Tesmart DKS202-M24 KVM Switch Quick Reference Card

Cluster: FreedomTower Multi-Node Setup
Systems: TheBeast (Dual RTX 5090) ↔ MiniBeast (Dual RTX 4090)
Model: Tesmart DKS202-M24 (2x2 DP 1.4 Dual Monitor KVM)
Date Created: January 2026
Owner: Peter Heller (ph3ll3r)

System Overview

Connected Systems

System	GPU Configuration	Primary GPU	Connected Ports
TheBeast	Dual RTX 5090	GPU0 (Top Slot)	PC1 INPUT 1 & 2
MiniBeast	Dual RTX 4090	GPU0 (Top Slot)	PC2 INPUT 1 & 2

Display Configuration

- **Monitor 1:** Connected to KVM OUTPUT 1
- **Monitor 2:** Connected to KVM OUTPUT 2
- **Maximum Resolution:** 8K@60Hz or 4K@144Hz/165Hz per monitor
- **Protocol:** DisplayPort 1.4 (32.4 Gbps bandwidth per port)

Quick Switching Methods

Method 1: Front Panel Buttons

- **PC1 Button (Orange):** Switch to TheBeast
- **PC2 Button (Orange):** Switch to MiniBeast
- **Physical Location:** Front left panel of KVM

Method 2: Keyboard Hotkeys (Default)

Action	Hotkey Combination
Switch to PC1 (TheBeast)	`Right-Ctrl` + `Right-Ctrl` + `1`
Switch to PC2 (MiniBeast)	`Right-Ctrl` + `Right-Ctrl` + `2`
Enter Hotkey Programming	`Right-Ctrl` + `Right-Ctrl` + `F1`
Toggle Keyboard/Mouse Mode	`Right-Ctrl` + `Right-Ctrl` + `F2`

Note: Press `Right-Ctrl` twice quickly, then press the number key.

Method 3: IR Remote Control

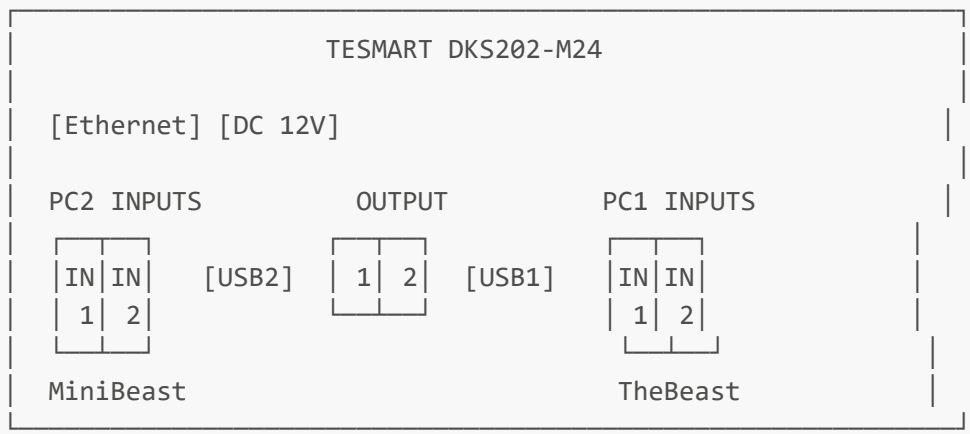
- Use included remote to switch between PC1 and PC2
- Direct line-of-sight required to front panel

Method 4: Mouse Wheel (If Enabled)

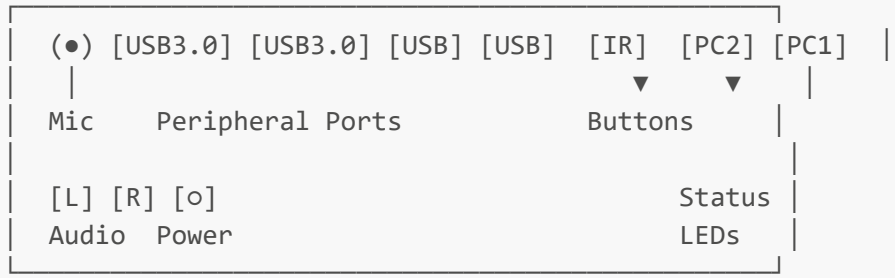
- Scroll mouse wheel while cursor is at screen edge
- Must be enabled in KVM settings

