Digitarium® Zeta Portable Digital Planetarium System
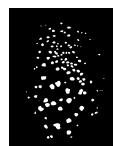
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Digitalis®
EDUCATION SOLUTIONS, INC.

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Introduction

The Digitarium Zeta portable digital planetarium system is a full-featured system ideal for portable or fixed domes up to approximately 12.2m/40 ft in diameter.

Our design goal was a planetarium system for the small to medium dome market that was simple to set up and use, portable, full-featured, and affordable, with excellent projection quality.

You will get the most out of your system if you understand the components of which it consists. The Digitarium Zeta system is comprised of a computer control unit (the Digitarium), a DLP projector, and two remote controls. The computer control unit runs planetarium and media software which are controlled by a Digitarium infrared remote control.

The Digitarium computer control unit produces video output which is projected onto a dome by the DLP projector using our own proprietary fisheye lens. The DLP projector has its own remote control which is used to change settings, such as lamp brightness and video sources, and to view or reset lamp usage.

The DLP projector remote control gives access to many projection specific settings, but we recommend that you do not modify these unless you are confident in your knowledge. Improper settings can potentially disable your Digitarium system.

Available as an optional add-on, our Universal Console interface is a cross-platform, web-based application that enables you to easily control your Digitarium planetarium system over a wired or wireless network. In a portable dome, you could run the Universal Console on an Apple iPad®, which would allow you to teach from anywhere in the dome while also providing finer control over your presentations. Learn more about the Universal Console at DigitalisEducation.com.

⚠ **Please review ALL manuals before attempting to use your system!**

- This user manual is designed to provide a general system overview.
- The Digitarium Software user manual explains how to interact with the system using the remote control.
- The Digitarium CU-1 user manual (or CU-Z user manual for Zeta 'Basic' models) includes detailed information about the control computer.
- The DLP projector user manual provides specific information about the DLP projector component.

Current versions of all user manuals are available on the Digitalis Community website:

http://Community.DigitalisEducation.com.

Features of Note

- Easy to use.
- Operated by backlit, handheld remote control or (optional) Universal Console interface from anywhere in the dome.
- Software is updated over the Internet at your command.
- Displays images or videos and plays scripts from a DVD, USB drive, or the internal hard drive.
- Plays third-party fulldome video shows.
- 5.1 channel surround sound support with video.
- Scripting feature allows you to create prerecorded segments or shows, including image manipulation, video, and audio. Read the scripting documents on the Manuals page of our Digitalis Community website for more information on writing scripts.
- Removable lens with user adjustable focus and centering.
- High contrast and reliable DLP projection technology.
- Spring assisted lift.

Safety

- We recommend removing the lens before shipping the system long distance with an outside carrier (i.e., not in your own vehicle). See the packing section for more information.
- For proper ventilation, always extend and lock the top frame in place before operating the projector.
- Be careful lifting the system due to its weight. We recommend using two people when lifting the loaded transit case.
- Always lift the system by its frame, not by any of the individual components.
- To avoid overheating, make sure vents are not blocked and the air filter is kept clean.
- Always use the Digitarium system with a surge suppressor to avoid damage caused by power surges, which is not covered by your warranty.
- Do not stare into the lens while the projector is projecting as the light is very bright.
- Refer servicing to qualified service personnel.
- Change the lamp at the end of its recommended life, or catastrophic failure can result. The DLP projector tracks how many hours the lamp has been used. See the DLP projector manual for instructions on checking lamp usage.

Security

The fisheye lens in your system is one of the most expensive components. Please note that the lens is removable and could be a target of theft. Plan accordingly.

