



EPIC PRO *V*

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EPIC PRO User Guide



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1. Introduction

1.1 The GigaPan Solution

Capturing stunning gigapixel images is easy with GigaPan - a complete solution with integrated equipment, software and website. The GigaPan works seamlessly with the GigaPan Stitch software and GigaPan.com to capture, upload and share gigapixel panoramas. Zoom into thousands of stunning panoramas from around the world with the amazing GigaPan Viewer. Join GigaPan.com to view and share with friends, take snapshots and embed panoramas on your own website.

Here is an overview of how easy and fun it is to use the GigaPan System, in 4 simple steps:

1. Pick a scene

The GigaPan system automates the panorama-taking process by taking hundreds of images of the selected scene.

2. Click

The GigaPan system automatically operates your camera to take a series of photographs of your scene.



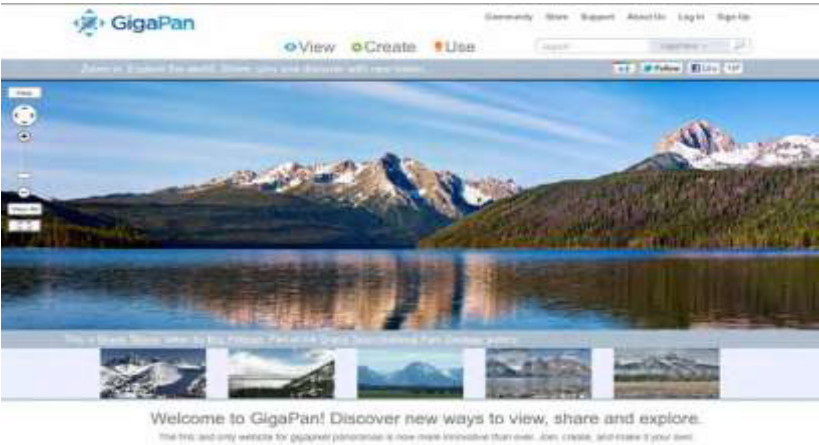
3. Stitch

The Gigapan Stitch software assembles, aligns and blends the individual images into one large panorama.



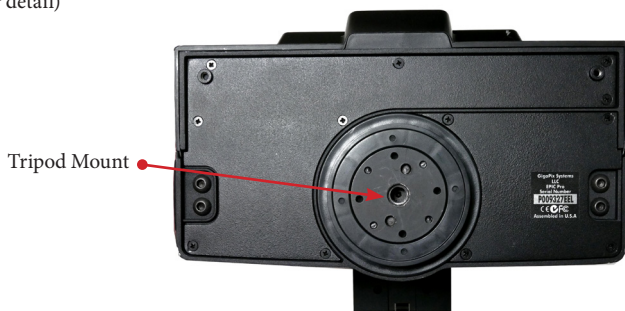
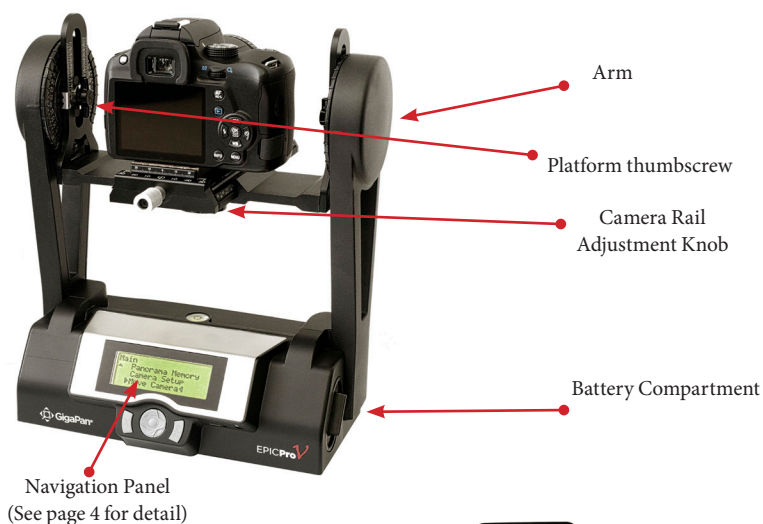
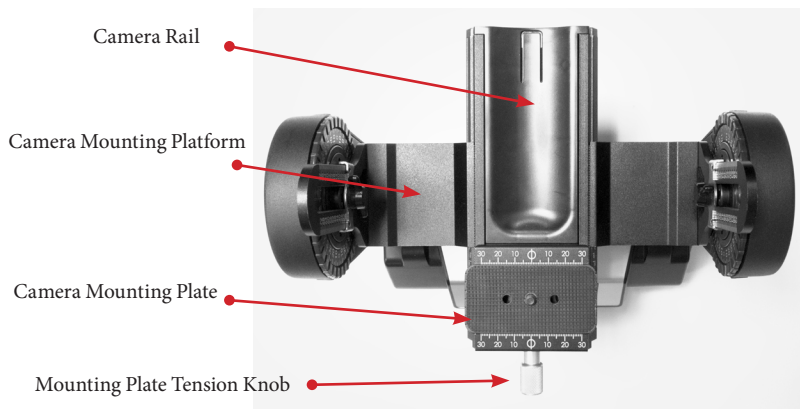
4. Share

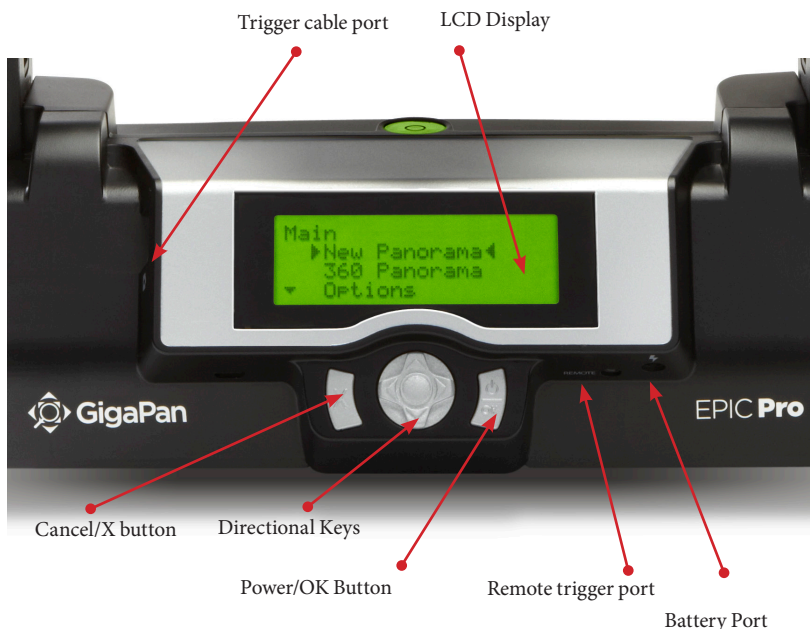
The GigaPan Stitch software then uploads your panorama to GigaPan.com to share with friends and the GigaPan community. You also have the ability to embed your uploaded panorama on any website.



Images created using the GigaPan are able to be stitched together using a variety of 3rd party software programs as well including Adobe Photoshop, PTGui and others. The popularity of gigapixel images has also led to the creation of new websites for sharing. One example may be found at <https://www.prodibi.com/>

1.2 GigaPan Parts





Please see Chapter 2: Setting Up Your GigaPan for more information about how to adjust the Gigapan parts to fit your camera and lens.

The GigaPan Body

Camera Rail - Holds the camera mounting plate and can be adjusted forward or back to accommodate the size of your camera and lens.

Rail Adjustment Knob - Loosen or tighten the knob to move the camera rail when mounting a camera and lens.

Camera Mounting Platform - Holds the camera rail and can be adjusted up or down to accommodate your camera.

Platform Thumbscrews - Loosen or tighten the thumbscrews to move the camera mounting platform.

Camera Mounting Plate - Attaches to the camera or lens to mount it on the GigaPan.

Camera Mounting Plate Lever - Holds the camera mounting plate securely in place. Move the small silver pin below the lever clockwise and rotate the lever clockwise to release the camera mounting plate.

Navigation panel - Contains the LCD display and directional buttons for operating the GigaPan Menu.

Tripod Mount - Attaches the GigaPan to your tripod.

Bubble Level - Measures that your GigaPan is level on your tripod and on the ground.

Battery Chamber - Holds the GigaPan battery. Turn the latch counterclockwise and pull it the battery holder away from the unit to remove it from the chamber.

Navigation Panel

LCD Display - Displays the GigaPan menu.

Directional Keys - Press up, down, left or right buttons to select items in the GigaPan Menu, or move the camera left to right and up or down to select parameters when shooting a panorama.

Cancel Button - Cancel selections in navigating the GigaPan menu.

Power/OK Button - Hold down for a few seconds to power the GigaPan ON or OFF, or use to select items when navigating the menu.

Trigger cable port - Use with electronic trigger cable to actuate the shutter and cause the camera to focus if you are using auto focus.

Remote trigger port - Use with a pocket wizard or a wireless shutter release that has a 2.5mm miniplug to trigger the GigaPan to capture a panorama.

Battery port - Plug the power cord into the battery port to charge the battery while it is in the GigaPan.

1.3 GigaPan Features

HIGHLIGHTS

DSLR camera compatible - GigaPan works with almost all digital DSLR and mirrorless cameras introduced after 2004.

Large lenses are supported - Camera and lens combinations of up to 10 lbs can be used with the GigaPan.

Precision accuracy - Powered camera movement and simple fore/aft up/down adjustment for optimal positioning of the nodal point and varied camera/lens combinations.

Quick set up - Easy to secure GigaPan to tripod. Fits standard tripods, with 1/4" or 3/8" thread. Onboard bubble level for horizontal alignment.

Clear and simple to navigate menu - Access frequently-used functions with the touch of a button, such as to move the camera or set the shutter delay. Screen is highly visible with back lit display.

Strong and durable yet lightweight - Excellent design with magnesium chassis and aluminum arm, the GigaPan weighs less than 8 lbs with battery pack.

SPECIAL FEATURES

Rechargeable battery pack (7.2V, 4300mAH) included - Charge the battery on its own or while inserted in the GigaPan, convenient for charging while shooting. Charger included.

Multiple triggering option - Allows the GigaPan to take multiple pictures at each image location up to 20 times per position for exposure bracketing or multiple image enhancement.

Optimized range of motion - 360 panoramic and -65/+90 tilt range of motion with precision incremental movement. **(Inclined & Declined Angle of Motion for Pro V)**

Remote trigger port - Enables you to start taking a panorama from a different location using a remote trigger with a Canon E3 type connector. (not included).

Advanced settings include: option to repeat last panorama, pause and scroll, and order pictures as rows or columns.

Adjustable features include: time between exposures, pre trigger delay, focus assertion time (shutter length), motor speed, aspect ratio, and picture overlap.

1.4 Navigate the GigaPan Menu

Turn the GigaPan on by pressing the Power/OK button. The first menu option, 'New Panorama', will appear. To navigate to other menu options, push the down button. To reach submenus within a menu option, push the OK button once you reach the desired main menu option, then the down button to access the submenu choices. To exit a menu or submenu, push the X button.

