



CAD PROJEKT K&A

operation manual

obserVeR

An app to make a virtual walk
in the designed interior in the real time technique



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1. Introduction

Thanks to the obserVeR application, users of our CAD Decor and CAD Kitchens programs with an additional Render PRO module and CAD Decor PRO program have the possibility to export visualizations of projects made in these programs to virtual reality and present them on computer screens or in special HTC VIVE or HTC VIVE Cosmos goggles enabling the view in the full 360° range. A person using goggles can easily walk around the project and look around. The spectator in the virtual reality presented on the computer screen has two ways to move. Detailed information can be found in point 5.



Illustration 1 Goggles HTC VIVE

The **obserVeR** application can be made available to project recipients to allow them to evaluate the results of their work. Along with the installer, sent in a link or downloaded from our website, you should provide self-created CPV files, that is, visualizations rendered using the **Radiosity** algorithm, and then exported to VR in the visualization of CAD Decor and CAD Kitchens with the Render PRO module or CAD Decor PRO. The procedure for creating CPV files is outlined in next section, and the sharing of applications and projects in section 2 and 4.

2. Project preparation and export to VR

To create CPV files to be presented in VR, when you consider a project to be completed, it must be rendered using the **Radiosity** method. To do this, go to the visualization and open the "**Render**" tab (Illustration 2). The calculation process starts by selecting the "**START**" button. Before that, it is worth making sure that the option "**Scene diagnostics and repair**" (Illustration 2) has been selected, which protects against the occurrence of so-called inverted surfaces, causing incorrect lighting distribution (example of such surfaces - Illustration 5). To check if the inverted surfaces are in the project, go to the "**Scene settings**" tab in the right menu and use the "**Show inverted surfaces**" function in the "**Diagnostics**" panel (Illustration 3).

To achieve the most optimal effects, wait until the **Radiosity** calculations are completed (the "**STOP**" button will then be active (Illustration 2). It may also be useful to perform **Ray tracing** calculations, but note that reflections in mirrors and on reflective surfaces are presented in a simplified form in the **obserVeR** application, not exactly in accordance with the principles of optics (this is to keep the application's hardware requirements as low as possible).

It is also worth remembering that the distribution of light in the **obserVeR** differs from the appearance of the scene after taking **Radiosity** calculations in visualization CAD programs and sometimes you need to adjust lighting to achieve optimal effects in virtual reality.

After rendering the scene, set the camera AT the point where you want to start a virtual walk. Avoid setting the camera near objects (e.g. furniture), because in walking mode the camera responds to obstacles and stop, which could confuse the viewer at the beginning of the walk. It is also worth remembering that after starting the obserVeR the camera is automatically set at a height of about 170 cm (that is, the eye height of the average viewer in the real world), so it is best to set it in the rendered stage on this level to ensure that there is no obstacle in the place and the view of the room is attractive. Camera settings in the right menu of CAD Decor PRO, CAD Kitchens and CAD Decor visualization (objective angle, rotation, speed) do not affect the camera behaviour in VR projects.

After the project has been rendered and the camera set correctly, you can export the project to VR. To do this, go to the "**Presentation**" tab in the left menu and select the "**Export project**" button in the "**obserVeR**" panel (Illustration. 4). Next, enter the name and location of the record for the exported CPV file (Illustration. 6).

