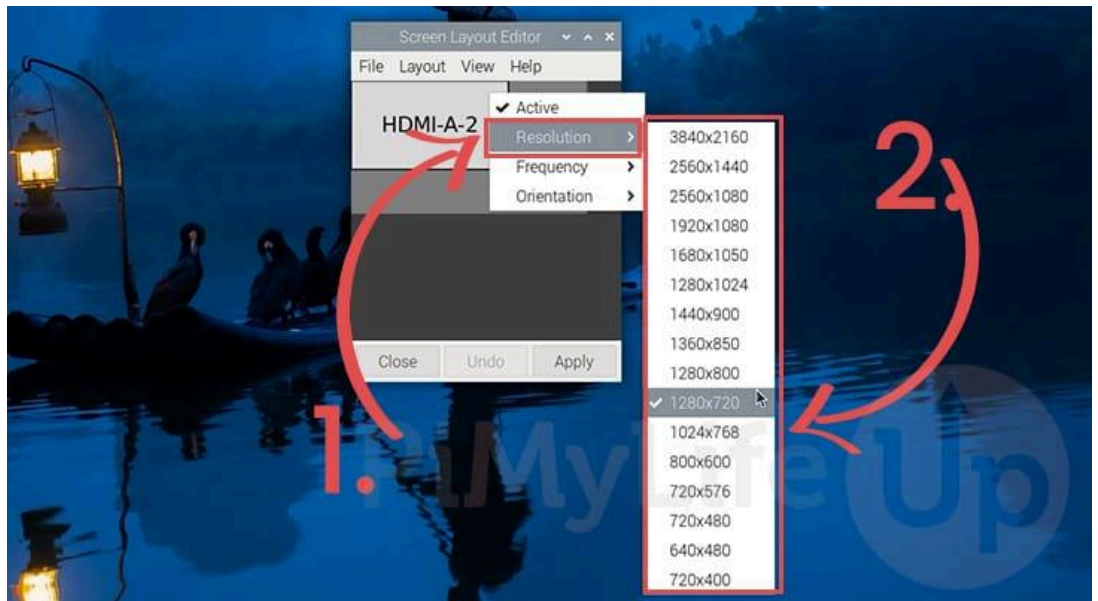
This will ensure good visibility of the screen. If any issues occur, you can try switching to light mode instead of dark mode.

- **The resolution of your screen might affect the size and/or the performance of the application. You can change the resolution to make text bigger or smaller and to change the smoothness of animations.**

- Exit Fullscreen mode in Circles by pressing ALT + F to access the menu bar.
- Open the Screen Configuration menu from the top Raspberry Pi menu.



- Right click on the HDMI-screen and select a resolution. We advise 2560 x 1440 for large screens or 1920 x 1080 for smaller screens.

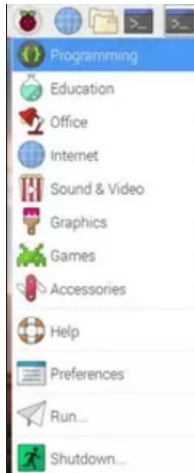


- Click 'Apply' and check if the settings are good. If not you can revert the settings and try another resolution.

Shutting down the installation

To shut down the installation:

- 1) **Close the application** by pressing the Start icon (or the Meta key on your keyboard left to the spacebar) and clicking on Shutdown



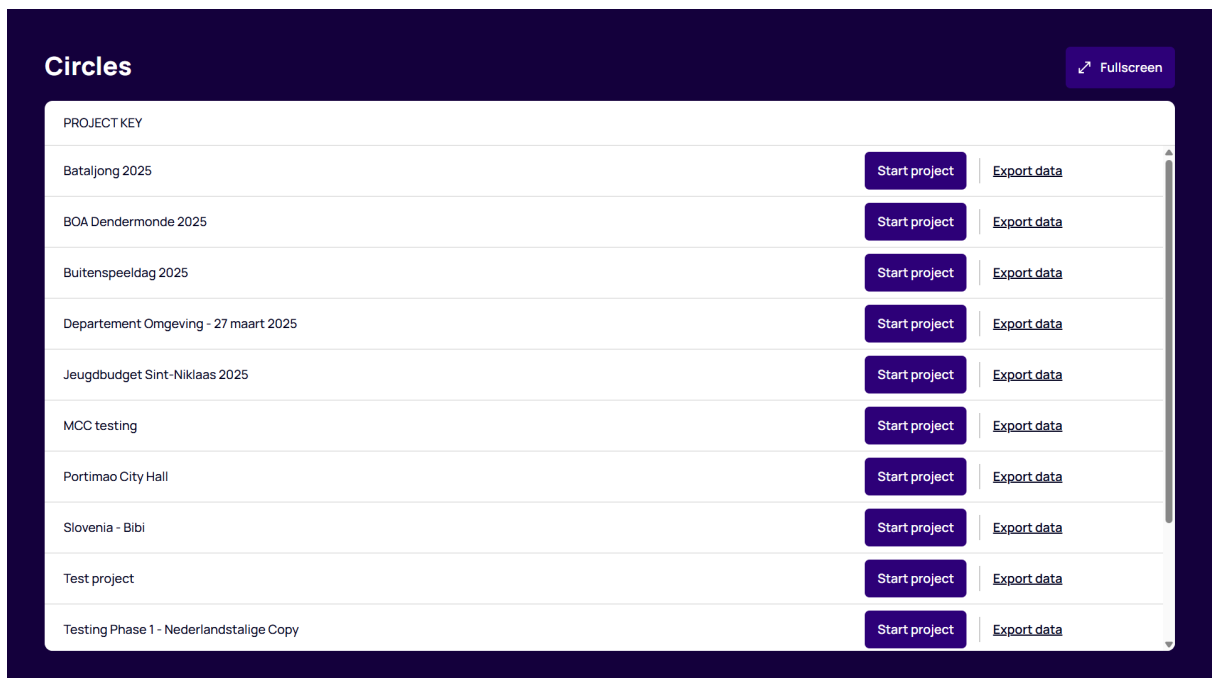
- 2) Once the device has shut down you can **disconnect the power**.

