



CaIMAN

Setup Guide

SpectraCal MobileForge

Pattern Generator App

Rev. 1.7

Introduction

MobileForge is a free pattern generator app for iOS, Android™, and Fire TV devices. MobileForge generates accurate test patterns automatically on your mobile device, controlled by CalMAN™ display calibration software. MobileForge provides free, accurate test patterns to those using CalMAN software for display measurement and calibration.

MobileForge enables accurate, reliable screen measurements to test how accurately your mobile device displays photos, videos and other digital content. Use MobileForge with CalMAN ColorMatch, SpectraCal's free testing and analysis software, to test your tablet or smartphone's conformance to industry standards, with over a hundred different X-Rite/Pantone ColorChecker® test colors, representative of naturally occurring colors such as foliage and skin tones.

The MobileForge test patterns can also be controlled by CalMAN to test or calibrate the HDMI input of an external TV or video monitor. When MobileForge is installed on a Fire TV device or on an iOS or Android™ device with HDMI output (either directly, through a plug adapter, or by screen mirroring to a streaming media device such as Apple TV or Chromecast), the MobileForge test patterns can be routed to a display's HDMI input.

Note: For external screen patterns, SpectraCal currently recommends using MobileForge with an Amazon Fire TV device or with an iOS mobile device mirrored to an Apple TV.

CalMAN Supported Software

- CalMAN ColorMatch (free)
- CalMAN Home Enthusiast
- CalMAN Studio
- CalMAN Video Pro
- CalMAN Ultimate

CalMAN Required Software Version

- Version 5.4.2 or newer for full range PC levels (0-255) (mobile device screen patterns)
- Version 5.5.0 or newer for SMPTE video levels (16-235) (external video screen patterns)

iOS Device Required Version

- Version 7.0 or newer*

*See [Device Limitations](#) section, at the end of this document.

Android Device Required Version

- Version 4.0.3 or newer*

*See [Device Limitations](#) section, at the end of this document.

MobileForge Control Connection

- Wireless IP (Wi-Fi)

MobileForge Installation and Operation

Click one of the following links to jump to the desired section in this document.

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MobileForge Installation - iOS



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MobileForge for iOS

To set up MobileForge to automatically produce test patterns on an iOS mobile device:

1. In the App Store, search for “MobileForge.”
2. On the MobileForge for CalMAN app, select *Get and Install* the app.
3. Tap the new MobileForge icon on the mobile device menu screen to open the app.
4. The MobileForge screen (Figure 1) will say “Waiting to connect to CalMAN...” and will display the mobile device IP address.
5. To connect CalMAN to control the MobileForge Pattern Generator, go to the [CalMAN Connection to MobileForge](#) section, on page 7 below.



Figure 1. MobileForge opening screen.

MobileForge Installation - Fire TV



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MobileForge for Fire TV

To set up MobileForge to automatically produce test patterns from a Fire TV box or Fire TV stick:

1. From the Fire TV Home screen, select Search, then type “MobileForge.”
2. Select and Install the MobileForge app.
3. From the main menu, select Apps, then select the new MobileForge icon to open the app.
4. The MobileForge screen (Figure 1) will say “Waiting to connect to CalMAN...” and will display the Fire TV IP address.
5. To connect CalMAN to control the MobileForge Pattern Generator, go to the [CalMAN Connection to MobileForge](#) section, on page 7 below.

MobileForge Installation - Android



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MobileForge for Android

To set up MobileForge to automatically produce test patterns on an Android mobile device:

Note: Android device compatibility will vary depending on mobile device and adapter.

1. In the Play Store, search for “MobileForge.”
2. Select and Install the MobileForge app.
3. On the Applications page, tap the new MobileForge icon to open the app.
4. The MobileForge screen (Figure 1) will say “Waiting to connect to CalMAN...” and will display the mobile device IP address.
5. To connect CalMAN to control the MobileForge Pattern Generator, go to the [CalMAN Connection to MobileForge](#) section, on page 7 below.