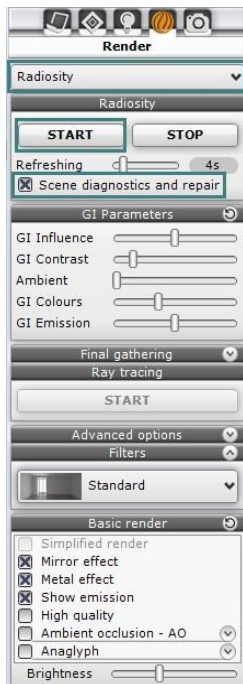


Illustration 2 Radiosity rendering options

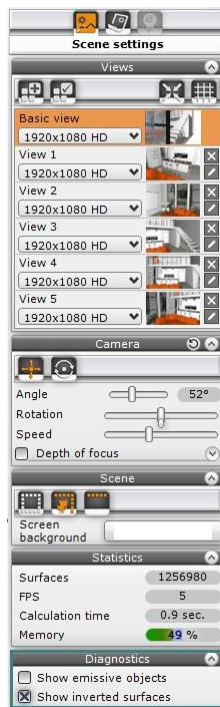


Illustration 3 Scene diagnostics

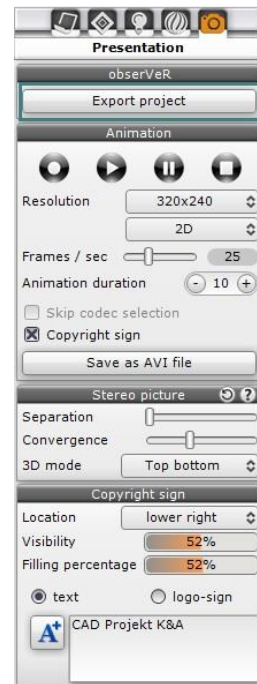


Illustration 4 Option to export to VR

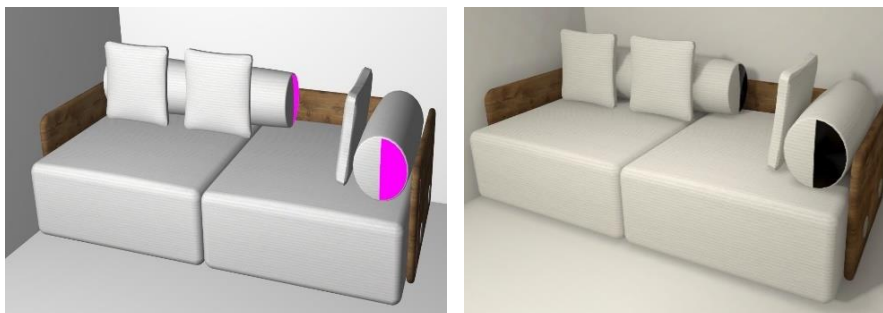


Illustration 5 An example of an object with inverted surfaces - visible incorrect lighting distribution

Note! If you use the HTC VIVE / HTC VIVE Cosmos goggles, please ensure that the glasses are properly placed on the head. Fit the fastening straps so that the goggles rest firmly and comfortably. Otherwise, the image may be blurred.

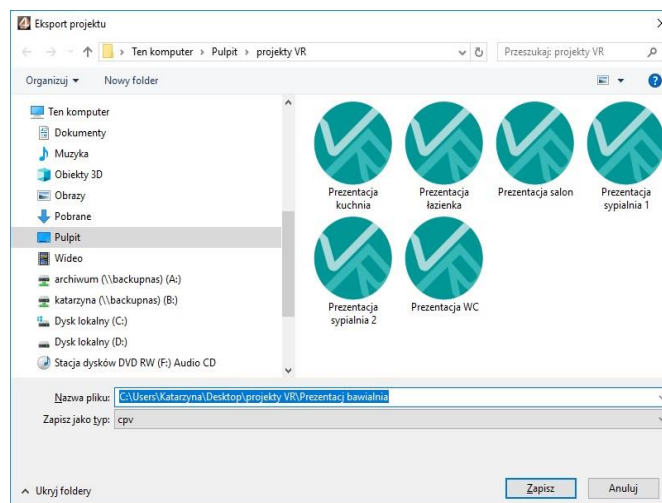



Illustration 6 Entering the project name and indicating the location for saving the CPV file

3. Starting work with the obserVeR

ObserVeR application can be run in several ways:

- double clicking on the icon on the desktop  ;
- starting application from the **Start** menu;
- by running the file obserVeR.exe in the main program location (CAD Decor PRO, CAD Decor or CAD Kitchens) (Illustration 7);
- double clicking on the CPV file.