Feature Identifier
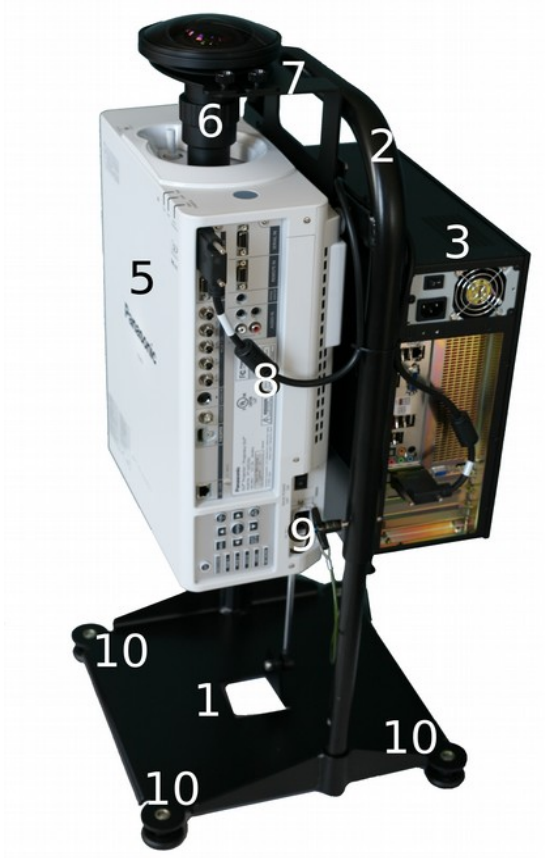
Features, as labeled in photos:

1. Frame base
2. Frame top
3. Digitarium® Control Unit*
4. DLP projector
5. Digitarium fisheye lens
6. Lens focus lock ring
7. Lens brace
8. Video cable (DVI version shown, HDMI cable is an alternate)
9. Frame locking pins
10. Adjustable feet
11. Lens caps (front cap shown with protective shipping film, which can be removed)

* Zeta 'Basic' model may look slightly different than image.

Set Up and Turning on the System

⚠️Before turning on the system, be sure to read the "Turning Off the System" section on page 9 for instructions on turning it off. Do not simply switch it off.

Set Up

If you are supplying your own projector and need to assemble your system from a kit, see "Assembly" on page 13. Otherwise if you need to install the lens, see "Lens Removal and Installation" on page 9.

1. With the transit case standing on end (wheels on the floor), undo the two clasps and open the case.

2. Remove the cords and remote control(s) from the transit case.

3. Grasp the frame by the curved handle. Pull the entire frame out of the case and place it on the floor. The transit case can now be stowed.

4. Position the system so that the projector lens is roughly under the zenith of your dome. For optimal cooling of projector components in an inflatable dome, make sure that the DLP projector is facing the fan intake vent.

5. If necessary, use the leveling feet to correct for an uneven floor.

6. Remove the two pins near the base of the frame by pushing in the button on each pin handle and pulling straight back.

7. Pull up on the top frame to raise the lens to projection height. (**Note:** You may want to stabilize the frame during this process by placing your foot on the frame base.)

8. When the frame reaches its travel limit, insert the pins into the holes from the projector side to hold the system in place. You will need to push in the button on each pin to insert it, and you may need to lightly push down on the frame to line up the holes.

9. Attach the power cords to the Control Unit and DLP projector (**Note:** The longer cord is for the DLP projector). Plug the other ends of the cords into a surge protector, uninterruptible power supply (UPS), or AC power conditioner plugged into an acceptable AC power outlet. These devices protect against damage from different types of electrical power disturbances not covered under your warranty.

10. Plug in optional PC speakers (not included with purchase).

11. Remove the lens cap by lifting straight up; **do not twist the lens cap**. If the cap is tight, gently angle up one side. We recommend setting the cap on top of the frame base so as not to misplace it.

Power On/Begin Projection

1. Switch on the Control Unit and DLP projector at their AC power switches.

2. For Zeta systems with a CU-1, switch on the control unit by pressing the green start button on the control unit. For troubleshooting, please refer to your Digitarium CU-1 manual.

3. For Zeta 'Basic' models with a CU-Z, the control unit should power on automatically when the power cable is plugged in. If it doesn't turn on automatically, you can press the power button on the CU-Z remote control to turn the control unit on. For troubleshooting, please refer to your Digitarium CU-Z manual.

4. Press the power button on the DLP projector remote to turn on the lamp.

5. Wait about 75 seconds. If you are using speakers, you will hear a few musical notes signifying that the control unit is ready. You will not hear these notes if you have a start up script on USB or DVD.