Port Mapping Reference

Back Panel Connections



Front Panel Layout



USB Peripheral Setup

Wenter 11-Port Hub → KVM Front USB 3.0 Port

- Keyboard
- Mouse
- SABRENT USB Audio Adapter
- UGREEN USB Audio Adapter
- USB Extension Cables (2×)

Direct PC Connections (Not Shared via KVM):

- USB drives/flash drives → Rear motherboard USB ports
- External storage → Rear motherboard USB ports

Cable Specifications

DisplayPort Cables

Connection	Cable Type	Length	Specs
GPU → KVM Input (×4)	IVANKY 8K DP 1.4	6.6ft	8K@60Hz, 4K@144Hz
KVM Output → Monitor (×2)	IVANKY 8K DP 1.4	3ft	8K@60Hz, 4K@144Hz

Capabilities:

- DP 1.4 Protocol
- 32.4 Gbps bandwidth per cable
- HDR, HDCP 2.2, G-Sync, FreeSync
- DSC (Display Stream Compression)

USB Cables

Connection	Cable Type	Purpose
PC1 → KVM	USB 3.0 Type-A to Type-B	Keyboard/Mouse/Peripherals
PC2 → KVM	USB 3.0 Type-A to Type-B	Keyboard/Mouse/Peripherals

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Display Resolution Support

Supported Resolutions (Per Monitor)

Resolution	Refresh Rate	Color Depth	Chroma
8K (7680×4320)	60Hz	10-bit	4:4:4
5K (5120×2880)	60Hz	10-bit	4:4:4
4K (3840×2160)	165Hz	8-bit	4:4:4
4K (3840×2160)	144Hz	10-bit	4:4:4
4K (3840×2160)	120Hz	10-bit	4:4:4
4K (3840×2160)	60Hz	10-bit	4:4:4
2K (2560×1440)	240Hz	8-bit	4:4:4
1080p (1920×1080)	240Hz	8-bit	4:4:4

EDID Management

What is EDID?

Extended Display Identification Data - Information exchanged between monitor and GPU to establish optimal display settings.

KVM EDID Features

- **Built-in EDID Emulation:** Enabled by default
- **Purpose:** Prevents Windows from:
  - Resetting resolution when switching
  - Rearranging windows
  - Changing refresh rates
  - Losing display configuration

EDID Best Practices

1. **Set identical resolution/refresh rate on both PCs** for seamless switching
2. **Configure displays before first switch** to establish EDID baseline
3. **Avoid hot-unplugging monitors** - EDID data may be lost
4. **Use Windows Display Settings** to verify resolution after switching

Verify EDID Status

```
# Check current display configuration
Get-CimInstance -ClassName Win32_VideoController |
    Select-Object Name, VideoModeDescription, CurrentRefreshRate
```

Advanced Configuration

Custom Hotkey Programming

To Change Trigger Key from Right-Ctrl:

1. Press and hold front panel `[○]` button for 10 seconds
2. Wait for long beep
3. Press desired new trigger key on keyboard
4. KVM will beep to confirm

Example: Change to `Scroll Lock` instead of `Right-Ctrl`

Note: This procedure is for hotkey customization only. The KVM does not have a factory reset function.