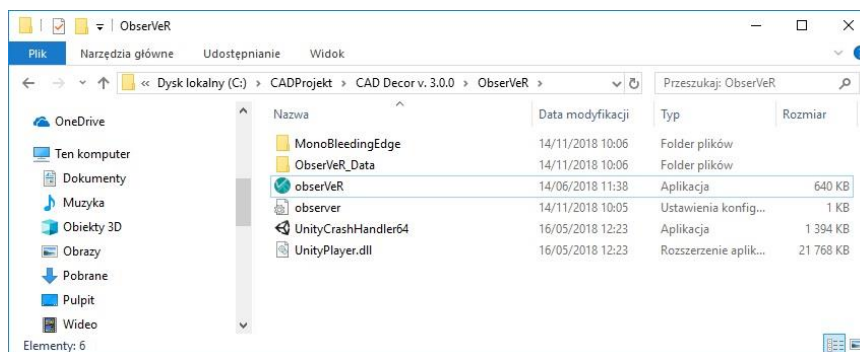


Illustration 7 Entering the project name and indicating the location for saving the CPV file

After starting **obserVeR**, the main program window will be displayed (Illustration 8 presents a view without connected HTC VIVE / HTC VIVE Cosmos goggles - if they are connected, the "walk" and "free camera" options disappear from the upper application menu, because only the walking mode is available in goggle mode).



To start the walk, select the **"Load file"** option from the top menu. The **"Open file"** window will open, in which you should indicate the project by left-clicking the mouse and confirm the selection with the **"Open"** button (Illustration 9).

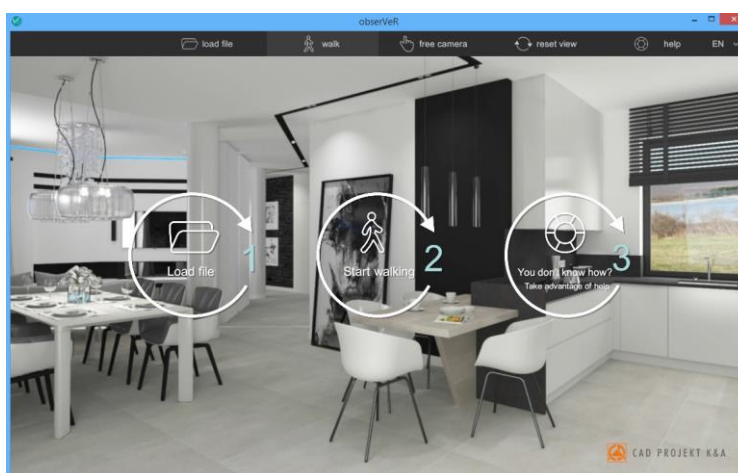


Illustration 8 Main window of the obserVeR program in the view without connected HTC VIVE goggles

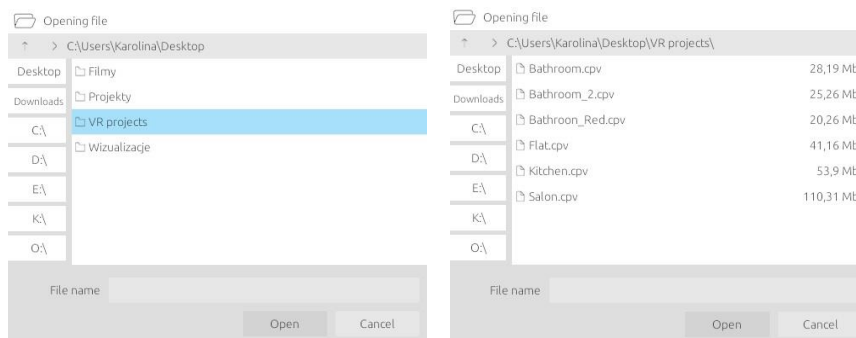


Illustration 9 Loading file into obserVeR application

4. Preparing the HTC VIVE set

4.1. Description of the elements of set

The HTC Vive set includes:

- goggles, which the viewer puts on his head (they should be adjusted using the fastening straps, and if necessary you can also use the knob adjusting the distance between pupils and knobs adjusting the distance of the lenses from the eyes);
- controllers that the viewer holds in his hands (one is enough to walk around the project) (Illustration 10);
- docking station (Link Box), which is connected by HDMI and USB cables with a computer and to which the goggles cables are then plugged in (the station must be connected to the power supply);
- two base stations (locators), i.e. viewer position recorders that analyse the location of goggles and controllers.



Illustration 10 Virtual walk in HTC VIVE goggles

4.2. Installation of the VIVE software

To use the HTC VIVE or HTC VIVE Cosmos goggles you must download the necessary software from the manufacturer's website <https://www.VIVE.com/us/setup/VIVE/> and create an HTC | VIVE account (this is one of the installation steps). The VIVE installer also checks if your computer is adapted for VR - if not, you will be informed. (Illustration 11).

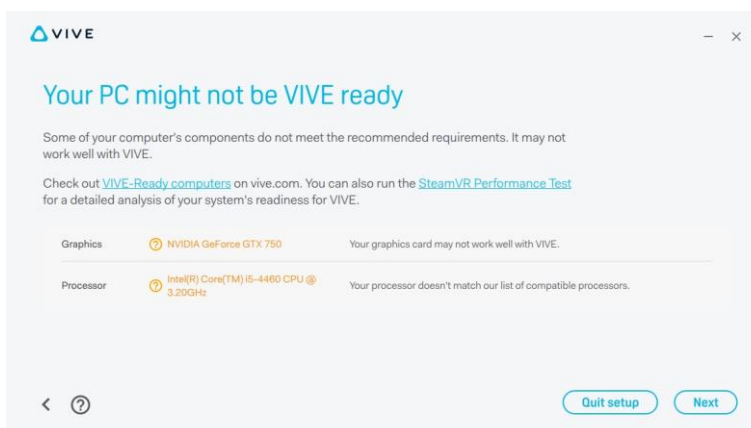


Illustration 11 The message that the computer is not ready for use VR, displayed by the VIVE installer

4.3. Hardware requirements for VR

To ensure that your computer is ready to present your projects in virtual reality, please check the hardware requirements on the HTC VIVE / HTC VIVE Cosmos goggles manufacturer's website (<https://www.vive.com/us/vive-ready/>) and our Render PRO module requirements (<https://www.en.cadprojekt.com.pl/system-and-hardware-requirements/>).

4.4. Preparation and calibration of space

To be able to comfortably use the HTC VIVE / HTC VIVE Cosmos goggles, you need to provide enough space and prepare it: remove all obstacles and make sure that there are electrical sockets available nearby to connect the docking station and base stations. Base stations should be placed opposite each other (e.g. in opposite corners of the room), at a distance of not more than 5 meters and at a height of about 2 meters (above the viewer's head, e.g. on shelves or racks). The area of goggles use should be visible from both locators and they must be mutually detectable.

Before you start a virtual walk, you need to calibrate the space. Depending on how large the area you have, you can use the room mode (e.g. 3 x 4 meters) or point (e.g. 1 x 1,5 meters). In the first case, you will be able to walk around the defined area - until you see a blue grid, indicating its border (e.g. wall), and in the second - move a few steps within a radius around the indicated point (the border will be marked by a blue circle on the floor) . Detailed instructions on the calibration procedure will be displayed on your computer screen after you connect HTC VIVE.

4.5. Preparing the HTC VIVE Cosmos

The HTC VIVE Cosmos goggles do not include a base station in the set. The complete setup can be found on the manufacturer's website: <https://www.vive.com/eu/product/vive-cosmos/specs/>. Please follow the manufacturer's instructions when installing the HTC VIVE Cosmos set.

