Tektronix

Grass Valley Model 1200
Digital Production Switcher



Ordering Guide

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PRODUCT OVERVIEW

The Model 1200 Digital Production Switcher employs component digital (CCIR 601, 4:2:2) processing to achieve the highest possible picture quality. The basic system includes:

- A full-function control panel with a built in crisp high resolution electroluminescent graphical display
- "Flat" easy to use menu structure
- No need for an external terminal
- Button per function operation
- High density 3 1/2 inch floppy disk drive
- A Mix/Effects (M/E) having a maximum of 16 primary inputs which can be used for either primary video or key sources, program/preset and auxiliary buses
- 20 wipe patterns with modifiers
- Up to 2 effects keyers
- A single downstream keyer (DSK) with fade to black

The Model 1200 accepts up to 16 sources; serial or parallel digital or CAV video sources make up the input compliment. Twelve primary inputs plus black and background can be directly accessed from the crosspoint buses. The remaining 4 inputs can be assigned as key signals. The analog component input option accepts either YUV or RGB plus a key signal per module. Personality programming is provided for assigning inputs as video or key sources and mapping the inputs to the control panel source select buttons. All inputs are processed in component digital with selectable 8 or 10 bit resolution. An automatic input timing range of +/- 24uS is provided for each input, which compensates for system installation cable length variations. Outputs from the switcher are provided in serial or parallel component digital along with component analog YUV or RGB. The Mix/Effects system (M/E) has one full-function effects keyer standard with a second available as an option. Each of the two full-function keyers in the M/E and the DSK are capable of linear, luminance, chroma key, or preset pattern keys. Each keyer has key memory which automatically stores all the parameters and modifiers used by the keyer. These include crosspoint selection, key type, clip, gain, and other modifiers. Additionally, all keyer setups can be copied to another keyer.

A Chromatte (tm) 4:2:2 / 4:4:4 Chroma Key can be assigned to either of the M/E keyers or the DSK. This advanced chroma key process provides quality and flexibility previously unseen in production switchers of any class. The unique Digital Dual Link 4:4:4 chroma key creates a new level of keying quality. Additionally, each keyer can be enhanced with a separate borderline ® Key Edge Generator and Z-Depth processing.

The M/E keyers use any of the switcher inputs for a video fill or an external key source. With the Auto Select feature, each fill video can have an external key source associated with it or act as a self key. Each keyer can be masked by utilizing any of the M/E's wipe patterns. The Digital Dual Link Chroma keyer uses two of the primary inputs to receive the special 4:4:4 signal and has an additional force / mask generator built in.

The unique Z-Key (tm) Depth Processor option allows the M/E keyers to key in the third dimension along the Z-axis. This option utilizes the Z-axis information from Graphics Factory, Kaleidoscope (tm) or Krystal (tm) digital effects systems to provide keying relative to the pictures location in space. It can also add Z-axis information to an Effects Send key being sent to an external digital effects device.

Effects Send allows any of the 3 keyers to be sent to an external Digital Picture Manipulator (DPM) effects device for image and key manipulation and then routed back into the switcher for combining with other images.

With this system keys can be flown within the DPM and then logically spliced into the keyer's path within the M/E.

Two aux buses are used to feed video sources into a 2-channel DPM or 1 video and 1 key to a single channel DPM that transforms key signals. A powerful feature of the DPM's seamless integration with the Model 1200 is its capability to control the aux busses as source selectors and save this as part of the DPM E-MEM ® effect. Recalling the effect also recalls the aux bus source selections along with the entire switcher state.

Numerous matte generators are included in the system. These provide independent color matte fill for the borderline ® Key Edge generators and wipe pattern borders. Additionally, the user can configure any input to generate a matte or black background. Any of the mattes can be copied to another source. Auto Transition and Cut are standard in the M/E and DSK. A master fade to black is also provided on the switcher output.

The Model 1200 includes a standard set of 20 wipe patterns. These patterns can be modified with border width, softness, aspect, vertical and horizontal multipliers, and a three axis rate controlled pattern positioner. The vertical and horizontal multipliers repeat patterns up to 15 times. A wipe transition preview is easily accomplished with Trans Pvw button.

Standard E-MEM ® Effects Memory system provides storage for 20 complete switcher setups. These registers are available for effects storage when controlled by an external edit controller. Learns and recalls of switcher setups can be performed either from the control panel or an edit controller. All switcher effects and configuration can be saved to disk using the built-in floppy disk drive.

Signal processing facilities are also included in the system architecture. Each input has adjustments for luma gain, chroma gain, luma offset, hue, and U and V offset.

A sync pulse generator is included and allows the system to be timed to an external NTSC/PAL analog color black signal. Output processing is included to insert proper timing reference information into the video.

The Model 1200 includes five communications ports on the electronics frame allowing interfacing to; Edit controller, DPM, External modem, Tally output, and GPIs.

The control panel receives its power from a built in auto-ranging power supply system. The processing frame is 6 RU (26.6 cm high, 10.5").

The control panel is connected to the electronics frame using a single 15-pin cable. A 30-meter system control cable is included. The control cable can be up to 100 meters in total length. Specifications to build cables are available.