6. When ready, you will see the sky projected onto the dome above you. If you see only black or blue, refer to the troubleshooting section in this manual.

7. When Nightshade, the simulator, starts up, it will automatically run a script called "/scripts/startup.sts" if one exists in the control unit's USB drive or on the disk in the DVD drive. For more information about scripts, see the section entitled "Script Playback Mode" in the Digitarium software user manual. Press if you want to cancel the script.

8. If you want to make sure you are in the center of the dome, press on the remote control to bring up an azimuthal grid. Gently move the system as needed to center the grid on the dome.

9. If the projection is tilted, recheck the centering (see below for details).

10. If you are using the projector at an altitude above 4,596 ft (1,400m), you will need to change the fan setting to high altitude. Follow the directions in the DLP projector user manual to do this.

11. Don't forget to change your latitude, longitude, and time zone, if necessary, and save your settings. Refer to the software manual for more information on this process.

Note: You will probably notice a smell of hot plastic while the projector is relatively new. This is normal.

Focusing the Lens

If projection seems blurry, refocus the lens. **NOTE:** Never touch the glass of the lens.

- Loosen the four thumb screws on the top of the lens brace.
- Hold the lens steady with one hand and loosen the focus lock ring on the lens by turning it counter-clockwise.
- Grasp the lens near the top, then slowly rotate it until projection is focused.
- Hold the lens steady and tighten the lock ring by turning it clockwise.

- Push the lens brace clamps against the lens, making sure not to tilt the projection.
- Tighten the four thumb screws to hold the lens in position.

Centering the Lens

You may need to center the lens if the projected horizon is not level:

1. Loosen the four thumb screws on the lens brace clamps.
2. Loosen the white lens adjustment joystick on the projector by twisting it counterclockwise.
3. Tilt the joystick to move the lens into the proper position.
4. Tighten the white joystick by twisting it clockwise.
5. Push the lens brace clamps against the lens, making sure not to tilt the projection.
6. Tighten the four thumb screws.

Turning off the System

To shut down your system, you should turn off the control unit first, and then the DLP projector.

To turn off the control unit:

1. With the remote control, use text menu item 8.3 (see the software manual for more information). With the (optional) Universal Console interface, tap the shut down button on the Settings screen.
2. If desired, flip the Control Unit power switch to the off position (0) when the shut down process is complete.

⚠️**To avoid corrupting the system, do not turn off the control unit during a software update or while the indicator light is bright (indicates disk activity). If necessary, you can simply turn off the control unit at the AC switch without following step 1 above. However, this runs the risk of corrupting the system.**

To turn off the DLP projector:

1. Press the power button of the DLP projector or DLP projector remote control twice. It takes about two minutes to cool down the projector lamp safely. While cooling, the power indicator light will be steady orange.
2. Put the lens cap on the fisheye lens to protect the lens.
3. When the DLP projector power indicator light is steady red, the projector has completed its cooling process. You can now flip the power switch to off (0).

Packing

1. Unplug the power cords from the Control Unit and DLP projector.

2. If necessary, screw the leveling feet as far as possible into the frame base.

3. Remove the two frame pins by pushing in the central button on each and pulling straight back.

4. Push down on the top of the frame to compress it for packing. One strong motion works best.

5. Insert the frame pins in the holes near the frame base.

6. If you need to remove the lens for transport, see the section "Lens Installation and Removal" below.

7. Bring the transit case over and position it on end, with the lid open. The projector always goes in the left side of the case, next to the remote controls.

8. Grasp the handle of the frame and lift the system slightly off the floor. Angle the top of the frame slightly toward you, and tilt the bottom of the frame into the transit case. Straighten out the frame and push the system all the way into the case. If the system gets stuck, gently tilt the transit case backward to the floor and let gravity assist with packing.

9. Pack the power cords, remote controls, user manual, and accessories in the provided spaces. See the photo below.

 NOTE: To avoid damage to the projector, we recommend removing the lens before shipping the system with an outside carrier (i.e., not in your own vehicle) or transporting it over rough terrain. Simply reverse the steps in the next section.

