

## 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/audi-tt-2016](http://www.pixelmagazin.de/audi-tt-2016)

## 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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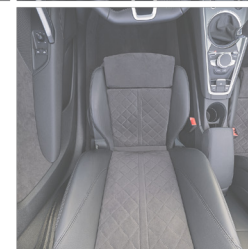
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# VR-System PRO II

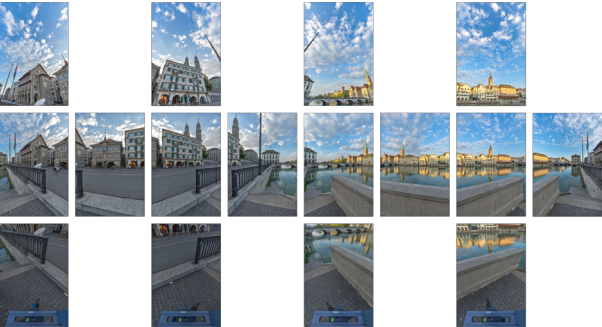
## USER MANUAL



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# Examples: Interactive spherical panoramas for a website

Here and below: 16 mm wide-angle lens on a full-frame camera



Used Software:

- PTGui,
- Pano2VR,
- Photoshop





## Optimizing the system for spherical panoramas with fisheye- and super wide angle lenses

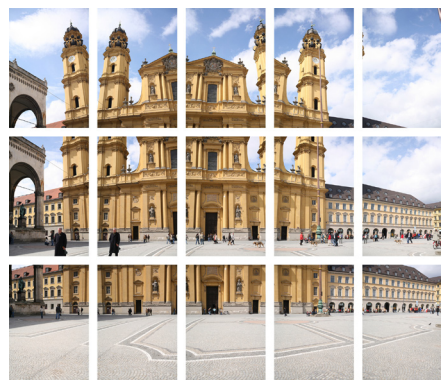
By replacing the lower panorama plate, your Panorama VR system PRO II can be converted. For this the PANORAMA = Q PRO II (10) is replaced by the PANORAMA = Q 6/8 II (not included in delivery, sold separately). Except for the missing cut-out on the back, this panning base is identical to your PANORAMA VR II (5).

In this version, the system is especially optimized for spherical panoramas with fisheye and super wide-angle lenses due to the smaller size and large click stops.



PANORAMA=Q 6/8 II

## Examples: Flat Panoramas with perspective compensation



Here: 40 mm lens on a full-frame camera.

Used Software:  
PTGui



## Scope of delivery

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



## Nomenclature

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

## Recommended accessories

- A digital camera (ideally a D-SLR or mirrorless system camera with interchangeable lenses with focal lengths between 8 and 200mm in terms of full frame)
- 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 possibly 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 PRO II hand over this manual also by all means.
- Never move your Panorama VR-System PRO II 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 (7 respectively 12) completely, but only a fourth turn. This is enough for a comfortable and safe handling of the plates.



- 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 cameras 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 (nodal point adjustment)?
- 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?

### Fine adjustment

To maximize the stability of the entire system the upper panning base should be positioned as low as possible, but allow the camera to swing through, with the longest lens in nodal point position mounted. This is important for shooting the zenith for a spherical panorama.

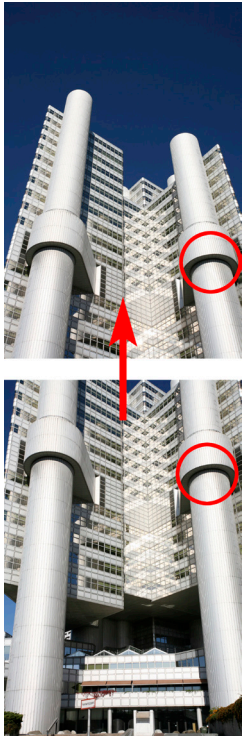
At the backside of the upper panning base PANORAMA VR II (5) (see fig. on the right) and the inner surface of the L-bracket (9) there is a guide rail system. Due to this you can shift the panning base up and down without new side adjustment. Mount the camera with the lens, that has the longest nodal point distance and set up this nodal point distance. Open the fixing screw with an Allen key® or coin, shift the panning base to the optimal height and tighten the fixing screw again.



### Advice

When doing the adjustment, ask a second person for help by all means! Open and tighten the fixing screw, while your assistant is holding the camera safe from falling.





## Step 6

### Define a vertical tilting angle

When working with multi-row panoramas, set the vertical tilting angle between two rows on the upper panning base PANORAMA VR II (5). This angle can be easily estimated in front of the scene by looking through the viewfinder and simultaneously tilting the camera up or down. Again, the rows should overlap by at least 20%. You can read this directly at the engraved, lateral 2 x 180 ° scale.

Always use a constant tilting angle between all rows. Typical values are 20° for a 50 mm lens or 45° for a 17 mm lens equivalent of a camera with full frame sensor.