Keyboard/Mouse Emulation Modes

Mode	Description	When to Use

Mode	Description	When to Use
Pass-Through (Default)	Direct USB device communication	Modern keyboards/mice
Legacy Emulation	PS/2 emulation mode	Compatibility issues

Switch Mode: `Right-Ctrl` + `Right-Ctrl` + `F2`

Symptoms requiring Legacy Mode:

- Keyboard not detected after switch
- Mouse cursor freezing
- Special keys not working (media keys, macros)
- Gaming keyboard lighting sync issues

Audio Configuration

Windows Audio Settings (Both PCs):

1. Open Settings → System → Sound
2. Set **Output Device:** "USB Audio Device"
3. Set **Input Device:** "USB Audio Device" (if using mic)
4. Test audio after KVM switch

Integrated Audio Ports:

- **Front Panel:** Mic input, L/R audio output
- **Transmission:** Via USB channel (no separate audio cable needed)

Network Switch (Built-in)

Gigabit Ethernet Port:

- Location: Back panel, left side
- Speed: 1000 Mbps
- Purpose: Share network connection between PCs
- **Note:** Both TheBeast and MiniBeast already on Tailscale VPN - this port is optional

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Troubleshooting Guide

Issue: No Display After Switching

Possible Causes & Solutions:

1. **EDID Not Initialized**

```
Solution: Set display configuration on both PCs first
- Windows Settings → Display
- Arrange monitors, set resolution/refresh rate
- Switch to other PC and repeat
```

2. **Advanced EDID Diagnostics**

```
# Check current EDID state
Get-CimInstance -Namespace root/wmi -ClassName WmiMonitorDescriptorMethods

# Verify monitor detection
Get-CimInstance -ClassName Win32_DesktopMonitor |
    Select-Object DeviceID, ScreenHeight, ScreenWidth, MonitorType

# Check display adapter status
Get-CimInstance -ClassName Win32_VideoController |
    Select-Object Name, Status, VideoModeDescription,
    @{Name='ActiveOutputs';Expression={$_.CurrentNumberOfColors}}

# Force display re-detection
# Run as Administrator:
pnputil /scan-devices
```

3. **Cable Connection Loose**

```
Check:
- GPU DP ports fully seated
- KVM input ports fully clicked in
- Monitor input ports secure
```

4. **GPU Not Detected**

```
# Verify GPU status
nvidia-smi -L

# Should show:
# GPU 0: NVIDIA GeForce RTX 5090 (or 4090)
# GPU 1: NVIDIA GeForce RTX 5090 (or 4090)
```

5. **Wrong GPU Selected**

```
Verify DisplayPort cables connected to GPU 0 (top slot)
Not GPU 1 (bottom slot)
```

Issue: Windows Rearranges Windows After Switch

Root Cause: EDID not properly emulated or different resolutions set

Solution:

1. Ensure both PCs have **identical display configuration**:
    - Same resolution (e.g., 4K 3840×2160)
    - Same refresh rate (e.g., 144Hz)
    - Same monitor arrangement (primary/secondary)
2. Disable Windows "Remember Window Positions":

```
Not a Windows setting - use third-party tools like:
- PowerToys FancyZones
- DisplayFusion
```

3. Re-establish EDID:
    - Disconnect monitors from KVM
    - Connect Monitor 1 directly to TheBeast
    - Configure displays
    - Connect Monitor 1 directly to MiniBeast
    - Configure displays identically
    - Reconnect to KVM

Issue: Keyboard/Mouse Not Working

Solution 1: Switch Emulation Mode

```
Hotkey: Right-Ctrl + Right-Ctrl + F2
This toggles between Pass-Through and Legacy modes
```

Solution 2: Re-seat USB Connections

```
1. Unplug USB Type-B cable from KVM
2. Wait 5 seconds
3. Replug cable
4. Wait for Windows USB detection sound
```

Solution 3: Check USB Hub Power

```
Verify Wenter hub power adapter is connected
Hub LED should be illuminated
```

Solution 4: Try Direct Connection

```

```

```
Temporarily connect keyboard/mouse directly to KVM front ports
Bypass USB hub to isolate issue
```

Issue: Reduced Refresh Rate (60Hz instead of 144Hz)

Root Cause: DP cable bandwidth limitation or incorrect settings

Check List:

1. ✓ Using IVANKY 8K DP 1.4 cables (not BENFEI 4K@60Hz cables)
2. ✓ Windows Display Settings show correct refresh rate available
3. ✓ NVIDIA Control Panel → Change Resolution → Refresh Rate set to 144Hz
4. ✓ Monitor OSD menu shows 144Hz mode active

Force Refresh Rate:

```
NVIDIA Control Panel:
1. Display → Change Resolution
2. Select 3840 × 2160
3. Refresh Rate: 144Hz
4. Apply
```

Issue: G-Sync/FreeSync Not Working

Verification Steps:

1. **NVIDIA Control Panel:**

   ```
   Display → Set up G-SYNC
   ☑ Enable G-SYNC, G-SYNC Compatible
   ☑ Enable for full screen mode
   Apply
   ```

2. **Monitor OSD:**

   ```
   Navigate to monitor settings
   Enable G-Sync/FreeSync/Adaptive Sync
   ```

3. **Test with Game:**

   ```
   Use NVIDIA GeForce Experience → FPS Counter
   Observe variable frame rate (not capped at refresh rate)
   ```

Issue: Audio Not Switching with KVM

Solution 1: Verify USB Audio Device

```
Windows Settings → Sound
Playback: USB Audio Device (not Realtek or other)
Recording: USB Audio Device
```

Solution 2: Re-enumerate USB Devices

```
Device Manager → Sound, video and game controllers
Right-click "USB Audio Device" → Uninstall
Unplug/replug USB hub from KVM
Let Windows reinstall driver
```

Solution 3: Check Adapter Connection

```
Verify SABRENT or UGREEN adapter firmly seated in hub
Try different USB port on hub
```

Issue: Monitors Show "No Signal" After Switch

Quick Fix:

```
1. Press KVM front panel button 2-3 times
2. Wait 3 seconds between presses
3. Allows EDID re-negotiation
```

Deep Fix:

```
1. Power cycle sequence:
   - Turn off both monitors
   - Press KVM power button (front panel)
   - Wait 10 seconds
   - Press KVM power button to turn on
   - Turn on monitors

2. Verify active PC LED on KVM front panel
```

Issue: One Monitor Works, Other Doesn't

Check:

1. Both monitors powered on
2. Both monitors on correct input (DisplayPort)
3. Swap monitor cables at KVM OUTPUT to isolate bad cable
4. Verify GPU has dual display enabled in BIOS/UEFI

GPU Multi-Monitor Check:

```
# Verify Windows sees both displays
Get-CimInstance -ClassName Win32_DesktopMonitor |
    Select-Object DeviceID, ScreenHeight, ScreenWidth
```

Advanced Signal Diagnostics

DisplayPort Signal Testing

Verify DP Signal Integrity:

```
# Check GPU DisplayPort output status
# NVIDIA-specific query
nvidia-smi --query-gpu=index,name,display_active,display_mode --format=csv

# Alternative: Check via WDDM
Get-CimInstance -ClassName Win32_VideoController |
    Select-Object Name, VideoProcessor,
    @{Name='ActivePorts';Expression={
        $_.VideoMemoryType -ne $null
    }}
```

Monitor DisplayPort Link Training:

```
Use monitor OSD to check:
- Current connection type (DisplayPort 1.4)
- Active resolution and refresh rate
- Color format (RGB 4:4:4 vs YCbCr)
- Bit depth (8-bit vs 10-bit)

Many monitors show this in:
OSD → Information → Input Signal
```

Cable Quality Test:

```
Test sequence for each DP cable:
1. Connect cable directly (GPU → Monitor, bypass KVM)
2. Set to maximum resolution/refresh (4K@144Hz or 8K@60Hz)
```

```
3. Run TestUFO motion test (testufo.com) for 5 minutes
4. Check for:
   - Sparkles/snow on screen
   - Signal dropouts
   - Intermittent black screens

If issues occur direct connection:
   → Cable is faulty, replace
If issues only occur through KVM:
   → Contact Tesmart support
```

