seitz
made in switzerland

roundshot
fast 360 degree panoramic equipment

# Instruction Manual


**Roundshot VR Drive – generation 2**

**Software release:** *version 1.0 (May 2011)*

# CONTENTS

# 1. System Overview

## 1.1 Roundshot VR Drive Hardware Options

The VR Drive is available in a variety of **hardware options**, each designed for a specific task:

| VR Drive "full" | VR Drive "semi" | VR Drive "base" | VR Drive "turntable" |
|---|---|---|---|
| • VR Drive motor with touch screen<br>• Li-Ion batteries (inside motor)<br>• charging unit<br>• VR bracket<br>• quick adaptor<br>• y-motor with clamp and connection cable<br>• release cable for digital camera<br>• spirit level<br>• allen key to attach camera | • VR Drive motor with touch screen<br>• Li-Ion batteries (inside motor)<br>• Charging unit<br>• VR bracket<br>• quick-adaptor<br>• y-clamp for manual tilting<br>• release cable for digital camera<br>• spirit level<br>• allen key to attach camera | • VR Drive motor with touch screen<br>• Li-Ion batteries (inside motor)<br>• charging unit<br>• quick-adaptor<br>• base rail<br>• release cable for digital camera<br>• spirit level<br>• allen key to attach camera | • VR Drive motor with touch screen<br>• Li-Ion batteries (inside motor)<br>• charging unit<br>• turntable with screw attachment<br>• release cable for digital camera with 2m extension cable<br>• spirit level<br>• allen key to attach camera |

The **VR Drive "full"** is equipped with a horizontal (X) and vertical (Y) motor and rotates fully automatically in all directions (X,Y).

The **VR Drive "semi"** is equipped with a horizontal motor (X) only. For this model the vertical tilting is done manually.

Designed for those applications requiring no vertical displacement - for example when capturing a sphere with a fisheye lens – **the VR Drive "base"** comes with the horizontal motor (X) and a base rail.

Finally, the **VR Drive "turntable"** consists of the VR Drive horizontal motor (X) and a turntable for object movies.

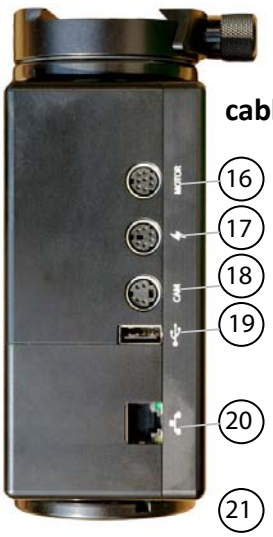
It is possible to purchase **additional accessories** to complete the VR kit, for example the turntable with 2m extension cable, additional release cables, additional rails. All hardware options are **upgradeable**. For example, it is possible to purchase the y-motor with connection cable to transform the VR Drive from "semi" to "full".

## 1.1 Roundshot VR Drive Hardware Options (continued)

### Roundshot VR Drive “full”


### VR Drive components

1. VR Drive x-motor
2. touch screen
3. on/off button
4. VR Drive y-motor
5. quick adaptor
6. quick adaptor release
7. VR bracket lock
8. VR bracket
9. nodal rail
10. nodal rail clamp
11. release cable
12. motor cable x-y
13. spirit level
14. tripod mount (3/8’’)
15. y-motor front
16. y-motor rear



### cables/plugs

16. x-motor
17. charging unit
18. release cable
19. USB
20. Ethernet
21. Socket for radio control unit (receiver)

## 1.1 Roundshot VR Drive Hardware Options (continued)

### Roundshot VR Drive “semi”



21 y-clamp for manual tilting

22 Allen key 4mm for
- attaching/removing camera to nodal rail
- attaching/removing y-motor to VR bracket
- locking/releasing VR Drive x-motor on tripod

23 Allen key 3/16’’ for removing/attaching or fine-tuning y-motor clamp

## 1.2 Roundshot VR Drive Software Options

**For cylindrical or spherical panoramas, single- or multi-row**

**„Quality“ mode**

The VR Drive **"quality mode"** is the base functionality for panoramas up to 360° (or more). The camera is stopped in every position. This mode is used for panoramas with difficult lighting conditions (indoors) and for bracketing and HDR images.

**„Speed“ mode**

In the **"speed mode"** the camera is rotated non-stop, ideal for moving scenes outdoors. As a rule of thumb, the camera shutter speed requires to be 1/500 sec. or faster (for a 6 second 360° rotation).

**For object movies**

**„Turntable“ mode**

In the **"turntable mode"** the camera captures images of a rotating object on a turntable for object movies. Never miss an image, perfect positioning!

**For video sweeps**

**„Video „mode**

The **"video mode"** is designed for smooth automated video sweeps, both position- and time-controlled, horizontally (x) and vertically (y). It enables a variety of advanced control functions such as speed (also very slow), pause, repeat, delay and ramp (acceleration).

## 1.2 Roundshot VR Drive accessories

**Additional nodal rail** (for longer lenses)

**Additional brackets / rails**


**Clamp for manual tilting**

**Additional spirit level**

**Radio release unit**


**Additional universal charger (110-220V)**

## 1.2 Roundshot VR Drive accessories (continued)

**Additional camera release cables**
(please check our website for list of compatible cameras)

**Additional motor cable x-y**

**Extension cable (2m) for turntable**

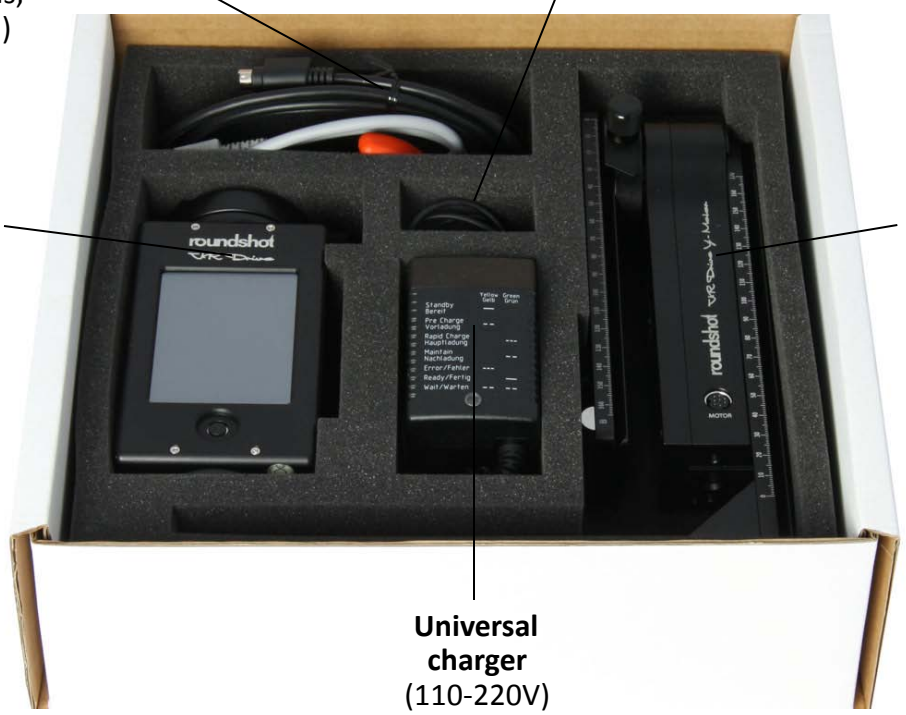
**Turntable**

# 2. First Steps With Your VR Drive

## 2.1 Setting up the VR Drive hardware


Your VR Drive is delivered in a **compact shipping box** with foam protection.

The shipping box consists of **five compartments**:



## 2.1 Setting up the VR Drive hardware (continued)

### 2.1.1 Roundshot VR Drive “full”

**Assemble your VR Drive “full”** in the following way:


Place the VR Drive x-motor on a **tripod with a large (3/8’’) thread**. When using a tripod with small thread (1/4’’) use an adaptor ring inside the VR Drive motor base.


When the VR Drive locks up very tightly on the tripod, it can be **released** with the allen key

**Slide the VR bracket** with attached y-motor **into the quick adaptor and close the quick adaptor lock tightly.**

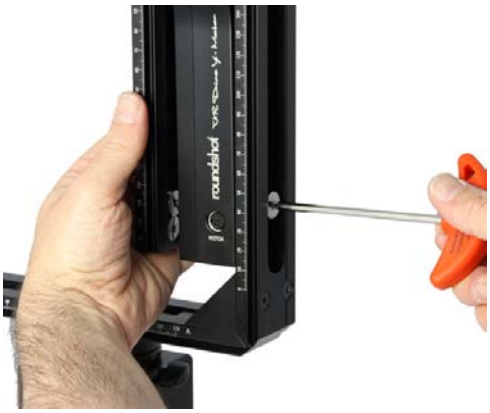
**To avoid damage to the VR Drive gears we recommend that you attach the VR Drive gently by hand** and then lock it using the allen key. The same is true when removing the VR Drive from the tripod.


**Open the quick adaptor release** and turn the VR bracket in position.


**Close the quick adaptor release** tightly.

**Do not turn the VR bracket, when the quick adaptor is locked.** Due to the high leverage the **VR Drive motor and the gears can be damaged**.

## 2.1.1 Roundshot VR Drive “full” (continued)



**Adjust the height of the y-motor** using the allen key.

Make sure that there is **enough space for large cameras and lenses** when tilting downward -90°.

It is possible to **slide the y-motor up** and fix it at the very top.

However, for **stability purposes it is better to keep the y-motor as low as possible.**

Now **connect the y-motor cable into the VR Drive x-motor**.

**Connect the other end of the cable into the VR Drive y-motor** (front or rear).

## 2.1.1 Roundshot VR Drive “full” (continued)

**Attach your digital camera to the nodal rail** using the allen key.

**Make sure that the camera is always attached at the same position.** We recommend sliding the camera to the very rear (zero position). When attaching the camera at different positions the nodal points in the software will no longer be correct.

**If the nodal rail is not long enough (or longer lenses) use a separate, longer nodal rail (available on request).**

Check that the **rear of the camera is mounted straight at exactly 90° with the nodal rail:**

**wrong**

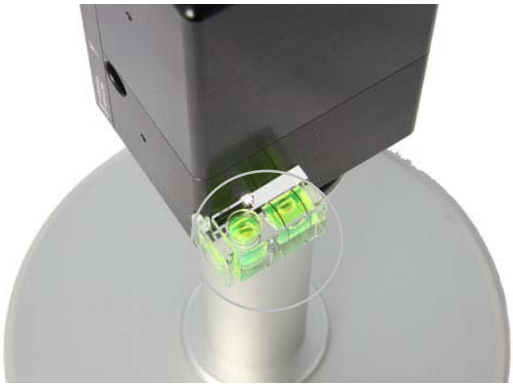
**correct**

## 2.1.1 Roundshot VR Drive “full” (continued)

**Slide** the camera with the nodal rail **into the nodal rail clamp.**

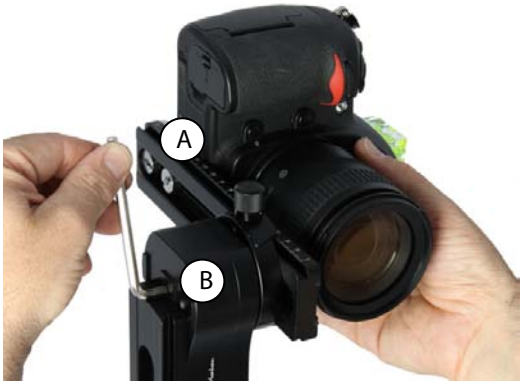
**Close the nodal rail clamp lock.**

**Check if the VR Drive x-motor is level** using the **spirit level** on the motor.



You can also attach the **spirit level** at the **side of the x-motor.**

Now **check that the camera is exactly level using the spirit level.**




It is possible to level the camera either **using the nodal rail screw (A)** or by **fine-tuning the nodal rail clamp (B).**

## 2.1.1 Roundshot VR Drive “full” (continued)


Finally **connect the release cable into the VR Drive x-motor**


**Connect the other end of the release cable** into the **camera** . Push it tightly into the socket.


Your **VR Drive “full”** is now **ready.**

## 2.1.2 Roundshot VR Drive “semi”

The **VR Drive “semi”** is set up in the same way as the VR Drive “full” except that there is just a **nodal rail clamp** instead of the y-motor and that **only the camera release cable needs to be connected.**

The **height** of the nodal rail clamp can be adjusted with the allen key.


**Connect the release cable** into the VR Drive **x-motor** and into the **camera** . Push it tightly into the socket.


Your **VR Drive “semi”** is now **ready.**

## 2.1.3 Roundshot VR Drive “turntable”

**Assemble your VR Drive “turntable”** in the following way:


**Lock the quick adaptor release** and **remove the quick adaptor from the VR Drive x-motor** by turning it anti-clockwise. Hold the turntable with the allen key without turning the allen key.

**Attach the VR Drive x-motor upside-down** on the tripod.

**Attach the 3/8’’ thread.**

**Attach the quick adaptor.**

## 2.1.3 Roundshot VR Drive “turntable” (continued)

***The turntable is covered with a protective foil on both sides.***

***Remove the protective foil on both sides of the turntable before use.***

Slide the **turntable** into the **quick adaptor** and lock it firmly.

Connect the **release cable** into the **VR Drive x-motor** and into the camera . Push it tightly into the socket.

