



CaIMAN

Setup Guide

SpectraCal VirtualForge
Software Pattern Generator

Rev. 1.2

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Introduction

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The VirtualForge pattern generator software runs on any Mac OS X or Windows workstation that, in addition to its standard graphics output adapter, also controls a video output device (i.e. AJA Video Systems or Blackmagic Design) to drive a TV video monitor (e.g. LCD/LED, OLED, plasma, projector, etc.).

The VirtualForge software is controlled by CalMAN to produce bit-accurate test patterns at any required triplet value, through the video output device to the video monitor, for accurate grayscale, CMS, or 3D LUT video display calibration. This allows a video monitor that is being driven through a video output adapter to be conveniently calibrated with CalMAN.

VirtualForge also provides specialty test patterns for visual display performance testing or for optimizing the adjustment of display Picture controls.

Mac OSX Requirements

- Macintosh® OS X 10.9 or later
- Intel Core® Duo processor
- 2 GB RAM
- 2 GB available disk space
- Either PCIe or Thunderbolt™ support

Windows Requirements

- Windows® Vista™ or later with latest OS updates installed (recommended: Windows 7® or later)
- 2 GHz processor (recommended: 2 GHz Dual Core Processor)
- 2 GB RAM
- 2 GB available disk space
- Either PCIe or Thunderbolt™ support

Note: Windows running under VMware Fusion is unable to access Thunderbolt ports.

VirtualForge Compatible Video Output Devices

According to their respective software development kits, the following AJA and Blackmagic video output devices should be compatible with VirtualForge, though not all devices have been available for testing.

(see [Appendix B](#), below, for additional device information)

***Note:** Before launching the VirtualForge software, be sure to install the proper software/driver for the AJA or BMD video output device.*

***Note:** The video output characteristics of each video output device controlled by VirtualForge are determined by the individual device and by its associated control app. Use the manufacturer's control app to select device output signal options, including output resolution and frame rate.*

AJA Video Systems video output devices

- T-TAP (not under Windows on Mac Mini)

***Note:** AJA Video Systems reports that some Mac computers cannot connect to the T-Tap in Windows running in Boot Camp.*

- Io XT
- Io IP
- * Io 4K
- * Io 4K Plus
- * KONA 4
- KONA 3G
- KONA Lhi/2G
- KONA LHe Plus
- KONA cards above, in a Sonnet Thunderbolt™ expansion chassis

** If you are using an AJA device that supports a LUT (e.g. Io 4K or KONA 4) with an RGB-8 or RGB-10 pixel format, see the [Pixel Format note](#) under AJA General Information, in [Appendix B](#).*

Blackmagic Design video output devices

***IMPORTANT:** VirtualForge does not support NTSC (480i) on Blackmagic video output devices. If this default setting on the Blackmagic device is not changed before opening VirtualForge, the software will not run.*

- UltraStudio 4K
- UltraStudio HD Mini

- UltraStudio Mini Monitor
- UltraStudio Express
- Intensity Pro 4K
- DeckLink 4K Extreme 12G
- DeckLink 4K Extreme
- DeckLink Studio 4K
- DeckLink 8K Pro
- DeckLink SDI 4K
- DeckLink Mini Monitor 4K
- DeckLink SDI
- DeckLink Quad
- DeckLink Optical Fiber
- DeckLink Duo
- DeckLink Mini Monitor

Note: VirtualForge support for Blackmagic SDI outputs, for sourcing calibration signals, is limited to the Blackmagic default YCbCr 4:2:2 10-bit pixel format, which the Blackmagic control app does not provide the option of changing.

AJA Video Systems Driver Requirements

- Version 12.4.0 Hardware Driver, or newer

Blackmagic Design Driver Requirements

- Version 10.8 Desktop Video, or newer

VirtualForge Software Installation - Mac OS X

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To install the VirtualForge software on a Mac workstation:

1. Download the VirtualForge disk image (.dmg) file, available on the SpectraCal website Downloads page, to either the Mac Desktop or Mac Downloads folder.

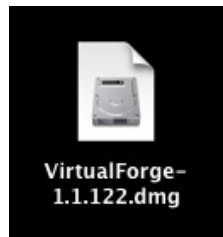


Figure 1. Mac desktop VirtualForge disk image icon.