GigaPan Menu Tree

New Panorama

360 Panorama

Options

- Time/Exposure
- Mult Shutter
- Brackets
- EV Step Size*
- Mirror Lock-up
- Lock-up Time*
- Shutter Teach
- Start Del/Trigger
- Pic Order
- Time-lapse Series
- Battery Status
- Save/Load Config
- Factory Reset

Expert Options

- Checklist
- Shutter Mode
- Shutter Length
- Motor Speed
- Motors Rigid
- Pre trigger Delay
- Bracket Delay
- Backlight Mode
- Auto Off Timer
- Aspect Ratio
- Picture Overlap
- Last Pic Hold
- Optimize Pan
- Shutter Feedback
- Shutter Retries*
- Quick Menu Set-up
- Firmware Ver

Test Shutter

Panorama Memory

- Previous
- Save Previous
- Recall

Camera Setup

Move Camera

<-----

Note: The Epic Pro V will have additional menu item " New Video Pan". This option is how you access Motion Time-Lapse and Video Panning. See Chapter 3.4 for instructions for these additional features.

***Note:** Some menu items will be available dependant upon other settings. When "Shutter Teach" is set to "ON" a small "T" icon will be displayed in the upper right hand corner. The "Options" menu items "Time/Exposure", and "Brackets" will not be displayed as they are not needed when "Shutter Teach" is enabled. When, or if, you wish to return to the normal mode, set the "Shutter Teach" option to "OFF". When "Options" -> "Brackets" is set to a value greater than one, the "Options" -> "EV Step Size" menus item will appear. You can also access "Options" -> "EV Step Size" from the "Options" -> "Brackets" menu by pressing the right arrow key.

1.5 Menu Options

Reminder: See chapter 3.4 for options specific to Epic Pro V

Main Menu

New Panorama – Sets the upper left photo and lower right photo that defines the rectangular area of the panorama.

360 Panorama – Sets the upper pitch and the lower pitch of a panorama that is 360 degrees and completes a full circle.

Options – Contains submenus that allow you to change more settings.

Test Shutter - Allows you to optionally test you settings such as single shutter, multiple shutters, exposure bracketing, and or mirror flip-up before starting the capture of a panorama. To set, select "Test Shutter" from the menu. Once you press the "OK" button, the GigaPan will trigger the camera with current settings.

Panorama Memory – Recalls a previously defined panorama or a previously saved panorama. Also allows you to save a panorama. When you save a new panorama, you must also set a reference point. The reference point provides a method to orient the GigaPan body in the same position. The reference point is in addition to placing the tripod in the same location.

Camera Setup – Any time you change the camera, lens, or zoom lens focal length, you need to do a camera setup. "Camera Setup" determine the coverage of a single photograph by measuring the vertical angles that the lens and camera sensor sees. Choose a unique point and move the lens so that the point is at the top of the lens. Then move the lens so that the unique point is at the bottom of the lens. The the GigaPan knows the vertical angles and calculates the horizontal angle of view using the aspect ratio. The GigaPan also accounts for image overlap which has a default setting of 30%. The default aspect ratio is 3:2, but can be set in the "Expert Options" menu.

Move Camera – Moves the camera and lens from left to right and up and down using the directional keys.

Options Menu

Time/Exposure - This was previously named "Time per Pic" in firmware 128.1 and is the amount of time that the GigaPan will wait until it moves the camera to the next position. It is important to allow enough time for the camera to process the current photograph and copy the data from the camera's buffer memory to the flash memory. This is the most likely reason the camera would miss a photograph. Some cameras will light an LED while the photograph is being transferred.

Mult Picture - This was previously called "Multi Shutter" and allows you to take multiple photographs that will be triggered per position. If you have "Brackets" enabled, "Mult Picture" will repeat the bracket sequence per the number of photographs you selected when setting "Mult Picture"

Brackets - Exposure bracketing of 1,3,5,7, or 9 photographs for HDR images by working with the camera AEB (automatic exposure bracketing) firmware. Use the "EV Step" setting to set the separation of exposure values to {0.3, 0.7, 1.0, 1.3, 1.7, or 2.0} EV (exposure value). You may exceed the capability of your camera AEB firmware by setting the "Expert Options" -> "Shutter Length" to "Bulb" if all exposures are slower than about 1/10 of a second, such as night photography.

EV Step Size - Use in conjunction with the "Brackets" setting to capture multiple exposures per position to create HDR panoramas. You can set the exposure value separation to {0.3, 0.7, 1.0, 1.3, 1.7, or 2.0} EV. One exposure value separation is equivalent to doubling or halving the shutter speed when you keep the aperture and ISO constant.

Mirror Lock-up - This is used in conjunction with the camera firmware to flip up the mirror and wait a delay of "Options" -> "Lock-up Time" before triggering the shutter. When "Mirror Lock-up" is enabled in the GigaPan and your camera, there will be two shutter signals for each photograph taken. The first assertion of the signal will flip up the mirror. The second shutter signal will be asserted after the "Options" -> "Lock-up Time" and will trigger the shutter. "Mirror Lock-up" is useful for longer focal length lenses where any lack of setting is amplified by the optical magnification. If you are using a large 200-400mm f/4.0 lens, you might set the lock-up time to 1.8 seconds. If you are using a 50mm or 100mm prime lens you might disable "Mirror Lock-up".

Lock-up Time - Is used in conjunction with "Mirror Lock-up" and your camera's mirror lockup settings. You may set a lock-up time of {0.25s, 0.50s, 0.75s, 1.00s, 1.25s, 1.50s, 1.75s, 2.00s, 2.25s, 2.50s, 3.00s}.

Shutter Teach - This setting is an alternative method of defining exposure bracketing timing or multiple pictures where you "teach" the GigaPan how you would like the camera's shutter button to be pressed. The Pro will then remember how many times you want the shutter to be pressed as well as the extra timing between shutters. "Shutter Teach" is located in the "Options" submenu and the left arrow button is used to teach the imager. End the sequence with the "OK" button.

Start Del/Trig - Enables a timer delay of {External trigger, 15s, 30s, 45s, 1m, 2m, 5m, Timer} before the panorama capture begins. The external trigger setting is designed to work with a Canon E3 style remote shutter that is inserted in the GigaPan remote trigger port.

Pic Order - Allows for different patterns of capturing the individual photographs such as {column-right, column-left, row - down, row - up}

Time lapse/Series - Used to capture a sequence of panoramas over a period of time. You may use a timer of zero seconds to 99 days or an external trigger to change when each panorama in the sequence is taken. When you choose the timer, the value includes the time to capture the panorama. When external trigger has been selected, use a Canon E3 style remote shutter that is inserted in the GigaPan remote trigger port.

Battery Status - Tells you the percentage voltage level of the battery. 100% means the battery is fully charged: a percentage around 20% means your battery will not be able to operate the GigaPan much longer.

Save/Load Config - Allows you to save up to three configurations, which is convenient when you want to quickly change lenses or bracketing options.

Language - Enable to GigaPan menu to display a choice of four languages: English, Español, Français, or Deutsch.

Factory Reset - Resets certain options to their default values. The "Camera Setup", "Time Per Pic", "Start Delay", "Multi Shutter", "Pic Order", "Saved Panoramas", and vertical field of view will be reset.

Expert Options Submenu

Checklist - If this option is set to ON, a checklist of things that need to be done in order to successfully create a technically good image are presented to the user before the panorama is taken. Selecting OFF will disable these prompts.

Shutter Mode - Allows you to choose how the unit will operate your camera's shutter. The settings are Remote or Manual. The Remote setting will use the electronic trigger cable to connect the GigaPan to the remote shutter port on your camera. If the Manual mode is used, the user must manually actuate the shutter and press the OK button on the GigaPan to advance to the next photograph.

Shutter Length - The amount of time that the focus and the shutter signals are asserted {Exposure (bulb), 0.5s, 0.6s, 0.7s, 0.8s, 1.0s, 2.0s, 2.2s, 2.4s, 4.0s, 4.5s, 5.0s, 8.0s}. You are able to incrementally increase the amount of time that the focus signal is asserted when using auto focus. You are able to quickly find a trade-off between allowing for enough time for your camera's auto focus subsystem to achieve good focus and not requiring too much time to capture the entire gigapan image. When "Shutter Length" exceeds "Time/Exposure", then "Shutter Length" takes precedent. You can also use the bulb so that the remote shutter controls the exposure time when using auto focus or doing exposure bracketing to capture HDR images.

Motor Speed - Options are Slow, Med, or Fast. It is recommended that you use the Slow setting when using large lenses to reduce the setting time after accelerating and decelerating a large lens.

Motors Rigid - The On setting will help hold large lenses in position when you are not in a "Move" mode, or actively capturing a panorama.

Pre-Trigger - Delay {0.0s, 0.5s, 1.0s, 1.5s, 2.0s, 2.5s, 3.0s}. This delay is between the GigaPan movements and the electronic trigger signal to your camera. This allows a lens and camera body to settle after an GigaPan movement. This is especially important for large and longer focal length lenses.

Bracket Delay – Time delay added to allow your camera to not overflow its memory buffer while capturing exposure brackets for HDR images. Programmable between 0.1s and 8.0s.

Backlight Mode – This setting allows you to choose when the backlight is in use. The options are Power Save, Always Off, or Always On.

Auto Off Timer – This setting controls when the GigaPan unit will power down automatically if idle. The default setting is 5 minutes. You can also set auto-off to 10 Minutes or Disable.

Aspect Ratio – The ratio of the width to height of the camera system. The default setting is 3 units wide by 2 units high, which is the default setting for standard DSLR cameras. You can set the Aspect Ratio to the following values of width and height {1:1, 3:2, 4:3, 16:9, and custom values 0.50:1, 0.55:1,... through 2.00:1}

Picture Overlap – Overlap {25%, 30%, 35%, 40%, 45%, 50%, 55%, 60%, 65%, 70%, 75%}
This setting allows you to increase the overlap to compensate for vignetting, or poor performance of a lens at the edges of the glass. Increasing this value may help give the stitch software more common area to find control points. The GigaPan default picture overlap value is 30%.

Last Pic Hold – Continues to assert the shutter signal after the last photograph in the panorama so that a camera does not power down. This is especially useful for the time lapse function.

Optimize Pan – Whenever a pan motion greater than n 180 degrees is required, the GigaPan will travel in the opposite direction (which is shorter and takes less time) to reach the next position. The default setting is ON. Use caution if you are doing a 360-panorama for example; each subsequent row will cause the unit to rotate another revolution, winding up and cable that are attaches to the unit (e.g. battery chargers or remote switches). Turning this setting to OFF will cause pan motions to move strictly back and forth and prevent any wind-up. When doing a 360-panorama and you find cords are wrapping around the unit, turn optimize pan to OFF.

Shutter Feedback – Used to automatically detect a missed photograph at each position and retry gain up to ten times. You must set the camera to focus priority, set “Expert Options” -> “Shutter Retries” and connect a sync cable between the camera and the GigaPan. The sync cable has a PC connector at one end and a mini plug at the other. You connect the PC end to the camera and the mini plug to the GigaPan remote trigger cable port. If your camera does not include a PC connector, you can purchase a hot shoe adapter that has a PC connector.

Shutter Retries – Determines the maximum number of times to retry per position when the shutter fails to trigger. Only visible when the “Expert Options” -> “Shutter Feedback” is set to ON. May be set from one to ten retries.

Firmware Version – This allows you to see what firmware version is currently installed for your unit.

1.6 Set up the GigaPan Quick Menu

Access the Quick Menu at any time by pressing and holding the X button until the Quick Menu appears. You can choose which items appear on this menu to suit your preferences. Use the 'Expert Options' submenu item 'Quick Menu Setup' to set one of the four menu items on the Quick Menu. You have the ability to choose one of the following items for each of the four quick menu items.

