

VR-System 6/8

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NOVOFLEX

Tip

The interactive presentation of the cubical panorama on the front page of this manual can be seen in the internet at www.pixelmagazin.de/beetle

Information

For more information, advice and tips concerning our products contact your photo dealer, the distributor of NOVOFLEX products in your country (have a look at "Where to buy" section at our website to find your distributor) or visit our website: <http://www.novoflex.com>

For personal advice about possible accessories which is suitable for your NOVOFLEX product please contact the following phone number or send us an e-mail.

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USER MANUAL



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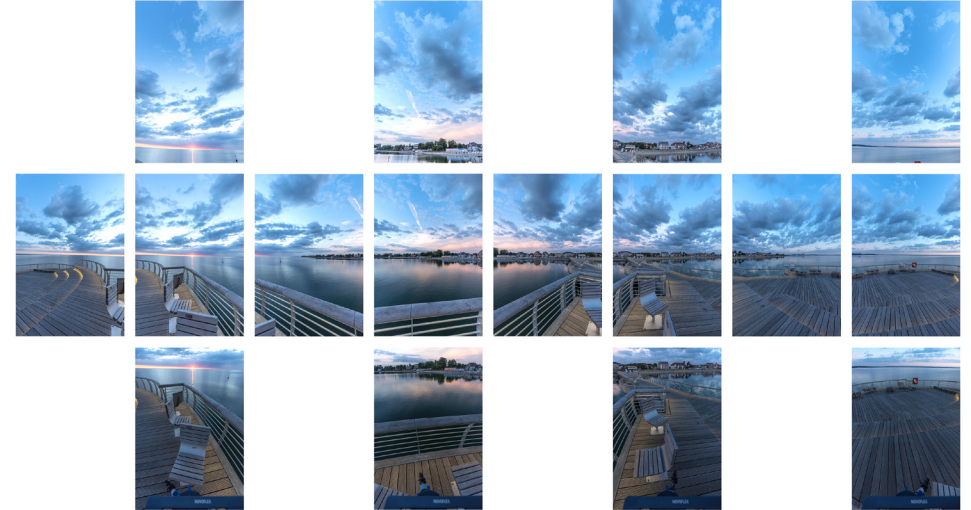
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Example: Interactiv spherical panorama for a website



Interactive presentation see www.pixelmagazin.de/niendorf



Above:

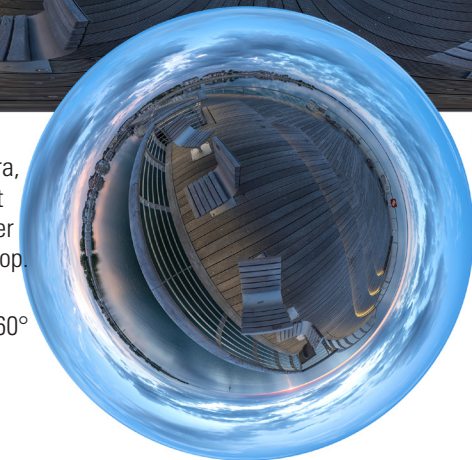
16 single frames, full frame camera, 16 mm wide angle lens. Increment selector lever at 8, upper and lower row taken at every second click-stop.

Middle:

Result in spherical presentation 360° x 180° field of view.

Below:

"Little Planet" presentation



Used software:
PTGui,
Pano2VR,
Photoshop

Tip

Don't take large charts with you when you go out taking pictures, but narrow them down to the information you really need. This is the value for the lower scale on the L-bracket (5) (depending on the camera you are using), the value for the upper scale (9) on the blue clamping plate (depending on the lens you are using) and the increments for all your favorite lenses. It is very useful to write down this information on a small label and place it on the angle bracket or tripod.

