BRAINLOGICS MR DIGITAL PROJECTOR
OPERATOR MANUAL
Model BLMRDP-200
REV 5
PN: PST-100371

For Research Only

Division of
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This manual describes the installation procedure for the BrainLogics MR Digital Projector. Please review the manual completely and thoroughly before unpacking and installation of the system. The BrainLogics MR Digital Projector is designed to collect responses via any computer system equipped with a 2.0 operating system. Proper performance of this system is guaranteed only while the system is used in accordance to the enclosed instructions and safety guidelines.

NOTICE:
TRANSPORT AND STORE THIS PRODUCT UNDER THE FOLLOWING ENVIRONMENTAL CONDITIONS ONLY, FOR A PERIOD NOT EXCEEDING 4 WEEKS:
AMBIENT TEMPERATURE OF -40°C to +60°C
RELATIVE HUMIDITY OF 10% TO 100% (Non-Condensing)
ATMOSPHERIC PRESSURE ON 765hPa TO 1011hPa
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Chapter 1: Safety

1.1 Safety Symbol

The following symbol will be used throughout this manual and as a means to alert you to potential safety hazards on the accompanying equipment.

Attention! Consult Accompanying Documents
Chapter 1: Safety

Please read all **WARNINGS** carefully and **completely** before continuing with the use of your BrainLogics MR Digital Projector Unit (MRDPU).

⚠️ **DO NOT** power up the BrainLogics MR Digital Projector until you are instructed to do so.

⚠️ The BrainLogics MR Digital Projector Unit (MRDPU) must be kept away from the magnet bore. The MRDPU contains ferromagnetic components and may become a projectile in the presence of a strong magnetic field. Failure to properly secure the MRDPU may result in serious or fatal injury.

⚠️ The MR Digital Projector Unit (MRDPU) contains no field serviceable components. To avoid the risk of shock or device failure, the MRDPU must not be opened. Opening the MRDPU may result in serious or fatal injury and/or invalidation of the warranty.

⚠️ The MR Digital Projector Unit (MRDPU) must not project directly into the eyes. Be sure the projection screen or other obstruction is in place to block direct eye exposure to the lens before turning the unit on. Looking directly into the lens may result in serious damage to the eyes.

⚠️ Service to be performed by qualified service personnel only. Opening the device by non qualified personnel may invalidate the warranty. See product documentation for proper procedures.
Please read all **WARNINGS** carefully and completely before continuing with the use of your BrainLogics MR Digital Projector Unit (MRDPU).

**DO NOT** attempt bulb replacement with the MR Digital Projector Unit (MRDPU) inside the Magnet Room. The bulb contains ferromagnetic components and may become a projectile in the presence of a strong magnetic field. Replacing the bulb inside the magnet room may result in serious or fatal injury. The bulb should be replaced somewhere other than the Magnet Room.

**The BrainLogics MR Digital Projector Unit (MRDPU) must stay outside of the 100 gauss field or personal injury and/or damage to the unit may result.**

**The projection screen must be in position between the projector beam and the participant's line of sight before projecting to a participant.**

**To prevent fire or shock, **DO NOT** expose this unit to rain or moisture.**

**DO NOT** use this unit’s grounded plug with an extension cord or in an outlet unless all three prongs can be fully inserted.

**For proper ventilation you must keep at least 3” free on all sides of the MRDPU.**

**DO NOT** touch cooling fan vents, they may be extremely hot and injury may result.
Chapter 1: **Safety**

Please read all **WARNINGS** carefully and completely before continuing with the use of your BrainLogics MR Digital Projector Unit (MRDPU).

⚠️ **DO NOT** Open the MRDPU housing. There are high-voltage components inside. All servicing should be done by qualified service personnel.

⚠️ Exposure to direct sunlight, smoke or steam can harm the MRDPU internal components.

⚠️ Handle the MRDPU carefully. Dropping or jarring can damage internal components.

⚠️ **DO NOT** take the Projector Control Room Console, Projector Control Room Console Power Supply or the Control Room - Remote Control into the magnet room. These components of the MRDPU contain ferromagnetic parts that could pose serious threat of harm or personal injury.

⚠️ Repeated power interruptions may shorten bulb and/or projector life.
Chapter 1: Safety

Please read all **WARNINGS** carefully and completely before continuing with the use of your BrainLogics MR Digital Projector Unit (MRDPU).

**Fire and Shock Precautions**

Ensure that there is sufficient ventilation and that MRDPU vents are unobstructed to prevent the build-up of heat inside your projector resulting in a subsequent fire or electrical malfunction.