An operators manual, quick reference guide, installation and service manual are supplied with each system.

MODEL 1200

Basic Switching Systems

Note:
Input and output modules need to be added to the basic switching system.

Model 1200 Component Digital Production Switcher

MODEL #

1200

Basic system includes:

- Single Mix/Effects system with mix / wipes and DSK
- Full-function control panel with high resolution electro luminescent display, floppy disk drive, button-per-function operation, and keyboard interface
- Full 10-bit signal paths input and outputs
- Automatic input timing of all sources (+/- 24uS)
- Full-function M/E keyer, with key priority control
- Full-function DSK keyer, with FTB
- 20 wipe patterns
- 20 E-MEM ® effects memory registers
- Effects Send/dual auxiliary busses
- Numerous matte generators, all with copy function
- 16 Programmable GPIs, 8 inputs and 8 outputs
- 5 External electronics frame control ports; DPM, Editor, Modem, Tally GPI
- Electronics frame auto-ranging power supply
- System software
- Manual set; Operation, Quick Reference, Installation and Service

STANDARD OPTIONS INCLUDED

Power Cables

In order to meet UL and TUV safety requirements, the appropriate power cables must be used with the system.

Both the TUV and the UL approved cables are provided with each unit, as required.

TUV Approved Power Cables

These cables must be used on all units installed in Europe. The control panel power will be supplied with a molded grounding connector (IEC 320-C13) on one end with pigtails on the other. The main electronics frame will have the power cable attached with pigtails on the free end. Appropriate connectors to be supplied by customer per local requirements. Areas outside of Europe may or may not require a TUV approved cable, please check local requirements and order accordingly.

UL Approved Power Cables

These cables must be used on all units installed in the United States, Canada, South America and South East Asia. A Standard 110VAC power cable is supplied with the Control Panel. It has a molded grounding plug (NEMA 5-15P) at one end and a molded grounding connector (IEC 320-C13) at the other end. The main electronics frame is supplied with a power cable with a 20 Amp Twist-Lock 240 VAC NEMA Type L6-20P Plug attached.

Control Cable

30-Meter Control Cable

One 30-meter control cable is included with the system. Maximum cable distance between control panel and electronics frame is 100 meters. Specifications for building cables longer than 30 meters are available from Customer Service.

ORDERABLE OPTIONS

Input Options

The Model 1200 will accept up to 16 video and key external inputs. There are 8 positions in the electronics frame designated for input modules. Each module can accommodate 2 inputs of digital video either serial or parallel, or one Component analog video (YUV or RGB) along with a key signal.

2-Input Parallel Digital Input module — ***1200-201***

2-Input Serial Digital Input module — ***1200-202***

Component Analog / Key Input module — ***1200-312***

One CAV input, and one analog key input per module.

Output Options

The electronics frame will accommodate four component digital output modules plus separate analog video program and preview outputs. The digital outputs can be configured in any combination of serial and parallel outputs up to a maximum of 4 output modules. Each output module provides a set of two outputs. Analog outputs available separately for program and preview. Analog output format may be configured by the user to be either color difference or RGB.

Effects Send/Dual Auxiliary Buses

Provide integration with digital effects devices. The Effects Send system routes signals processed by the M/E to a digital effects system for manipulation. Any of the switcher's 3 keyers may be sent to a DPM for image and key manipulation and then routed back into the switcher M/E for combining with other images.

The Look-Ahead Preview (LAP) Mixer

Allows the next event for both the M/E and DSK to be previewed. Order with either parallel or serial outputs or separately when the analog output option is desired.

LAP (Look-Ahead Preview) Mixer Module — ***1200-600***

Includes: M/E and DSK preview system. This option must be selected in order to support the Preview Video output in the Analog output module, and/or the Serial Digital output module, and/or the Parallel Digital output module.

Note:
The physical outputs must be specified when ordering the Parallel Digital Output Module

Parallel Digital Output Module for Program Video/ Program Key

order:
1200-301
then specify:
1200-CFGPGM

Parallel Digital Output Module for Preview Video/ Clean Feed Video

order:
1200-301
then specify:
1200-CFGPVW

Note: Mutually exclusive with Serial Digital Output Module for Preview Video/Clean Feed Video.

Requires the LAP (Look-Ahead Preview) Mixer option, 1200-600, for preview output. Option not required for Clean Feed output.

Parallel Digital Output Module for Effects Send/Dual Auxiliary Buses

order:
1200-301
then specify:
1200-CFGAUX

Note: Mutually exclusive with Serial Digital Output Module for Effects Send/Dual Auxiliary Buses
.

Note:
The physical outputs must be specified when ordering the Serial Digital Output Module

Serial Digital Output Module for Program Video/ Program Key

order:
1200-302
then specify:
1200-CFGPGM

Serial Digital Output Module for Preview Video/Clean Feed Video

order:
1200-302
then specify:
1200-CFGPVW/CF

Note: Mutually exclusive with Parallel Digital Output Module for Preview Video/Clean Feed Video.