Lens Installation and Removal

When you first receive your system, you will need to install the lens as described below. If you need to remove the lens, reverse the steps below and transport the lens separately in a padded box.

Follow these steps for Digitarium Zeta Portables sold before 2015:

1. Remove the fisheye lens from the box.

2. Loosen the four thumb screws on the lens brace clamps.

3. Make sure the lens focus lock ring on the lens mount is loose (not tightened all the way clockwise).

4. Remove the small lens cap from the back end of the lens and the brightly colored dust cap over the lens mount opening.

5. Fit the small end of the fisheye lens into the lens mount opening.

6. Grab the top outer rim of the lens, and rotate the entire lens clockwise approximately 20 turns.

7. You will need to adjust the focus after you have turned the projector on. See the section "Focusing the Lens" on page 7.

Follow these steps for Digitarium Zeta Portables sold in (or after) 2015:

1. Remove the fisheye lens from the box.

2. Loosen the four thumb screws on the lens brace clamps.

3. Remove the bright red dust cap which covers the lens mount opening. Make sure to remove any tape which may have been used to secure the cap.

4. Remove the small lens cap from the back end of the lens.

5. Fit the small end of the fisheye lens into the lens mount opening, lining the silver plunger on the lens with the small red dot on the plastic lens mount cover (as shown to the right).

6. Gently push the lens downward into the lens opening.

7. Grab the top outer rim of the lens and rotate the entire lens clockwise to lock it into place. You will feel a click as the plunger finds its slot (as shown to the right).

8. You will need to adjust the focus after you have turned the projector on. See the section "Focusing the Lens" on page 7.

Transit Case Packing Diagram
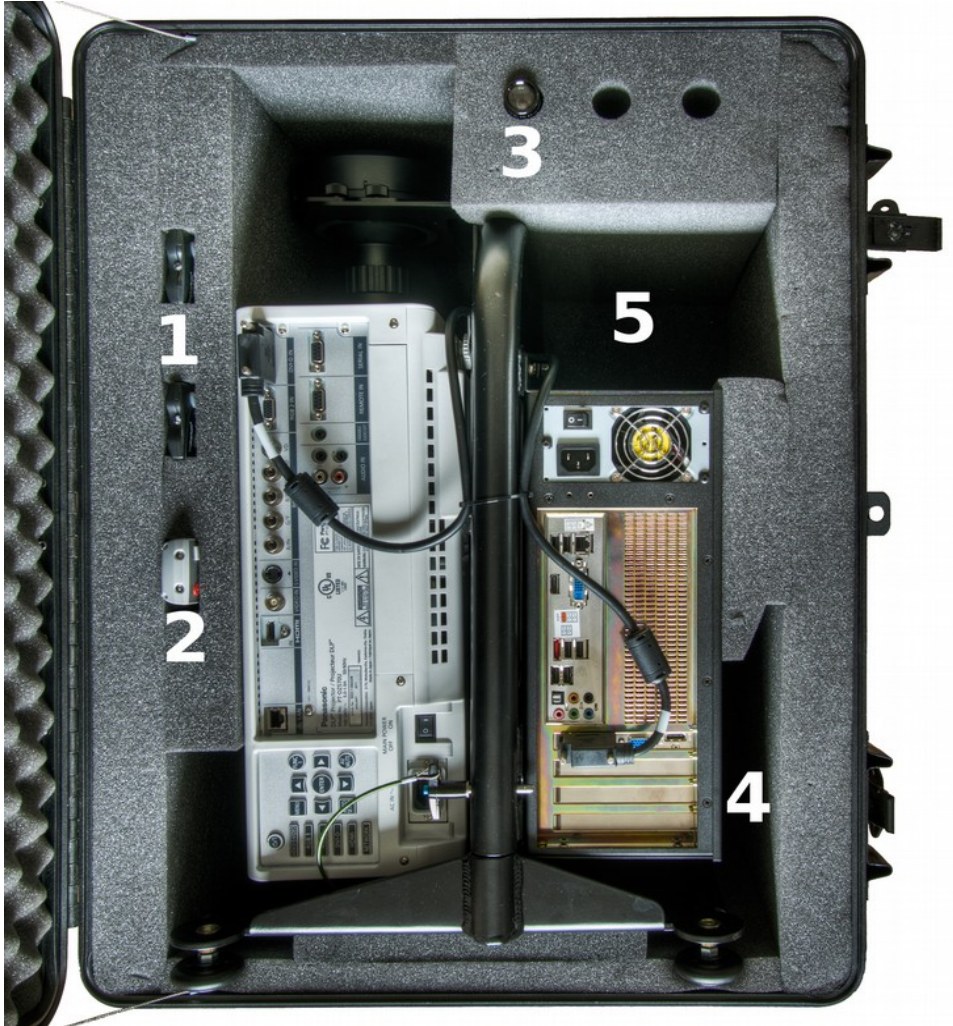
1. Digitarium remote controls (two)