Move Camera	Pre trigger Delay
Time/Exposure	Bracket Delay
Start Del/trig	Backlight Mode
Mult Picture	Auto Off Timer
Brackets	Aspect Ratio
EV Step Size	Picture Overlap
Shutter Teach	Shutter Mode
Mirror Lock-up	Shutter Length
Lock-up Time	Checklist
Pic Order	Last Pic Hold
Time lapse Series	Optimize Pan
Battery Status	Shutter Feedback
Motor Speed	Shutter Retries
Motors Rigid	Language

1.7 Electronic Trigger Cable Compatibility

Your GigaPan arrived with six electronic trigger cables, for a full list of compatible cameras, please visit www.omegabrandess.com/products/gigapan then click on "Epic Pro Camera Compatibility Chart by Cable"

Cables Included

- Canon N3 Cable
- Canon E3 Cable (Also compatible with most current Fuji & Pentax cameras)
- Nikon 10-pin Cable
- Nikon MC-DC2
- Olympus RM-UC1
- Sony RM-S1AM

*Sony S2 Micro 10-pin cable sold separately for Sony Mirrorless Cameras

*Nikon MC-DC1 cable sold separately for certain Nikon models

2. Setting up the GigaPan

Carefully follow the steps below to capture the highest quality panoramas.

2.1 Get your equipment ready

To start shooting panoramas with the GigaPan, you will need:

- GigaPan battery and power cord (included with the unit)
- A tripod, fitted with a standard 1/4-20 tripod screw
- Digital camera & lens and compatible electronic trigger cable
- Camera battery and/or charger
- A memory card (at least 4 GB) *Make sure you have enough memory on your memory card to take the number of pictures the panorama requires.*
- A memory card reader, or your camera's USB cable

2.2 Charge and Install Batteries

Your GigaPan will arrive with its battery ready to be charged. There are two ways to charge the battery – you can charge the battery while it is in the GigaPan or remove the battery to charge it on its own.

To charge the battery inside the GigaPan:

1. You can charge the battery in the GigaPan while it is powered on or off. You can also operate the unit while the battery is charging, if there is a sufficient level of charge on the battery.
2. Insert the battery into the GigaPan battery compartment until the end of the battery is flush with the opening. When the battery is inserted, flip the latch clockwise to lock the battery into place.
3. Plug the power cord into the GigaPan battery port under the right side of the LCD display.
4. Plug the power cord into an AC wall socket. A plug icon will appear in the lower right corner of the LCD display. When the GigaPan is powered off, the plug icon will not appear while the battery is charging.
5. Place the GigaPan level in a space that has ample ventilation.
The power cord will show a red light indicating the battery is charging. When the battery is fully charged, the red light will change to green, signaling the battery is ready to use.

To charge the battery on its own:

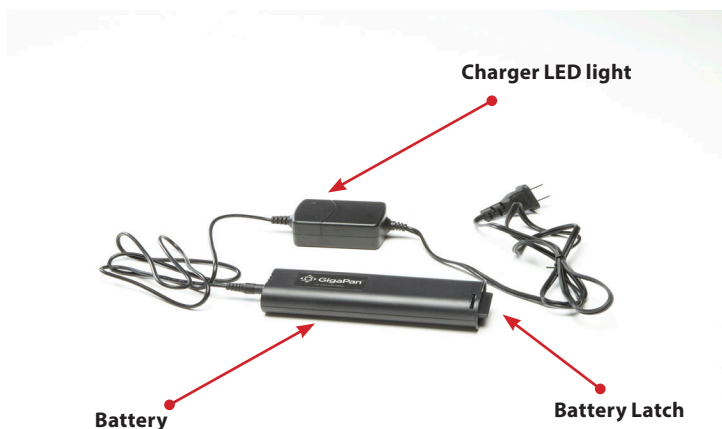
1. To remove the battery from the GigaPan, open the battery compartment by flipping the latch counter-clockwise.
2. Plug the connector end of the power cord into the battery and then plug the power cord into an AC wall socket.
3. Place the battery level in a space that has ample ventilation.

The charger LED light will display a red light, indicating the battery is charging. When the battery is fully charged, the red light will change to green signaling the battery is ready to us.

To check the GigaPan battery status:

When the battery is low, a low battery icon will flash in the lower right corner of the GigaPan LCD display. When the battery is so low that proper functionality is no longer possible, a "Please recharge the battery" message will appear.

To check the battery status, press the directional keys until you reach the 'Options' menu item and press OK. Select the 'Battery Status' menu item and press OK. 100% means the battery is fully charged; a percentage around 20% means your battery will not be able to operate the unit much longer.



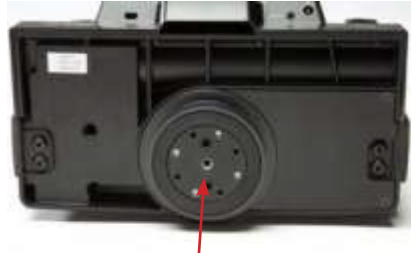
2.3 Mount the GigaPan on a tripod

To ensure a steady series of images, use the GigaPan with a sturdy tripod fitted with a standard 1/4-20 tripod screw.

1. Set up the tripod. Ensure that the legs have a solid footing on the ground and that the tripod is relatively level. If the tripod has a bubble level use it to help level the tripod. Tighten the adjustment screws on the tripod
2. Remove the tripod quick release plate and attach it to the GigaPan's tripod mount at the bottom.



Quick-Release Plate



Tripod Mount

3. Gently tighten the screw until the quick release plate is firmly attached to the GigaPan.
4. Clip the plate back onto the tripod.
5. Use the bubble level to center and level the GigaPan. Adjust the tripod legs and mount as necessary.



Bubble Level

6. You can also mount the GigaPan directly on to a tripod without a head. To do this, remove the 1/4-20 thread adapter in the GigaPan tripod mount, and secure it to the 3/8" stud on the top of your tripod.

2.4 Mount your camera and lens

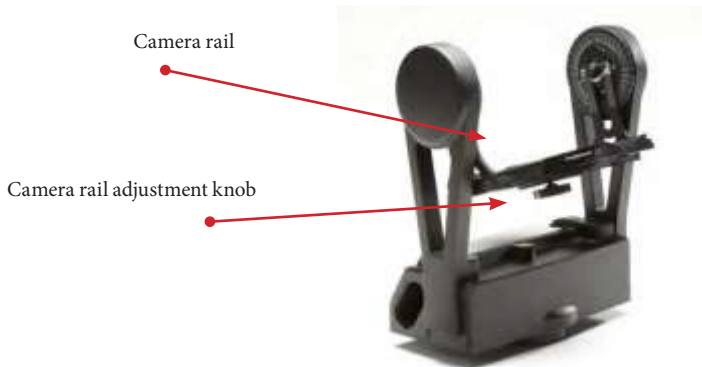
Use these steps below to mount your camera and lens on the GigaPan. Refer to the GigaPan diagram and part names in Chapter 1.2 as you follow these steps.

1. Turn the GigaPan on by pressing and holding the OK button for one to two seconds.
2. Level the camera rail by pressing the down button until the 'Move Camera' menu item is selected. Press OK.
3. Use the up and down arrows to move the camera rail to a level position, approximately even and parallel to the base of the GigaPan.
4. To remove the camera mounting plate from the camera rail, turn the tension knob counter-clockwise until the mounting plate slides freely. Then remove the camera mounting plate.
5. Mount either the camera body or the lens mount to the camera mounting plate. Larger lenses have a mount because a camera body is not able to support the mass and size of the lens.
6. Re-attach the camera mounting plate to the camera rail with the lens and camera attached. Ensure that it is securely fastened.
7. Loosen the camera rail by turning the camera rail adjustment knob underneath the rail clockwise.
8. Slide the camera rail so that the mass of the camera and lens is centered over the axis of rotation so that the GigaPan can easily move the lens and is less susceptible to external forces such as wind or vibration from vehicles. If you are photographing subjects that are closer with a medium to small mass lens you may opt to adjust the lens so that the optical center is centered at the axis of rotation. This choice affects the adjustment of the rail forward or backward. It does not effect the height adjustment, which will be adjusted to the center of the lens or as close as possible.



Tension knob

9. Adjust the rail forward to center the mass over the axis of rotation unless you are very close to your subject. If you are close to your subject you will need to use a lens that allows you to position the camera rail so that the lens is approximately at the optical center which minimizes parallax error. This position will be close to the region of the lens between the front glass element and the focus ring in most cases.
10. Adjust the height of the camera rail and the camera mounting plate so that the center of the lens is at the level of the platform thumbscrews attached to the GigaPan arms. Loosen the platform thumbscrews to allow for adjustment of the camera mounting plate and lens height. A few larger cameras, such as the Nikon D3X, will not allow you to perfectly center the height of the lens to the midpoint. For the majority of usage, this should not be an issue.



2.5 Set up your camera

Follow the steps below to optimize your digital camera settings for panorama taking.

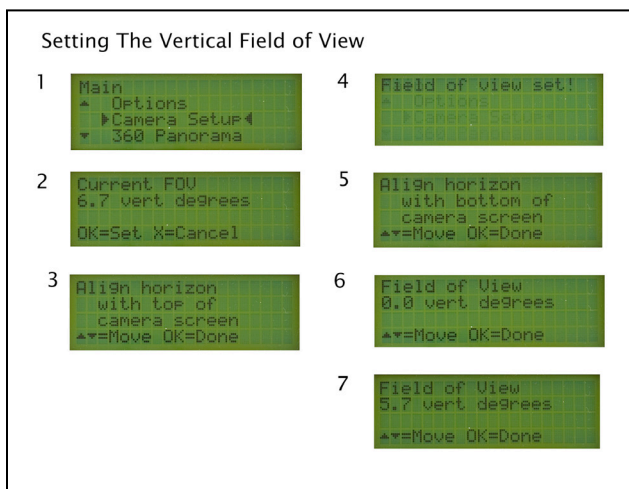
1. Turn on your camera and select the 'Manual mode'.
2. Adjust the focus and exposure. (ISO, aperture value, shutter speed)
3. Set your camera's 'White Balance' (Daylight, Cloudy, Tungsten or Fluorescent) based on the lighting conditions. You may use a device such as an expodisc, color card, or grey card to get better white balance.
4. Connect the electronic trigger cable to the trigger cable port, which is located to the left of the LCD display. Connect the cable to the camera.
5. Set the GigaPan 'Time/Exposure' in the 'Options' submenu to ensure enough time for the camera to be ready to capture another photograph. You need to account for the shutter speed and enough time to write the image to flash memory. It is important to allow sufficient 'Time/Exposure' to avoid missing photos.

2.6 Align your a camera to the GigaPan

Any time you change the lens, camera body, or the focal length on a zoom lens you will need to use the menu item 'Camera Setup' to tell the GigaPan how much your camera can see for each photograph taken. The term "Field of View" (FOV) is used for image viewers and "angle of view" is used for lenses.

By setting the angle of view, the GigaPan will be aligned with the specific focal length of your camera. This allows the GigaPan to calculate how far to move between each position to ensure the proper amount of image overlap. And, when combined with the parameters set for your panorama, the GigaPan can calculate the number of images to be taken.

1. To set the field of view, select 'Camera Setup' from the GigaPan Menu.
2. The first time you select "Camera Setup", you will be asked if you want to set the field of view. Set your field of view and press "OK". (After setting up the field of view the first time, the current field of view will be displayed)
3. If you have not disabled the "Checklist" function under "Options" -> "Expert Options" -> "Checklist" by setting it to "OFF", you will be prompted to set the camera's zoom. Press "OK" after you have set this.
4. Now the GigaPan will prompt you to align a unique point with the top of the camera viewfinder or the top of the LCD screen. Ensure you choose a feature that you can easily identify and use the directional keys to move the camera so that this unique point is at the top, middle of the lens, then press "OK".
5. The GigaPan will momentarily display "Reference Set!"
6. Now the GigaPan will prompt you to move the camera using the up and down keys.
7. Adjust the position of the lens so that the unique point that you chose in step 4 is located at the bottom of the lens, then press "OK".
8. The GigaPan will momentarily display "Field of View Set!"