When you shut down the installation, the data is saved on the SD card in the Raspberry Pi.

Downloading the data

You can download the data of a project in .xlsx format (Excel or Google Sheets compatible) by:

- 1) Starting the application and clicking “Export data”



- 2) The easiest way to get the data is by connecting a USB-stick to the Raspberry Pi through one of the USB ports and saving the export there. Alternatively you can save the export anywhere and upload it to an online cloud storage.
- 3) Press the "EXPORT" button and choosing where you want to save the file. Make sure to end the name by **".xlsx"**.

Updating the installation

If you want to use the installation for a new project you have to update the installation. For this you need a Wi-Fi or ethernet connection and a few parts of the installation. These parts are:

- A USB mouse
- A USB keyboard
- A screen
- The Raspberry Pi
- The Raspberry Pi USB-C Power Adapter
- The Micro-HDMI cable

The steps:

1. Plug in the Raspberry Pi to a power outlet. The machine will show a green light and boot-up automatically.
2. Connect the following cables/peripherals:
 1. Your usb mouse
 2. Your usb keyboard
 3. The Micro-HDMI cable to a HDMI input on your screen
3. When the desktop shows the device is booted up.
Connect to a Wi-fi network by clicking on the wi-fi icon on the top right corner. Fill in the password of the network if needed.
4. If Wi-fi is connected you can start the Circles app by double-clicking on the icon "Circles" on the desktop.
5. There should be a pop-up that asks if you want to update the application. Press "Yes".
6. Wait till the application restarts. This can take up to 5 minutes.
7. You can now power off the Raspberry Pi by pressing the small green button on the device or by simply disconnecting the power.

Packing the installation for transport

Put the installation components back in the boxes as you received them. Make sure that everything is secured in place so it can't move around too much during transport. Use reusable cable management straps to secure the cables.

Troubleshooting

Controller

- The controller isn't working
 - Make sure the controller is connected with the USB-C cable. It should display a 1 and a battery icon. If it doesn't, try to disconnect it and reconnect it. You can also press the reset button on the top right of the device next to the USB-C port.
- The controller reacts very slow
 - Check the resolution of the screen (see above). In the right resolution, the controller should react more quickly.

Application

- The application isn't recognising any tags
 - Make sure the antennas are well connected and the Zebra FX9600 RFID Reader's LEDs are green.
 - Make sure participants are not too close to the reader. It's best to keep a distance from the reader of about 1 meter.
 - Make sure participants are not too far away from the reader. The reader can detect RFID tags to a distance of maximum 20 centimeters.
 - Make sure participants keep their sticks close enough to the antennas and make sure that they keep them there until you have switched to the next question using the controller.
- It's difficult to read the screen because of the light
 - When using the installation outside, it's best to start it up in light mode. Restart the application (if necessary, quit full screen mode using ALT + F) and uncheck 'Dark mode'
- The screen freezes

- Restart the application by closing the window and opening the app again.
Restart the reader by turning the power off and on (by unplugging and plugging in the cable).

FAQ

- **How does the installation work?**

The installation uses RFID technology to recognise RFID tags in the proximity of the RFID antennas. It's the same technology used in stores for anti-theft.

- **Does the installation require WiFi or an internet connection?**

No. The installation works completely offline.

- **Should I take a separate mouse and keyboard, or can I use my laptop?**

You will need a separate mouse and keyboard.

- **Do I need to bring a laptop?**

No. The Raspberry Pi is in fact a mini computer.

- **Is the data lost in case of an unexpected power shutdown?**

No. Even if power shuts down unexpectedly at any point, everything is saved automatically. On rare occasions the file could become corrupted but this is very unlikely.

Annex