USB Signal Diagnostics

Verify USB Hub Enumeration:

```
# List all USB devices and their power states
Get-PnpDevice -Class USB |
    Select-Object FriendlyName, Status, InstanceId |
    Where-Object {$_.Status -ne "Unknown"} |
    Format-Table -AutoSize

# Check USB controller status
Get-PnpDevice -Class USB | Where-Object {
    $_.FriendlyName -like "*USB*Host Controller*"
} | Select-Object FriendlyName, Status

# Verify USB 3.0 SuperSpeed enumeration
# KVM should appear as USB 3.0 (5 Gbps)
Get-ItemProperty "HKLM:\SYSTEM\CurrentControlSet\Enum\USB\*" -ErrorAction
SilentlyContinue |
    Where-Object {$_.DeviceDesc -like "*KVM*" -or $_.DeviceDesc -like "*Hub*"} |
    Select-Object DeviceDesc, Service
```

Test USB Bandwidth:

```
Method 1: Use CrystalDiskMark with USB flash drive
- Connect USB drive to hub
- Run sequential read/write test
- USB 3.0: Should achieve 100+ MB/s read
- USB 2.0: Will cap at ~35 MB/s read

Method 2: Check Device Manager
- Device Manager → USB controllers
- Expand "Generic USB Hub"
- Properties → Advanced → "Hub is bus powered: No"
  (KVM hub should show as self-powered if external hub is used)
```

Network Diagnostics (Built-in Gigabit Switch)

If using KVM's built-in network port:

```
# Test network throughput
# From TheBeast, test to known server
Test-NetConnection -ComputerName 192.168.1.1 -TraceRoute

# Verify gigabit link speed
Get-NetAdapter | Where-Object {$_.Status -eq "Up"} |
    Select-Object Name, LinkSpeed, MediaType

# Should show: LinkSpeed = 1 Gbps

# Test actual throughput (requires iperf3)
# Server: iperf3 -s
# Client: iperf3 -c <server_ip> -t 30
# Should achieve 900+ Mbps
```

Performance Verification

Display Performance Test

Test 1: Refresh Rate Verification

```
Website: testufo.com
1. Navigate to TestUFO Motion Tests
2. Run "Framerate" test
3. Verify actual vs. expected FPS matches
4. Should show 144 FPS for 144Hz, 60 FPS for 60Hz
```

Test 2: Pixel Response

```
Website: testufo.com/ghosting
1. Run ghosting test
2. Check for:
   - Clean edges on moving objects
   - No trailing/smearing
   - Smooth motion
```

Test 3: Input Latency

```
Human perception test:
- Move mouse cursor in circles
- Click/drag windows rapidly
- Should feel identical to direct GPU connection
- No perceptible delay
```

GPU Performance Verification

Confirm Primary GPU Active:

```
# Run on current active PC
nvidia-smi --query-gpu=index,name,utilization.gpu,memory.used,memory.total --
format=csv

# Expected output shows GPU 0 driving displays
# GPU 1 should show 0% utilization (unless running compute tasks)
```

Display Adapter Check:

```
Get-CimInstance -ClassName Win32_VideoController |
    Where-Object {$_.Name -like "*NVIDIA*"} |
    Select-Object Name, AdapterRAM, VideoModeDescription, DriverVersion |
    Format-Table -AutoSize
```

Bandwidth Test

4K@144Hz Bandwidth Calculation:

```
Formula: (Width × Height × Refresh × Color Depth) / Compression

Example 4K@144Hz 10-bit:
(3840 × 2160 × 144 × 30 bits) / 1.5 (DSC) = 23.9 Gbps
✓ Within DP 1.4 limit of 32.4 Gbps
```

Verify No Compression Artifacts:

- Display solid color test patterns
- Check for banding, dithering, or color shifts
- Compare switched display vs. direct GPU connection

Maintenance & Best Practices

Daily Operations

Switching Between Systems:

1. Save all work before switching
2. Use hotkey or front button
3. Wait 2-3 seconds for displays to sync

4. Verify both monitors active before proceeding

Audio Switching:

- Audio follows KVM switch automatically
- If no audio, check Windows Sound settings (USB Audio Device)

