Tip

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

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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NOVOFLEX

VR-System PRO II HD Heavy Duty

USER MANUAL

NOVOFLEX

Shown separately for better illustration

Examples: Interactive spherical panoramas for a website

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

Interactive presentation see www.pixelmagazin.de/messestand

Used Software:

- PTGui,
- Pano2VR,
- Photoshop

Interactive presentation see www.pixelmagazin.de/zurich

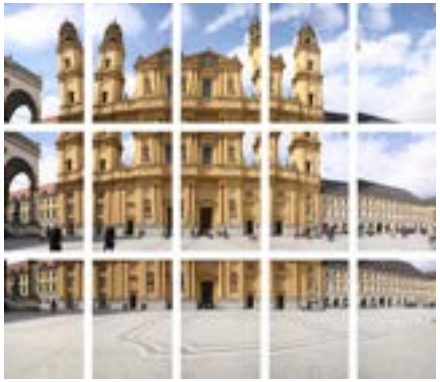
Optimizing the system for spherical panoramas with fisheye- and super wide angle lenses

By replacing the lower panorama plate, your Panorama VR-System PRO II HD 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).

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

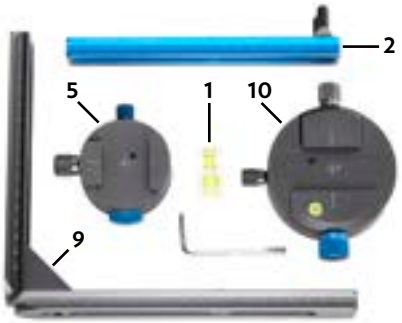


40 mm lens on a full-frame camera.

Stitching-Software: PTGui

Scope of delivery

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



Nomenclature

1	**Spirit level** for hot shoe
2	Clamping plate **QPL-PANORAMA** with scaling 180 mm and adjustable end stop
3	Camera screw 1/4"-20
4	End stop screw
5	Upper panning base **PANORAMA VR III** with 2 x 180 degree engraving
6	Upper angle locking screw
7	Upper locking screw - Q=PLATEs
8	Angle unlock button
9	L-bracket **QPL-VR PRO** 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 - Q=PLATEs
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.

Product description

The VR-System PRO II HD enables the parallax-free, horizontal and vertical pivoting around the nodal point of the lens. It is designed for multi-row panoramas in flat or spherical projection. Due to the lower panorama base that can be moved in eight adjustable increments, classic single-row cylinder panoramas can easily be done as well. Comfort, stability and precision are the main features of this professional panoramic head.

Safety notes

- Before starting up, read these safety notes carefully. Pay attention to warnings and advice in this instruction. When selling or passing on your Panorama VR-System PRO II HD hand over this manual also by all means.
- Never move your Panorama VR-System PRO II HD with a camera attached to it. 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 coupling plate pay attention, that both jaws 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 coupling plates (e.g. to set up nodal point adjustments) don't open the locking screws (7 respectively 12) completely, but only a quarter turn. This is enough for a comfortable and safe handling of the plates.

Upper panning base
PANORAMA VR III

- Place the focus on the main subject of the scene. Then turn autofocus off.
- 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 times, we recommend using a remote release and - if possible - the mirror lockup or live-view function of your camera. Please refer to your cameras manual. The image stabilizer should always be switched off.

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 and fixed ISO value?
- Correct exposure (f-stop in the middle range, corresponding exposure time)?
- Focused on the main subject of the scene?
- Auto focus and image stabilizer turned off?

Fine adjustment

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

The upper panning base PANORAMA VR III (5) is equipped with two milled grooves on the bottom, to provide anti-twist protection when combined with the L-bracket (9). This helps you to avoid making lateral adjustments when moving the base up-and-down on the rail. 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.

Shooting
the zenith

Advice

When doing the adjustments, ask a second person to assist you.

Step 6

Define a vertical tilting angle

When creating multi-row panoramas, set the vertical tilting angle between two rows on the upper panning base PANORAMA VR III (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 determine 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 50° for a 17 mm lens equivalent of a camera with full frame sensor.

Any angle can be approached with the upper panning base (5), but the weight of the camera always pulls the base into one of the 10° notches. To set up an angle open the rear angle locking screw (6), hold down the front angle unlock button (8), use the angle scale to move to the desired angle position and release the front angle unlock button (8) again. For optimal stability, re-tighten the rear angle locking screw (6).

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 results, 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. Also make sure to work with a fixed ISO value.

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 at any time, except when you are working in stepless mode and want to lock 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 II HD!

Advice

To avoid confusion, the upper locking screws (7) is anodized in grey and the angle locking screw (6) in blue. When mounting the clamping plate QPL-PANORAMA (2), we recommend having the locking screw (7) facing down (see fig. left). This may prevent quick access but also prevents unintentional opening.

Lower panning base PANORAMA=Q PRO II

Basic assembly

Upper panning base

Start your assembly by connecting the upper panning base PANORAMA VR III (5) to the vertical leg (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).