Step 6

Camera settings:

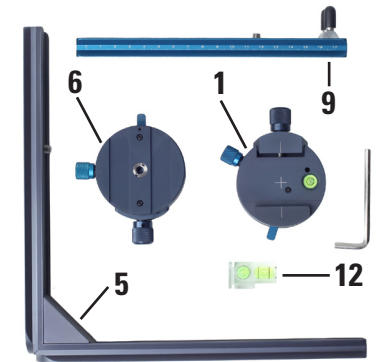
- For best quality, standardize the exposure in each single frame, meaning choose manual exposure mode. When it is not possible, because the intensity of light varies between the single exposures strongly, consider the HDR technique using autobracketing with your camera.
- The optimal f-stop is located between f8 and f11. In this range you have enough depth of field and fewer problems with vignetting of the lens (dark corners).
- Place the focus on the main subject of the scene. Then turn off the auto focus system.
- Use a fixed white balance such as sunny, cloudy etc. (don't use automatic white balance, otherwise you will have frames with different colors). When taking the pictures in RAW format you can match the white balance afterwards also.
- In the case of longer exposure time, we recommend using a remote cable and - if possible - the mirror lockup or live-view function of your SLR camera. Please refer to your camera's manual.

Last checkup in front of the scene:

- System leveled to the horizon (verify with the spirit level on the lower panning base)?
- Set panning angle (increment), depending on the focal length?
- Correct values on the lower and upper scale?
- Set fixed white balance (e.g. sunny)?
- Manual exposure mode?
- Correct exposure (f-stop in the middle range, corresponding exposure time)?
- Focused on the main subject of the scene?
- Auto focus system turned off?

Scope of delivery

- 1 Lower panning base **PANORAMA=Q 6/8 II**
- 5 Clamping plate **QPL-VR PRO** in L-shape
- 6 Upper panning base **PANORAMA VR II**
- 9 Clamping plate **QPL-PANORAMA**
- 12 **Spirit level** for flash shoe
- + User manual
- + Allen key®



Nomenclature

- 1 Lower panning base **PANORAMA=Q 6/8 II** with 360 degree engraving
- 2 Lower locking screw
- 3 Lower angel locking screw
- 4 Increment selector lever (4 different settings possible + stepless operation)
- 5 Clamping plate **QPL-VR PRO** in L-shape with 150/180 mm scaling
- 6 Upper panning base **PANORAMA VR II** with 2 x 180 degree engraving
- 7 Upper locking screw
- 8 Upper angel locking screw
- 9 Clamping plate **QPL-PANORAMA** with scaling 180 mm and end stop
- 10 End stop screw
- 11 Camera screw
- 12 **Spirit level** for flash shoe

Accessories

- A digital camera (ideally a full-featured SLR with a fisheye- or super wide angle lens)
- A stable tripod (recommended: Novoflex **TrioPod** or **TrioBalance**)
- A ball head (recommended: Novoflex **ClassicBall** or **MagicBall**), a 3-way head or a leveling device (recommended: Novoflex **MagicBalance**)
- A Windows™ PC or Mac™ (ideally a current computer with a lot of RAM and a large hard disk)
- A stitching software, which is able to deal with multirow panoramas and fisheye lenses such as PTgui™ or PanoramaStudio Pro.

Safety notes

- Before starting up, read this safety notes carefully. Pay attention to warnings and advices in this instruction. When selling or passing on your Panorama VR-System 6/8, hand over this manual also by all means.
- **Never move** your Panorama VR-System 6/8 **with mounted camera**. The assembly of the camera is always the last step in front of the scene.
- **Never open any screw, while not securing the camera** with the other hand!
- When working on the upper panning base, **always hold the camera in one hand**, while making adjustments with the other hand.
- When installing a mounting plate pay attention, that **both clamps** of the quick release are **grabbing** at the profile of the plate. The easiest way to check this, is to exert pressure on the camera slightly, while verifying if the camera moves.
- The upper and the lower panning bases have safety pins, to prevent inadvertent dropping of the equipment. However, this only works when the locking screws are open less than a half turn. When sliding the mounting plates (e.g. to set up nodal point adjustments) **don't open the locking screws** (2 respectively 7) completely, but **only a fourth turn**. This is enough for a comfortable and safe handling of the plates.
- Both panning bases have additional headless screws for an anti-twist assembly. In order to use this screws, turn the base in the 0° angle position and use the small Allen key® (in the scope of delivery) by inserting it from above in the hole near the spirit level. By turning the Allen key® in a clockwise direction, the headless screw will be pressed against the device mounted below. In this way, the base gets stuck on the device and will not disassemble when doing a left panning in front of the scene.