CalMAN Connection to MobileForge

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To connect CalMAN to control the MobileForge Pattern Generator:

1. Connect the CalMAN computer to the same local network to which the mobile device is connected. The first three sections of IP addresses on the same local network will be the same (e.g. [192.168.10.113](#) and [192.168.10.105](#)).
2. In CalMAN, on the *Source Settings* tab, under *Find Source* (Figure 2), select “SpectraCal – MobileForge Pattern Generator (Ethernet @2150).”

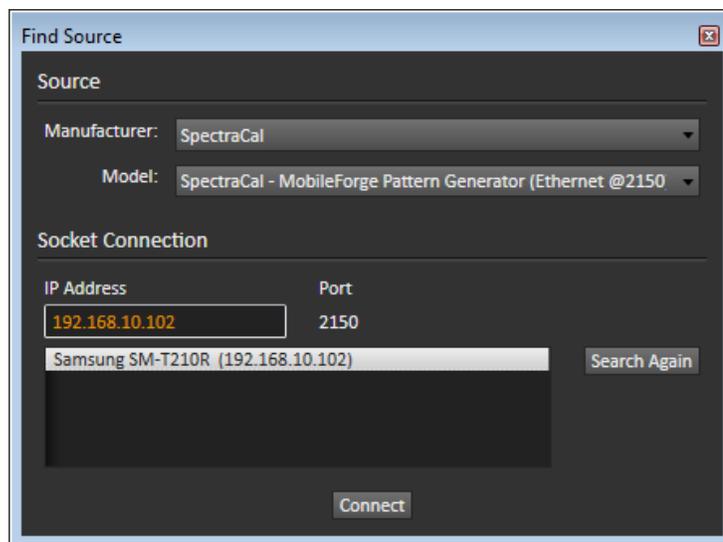


Figure 2. CalMAN Find Source dialog.

3. Select the mobile device listing with the IP address that you noted on the MobileForge opening screen (Figure 1). If there is no device listed with that expected IP address, enter the expected MobileForge address in the *IP Address* box.
4. Click *Connect* on the *Find Source* dialog.
5. On the *Source Settings* tab (Figure 3), under *Window Size*, select the desired test pattern window type and size.

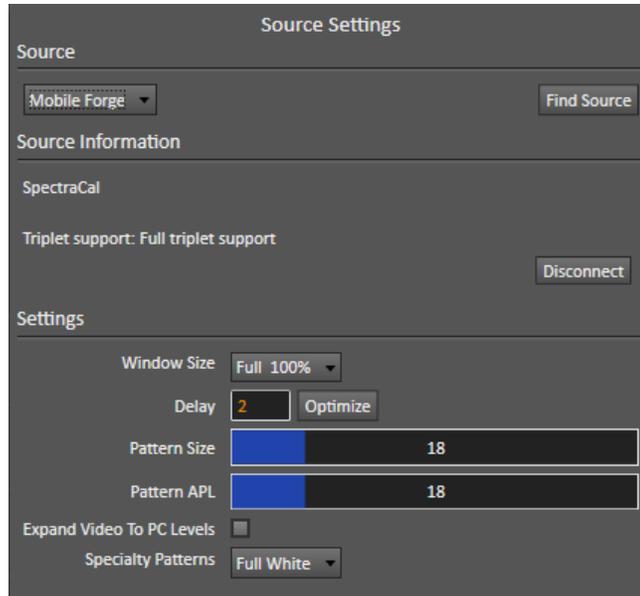


Figure 3. CalMAN Source Settings tab.

Apple TV Connection

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The 2nd generation or later Apple TV can be used to accurately transfer grayscale and color test patterns from an Apple mobile device to a TV to be calibrated, using AirPlay Mirroring.

Note: The AppleTV must be set to YCbCr mode before screen-sharing patterns from MobileForge. On the Apple TV menu, go to Settings > Audio & Video > HDMI Output > YCbCr.