Use the **2m extension cable** to increase the distance between camera and turntable. It is possible to use several 2m extension cables.

Your **VR Drive “turntable”** is now **ready.**

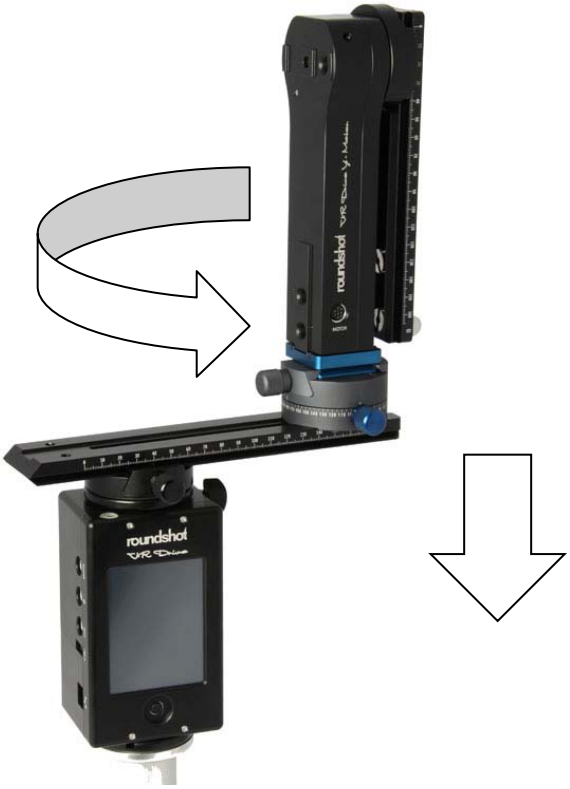
## 2.1.4 Special hardware assembly options

There is a variety of **special assembly options** for particular tasks:


Attach camera adaptor into quick adaptor for **mounting camera directly on VR Drive x-motor.**


Slide nodal rail into quick adaptor for **mounting camera directly on VR Drive x-motor with nodal point adjustment.**

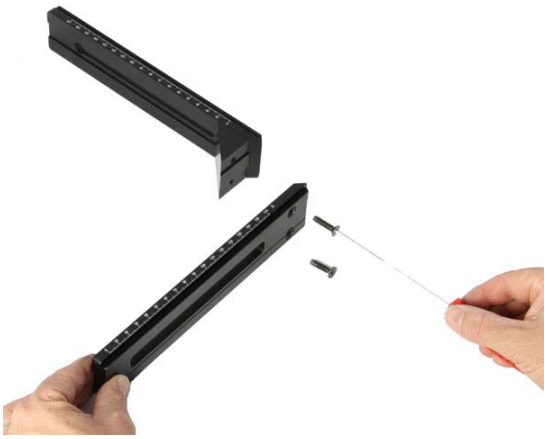

**Fix VR Drive y-motor at a 90° angle on the VR bracket** to make the unit very compact **for gigapixel photography (cylindrical), especially with large cameras and heavy lenses**




**Fix VR Drive y-motor directly on lower bracket with q-mount** to turn camera away from centre of VR Drive **for -90° image (spherical panorama)**

## 2.1.4 Special hardware assembly options (continued)


**Fix VR Drive y-motor directly on lower bracket for compact cameras** (greater stability).



The **VR bracket can be disassembled** by loosening the two screws below.


It is then possible to **attach the VR Drive y-motor directly on the lower VR bracket** using the two screws.

### 2.1.5 Radio control unit

The **radio control unit** consists of the following parts:

**Allen key with screws**


**Radio receiver** (on VR Drive)

**Radio sender** (remote)


With the VR Drive delivery the radio control unit is **already attached** on the VR Drive. It does not have to be removed.

When separated from VR Drive **never place the radio receiver on the connector pins** as they are fragile.

## 2.1.5 Radio control unit (continued)

Attach the **radio receiver** in the following way:


Insert the **radio receiver pins** into the **plug** marked with the antenna symbol: Y


Insert the **lower screw** and attach it with the allen key.


Insert the **upper screw** and attach it with the allen key.

Now press a **sharp item (for example a pen) into the sync contact** in the middle of the radio receiver.

Then press the **"OK"** button of the **radio sender.** This will synchronise the radio signal between sender and receiver.

## 2.1.5 Radio control unit (continued)

Once the synchronisation process is complete, the red blinking LED turns off.
The radio sender and receiver are now set up for operation.


Position the VR Drive in the X and Y dimension using the **left/right/up/down buttons**.

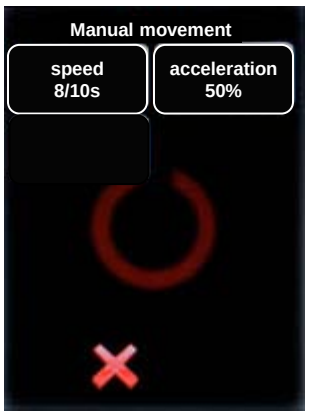
**"OK"** will start the currently active VR Drive program.

The VR Drive will start a new program from the actual **x-position** set with the control unit.

The red LED will turn on when a positioning command is received. The radio control unit allows to bridge a distance of about **30 metres** (100 feet).

Pressing a button continuously will accelerate the positioning speed.

The **VR Drive software** allows to set certain parameters for the radio control unit in the **settings/general menu**:


In the **manual movement menu** the user can set the **speed of rotation** and the **acceleration** preferences when using the radio control unit.




With **wake on radio** set to "yes", the VR Drive can be turned on remotely with the radio control unit. The remote positioning (left/right/up/down) is possible in both wake on radio options (no or yes).

Please consult the **settings menu** for further information on these two functions.

## 2.2 Setting up the digital camera


Always use **manual exposure**.

When using automatic exposure the images will have entirely different exposure throughout the panorama and will be difficult to blend the images together in the stitching software.


Always use **manual focusing**.

When using automatic focusing the focusing will be different for every image, making it very difficult to stitch the panorama.

Also, a change in focus changes the effective focal length and the nodal point.


Use a **fast CF card** with enough capacity.

When using a compact flash card with slower write speed, the images captured by the camera cannot be saved fast enough and some images may get delayed or omitted.

This is especially relevant when using the VR Drive “speed” mode.

## 2.3 Setting up the VR Drive software

Press the VR Drive **“on/off”** button to start the VR Drive:


When delivered the VR Drive is already set-up with your language, time settings and camera favourites.

These steps are normally only necessary after a factory reset.


As a first step, select your **language**. The options are:

- English
- German
- French
- Italian
- Spanish

Confirm with the **“next”** button.

Now set the **year, month, day and time** by using the number keypad.

When several entry fields are available, the active one is highlighted in light blue, the inactive one in darker blue. Click on an entry field to activate it.

Confirm the entries with the **“next”** button.




## 2.3 Setting up the VR Drive software (continued)


Load the **cameras** that you will be using with the VR Drive from the data base , selecting the camera brand/type from the list.

These cameras will be loaded into your personal favourites list which is required to program the VR Drive.

Click on the  button to add more cameras from the database.

Additional cameras can be added later in the “settings” menu. If your camera is not in the list, it can be added manually to the database.





When your selection is complete, confirm with the **“next”** button.

The set-up wizard is now complete.

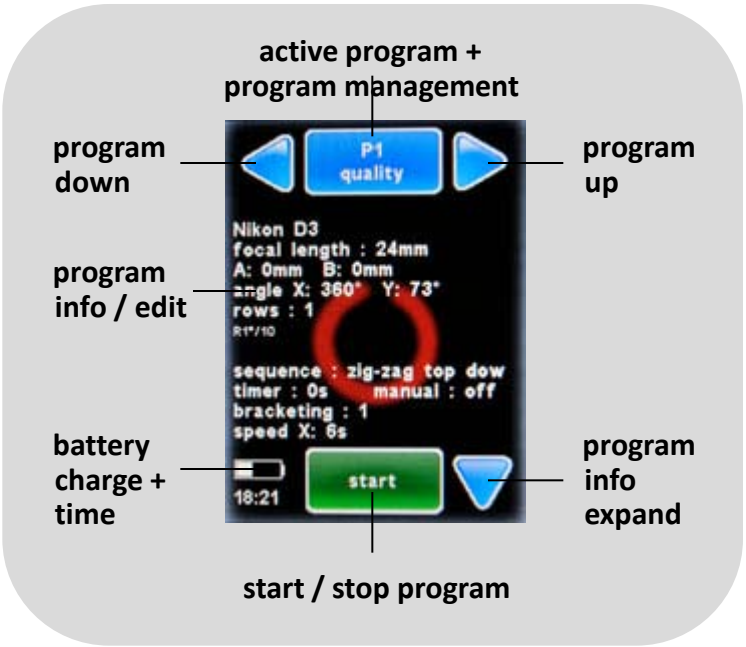
A first default program in “quality” mode is displayed which uses the camera data of the first camera in the favourites list and some default values: **“P1”**.

“P1” can later be edited, copied, moved or deleted. It is created only for setting up the VR Drive at this stage.

The camera type (ie the sensor size) is required for automatic calculation of rows/images in the “quality” and “speed” modes. For the “turntable” and “video” modes the camera type is used for information only and has no computation purpose.

## 2.4 Navigation

The VR Drive starts up with the **“home menu”:**




The “home menu” shows the currently **active program**. Clicking on this button will load the **program management** menu.


The arrow buttons **“program down”** + **“program up”** allow easy navigation between existing programs.

In the centre of the screen the main **program info** parameters are displayed. Clicking in this section will load the **program edit** menu.


The **“start”** button enables to launch the active program.


When the program sequence is ongoing, this icon will switch to a red **“stop”** button.


With the **program info expand** button the second part of the program info parameters can be displayed.

The **battery charge** and the **current time** are displayed with their respective icons.

## 2.4 Navigation (continued)

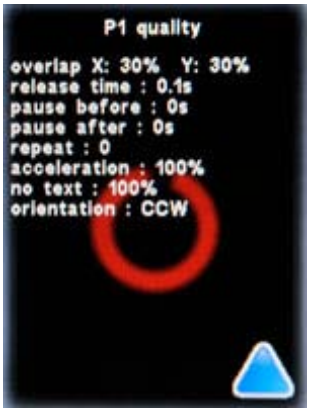


Clicking the **“active program + program management”** button opens the “program management” menu.

In this menu new programs can be created with the **“Program Wizard”**, existing programs can be deleted, copied or moved into a different position.

More details about this menu are given in section “Program management”.

Return to the “home menu” by clicking **“X”** (cancel).




The centre section of the “home menu” shows the first part of the **program details**. Click on the **“program expand”** button to display the second part of the program details.

Only the program details relevant to a specific mode are displayed. For example, in “speed” mode pause before/after, bracketing and mirror prerelease details are left empty.

Move back up to the “home menu” with the **“program collapse”** button (arrow up).



Clicking the **“program info”** section opens the **“program edit”** menu.

In this menu all program parameters can be changed.

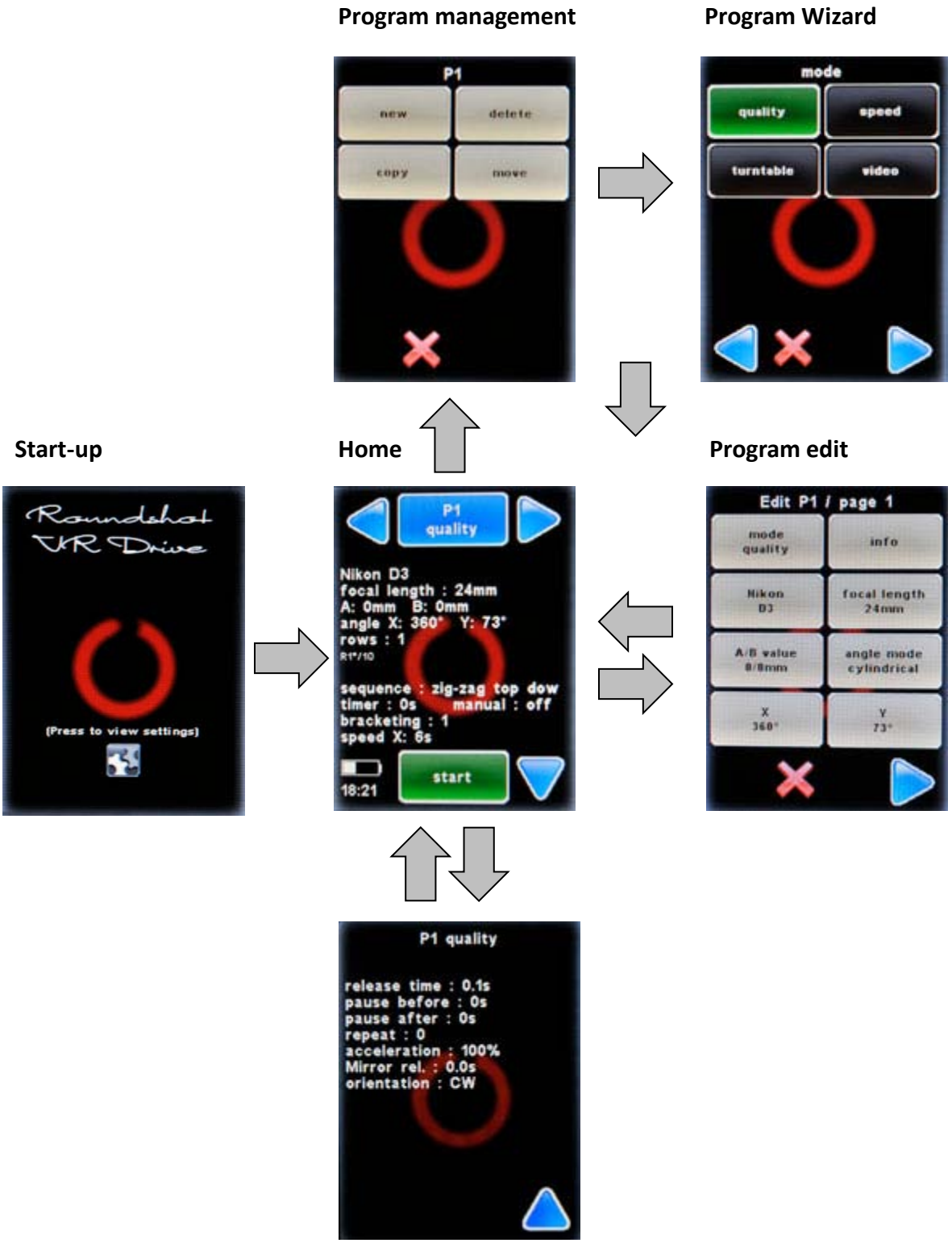
This menu also allows to access the VR Drive settings menu.