Increment recommendations:

Here we have listed the most common settings for creating a complete spherical panorama (360 x 180° field of view). They should only be used as a rough template. With experimentation you can easily find your own optimized settings.

Equipment 1

Camera with full frame sensor and 12 mm or 15 mm fisheye lens or camera with a sensor in APS-C size and 8 mm or 10 mm fisheye lens

6 frames every 60° (setting 6 at the lower lever)
plus 1 picture of the zenith and 1 picture of the nadir.

Equipment 2

Camera with full frame sensor and 17 mm fisheye lens or camera with a sensor in APS-C size and 15 mm fisheye lens

8 frames every 45° (setting 8 at the lower lever)
plus 1 picture of the zenith and 1 picture of the nadir.

Equipment 3

Camera with full frame sensor and 16 mm up to 20 mm wide angle lens or camera with a sensor in APS-C size and 10 mm up to 12 mm wide angle lens

8 frames every 45° (setting 8 at the lower lever)
plus 4 frames vertical +50° every 90° (setting 8 / 2 clicks)
plus 4 frames vertical -50° every 90° (setting 8 / 2 clicks)
plus 1 frame of the zenith and 1 frame of the nadir.

Equipment 4

Camera with full frame sensor and 24 mm wide angle lens or camera with sensor in APS-C size and 15 mm wide angle lens

10 frames every 36° (setting 10 at the lower lever)
plus 8 frames vertical +60° every 45° (setting 8)
plus 8 frames vertical -60° every 45° (setting 8)
plus 1 frame of the zenith and 1 frame of the nadir.

Terms

The size of a **full frame sensor** is about 24 mm x 36 mm. This is the size of the analog standard 35 mm film.

The sensor in **APS-C format** is smaller. Sensor sizes range from 20.7x13.8 mm to 28.7x19.1 mm.

When shooting the **zenith**, the camera is tilted up vertically +90°, when shooting the **nadir** the camera is tilted down vertically -90°.



Shooting the zenith

Experimental increments determination

Not having your increments table at hand in front of the scene, you can determine the horizontal panning angle by trial and error visually. Search for a remarkable object in the right area of the view-finder. Pan the system clockwise to the next click-stop. When you see the object now in the left area of the view-finder, the selected increment was right. If you don't see the object, the increment was too large, select a smaller one (greater number n) and try again. Try "multi-clicks" as well. When using too small increments, the object will appear not in the left, but rather in the middle area after panning clockwise. Try a larger one (smaller number n).

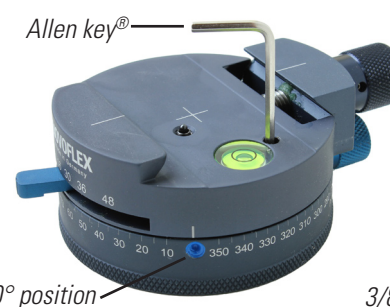


Define a vertical tilting angle

When taking a multi-row panorama you tilt the camera around a specific vertical angle between the single rows, using the upper rotator PANORAMA VR II (6). This rotator has the same increments like the lower panorama base. To estimate the distance between the rows, look through the viewfinder while tilting your system through the scene. The overlap of two rows should also be at least 20%. Always use a constant tilting angle between all rows. Characteristic values are 30° when using a 35 mm lens or 50° when using a 17 mm wide angle lens on a full-frame camera.

Tip

Dependent on the applied camera-lens combination it might be useful to use step less operation at the upper rotator (6), meaning set the lever to the 0 position. In this case you can set up vertical angles not having a click-stop quick and effective with the help of the engraved angle scale.



Please keep in mind, that the use of the headless screw can damage the device below the panning base a little. Therefore do not tighten the headless screw too much. When dismantling the base afterwards, you have to unloose the headless screw first!

In order to connect the lower panning base to your tripod, ballhead, tripod head or leveling device, use the center 3/8" drilling hole. The silver-colored insert is an adapter to the smaller 1/4" thread, which can be removed if needed.