Prevent foreign objects such as paper clips and bits of paper from falling into the projector. **DO NOT** attempt to retrieve any objects that might have fallen into your MRDPU. **DO NOT** insert any metal objects such as wires or tools into your projector. If something should fall into your MRDPU, disconnect it immediately and have the object removed by a qualified service personnel.

**DO NOT** place any liquids on top of your MRDPU.

**DO NOT** look into the lens while the MRDPU is on. Serious damage to your eyes could result.

Keep any items such as magnifying glass out of the light path of the projector. The light being projected from the lens is extensive, therefore any kind of abnormal objects that can redirect light coming out of the lens, can cause unpredictable outcome such as fire or injury to the eyes.

**DO NOT** cover the lens with a lens cap or equivalent while the MRDPU is on. Doing so can lead to melting of the cap and possibly burning your hands due to the heat emitted from the light output.

If the MRDPU is not to be used for an extended period of time, make sure the projector is turned off, then disconnect the plug from the power outlet.
Chapter 1: Safety

Please read all **WARNINGS** carefully and completely before continuing with the use of your BrainLogics MR Digital Projector Unit (MRDPU).

⚠️ **DO NOT** unplug the power cable from the wall outlet or do not turn off the main power while the projected image still indicates that it is on, doing so can cause damage to the MRDPU.

⚠️ **DO NOT** unplug the power cable from the wall outlet or do not turn off the main power while the message “Please wait a moment.” appears, doing so can cause damage to the projector. This message will be displayed after the MRDPU is turned off.

⚠️ **DO NOT** unplug the power cable from the wall outlet or do not turn off the main power while the cooling fans are running. (The cooling fans continue to work for 90 seconds after the projector is turned off), doing so can cause damage to the projector.

⚠️ **SEIZURE WARNING** Some people (about 1 in 4000) may have seizures or blackouts triggered by light flashes or patterns even if they have never had a seizure before. Risk of seizure may also increase in participants with epilepsy, those with a history of seizures, or in participants with a recognized risk for seizure (such as head trauma, metabolic disorders, alcohol and drug withdrawal, CNS infections).
2.1 Control Room Components

The BrainLogics MR Digital Projector Unit (MRDPU) is shipped with all of the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRDPU Control Room Console</td>
<td>PST-100351</td>
</tr>
<tr>
<td>Power Supply</td>
<td>PST-100138</td>
</tr>
<tr>
<td>Fiber Optic Cable</td>
<td>PST-100048</td>
</tr>
<tr>
<td>Control Room Remote Control</td>
<td>PST-100389</td>
</tr>
</tbody>
</table>
Chapter 2: **Components and Technical Specifications**

### 2.2 Magnet Room Components

The BrainLogics MR Digital Projector Unit (MRDPU) is shipped with all of the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BrainLogics MR Digital Projector Unit</strong></td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>PST-100352</td>
<td></td>
</tr>
<tr>
<td><strong>MRDPU AC Power Cable</strong></td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>PST-1000135</td>
<td></td>
</tr>
<tr>
<td><strong>MR Safe Remote Control</strong></td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>PST-100356</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 2: Components and Technical Specifications

2.2 Magnet Room Components

There are three major components of the BrainLogics MR Digital Projector Lens.

1. Lens aperture
2. Zoom lens.
3. Lens barrel

The lens barrel will be screwed completely into the Projector Housing upon unpacking.

The lens aperture is designed to reduce the brightness of the projector and increase the contrast.
Chapter 3: Hardware Setup

3.1 Fiber Optic Cable Assembly

⚠️ **NOTE:** Please use caution while handling the Fiber Optic Cable. Failure to exercise caution may result in damage to the Fiber Optic Cable, Fiber Optic Cable Connectors or invalidation of warranty.

**To connect** - Remove the dust cap. Hold the black rubber boot section of the connector (shown below), making sure it is keyed correctly, and push in until the connector clicks into place.

![Fiber Optic Connector](image)

**To disconnect** - Grab the beige colored release sleeve on the connector (shown below) and pull to release the cable. Cover immediately with the dust cap.

![Fiber Optic Connector](image)

⚠️ **NOTE:** Directions are imprinted on the connector sections.

⚠️ **NOTE:** Never touch, rub or scratch the fiber optic connector ends. **DO NOT** place excessive stress on the fiber cable, the fiber cable ends or fiber cable connectors leading into the Projector or the Control Room Console.
Chapter 3: Hardware Setup

3.2 Control Room Assembly

Necessary components:
• Projector Control Room Console
• Projector Control Room Console Power Supply
• Control Room - Remote Control
• Stimulus presentation computer with DVI output video card (Not Supplied)

Be certain that the PC’s power is removed from the Projector Control Room Console.