Additional Information

Verify the field of view at any time by selecting the "Camera Setup" function. If you wish to preserve the current angle of view, press the "X" button. If you wish to change the angle of view, press "OK" and follow the directions above in chapter 2.7.

2.7 Set manual focus or auto focus

Focus is very important when capturing panoramas with the GigaPan. By paying close attention to the focus both before and during shooting, you can create panoramas with ultra high resolution and incredible clarity in their detail. By not paying close attention to focus, the amount of time and effort spent capturing a large 1000 photograph panorama may not generate as good of results as the same panorama using a shorter focal length and 400 photographs.

Manual Focus

Consistent Focus

The use of manual focus to capture a panorama reduces the risk of missing photos, inconsistent focus, or complete lack of focus. When you choose to use manual focus, you are assured that the focus will remain consistent over all areas of the panorama. You will also not need to be so concerned about missing an image in a large panorama. Consult a depth of field table to become familiar with the distances which will have an acceptable sharpness.

Maximize Depth of Field

Depth of field is a function of

1. Aperture - diameter of diaphragm opening. Decreasing the diameter will increase the DOF. Increasing the aperture value too much, such as $f/22$ versus $f/8$ through $f/16$ will result in diminishing returns in sharpness due to diffraction losses.
2. Focal length - distance from image sensor plane to principle point. Decreasing the focal length will increase the DOF.
3. Distance to subject - increasing the distance to the closest point that needs to be acceptably sharp increases the DOF.
4. Size of image sensor { full frame, partial frame, point and shoot } A smaller size sensor will increase the DOF.
5. Circle of confusion - diameter of circle considered to be one point. This is not a camera setting, but a definition of what is considered to be sharp. You need to pay attention to this value so that you do not misinterpret the depth of field. When the circle of confusion diameter is increased (what is considered to be one point) the standard for what is considered to be acceptably sharp decreases.

Plan your Panorama

If you have time to plan the capture of a panorama, the measuring tool on Google Earth allows you to measure the potential distances involved. Google Earth also has a tool for visualizing the lighting conditions with respect to the time of day and the date.

Auto Focus

There are situations when auto focus is a better choice, than manual focus for increasing the sharpness of a panorama. One example is a crowd of people or a building that are at an angle and span a large distance. You will not be able to increase the depth of field to cover the entire distance, especially if you are using a longer focal length. You can use auto focus to shift the center of focus closer or farther for each position in the panorama if you have a suitable situation for auto focus. There are advantages and difficulties with each method depending upon the particular situation. The 'Shutter length' setting in the 'Expert options' and using a faster lens with a minimum aperture value such as f/2.8 versus f/5.6 are two ways to make auto focus work better. Another important hardware consideration is the auto focus system of the particular camera body that you are using.

Potential subject problems

Multiple objects at different distances - may need to reduce focus points used or temporarily switch to manual focus for that region of the panorama.

Areas devoid of discernible features - need to use manual focus for entire or part of panorama. There needs to be discernible features where the camera body focus points are located.

Moving objects - May need to repeat particular photograph or pause panorama

Enough light - May need to use better equipment such as a faster lens such as f/2.8 versus f5.6. May need to use manual focus

Important auto focus camera settings include:

1. A faster lens with a lower minimum aperture value such as f2.8 versus f5.6. The aperture value is inversely proportional to the diaphragm diameter. A wider opening allows more light to hit the auto focus sensor.
2. A focus policy where a photograph is taken only if good focus is achieved versus a release policy where the photograph will be taken regardless of whether good focus has been achieved. Increase the 'Shutter Length' setting to increase the amount of time that the focus signal is asserted.
3. The auto focus mode such as single servo, continuous servo, or mixed.
4. The focus points that are selected.

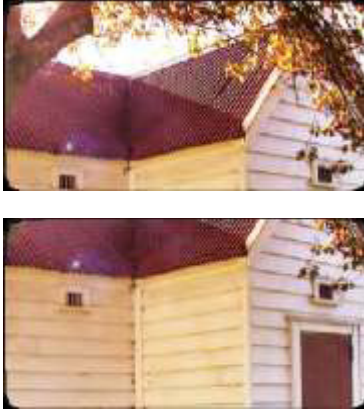
With Canon DSLR cameras the auto focus mode is tied to the release or focus priority. Nikon cameras have a default release priority or focus priority which may be changed using the camera menu system.

You can use a combination of auto focus and manual focus in difficult lighting situations, such as blue sky, smooth water, or bright lights.

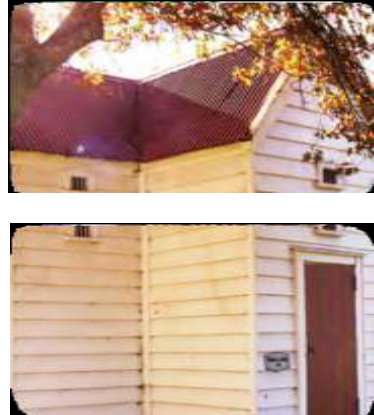
2.8 Test your set-up

You get the best panoramas when two consecutive pictures overlap by about a third. The best way to test whether your setup is all right is to take a 2x2 panorama. Use the instructions in Chapter 3 to take a panorama, and preview the images in your camera. If you don't see a good overlap despite following the instructions, go back and adjust your GigaPan set-up.

Good Overlap



Insufficient Overlap



2.9 Minimize parallax error

Use the following tips to eliminate an effect called parallax, which causes objects to appear to have shifted when viewed from different lines of sight.

Note: If the subject of your panorama is far away, you will want to adjust the position of the camera rail forwards or backwards to balance the camera and lens instead of following these tips to minimize parallax error (See Chapter 2.4 for information about balancing the mass of your camera and lens). At further distances, it is more important that your camera and lens be stable for minimizing parallax error.

Adjust the lens position

If you are capturing a panorama where the subjects include objects that are close to the lens along with objects that are farther away, you may be able to increase the image quality by adjusting the lens so that the front entry pupil of the lens is centered over the axis of rotation.

Approximate adjustments for minimizing parallax error

1. Adjust the height of the camera by loosening the two platform thumbscrews on the GigaPan arms. Move the camera mounting platform up or down until the midpoint of the camera lens is located at the same height as the thumbscrew and the axis of rotation for pitch (up and down).
2. Adjust the camera rail by loosening camera rail adjustment knob. Slide the rail forwards or backwards until the entry pupil of the lens is at the same position as the middle of the arm where the platform thumbscrews on the GigaPan arms are located. The entry pupil is now approximately aligned with the axis of rotation for yaw (left to right).

Fine adjustments to the camera mounting platform for minimizing parallax error

Note: The approximate adjustments described above are sufficient for most instances. However, sometimes it may be necessary to make the following fine adjustments and work the extra time and effort.

1. Find two objects in your scene that are adjacent to each other and at different distances, such as two trees at different distances or a window frame and a door. You will use these two objects to accurately repeat images at two angles with the camera rail adjusted at different points.
2. Place two additional objects that will help you consistently position the GigaPan at different angles. You might use two chairs and use the back of a chair just visible at the left side of the viewfinder to repeat two angles.
3. Loosen the knob underneath the camera rail and move the rail so that the estimated location of the lens entry pupil is located at the midpoint of the GigaPan arms, which is the yaw axis.
4. Determine the position of the camera rail using the millimeter markings on the rail.
5. Measure the distance between the two objects at the two angles for different positions of the camera rail.
6. When you find the position of the rail where the distance between the two objects changes the least number of pixels at the two different angles, you have minimized the parallax error for the yaw axis (left to right)

3. Using the GigaPan

To shoot a panorama with the GigaPan, you can select 'New Panorama', '360 panorama' or select 'Previous' under 'Panorama Memory' if you have saved a previous set-up.

Remember that you will need to repeat the camera set-up instructions in Chapter 2 if you change lenses or focal lengths.

3.1 Start a new panorama

1. Turn the GigaPan on by holding down the Power/OK button.
The first menu item is 'New Panorama'.
2. Press OK to select 'New Panorama'. The GigaPan will prompt you through the following steps.
3. Use the directional keys to point the camera to the top left corner of your scene, and press OK when you're ready.
4. Now use the directional keys to point the camera to the bottom right corner of your scene, and press OK when you're ready.
While you're doing this, you'll be able to see how many horizontal and vertical pictures the GigaPan is going to take.
5. The GigaPan will display 'Show Panorama?' to let you preview the panorama before it begins. Press OK if you want it to, or press X to continue without a preview.
6. You'll now need to confirm if you want to go ahead with the panorama by pressing OK.
7. Watch the scene while the GigaPan takes your panorama.
8. If someone steps into your frame, or if your camera misses a picture, press X to pause the panorama, use the directional keys to go back to an earlier camera position and retake the photo.
9. Access the Quick Menu at any time by pressing and holding the X button until the Quick Menu is displayed.

3.2 Shoot a 360 degree panorama

Taking a 360 degree panorama is easy and is similar to shooting any other panorama. Instead of setting the GigaPan to the upper left and lower right corners of the panorama, you just have to set it to the top and bottom.

1. Use the directional keys on the GigaPan to navigate to '360 Panorama' in the menu and press OK.
2. Use the directional keys to point the camera to the top of your scene and press OK.
3. Use the directional keys to point the camera to the bottom of your scene and press OK.
4. The GigaPan will display 'Show Panorama?' to let you preview the panorama before it begins. Press OK if you want it to, or press X to continue without a preview.
5. Confirm whether you want to go ahead with the panorama by pressing OK.
6. Watch the scene while the GigaPan takes your panorama to make sure it does not miss a picture and no one steps into your frame. If so, press X to pause the panorama and use the directional keys to go back to an earlier camera position.

3.3 Repeat your last panorama

The GigaPan can save the data for your previous panorama, so you can repeat it and correct it if something went wrong with your first try, or if you just want to try the same panorama with a different camera setting.

Following are different options for repeating a panorama.

To save a previous panorama for future use:

1. After finishing shooting your panorama, use the directional keys to select 'Panorama Memory' in the main menu and press OK.
2. Select 'Save Previous' and press OK.
3. To save a previous panorama, the GigaPan requires a reference point in order to return to the same position. Move the camera to a reference point and press OK.
4. The GigaPan will display 'Reference Set!' and 'Panorama Saved!'

To recall a previous panorama:

1. Use the directional keys to select 'Panorama Memory' in the main menu and press OK.
2. Select 'Recall' and press OK.
3. To recall a previous panorama, the GigaPan requires a reference point in order to return to the same position. Move the camera to the reference point you selected and press OK.
4. The GigaPan will display 'Reference Set!' and 'Taking Panorama!'
5. The rest of the process is the same as any other panorama.

To repeat a previous panorama:

It is not necessary to use a reference point to repeat the last panorama unless you physically move the GigaPan.

1. Use the directional keys to select 'Panorama Memory' in the main menu and press OK.
2. Select 'Save Previous' and press OK.
3. The GigaPan will display 'Show Panorama?' to let you preview the panorama before it begins. Press OK if you want it to, or press X to continue without a preview.
4. The rest of the process is the same as any other panorama.

3.4 Guide to Epic Pro V Specific Features

The Epic Pro V has added video functionality; including time-lapse, motion time-lapse, and video panning. Some models of the base Epic Pro may be capable of an upgrade to the Epic Pro V version, please contact customerservice@omegabrandess.com for more information.

To access these unique features from the main menu, select “New Video Pan” to do a motion time-lapse or sweeping video pan, or select “New 360 Panorama” for a complete 360 ° rotation.