For more information about the “program edit” menu please refer to chapter 4.

Return to the “home menu” by clicking **“X”** (cancel).

## 2.4 Navigation (continued)

The following is an overview of the VR Drive navigation:



# 3. Program Wizard

## 3.1 Program Wizard “quality mode”



Click the **“program management”** button.

Launch the Program Wizard by clicking on **“new”.**

The Program Wizard will guide you step by step to set up a new VR Drive program.


Give the new program an **ID number**.

By default the new program will get the next available number after the last program.


As a first step select the VR Drive **mode** which you would like to use for the program.

All active modes are displayed in the list.

Click on **“quality”** to set up the program in “quality mode”.

The **navigation** for the following steps in the Wizard is:
- **“next”** for confirming the choice and moving to the next step
- **“back”** for undoing the choice and returning to the previous step
- **“X”** for cancelling the program and exiting the Program Wizard


**Label** your project by entering an alphanumeric/numeric text using the electronic keyboard.

It may be helpful to use a pen or other sharp item when using the keyboard.

## 3.1 Program Wizard “quality mode” (continued)


Select the **camera** that you would like to use for the new program from your favourites list.

Confirm with **“next”.**

If the desired camera is not in the list, exit the Wizard by clicking **“X”** and add the camera in the “program edit/settings” menu. Please refer to section 4.3 for details.


Enter the **focal length** of the camera lens.

This value must correspond with the exact setting on the lens. It is used – together with the camera sensor size – to automatically calculate the number of rows and images.

Confirm with **“next”.**


**For VR Drive “full” (with y-motor):**

The VR Drive will now ask the user whether it should move the camera 90° downwards for setting the centre point of rotation (A value).

If you already know the A-value, choose **“cancel**” and enter the A-value in the following window.

If not, select **“Yes”** to move the camera 90° down. Be careful not to squeeze your hand between camera and y-motor.

**For VR Drive “semi” (without y-motor):**

There will be no VR Drive message.

If you already know the A-value when using the same camera/lens in previous projects, enter the A-value in the following window.

If not, move the camera 90° down. Be careful not to squeeze your hand in the moving VR Drive vertical arm.

## 3.1 Program Wizard “quality mode” (continued)

Look through the camera viewfinder, open the VR bracket holder and slide the VR bracket sideways so that the centre of the viewfinder is exactly on the centre cross of the rotation axis.

Read the exact **A-value** (in mm) on the scale of the VR Holder.


Enter the exact **A-value** (in mm) in the software.

When the camera was moved 90° down with a VR Drive “full”, it will be lifted back up into the 0° position after confirming with **“next”.**

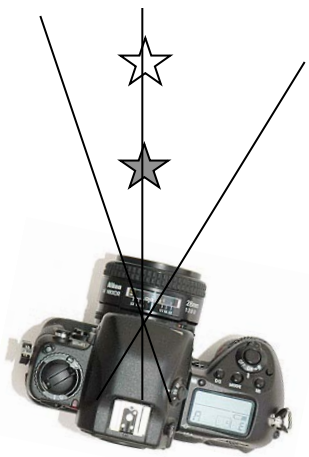
For VR Drive “semi” lift the camera manually back up into the 0° position.

## 3.1 Program Wizard “quality mode” (continued)

The next step consists in setting the **nodal point** for the camera.

The correct point about which to pivot a camera for panoramic photography is the **centre of the system’s entrance pupil**.

**Good nodal point:**



**Bad nodal point (parallax effect):**

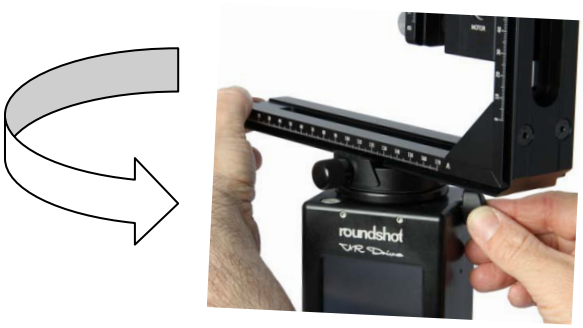
In practice, when turning the camera sideways, the **relative distance between two objects**
- **always remains the same** when the camera is at the correct nodal point
- changes when the camera is not at the correct nodal point

There are **two nodal points**: the front and rear nodal point. The position of the entrance pupils for panoramic photography is a function of the **camera hardware** (distance from camera rear to lens), the **construction of the lens** itself (centre of perspective), the **zoom setting** on the lens and finally the **focusing.**

As there are **virtually unlimited combination possibilities**, it is not possible to store all nodal points for all cameras, lenses, zoom positions and focusing distances. Therefore it is necessary to calibrate the nodal points for your camera + lens combinations yourself.

There is a simple practical procedure to determine the nodal point:

**Open the quick adaptor release** so that the VR bracket and camera can be moved sideways:

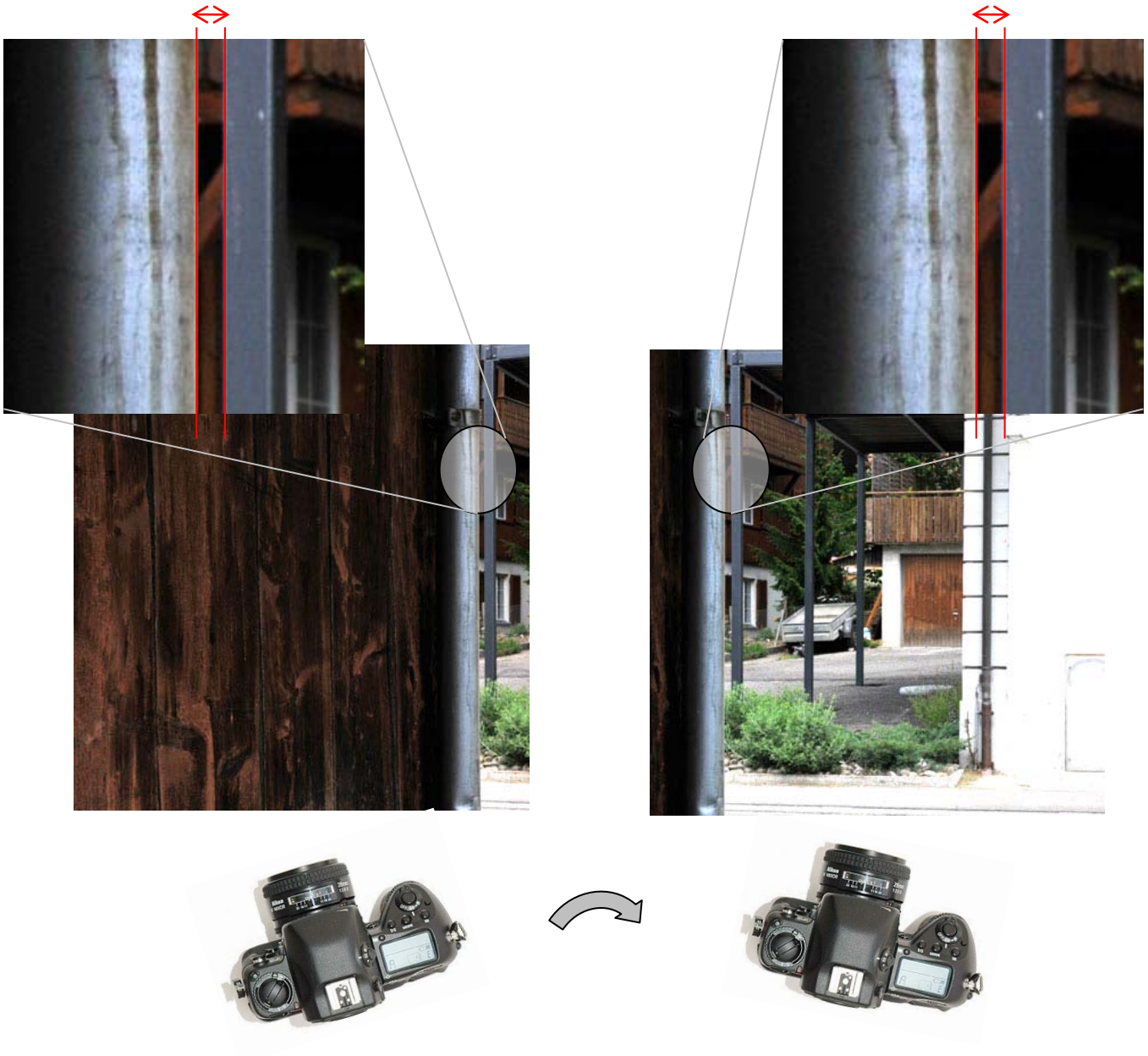


## 3.1 Program Wizard “quality mode” (continued)

Choose **two vertical lines in space**, for example the edge of a building with a pillar in the background.

Look through the viewfinder and position the camera so that the edge of the building is at the right margin of the image.

Then move the camera clockwise (to the right) so that the edge of the building is now on the left margin of the image.



If the distance between the two lines moves, the camera is not at the correct nodal point.

**If the distance between the two lines remains constant, the camera is in the correct nodal point**.

Close the quick adaptor release.

## 3.1 Program Wizard “quality mode” (continued)

Now read the **B-value** off the nodal rail (in mm):


Enter the exact **B-value** (in mm) in the software.

Confirm with **“next”**.

This procedure must be repeated every time a new camera/lens/focal length/focusing combination is used.

For security reasons, repeat this procedure every time a new program is set up or after reattaching the camera on the VR Drive.

Setting the correct nodal point is essential for successful stitching of the images. If the nodal point is not correctly set, it may be that the panorama cannot be stitched and that it is necessary to repeat the image capture.

When detaching/reattaching the digital camera there is a risk that the zero position of the camera changes. Make sure that you always attach the camera at the very same position. Slide the camera body to the rear metal base to make sure that there is no deviation.

When using larger cameras with larger lenses the nodal bench rail may not be long enough. Instead of sliding the zero position of the camera on the rail we strongly recommend to use a second – larger – nodal bench rail for long lenses and attach the camera always at the very rear metal base. This avoids any potential error when using different cameras/lenses.

## 3.1 Program Wizard “quality mode” (continued)


Now define in which **“angle mode”** you would like to create your panorama:

**Cylindrical**
Generates a panorama with a vertical angle of less than 180° using one row or several rows of images (multi-row).

**Spherical**
Creates a fully spherical panorama with a vertical angle of view of 180°.

**Manual**
Allows manual programming of image rows , for example for gigapixel photography.

### 3.1.1 Cylindrical panorama


Click on **“cylindrical”** to calculate the rows (elevation, images) for a cylindrical panorama.


Given the focal length of the lens and the size of the camera sensor the program computes the vertical field of view (**“Y”**) for one row of images.

Look through the viewfinder to check if this angle of view is sufficient.

If the vertical angle (“Y”) is OK, confirm the entry with **“next”**.

If not, change the vertical field of view to any value between 1 and 180°. If this value is below the vertical field of view, only one row of images will be captured. If it is above the vertical field of view, several rows will be created.


As a next step enter the horizontal angle (**“X”**) of the panorama.

## 3.1 Program Wizard “quality mode” (continued)

### 3.1.1 Cylindrical panorama (continued)


Enter the “**X overlap**” and the **“Y overlap**” in %.

The overlap between images in the horizontal (X) and vertical (Y) dimension is required to compute the number of rows and images.



The VR Drive software computes the number of rows (in this example 1), elevation (0°) and images per row (6).

If this calculation is correct, confirm with **“next”**.

If you would like to modify the first row, click on the row and enter the elevation (in degrees) and number of images.

For cylindrical single-row panoramas the overlap is uniform. Therefore the stitching will work with less overlap.

## 3.1 Program Wizard “quality mode” (continued)

### 3.1.1 Cylindrical panorama (continued)

The following commands are **optional** and will modify the rows which have already been calculated:

By clicking on the  button additional rows/images can be added to the program. Enter the desired **elevation** in degrees and the **number of images** per row.



Click on a row and select **“edit”** to modify the elevation and number of images for a row.
Click on a row and select **“delete”** to remove the row from the list.