2. DLP projector remote control

3. LED pointer (two additional spaces if you wish to purchase more)

4. Space for user manual

5. Space for cords

Projecting Other Video Sources

The projector allows you to project directly from another computer or video source onto the dome. See the DLP projector user manual for details.

Maintenance

Lens Care

To protect the lens, always attach the lens cap when you are not using your Digitarium system. If you notice dust or dirt on the lens, clean it with a soft, lint-free tissue or cloth and methyl alcohol.

⚠ If you remove the lens from the system, be sure to use both the front and back lens caps.

Lamp Life

The Digitarium system is designed to require minimal maintenance. However, the projector lamp will eventually grow dimmer and burn out. It is important to check lamp life and to replace the lamp when its design lifetime is reached, even if it is still apparently working fine, in order to avoid catastrophic failure.

The standard projector lamp must be replaced after 2,000 hours of projection if used in high brightness mode or 3,000 hours in eco (low brightness) mode. It may be necessary to replace it sooner if the lamp becomes noticeably dimmer or projection will not start. To assist you, the DLP projector tracks how many hours the lamp has been used and will provide reminder messages.

Refer to the DLP projector user manual for detailed instructions on checking lamp hour usage and replacement procedure.

⚠ We highly recommend that you always keep a spare lamp on hand to be prepared for any eventuality. Otherwise, if your only lamp fails, you may have days or weeks of downtime waiting for a replacement.

⚠ The projector lamps contain a small amount of mercury. Please dispose of them in an environmentally safe manner, such as at a hazardous waste collection site.

⚠ The Control Unit and projector need to be kept clean of dust internally for adequate cooling. See those manuals for service recommendations.

Assembly

If you have purchased your own Panasonic projector or had to disassemble your system, here are assembly directions.

To mount the DLP projector to the frame, you will need:

- Phillips screwdriver
- Medium thread locker such as Loctite 242 (optional, but recommended for better fastener reliability)
- Zeta mounting hardware kit (provided by Digitalis)
- A cushion or piece of foam at least two inches/five cm thick to rest the DLP projector on
- A low dust environment, to keep dust out of the projector optics.

First Time Projector Setup

This section is only required for a brand new Panasonic projector. Skip to the next section if your projector already has a Digitarium lens mount in it (there will be a brightly colored mount cap in place) skip to the next section.

1. Unpack the projector, set it on its feet on a table, and remove the lens cap.

2. Plug the projector in, switch on the power switch next to the power cord, and turn on the lamp by pressing the power button on the remote control.

3. While the projector is running, use the projector remote control to enter the projector menu:

- Select your default language (Display Language).
- Select Orientation as Vertical Up.
- Change the menu display so that it displays in the center of the projection area (Display Options – On Screen Display – OSD Position = 6).

NOTE: Failing to follow these instructions will make it difficult to see or change your settings after the fisheye lens is mounted.

4. Turn off the projector by pressing the power button twice. Allow it to fully cool down (indicator light is steady red), then unplug it.

Remove Stock Lens

This section is only required if you see the stock lens as shown at right (cap shown). Otherwise skip to the section Mount Projector to Frame on page 15.

1. Set the projector on its rear with the lens pointing up.

2. Locate the cover plate on the front of the projector. This piece surrounds the hole where the lens exits the projector body, and it is secured with a single mounting screw.