On the back of the Projector Control Room Console,
1. Connect the stimulus presentation PC to the DVI input.
2. Insert the Fiber Optic cable into the Fiber connector.
3. Connect the Projector Control Room Console Power Supply and plug in the power supply to a suitable power outlet.

⚠️ WARNING: DO NOT exceed 1024 X 768 pixel resolution and 60Hz refresh rate.
3.3 Magnet Room Assembly

The following instruction assumes that a proper place has been created in the magnet room that can support the BrainLogics MR Digital Projector Unit (a 50 lb consideration). We recommend that the projector is set-up for rear projection, and that the screen be placed at the back of the bore behind the participant’s head. This configuration is optimal for the safety of the participant and safeguarding the equipment. Reconfiguration of projector and accompanying accessories should not be conducted while a participant is in the bore. Repeated rearrangement may cause damage to equipment, and should only be performed by authorized MR personnel.

The necessary components are
- BrainLogics MR Digital Projector Unit (MRDPU)
- MRDPU Power Cable
- MRDPU Remote Control

Be certain the power switch on the BrainLogics MR Digital Projector is off before connecting the Projector Power Cable. The switch is in the off position, when the (O) button is depressed.

Run the Fiber Optic cable from the Control Room through a suitable wave guide. Then connect the end of the Fiber Optic cable that has been passed into the magnet room from the Projector Control Room Console and connect it to the Fiber Cable input.
Chapter 4: Operating Instructions

4.1 Remote Control

Communication with the BrainLogics MR Digital Projector Unit can only be made through the use of the Control Room Remote Control or the Projector Remote Control (see below) which plugs directly into the side or the BrainLogics MR Digital Projector through the Remote Control Power connector (see 1 below). The Remote Control must be pointed at the IR Signal Input LED (see 2 below) to operate the projector.

Additionally, the Control Room Remote Control (see 3 below) can communicate with the projector via the Control Room Console if the Remote Enabled/Disabled switch (see 4 below) is in the enabled position. Point the Remote Control at the IR Remote Sensor Window (see 5 below) the Transmit LED will flash when communication with the MRDPU occurs.
4.2 Remote Control

**Button Guide**

1. **Infrared Transmitter** - Direct the remote control toward the remote sensor on the Control Room Console.

2. **POWER Button** - Use this button to turn the power on and off when the main power is supplied and the projector is in standby mode (Power-saving mode or Idle mode). To turn on or off the projector, press and hold this button for a minimum of two seconds.

3. **LIGHT Button** - Use this button to turn on or off the button’s backlight. Unless another button is pressed within 10 seconds while the backlight is on, it will turn off to conserve the batteries.

**NOTE:** Buttons 4-8 are video input signal selections. The MRDP currently supports DVI only (button 8). Selecting another input (Buttons 4, 5, 6 or 7) will result in loss of video signal output.

4. **VIDEO Button** - N/A See above **NOTE**
5. **S-VIDEO Button** - N/A See above **NOTE**
6. **COMPONENT Button** - N/A See above **NOTE**
7. **COMPUTER Button** - N/A See above **NOTE**
## Chapter 4: Operating Instructions

### 4.2 Remote Control Button Guide

<table>
<thead>
<tr>
<th>Button Guide</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. DVI Button -</td>
<td>Press this button to select a DVI digital signal from a computer or DVD player. See Note 9.</td>
</tr>
<tr>
<td>9. Select Volume Buttons -</td>
<td>N/A - There are no volume components to the BrainLogics MR Digital Projector Unit</td>
</tr>
<tr>
<td>10. ENTER Button -</td>
<td>Executes your menu selection and activates items selected.</td>
</tr>
<tr>
<td>11. MENU Button -</td>
<td>Displays the menu for various settings and adjustments.</td>
</tr>
<tr>
<td>12. CANCEL Button -</td>
<td>Press this button to exit “Menus”. Press this button to return the last condition selected in the adjustment or setting menu.</td>
</tr>
<tr>
<td>13. ASPECT Button -</td>
<td>Press this button to display the Aspect Ratio select screen. Each time this button is pressed, the option will be changed.</td>
</tr>
<tr>
<td>14. PICTURE Button -</td>
<td>Press this button to display the Preset window. Each time this button is pressed, the option will be changed.</td>
</tr>
<tr>
<td>15. AUTO ADJ Button -</td>
<td>This function may not be available depending due to the input signal.</td>
</tr>
<tr>
<td>16. PIC-MUTE Button -</td>
<td>N/A - There are no volume components to the BrainLogics MR Digital Projector Unit</td>
</tr>
<tr>
<td>17. FREEZE Button -</td>
<td>This button will freeze a picture. Press again to resume motion.</td>
</tr>
<tr>
<td>18. VIEWER Button -</td>
<td>Press this button to select the Viewer source.</td>
</tr>
<tr>
<td>19. POSITION Up/Down Button -</td>
<td>This button adjusts position of a zoomed image.</td>
</tr>
<tr>
<td>20. MAGNIFY (+) (–) Button -</td>
<td>N/A - Functionality no longer available.</td>
</tr>
<tr>
<td>21. 3D REFORM Button -</td>
<td>Press this button to enter 3D Reform to correct the keystone (trapezoidal) distortion, and make the image square.</td>
</tr>
<tr>
<td>22. HELP Button -</td>
<td>Provides the online help or the set information.</td>
</tr>
</tbody>
</table>
Chapter 4: Operating Instructions