Modify the desired **elevation** in degrees and the **number of images** per row.

Confirm with **“next”.**

## 3.1 Program Wizard “quality mode” (continued)

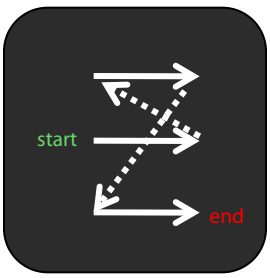
### 3.1.1 Cylindrical panorama (continued)


Select the **sequence of image** taking.

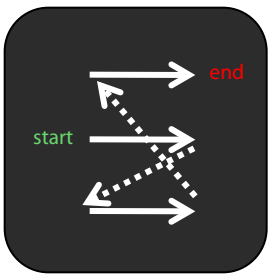
The preset is “zig-zag top down”.

Confirm with **“next”**.

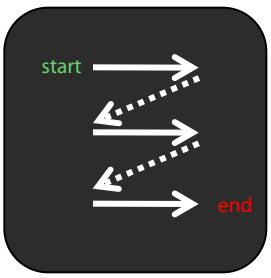
**zig-zag center up:**



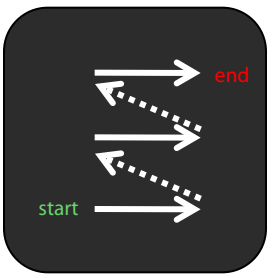

**zig-zag center down:**



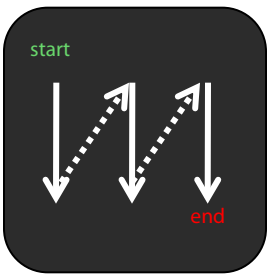

**zig-zag top down:**



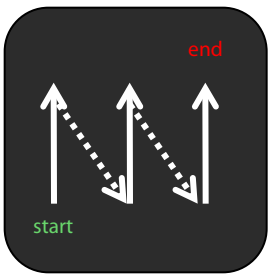

**zig-zag bottom up:**



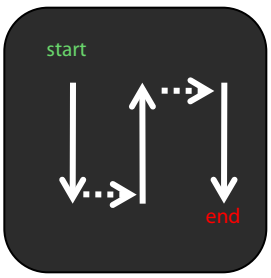

**vertical top down:**



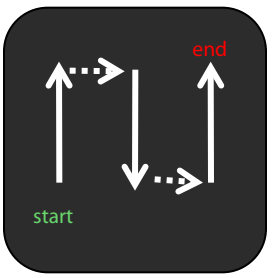

**vertical bottom up:**




**snake top down:**




**snake bottom up:**



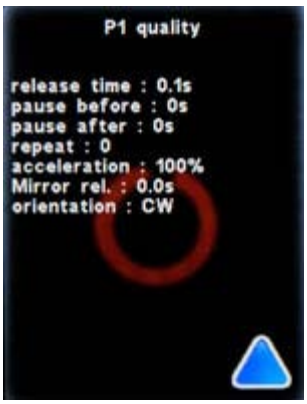

The sequence of image taking is only relevant for multi-row panoramas.

It is designed for those situations where the light changes quickly (for example at sunrise/sunset) or where there is movement in the scene.

If none of the 8 sequence presets are ideal, use the “manual” angle mode. In this mode the rows (elevation in °, number of images) and their sequence can be customised.

## 3.1 Program Wizard “quality mode” (continued)

### 3.1.1 Cylindrical panorama (continued)


The Program Wizard is now complete and the new program **“P2”** is computed and stored in the VR Drive software.

Check the settings in the program info window and by expanding it with the “expand” button.

In summary, with the help of the **Program Wizard** the following program parameters have been defined:

- Mode
- ID
- Info text
- Camera
- Focal length
- A- + B-value
- X-angle (horizontal)
- Y-angle (vertical)
- X- and Y-overlap
- Rows (elevation + number of images)
- Sequence of image taking

These are project-specific parameters which often change from assignment to assignment.

Other parameters are more general and remain often the same from project to project. Instead of having to select them every time a new program is created, they are loaded as **“presets”**. These parameters include:

- Timer
- Manual image release
- Bracketing
- Speed X / Speed Y
- Release time
- Pause before / after image taking
- Repeat
- Acceleration
- Mirror prerelease
- Orientation of camera

If one or several of these parameters need to be changed, they can be accessed in the **“program edit”** menu.

Before going on assignment, always run a test to see if the program delivers images that can be successfully stitched.

If the images cannot be stitched, check your nodal point settings (A, B). Also check the choice of camera and focal length. Increase the horizontal and vertical overlap and/or increase the number of images per row.

## 3.1 Program Wizard “quality mode” (continued)

### 3.1.2 Spherical panorama

The first steps for setting up a new program in “quality” mode are identical for a cylindrical. spherical or manual panorama (choice of mode, mode, ID, info text, camera, focal length, A/B).



Click on **“spherical”** to calculate the rows (elevation, images) for a spherical panorama.


For spherical panoramas, the vertical angle “Y” is automatically 180°.

Enter the horizontal angle (**“X”**) of the panorama.

Confirm with **“next”.**


Enter the “**X overlap**” and the **“Y overlap**” in %.

The overlap between images in the horizontal (X) and vertical (Y) dimension is required to compute the number of rows and images.

The more spherical the panorama, the less the overlap between images will be uniform, because for the stitching the images are projected on a sphere. This is why the overlap for spherical panoramas needs to be larger.

## 3.1 Program Wizard “quality mode” (continued)

### 3.1.2 Spherical panorama (continued)




The VR Drive software computes the number of **rows** with their **elevations** and **images**, in this example:

- row 1: elevation 90° / 1 image
- row 2: elevation 45° / 8 images
- row 3: elevation 0° / 8 images
- row 4: elevation -45° / 8 images
- row 5: elevation -90° / 1 image

If this calculation is correct, confirm with **“next”**.

If you would like to modify the first row, click on the row and enter the elevation (in degrees) and number of images.

The following commands are **optional** and will modify the rows which have already been calculated:

By clicking on the  button additional rows/images can be added to the program. Enter the desired **elevation** in degrees and the **number of images** per row.

Click on a row and select **“edit”** to modify the elevation and number of images for a row.
Modify the desired **elevation** in degrees and the **number of images** per row.

Click on a row and select **“delete”** to remove the row from the list.

Confirm with **“next”.**

## 3.1 Program Wizard “quality mode” (continued)

### 3.1.2 Spherical panorama (continued)


Select the **sequence of image** taking.

The preset is “zig-zag top down”.

Confirm with **“next”**.

The Program Wizard is now complete and the new program **“P3”** is computed and stored in the VR Drive software.



Check the settings in the program info window and by expanding it with the “expand” button.

The general program parameters are again loaded as “presets”. If one or several of these parameters need to be changed, they can be accessed in the **“program edit”** menu.

Before going on assignment, always run a test to see if the program delivers images that can be successfully stitched.

If the images cannot be stitched, check your nodal point settings (A, B). Also check the choice of camera and focal length. Increase the horizontal and vertical overlap and/or increase the number of images per row.

## 3.1 Program Wizard “quality mode” (continued)

### 3.1.3 Manual panorama

The first steps for setting up a new program in “quality” mode are identical for a cylindrical. spherical or manual panorama (choice of mode, mode, ID, info text, camera, focal length, A/B).



Click on **“manual”** to define the rows (elevation, images) for a user-defined panorama.

In this angle mode the VR Drive makes no computation of rows/elevation/images. Rather, the user enters this information manually.

This allows to create user-specific / customised programs.


Enter the horizontal angle (**“X”**) of the panorama.

As the angle mode is manual, no vertical image angle is calculated or used.

The vertical image angle “Y” is given by the rows with their elevation and number of images which are entered manually by the user.



A first default row is displayed.
Click on a row to modify the elevation and number of images for this row.

## 3.1 Program Wizard “quality mode” (continued)

### 3.1.3 Manual panorama (continued)

By clicking on the  button additional rows/images are added to the program. Enter the desired **elevation** in degrees and the **number of images** per row.







Click on a row and select **“edit”** to modify the elevation and number of images for a row. Modify the desired **elevation** in degrees and the **number of images** per row.


Click on a row and select **“delete”** to remove the row from the list.

Confirm with **“next”.**

## 3.1 Program Wizard “quality mode” (continued)

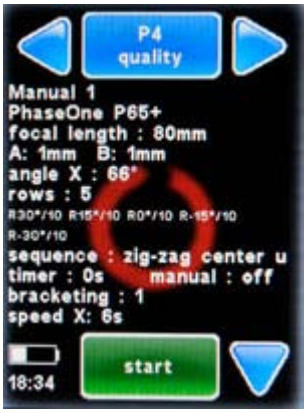
### 3.1.3 Manual panorama (continued)


Select the **sequence of image** taking.

The preset is “zig-zag top down”.

Confirm with **“next”**.

The Program Wizard is now complete and the new program **“P3”** is computed and stored in the VR Drive software.





Check the settings in the program info window and by expanding it with the “expand” button.

The general program parameters are again loaded as “presets”. If one or several of these parameters need to be changed, they can be accessed in the **“program edit”** menu.

Before going on assignment, always run a test to see if the program delivers images that can be successfully stitched.

If the images cannot be stitched, check your nodal point settings (A, B). Also check the choice of camera and focal length. Increase the horizontal and vertical overlap and/or increase the number of images per row.

## 3.2 Program Wizard “speed mode”



Click the **“program management”** button.

Launch the Program Wizard by clicking on **“new”.**

The Program Wizard will guide you step by step to set up a new VR Drive program.


Give the new program an **ID number**.

By default the new program will get the next available number after the last program.


Click on **“speed”** to set up the program in “speed mode”.

The **navigation** for the following steps in the Wizard is:
- **“next”** for confirming the choice and moving to the next step
- **“back”** for undoing the choice and returning to the previous step
- **“X”** for cancelling the program and exiting the Program Wizard

All following steps for setting up a VR program in **“speed”** mode are identical to the ones in **“quality”** mode.

Therefore please refer to the **“Program Wizard Quality Mode”** for a step-by-step guide in setting up the program.

## 3.2 Program Wizard “speed mode” (continued)

In **“quality” mode** the VR Drive stops and releases the camera in every position.
In **“speed” mode** the VR Drive releases the camera “on the fly” without stopping in every position.

**“quality” mode:**
**stop + release**

**“speed” mode:**
**non-stop release**

The faster the total rotation time, the faster the shutter speed of the camera needs to be, otherwise the images will be blurred (unsharp).

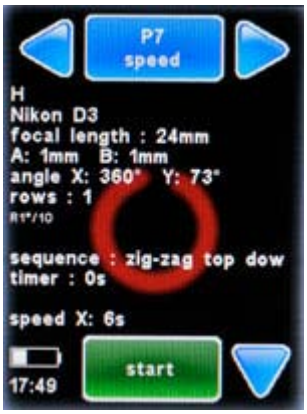
The following table indicates the maximum shutter speed required for different rotation times. For example, when setting the rotation time to 6 seconds, **the camera shutter speed needs to be 1/1500 sec. or faster (1/1000 s, 1/2000 s, …):**

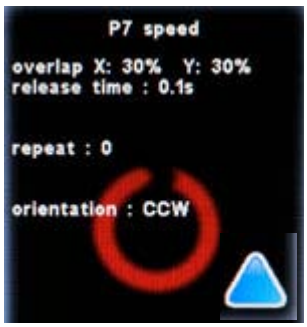
| Rotation time (X, 360°) | Maximum shutter speed |
|---|---|
| 6 s | 1/1500 s (or faster) |
| 10 s | 1/900 s (or faster) |
| 20 s | 1/450 s (or faster) |

When a fast shutter speed cannot be reached (i.e. under difficult lighting conditions), it is possible to compensate in the following way:

- Increase ISO/ASA
- Open the aperture (use a lower f-stop) and save the image at a larger resolution – the lower depth of field can be compensated by compressing the resolution of the images
- Reduce the rotation speed

## 3.2 Program Wizard “speed mode” (continued)




Once the Program Wizard for a new program in “speed” mode is complete, it will display the new program **“P7”** as pictured in this example.

Check the settings in the program info window and by expanding it with the “expand” button.

In summary, with the help of the **Program Wizard** the following program parameters have been defined:

- Mode
- ID
- Info text
- Camera
- Focal length
- A- + B-value
- X-angle (horizontal)
- Y-angle (vertical)
- X- and Y-overlap
- Rows (elevation + number of images)
- Sequence of image taking

The following **“presets”** are loaded automatically to the program:

- Timer
- Speed X / Speed Y
- Release time
- Repeat
- Orientation of camera

Because the image-taking happens non-stop, some of the parameters in “quality” mode do not apply in “speed” mode. These parameters are:

- Manual image release
- Bracketing
- Pause before / after image taking
- Acceleration
- Mirror prerelease

If one or several of these parameters need to be changed, they can be accessed in the **“program edit”** menu.

Before going on assignment, always run a test to see if the program delivers images that can be successfully stitched.

If the images cannot be stitched, check your nodal point settings (A, B). Also check the choice of camera and focal length. Increase the horizontal and vertical overlap and/or increase the number of images per row.

In the “speed” mode it is necessary to set the release time for the camera. If the camera releases irregularly, increase the release time, increase the total rotation time and make sure to use a fast CF storage card.