3. Using a Phillips screwdriver, remove the mounting screw. Remove the plate by pulling it away from the projector and over the lens. Set this piece carefully aside.

4. Remove the flexible white plastic gasket from around the lens. Save this piece for later.

Cover Plate

Mounting screw➡️

5. To remove the lens assembly, locate the three lens assembly mounting screws—two toward the bottom of the projector and one toward the top. Only the two bottom screws are visible in the image below. The top screw is covered by a thin layer of foil. To remove this screw, you will need to carefully bend the foil out of the way.

6. Using a Phillips-head screwdriver, remove all three screws, and set them aside. **Note:** Each screw has a small metal washer behind it. When you remove the screws, do not drop the washers or screws into the projector. We highly recommend using a magnetized screwdriver.
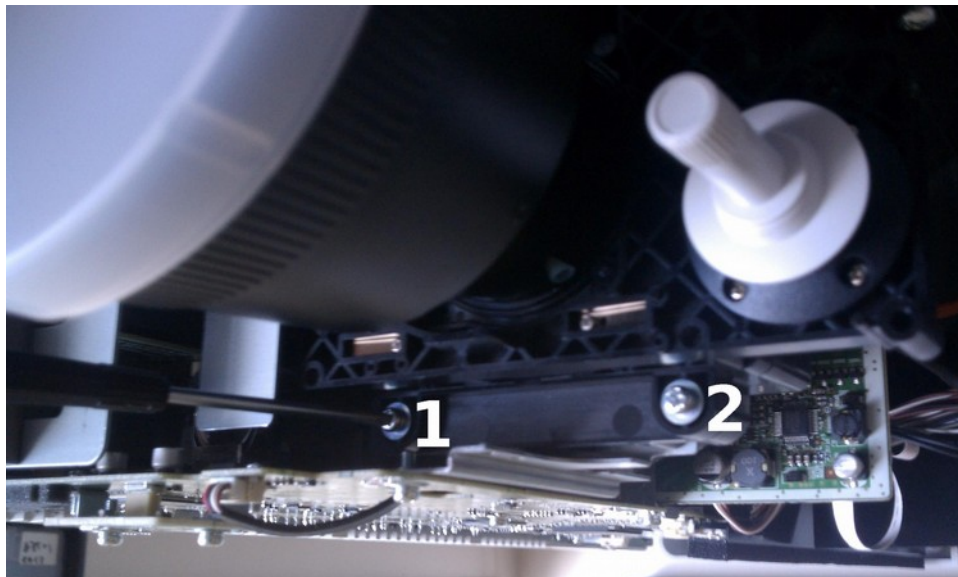
7. Remove the entire lens assembly from the projector body. You will need to tilt the lens to remove it.

8. Unmount the factory lens from the lens mounting bracket by removing the four screws on the back. Store this lens somewhere safe, as you will need it for servicing the projector.

Swap Lens Mount

If the Digitarium fisheye lens mount is already installed, skip to Mount Projector to Frame on page 15.

1. If the system will be used in a stationary configuration like a fixed dome, this step is not required:

    Disassemble the Panasonic mounting bracket, and replace the plastic lens mounting piece with the machined aluminum piece supplied with your order. Make sure that the bracket has the same freedom of movement it had originally and that the aluminum mounting piece moves freely in the assembly. Figure to the right shows a mounting bracket after replacement aluminum piece has been correctly installed.
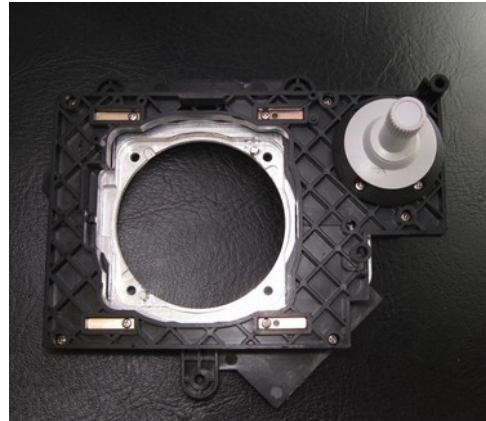
    We created this piece to prevent damage to the assembly and projector due to shipping or transportation damage, and is not required if the system is well-treated and not moved frequently.