4.3 Powering up the Projector

When plugging in or unplugging the supplied power cable, be sure that the main power switch is pushed to the off (O) position.

The projector has two power switches: the main power switch and POWER button on the remote control. (The projector cannot be powered up or powered down correctly without using a Remote Control or the power button on the Control Room Console) To turn on the main power to the projector, press the main power switch to the ON position (I).

Before you turn on your projector, ensure that a proper video source is supplied and that any lens coverings (other than the adjustable aperture) are removed.

⚠️ NOTE: Only after you press the POWER button on the remote control or the power button on the front panel of the Control Room Console for a minimum of 2 seconds will the power indicator turn to green and the projector become ready to use.
Chapter 4: **Operating Instructions**

4.3 Powering up the Projector

On the front right of the Control Room Interface Console and on the top of the BrainLogics MR Digital Projector there are 3 indicator lights:

- **POWER**
- **STATUS**
- **LAMP**

These indicator lights provide valuable information about the operation of your MRDPU.

The following table provides you with the meaning of the current state of the POWER indicator.

<table>
<thead>
<tr>
<th>Indicator Condition</th>
<th>Projector Condition</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>The main power is on</td>
<td>--</td>
</tr>
<tr>
<td>Blinking Light</td>
<td>Green 0.5 sec On</td>
<td>The projector is getting ready to turn on. Wait a moment</td>
</tr>
<tr>
<td></td>
<td>0.5 sec Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Orange 0.5 sec On</td>
<td>The projector is cooling down. Wait a moment</td>
</tr>
<tr>
<td></td>
<td>0.5 sec On</td>
<td></td>
</tr>
<tr>
<td>Steady Light</td>
<td>Green</td>
<td>The projector is turned on. --</td>
</tr>
<tr>
<td></td>
<td>Orange</td>
<td>The projector is in Power-saving or Idle. --</td>
</tr>
</tbody>
</table>
Chapter 4: Operating Instructions

4.3 Powering up the Projector

The following table provides you with the meaning of the current state of the STATUS indicator.

<table>
<thead>
<tr>
<th>Indicator Condition</th>
<th>Projector Condition</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Red</td>
<td>Re-firing the lamp</td>
</tr>
<tr>
<td>Blinking light Red</td>
<td>1 cycle (0.5 sec On, 2.5 sec Off)</td>
<td>Lamp cover error Replace the lamp cover correctly.</td>
</tr>
<tr>
<td></td>
<td>2 cycle (0.5 sec On, 0.5 sec Off)</td>
<td>Temperature error The projector is overheated. Move the projector to a cooler location.</td>
</tr>
<tr>
<td></td>
<td>3 cycle (0.5 sec On, 0.5 sec Off)</td>
<td>Power error Power unit will not work correctly.</td>
</tr>
<tr>
<td></td>
<td>4 cycle (0.5 sec On, 0.5 sec Off)</td>
<td>Fan error Fans will not work correctly.</td>
</tr>
<tr>
<td></td>
<td>5 cycle (0.5 sec On, 0.5 sec Off)</td>
<td>Lamp error Lamp fails to light. Wait a full minute and then turn on again.</td>
</tr>
<tr>
<td>Steady light Green</td>
<td></td>
<td>Idle condition</td>
</tr>
</tbody>
</table>

The following table provides you with the meaning of the current state of the LAMP indicator.