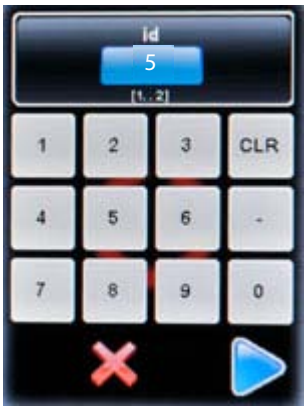
## 3.3 Program Wizard “turntable mode”



Click the **“program management”** button.

Launch the Program Wizard by clicking on **“new”.**

The Program Wizard will guide you step by step to set up a new VR Drive program.




Give the new program an **ID number**.

By default the new program will get the next available number after the last program.


Click on **“turntable”** to set up the program in “turntable mode”.

The **navigation** for the following steps in the Wizard is:
- **“next”** for confirming the choice and moving to the next step
- **“back”** for undoing the choice and returning to the previous step
- **“X”** for cancelling the program and exiting the Program Wizard


**Label** your project by entering an alphanumeric/numeric text using the electronic keyboard.

It may be helpful to use a pen or other sharp item when using the keyboard.

## 3.3 Program Wizard “turntable mode” (continued)


Select the **camera** that you would like to use for the new program from your favourites list.

If the desired camera is not in the list, exit the Wizard by clicking **“X”** and add the camera in the “program edit/settings” menu. Please refer to section 3.1 for details.


Enter the **focal length** of the camera lens.

In “turntable” mode this value is for information purposes only. No calculations are necessary with the focal length.


As a next step enter the horizontal angle (**“X”**) of the panorama.

For an object movie that turns seamlessly around its axis enter **“360°”**.


Finally enter the number of **images** to be released within the “X” angle.

## 3.3 Program Wizard “turntable mode” (continued)



Once the Program Wizard for a new program in “turntable” mode is complete, it will display the new program **“P5”** as pictured in this example.

Check the settings in the program info window and by expanding it with the “expand” button.

In summary, with the help of the **Program Wizard** the following program parameters have been defined:

- Mode
- ID
- Info text
- Camera
- Focal length
- X-angle (horizontal)
- Number of images

The following **“presets”** are loaded automatically to the program:

- Timer
- Manual release
- Bracketing
- Speed X
- Release time
- Pause before/after
- Repeat
- Acceleration
- Mirror prerelease
- Orientation of camera

If one or several of these parameters need to be changed, they can be accessed in the **“program edit”** menu.

## 3.4 Program Wizard “video mode”



Click the **“program management”** button.

Launch the Program Wizard by clicking on **“new”.**

The Program Wizard will guide you step by step to set up a new VR Drive program.


Give the new program an **ID number**.

By default the new program will get the next available number after the last program.


As a first step select the VR Drive **mode** which you would like to use for the program.

All active modes are displayed in the list.

Click on **“video”** to set up the program in “video mode”.

The **navigation** for the following steps in the Wizard is:
- **“next”** for confirming the choice and moving to the next step
- **“back”** for undoing the choice and returning to the previous step
- **“X”** for cancelling the program and exiting the Program Wizard


**Label** your project by entering an alphanumeric/numeric text using the electronic keyboard.

It may be helpful to use a pen or other sharp item when using the keyboard.

## 3.4 Program Wizard “video mode” (continued)


Select the **camera** that you would like to use for the new program from your favourites list.

If the desired camera is not in the list, exit the Wizard by clicking **“X”** and add the camera in the “program edit/settings” menu.


Enter the **focal length** of the camera lens.

In the “video” mode this value is for information only and has no computation purpose.

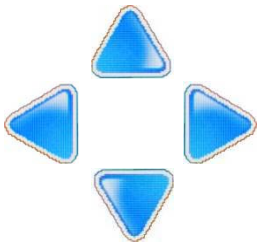
Confirm with **“next”.**

The camera will now be moved to the starting position.
The following warning is displayed:
**“Please wait until the camera is in position”.**



As a next step the VR Drive will move to X/Y points.

Move the VR Drive with **the cursor buttons right/left/up/down**. The exact X/Y position is indicated in degrees.



Confirm a point with **“OK”**.

**Important:** do not confirm the X/Y coordinates with the “next” button as this will save the program and continues to the “home” menu.

## 3.4 Program Wizard “video mode” (continued)




For every acquired point indicate the following:
• **Speed** – time (in seconds) from this point to the next
• **Pause** – time (in seconds) for this point
• **Acceleration** – degree of speed adaptation from this point to the next (1% slow, 100% fast)

Confirm every choice with **“next”.**

Then **continue to acquire** as many points as the video sweep requires, for example:






When the point acquisition is finished, confirm with **“next”.**

## 3.4 Program Wizard “video mode” (continued)


Once the Program Wizard for a new program in “speed” mode is complete, it will display the new program **“P6”** as pictured in this example.

Check the settings in the program info window and by clicking the “expand” button.

In summary, with the help of the **Program Wizard** the following program parameters have been defined:

- Mode
- ID
- Info text
- Camera
- Focal length
- Points (X/Y, speed, pause, acceleration)

The following **“presets”** are loaded automatically to the program:

- Start position (X/Y)
- Timer
- Repeat

If one or several of these parameters need to be changed, they can be accessed in the **“program edit”** menu.

Before going on assignment, always run a test to see if the program delivers the intended video sweep.

## 3.5 Starting/stopping the VR Drive

In the “Home” menu click on “start” to launch your first VR Drive image sequence:


The VR Drive will start executing the active program – in this example “P1” in “quality mode”.
In this example it will rotate 360° horizontally to take 10 images spaced at exactly 36°.
The VR Drive stops and releases the camera in every position.


While the VR Drive is running, the touch screen display shows the **progress of image takin**g:

- Row
- Angle X
- Angle Y
- Total images released
- Current image
- Number of times the program was repeated
- Timer


Stop the program any time by pressing the “stop” button.
The VR Drive will return to its initial position and the software displays the “home” menu with the currently active program.

## 3.6 Program management



Click the **“program management”** button.

Besides creating **new programs** with the **Program Wizard** the program management menu allows to:

- **Delete** a program
- **Copy** a program
- **Move** the ID number of program and the sequence of programs


Clicking the **“new”** button will launch the **Program Wizard** to set up new VR Drive programs using various modes.

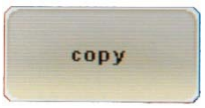

When clicking the **“delete”** button the currently active program will be deleted. This is the program from which the “program management” menu has been launched, in this example P1. All subsequent programs (P2, P3, …) will move up and will get new program numbers assigned (P1, P2, …).


Before deleting the program the program asks for confirmation.

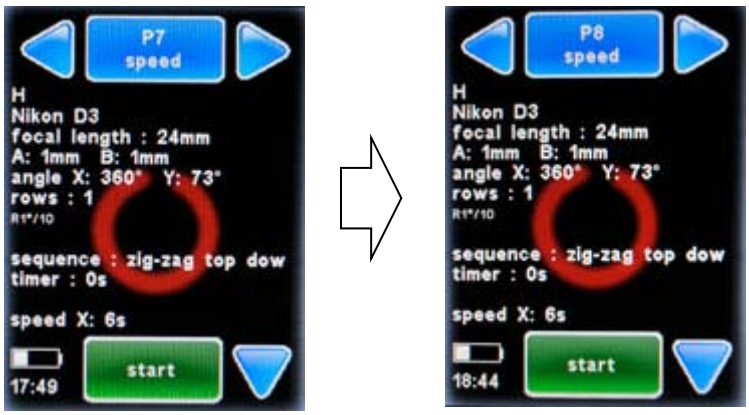
Cancel with **“X”**.

Confirm with **“OK”**.

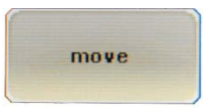
## 3.6 Program management (continued)




The **“copy”** command duplicates the currently active program.




This function is helpful when a new program needs to be created that is very similar to an existing one. After copying the program, simply edit the relevant parameters in the “program edit” menu.




The **“move”** command changes the sequence of programs by moving the currently active program to a new position.

For example, when **“P8”** is selected and when clicking on “move”, the program will ask for the new program ID:

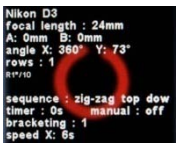

After entering the new program number – in this example **“7”** – all subsequent programs will move one number down, so the previous “P7” will now become “P8”.

# 4. Program Editing

## 4.1 Editing in “quality”, “speed” + “turntable” mode

Click on the **“program info”** section to open the **“program edit”** menu.

In this menu all program parameters can be changed. It also allows to access the VR Drive settings.







All program parameters can be accessed and modified one by one.



Click on **“mode”** to change the VR Drive mode.

It is possible to **switch from “Quality” to “Speed” mode** and vice-versa.

Changing to “Speed” mode does not change the calculation of rows (elevation and images) or any other program parameters.

The only difference is that the following parameters will no longer be accessible in “speed” mode and will therefore be deactivated:

- Manual image release
- Bracketing
- Pause before / after image taking
- Acceleration
- Mirror prerelease

The “Turntable” mode is an entirely different application. The number of images are not calculated and therefore this mode has different variables. The same is true for the “Video” mode.

This is why it is not possible to switch to “Turntable” or “Video” mode from “Quality” mode.

## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)

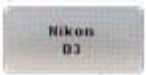


Click on **“text”** to change the label of the program.

Enter an alphanumeric/numeric text using the electronic keyboard.

It may be helpful to use a pen or other sharp item when using the keyboard.

Confirm with **“OK”** or cancel with **“X”**.





Click on **“camera”** to change camera brand/type.

As the sensor size is different from camera to camera, changing the camera will lead to an automatic recalculation of rows (elevation/images) for the program.

In angle mode “cylindrical” and “spherical” the existing rows will be overwritten. In angle mode “manual” the change of camera has no consequences. Here the rows must be edited manually.

Continue with **“OK”** or cancel with **“X”**.

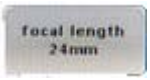

Select the **camera** that you would like to use for the new program from your favourites list.

If the desired camera is not in the list, exit the “camera edit” menu by clicking **“X”** and add the camera in the “settings” menu.

Confirm the choice of camera with **“X”**.

The rows (elevation, number of images) will now be automatically recalculated.

## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)




Click on **“focal length”** to change the focal length of the lens used for the program.


Changing the focal length will lead to an automatic recalculation of rows (elevation/images) in angle modes “cylindrical” or “spherical”. In angle mode “manual” the change of camera has no consequences. Here the rows must be edited manually.

Continue with **“OK”** or cancel with **“X”**.


Enter the **focal length** of the camera lens.

This value must correspond with the exact setting on the lens. It is used – together with the camera sensor size and the vertical field of view – to automatically calculate the number of rows and images.

Confirm with **“OK”** or cancel with **“X”**.

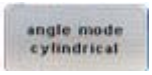
In angle mode “cylindrical” and “spherical” the existing rows will be overwritten. In angle mode “manual” the change of camera has no consequences. Here the rows must be edited manually.


Click on **“A/B value”** to change the rotation and nodal point values for the program.


Please make sure that these values are correct. When setting the camera at wrong rotation or nodal points the stitching of images will not work.

Confirm with **“OK”** or cancel with **“X”**.

## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)




Click on **“angle mode”** to change the way the rows (elevation, number of images) are calculated.


The options are:
- cylindrical
- spherical
- manual

Changing the angle mode will lead to an automatic recalculation of rows (elevation/images) for the program.

Choose the new “angle mode” by clicking on the button.


The following angle mode modifications are possible:
- from cylindrical to spherical (computes a sphere)
- from spherical to cylindrical (computes one row with vertical FOV of chosen lens)
- from cylindrical to manual (requires manual programming of rows)
- from spherical to manual (requires manual programming of rows)

The transition from manual to cylindrical or spherical is not possible.

Continue with **“OK”** or cancel with **“X”**.

In angle mode “cylindrical” and “spherical” the existing rows will be overwritten. In angle mode “manual” the change of camera has no consequences. Here the rows must be edited manually.

## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)


Click on **“X”** or **“Y”** to change the horizontal or vertical angle for the program.


Changing the angle will lead to an automatic recalculation of rows (elevation/images) or number of images per row for the program.

Continue with **“OK”** or cancel with **“X”**.


Enter the **“X”** angle (horizontal angle).

Confirm with **“OK”** or cancel with **“X”**.

The number of images per row will now be automatically recalculated.


Enter the **“Y”** angle (vertical angle).

Confirm with **“OK”** or cancel with **“X”**.

The rows (elevation, number of images) will now be automatically recalculated.

## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)


Click on **“overlap”** to change the % overlap between images horizontally and vertically.


Changing the overlap will lead to an automatic recalculation of rows (elevation/images) or number of images per row for the program.

Continue with **“OK”** or cancel with **“X”**.


Enter the **“X overlap”** (horizontal overlap).

Confirm with **“OK”** or cancel with **“X”**.

The number of images per row will now be automatically recalculated.

Enter the **“Y overlap”** (vertical overlap).

Confirm with **“OK”** or cancel with **“X”**.

The rows (elevation, number of images) will now be automatically recalculated.

## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)


Click on **“rows”** to create new rows, delete existing rows or edit a row (elevation, number of images).


By changing the rows any previous automatic computation will be overwritten.

Select the row by clicking on it.

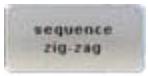

Select **“edit”** or **“delete”.**


Enter the desired **elevation** in degrees and the **number of images** per row.

Confirm with **“OK”** or cancel with **“X”**.