2. Remove your Digitarium Zeta lens from its box. Loosen the focus lock ring (counter-clockwise half a turn or so). Remove the back lens cap on the lens and unscrew the lens from the fisheye mount (about 20 turns). Replace the lens cap on the back of the fisheye lens for safety.

3. Use the four 4-40 screws in the Zeta hardware kit to secure the fisheye mount to the projector mounting bracket. Use threadlocker if available. **Note:** Do NOT use the screws that secured the Panasonic lens to the bracket.

4. Mount the lens mount assembly in the projector using the three long screws from earlier.

5. Insert the flexible white plastic gasket (white side up) around the lens, below the cover plate.

6. Reattach the projector cover plate with the single mounting screw. Note that one side has two tabs to engage before screwing in the other side.

Mount Projector to Frame

1. Lay the projector top down (the side with the Panasonic logo) on the piece of foam.

2. Orient the lens brace so that it will fit around the fisheye lens when put into the system. Two clamps go on either side of the lens and attach to the brace with thumb screws. Add these, but do not tighten the thumb screws. The long side of the brace should rest on the back of the projector.

3. Line up the holes in the lens brace with the mounting holes in the back of the projector. See photo at right. Place the short screw in the hole furthest from the lens; use a star washer with this screw and tighten it fully. Place the shorter spacers on the three mounting screw holes closest to the lens, and the longer spacer over the fourth hole.

4. Carefully lower the portable stand frame on top of the spacers so that the screw holes are aligned with the spacers. See below.

5. Attach the projector to the frame with the 30mm M4 screws and star washers. If possible, use a drop of threadlocker on each screw.

6. Place the Control Unit on top of the frame. Line up the holes in the Control Unit flange with the holes in the frame.

7. Use the four 10/32 screws with captive star washers to attach the Control Unit to the frame. If possible, use a drop of threadlocker on each screw. Push the Control Unit down toward the frame base so that the screws will go through the smallest area of the mounting holes. Tighten the screws fully.

8. Stand the system up on its base. Attach the video cable to both the projector and the Control Unit. See the photo at right. (DVI cable shown, HDMI is an alternate with fairly similar routing.)

9. Place one of the brightly colored plastic caps over the lens mount to keep dust out of the projector unless you will immediately install the lens in the next step.

10. You are now almost ready to turn on and test your system. See the section Set Up on page 6. **Once the system is booted up, make sure your projector settings are correct (see Recommended Projector Settings below).**

Disassembly

Should you need to disassemble your Digitarium Zeta system, **first shut it down and unplug it.** Then follow the assembly steps in reverse order, as required for your purposes.

If you need to send your DLP projector to Panasonic for servicing, we recommend that you remove it from the Digitarium system frame and replace our fisheye lens with the standard projector lens before doing so.

Recommended Projector Settings

For the best performance and projection quality, we recommend using the following settings which you can change in the DLP projector menu:

- Projector Setup – Cooling Condition – Vertical Up
- Picture – Picture Mode = Natural
- Picture – Sharpness = 0
- Picture – Noise Reduction = Off
- Picture – AI = Off
- Display Options – Back Color = Black
- Display Options – On Screen Display – OSD Position = 6

Basic Troubleshooting

(See specific manuals for detailed information.)

Symptom	Possible Solution
Nothing projected.	1. Do the DLP projector and the Digitarium® Control Unit have power?
	2. Are the DLP projector and Digitarium® Control Unit turned on? The case fan on the Control Unit on page 25 should be running and at least one lamp indicator light should be green on the side of the projector.
	3. Is the video cable securely connected at the Control Unit and projector? If not, connect it.
	4. Press the "DVI" or "HDMI" button on the DLP remote control, depending on your system's video cable.
	5. If that does not solve the problem, remove any CD/DVD or USB drive that contains a start-up script. Plug in speakers and reset the Control Unit. If the Control Unit is working, you will hear a few musical notes after Nightshade has started up.
	6. If everything seems correct but nothing is projected, shut down and then restart the projector.
	7. If the Control Unit is working, try using a different video cable to connect the DLP projector and Control Unit.
	8. If all of the above fails, contact technical support.
Projection is not level.	See the section entitled "Centering the Lens" on page 8 above.