Motion Time-lapse Settings

To get started, you will need to select “New Video Pan” from the main menu

Set Start Position– After selecting “New Video Pan” you will see a prompt to “Set Start Position”, move the Gigapan to the start position of the time-lapse using the movements arrows. Keep in mind that the unit can move both horizontally and vertically, which allows for diagonal movements as well. Once you have your position adjusted, press the “OK” button to set it.

Set End Position– Next you will see a prompt to “Set End Position”, move the Gigapan once again until it is in your desired end position and press “OK” to set it.

Set Duration– Next you will be prompted to set your duration. You can set the duration time of the time lapse in days, hours, minutes, and seconds. Once you have your desired duration, press “OK” to set it.

Time-lapse/Video Pan– A new menu will pop up asking if you are doing a time-lapse or a video pan. Since you are creating a time-lapse, you will need to highlight that selection and then press the “OK” button to proceed to the next step.

Set Number of Pics – The last step is setting the number of images that your camera will take during the time-lapse. Keep in mind the number of pictures your camera is capable of taking and storage per charge. It is possible to pause the time lapse to change your camera’s battery or memory card and then continue. You can do so by pressing the “OK” button during the time-lapse to pause, and then pressing the “OK” button again when you are ready to resume. There is, however, no automated way to do this, so you will need to monitor your camera’s battery and memory manually. Once you have decided on the number of pictures, press the “OK” button to set it.

Preview/Start Pan– At this point the Gigapan will ask if you would like to see the panorama. Selecting “Yes” will cause the unit to go to the start position, then move through to the end position to show a preview of the motion. If you select “No”, it will ask if you have turned on your camera, locked the focus, set white balance, set exposure, and turned off your flash. After pressing “OK” for each of these prompts, it will then ask if you would like to start the pan. Pressing “OK” will start the sequence.

360 ° Time-lapse Settings

In the “New Video Pan” menu, select “New 360 Video Pan” to get started

Set Start Position– After selecting “New 360 Video Pan” you will see a prompt to “Set Start Position”, move the Gigapan to the start position of the time-lapse using the movements arrows. Once you have your position adjusted, press the “OK” button to set it.

Set End Height– Next you will see a prompt to “Set End Height”, move the Gigapan once again until it is in your desired end height and press “OK” to set it. Since the panorama will end on the same vertical position as it started, you will only need to adjust the height if you would like any diagonal motion.

Set Direction– Use this option to select if you would like the Gigapan unit to rotate in a clockwise, or counter-clockwise motion. Use the movement arrows to highlight your selection, then press the “OK” button to proceed.

Set Duration– Next you will be prompted to set your duration. You can set the duration time of the time lapse in days, hours, minutes, and seconds. Once you have your desired duration, press “OK” to set it.

Set Number of Pics – The last step is setting the number of images that your camera will take during the time-lapse. Keep in mind the number of pictures your camera is capable of taking and storage per charge. It is possible to pause the time lapse to change your camera’s battery or memory card and then continue. You can do so by pressing the “OK” button during the time-lapse to pause, and then pressing the “OK” button again when you are ready to resume. There is, however, no automated way to do this, so you will need to monitor your camera’s battery and memory manually. Once you have decided on the number of pictures, press the “OK” button to set it.

Preview/Start Pan– At this point the Gigapan will ask if you would like to see the panorama. Selecting “Yes” will cause the unit to go to the start position, then move through to the end position to show a preview of the motion. If you select “No”, it will ask if you have turned on your camera, locked the focus, set white balance, set exposure, and turned off your flash. After pressing “OK” for each of these prompts, it will then ask if you would like to start the pan. Pressing “OK” will start the sequence.

Video Pan Settings

The video features of the Epic Pro V are designed to create a fluid panning motion for your camera. It does not, however, start or stop the video recording on the camera itself. You must manually start and stop recording on your camera. To get started with a video pan, select the “New Video Pan” option from the main menu.

Set Start Position– After selecting “New 360 Video Pan” you will see a prompt to “Set Start Position”; move the Gigapan to the start position of the time-lapse using the movements arrows. Once you have your position adjusted, press the “OK” button to set it.

Set End Position– Next you will see a prompt to “Set End Position”; move the Gigapan once again until it is in your desired end height and press “OK” to set it.

Select Direction– Use this option to select if you would like the Gigapan unit to rotate in a clockwise, or counter-clockwise motion. Use the movement arrows to highlight your selection, then press the “OK” button to proceed.

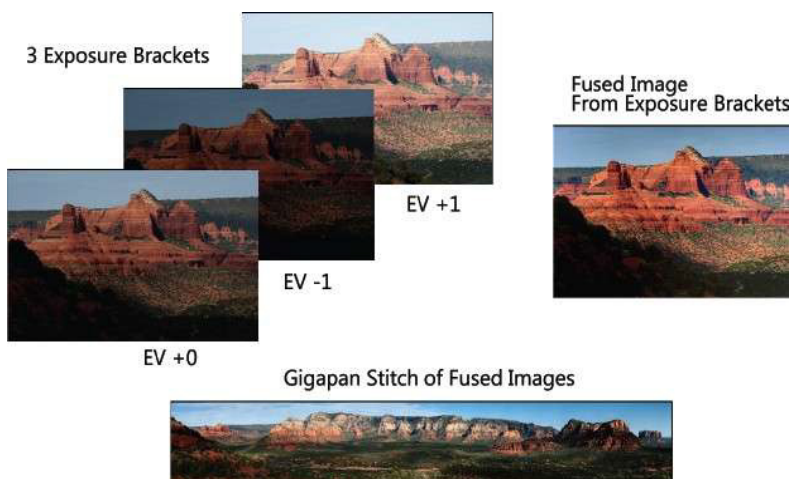
Set Duration– Next you will be prompted to set your duration. You can set the duration time of the time lapse in days, hours, minutes, and seconds. Once you have your desired duration, press “OK” to set it.

Time-lapse/Video Pan– A new menu will pop up asking if you are doing a time-lapse or a video pan. Since you are creating a video pan, you will need to highlight that selection and then press the “OK” button to proceed to the next step.

Preview/Start Pan– At this point the Gigapan will ask if you would like to see the panorama. Selecting “Yes” will cause the unit to go to the start position, then move through to the end position to show a preview of the motion. If you select “No”, it will ask if you have turned on your camera, locked the focus, set white balance, set exposure, and turned off your flash. After pressing “OK” for each of these prompts, it will then ask if you would like to start the pan. Pressing “OK” will start the sequence.

4. GigaPan Additional Instructions

Exposure Bracketing to Capture HDR Images



When your panorama has areas with significantly different amounts of light, such as shadows, neutral colored rock, or blue skies, a single exposure will not yield all of the detail that you can see with your own eyes. This is especially true for panoramas that cover a large field of view. You can improve the overall exposure by capturing multiple photographs with different exposures for each position. You do this by using the GigaPan "Brackets" setting and the "EV Step Size" setting. The panorama shown above is a good example of exposure bracketing because it has a very large horizontal field of view with areas that have very dark shadows.

4.1 Basic Exposure Bracketing Settings

In-camera Bracketing for HDR (preferred method)

This configuration will have the GigaPan capture multiple frames in each position, while the camera adjusts the shutter speed to correctly expose the images.

1. Configure you equipment to do bracketing exposure

Configure the GigaPan using the following settings:

In the "Options" menu, configure your settings as follows...

1. Set Brackets to 1 (normal)
2. Set Multi Picture to the number of exposures per position (ie. 3,5,7,9)
3. Set Time/Exposure to the longest shutter speed you camera will fire
4. In the "Expert Menu", set shutter length to 0.5 seconds

Configure the camera using the following settings:

1. Set the camera to shoot single shots
2. Set the desired bracketing configuration
3. Set camera to whatever mode you deem necessary to get your desired shot
4. Set your shutter and aperture to your 0 exposures value. Might need an ND so as to not overexpose on the longer bracketing shots.

2. Configure the GigaPan to take a panorama as usual. While taking the panorama, the GigaPan will take multiple exposures at each location. Your camera will do the necessary adjustments for shutter speed to get the desired exposure levels. If the camera has trouble writing the images to the card before the next image position, increase the "Time/Picture" in the "Options" menu.

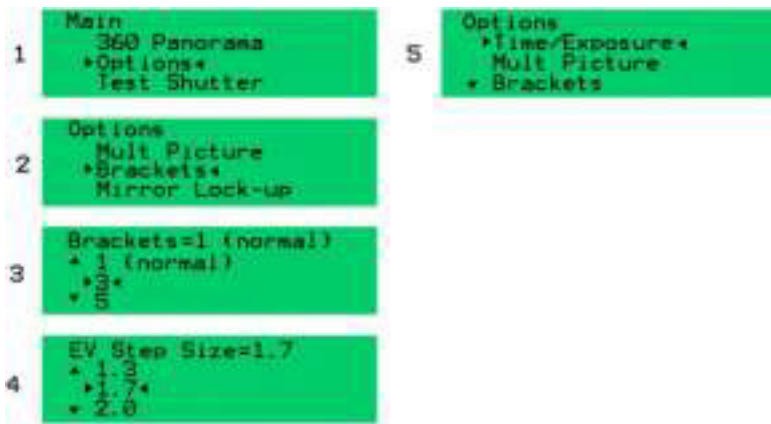
Reference example has 3 images with 0 EV at 2 sec

+ 1.0 EV 4 sec

- 1.0 EV 1 sec

EV Bracketing adjustment is 1.0 stops

4.2 Using the GigaPan to Control Bracketing Exposure



This configuration will have the GigaPan perform the necessary shutter length to correctly expose bracketed images. It assumes you know that your center or 0 exposure point is. It will then fire a sequence of shots at 0, -EV stops, and +EV stops in increasing time values. For example, it will shoot 0, -2, -1, +1, and +2, when 5 brackets and ± 1 EV stops is selected.

1. Configure your equipment to do bracketing exposure

Configure the GigaPan using the following settings:

In the "Options" menu, configure your settings as follows...

1. Brackets: Set to desired number of levels (3, 5, 7, or 9)
2. EV Step Size: set to desired step size (0.3, 0.7, 1.0, 1.3, 1.7, 2.0)
3. Set Time/Exposure to your 0 EV exposure shutter speed value
4. In the "Expert Menu", set "Shutter Length" to Exposure (bulb)

Configure the camera using the following settings:

1. Set the camera to shoot single shots
2. Set shutter to bulb mode by turning the dial to "B" or shutter speed to "B"
3. Set your aperture to your 0 EV exposure value. Might need an ND filter so as to not overexpose.

2. Configure the GigaPan to take a panorama. While taking the panorama, the GigaPan will take multiple exposures at each location in the bracket sequence. If the camera has trouble writing the images to the card before the next image position, increase the bracket delay in the "Expert Options" menu.

3. Make sure that each exposure is under (slower) than the camera's recommended shutter setting for bulb mode (recommended slower than 1/10s). However, some modern DSLRs can go as fast as 1/50s.

4.3 Frequently Asked Questions

1. What changes exposure and why should I only vary the shutter speed?

When you capture multiple exposure brackets for each position for the purpose of capturing HDR images, you vary the exposure by varying the shutter speed and keeping the ISO & aperture constant. Do not vary the aperture as this will change the depth of field.

2. What does EV (Exposure Value) mean?

An increase of one full exposure value means that you double the amount of light in the image. You can do this by doubling the shutter speed from one second, to two seconds. A decrease of one full exposure value means that you decrease the amount of light in the image by one half. One full exposure value less than one second is one half-second.