By clicking on the button additional rows/images can be added to the program. Enter the desired **elevation** in degrees and the **number of images** per row.

## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)



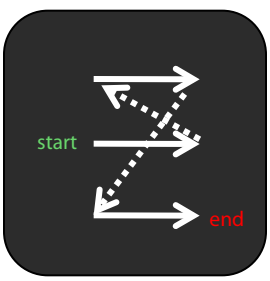

Click on **“sequence”** to change the order in which the rows of images are captured.


Select the new sequence.

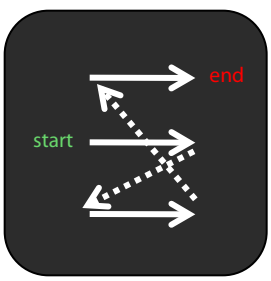
Confirm with **“OK”** or cancel with **“X”**.

The **sequence options** are:

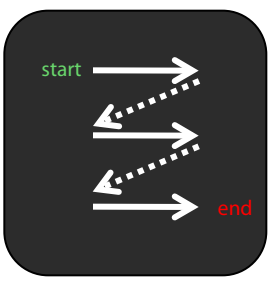
**zig-zag center up:**



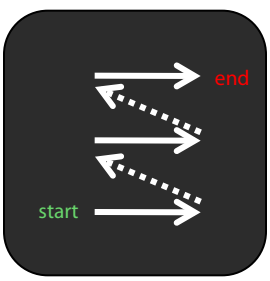

**zig-zag center down:**



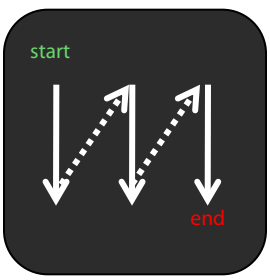

**zig-zag top down:**



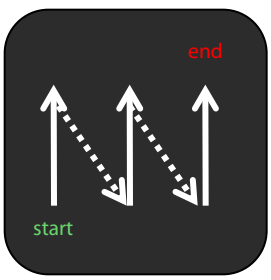

**zig-zag bottom up:**



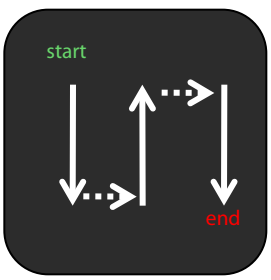

**vertical top down:**



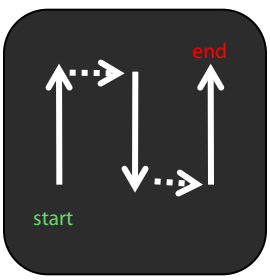

**vertical bottom up:**




**snake top down:**




**snake bottom up:**



## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)



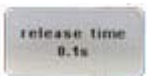
Click on **“speed”** to change the rotation speed for the VR Drive.

Enter the “X speed” for the horizontal movement.

Enter the “Y speed” for the vertical movement.

The minimum speed is **6 seconds**.

Confirm with **“OK”** or cancel with **“X”**.





Click on **“release time”** to change the duration of the release signal given by the VR Drive to the camera for every image.

The release time corresponds to the duration of the release signal given from the VR Drive to the camera.

Varying the release time is required to optimise the operation of the VR Drive in “speed” mode.

Confirm with **“OK”** or cancel with **“X”**.



Click on **“pause”** to change the pause before or after image-taking.

The pause before/after image-taking is used to minimise potential vibrations.

Confirm with **“OK”** or cancel with **“X”**.

## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)


Click on **“repeat”** to program a repetition of the program.

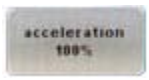

Enter the number of repetitions.

Confirm with **“OK”** or cancel with **“X”**.


Click on **“timer”** to program a time delay before the program is launched.


Enter the time delay.

Confirm with **“OK”** or cancel with **“X”**.




Click on **“acceleration”** to define the speed adaptation when the VR Drive starts and stops.

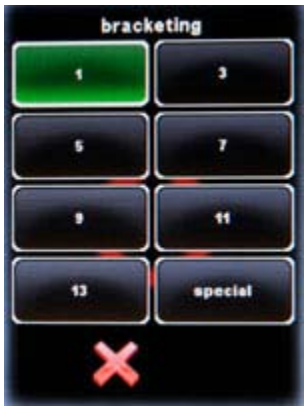

The acceleration values range from 1% (slow speed adaptation) to 100% (fast speed adaptation).

Confirm with **“OK”** or cancel with **“X”**.

## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)


Click on **“bracketing”** to program multi-exposures per position.

Bracketing “1” means no multi-exposures – only one image will be released per position.

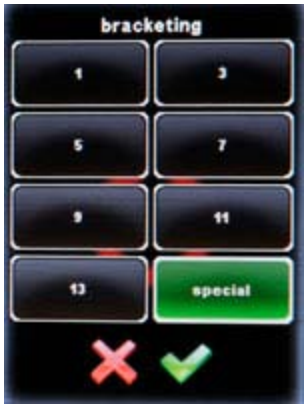



With bracketing “3”, “5”, “7”, “9”, “11” and “13” several images are released per position.

The bracketing values (number of images, bracketing range in f-stops, type of bracketing) need to be set in the camera software.

Make sure that the number of images set in the camera software and in the VR Drive software match.

Confirm with **“OK”** or cancel with **“X”**.




**“Special bracketing”** is used with cameras which allow the release and bracketing of several images in multi-shot mode.

Set the bracketing and multi-shot feature on the camera.

Enter the total duration of the “multi-shot” in the VR Drive software. The VR Drive will then give a longer release signal to the camera for the multi-shots.

Confirm with **“OK”** or cancel with **“X”**.



Click on **“manual”** to activate or deactivate the manual release of the image in every position:

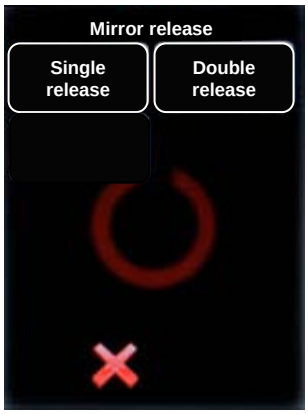
- Manual **“on”**: requires releasing every picture manually
- Manual **“off”:** releases the images automatically

## 4.1 Editing in “quality”, “speed” + “turntable” mode (continued)


Click on **“mirror release”** to activate the release of the camera mirror before image taking.


Enter the duration of mirror release.

Confirm with **“OK”** or cancel with **“X”**.




Now choose whether to give a **single or double mirror release signal.**

Typically, Nikon cameras require a single, Canon a double signal.

Confirm with **“OK”** or cancel with **“X”**.



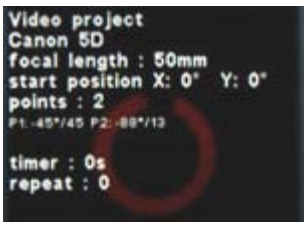
Click on **“orientation”** to change the direction in which the VR Drive turns.

- Orientation**“CW”**: rotates clockwise
- Orientation**“CCW”**: rotates anti-clockwise

## 4.2 Editing in “video” mode

Click on the **“program info”** section to open the **“program edit”** menu.

In this menu all program parameters can be changed. It also allows to access the VR Drive settings.






All program parameters can be accessed and modified one by one.

The parameters for the **“video” mode** are very specific. This is why it cannot be changed into another mode (such as “quality”, “speed” or “turntable”).

In the “video” mode edit menu the program parameters can be modified in the same way as for the “quality”, “speed” or “turntable” modes. For example, it is possible to change the **program info text, the camera, the focal length, the release time, program repetition, timer** and the **manual function**.

In addition to these modes, the “video” mode allows to edit the **starting position** as well as the **points for the video sweep**.


Click on **“start position”** to change initial position from which the VR Drive launches the video sweep.


By default, the VR Drive starts from **0° / 0°** to reach the first point defined in the “Program Wizard”.

Enter the **“X”** and **“Y”** coordinates of the starting point.

Confirm with **“OK”.**

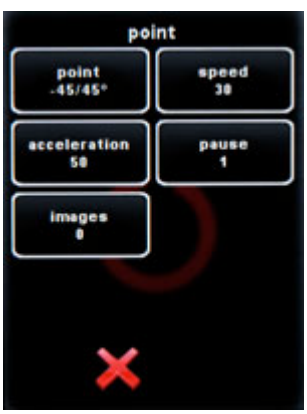
## 4.2 Editing in “video” mode (continued)


Click on **“point”** to edit the points through which the video sweep navigates.


**Click on a point** to edit or delete it.


Delete a point by clicking **“delete”.**

Edit a point by clicking **“edit”.**




The **parameters** of the point are displayed and can be selected one by one:

- Point coordinates (X/Y)
- Speed
- Acceleration
- Pause
- Images


For example, change the X/Y coordinates of a point.

Confirm with **“OK”**.

## 4.2 Editing in “video” mode (continued)


It is also possible to release images with a digital camera in the “video” mode.

To do this, click on **“images”** to define the number of images that need to be released between two points.

Any number of images can be released. Make sure that the camera has enough time to create the images.

Confirm with **“OK”.**

The “video” mode can be used for time-lapse sweeps using individual images instead of video. The camera can be moved 180x360° and triggered in any X/Y position.

## 4.3 Settings

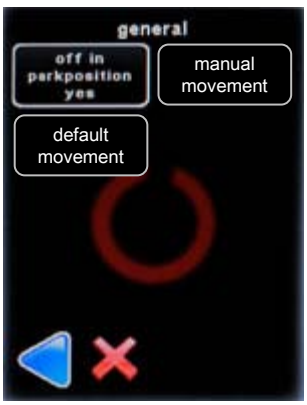

Click on **“settings”** to access the VR Drive settings menu.


The “settings” menu is divided into 3 submenus:

- general
- database
- service menu


Click on **“general”** to access the “general” submenu.

The **“general”** submenu consist of 9 functions:



Click on **“language”** to access the “language” function.


Select the language of your choice.

Please note that the language will only be active after closing the “edit program” menu or after restarting the VR Drive.

Confirm with **“X”**.

## 4.3 Settings (continued)

date

Click on **“date”** to access the “date” function.




Set the year, month and day

Confirm every entry with **“next”** or cancel with **“X”.**

time

Click on **“time”** to set the hours and minutes of your VR Drive.


Enter the hours and minutes.

Confirm with **“next”** or cancel with **“X”.**

auto turn off

Click on **“auto turn off”** to define the time for automatic shut down of the VR Drive.

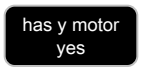

This function is designed to help save battery.

For extended operation times the auto turn off time can be increased.

Enter the time in minutes.

Confirm with **“next”** or cancel with **“X”.**

## 4.3 Settings (continued)





Click on **“has y motor”** to activate / deactivate the y-motor.

For VR Drive “full” select **“yes”.**

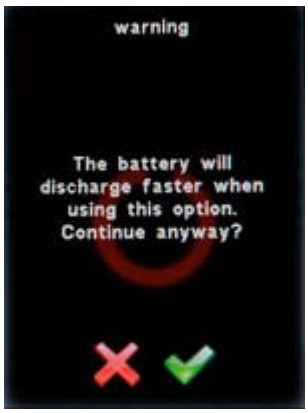
For VR Drive “semi” select **“no”.**



Click on **“wake on radio”** to activate / deactivate the wake-up function of the radio release unit for the VR Drive remote control.

Deactivate the wake on radio with **“no”.**

Activate the wake on radio with **“yes”.**




With the radio receiver deactivated it is possible to turn the VR Drive left/right/up/down and to start it. However, it is not possible to turn it on. This can only be done with “wake on radio” set to “yes”.

As the battery discharges faster with the radio receiver activated, the VR Drive displays a warning message.

Confirm with **“OK”** or cancel with **“X”**.


Click on **“software”** to display information on the software

This function consists of


- key
- version
- IP

## 4.3 Settings (continued)

key


Click on **“key”** to display the software key.

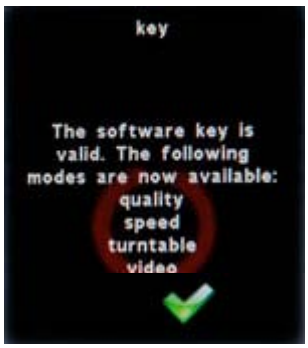
The software key is used to **activate the VR Drive modes** (“quality”, “speed”, “turntable”, “video”).

This key is **specific to the VR Drive hardware ID**.

It will be delivered with your VR Drive or when upgrading to a new software mode.

If you received a **new key** after upgrading, enter it here.

Confirm with **“OK”.**




After entering a valid key, the software displays **the available software modes.**

When entering an invalid key, the last valid key will be loaded.

Confirm with **“OK”.**

version


Click on **“version”** to display the software version.

Confirm with **“OK”.**

IP


Click on **“IP”** to display the internet protocol number of the VR Drive.

The IP is required to establish a network connection with the VR Drive ethernet plug.

This IP must be in the same range as the computer connecting to the VR Drive.

Confirm with **“OK”** or cancel with **“X”.**

## 4.3 Settings (continued)

Hardware ID

Click on **“hardware ID”** to display the unique hardware identification number of your VR Drive.


This ID is at the same time the serial number and is stored in the “Club VR Drive” database.

Together with the software key this hardware ID activates the VR Drive software mode.

The hardware ID cannot be modified.

Confirm with **“OK”.**

Off in park position

Click on **“off in park position”** to set the preferences for the VR Drive parking position.