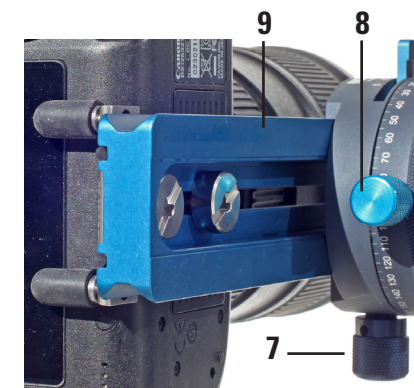
- The lower **angle locking screw (3)** should **be open** any time, except when you are working in the step less mode and want to fix the current position. **Never turn the system by force when the lower angle locking screw (3) is tightened. This could damage your Panorama VR-System 6/8.**

Tip

If you are exclusively working with click-stops, you can remove the lower locking screw (3) permanently. In this case the screw can not intrude into the picture. This is important when you are working with an extreme fisheye lens.

Advice

To avoid confusion all locking screws (2 and 7) are grey and all angle locking screws (3 and 8) are blue anodized. When installing the blue clamping plate (9), we recommend to turn the upper panning base, that the locking screw (7) is in the lower position (see fig. right). By doing so, you avoid quick access to the locking screw, which is an additional protection against inadvertent opening of the screw.



Upper panning base PANORAMA=Q VR II

Basic assembly

Upper panning base:

Start your assembly by connecting the upper panning base PANORAMA=Q VR II (6) to the leg (with scale 0-18) of the L-bracket QPL-VR PRO (5). Use the guide rail system on the backside of the panning base and the inner surface of the L-bracket for precise alignment (see fig. on the right).

Make sure, that the 0° mark of the scale is heading upwards.

Choose a relatively high position at first. You can fix the optimal height afterwards with mounted camera and preferred lens. Tighten the screw with the Allen key® or a coin.



Mounting the clamping plate (9) beneath your camera:

In the optimal position of the camera on the blue clamping plate QPL-PANORAMA (9) the front lens respectively the hood is mounted in line with the front edge of the clamping plate or (when using an extreme fisheye lens) protrudes maximal 1 or 2 mm over the edge. The plate should not be seen in the viewfinder.

Remove the transportation lock (rubber ring) from the camera screw before finally assemble the camera. Otherwise it is not assured that the camera fits correctly.



The **adjustable end stop** (see red arrows above) enables a parallel course of the clamping plate to the optical axis and allows a reproducible positioning of the camera on the plate.

You can fix the adjustable end stop in front **or** behind the camera, depending on the external shape and dimensions of the camera body and lens. In the illustration above you see both possibilities. Some camera bodies allow only one option.

Although your PANORAMA 6/8 II panning base has only 4 selectable increments (due to small dimensions and low weight) you can use all required increments by counting the clicks up to a focal length of 160 mm (on a full-frame camera). The first three increments (6, 8 and 10) are optimized for wide angle lenses and can be used without counting the clicks. The last setting (48) can be used for focal lengths above 25 mm (referred to a full-frame camera). Here you have to count the clicks when using focal lengths between 26 mm and 65 mm.

Recommended horizontal increment and adjustment at lever (4) when using focal distances over 25 mm

focal length full-frame sensor	focal length sensor APS-C size	increment in °	exposures per 360° turn n	adjustment at lever
26-30 mm	17-19 mm	30	12	48 (4 clicks)
31-44 mm	20-28 mm	22,5	16	48 (3 clicks)
45-65 mm	29-41 mm	15	24	48 (2 clicks)
66-160 mm	42-56 mm	7,5	48	48 (1 click)

Example:

You are using a full frame camera and a 50 mm lens (referred to a camera with sensor in APS-C size and an 32 mm lens). Set up the value 48 at the lever and take the pictures at every second click stop.

Tip

When using a camera, whose sensor size is not listed in the table, convert the focal length into the full-frame value using the cameras "crop factor". After that, use the column for full-frame sensor in the table.

This panoramic head can also be used without click-stops (setting 0 at the lever = step less operation). This is useful when using longer focal distances. In this case you can estimate the panning angle using the angle scales engraved on the lower and upper panning base. Also multi row operation is possible just like that.