<table>
<thead>
<tr>
<th>Indicator Condition</th>
<th>Projector Condition</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Red</td>
<td>Lamp has reached its end of life. Lamp replacement message will be displayed.</td>
</tr>
<tr>
<td>Blinking Light Red</td>
<td></td>
<td>Replace the lamp.</td>
</tr>
<tr>
<td>Steady Light Red</td>
<td></td>
<td>Lamp has been used beyond its limit. The projector will not turn on until the lamp is replaced.</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>Lamp mode is set to Eco mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>--</td>
</tr>
</tbody>
</table>
## Chapter 4: Operating Instructions

### 4.4 Remote Control Menu Guide

The next two tables show the menu tree and options available for the projector. These are for reference as many of these features will not be used or needed.

#### Menu Tree

<table>
<thead>
<tr>
<th>Main Menu</th>
<th>Submenu</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picture</td>
<td>Preset</td>
<td>1 to 5</td>
</tr>
<tr>
<td></td>
<td>Reference</td>
<td>Video, Movie, Game, sRGB, Graphic</td>
</tr>
<tr>
<td></td>
<td>Brightness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contrast</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Color</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hue</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sharpness</td>
<td></td>
</tr>
<tr>
<td>Noise</td>
<td>Reduction</td>
<td>Off, Low, Medium, High</td>
</tr>
<tr>
<td>Detail</td>
<td>Settings</td>
<td>Page 1, Gamma Correction, Dynamic, Natural, Black, Detail</td>
</tr>
<tr>
<td></td>
<td>Page 3</td>
<td>Red, Green, Blue, Yellow, Magenta, Cyan, Color Gain</td>
</tr>
<tr>
<td></td>
<td>Page 4</td>
<td>SweetVision Mode, Off, On, Split</td>
</tr>
<tr>
<td></td>
<td>Image</td>
<td>Aspect Ratio (4:3), Normal, Zoom, Cinema, V-Zoom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(16:9; Anamorphic)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal, Full, Zoom, Stadium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blanking Top, Bottom, Left, Right</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Position/Clock Horizontal, Vertical, Clock, Phase</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Image Position -64 to 64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overscan 0%, 5%, 10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal Type RGB, Component</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Setup Level Off, On</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Video Filter Off, Less, More</td>
</tr>
<tr>
<td></td>
<td>Page 2</td>
<td>Entry List</td>
</tr>
</tbody>
</table>

The next two tables show the menu tree and options available for the projector. These are for reference as many of these features will not be used or needed.
### Chapter 4: Operating Instructions

#### 4.4 Remote Control

**Menu Guide**

<table>
<thead>
<tr>
<th>Main menu</th>
<th>Submenu</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setup</td>
<td>Screen</td>
<td>Screen Type 4:3, 16:9, Anamorphic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Position -64 to 64</td>
</tr>
<tr>
<td></td>
<td>Orientation</td>
<td>Desktop Front, Calling Rear, Desktop Rear, Ceiling Front</td>
</tr>
<tr>
<td></td>
<td>Lamp Mode</td>
<td>Normal, Eco</td>
</tr>
<tr>
<td></td>
<td>Screen Trigger</td>
<td>Off, On</td>
</tr>
<tr>
<td></td>
<td>Background</td>
<td>Blue, Black, Logo</td>
</tr>
<tr>
<td></td>
<td>Language</td>
<td>English, Deutsche, Francais, Italiano, Español, Swenska, Suomni, Norsk, Nederlands, Türkçe, Polski, Pyccknz, cesky, Ελληνικά, Português, 日本語, 漢語 and 한국어</td>
</tr>
<tr>
<td>Test Pattern</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main menu</th>
<th>Submenu</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Signal Select</td>
<td>Computer RGB Component, RGB, Component, Scart</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>Standby Mode</td>
<td>Idle Model, Power-saving Mode</td>
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<td>Fan Mode</td>
<td>Auto, High Speed</td>
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<tr>
<td></td>
<td>Lamp Hour</td>
<td>Clear, Lamp Hour Meter</td>
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<td>Auto Adjust</td>
<td>Off, Normal, Fine</td>
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<th>Submenu</th>
<th>Items</th>
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<td>Password (Logo)</td>
<td>Entry, Delete</td>
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<td>LAN Mode</td>
<td>IP Address Automatic, Manual</td>
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<td>Use Protectkey, Read, Register, Delete</td>
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<th>Submenu</th>
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<tr>
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<td>Version (BIOS, Firmware, Data)</td>
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<td>Reset</td>
<td>Current Signal, All Data, All Data (Including Entry List)</td>
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</table>
Chapter 4: Operating Instructions

4.5 Focusing the MRDPU

Before you attempt to focus the BrainLogics MR Digital Projector Unit, insure the projector is at the proper distance away from the display screen to achieve the desired image size. Use the chart provided in Appendix A, page 31 of this manual to approximate the distance needed between the projector and display screen for desired image size. You may be forced to adjust the screen size due to the location of the MR scanner’s 100 gauss line. The MRDPU must be placed outside of the 100 gauss field.