5. Moving in the project in virtual reality

Moving in the obserVeR application varies depending on whether you are using HTC VIVE / HTC VIVE Cosmos goggles or watching VR projects on your computer screen. In the first case, you are taken to an alternative world in which all proportions are presented in a scale of 1: 1, so the arrangement of space in 100% corresponds to that of the real world. In this space you can move around freely, experiencing the ergonomics and appearance of the designed interior. You can look at every corner, assess the aesthetics and convenience of the solutions used.

In the second case, by watching VR projects on the computer screen, you have two modes to choose from: "walk" and "free camera", and the mouse and keyboard are used to move.

All ways of moving are described in points 5.1. and 5.2.

5.1. Moving in the HTC VIVE goggles

Using goggles, you have only one way to move, called a "free" virtual walk around the whole project (also when it consists of several rooms). The camera is located exactly at the eye level of the viewer and mimics the real movements of the person in the real world (walking, all changes in body position, shaking his head, etc.). Moving can also be done using a controller that the viewer holds in the hand - it allows you to teleport to other places in the room. Using the controller consists of aiming at the appropriate points in the project (green circles appear when they are visible) and using the buttons on the controller (after aiming at the teleport, the corresponding button is highlighted in the controller preview). You should not teleport yourself into an unknown space (e.g. behind a wall), because it threatens to move outside of the project (if this happens, you can use the function "**reset view**" to get back to the starting point).

During a virtual walk in the goggles it is not possible to walk up the stairs in the project - to get to another floor or mezzanine, you need to use the teleport function, previously aiming at the place where you want to find. However, it is possible to penetrate through closed doors, walls and other obstacles, but the most favourable situation is when there is a wide door between the rooms and you can check what is behind them before going through them - there is no risk of hitting the object (e.g. wardrobes or walls), or going beyond the project, which may be associated with confusion in the viewer.

5.2. Moving on the computer screen (without connected goggles)

In the version without the HTC VIVE / HTC VIVE Cosmos goggles, there are two modes of movement: "**walk**" and "**free camera**", and moves using the mouse buttons and the arrow keys on the keyboard.

5.2.1. Moving in "walk" mode

The "**walk**" mode is the default, it is set automatically after starting the application. A walk around the project on a computer screen starts at 170 cm above the floor, in the place where the camera was set when the CPV file was exported (this is the average eye height of the viewer in the real world). Movement is on the same level in the front, back and sides (using the arrows on the keyboard $\leftarrow \uparrow \downarrow \rightarrow$), always at the same speed. It is not possible to move the camera up or down. There is collision control in walking mode and it is therefore not possible to walk through furniture, walls, closed doors or any other objects (as in real life). However, if the project has an open door, the user can go to the next room (but the door must be wide open).

In walking mode, you can go up and go down the stairs - to do this, set the camera at the beginning of the stairs or the top of the stairs and use the \uparrow arrow on the keyboard to move forward.

You can use the left mouse button to look around in all directions (in the 360 ° range, also up and to the side). You can use the keyboard arrows (e.g. to move forward) and the left mouse button (turning the camera in any direction, as if the walking figure were looking around).

5.2.2. Moving in the "free camera" mode

When watching VR projects on your computer, you can switch from walk to "free camera" mode and back again at any time. At the moment of changing the mode, the camera can move to a different height (after returning to the walk it will return to the level of 170 cm).

Free camera mode allows penetration through walls, ceilings, floors and all other objects in the project and unrestricted movement of the camera up and down. Moving vertically can occur in two ways:

- stepwise, using the right mouse button: press the button, hold it down and move the mouse forward (the camera will rise higher) or back (the camera will lower);
- smoothly, aiming the camera up or down using the left mouse button and at the same time using the arrow \uparrow or \downarrow - in this case the camera goes in the direction in which it is directed.



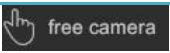





Note! In case of getting out of the room and problems back, the "reset view" function may be helpful, which restores the camera to the start position.