Recommended horizontal increment and adjustment at lever (4) when using focal distances up to 25 mm

focal length full-frame sensor	focal length sensor APS-C size	increment in °	exposures per 360° turn n	adjustment at lever
Fisheye 8-12 mm	Fisheye 4-7 mm	90	4	8 (2 clicks)
Fisheye 13-16 mm	Fisheye 8-10 mm	60	6	6
14-21 mm	8-14 mm	45	8	8
22-25 mm	15-16 mm	36	10	10

Example:

You are using a full-frame camera and a 24 mm lens (corresponds roughly to a camera with APS-C sensor size and 15 mm lens). According to the table you set up the value 10 with the lever and take the pictures at every click-stop.

Advice

As shown above the table differs between fisheye lenses and normal wide angle lenses. This is important, because a fisheye lens has a larger field of view compared to a normal wide angle lens with similar focal length. However the distortion is not corrected at a fish-eye lens, which leads to curved reproduction of objects located at the edge of the picture.

Tip

Leading stitching software like *PTGui* or *PanoramaStudio PRO* can deal with fisheye distortion and correct it when working out the final panorama. However, the information if a fish-eye- or normal wide angle lens was used when taking the pictures has to be transferred by the user manual afterwards, because it is not written in the EXIF-Data of the exposures.

Camera / lens parameters

☐ Automatic (use EXIF data from camera, if available)

Lens type: Full Frame Fisheye

Focal length: 15 mm Focal length multiplier: 1,005 x

Screenshot PTGui

More increments by counting the "clicks"

When taking the pictures not at any snap in, but at every second, third or fourth "click-stop", you have notable more selectable increments available. Here's an example: The increment of $n=24$ (15°) can be achieved by selecting $n=48$ ($7,5^\circ$) with the increment selector lever and taking the pictures at every second stop.

Now install your camera with mounted lens on the blue clamping plate (9) in the optimal position and slide the adjustable stop end to the housing. After that tighten the camera- (11) and stop end screw (10) with Allen key® or a coin.

Advice

In the event the front lens or hood of a wide angle- or fish-eye lens contacts the upper clamping plate, then don't tighten the camera screw. This would exert strong pressure on the camera body and may damage your camera or lens.

In this case, a spacer plate, such as the NOVOFLEX PLATTE-U (see fig. on the right) is required. Alternatively use a battery grip. The problem only appears with compact DSLR's such as the EOS Rebel T2i or T3i and others in combination with a large front lens. Professional camera bodies are higher and not affected.



Tip

The systems L-bracket **QLP-VR PRO (5)** can be disassembled for transport.



The assembly of the remaining system should always be done from the bottom to the top:

- Set up your tripod and pay attention to a safe stand. When using a leveling device beneath your system you don't have to level your tripod.
- Level the lower panning base (1) with the horizon. Watch the spirit level on the plate and level the system by the ball head or leveling device beneath.

- The assembly of the clamping plate QPL-VR PRO in L-shape (5) has to be done principally **without camera**. Check the stability after tightening the lower locking screw (2). Pay attention, that both clamps of the quick release are grabbing at the profile of the plate.
- The last assembly step is to install the blue clamping plate (9) completely with the premounted camera into the quick release of the upper panning base (6). Check the stability after tightening the upper locking screw (7). Pay attention that both clamps of the quick release are grabbing at the profile of the plate and make sure, that the blue angle locking screw (8) is locked.



The L-bracket (5) and the upper, blue clamping plate (9) are shiftable along the X- and Y-axis. Both plates have scales on their sides to mount them in reproducible positions.

To avoid a parallax effect between the single shots, you mount the camera in a specific position, so that the centre of rotation is in the centre of the entrance pupil of the lens. This point is also called "nodal point", "no parallax point" or "optical centre".

Preparatory steps - finding the nodal point

The position of the entrance pupil "nodal point" depends on the camera-lens combination and - when using a zoom lens - on the focal length you use. Therefore you should try to find the position of the nodal point of all lenses you will use and write them down. When taking the pictures later, you only have to transfer the values to the scales on the clamping plates before you start shooting.

Tip

The parallax problem (meaning the shifting between fore- and background) when using a fisheye- or super wide angel lens appears especially in short distances below 1 m (39 inch) e.g. interior of a car or refrigerator etc. Here you should work with a precisely adjusted panoramic head by all means. Please have in mind that you have to find the exact position of the entrance pupil of your lens only once. Therefore you should invest a little more time in this procedure. A precisely adjusted panoramic head saves hours of work on the computer afterwards!