Like the lower panning base (10), the upper panning base (5) has click stops too. You can choose between 45° (setting 8), 60° (setting 6), 36° (setting 10), 7.5° (setting 48) or stepless (setting 0). To change the tilting angle set up the corresponding value on the selector lever (8).



## Tip

Don't take large charts with you, when you go out taking pictures, but narrow them down to the information you really need on location. This is the value for the lower scale on the L-bracket (9) (depending on the camera you are using), the value for the upper scale on the blue clamping plate (2) (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 7

### 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).

- The lower angle locking screw (11) 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 (11) is tightened. This could damage your Panorama VR-System PRO III!

## Advice

To avoid confusion, the upper locking screws (7) is grey and the angle locking screws (6) is blue anodized. When installing the blue clamping plate (2), we recommend to turn the upper panning base (5), that the locking screw (7) is in the lower position (see fig. left). Hereby, you avoid quick access to the locking screw, which is an additional protection against inadvertent opening of the screw.



Lower panning base  
PANORAMA-Q PRO II

## Basic assembly

### Upper panning base

Start your assembly by connecting the upper panning base PANORAMA VR II (5) to the long flank (with scale 0-18) of the L-bracket QPL-VR PRO (9). 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.

Scale shows 0° heading upwards



### Mounting the clamping plate beneath your camera

In the optimal position of the camera on the blue clamping plate QPL-PANORAMA (2) 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.



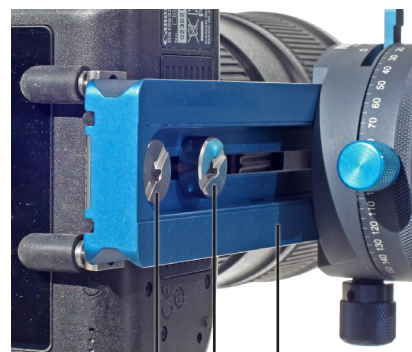
The adjustable end stop (4) enables a parallel course of the clamping plate to the optical axis and allows a reproducible positioning of the camera on the plate.

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 on page 4 you see both possibilities. Some camera bodies allow only one option.

Now install your camera with mounted lens on the blue clamping plate (2) in the optimal position and slide the adjustable end stop to the housing. After that tighten the camera- (3) and end stop screw (4) with the Allen key® or a coin.

In the event the front lens or hood of a wide angle- or fisheye lens contacts the clamping plate (2), 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 NOVO-FLEX PLATTE-U (see fig. on the right) is required. Alternatively use a battery grip or a quick release unit like the NOVOFLEX Q=MOUNT Mini D on the clamping plate. The problem only appears with compact DSLR's such as the Canon EOS Rebel T7 or SL2 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 (9) can be disassembled for transport.



## Guide values for various focal lengths and cameras

### Recommended increments using cameras with APS-C sensor size (crop 1.5)

Focal length	No. of shots for a 360° turn	Increment (panning angle)	Overlap
10 mm	8	45°	38.66 %
12 mm	8	45°	29.32 %
14 mm	10	36°	35.76 %
17 mm	12	30°	36.61 %
20 mm	12	30°	26.57 %
22 mm	16	22.5°	39.87 %
24 mm	16	22.5°	34.76 %
28 mm	18	20°	32.88 %
35 mm	24 (48/2)	15°	37.57 %
40 mm	30	12°	43.12 %
50 mm	30	12°	29.20 %
60 mm	48	7.5°	44.85 %
70 mm	48	7.5°	38.27 %
85 mm	48	7.5°	25.14 %
100 mm	72	5°	41.31 %
105 mm	72	5°	38.42 %
120 mm	72	5°	29.67 %
135 mm	72	5°	20.88 %

### Recommended increments using cameras with full frame sensor

Focal length	No. of shots for a 360° turn	Increment (panning angle)	Overlap
12 mm	6 (12/2)	60°	33.33 %
14 mm	6 (12/2)	60°	26.10 %
16 mm	8	45°	38.94 %
20 mm	8	45°	27.30 %
24 mm	10	36°	32.20 %
28 mm	12	30°	35.34 %
35 mm	16	22.5°	40.47 %
40 mm	16	22.5°	32.63 %
50 mm	18	20°	25.92 %
60 mm	24 (48/2)	15°	33.62 %
70 mm	30	12°	38.14 %
85 mm	30	12°	25.32 %
100 mm	36 (72/2)	10°	26.95 %
105 mm	36 (72/2)	10°	23.31 %
120 mm	48	7.5°	34.32 %
135 mm	48	7.5°	26.18 %
140 mm	48	7.5°	23.46 %
160 mm	72	5°	41.72 %
180 mm	72	5°	34.46 %
200 mm	72	5°	27.21 %
220 mm	72	5°	19.87 %

### Tip

When requiring an increment not on the increment selector knob, use the half click-stopped angle and take the picture every second click-stop. Example: If you need an increment of 24 steps use 48 steps and take the exposure every second click-stop.

