

# Video Signal Generator for Composite Video (CVBS)

## NI VideoMASTER for Composite Video Generation **NEW!**

- Generation of NTSC/PAL/SECAM signals
- Adjustment for more than 40 video parameters
- Comprehensive library of signal bitmaps and ITS lines
- Output sampling at 100 MS/s with 16-bit resolution
- Easy setup with custom step types for NI TestStand

### Operating Systems

- Windows XP/2000

### Required Software

- NI TestStand

### Included Software

- VideoMASTER - Analog Generator
- VideoMASTER Analog Generator license
- Required NI drivers



## Overview

NI VideoMASTER, a versatile video generation and analysis test suite for validation and production test, works with a wide variety of video standards and formats for both analog and digital video. VideoMASTER for Composite Video Generation combines an NI 5421 16-bit, 100 MS/s signal generator with VideoMASTER - Analog Generator software to deliver a comprehensive test solution that generates all of the common composite video formats including M-NTSC (NTSC), B/G/D/H/I-PAL (Standard-PAL or simply PAL), and L/K-SECAM (SECAM). The software handles the generation of the video signals so you can adjust more than 40 video parameters and download waveforms to the onboard memory of the NI 5421 signal generator hardware.

The high accuracy of NI 5421 devices, with specifications such as -68 dBc THD at 5 MHz and spurious-free dynamic range (SFDR) of -71 dB at 1 MHz and -64 dB at 10 MHz, ensures high-quality video test signals for video test of analog composite video (CVBS or color, video, blanking, and sync) devices.

The VideoMASTER solution offers easy-to-use graphical user interfaces, the ability to adjust to more than 40 parameters for video generation, video generation optimized for automated test, high resolution of 16 bits, and seamless integration into NI TestStand test management software for automated validation and production environments. High test throughput, coverage for design and production requirements, and a relatively low cost ensure a reduced overall ownership cost for high-performance video test.

## Video Generation Using Smart Algorithms

You can define your own signal parameters with the VideoMASTER generator user interface. For example, you can use these features to modify the following:

- Timing parameters (synchronization pulse rise/fall times or color burst duration)
- Geometry parameters (active image size and position)
- Level parameters (synchronization amplitude or color saturation)

You can also set the attributes to change dynamic conditions by:

- Inserting filters on all video components (affects the bandwidth of components)
- Adding white noise or distortion to your signal (for example, you can simulate bad signal transmission conditions by adding white noise or distortion to your signal)

Along with flexibility, VideoMASTER for analog video generation offers ease of use. You can still generate standard signals using a few operations, which improves productivity considerably. The tool supports the M-NTSC, NTSC-4.43, B/G/D/H/I-PAL, M-PAL, N/PAL, Nc-PAL, and B/D/G/K/K1/L-SECAM standards.

## Bitmap Images and Insertion of Test Signals

VideoMASTER offers several ways to create and generate standardized as well as custom, arbitrary analog composite video signals. The solution is ideal for production testing of TVs, video recorders, set-top boxes, and broadcast equipment.

Signal generation is based on two essential modes of generation:

- Bitmap-based generation
- Insertion of test signals

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Bitmap images are grouped into two sets of resolution for each of the color coding systems. For NTSC and M/PAL, the bitmaps used are 640x480 pixels and 1044x480 in higher resolution. For all other PAL and SECAM variants, the bitmaps come in 768x576 pixels and 1040x576 pixels. These pixel resolutions are for the active video image. VideoMASTER comes with a large number of bitmaps for each resolution, and you can use bitmaps from other sources that meet the correct resolution formats as well.

You can also generate images using insertion test lines (ITLs). Commonly used in video testing, this feature is a powerful way to generate custom test images, such as a matrix pattern for production testing or validation, or to add ITLs in the blanking area of a video signal. The VideoMASTER for analog video generation comes with a large library of insertion test signals such as an NTC-7 composite test signal, multiburst, modulated ramp, and color bars. An editor for test signal insertion is available through the "Insert Test Lines" interface. A signal previewer further helps identify the signals. In addition, take advantage of the full power of the VideoMASTER library to create final test images using a combination of bitmaps and inserted signals.

## Integrated NI TestStand Step Types

The simplest way to generate an NTSC, PAL, or SECAM video signal is to use the VideoMASTER – Analog Generator custom step type that executes directly in NI TestStand.

The VideoMASTER step type for composite video generation provides an interactive interface to configure and program an NI 5421 to generate composite video signals. With the step type, you can generate standard test patterns or create custom test patterns based on an RGB bitmap image combined with inserted test lines from a large library of video test lines. VideoMASTER comes with several bitmap images for each resolution that you can use to configure the video signal you generate, or you can use bitmap patterns from other sources, provided that they fit the bitmap size format you are using. You can also combine these bitmap patterns with ITLs to create the final video test signal.