To connect your iOS device to an Apple TV:

1. Connect your iOS device to the same Wi-Fi network as your Apple TV to which you want to AirPlay Mirror.
2. On your iOS device, swipe up from the bottom of the screen to open *Control Center*.
3. In *Control Center*, tap *AirPlay Mirroring*, then select your Apple TV from the list.

The diagram in Figure 4, below, illustrates the device connections between the CalMAN computer and the display to be calibrated.

How MobileForge Works With Apple TV AirPlay Mirroring

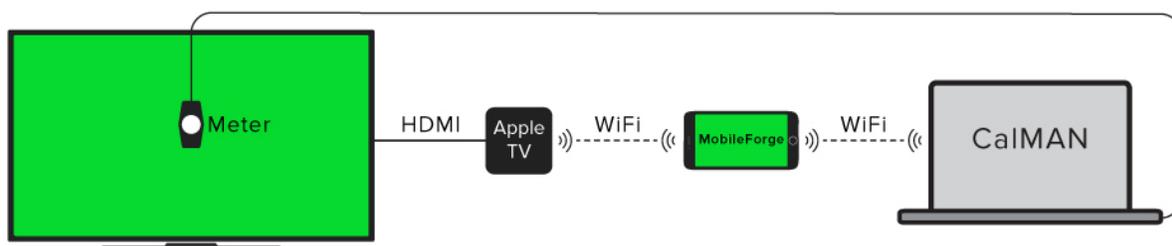


Figure 4. Device configuration for mirroring test patterns from MobileForge running on an iOS mobile device to an Apple TV device.

Fire TV Connection

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With MobileForge installed on a Fire TV Stick or on a Fire TV Box (see [MobileForge Installation - Fire TV](#)), the MobileForge test patterns can be fed directly to an HDMI input of a TV or monitor.

The diagram in Figure 5, below, illustrates the device connections between the CalMAN computer and the display to be calibrated.

How MobileForge Works With Amazon Fire Devices

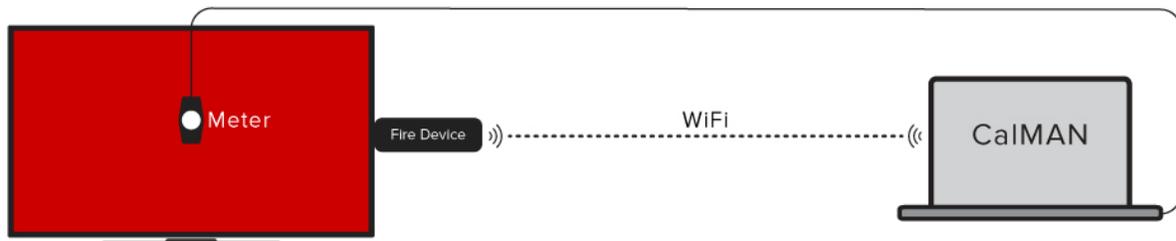


Figure 5. Device configuration for displaying test patterns from MobileForge running on a Fire TV device.

Chromecast Connection

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You can cast your Android screen (running Android 4.4.2 or higher) to a Google Chromecast, Chromecast Ultra, or TV with built-in Chromecast.

Caution: Casting test patterns from an Android screen to a Chromecast converts grayscale levels accurately, but does not provide bit-accurate color patterns.

Most other Android devices, such as the Nexus player and HDMI adapters seem to convert all test patterns accurately.

1. Connect the Chromecast device to the desired TV HDMI input.
1. Turn off "Power Saving Mode" on your Android device. Power Saving Mode can limit the processing power of your device, which might affect the performance of the Cast Screen feature.
2. Connect your Android device to the same Wi-Fi network as your Chromecast or TV with built-in Chromecast.
3. Open the Google Home app.
4. In the top-left corner of the app's Home screen, tap Menu > Cast Screen / audio > Cast Screen / audio.
5. Select your Chromecast or TV with built-in Chromecast.