Weekly Checks

- ✓ Verify all cables firmly seated
- ✓ Check KVM LEDs indicate correct active PC
- ✓ Test switch between PCs at least once
- ✓ Confirm resolution/refresh rate maintained

Monthly Maintenance

- ✓ Clean KVM vents (dust accumulation)
- ✓ Verify firmware (check Tesmart support site)
- ✓ Test all 4 switching methods (button, hotkey, remote, mouse)
- ✓ Backup display profiles on both PCs

Cable Management

Organization:

- Bundle PC1 cables separately from PC2 cables
- Label cables at both ends (e.g., "TheBeast-DP1", "MiniBeast-DP2")
- Use velcro ties, not zip ties (allows re-routing)
- Leave some slack for maintenance access

Strain Relief:

- Don't over-bend DisplayPort cables (max 90° bend)
- Support cable weight with cable management clips
- Keep cables away from power cables (EMI prevention)

Firmware Updates

Check for Updates:

```
Website: support.tesmart.com
Navigate to: Products → DKS202-M24 → Firmware

Current Version: Check KVM sticker or manual
Update Method: USB firmware updater (Windows/Mac tool)
```

Update Procedure:

1. Download latest firmware from Tesmart support
2. Connect KVM to PC via USB (special firmware update cable may be required)

3. Run firmware updater tool
4. Follow on-screen instructions
5. Do not power off KVM during update

System Specifications

KVM Technical Specs

Specification	Value
Model	Tesmart DKS202-M24
Input Ports	2 PCs × 2 DP 1.4 ports each
Output Ports	2 monitors (DP 1.4)
Video Protocol	DisplayPort 1.4
Bandwidth	32.4 Gbps per port
Max Resolution	8K@60Hz, 4K@165Hz
USB Ports	USB 3.0 (5 Gbps)
Front Panel USB	4× USB 3.0 Type-A ports
Audio	Integrated mic in, L/R audio out
Network	1× Gigabit Ethernet
Power	12V DC adapter (included)
EDID Emulation	Yes (built-in)
Dimensions	~295mm × 100mm × 40mm
Weight	~1.2 kg

Connected System Specs

TheBeast:

- GPU: 2× NVIDIA RTX 5090 (GPU0 = primary display)
- DisplayPorts Used: GPU0 DP1, GPU0 DP2
- USB: Rear motherboard port → KVM PC1
- Purpose: Primary workstation, AI compute

MiniBeast:

- GPU: 2× NVIDIA RTX 4090 (GPU0 = primary display)
- DisplayPorts Used: GPU0 DP1, GPU0 DP2
- USB: Rear motherboard port → KVM PC2
- Purpose: Secondary workstation, AI compute

Hotkey Quick Reference

Essential Hotkeys

Function	Hotkey
Switch to PC1 (TheBeast)	`Right-Ctrl Right-Ctrl 1`
Switch to PC2 (MiniBeast)	`Right-Ctrl Right-Ctrl 2`
Toggle Keyboard/Mouse Mode	`Right-Ctrl Right-Ctrl F2`
Enter Custom Hotkey Setup	Hold front `[○]` button 10 sec

Extended Hotkeys (If Supported)

Function	Hotkey
Cycle Through PCs	`Right-Ctrl Right-Ctrl Enter`
Audio Mute Toggle	`Right-Ctrl Right-Ctrl M`
Show Active PC	`Right-Ctrl Right-Ctrl I`

Note: Extended hotkeys availability depends on firmware version. Check manual for complete list.