### Notice

- If the blue increment knob (13) is a little hard to operate, simply put the base plate in a position between two click-stops. Then it can be operated more easily. Please also notice, that the knob can only be turned in one direction in position 0/72. Try by turning the plate: 72 click-stops: Turn only to the right, 0 click-stops: Turn only to the left.
- Please keep in mind that the lower angle locking screw (11) is open when using click-stops!



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## Advice

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 (10)
- Part 2: L-bracket (9) with upper panning base (5)
- Part 3: Camera mounted on clamping plate (2) with spirit level (1)

### Step 2

#### Level the lower panning base (10) 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 (9) on the quick release of the lower panning base (10)

Use the lower scale on the L-bracket (9) and the value you have found (see last chapter "Finding the nodal point, preparatory step 2") to position the clamping plate (9) on the right spot, which is dependent on the camera you use.

### Step 4

#### Install the blue clamping plate (2) - including premounted camera - into the quick release of the upper panning base (5)

Use the scale on the blue clamping plate (2) 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 (10) around a specific angle, which can be set at the blue increment selector knob (13). This angle depends on the wanted overlap, the camera you use (crop factor) and the focal length.

For optimal performance the software needs an overlap of 20-50%. Between each exposure use a fixed panning angle. To estimate the increments, look through the viewfinder while panning your system through the scene, but it is much more easier to follow the tables on the next page. The number of shots for a 360 ° rotation (second column in bold) can be selected directly at the lower increment selector knob (13). Simply move the equipment between two single frames to the next click-stop.

## 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. The tripod can also stand in a slightly inclined position.
- Level the lower panning base (10) 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 (9) has to be done principally **without camera**. Check the stability after tightening the lower locking screw (12). 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 (2) completely with the premounted camera into the quick release of the upper panning base (5). 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 (6) is locked.



The L-bracket (9) and the upper, blue clamping plate (2) 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 "nodalpoint", "no parallax point" or "optical centre". How to determine this position is the topic of the next chapter.



## 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 problem of parallax shift between foreground and background occurs especially at close range. 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!

### Preparatory step 1

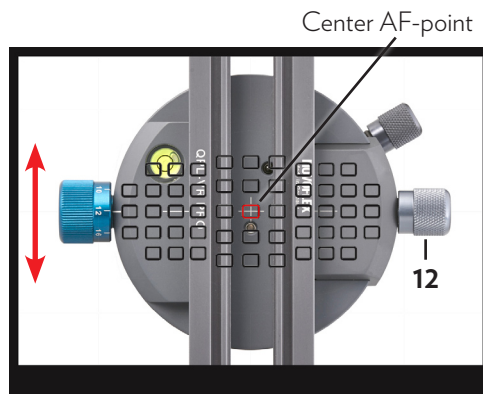
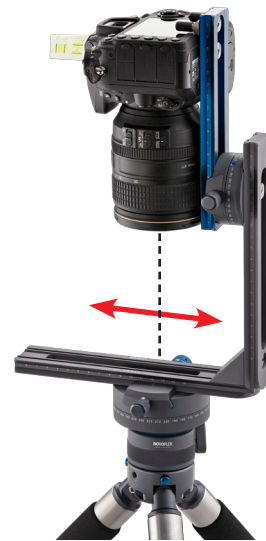
#### Assemble all components of your system

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 (10) 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 (1) on the flash shoe of your camera. Open the blue angle locking screw (6), position your camera facing straight downwards and tighten up the screw again.
- Look through the viewfinder of your camera, open the lower locking screw (12) and slide the L-bracket (9) back and forth until the center autofocus point is aiming at the white cross on the lower panning base (mark for the rotation axis), see illustration at the right.
- After that, tighten up the lower locking screw (12) and write down the value given by the indicator scale at the L-bracket (9) for future exposures with this camera body.



Look through the viewfinder of the camera

### Preparatory step 3

#### Forward-Backward Adjustment

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.

1. Now bring the camera into a precise vertical position. For this purpose use the blue upper angle locking screw (6) and observe the spirit level (1) on the flash shoe.
2. Mount the lens, whose nodal point you want to find, to the camera body. When using a zoom lens, set the required focal length.
3. 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 door frame or an edge of a building. You may have to move the tripod for this purpose.
4. 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).
5. Here: When I panned the camera to right, the floor lamp moved to left in relation to the door frame (fig. 2). This is an indication of rotating outside the nodal point of the lens.
6. Now set another distance on the blue clamping plate (2). 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.
7. Repeat the procedure until the vertical lines don't move (see fig. 3+4).
8. 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 (2).



fig. 1



fig. 2



fig. 3

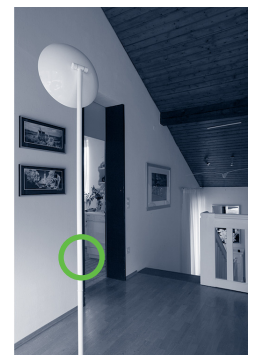


fig. 4