We recommend that two people are present to focus the projector, especially if the projected image needs to be reflected off a mirror onto the screen. This will allow one person to focus the lens, while the other person verifies the image on the screen is in focus. We also recommend that before you attempt to focus the projector you connect the projector to a computer or other external device that has the ability to display an image.

1) **Plug in** the projector and **turn** it on.
   *If the projector is plugged in to the wall socket and still is not getting power, check the power switch located by the power cable input, and confirm the switch is in the on position with the (I) symbol depressed.*

2) Once the projector is running, **hold in** the **POWER button** on the remote.

3) There are **three indicator lights** located on the **control room interface console** and the **projector housing**.

4) The **POWER indicator** will **blink green** indicating the projector is **turning on**, after you press the power button on the remote.

5) Once the projector has **initialized**, the **POWER indicator** will be **steady green**.
Chapter 4: Operating Instructions

4.5 Focusing the MRDPU

Please take the time to review the components of the MRDPU lens, as the directions refer to these parts extensively. The three major components of the BrainLogics MR Digital Projector Lens are:

1. **Lens Aperture:** The lens aperture is used to control the amount of light that is projected onto the screen. Make sure that the aperture hole is positioned at twelve o’clock or the top of the lens because the majority of the light from the projector is directed towards the top of the lens.

   There is a small metal post located on the aperture. This post can be used to adjust the size of the opening in the aperture while immobilizing the remaining part of the aperture.

   Decreasing the aperture opening size will decrease image brightness while increasing the overall image contrast.

   The optimal contrast level will depend on the amount of light in the scanner room.

2. **Zoom Lens:** The zoom lens is used to increase or decrease the size of the projected image. It can be used to adjust the focus slightly but its main function is to adjust image size.

3. **Lens Barrel:** The lens barrel is used to focus the projected image. When focusing the image, be careful not to completely unscrew the lens from the projector housing. Be sure to grasp only the Lens Barrel when adjusting focus to avoid inadvertently turning the zoom adjustment.

4. **Thumb Screw:** The thumb screw is tightened to lock the zoom lens in place, and must be loosened to adjust the zoom.
Chapter 4: Operating Instructions

4.5 Focusing the MRDPDU

Now we will go through the steps necessary to zoom the image. Be sure an active video signal with the desired image to focus is being supplied to the MR Digital Projector.

1) **Locate** the projector lens.

2) **Find** the silver post on the aperture.

3) **Insure** that the aperture hole is at the top of the lens, or 12 o’clock.

4) **Locate** the plastic thumbscrew on the zoom lens **behind** the silver post on the aperture, and **loosen** it. The thumbscrew may not be located in the same place relative to the aperture shown in the picture.

5) **Adjust the zoom** until the desired projected image size is achieved. When facing the projected image, turn the zoom lens to the left, to increase the image size and to the right to decrease the image size.

6) **Tighten** the white thumbscrew to **prevent** the zoom lens from **moving** once after the desired image size is achieved.
Chapter 4: Operating Instructions

4.5 Focusing the MRDPU

Next we will focus the image and set the contrast by changing the aperture size. Please note that the projector ships with the lens barrel fully tightened into the projector housing to prevent damage to the lens. This means that you will have to turn the lens barrel a significant amount before you can see a difference in the focus of the image.

1) **Turn the Lens Barrel** to adjust focus until the **image** is clear.

2) **Grasp the aperture** by the black mounts to **immobilize** the aperture.

3) **Use the silver post** to alter the **size** of the aperture until the desired contrast is achieved.

**NOTE:** If you *cannot* get a clear image:
Check that the projector is at an appropriate distance from the screen for the desired image size.

*If you need further assistance, please refer to Appendix A, or contact brainlogics@pstnet.com.*
Chapter 5: Care and Maintenance

5.1 Projector Lamp Replacement

Make certain the projector power cable is disconnected and the lamp has had adequate time, about an hour, to cool down.

To ensure safety, before proceeding, be sure to remove the projector from the magnet room. (All projector maintenance should be performed outside of the magnet room)

The BrainLogics MR Digital Projector lamp is located behind the larger vent panel clockwise from the projector lens. (see below)

The vent panel is easily removed by loosening the eight screws with a Phillips head screwdriver.

Inside you will see the lamp housing.
Chapter 5: Care and Maintenance

5.1 Projector Lamp Replacement
The actual lamp removal requires loosening the two screws pictured below. (The screws are captive and will not come completely out.)