Emergency Procedures

Display Completely Black - Both Monitors

Emergency Recovery:

1. **Power Cycle Everything:**

```
- Turn off both monitors
- Unplug KVM power adapter
- Wait 30 seconds
- Plug in KVM power
- Turn on monitors
- Press PC1 button on KVM
```

2. **If Still No Display:**

```
- Disconnect one monitor cable from KVM OUTPUT
- Connect directly to TheBeast GPU0 DP1
- Verify GPU/PC is functioning
- If display works, issue is KVM-related
- If no display, issue is PC/GPU-related
```

3. **Check Active PC:**

```
- Look at front panel LEDs
- Orange LED should indicate active PC
- If no LED lit, KVM may not be receiving power
```

Cannot Switch Between PCs

Troubleshooting Steps:

1. **Verify USB Connection:**

```
- Check USB Type-B cables connected to both PCs
- Try unplugging and re-seating
- Switch using front panel button (not hotkey)
```

2. **Reset KVM Power:**

```
- Unplug KVM power
- Unplug both USB cables from KVM
- Wait 30 seconds
- Reconnect power
- Reconnect USB cables
- Try switching again
```

3. **Advanced Diagnostics:**

```
# Check USB enumeration on active PC
Get-PnpDevice -Class USB | Where-Object {$_.Status -eq "OK"} |
    Select-Object FriendlyName, InstanceId | Format-Table

# Check for USB errors in Event Viewer
Get-EventLog -LogName System -Source "USB" -Newest 50 |
    Where-Object {$_.EntryType -eq "Error"}

# Verify HID devices
Get-PnpDevice -Class HIDClass | Select-Object FriendlyName, Status
```

4. **Contact Tesmart Support:**

```
If KVM still not responding:
- Email: service@tesmart.com
- Support ticket: https://support.tesmart.com
```

```
- Provide: Model (DKS202-M24), purchase date, issue description
- Note: KVM does not have a factory reset function
```

Keyboard/Mouse Frozen After Switch

Quick Fix:

```
1. Press Right-Ctrl + Right-Ctrl + F2 (toggle emulation mode)
2. Wait 3 seconds
3. If still frozen, unplug USB hub from KVM
4. Wait 5 seconds
5. Replug USB hub
6. Windows should re-enumerate devices
```

One Monitor Much Dimmer Than Other

Possible Causes:

1. **HDR Mismatch:**

```
Windows Settings → Display → HDR
Ensure both monitors have identical HDR settings
Either both ON or both OFF
```

2. **Monitor Brightness Settings:**

```
Use monitor OSD to check brightness/contrast
Set identical values on both monitors
```

3. **DP Cable Quality:**

```
Swap the two monitor output cables
If dimness follows cable, replace cable
If dimness stays with monitor, check monitor settings
```

Support Resources

Tesmart Support

Website: https://support.tesmart.com
Email: service@tesmart.com
Documentation: https://support.tesmart.com/hc/en-us/articles/32098347430937

Manual PDF: UART-DKS202-M24-V003.pdf
QR Code: Scan QR code on user manual page 2 or back cover

Driver Downloads

NVIDIA GPU Drivers:

- Website: https://www.nvidia.com/Download/index.aspx
- Select: RTX 5090 or RTX 4090
- OS: Windows 11 64-bit
- Update via GeForce Experience or manual download

USB Audio Drivers:

- Typically use Windows built-in USB Audio Class driver
- No separate driver installation required
- If issues, check Windows Update for optional driver updates

Cluster Documentation

Related Documents:

- `Cluster_Infrastructure_Overview.md`
- `TheBeast_System_Configuration.md`
- `MiniBeast_System_Configuration.md`
- `Tailscale_VPN_Configuration.md`
- `GPU_Compute_Workload_Distribution.md`

Appendix A: Display Resolution Reference

Common Gaming Resolutions

Resolution	Aspect Ratio	Pixels	Common Names
1920×1080	16:9	2.1M	1080p, Full HD, FHD
2560×1440	16:9	3.7M	1440p, QHD, 2K
3840×2160	16:9	8.3M	4K, UHD, 2160p
5120×2880	16:9	14.7M	5K
7680×4320	16:9	33.2M	8K, UHD-2

Ultrawide Resolutions

Resolution	Aspect Ratio	Pixels	Common Names
2560×1080	21:9	2.8M	UW-FHD
3440×1440	21:9	5.0M	UW-QHD