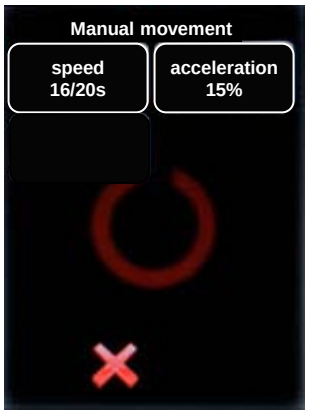

Enter the desired parking position horizontally (“X”) and vertically (“Y”).

For example, to tilt the camera 90° down (for transport), enter:
- X: 0° (or any value)
- Y: -90°

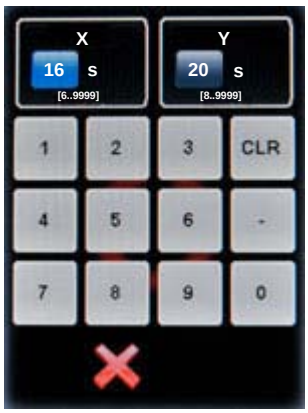
Confirm with **“OK”** or cancel with **“X”.**

## 4.3 Settings (continued)


Click on **„manual movement“** to set the preferences for manual positioning of the VR Drive.




Click on **„speed“**.




Enter the speed of X / Y movement (in seconds).

The standard settings are:

- X: 16s
- Y: 20s

Confirm with **“OK”** or cancel with **“X”**.


Click on **„acceleration“.**

Enter the degree of speed adjustment:

- 1%: slow adjustment
- 100%: fast adjustment

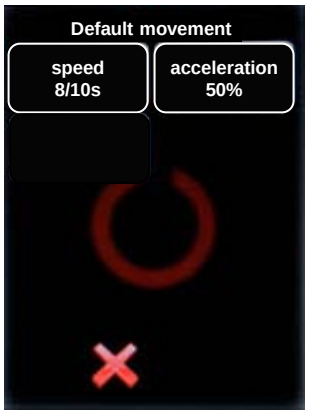
The standard is 15%.

Confirm with **“OK”** or cancel with **“X”**.

The **manual movement** speed and acceleration parameters are used when the VR Drive is moved with the remote radio release or with the touch screen unit for point definition (video mode).

## 4.3 Settings (continued)


Click on „default movement“ to set the preferences for automatic positioning of the VR Drive.




Click on **„speed“**.


Enter the speed of X / Y movement (in seconds).

The standard settings are:

- X: 8s
- Y: 10s

Confirm with **“OK”** or cancel with **“X”**.


Click on **„acceleration“.**

Enter the degree of speed adjustment:

- 1%: slow adjustment
- 100%: fast adjustment

The standard is 50%.

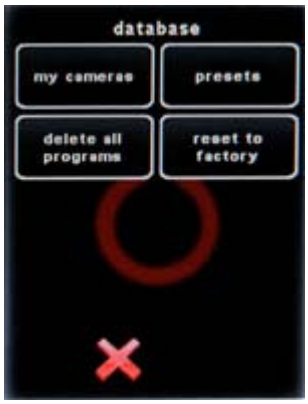
Confirm with **“OK”** or cancel with **“X”**.

The standard movement speed and acceleration is applied when the VR Drive moves from zero position to start a program, back into zero position after a program or from/into a parking position.

## 4.3 Settings (continued)

database

Click on **“database”** to access the database functions of your VR Drive.




The “database” submenu consist of the following functions:

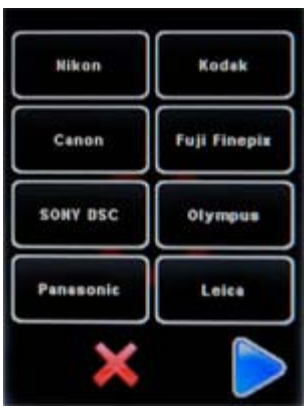
- my cameras
- presets
- delete all programs
- reset to factory

my cameras

Click on **“my cameras”** to display the list of favourite cameras used with your VR Drive.


Add a new camera by clicking the button.

For example for Nikon D700:




Nikon


Nikon D700

## 4.3 Settings (continued)

To **edit** the parameters of a camera, select the **camera.**


Click 


The camera parameters are displayed as follows:


It is possible to edit the sensor size in mm or in pixels.

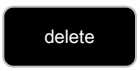
Select **“X (mm)”, “Y (mm)”, “X (pixel)”** or **“Y (pixel)”.**

Enter the new values in mm or pixels.

Confirm with **“OK”.**





To **delete** a camera from the list, select the camera and click 


The camera will still be in the database, but removed from the “favourites” list.

## 4.3 Settings (continued)

To **add a new camera that is not in the database**, select any camera in the list and overwrite its values.


Click 


The camera parameters are displayed as follows:



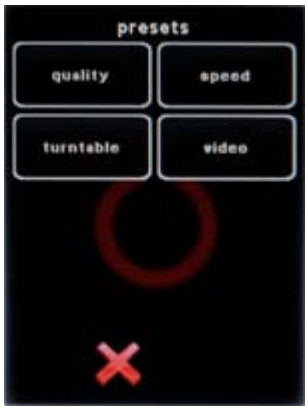

Enter the camera brand, camera type, X/Y (mm) and X/Y (pixel).

Confirm with **“OK”.**




## 4.3 Settings (continued)


Click on **“presets”** to define the parameter preferences of your VR Drive.




The “presets” are grouped by software mode:
- “quality”
- “speed”
- “turntable”
- “video”


Click on **“quality”, “speed”, “turntable” or “video”** to set up the presets.


Click on the preset to modify, for example:


When always using the same camera, it may be more efficient to set the **A-value** to a preset. This way, this value will always be automatically loaded every time a new program is created.

The table on the following page summarises all program parameters created in the **“Wizard”** and loaded as **“presets”** for the different VR Drive modes.

## 4.3 Settings (continued)

The different modes have different **program parameters** defined in the **“Wizard”** as well as loaded as **“presets”:**

| **“Wizard”** | quality | speed | turntable | video |
|---|---|---|---|---|
| Info | ✓ | ✓ | ✓ | ✓ |
| Camera | ✓ | ✓ | ✓ | ✓ |
| Focal length | ✓ | ✓ | ✓ | ✓ |
| A/B value | ✓ | ✓ | -- | -- |
| Angle mode | ✓ | ✓ | -- | -- |
| Angle X | ✓ | ✓ | ✓ | -- |
| Angle Y | ✓ | ✓ | -- | -- |
| Overlap (X, Y) | ✓ | ✓ | -- | -- |
| Rows (elevation, images) | ✓ | ✓ | ✓ | -- |
| Sequence | ✓ | ✓ | -- | -- |

| **“presets”** | quality | speed | turntable | video |
|---|---|---|---|---|
| Speed (X, Y) | ✓ | ✓ | ✓ | -- |
| Release time | ✓ | ✓ | ✓ | ✓ |
| Pause (before, after) | ✓ | -- | ✓ | -- |
| Repeat | ✓ | ✓ | ✓ | ✓ |
| Timer | ✓ | ✓ | ✓ | ✓ |
| Acceleration | ✓ | -- | ✓ | -- |
| Bracketing | ✓ | -- | ✓ | -- |
| Manual | ✓ | -- | ✓ | ✓ |
| Mirror prerelease | ✓ | -- | ✓ | -- |
| Orientation | ✓ | ✓ | ✓ | -- |
| Start position | | | | ✓ |
| Points | | | | ✓ |

## 4.3 Settings (continued)

This table explains all **program parameters**, their units and function:

| | units | function |
|---|---|---|
| info | text | Information on project |
| camera | text | Camera brand + type; used for automatic calculation of rows in “quality” and “speed” mode |
| focal length | mm | For automatic calculation of rows in “quality” and “speed” mode |
| A/B value | mm | Information to determine center and nodal points |
| Angle mode | Cyl/sph/manual | Automatic calculation of rows or manual programming |
| Angle X | degrees | Horizontal angle |
| Angle Y | degrees | Vertical angle |
| Overlap | % | Overlap between images horizontally (X) and vertically (Y) |
| rows | elevation: °<br>images: # | Position of image release in X/Y dimension; for turntable in X dimension only |
| sequence | various | Sets the direction of image release (zig-zag, vertical, snake, center-up, center-down, top-down, bottom-up) |
| speed | seconds | Rotation speed in horizontal and vertical direction |
| release time | seconds | Time during which the VR Drives gives a release signal to the camera |
| pause | seconds | Pause before or after the image |
| repeat | x | Number of times a program is repeated |
| timer | seconds | Delay time before a program sequence is launched |
| acceleration | % | Degree of speed adaptation (1% slow, 100% fast) |
| bracketing | 1x..9x, special | Number of multiple releases per position; special for continuous signal |
| manual | off/on | Manual release of camera in every position |
| mirror prerelease | off/on | Time for release of camera mirror prior to image-taking |
| orientation | CCW, CW | Direction of rotation – counter-clockwise, clockwise |
| start position | degrees | Starting position for video in X/Y dimension |
| points | degrees, seconds, images | For definition of every point in video sweep: X/Y position, speed between points, acceleration (degree of speed adaptation), pause at every point, release of images between points |

## 4.3 Settings (continued)

delete all programs

Click on **“delete all programs”** to remove all programs from your VR Drive.


Confirm with **“next”** or cancel with **“X”.**

After deleting all programs a default program in “quality” mode will be stored as “P1”.

All settings (general (time settings etc.) and database (camera, presets) will remain unchanged.

reset to factory

Click on **“reset to factory”** to remove all programs and reload the default factory settings.

Confirm with **“next”** or cancel with **“X”.**


After deleting all programs a default program in “quality” mode will be stored as “P1”.

The settings (general (time settings etc.) and database (camera, presets) will be created from factory settings.

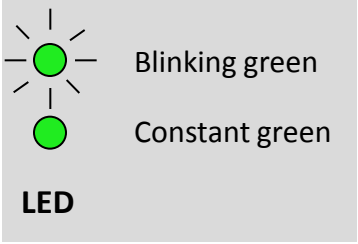
# 5. Maintenance & Warranty

## 5.1 Recharging the VR Drive

The VR Drive is powered by **4 long-lasting rechargeable Li-Ion batteries**. The battery status is indicated permanently on the display. 

**Recharge** it with the universal speed charger supplied with the VR Drive. Connect the charger to a power source (110-220V) and plug the cable into the socket for the charger cable marked with a **"flash"** sign.

The normal recharge time is **6-7 hours** (green blinking LED). As soon as the charging process is complete, the LED changes to constant green.


## 5.2 Transport & storage

When transporting the VR Drive from one location to the next, either **disassemble** the unit and use a bag for transport or make sure to **turn off** the VR Drive into **parking position -90° or +90°.**

When turned off no damage can be done to motor and gears.

**Avoid moving the VR bracket and nodal rail by hand** as this may damage the motors and gears.


If the VR Drive is not used for a longer period of time, use the **shipping box** to store it in a dry and cool place.

The Li-Ion batteries do not have to be drained – they have no memory effect.

## 5.3 Touch screen calibration


When the touch screen positioning becomes less precise, it is possible to calibrate it.

After start-up of the VR Drive, **click anywhere on the touch screen**.

For maximum precision use a sharp item such as a pen.


Click on the **top/left** cross.


Now click on the **bottom/right** cross.


**Click anywhere** on the screen.

Check the touch precision (cross).

If OK, confirm with **“OK”.**
If not, repeat the test by clicking **“repeat”.**


After **“OK”** the VR Drive will start-up with the **“home”** menu.

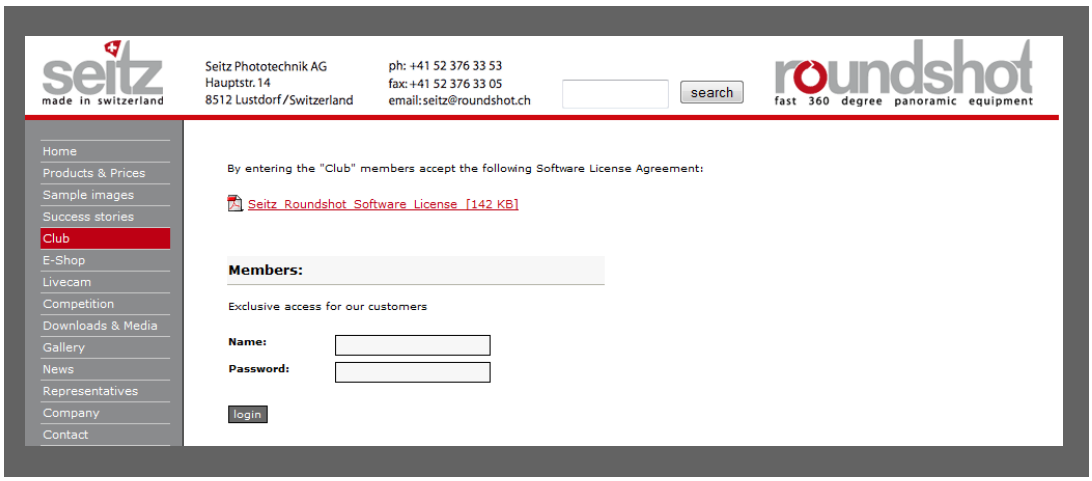
## 5.4 International Warranty

Your Roundshot VR Drive is covered by the international 2-year Seitz warranty. The warranty is linked to the hardware ID (serial number) and is stored in our database.