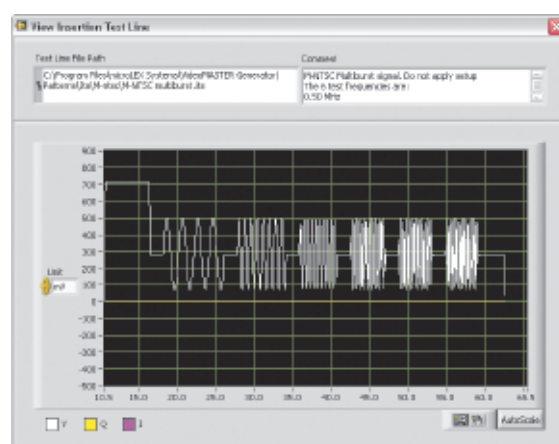
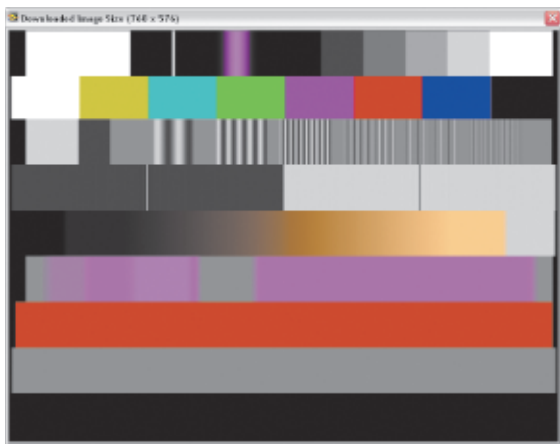


Figure 1. NI VideoMASTER for Composite Video Generation includes interactive graphical interfaces to adjust more than 40 video parameters, display the generated video pattern, create signals with bitmaps and insertion test lines (ITLs), and view individual ITLs.

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The step type for NI TestStand improves productivity, ease of use, and debugging significantly by offering extensive code reuse. It also reduces application software maintenance. Using VideoMASTER step types is the preferable and cost-optimal approach for composite video generation in application test development because it allows many instantiations of the generator in a single test application.

### Filter Characteristics

Filter functions play an important role in video signal generation and transmission. A high-performance video generator needs several essential filter functions to offer quality signal generation. The video bandwidth in transmission systems for the luminance information is 4.2 MHz for M-NTSC; 4.2 to 6.0 MHz for the PAL standard, depending on the specific PAL variant; and 5.0 or 6.0 MHz for SECAM, depending on the specific SECAM variant. For color transmission information, the color difference signals U and V are normally bandwidth-limited to 1.3 MHz in both NTSC and PAL. SECAM uses FM modulation to transmit the Pb and Pr color difference information with each component having its own subcarrier. The Pb and Pr color difference signals are lowpass-filtered to 1.3 MHz as well. VideoMASTER for Composite Video Generation offers several ways to filter different video components while computing a video signal. Depending on the video formats (PAL, NTSC, or SECAM), shifting filter combinations are required. You can use the following three options to filter:

- One or more of the predefined finite impulse response (FIR) filters
- One or more of the predefined infinite impulse response (IIR) filters

All predefined filters are designed to avoid group delay across the entire frequency range. In other words, there is no phase error and no delay between any parts of the different signal components whether or not they are filtered.

Visit [ni.com/vidiomaster](http://ni.com/vidiomaster) to configure your VideoMASTER solution.

### Ordering Information

NI VideoMASTER for Composite Video Generation with NI PXI-5421  
*Includes NI VideoMASTER – Analog Generator software, a license for composite video generation, and one of the following PXI-5421 options.*

- 8 MB/channel .....780431-01
- 32 MB/channel .....780431-02
- 256 MB/channel .....780431-03

#### VideoMASTER - Analog Generator Software Add-On

Advanced Composite Generation Add-On .....780477-01  
*Includes support for composite STANAG and RS-343 standards.*

#### NI LabVIEW and NI TestStand Compatibility

VideoMASTER – Analog Generator Version 2.3.1.1

- NI TestStand 3.5, 4.0, or 4.0.1 (required) with LabVIEW 8.2 or 8.2.1 runtime (or LabVIEW 8.2 or 8.2.1 development software)

#### Related VideoMASTER Solutions

- NI VideoMASTER for Analog Video Analysis
- NI VideoMASTER for Digital Video Analysis
- NI VideoMASTER for Digital Video Generation

### BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to [ni.com/vidiomaster](http://ni.com/vidiomaster).

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## Hardware Services

### NI Factory Installation Services

NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with [ni.com/pxiadvisor](http://ni.com/pxiadvisor).

### Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit [ni.com/calibration](http://ni.com/calibration).

### Repair and Extended Warranty

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