2. Double-click the disk image icon (Figure 1) to create a VirtualForge application shortcut.

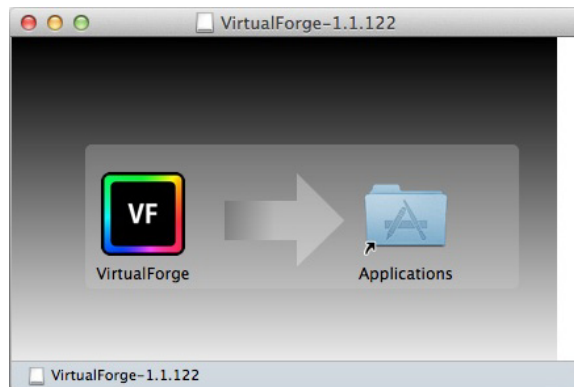


Figure 2. VirtualForge shortcut drag prompt, for moving the VirtualForge shortcut to the Applications folder.

3. Drag the VirtualForge shortcut to the 'Applications' folder in Finder (Figure 2).



Figure 3. VirtualForge shortcut icon in Mac Applications folder.

4. Double-click the VirtualForge shortcut in the 'Applications' folder (Figure 3) to start the application.

Note: You can now eject or delete the VirtualForge disk image (.dmg) file from the Desktop.

VirtualForge Setup on Mac OS X

1. In the Mac menu bar, click the VirtualForge (VF) icon to open its menu (Figure 4). You can select the 'VideoEQ-Test-Card' or the 'Colorbars' test pattern to verify that VirtualForge is properly controlling the workstation video output device. These patterns function whether the VirtualForge software is licensed or not.

Note: See [Appendix A](#) for details on using individual video output devices, including setting their output resolution and frame rate.

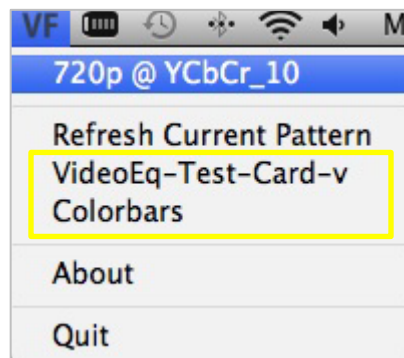


Figure 4. VirtualForge main menu, with patterns for verifying the application.

2. Select *About* from the VirtualForge menu (Figure 4). Record the Machine ID shown on the About dialog (Figure 5). Send the Machine ID to customerservice@spectracal.com with a request for a VirtualForge license key.

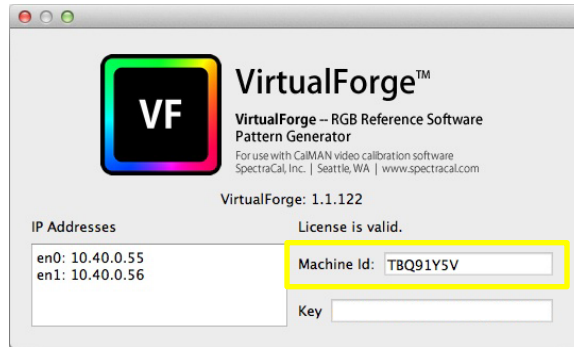


Figure 5. Machine ID field on VirtualForge About dialog.

3. When you receive the license key, copy and paste the key into the Key field on the VirtualForge About dialog (Figure 6).

Note: See [Appendix C](#) if an incorrect license key has been entered, which may result in the software crashing.

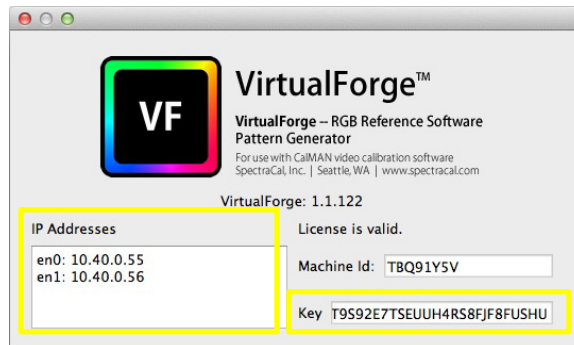


Figure 6. License Key field on VirtualForge About dialog.