The diagram in Figure 6, below, illustrates the device connections between the CalMAN computer and the display to be calibrated.

How MobileForge Works with Google Chromecast Screen Mirroring

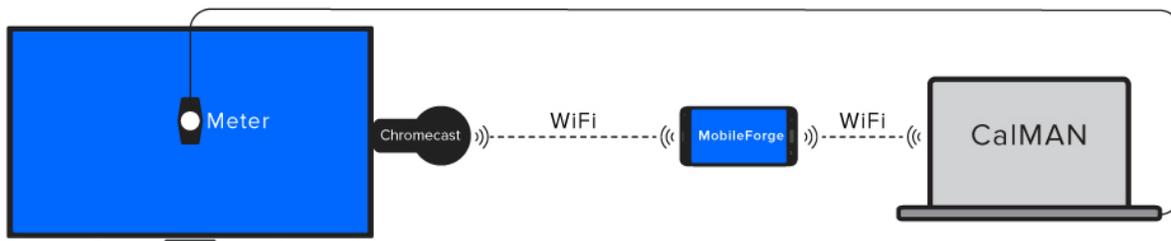


Figure 6. Device configuration for mirroring test patterns from MobileForge running on an Android mobile device to a Chromecast device or to a TV with built-in Chromecast.

Measuring and Calibrating Screens

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Measure a Mobile Device Screen

When the MobileForge test patterns are being used to measure the screen of the mobile device on which MobileForge is installed:

1. Select “PC (0-255)” under *CalMAN Settings > Workflow Basic Options > Luminance Levels*.
2. Uncheck the “Expand Video To PC Levels” option on the *CalMAN Source Settings* tab.

Measure/Calibrate an External TV or Monitor Screen

When the MobileForge test patterns are routed through an HDMI output to test or calibrate the HDMI input of an external TV or video monitor:

1. Select “Video (16-235)” under *CalMAN Settings > Workflow Basic Options > Luminance Levels*.
2. Check the “Expand Video To PC Levels” option on the *CalMAN Source Settings* tab.

Note: When using the Apple TV to mirror MobileForge test patterns to an external TV or video monitor, set the Apple TV’s HDMI output to YCbCr. On your Apple TV menu, go to Settings > Audio & Video > HDMI Output > YCbCr

Optimize Pattern Delay Time

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Different mobile devices may have different delay times when switching test patterns. To optimize CalMAN to take a measurement as quickly as possible after switching to a new test pattern, without taking a measurement before the test pattern image is stable, do the following:

1. Connect CalMAN to control the MobileForge Pattern Generator, as outlined above.
2. Position your color meter to make screen measurements at the center of the test pattern.
3. On the CalMAN *Source Settings* tab, click the *Optimize* button, toward the bottom of the panel.
4. Wait for the Optimize process to complete and display an updated pattern *Delay* time.

Device Limitations

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Apple iPhone 4

The iPhone 4, when used with a video output adapter, supports only video output, not still images. While the iPhone 4 does support MobileForge for measuring the iPhone 4 screen, it does not produce test patterns to an external video screen.

The iPhone 4s, however, does output still images through a video output adapter and does support MobileForge for measuring or calibrating an external video screen.

Apple Lightning to HDMI Adapter

The Apple lightning to HDMI adapter converts grayscale levels accurately, but does not provide bit-accurate colors.

Samsung Galaxy S6/S6 Edge

The Galaxy S6/Edge has no provision for a physical video output connection. The S6 does support streaming to a Google Chromecast device to stream MobileForge test patterns to an HDMI input on an external video screen.

Smart TV Streaming Apps

When MobileForge test patterns are streamed directly into the streaming app on a smart TV, the test patterns bypass the display's physical video inputs. Thus, the display's HDMI video inputs cannot be calibrated with MobileForge test patterns sent directly to the smart TV's built-in streaming app.

Also, the smart TV may or may not have calibration controls for the display's streaming app input.

About / Contact

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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