Symptom	Possible Solution
Digitarium® remote control is not working.	1. Are you pointing it at the zenith of your dome? 2. Is the infrared receiver covered or blocked? If so, remove the problem. 3. Test by pointing the remote directly into the IR receiver window when hitting buttons. 4. Replace the batteries in the remote with new ones. 5. Reboot the computer control unit by hitting the red reset button.
Thick or blurry line drawings; cursor segments are different pixel thicknesses.	1. Adjust the lens focus. See the section entitled "Focusing the Lens" on page 9 of this manual for instructions. 2. Make sure that the DLP projector is using the correct resolution (1920 x 1200) and that keystone correction is set to zero. A quick way to check the resolution is to go into media mode and with the menu visible hit the 🔘 button. The current resolution will display below the menu. 3. Are the lines being anti-aliased? Use the text menu (see the software manual) to turn anti-aliasing on and off for comparison, then save your preference as default.
Lamp shuts off unexpectedly.	See DLP projector user manual.
Projection seems to pulsate/jiggle (not caused by star twinkling)	1. This can be caused by vibration in the system or its environment. Due to the large magnification inherent in the fisheye lens, a small amount of pixel vibration should be expected. 2. Remove any disk in the DVD drive and see if that helps. A USB thumb drive is a better option than a CD or DVD (silent and vibration-free). 3. Is a DLP projector fan out of balance (this may be audible)? Try having the DLP projector serviced if the vibration is distracting.
Bright fuzzy spots on black image.	Dust particles may be inside the optical path. 1. Turn off the system and remove the lens (see the "Disassembly" section on page 18 of this manual). 2. Gently clean the optical prism inside the projector with a soft, clean brush, or carefully vacuum it without touching the optics. 3. Reattach the lens and test the system.

Symptom	Possible Solution
Default speaker volume too high or too low. (Zeta Basic model w/ speakers)	1. When looking into the system through the opening on the back of your control unit you will find the speaker volume dial located on the back of the left hand speaker. Adjust the volume dial to a desirable level. 2. Additionally, the volume between different media sources can be adjusted with the Digitarium remote control buttons labeled -7 and +7. Press the -7 button to decrease the volume, and +7 to increase the volume.
No sound coming from speakers. (Zeta Basic model w/ speakers)	1. Verify that you are playing a video with audio or an audio track. 2. Verify that the internal speaker volume is set loud enough to be heard. When looking into the system through the open access door you will find the speaker volume dial located on the back of the left hand speaker. 3. Verify that the speaker cables are plugged into the control unit. When looking into the system through the opening on the back of your control unit you will find the audio cable plugged into the outlet with a headphone symbol on the front of your control unit. The speakers' USB power cable is plugged into a USB hub in the front of the control unit. Make sure they are both fully seated. 4. If those steps fail to resolve your problem, contact technical support for further instructions.

How to Get Help

If you are experiencing problems with your Digitarium system, please:

1. Reread the manuals, especially the trouble shooting sections, to make sure you haven't missed a possible solution.

2. Contact your local distributor, if any:

3. Or create a support ticket (in English) with Digitalis Technical Support by going to the Support section of the Digitarium Community site at: http://Digitarium.com/community/

4. Did you know Digitalis offers a Priority support package that includes 24/7 telephone support? If you would like details and pricing please contact your Digitalis sales representative or email sales@DigitalisEducation.com.

Product Specifications

Pixels per degree	6.7 (average)
Dimensions	Digitarium® system: 16 x 16 x 25 in. (40 x 40 x 63.5 cm) for storage; 16 x 16 x 35 in. (40 x 40 x 89 cm) for projection. Transit case: 19 x 21 x 31 inches (47.5 x 52.5 x 77.5 cm).
Weight	Projection system is approximately 60 pounds (27.3 kg); transit case is approximately 34 pounds (15.5 kg).