Resolution	Aspect Ratio	Pixels	Common Names
5120×2160	21:9	11.1M	5K2K

Appendix B: DP 1.4 Bandwidth Calculator

Maximum Configurations

Without DSC (Display Stream Compression):

```
8K@60Hz 10-bit 4:4:4  = 31.8 Gbps ✓
8K@60Hz 10-bit 4:2:0  = 21.1 Gbps ✓
4K@144Hz 10-bit 4:4:4 = 28.8 Gbps ✓
4K@165Hz 10-bit 4:4:4 = 33.0 Gbps ✗ (requires DSC)
4K@240Hz 8-bit 4:4:4  = 37.8 Gbps ✗ (requires DSC)
```

With DSC (Typically 3:1 compression):

```
4K@165Hz 10-bit 4:4:4 = 11.0 Gbps ✓
4K@240Hz 10-bit 4:4:4 = 15.8 Gbps ✓
8K@120Hz 10-bit 4:4:4 = 21.2 Gbps ✓
```

Formula:

```
Bandwidth = (Width × Height × Refresh × Color Depth × 3 channels) / Compression

Example for 4K@144Hz 10-bit:
(3840 × 2160 × 144 × 10 × 3) / 1.0 = 28.8 Gbps
```

Appendix C: Windows Display Settings Optimization

NVIDIA Control Panel Settings

For Gaming/High Refresh Rate:

```
Display → Change Resolution:
  ✓ 3840 × 2160
  ✓ 144Hz refresh rate
  ✓ Full (native) color depth
  ✓ RGB (full dynamic range)

Display → Adjust desktop color settings:
  ✓ Use NVIDIA settings
  ✓ Output dynamic range: Full
```

```
3D Settings → Manage 3D Settings:
  ✓ Vertical sync: Use application setting
  ✓ Low Latency Mode: Ultra (for gaming)
  ✓ Power management mode: Prefer maximum performance
```

For Content Creation/Color Accuracy:

```
Display → Change Resolution:
  ✓ 3840 × 2160
  ✓ 60Hz refresh rate
  ✓ 10-bit color depth
  ✓ RGB (full dynamic range)

Display → Adjust desktop color settings:
  ✓ Use NVIDIA settings
  ✓ Digital vibrance: 50% (neutral)
```

Windows Display Settings

Recommended Configuration:

```
Settings → System → Display:

Scale and layout:
  ✓ Change the size of text, apps: 100% or 125%
  ✓ Display resolution: 3840 × 2160

Multiple displays:
  ✓ Extend desktop to both monitors
  ✓ Make this my main display (select primary monitor)
  ✓ Remember window positions: OFF (reduces issues)

Graphics:
  ✓ Hardware-accelerated GPU scheduling: ON
  ✓ Optimize for windowed games: ON (if gaming)
```

Monitor OSD Recommended Settings

For Both Monitors (Keep Identical):

```
Picture Settings:
  ✓ Picture Mode: Standard or User
  ✓ Brightness: 75-80 (to preference)
  ✓ Contrast: 70-75
  ✓ Sharpness: 50 (neutral)
  ✓ Color Temperature: 6500K (neutral)
```

```
Gaming Settings (if applicable):
  ✓ Response Time: Fast or Faster
  ✓ Black Equalizer: 10-15
  ✓ FreeSync/G-Sync: ON
  ✓ Low Input Lag: ON
```

Document Revision History

Version	Date	Author	Changes
1.0	2026-01-06	Peter Heller	Initial creation for TheBeast/MiniBeast KVM setup
1.1	2026-01-06	Peter Heller	Corrections based on Tesmart support feedback (Kelly): Removed incorrect factory reset procedure (KVM has no reset function), added advanced diagnostics (EDID, USB, DisplayPort signal testing), enhanced troubleshooting with PowerShell commands

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Contact Information

Cluster Owner: Peter Heller
GitHub: ph3ll3r (personal), QCadjunct (educational)
System Location: FreedomTower Multi-Node Cluster
Network: Tailscale VPN across all nodes

END OF QUICK REFERENCE CARD