Exposure Value	-2	-1	0	+1	+2
Shutter Speed	1/4 s	1/2 s	1 s	2 s	4 s
Canon Cameras	4	0"5	1"	2"	4"
Nikon Cameras	4	2	1"	2"	4"

3. What is a simple method to determining the center exposure, number of brackets, and the exposure value separation?

Use an evaluative metering mode to determine the center "Time/Exposure" and then simply choose three brackets with a larger EV separation, such as 1.7 EV or 2.0 EV.

4. What is an accurate method of determining the number of brackets and the exposure value separation?

Determine the exposure for the brightest, average, and darkest areas that you would like to be able to see details in your image.

Use the following steps...

1. Change the metering mode to spot mode, if your camera has that capability.
2. Point the camera lens to each area and depress the shutter button half-way to determine the shutter speed that will center the reflective meter marker to zero. Take note of the shutter speeds as you do this.
3. Determine the distance from the average exposure which you use to set "Time/Exposure". Do this by counting how many shutter speed settings your darkest and brightest shutter speeds are away from your "Time/Exposure" setting.
4. The default setting for shutter speeds in DSLR cameras is 1/3 stop. When you change the shutter speed three times, you changed the exposure by one exposure value or one EV.

Setting Your Camera for Spot Metering

Please refer to your camera's user manual for any specific information

Two methods on the next page. The first method simply requires you to count the number of shutter values required to travel between each extreme to the average exposure. The second method requires you to divide by two or multiply by two until you reach the other meter reading. Let's use an example where you meter 1 second in the shadows, 1/4 second average exposure, and 1/160 second in bright areas where you want to be able to resolve details.

Method One:

EV distance from brightest area to average exposure using 1/3 EV shutter settings

			1/80	1/60	1/50	1/40	1/30
0	1	2	3	4	5	6	7
0 EV	1/3	2/3	+1 EV	4/3	5/3	+2 EV	7/3

1/25	1/20	1/15	1/13	1/10	1/8	1/4
8	9	10	11	12	13	14
8/3	+3 EV	10/3	11/3	+4 EV	13/3	14/3

EV distance from shadows to average exposure using 1/3 EV shutter settings

1"s	0"8	0"6	0"5	0"4	0"3	1/4
0 setting	1	2	3	4	5	6
0 EV	1/3	2/3	-1 EV	4/3	5/3	-2 EV

Set your camera shutter speed to the brightest 1/160s meter reading and then change the shutter speed and count how many settings it takes to reach the average 1/4s meter reading. With default camera settings you will count fourteen shutter dial changes in order to reach 1/4s. Divide 14 by 3 and you get 4 EV with 2/3 EV remaining. The distance from the shadow meter reading is smaller at six shutter speed setting changes on the dial which equals -2 EV. So the distance is 4 and 2/3 EV plus 2 EV for a total of 6 2/3 EV distance to cover the entire range.

If you are using a Nikon with a nine EV span or a Canon with a span of seven EV, you are able to capture these exposures using the camera's AEB function.

You can move the center exposure which is what you set the "Time/Exposure" setting to and lose 2/3 stops of desired dynamic range. Another option is to use a good neutral density filter to shift all of the exposures to shutter speeds that are slower than about 1/10 of a second and use the BULB setting on the camera and the imager. If you use the bulb setting on the camera and the imager then the imager opens and closes the shutter instead of the camera's AEB function. Change the imager to BULB mode by changing the "Options" -> "Expert Options" -> "Shutter Length" to Exposure (bulb).

Method Two:

EV distance from brightest area to average exposure by multiplying exposure by two

1/160s	1/80	1/40	1/20	1/10	1/5
0 EV	+1 EV	+2 EV	+3 EV	+4 EV	+5 EV

EV distance from shadows to average exposure by dividing exposure by two

1"	1/2	1/4
0 EV	-1 EV	-2 EV

5. What is an accurate method of determining the number of brackets and the exposure value separation?

When using Gigapan Stitch to align and render your panorama along with exposure bracketing, you will need to use a fuser or tone mapper with batch capability to consistently apply the same settings to each set of exposure brackets. The resulting fused or tone mapped images are then stitched by Gigapan Stitch. Some of your fusion or tone mapping options are...

- Photomatix 4.0
- Enfuse (freely available)
- Enfuse GUI Wrapper
- HDR Expose

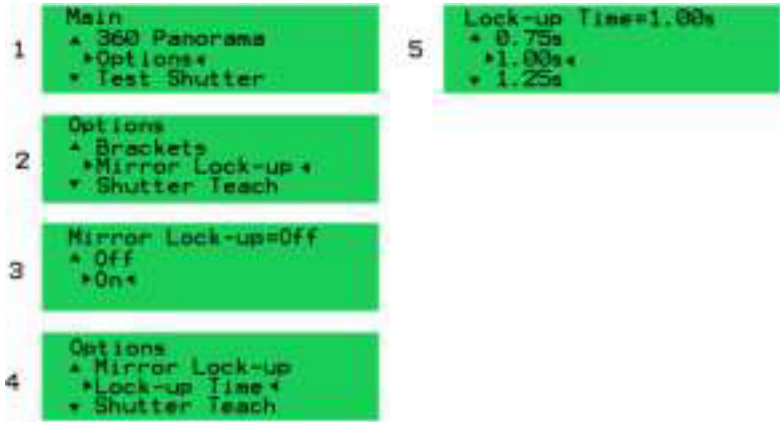
Preview your exposure brackets with a file browser or Adobe Bridge, adjusted so that an entire exposure bracket sequence is displayed on each row. Review the rows, checking to see that features match and that you did not miss any exposure brackets. If you are fusing the exposure brackets with Enfuse, and the Enfuse GUI Wrapper, you should convert the files to 16-bit .tiff format before fusing them. Photomatix and HDR Expose can process RAW and other formats.

When using the fusion or tone mapping software, it is often necessary to adjust several parameters to achieve realistic looking results. Fusion will yield realistic results with less intervention. Common parameters that you might need to change are Strength, Color Saturation, Exposure Bias, and Black Level.

Once you have processed your exposure brackets and produced fused or tone mapped files, you are ready to stitch your panorama using the Gigapan Stitch software.

4.4 Mirror Lock-Up

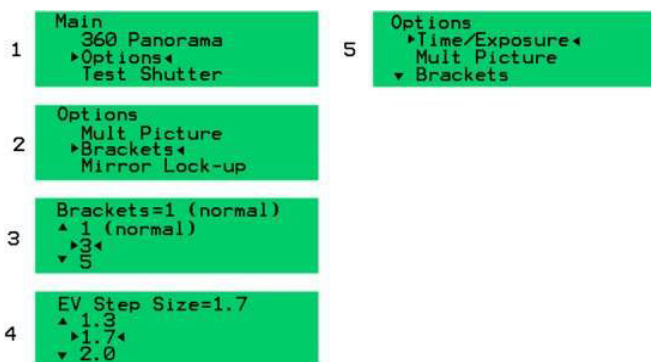
The “Mirror Lock-Up” function is used to flip up the mirror and wait a programmable delay that is independent of the “Time/Exposure” delay before actuating the shutter. “Mirror Lock-Up” is especially important for longer focal length lenses that are larger and heavier. The longer focal length indirectly means that the magnification is greater and that any lens movement is magnified more, and more likely to cause blurry photographs.



1. Select the “Options” submenu from the main menu
2. Select the “Mirror Lock-Up” menu item and press “OK”
3. Select the value “ON” and press “OK”
4. The menu item “Lock-Up Time” will appear once you have enable “Mirror Lock-Up”, select “Lock-Up Time” and press “OK”
5. Choose a value that is appropriate for the stability of your lens size and mass, and press “OK”. A larger and heavier lens will require mote time to settle. Choosing too long of a lock-up time will increase your capture time.

4.5 Shutter Teach

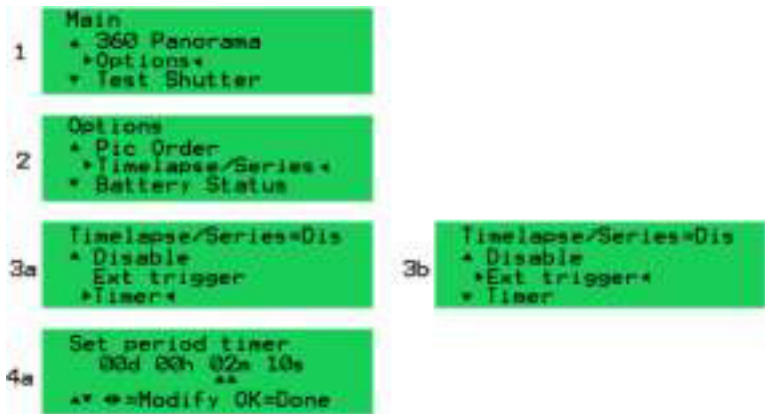
The “Shutter Teach” function is an alternative method of setting the timing for exposure bracketing for multiple pictures. The GigaPan enters a teaching mode where you press the left directional button at each point in time you want it to take a photograph.



1. First, configure your camera with the bracketing or multiple exposure mode you wish for your panorama.
2. Next, select the “Options” submenu from the main menu and press “OK”.
3. Scroll to the “Shutter Teach” menu item and press “OK”.
4. Select “ON” and press “OK”, you will now enter “Shutter Teach” mode.
5. The display will ask you to use the left arrow button to tell the GigaPan when to trigger the shutter.
6. Press the “OK” button when you are ready to begin teaching the GigaPan when to trigger. Press the left arrow button as if you are pressing the camera’s shutter button. The GigaPan will mimic your actions and actuate the shutter on the camera.
7. When you have pressed the left arrow button for the last picture to be taken, you need to tell the GigaPan how long to wait before it moved to the next position in the panorama. You do this by pressing the “OK” button after the last left arrow button press.
8. Now the GigaPan has been taught how many times and when to trigger the shutter. The display now has a small “T” for teach mode at the upper right-hand corner of the LCD display.
9. You can now start a panorama from the main menu and the GigaPan will use the shutter information you just taught it.

4.6 Time lapse/Series

You can use the “Time lapse/Series” function to take a series of panoramas over a period of time. You can use either the external trigger and a remote, or a timer to tell the GigaPan when to start each successive panorama.



1. Select the “Options” submenu from the main menu.
2. Select the “Time lapse/Series” menu item.
3. Select either the “Timer” or “Ext Trigger” option, and press “OK”.
4. If you choose “Timer”, then you will need to set the amount of time that elapses between the start of each panorama. Use the left and right buttons to switch between day, hour, minutes, and seconds. Use the up and down buttons to change the actual value that is highlighted by two upward arrows. Press “OK” when you have set the desired amount of time.
5. If you chose “Ext Trigger”, then you will need a remote shutter device with a Canon E3 mini plug style connector. It can be wired or wireless. Connect it to the remote trigger port on the GigaPan.
6. Now, return to the main menu by pressing the “X” button, and select “New Panorama” from the main menu.
7. After setting up the new panorama, the GigaPan will capture the panorama and either wait for the timer or a button press from the remote shutter that is connected to the remote trigger port.
8. When you want to exit the repeated capture of panoramas, press the “X” button to quit.

Some things to consider before starting a time lapse series

1. If you are mounting the GigaPan on a structure or a pole, is it secure? Will it present a danger to any people in the area if it falls? Safety First!
2. How are you going to power the GigaPan and camera body?
3. How are you going to store all of the images?
4. Is the equipment protected from weather, such as rain?

4.7 Save/Load Config

There are three configuration memories, config A, B, and C, that you can use to save settings. These configurations may allow you to save a significant amount of time switching between lenses or cameras.