Step 4

Install the blue clamping plate (9) - including premounted camera - into the quick release of the upper panning base (6):

Use the scale on the blue clamping plate (9) and the value you have found (see last chapter "Finding the nodal point, preparatory step 3") to position the clamping plate on the right spot, which depends on the lens you use.

Step 5

Define the horizontal panning angle "increment":

In each row you rotate the system horizontally with the lower panning base (1) around a specific angle, which can be set at the blue increment selector lever (4). This angle depends on the wanted overlap, the camera you use (crop factor) and the focal length.

Optimised for fisheye lenses your VR-System 6/8 enables horizontal and vertical rotation around the nodal point of the lens with the lower (1) and upper (6) click-stop-panorama base.

Increments of 7,5° (setting 48), 36° (setting 10), 45° (setting 8) and 60° (setting 6) as well as step less rotation (setting 0) can be set up. To change the panning respectively tilting angle set up the corresponding value on the increment selector lever (4).



Lower panning base
PANORAMA-Q 6/8 II
with bubble level

Advice

Click-stops are mechanically angle step presets. They enable accurate, fast and comfortable positioning. Just move the equipment between two single frames to the next click-stop. Make sure that the lower angle locking screw (3) is open when working with click-stops.

The value 0, 6, 8, 10 and 48, which can be set up with the increment selector lever (4) means the number of "stops" for a complete 360° turn. A value of 8 for example means 8 stops every 360°/8 = 45°.

For wide angle- and fisheye lenses the values 10, 8, and 6 are optimal. These settings are suitable when using focal lengths from 25 mm down to 8 mm based on a camera with a full frame sensor.

The following table is based on an overlap of 20-50% between two single shots and shows the recommended adjustment of the increment selector lever (4) as a function of the camera (full-frame or APS-C sensor size) and the focal length of the lens in mm.

When panning again you will notice that the movement of the lines will either be stronger or weaker. In the last case you shifted the clamping plate in the right direction.

Repeat the procedure until the vertical lines don't move (see fig. 3+4).

Now the whole system is panning in the entrance pupil of the lens. Write down these settings for future exposures with this camera-lens-combination. For this purpose read off the values given by the indicator scale at the blue clamping plate (9) (see fig. right). Repeat this testing for all lenses you will use.

Keep in mind

When using a zoom lens, you have to find out the nodal point for each focal length separately.

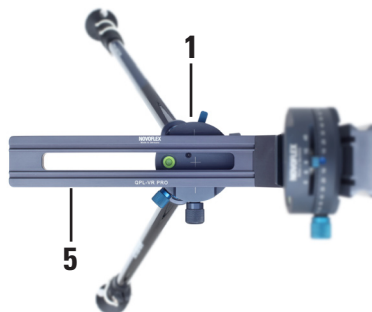
Field use

Step 1

Transport:

Common practice is to transport the equipment separated in three parts:

- Part 1: Tripod with mounted ball head and lower panning base (1)
- Part 2: L-bracket (5) with upper panning base (6)
- Part 3: Camera mounted on clamping plate (9)



Step 2

Level the lower panning base (1) with the horizon:

Set up your tripod and pay attention to a safe stand. You don't have to align the tripod. Watch the bubble level on the base and level the system by the ball head beneath.

Step 3

Fix the L-bracket (5) on the quick release of the lower panning base (2):

Use the lower scale on the L-bracket (5) and the value you have found (see last chapter "Finding the nodal point, preparatory step 2") to position the clamping plate on the right spot, which is dependent on the camera you use.



Preparatory step 1

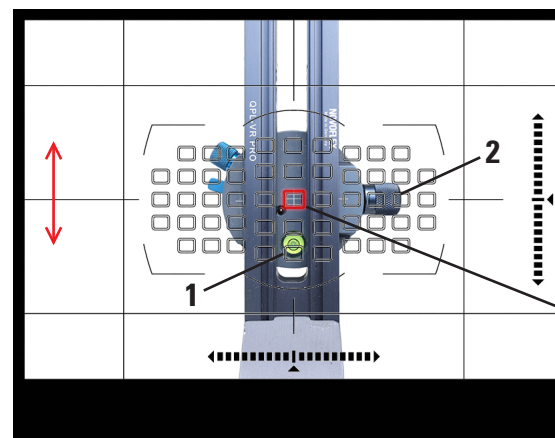
Assemble all components of your system

Use the method as described in the last chapter. Set up your tripod and pay attention to a safe stand. You don't have to align the tripod. Level the lower panning base (1) with the horizon. Watch the bubble level on the plate and level the system by the ball head beneath.