Pull the silver handle towards you and the lamp should slide out easily. (see below) This is the entire lamp unit, there is no further disassembly necessary. Now insert the new lamp, tighten the attached screws, re-fit the Vent Panel and replace the vent panel screws, and you are finished.

Replacement Lamp
NEC
P/N LT60LPK
(Not Supplied by PST)
Chapter 5: **Care and Maintenance**

5.2 **Lens Care and Cleaning**

Use forced air or lens paper to clean the lens. Be careful to avoid scratching or marring the lens. Isopropyl alcohol pads, like those used to clean the fiber optic connectors may also be used.

5.3 **Fiber Optic Cable Care and Maintenance**

To avoid damaging the fiber optic cable, do not kink the fiber.

Always replace dust caps on projector and fiber cable when fiber cable is not connected to the projector or the Control Room Console.

⚠️ **NOTE:** Please use caution while handling the Fiber Optic Cable. Failure to exercise caution may result in damage to the Fiber Optic Cable, Fiber Optic Cable Connectors or invalidation of warranty.
Appendix A: **Screen Width/Zoom Lens Range Chart**

The following chart allows you to derive all of the screen sizes possible at various distances that the BrainLogics MR Digital Projector can produce. This assumes a projected window with an aspect ratio of 4:3 (width to height).

![PST Projector Zoom Lens Range Chart](image)

<table>
<thead>
<tr>
<th>Screen Width Width (inches)</th>
<th>The length of the projected image within inches.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throw Distance (feet)</td>
<td>The length the projector screen must be from the end of the projector lens in feet to achieve the corresponding screen width.</td>
</tr>
<tr>
<td>Focus Area of Zoom Lens</td>
<td>The minimum and maximum range the zoom lens can project the screen width at the given throw distance.</td>
</tr>
<tr>
<td>Focal Length</td>
<td>The minimum and maximum focal length of the zoom lens.</td>
</tr>
</tbody>
</table>
Appendix B: Accessories

⚠️ NOTE: The tools needed for the assembly of the accessory stands are NOT magnet safe. Any assembly of these items must be done outside of the magnet room.

1.1 Projector Stand Assembly
Instructions on the assembly of the BrainLogics MR Digital Projection System Projector Stand

Parts
The Projector stand is shipped as shown below:

*The Main Parts include:*
Adjustable Platform with T-Handle Bearing Brakes *(circled below)*
Appendix B: **Accessories**

Two (2) - Preassembled T-slotted legs with Leveling Feet

![T-slotted legs with Leveling Feet](image)

One (1) - T-slotted extrusions with Carriage bolts

![T-slotted extrusions with Carriage bolts](image)

Additional components for assembly (shown below)
Four (4) - End caps
Four (4) - Push in fastener
One (1) - Hex wrench

![Additional components](image)
Appendix B: **Accessories**

**Assembly:** Place the Adjustable Platform face down so that the T-Handle Bearing Brakes are pointing up.

Take one of the Preassembled T-slotted legs and guide it onto the Adjustable Platform Brakes shown below.

Be sure to get the T-slotted extrusions fitted correctly over the T-Nut.
Appendix B: **Accessories**

**Assembly:**  Tighten the T-Handle Bearing Brakes.

Take the other Preassembled T-slotted leg with Leveling Feet and guide it into the Adjustable Platform Brake as shown below. And tighten the T-Handle Bearing Brakes.

The Stand should appear as follows.
Assembly: Find the T-slotted extrusions support with Carriage bolts.

Slide it between the two Preassembled T-slotted legs.

Move the T-slotted extrusions support with Carriage bolts down until it is equal with the supports on the two Preassembled T-slotted legs (see below).
Appendix B: **Accessories**

*Assembly:* Now tighten the Carriage bolts on both ends of T slotted extrusions support with the Hex Wrench (*provided*).

Now turn the Projector stand over. Now you may place the Adjustable Platform at your desired height by loosening and moving the T-Handle Bearing Brakes and using the provided Bubble levels to make sure that the platform is level. Some adjustments of the Leveling Feet on the Preassembled T-slotted legs may be necessary.
Appendix B: Accessories

Assembly: Until it looks like the finished Stand pictured below:
Appendix B: **Accessories**

⚠️ **NOTE:** The tools needed for the assembly of the accessory stands are **NOT** magnet safe. Any assembly of these items must be done outside of the magnet room.