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

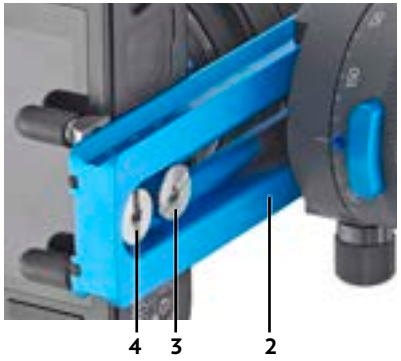
Attaching the clamping plate to your camera

Depending on your preferred lenses you should consider two aspects when positioning the camera onto the blue clamping plate (2): The camera should be positioned as far as possible in the back so that the adjustment range becomes as long as possible along the optical axis (important for zoom lenses). On the other hand, the camera should be moved forward so that the plate itself cannot be seen in the viewfinder (important for extreme wide-angle lenses).

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

You can position 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 for one option only.

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



Attention

In the event the front lens or hood of a wide angle- or fish-eye lens comes in contact with the clamping plate (2), 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 or a quick release unit like the NOVOFLEX Q=MOUNT Mini D on the clamping plate. You can also replace the QPL-PANORAMA with the optionally available plate QPL-Slim 200. This requires a camera with an L-bracket or separate coupling plate attached to it. 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.

NOVOFLEX PLATTE-U

Tip

The system's L-bracket QLP-VR PRO (9) can be taken apart for transport.

Guide values for various focal lengths and sensor sizes

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

Focal length	No. of shots for a full 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 full 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 that is not available on the increment selector knob, use the half click-stopped angle and take a picture at every second click stop. E.g.: If you need an increment of 24 steps use 48 steps and take the exposure at 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!

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 into 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 secure stand. You don't have to align the tripod. Watch the bubble level on the base and level the system by the ball head underneath.

Step 3

Attach the L-bracket (9) to 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 secure stand. The tripod can be positioned slightly inclined as well.
- 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 underneath.
- Attaching the L-bracket QPL-VR PRO (9) to the lower panning base (10) has to be done without a camera. Check the stability after tightening the lower locking screw (12). Pay attention, that both jaws of the quick release are sitting flush with the profile of the plate.
- The final 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 jaws of the quick release are sitting flush with the profile of the plate.

The L-bracket (9) and the upper, blue clamping plate (2) can be shifted along the X- and Y-axis. Both plates have scales on their sides to mount them in reproducible positions.

To avoid the parallax effect between the single shots, you mount the camera in a specific position, so that the center of rotation lies directly in the center of the entrance pupil of the lens. This point is also known as "nodal point", "no-parallax point" or "optical center". The following chapter explains how to find this point.

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 as well. 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 effect (shift between foreground and background) becomes visible, especially at close range. To avoid its ramifications, you should work with a precisely adjusted panoramic head by all means. Please keep in mind that you need 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

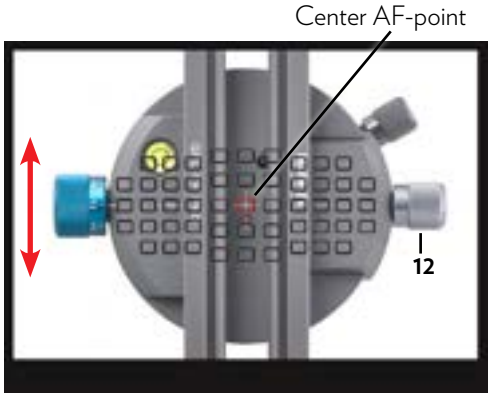
Assemble all components of your system

Use the method as described in the previous chapter. Set up your tripod and pay attention to a secure 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 underneath.

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 above, while paying attention to the safety references. Observe the spirit level (1) sitting in the hot shoe of your camera. Open the rear angle locking screw (6), hold down the front angle unlock button (8), position your camera facing straight downwards, release the angle unlock button (8) and tighten up the locking screw (6) 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 to the right.
- Next, 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 created at home, should have vertical lines in the foreground as well as in the background.

1. Align the camera horizontally with the help of the upper, blue angle locking screw (6), the angle unlock button (8) and the spirit level on the hot shoe (1).
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 in relation to each other (see fig. 1+2) or stay together (see fig. 3+4).
5. Fig.1+2: Maladjusted panoramic head - When panning the camera to the right, the floor lamp moved to the left, relative to the door frame (fig. 2). This is an indication of rotating outside the nodal point of the lens.
6. Now choose another distance on the blue clamping plate (2). When panning again you will notice that the movement of the lines relative to each other will either be stronger or weaker. In the latter case you've shifted the clamping plate in the right direction.
7. Repeat this procedure until the vertical lines stop moving towards each other (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 particular 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

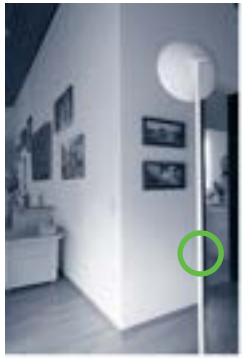


fig. 3

fig 4