Preparatory step 2

Side-to-side adjustment: Move the camera into the pivot axis of the tripod head

- Bring your camera in the position shown on the right, while paying attention to the safety references. Observe the spirit level (12) on the flash shoe of your camera. Open the blue angle locking screw (8), position your camera facing straight downwards and tighten up the screw again.
- Look through the viewfinder of your camera, open the lower locking screw (2) and slide the L-bracket (5) back and forth until the centre autofocus point is aiming at the white cross on the lower panning base (mark for the rotation axis), see illustration below. After that, tighten up the lower locking screw (2) and write down the value given by the indicator scale at the L-bracket (5) for future exposures with this camera body.



Look through the viewfinder of the camera

The centre autofocus point is now aiming at the rotation axis (white cross)

Preparatory step 3

Forward-Backward Adjustment

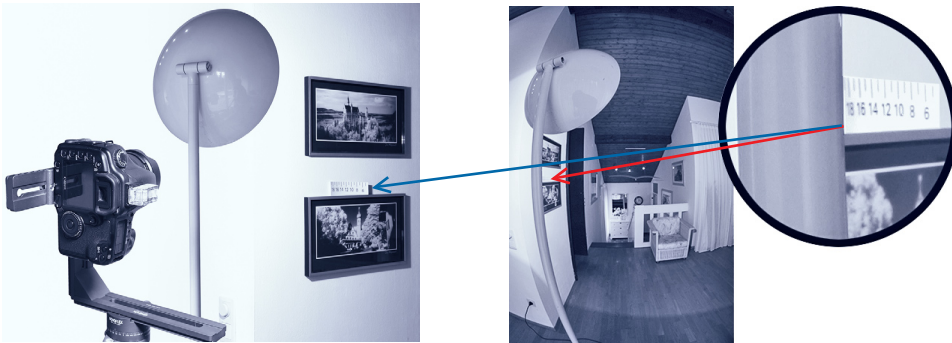
Bring the camera now into a precise vertical position. For this purpose use the blue upper angle locking screw (8) and observe the spirit level (12) on the flash shoe.



In the following, you need a one-time set-up for testing. This set-up, which can be easily done at home, should have vertical lines in the foreground as well as in the background.

Find a vertical edge or line, such as a floor lamp, which is located in the foreground and bring it in line with a vertical object in the background e.g. a picture on the wall or a door frame. You may have to move the tripod for this purpose.

Now pan the camera horizontally from right to left and back while looking through the viewfinder. Observe if the objects move to each other or stay together.



Tips

Even with fisheye lenses, as seen above, the parallax effect isn't clearly visible in the viewfinder. This is caused by the typical linear distortion and the small details, due to the extreme large field of view. Here's therefore some useful knowledge relating to practice:

- If possible, use the same settings for aperture and focus as you will do it afterwards when taking the pictures in front of the scene. For a spherical panorama in close-up range this could be f-stop 11 and focus 0.6 m (2 feet).
- Place the vertical object in the foreground as close as possible in front of the camera but make sure that it could be seen sharp together with the background in the viewfinder. Therefore use the depth of field preview button on your camera.

- A scale in the background is very helpful (e.g. ruler on the picture frame, see fig. below). The object in the foreground could act as a pointer. However the minimal shifting of the vertical lines isn't clearly visible in the viewfinder. Therefore you should take pictures for testing and display them on your PC.
- When using a camera with zoomable LiveView function, that could be used together with the depth of field preview function, you can directly read off the numbers of the background scale in the display of the camera.

Now pan the camera from right to left and back while looking through the viewfinder. Observe if the objects move to each other (see fig. 1+2) or stay together (see fig. 3+4).

Here: When I panned the camera to the right, the floor lamp moved to the left (fig. 2). The "pointer", the floor lamp, now shows another number on the background scale. This is an indication of rotating outside the nodal point of the lens.

Now set another distance on the blue clamping plate (9).