4. Record the workstation's IP address(es), shown on the About dialog (Figure 6), for use when connecting to VirtualForge in CalMAN.
5. Quit and restart the VirtualForge software to activate the license.

VirtualForge Software Installation - Windows

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To install the VirtualForge software on a Windows workstation:

1. Download the VirtualForge Windows installation file, available on the SpectraCal website downloads page, to the Windows Desktop or Downloads folder.
2. Run the installation file to create a VirtualForge application shortcut.
3. Double-click the VirtualForge shortcut to start the application.

VirtualForge Setup on Windows

1. In the Windows System Tray (by the clock), click the VirtualForge (VF) icon to open its menu. You can select the 'VideoEQ-Test-Card' or the 'Colorbars' test pattern (Figure 7) to verify that VirtualForge is properly controlling the workstation video output device. These patterns function whether the VirtualForge software is licensed or not.

Note: See [Appendix A](#) for details on using individual video output devices, including setting their output resolution and frame rate.

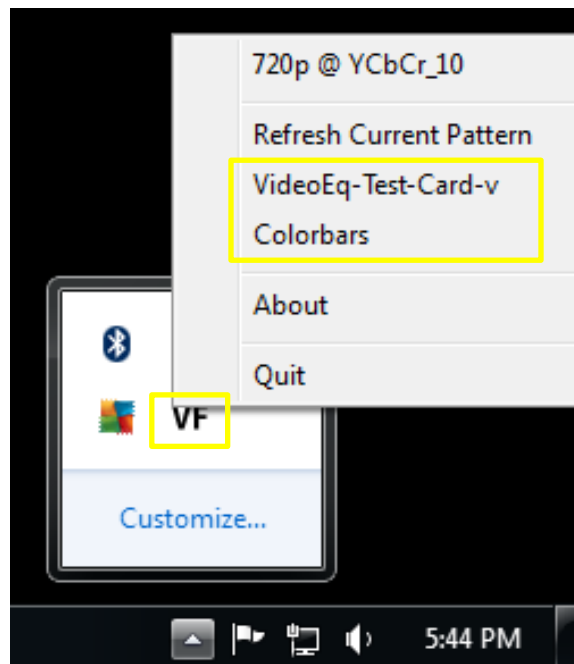


Figure 7. Verification test patterns on VirtualForge menu.

2. Select *About* from the VirtualForge menu (Figure 7). Record the Machine ID shown on the About dialog (Figure 8). Send the Machine ID to customerservice@spectracal.com with a request for a VirtualForge license key.

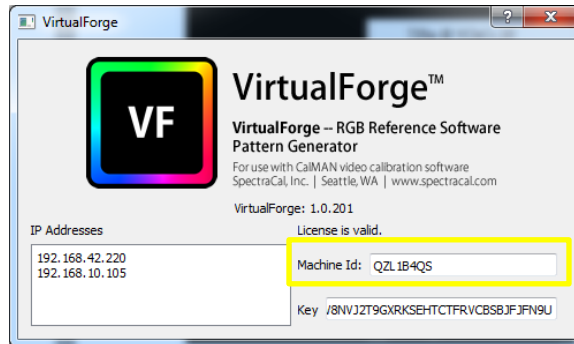


Figure 8. Machine ID field on VirtualForge About dialog.

3. When you receive the license key, copy and paste the key into the Key field on the VirtualForge About dialog (Figure 9).

Note: See [Appendix C](#) if an incorrect license key has been entered, which may result in the software crashing.

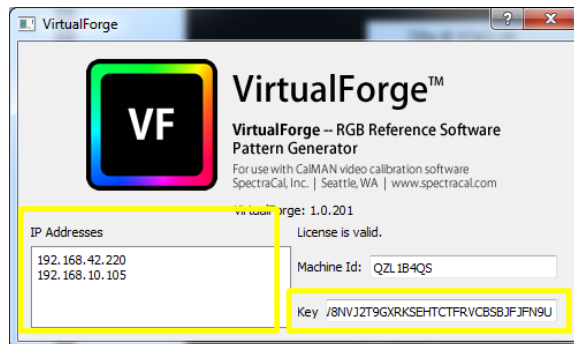


Figure 9. Workstation IP Addresses on VirtualForge About dialog.

4. Record the workstation's IP address(es), shown on the About dialog (Figure 9), for use when connecting to VirtualForge in CalMAN.
5. Quit and restart the VirtualForge software to activate the license.