Saving or Loading a configuration:

1. From the main menu, select the "Options" submenu and press "OK"
2. Select the "Save/Load Config" menu item and press "OK"
3. Select one of the configuration memory locations, A, B, or C, and press "OK"

4.8 Last Pic Hold

When the "Last Pic Hold" function is set to "ON", the GigaPan will keep the half button press signal asserted so that the camera is ready for the next panorama. This is very useful for time lapse panoramas.

1. From the main menu, select the "Options" submenu and press "OK"
2. From the "Options" submenu, select the "Expert Options" submenu, and press "OK"
3. Select the "Last Pic Hold" menu item and press "OK"
4. Select "ON" and press "OK"

4.9 Shutter Feedback

The "Shutter Feedback" function tells the GigaPan whether the shutter was triggered by using the strobe signal from the PC connector or hotshoe. When "Shutter Feedback" is set to "ON", and a cable is connected along with a shutter speed that is less than 1/250s, the camera will attempt to take a photograph the number of times set in the "Shutter Retries" function.

1. From the main menu, select the "Options" submenu and press "OK"
2. From the "Options" submenu, select the "Expert Options" submenu, and press "OK"
3. Select the "Shutter Feedback" menu item and press "OK"
4. Select the "ON" setting and press "OK"
5. The "Shutter Retries" menu item will now appear in the menu since "Shutter Feedback" is set to "ON". Select "Shutter Retries" and press "OK"
6. Select the number of times that you want the GigaPan to retry triggering the shutter and press "OK"
7. Connect the optional user supplied cable's PC end to the camera body's PC port. Connect the mini plug end of the cable to the remote trigger port of the GigaPan. The remote trigger port is located underneath the right-hand side of the GigaPan LCD panel. Note, you can buy a hotshoe adapter if your camera does not have a PC port.

NOTE: The "Shutter Feedback" function is good at detecting when the shutter has not been actuated, but may not detect a successful trigger after a failure. So, once you see that a shutter failure has occurred, watch the retries by the GigaPan.

5. Stitch and Share

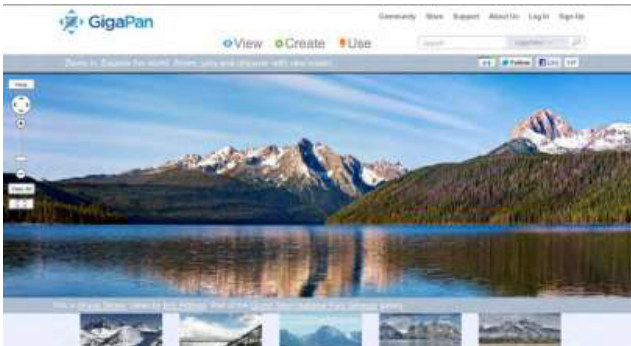
You must use a stitching software program to take all your photos and combine them into one big panorama, there are a number of these available from various companies. Once your panorama has been stitched and you're happy with it, you can upload it to GigaPan.com, Prodibi.com, and other similar sites. You'll need an Intel based Mac or PC with at least 1GB of RAM to stitch photos. To upload to the GigaPan.com site, your panorama must be at least 50 megapixels.

At Gigapan.com you can:

Explore Thousands of Gigapans from around the world, take snapshots, comment and share.

Discover amazing ways Gigapans are being used to communicate, promote, document, and provide amazing new vision.

Learn how to create you own Gigapans and embed them on your website



5.1 Embed your panorama

You can easily embed your panoramas on another website with all the functionality of the GigaPan Viewer to pan and zoom.

1. Log-in to GigaPan.com, and select "My Home", followed by "My Gigapans" to view your panoramas.
2. Choose a panorama, and click on the 'Embed' link below it to access the Embedding Wizard.
3. Copy the HTML code and paste it into your website or blog.

NOTE: To embed a panorama owned by someone else, please contact the author for permission and a copy of the embed code. Click on the author's name to view his or her profile, and select "send a message". You must be logged in to your Gigapan.com account to send a message.

6. Troubleshooting

Read on to find out how to fix common problems with the GigaPan. If you don't find your solution here, contact technical support at GigaPanSystems.com.

6.1 My photos are blurry

There could be several causes for blurry photos:

(See Next Page for troubleshooting tips) -->

1. The GigaPan might be moving before your camera has captured the photograph.
 - a. Navigate to 'Options' > 'Time Per Pic' in the GigaPan menu.
 - b. Use the directional keys to increase the time that the GigaPan will wait before moving. This is especially useful for nighttime panoramas.

2. The moving GigaPan platform might not have sufficiently settled before the photograph is taken.
 - a. Navigate to 'Options' > 'Expert Options' > 'Pre trigger Delay' in the menu.
 - b. Set the 'Pre trigger Delay' to a higher value to allow for more settling time.
 - c. Navigate to 'Options' > 'Expert Options' > 'Motor Speed'
 - d. Set the 'Motor Speed' to 'Med' or 'Slow' to allow for more settling time.
 - e. Shoot a test panorama while watching for settling through the camera viewfinder. If more settling time is needed, pause the panorama by pressing the X button and then adjusting the 'Pre trigger Delay' using the Quick Menu. (See Chapter 1.5 or instructions on programming 'Pre trigger Delay' in the Quick Menu).

Note: When you are using larger and heavier lenses it is especially important to adjust the 'Pre trigger Delay' and 'Motor Speed' settings.

3. Wind gusts or vibration might have disturbed the lens and camera.
 - a. Use a faster shutter speed that is at least the reciprocal of the lens focal length. If you are using a 300mm lens, then attempt to use a shutter speed that is at least 1/300th of a second. Consider increasing the ISO to allow for a higher shutter speed if there is not enough light.
 - b. Attempt to shield the lens and GigaPan from the wind by placing it to the side of an object such as a tree, car trunk, or a large collapsible portrait reflector. In extreme conditions, consider placing the GigaPan inside of a small camping tent.
 - c. Consider taking two or three photographs per position at the same exposure to increase the probability that one of the photographs is not blurry if the disturbance is intermittent.

4. Auto focus may not be yielding consistently focused images.
 - a. Navigate to 'Options' > 'Expert Options' > 'Shutter Length' in the GigaPan Menu. Increase the value of the 'Shutter Length' setting to a value greater than 'Time per Pic' to permit the auto focus sub system longer to achieve good focus.
 - b. If you have a faster lens (lower minimum aperture value such as f/2.8) consider using this lens. Note that a zoom lens will normally have two values printed on the lens. A minimum effective aperture at the shortest focal length and then a slower effective aperture at the longest focal length.
 - c. Consider using manual focus or a mixed manual focus and auto focus approach with areas such as sky, water, plain walls that do not contain detailed features.

(See Chapter 2.7 for more information on auto focus)

6.2 My photos have a narrow depth of field

There are several factors that affect the depth of field. You can increase the depth of field on your camera by:

- increasing the aperture value
- decreasing the focal length
- increasing the distance to your subject
- using a smaller size image sensor
- using auto focus to shift the critical focus if appropriate

You can also consult a depth of field chart provided by your lens manufacturer.

There is a point at which you will experience diminishing returns in image quality while increasing the aperture value to maximize the depth of field. The image will begin to be degraded by diffraction losses if you use too high of an aperture value such as f/22 versus f/8, f/11 or f/16.

You may be able to use auto focus to increase the sharpness of your panorama depending upon your subject, available light, lens, and camera. Using auto focus allows you to move the critical focus for each position in your panorama. (See Chapter 2.8 for more information on auto focus)

6.3 My camera is missing pictures, or the first exposure

There could be several causes for your camera to miss pictures:

1. The GigaPan's platform is moving faster than your camera can take pictures.
 - a. Navigate to 'Options' > 'Time per Pic' in the GigaPan Menu.
 - b. Use the directional keys to increase the time that the GigaPan will wait before moving.
2. While using auto focus you did not focus the lens before starting your panorama.
 - a. Press the shutter button on your camera halfway to engage the focus system and achieve good focus before starting your panorama.
3. Auto focus is not achieving focus and not taking pictures.
 - a. Navigate to 'Options' > 'Expert Options' > 'Shutter Length' in the GigaPan Menu. Increase the value of the 'Shutter Length' setting to a value greater than 'Time per Pic' to permit the auto focus sub system longer to achieve good focus.
 - b. If you have a faster lens (lower minimum aperture value such as f/2.8) consider using this lens. Note that a zoom lens will normally have two values printed on the lens. A minimum effective aperture at the shortest focal length and then a slower effective aperture at the longest focal length.
 - c. Consider using manual focus or a mixed manual focus and auto focus approach with areas such as sky, water, plain walls that do not contain detailed features.

6.4 The electronic trigger cable is not actuating the camera shutter

There are a few common reasons why the electronic trigger cable might not be actuating the camera shutter.

1. Ensure that the electronic trigger cable is connected to the camera body and to the GigaPan on the left of the LCD display.
2. Verify that a memory card has been inserted into the camera and that it is not full.
3. Verify that the camera is powered and that there is sufficient charge on the GigaPan battery to complete a panorama. (See Chapter 2.2 for checking battery status.)
4. If you plan on using manual focus, verify that the lens is in the manual focus mode.
5. If you plan on using auto focus, ensure that you are able to achieve focus by pressing the shutter button half way to engage the auto focus sub system.
(See Chapter 2.7 for more information on auto focus)

6.5 The electronic trigger cable is not allowing the camera to auto focus

1. Navigate to 'Options' > 'Expert Options' > 'Shutter Length' in the GigaPan Menu. Increase the value of the 'Shutter Length' setting to a value greater than 'Time per Pic' to give your auto focus sub system longer to achieve good focus.
2. If you have a faster lens (lower minimum aperture value such as f/2.8) consider using this lens. Note that a zoom lens will normally have two values printed on the lens. A minimum effective aperture at the shortest focal length and then a slower effective aperture at the longest focal length.
3. Check the servo mode or release policy of the servo mode. Different camera manufacturers use different terms for the servo modes. Typically a single servo mode uses a focus policy where the camera will not actuate the shutter unless the auto focus system communicates that a good focus was achieved. On some cameras you can change the default focus policy to a release policy where the photograph will be captured regardless of whether the camera achieves good focus. Continuous servo modes typically have a default policy of release where the trigger will be actuated regardless of the whether the camera achieved a good focus. Release policy can cause more problems than it solves depending upon your equipment and the subject you are photographing.
4. Consider using manual focus or a mixed manual focus and auto focus approach with areas such as sky, water, plain walls that do not contain detailed features.

(See Chapter 2.7 for more information on auto focus)

6.6 My panoramas are distorted or misaligned

There could be several causes for distorted or misaligned panoramas:

1. Check your setup for errors.

- a. Go through the Set-up steps in Chapter 2.

Note: Remember that you must repeat this every time you change the camera, lens or focal length.

- b. Make sure that your camera is tightly mounted on the GigaPan unit.

- c. Make sure that the GigaPan is firmly mounted on your tripod.

- d. Make sure that your tripod is on steady ground.

- e. Make sure that nothing disturbs the GigaPan while it's taking photographs.

2. Make adjustments for vertical or horizontal lines in your panorama.

GigaPan Stitch aligns the larger elements of photos, and thus might ignore vertical or horizontal lines such as poles and window frames.

- a. Try to avoid taking panoramas with too many vertical lines in the foreground.

- b. Try using a third-party tool to stitch your panorama.

3. Check and adjust the platform's forward-back position.

If you're taking macro panoramas (that is, really close to the subject), you'll need to adjust the position of the platform..