If there is any malfunction or defect of the equipment we will repair the VR Drive at no cost. The warranty extends to technical defaults that are not caused by careless use, damage by transportation or other defaults not related to the manufacturing of the equipment.

We invite you to register your product with us. Registering your product has several advantages:

- Free access to the latest software downloads and instruction manuals
- Email software update alerts + release notes
- Direct technical assistance in case of a problem




Registering your product is a simple 2-step process:

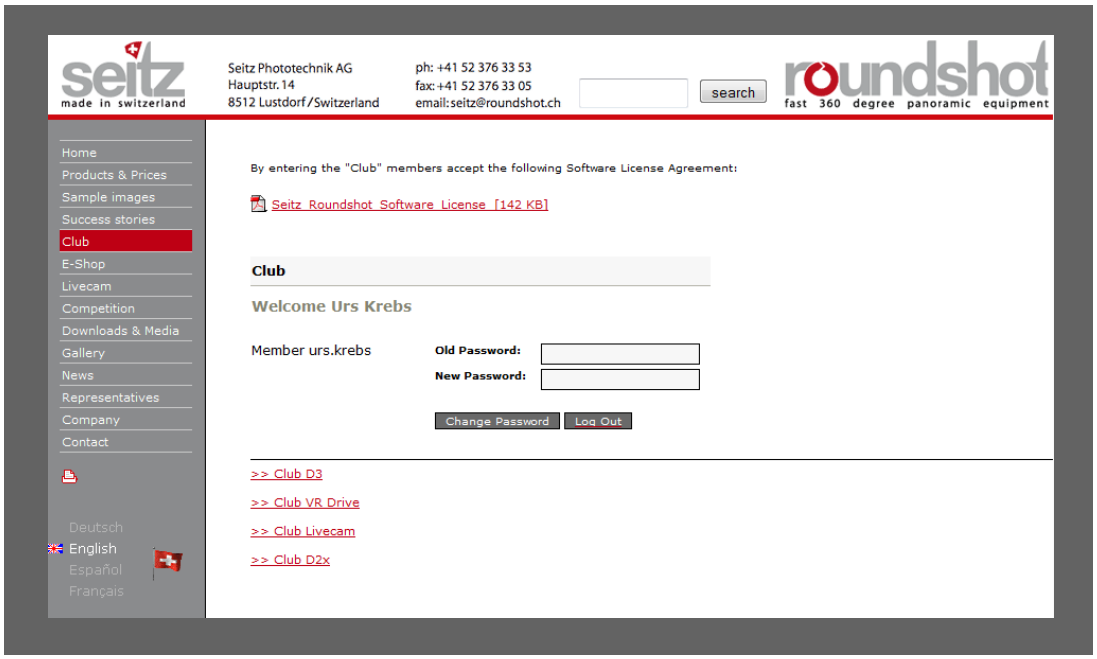
1. Send us an email to seitz@roundshot.ch indicating the hardware ID of your VR Drive as well as where you bought the equipment.

2. We will activate your membership and confirm your “Club” registration by email.

## 5.5 Software update: “Club VR Drive”

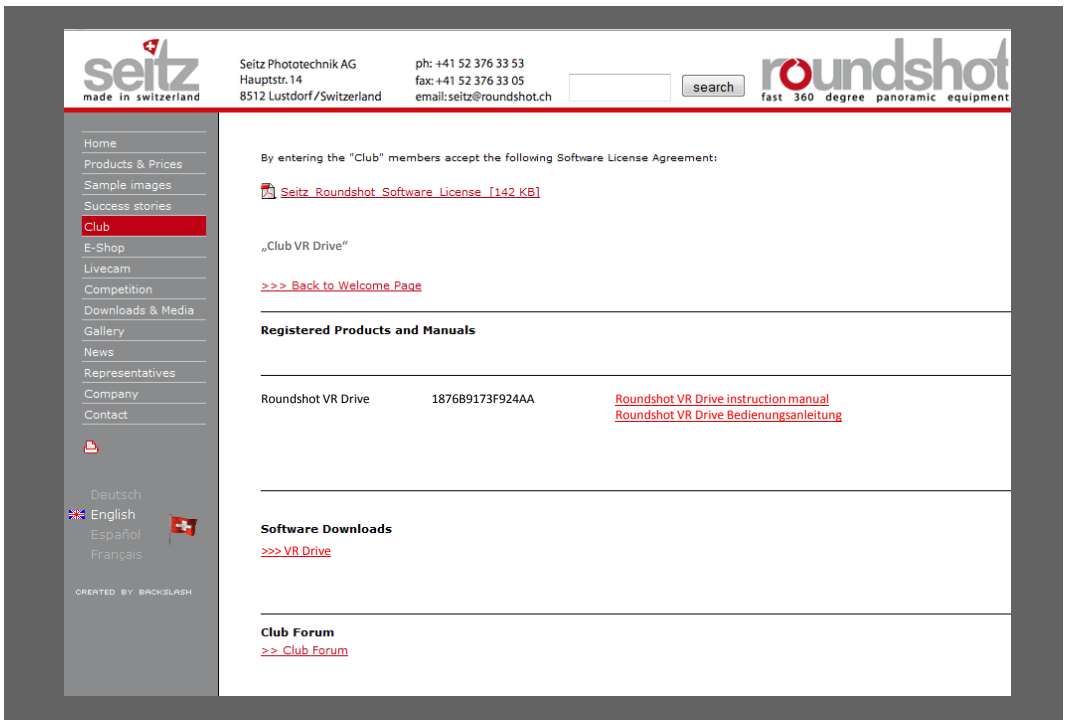
Connect to the “Club” website at www.roundshot.ch.

Please change your password on your first visit.




The **“Club VR Drive”** contains your registered product(s), the **latest instruction manuals** as well as the **up-to-date VR Drive software for download**.

In the **“Club Forum”** it is possible to interact with other VR Drive owners by posting messages or browsing through existing posts.

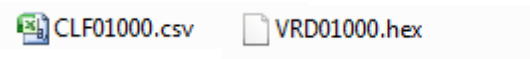


## 5.5 Software update: “Club VR Drive” (continued)

Download the latest VR Drive software from the “Club VR Drive” website.

**Important:** unzip the zipped folder.

The software download consists of two files:




The .csv file contains the **camera database**. As camera brands/models are in continuous evolution, we update the camera database regularly.

The .hex file contains the **VR Drive software**. This software will also be updated to include new features and enhanced useability.

Load these two files on a USB data stick.


**Important:** Due to driver incompatibilities, not all USB data sticks can be used for updating the VR Drive.

For security, we supply a Roundshot USB data stick (capacity: 1 GB) with your VR Drive.

**We recommend that you use the original (and tested) Roundshot USB stick** and keep it with your VR Drive at all times.

**Turn the VR Drive off** by pressing the on/off button during several seconds. The screen will go black.

**Insert the Roundshot USB key** into the USB drive. 


**Start up the VR Drive by pressing the on/off button during several seconds** until the rotating Roundshot icon appears.

This confirms that the VR Drive is now in **software update mode**.

## 5.5 Software update: “Club VR Drive” (continued)

The VR Drive will now load the new software from the USB key.

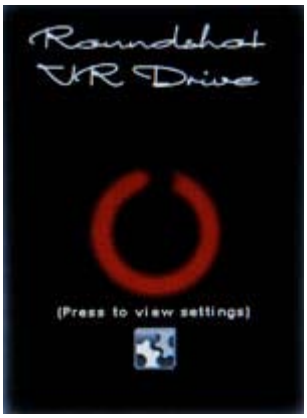
This is confirmed with the status: **“Firmware update / v xx.xxx”.**



Once the software update is complete, the VR Drive will also **update the camera database** if the update file is also loaded on the USB key.

This process is confirmed with the message **“camera data are being loaded”.**






As soon as the camera database upload is finished, the VR Drive will go into normal **start-up mode**.

This is confirmed with the **start-up screen**.

The software updates are now complete.

It is now safe to remove the USB stick.

## 5.6 Upgrades: Adding new software modes

Software upgrades can be ordered after initial purchase of your VR Drive.

They can be ordered from your distributor or directly from Seitz Roundshot on our website www.roundshot.ch.

Once your purchase is confirmed, we will send you a **16-digit key** which is linked to the unique hardware ID (serial number) of your VR Drive. This key activates the software modes.


Click on **“settings”** to access the VR Drive settings menu.


Click on **“general”.**


Click on **“software”**.


Click on **“key”** to display the software key.


Enter the new software key.

Confirm with **“OK”.**


After entering a valid key, the software displays **the available software modes.**

When entering an invalid key, the last valid key will be loaded.

Confirm with **“OK”.**

## 5.7 Return of equipment / recycling

Your Roundshot product and the accessories are produced from highest quality materials and parts and will provide you continued pleasure. Should you nevertheless want to dispose of your Roundshot equipment one day, it should not be placed in normal waste. The correct disposal of your old equipment is a contribution to preventing possible negative causes for the environment.

For optimum recycling we kindly ask you to return us your camera (with accessories) to the following address:

**Seitz Phototechnik AG**
**Environment & Recycling Department**
**Hauptstr. 14**
**8512 Lustdorf / Switzerland**

swico *Recycling-Garantie*
*Garantie de recyclage*

This return shipment to the manufacturer is **free of charge**. The service is available **worldwide**.

Please contact us to arrange the return shipment and prepare the materials for the delivery. Your camera and accessories will be picked up by our courier service and will be recycled in our factory.

We wish you continued success and fun with your Roundshot VR Drive!

## 5.8 Frequently asked questions


**Q: What are the ideal camera settings and accessories?**

A: Ideal settings: manual exposure, manual focus.
Accessories: additional spirit level in the viewfinder shoe for levelling, fast CF storage card (especially for “speed” mode).

**Q: I have a VR Drive “full” but the vertical motor does not respond. What can I do?**

A: Please check if the cables are correctly plugged and if the vertical motor is activated in the software (settings/general/”has y motor: yes”).

**Q: How can I connect the radio release unit?**

A: Insert the radio release unit into the radio socket on the VR Drive.
Activate the radio release signal in the VR Drive software (settings/general/radio on).

**Q: How do I find the nodal point? Is there a database for nodal points for my camera/lens?**

A: There is a simple procedure to set the nodal point for every camera/lens combination. Please follow the instructions in section 3.1. Due to the virtually unlimited combination possibilities of cameras, lenses, focal lengths and focusing distances, it is not possible to provide a database of nodal points.

**Q: How can I load a camera into the list of “my cameras” (favourites) that is currently not included in the factory database?**

A: Go to settings/database/my cameras.
Load any new camera from the database into the “my cameras” list.
Click on the new camera, edit the camera.
Overwrite the parameters: camera, type, X (mm), Y (mm), X (pixels), Y (pixels).
For more information please read chapter 4.3 settings (database/my cameras).

Please contact us by email at seitz@roundshot.ch to report the new camera. We will then include it in the camera database and provide the updated file (.csv) as a download in the “Club VR Drive”. It is then possible to update the factory list of cameras by a software update.

## 5.8 Frequently asked questions (continued)


**Q: Can I replace the batteries of my VR Drive?**

A: This is generally possible but not necessary.
The VR Drive contains 4 powerful Li-Ion batteries that can be recharged using the supplied universal charger.

**Q: How can I update the software of my VR Drive?**

A: Connect to the roundshot website at www.roundshot.ch, log in at the “Club”, go to “Club VR Drive”, download the latest VR Drive software and camera database file. Unzip these files and load them on the Roundshot USB stick supplied with the VR Drive. Follow the instructions in section 5.5. If you do not have a “Club” access, please contact us at seitz@roundshot.ch indicating the hardware ID of your VR Drive as well as where you bought the equipment. We will activate your membership and confirm your “Club” registration by email.

**Q: Can I upgrade my VR Drive with new software modes?**

A: Yes, you can. Purchase the additional software mode(s) through your distributor or directly via the Roundshot e-shop. We will then send you a new software key to activate the new mode(s). Please follow the instructions in section 5.6

# 6. Technical Data

### Technical Data Roundshot VR Drive - generation 2

| | |
|---|---|
| Camera compatibility | any digital camera with shutter release cable or video camera |
| Vertical resolution | camera-specific |
| Dynamic range | camera-specific |
| Lens brands and focal length | any |
| Resolution at 360° | depends on camera, lens, rows and angle |
| File size | depends on camera, lens, rows and angle |
| Min. time for image capture | example speed mode (1 row): 6 seconds |
| Exposure range | camera-specific |
| Exposure control | by camera and optionally by VR Drive (USB) |
| Sensitivity control | camera-specific |
| File format | camera-specific |
| Camera control | VR Drive, Scheduler, timer, radio control |
| Image transfer | flash card on camera |
| Weight | 2.7 kg (VR Drive x-motor, VR bracket, y-motor, motor connection cable, release cable) |
| Dimensions | VR Drive full: width: 230mm, height: 440mm, depth: 70mm |
| Power supply | Li-Ion batteries (rechargeable) |
| Modes | VR quality, speed, turntable, video, HDR |
| Software features | camera information, nodal points, focal lengths, images, image rows, angle of rotation, rotation + positioning speed, ramp speed, bracketing, manual mode, repeat, scheduler, timer, HDR, control points (video) |

*Technical changes reserved.*

# Impressum



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Technical changes reserved
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