CalMAN Control of VirtualForge

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CalMAN Required Version

- Version 5.5.0 or newer

CalMAN Connect to VirtualForge

1. Start CalMAN 5.
2. On the main menu, select 'Open Workflow Template' (Figure 10).
 - To perform standard grayscale/CMS display calibration, select either the 'SI Basic Calibration' or the 'SI Advanced Calibration' workflow (Basic is 2 pt. grayscale only).
 - To perform 3D LUT calibration, select the 'Color Cube (3D LUT)' workflow.

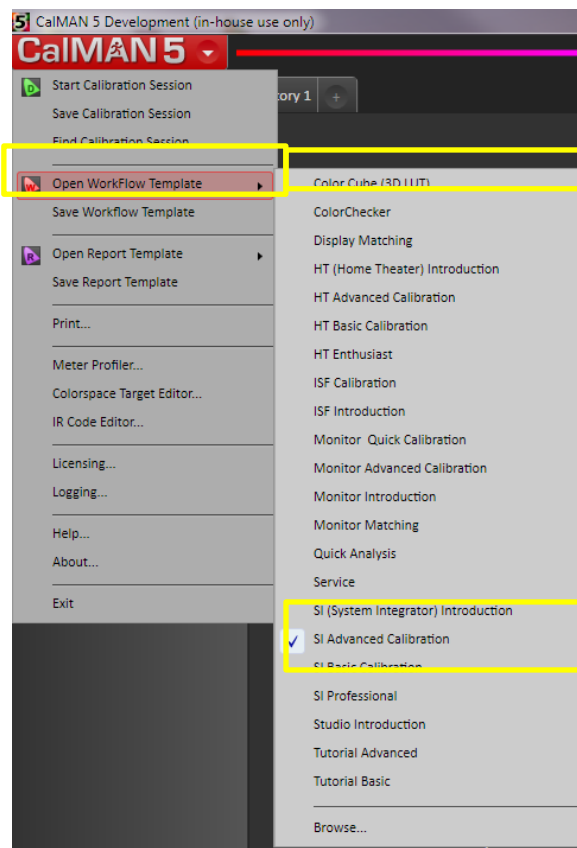


Figure 10. CalMAN workflows typically used with VirtualForge.

3. On the *CalMAN Source Settings* tab, click *Find Source* (Figure 11).

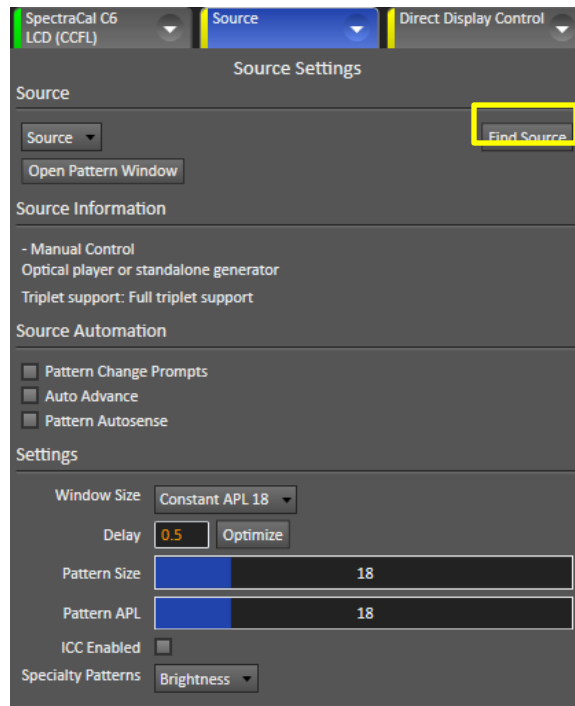


Figure 11. CalMAN Source Settings tab.

4. From the *Manufacturer* drop-down on the *Find Source* dialog (Figure 12), select 'SpectraCal.'
5. From the *Model* drop-down, select 'SpectraCal - VirtualForge (Ethernet @9022).'

Exception: Mac versions of *VirtualForge* prior to 1.1.300 connect under *AV Foundry\VirtualForge*.