- a. Turn to Chapter 2.9: Minimize Parallax Error. **Note:** *This is a time-consuming process, and should only be used when necessary. However, it may be necessary for panoramas that have subjects that are both close and far away, and macro panoramas.*

6.7 My computer freezes while GigaPan Stitch is working

The GigaPan stitching software needs a lot of processing power to stitch panoramas, and will use up nearly 100 percent of your CPU, leaving little for other programs. In addition, larger panoramas need more power, and take more time. So while it might appear that your computer is frozen, it's just GigaPan Stitch working hard. Ideally, you should avoid working on your computer while the stitching software is running.

To monitor GigaPan Stitch in Windows, turn on the Task Manager ([Ctrl] + [Shift] + [Esc]). If GigaPan Stitch reports "Not Responding", use the 'report a bug' feature under the 'help' tab of GigaPan Stitch or contact tech support via GigaPanSystems.com.

On the Mac, you can monitor GigaPan Stitch using the Activity Monitor ('Applications' > 'Utilities' > 'Activity Monitor'). If GigaPan Stitch reports "Not Responding", use the 'report a bug' feature under the 'help' tab of GigaPan Stitch or contact tech support via GigaPanSystems.com.

6.8 My panoramas have vignetting

Vignetting is the result of less light reaching the edges and corners of a photo than the center of a photo. Vignetting manifests itself as a pattern of stripes in a panorama. You can adjust camera settings to minimize vignetting and you can reduce vignetting using an image editor before stitching the photos together.

Methods of minimizing vignetting while capturing photos

1. Reduce the diameter of the camera's diaphragm by using a larger aperture value such as f/8 versus f/4. The aperture value is inversely proportional to the diameter of the diaphragm opening.
2. Use a smaller focal length such as 200mm versus 400mm.
3. Use a petal type lens hood or no lens hood.
4. Newer Nikon and Canon cameras have vignetting compensation settings that help reduce vignetting for supported lenses. Nikon vignetting correction controls are located in the custom function menu. Newer Canon cameras support 'peripheral illumination' settings for certain lenses.
5. Increase the amount of overlap to an percentage higher than the GigaPan default of 30% using the 'Picture Overlap' setting in the GigaPan Menu.

Post processing photographs to remove vignetting before stitching

At times you may need to rely on editing your photos in post-production because your camera adjustments during the capture of the panorama were not enough to eliminate vignetting or the settings would have prevented you from capturing the images due to low light conditions. Note that you are able to adjust .jpeg format images to minimize vignetting, but you are able to make a more aggressive adjustment to files that are in the camera RAW format.

7. Tips and tricks

Here are some tips and tricks to make the most of your panoramas. Also, check out the creative ideas and advanced tips to go beyond the basics with your shots.

7.1 Shoot more than you need

Always take a larger panorama than you need to. Because stitched panoramas are rarely rectangular, you will need to crop your panorama to print it out. This could lead to a lot of lost information, especially at the boundaries.

Another good idea is to set your lower-right corner so that it's just after the point when the number of horizontal and vertical photos increases. For example, if the GigaPan shows you 20 horizontal and 10 vertical images, move it lower and to the right so that it reads 21 horizontal and 11 vertical.

What you need

What you should shoot



7.2 Shooting Outdoors



Try these tips settings for photographing huge vistas:

1. Examine the scene to identify what will make your panorama interesting and aesthetically pleasing, such as framing, colors, symmetry, perspective, textures, etc. Take a few individual photographs to assess exposure and contemplate the rectangular boundaries of what you want to capture.
2. Gigapan panoramas usually cover a larger area, which means that you will need to learn to make choices about exposure and focus.
3. Choose an appropriate focal length for your needs. You need a longer focal length such as 300mm to be able to see details that are far away, but changing light conditions or weather changes may require a shorter focal length such as 50mm to decrease the capture time.
3. Focus on an important element of the scene and manually set the focus.
4. Focus on an element that isn't too bright or too dark, and manually set the exposure. Use a lower ISO if possible to reduce image noise.
5. Set your camera's White Balance to either Sunlight or Cloudy, depending on the weather. Do not leave it at Auto. Use an Expodisc, color card, or grey card to set a custom White Balance.
6. Make sure that the sun is behind you. If this isn't possible, hide the sun behind an object. If you photograph into the sun you greatly increase the contrast and range of exposures necessary to capture the scene.
7. If you are using a larger lens, ensure that you set 'Motor Rigid' to 'On' and 'Motor Speed' to 'Med' or 'Slow'. Also, set the pre trigger delay to a value great enough to allow the lens to settle after the GigaPan moves and before actuating the shutter.
8. If there is substantial wind gusts, consider placing the GigaPan and lens behind a car trunk, tree, building, or a collapsible portrait reflector. Use a higher shutter speed that is at least the reciprocal of the focal length such as faster than 1/300 of a second for a 300mm lens.

7.3 Shooting Indoors



Try these tips settings for shooting indoors:

1. Examine what you are photographing to determine the framing, symmetry, color, perspective and texture that will give you an aesthetically pleasing or interesting panorama. Take a few photographs to help you evaluate exposure. It is important to determine the most important elements of the panorama so that you can make good choices before you concentrate on the details necessary for a successful capture.
2. Indoor scenes may have mixture of lighting types. Set your camera's White Balance so that it matches the type of light that illuminates the most important part of your panorama. Set the White Balance to Daylight, Tungsten, or Fluorescent. You may use an Expodisc, color card, or grey card to set a custom White Balance.
3. Parallax error will be more of an issue if the indoor subject is close to your camera lens. Consider using a shorter focal length such as 50mm to 100mm so that you are able to adjust the lens to a minimum parallax point instead of centering the mass of the camera and lens. The height will always be set to the center of lens if possible. Move the lens forward or backwards so that the end of the end of the lens between the focus ring and the edge of the first glass element is at the axis of rotation. A 50mm to 105mm might be a good range of focal lengths to choose from. (See Chapter 2.9 for more information on reducing parallax error)
4. Depth of field will be less as well because you are closer to your subject. Using a higher aperture such as f/11 instead of f/8, and a lower focal length will help increase the depth of field. Another option with the GigaPan is to use auto focus if the subject is suitable. (See Chapter 2.8 for more information about auto focus.)
5. If there are objects that are moving, you may want to use a higher ISO such as 400 or 800 to be able to use a faster shutter speed to freeze movement.

7.4 Night shots



Here are a few tips for shooting panoramas at night. The key is to increase the exposure time for each photo and make sure that the GigaPan and your camera are free from vibrations.

1. If your camera body or lens has Image Stabilization, turn the feature off. Nikon refers to image stabilization as VR vibration reduction.
2. If your subject is located in an urban setting, set your camera's White Balance to about 2900 Kelvin, or Tungsten if your camera does not have a Kelvin setting. Often urban settings include low pressure sodium or similar lighting which will cause your images to appear a burnt orange color. If you are located in a non-urban setting you will need to set your camera's White Balance to Daylight and a much longer exposure.
3. Increase the exposure setting for your camera. Preview the effect in the camera's screen until you're satisfied. Expect exposure times of about 15 seconds to 30 seconds at ISO 100 or 200 unless there is ample illumination.
4. A lower ISO setting will reduce image noise. The highest usable ISO depends on the camera body that you are using. Typically full frame sensors for newer cameras allow you to use higher ISO settings to reduce the capture time without introducing significant noise.

7.5 City scenes



In cities, you need to be more aware of objects in motion—specifically vehicles and people. You may also find that buildings can get distorted when you stitch your panorama.

To avoiding moving objects, watch for people or street traffic that might get in the way of your shots - pause the panorama before they do and resume the panorama after they have left the frame, or pause go back and resume where you left off. This may not always be feasible, so you can also retake the shot where the moving object got in the way and insert it into your image in using image editing software. Remember to remove any extra images you shoot before stitching.

A few tips if you're shooting buildings:

1. Try to get as far from the building as possible to capture the full building.
2. Instead of facing the building, shoot it from a 45° angle for a unique perspective.
3. Make sure that the corner of the building is at the center of your scene.

7.6 Panoramas in Motion: Capturing a Crowd

Sporting events, races or crowds of people are great opportunities to take an epic shot that captures every detail of the moment. You'll be sure to capture every face in the crowd.

When shooting a panorama of a sporting event that has a lot of motion, capture the whole scene and crowd, and then re-shoot the areas in motion individually. Drop these individual shots into the final panorama during post-production and you won't have any "ghosts" or missing people.


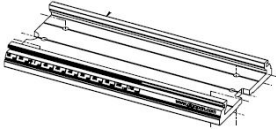
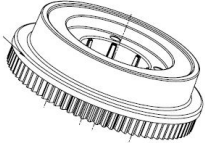
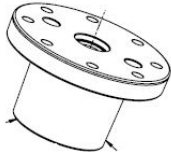


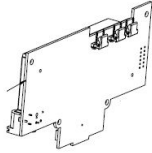
Also, set your tripod above the crowd or at an elevated level to capture the full scene.



8. Parts & Accessories

Parts are available for purchase online at the following web-address
www.omegabrandess.com/products/gigapan_parts_accessories

<p>GigaPan Pro Backpack Insert SKU: 700-5001</p> <p>Backpack insert to hold GigaPan unit and camera</p>	
<p>Epic Pro & Epic Pro V Battery Charger SKU: 520-2010</p> <p>Battery charger to charge the 7.2V Ni-MH battery that is supplied with the GigaPan unit. 110-240VAC (Type B, C, G, and I power adapters also available)</p>	
<p>Epic Pro & Epic Pro V Battery SKU: 590-0021</p> <p>GigaPan Rechargeable 7.2V Ni-MH Battery for Epic Pro & Pro V. Non-spillable dry battery, not restricted per SP A67.</p>	
<p>Extended Down Strut (Set of 2) SKU: 390-0036SET</p> <p>Extended downstruts to increase vertical travel of camera support arm by an additional 25mm, to accommodate larger professional cameras and lenses.</p>	
<p>Epic Pro & Epic Pro V Mounting Plate SKU: 590-3001</p> <p>Universal "Arce-style" mount for the Gigapan base that will work with any camera with a 1/4" thread socket.</p>	
<p>Epic Pro & Epic Pro V Mounting Clamp SKU: 590-3000</p> <p>Sliding "Arca-style" mounting clamp. Marked with scale to easily center any camera with an offset mounting socket. Attaches to sliding rail of GigaPan unit.</p>	
<p>Epic Pro & Epic Pro V Mounting Clamp/Plate Set SKU: 590-3000SET</p> <p>Single set that includes the mounting plate and mounting clamp for the GigaPan unit.</p>	

<p>Epic Pro Quick Change Camera Mount (for original Epic Pro Model) SKU: 590-0002</p> <p>Quick release plate for original Gigapan design with propriatary mount design (prior to "Arca-style" design)</p>	
<p>Extrusion Slide Arm SKU: 390-0016REVL</p> <p>Replacement sliding arm for GigaPan unit</p>	
<p>Drive Ring, 80T, Pan-Axis SKU: 390-0067REVC</p> <p>Replacement drive ring for GigaPan pan-axis</p>	
<p>Hub Drive, Pan-Axis SKU: 170-0117REVE</p> <p>Replacement hub drive for GigaPan pan-axis</p>	
<p>1/4" Black Thunbscrew (1) SKU: 300-0007</p> <p>Replacement 1/4" black thumbscrew for strut adjustment</p>	
<p>Epic Pro & Epic Pro V Daughter Board SKU: 150-0028</p> <p>Replacement daughter board for GigaPan Epic Pro & Epic Pro V units</p>	
<p>Epic Pro & Epic Pro V Main PCB Assembly SKU: 150-0024TK</p> <p>Replacement main PCB assembly replacement for GigaPan Epic Pro & Epic Pro V units.</p>	

8.1 Repairs

If you are in need of repair to your unit, or need a part you do not see listed, please contact us at customerservice@omegabrandess.com for assistance.