Button	Moving mode	Description of movement in obserVeR on computer screen
Left mouse button	walk free camera	turning in all directions (looking around);
Right mouse button	free camera	moving the camera up and down (it is necessary to hold the button and move the mouse forward or backward);
Arrows on the keyboard	walk free camera	moving from side to side (right / left arrows: ← →) and forwards and backwards (up / down arrows: ↑ ↓).

5.3. ObserVeR application menu

The functionality of the functions in the **obserVeR** application changes depending on whether VR designs are presented on the computer screen or via the HTC VIVE / HTC VIVE Cosmos goggles (the options for changing the movement mode disappears then).

The table below presents a summary of all options and information on their availability and use.

Option	Availability	Description
 load file	with goggles without goggles	- allows you to select the CPV file to be presented (information on creating CPV files can be found in point 2);
 walk	without goggles	- the camera moves on a constant height of 170 cm above the floor; - moving occurs using the mouse and keyboard (according to the rules described in the table in point 5.2.); - you can not penetrate walls and closed doors; - you can move between rooms if you have an open door and walk up the stairs.
 free camera	without goggles	- in this mode, the camera can move to any height, e.g. to another floor; - you can go through ceilings, floors, walls, furniture, closed doors and other objects.
 reset view	with goggles without goggles	- the function is helpful when the camera is outside the project or inside the object (e.g. walls) and the user will not be able to return to the sightseeing; - moves the camera to the project (to the starting point);
 help	with goggles without goggles	- displays camera control tips and an icon that opens the operation manual (Illustration 12);
 Operation manual	with goggles without goggles	- this icon appears when the program's help is displayed; - after selecting it, the user is transferred to the operation manual, which opens in the web browser (Internet access is required);
 EN	with goggles without goggles	- in the upper right corner of the screen you can expand the list of available language versions; - the application language can be changed at any time.
	with goggles without goggles	- after clicking on this icon information about the latest available version of obserVeR will be displayed (it can be downloaded or cancelled by clicking on the "skip" button); - this icon <u>will not be available</u> if obserVeR has been installed using the CAD Decor, CAD Kitchens, or CAD Decor PRO updater.

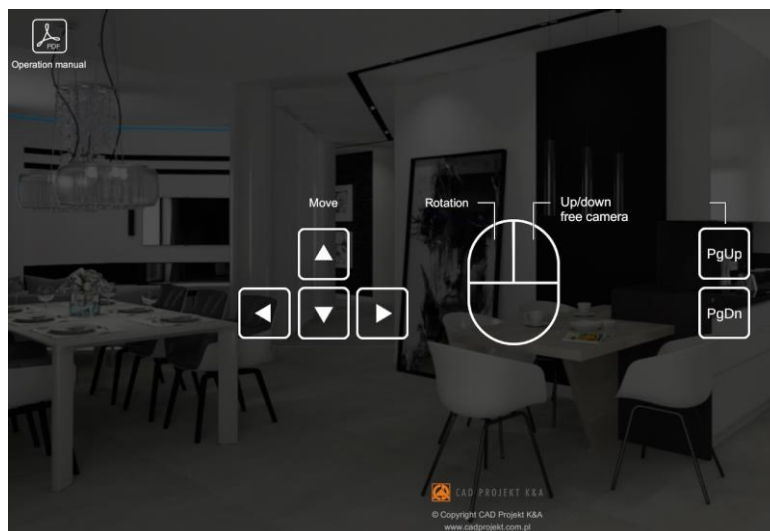


Illustration 12 obserVeR application help - the icon that opens the operation manual is visible in the upper left corner

6. Sharing applications and projects

To provide your customers the obserVeR application and your projects, please send them the following link to the installer: https://cadprojekt.com.pl/zasoby/inne/obserVeR_Installer.exe and self-created CPV files with VR projects. CPV files can be placed on any server for file exchange, e.g. on: Dropbox (<https://www.dropbox.com/>), Google Disk (<https://www.google.com/drive/>), Microsoft OneDrive (<https://onedrive.live.com/about/pl-pl/>).