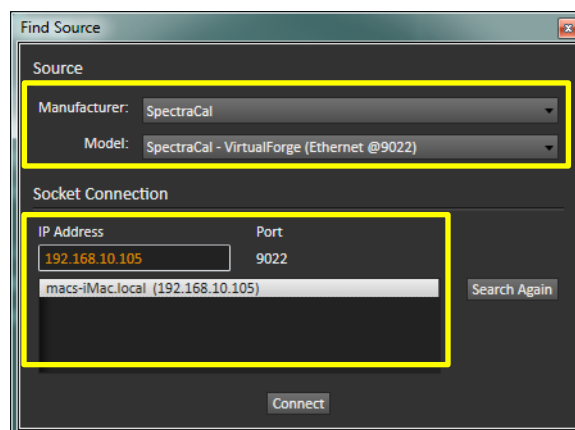


Figure 12. CalMAN Find Source dialog for connecting VirtualForge.

6. Either select the desired VirtualForge IP address from the bottom search box or type in the VirtualForge IP address, from the VirtualForge *About* dialog, then click *Connect*.

As you proceed through your selected workflow, whenever display measurements or adjustments are performed, CalMAN controls the VirtualForge software to produce the required test pattern.

Appendix A - VirtualForge Test Patterns

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The VirtualForge reference software pattern generator provides any RGB color in a full field or window pattern, as requested by CalMAN for display measurement and calibration (16.78 million 8-bit colors or 1.07 billion 10-bit colors).

VirtualForge also provides specialty test patterns for visual display performance testing or for optimizing the adjustment of display Picture controls (contrast, brightness, etc.). When CalMAN is connected to the VirtualForge software generator, these patterns are available from CalMAN's specialty pattern icon (Figure 13).

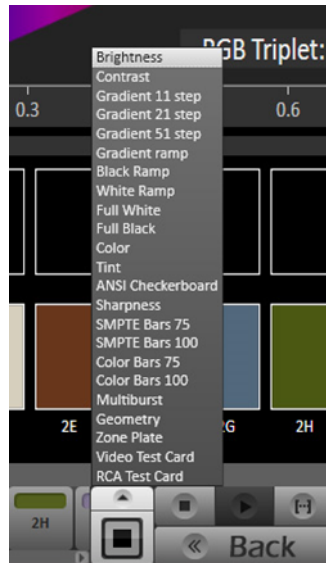


Figure 13. VirtualForge specialty test patterns, accessed from CalMAN's specialty pattern icon.

Following is a list of the VirtualForge specialty test patterns:

Brightness	Full White	Color Bars 75
Contrast	Full Black	Color Bars 100
Gradient 11 step	Color	Multiburst
Gradient 21 step	Tint	Geometry
Gradient 51 step	ANSI Checkerboard	Zone Plate
Gradient ramp	Sharpness	Video Test Card
Black Ramp	SMPTE Bars 75	RCA Test Card
White Ramp	SMPTE Bars 100	



Appendix B - Video Output Devices

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AJA Video Systems General Information

- AJA ControlPanel app and unified device driver;
Minimum Version: 12.4.2
<http://www.aja.com/en/support/software/>
- The video output characteristics of each AJA video output device controlled by VirtualForge are determined by the individual AJA device and by the AJA ControlPanel app.
- Use the AJA ControlPanel to select AJA output signal options, including output resolution and frame rate (Figure 14).

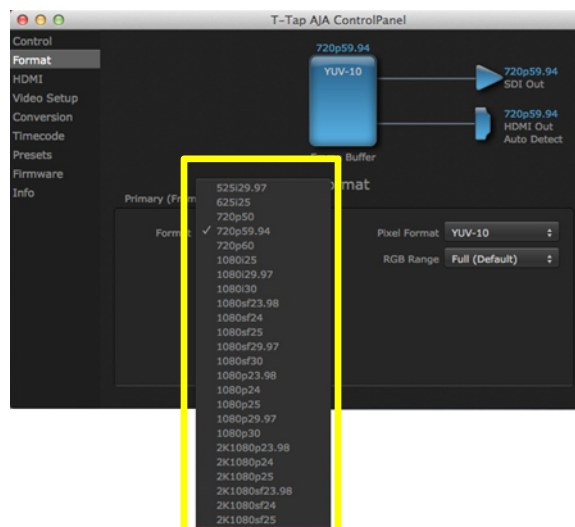


Figure 14. Output signal options in AJA ControlPanel utility.