### 1.2 Mirror Stand Assembly

Instructions on the assembly of the BrainLogics MR Digital Projection System Mirror Stand

**Parts**
The Mirror stand is shipped with:
- One (1) - Mirror Stand Upright
- Four (4) - Legs with Adjustable Rubber Feet
- Four (4) - Anchor Fasteners
- One (1) - Plastic End Cap
Appendix B: **Accessories**

*Assembly:*  Place the Anchor Fasteners to the Legs with the Adjustable Rubber Feet *(see below)*

Slide the Legs with Adjustable Rubber Feet onto the Mirror Stand Upright and tighten with the Tightening wrench provided with the Projector Stand.

Be certain all four Legs with Adjustable Rubber Feet are even and tightened to the Mirror Stand Upright.
Appendix B: **Accessories**

**Assembly:** Slide the T-Handle Bearing Brake holding the Mirror over the other end of the Mirror Stand Upright.

(Remember the side of the mirror covered with the blue plastic is the side that is to be used and is covered and should remain covered when not in use, to protect the mirror face).

Place the end cap over the open end of the Mirror Stand Upright.
Appendix B: **Accessories**

⚠️ **NOTE:** The tools needed for the assembly of the accessory stands are **NOT** magnet safe. Any assembly of these items must be done outside of the magnet room.

### 1.3 Screen Stand Assembly

Instructions on the assembly of the BrainLogics MR Digital Projection System Screen Stand

**Parts**

The Screen stand is shipped with:
- One (1) - Screen Stand Upright
- Four (4) - Legs with Adjustable Rubber Feet
- Four (4) - Anchor Fasteners
- One (1) - T-Handle Allen Wrench
Appendix B: **Accessories**

**Assembly:** Place the Anchor Fasteners to the Legs with the Adjustable Feet as shown below.

Slide the Legs with Adjustable Feet onto the Screen Stand Upright and tighten with the T-Handle Allen Wrench provided with the Screen Stand.

Be certain all four Legs with Adjustable Feet are even and tightened to the Screen Stand Upright.
Appendix B: **Accessories**

*Assembly:* Before completing the following steps make sure the pivot assembly is slid into place, pinned and tightened as shown below.

Turn the assembled Screen Stand Upright so that it faces you. The screws that hold the screen are included in the screen retainer on the upright. It should look like this, as shown below.

Remove the screws and line up the holes in the screen to the holes on the Screen Stand Upright.

⚠️ **NOTE:** Prior to sliding the screen into the slot on the upright, make sure the reflective side faces you.
Appendix B: **Accessories**

**Assembly:** Insert two screws into the screen holes on each side and tighten them as shown below.

The assembled Screen Stand Upright with Screen should look like the image below. When positioning the assembled Screen Stand, place it at the rear of the bore.
Appendix B: **Accessories**

*Assembly:* To adjust the height of the Screen Stand Upright, first loosen the bottom black knob as shown below. Then pull up on the top part of the Upright, setting it to the desired height. Lastly, tighten the black knob to set the height.

To flip the screen down, first loosen the top black knob and slide it to the side as shown below.
Appendix B: Accessories

Assembly: Gently pivot the screen away from the bore so that screen rests behind the Screen Stand Upright, as shown below.
Appendix B: Accessories

1.4 Vision Correction Glasses

Instructions on the assembly of the BrainLogics MR Digital Projection System Vision Correction Glasses.

Parts
The Vision Correction Glasses are shipped with:
Two (2) - Frames
Two (2) - Headbands
Forty-Four (44) - lenses (from +/- 2 to 7 diopters in 1/2 diopter increments)
One (1) - binder to hold all of the above
Appendix C: **Electrical Information**

**MR Digital Projection Unit**

*Input Voltage:* 100-120V AC/200-240V AC, 50/60Hz  
*Input Current:* 4A(100-120VAC)/2A(200-240VAC)  
*Fuse:* 250V, 4A

**MR Digital Projection Control Room Console**

*Input Voltage:* 9 VDC  
*Input Current:* 500mA
Appendix D: Replacement Parts

Replacement MRDPU Control Room Console Power Supply
(PST-100138)

Projector Lamp
Replacement Lamp
NEC
P/N LT60LPK
(Not Supplied by PST)
Appendix E: **Contact Information**

For additional information or support

Contact us at
Psychology Software Tools, Inc
311 23rd Street Extension, Suite 200
Sharpsburg, PA 15215-2821
Phone: 412-449-0078
Fax: 412-449-0079
www.pstnet.com

For product support and technical issues
Please e-mail us at
info@pstnet.com

To report a medical emergency that is suspected to be caused by a MR Digital Projector failure call **412-449-0078 ext. 1441**.

For failure outside of normal business hours, please call **888-540-9664**.