The client should install the obserVeR application in the way described in point 7, and then load the received CPV files into it. He can immediately visit the room on the computer screen, and after connecting the HTC VIVE / HTC VIVE Cosmos goggles, also take a virtual walk in it.

Note! The obserVeR application and your projects are made available to clients on your own. We do not offer support in this area.

7. Installation of the obserVeR application on the computers of your clients

Your customers can install **obserVeR** using the installer's package from your link. Below we describe the installation process.

In a situation where your customers received a link with the installer, after clicking on it, they can indicate the place of saving the installer (Illustration 13).

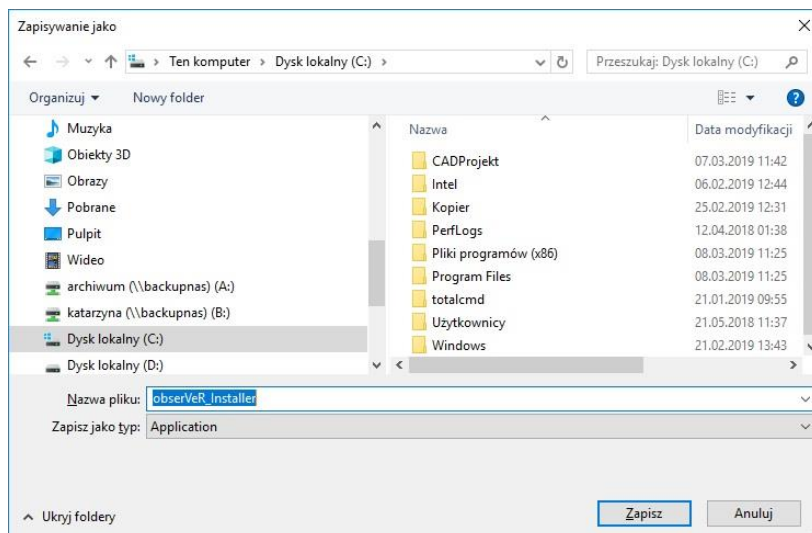


Illustration 13 Indication of the location of the installer downloaded from the link

To run the downloaded file **observed_installer.exe**, you have to double-click it with the left mouse button. The installer welcome screen appears (Illustration 14). After clicking the "Next" button, the window with the license agreement will be displayed (Illustration 15).



Illustration 14 Installer startup screen

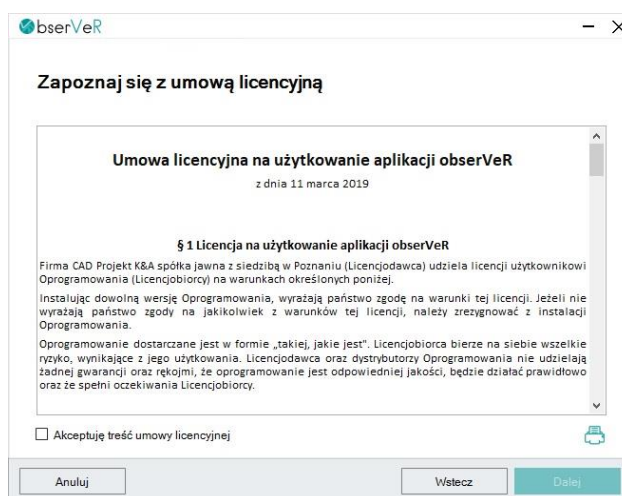


Illustration 15 Acceptance of the license agreement is required

After reading the agreement and confirming it, select the "Next" button. In the next step you can indicate the place where the **observed** application should be installed, after selecting the "Browse" button (Illustration 16). Then select the "Install" button and wait a few to several seconds when the program will load. The process will be visible on

the progress bar (Illustration 17). After the installation is finished, the final window will be displayed, which should be closed with the "**Close**" button (Illustration 18).