- If you change AJA device parameters, click the ‘Refresh Current Pattern’ link on the VirtualForge menu to update the device data in the VirtualForge software.
- If you are switching between multiple AJA devices, be sure to check the format selection after you switch to a new device (all devices don’t support the same formats).
- If the AJA device supports a LUT (e.g. Io 4K and KONA 4), and if the AJA device’s Pixel Format, is selected as “RGB-8” or “RGB-10” on the ControlPanel Format screen, select the ControlPanel LUT screen (shown below). Under LUT Type:, select “Linear” (Figure 15).

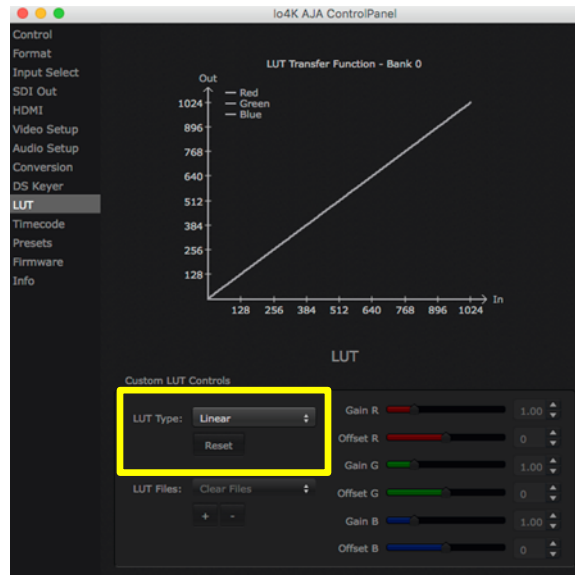


Figure 15. LUT Type selection in AJA ControlPanel utility.

Note: AJA Video Systems reports that some Mac computers cannot connect to the T-Tap in Windows running in Boot Camp.

Blackmagic Design General Information

- The video output characteristics of each Blackmagic video output device controlled by VirtualForge are determined by the individual Blackmagic device and by the Blackmagic control app.
- Use the Blackmagic control app to select Blackmagic output signal options, including output resolution and frame rate.
- VirtualForge does not support NTSC (480i) on Blackmagic video output devices.
- VirtualForge supports Blackmagic HDMI outputs for sourcing calibration signals only with Blackmagic software version 7.07, or newer.
- Blackmagic SDI support in CalMAN, for sourcing VirtualForge calibration signals, is currently limited to the default YCbCr 422 10-bit pixel format, which the Blackmagic control app does not provide the option of changing.

Appendix C - VirtualForge Crash Recovery

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If a non-valid license key is inserted into the *Key* field on the VirtualForge *About* dialog, VirtualForge may crash the next time it is opened. To remedy this, you can delete the non-valid VirtualForge license file in the license directory.

Mac OSX

The VirtualForge license file is in the hidden "Library" folder.

To delete the non-valid license file and recover VirtualForge:

1. Hold down *Option* key on the keyboard.
2. Select *Go* from the top menu. This exposes the "Library" folder.
3. Select Preferences -- /Users//[user name]/Library/Preference (Preferences/Users/[user name]/Library/Preference)
4. Find and delete the *com.virtualforge.plist* or *com.spectracal.plist* file.
5. Restart Mac OS X.
6. Restart VirtualForge and enter a valid license key.

Windows

The VirtualForge license file is in the "C:\ProgramData\SpectraCal\VirtualForge\License" folder.

To delete the non-valid license file and recover VirtualForge:

1. Navigate to the "C:\ProgramData\SpectraCal\VirtualForge\License" folder.
2. Delete the VirtualForge.lic file.
3. Restart Windows.
4. Restart VirtualForge and enter a valid license key.

About / Contact

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About Portrait Displays

Portrait Displays, Inc., since 1993, is a leading application software provider (ASP) for PC, smartphone, and tablet displays. The Portrait Displays team now includes **SpectraCal**, the world's leading provider of video display calibration software. The combined companies offer value-added, feature-rich solutions to both OEM display manufacturers and end users seeking improved accuracy and manageability of their displays.

Portrait Displays, an Intel Capital Portfolio company, is a private corporation with headquarters in Pleasanton, California, USA with representatives in Europe, Taiwan, China, Japan, and Korea.

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