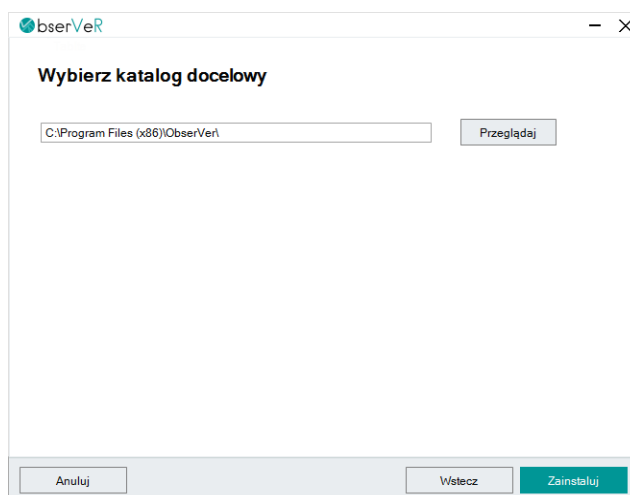


Illustration 16 Selection the application save location

Note! The installation can be stopped at any time, however, in this case the obserVeR application will not be installed.

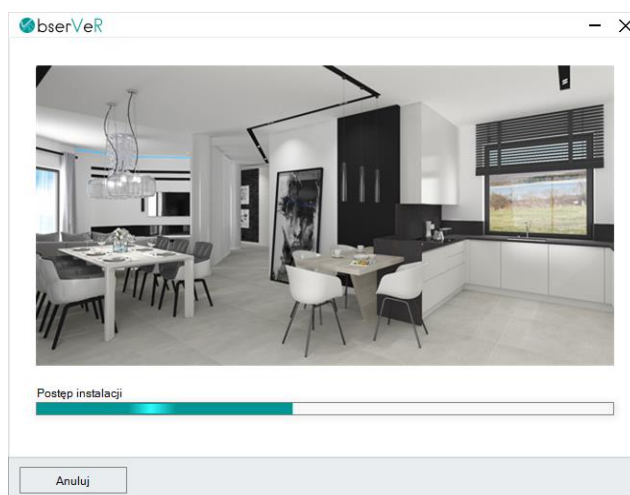


Illustration 17 The installation progress can be followed on the strip, it lasts from a few to several seconds

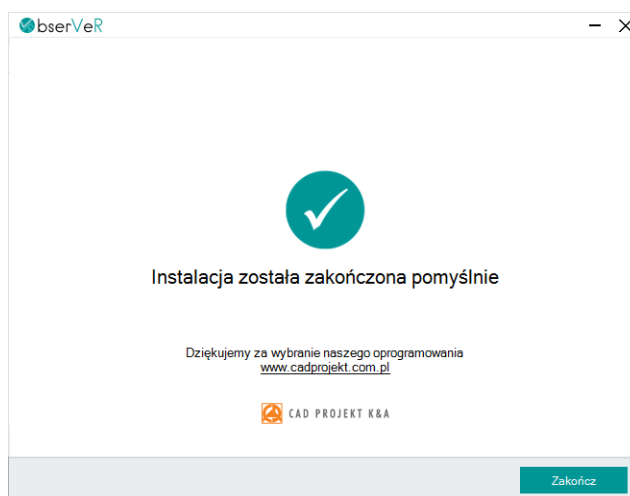


Illustration 18 Screen informing about the successful finishing of the installation

8. Changing the language version

The **obserVeR** application is available in seven language versions: Polish, English, Spanish, Czech, Hungarian, Slovak and Russian. The language can be changed at any time by selecting it from the drop-down list in the upper right corner of the application window (Illustration 19).

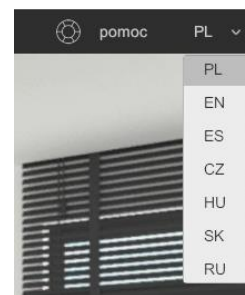


Illustration 19 Language selection

Technical support

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