Requires the Look-Ahead Preview Mixer option, 1200-600, for preview output. Option not required for Clean Feed output.

Serial Digital Output Module for Effects Send/Dual Auxiliary Buses

order:
1200-302
then specify:
1200-CFGAUX

Note: Mutually exclusive with Parallel Digital Output Module for Effects Send/Dual Auxiliary.

Note:
The physical outputs must be specified when ordering the Analog YUV/RGB Output Module.

Analog YUV/RGB Output Module for Program Video

order:
1200-310
then specify:
1200-310-CFGPGM

Analog YUV/RGB Output Module for Preview Video

order:
1200-310
then specify:
1200-310-CFGPVW

Requires LAP (Look-Ahead Preview) Mixer Module, 1200-600

Keying Options

The Model 1200 comes standard with a single M/E keyer and DSK keyer. The following keying options are available.

Z-Key Depth Processor for Program Video

Note: The Z-Depth Processor for Program Video and/or Preview Video requires one 1200-510 Second M/E Keyer option.

order:
1200-500
then specify:
1200-500-CFGPGM

Z-Key Depth Processor for Preview Video

Note: The Z-Depth Processor for Program Video and/or Preview Video requires one 1200-510 Second M/E Keyer option.

order:
1200-500
then specify:
1200-500-CFGPVW

Second M/E Keyer

Note: This module must be ordered when the Z-Key Depth Processor for Program Video and/or Preview Video are ordered.

1200-510

Note:
Function of Borderline modules must be specified, i.e. for key 1, and/or key 2, and/or DSK

Borderline® Key Edge Generator for M/E Keyer 1

Borderline modes include: 1 to 3 line border, Shadow with 1 to 6 line offset, 1 to 6 line extrude, 1 to 3 line outline. Edge attributes can be any luminance level or colorized with a matte generator. Shadow and extrude may be positioned drop left or drop right.

order:
PSWL-521
then specify:
ME1K1

Borderline Key Edge Generator for M/E Keyer 2

order:
PSWL-521
then specify:
ME1K2

Borderline Key Edge Generator for DSK

order:
PSWL-521
then specify:
DSK1

Chromatte™ Chroma Keyer

Provides both 4:2:2 and 4:4:4 component chroma keying on any of the three keyers. Every video input may be a chroma key source. Features include: digital dual link 4:4:4 keying, color background suppression, foreground fringe control, foreground noise suppression, key edge, shadow processor, show key, hue selectivity, inhibit and force masking, foreground hue suppression, color tinting effects.

Chromatte Component Chroma Keyer module *1200-530*

Control Panel Option, Source Display module *1200-410*

4-Character display above the Key bus selection buttons.

System Options

The following options, designed to enhance system operation and servicing, are available.

Satellite Auxiliary Bus Control Panel *1200-730*

A control cable is included for the Satellite Auxiliary Bus control panel to interconnect to the Model 1200 electronics frame.

Aux Bus Control Cable, 100 meters (included)

Manuals

Standard 1200 Manual Set *TP0713-00*

Included with each system

MODEL 1200
TECHNICAL SPECIFICATIONS

Specifications are subject to change without notice

System Performance

Video System Characteristics Digital Outputs

Outputs per module:
2 (Two) 75 Ohm BNC

Return Loss:
> 15dB 5MHz to 270mhz

Output Amplitude:
800 mV pp terminated

DC on Output: < 50 mV

Rise and Fall time:
Between 0.75ns & 1.5ns

Max video cable length: 300 meters (Belden 8281 or equivalent)

Number of Bits: 10 bits

Aux Data:Auxiliary data is blanked

Video System Characteristics Analog Outputs

Frequency Response:

4x3 aspect ratio
0.2dB to 5.5mhz
-60dB above 8.0mhz

16x9 aspect ratio
0.2dB to 7.0mhz
-60dB above 8.0mhz

Group Delay Error:
+/- 6 ns to 5.0mhz

Field rate tilt: <0.25%

K Factor (2t Pulse): < 0.25%

K Factor (Bar): < 0.25%

K Factor (Pulse to Bar): < 0.25%

Signal/P-P Noise Ratio:
> 60 dB unweighted
5mhz bandwidth

Line Time Non Linearity: < 0.5%

Gain Stability: 1%

Y/C Delay error: +/- 5ns

Crosstalk: >50 dB

Video System Characteristics

Maximum number of inputs:
16, parallel/serial/analog

Blanking width:
10.222 us (525 line)
10.666 us (625 line)

Number of Quantization bits:
10 minimum

Mix tracking error: 1 LSB

Linearity during a mix:
Linearity is not affected

Frequency response during a mix:
Response is not affected

Path Length: 63 us, nominal

Rounding method (digital only):
Adaptive Bit Reduction

Power Requirements

Frame Consumption: 400 Watts

Voltage: 90-260 Vac, 50/60 Hz

Panel Consumption: 200 Watts

Voltage: Auto-ranging

Environmental Characteristics

Ambient Temperature at Frame

Operational: 0 - 40° C, 32 - 104° F

Full specifications met:
20-30° C, 68-86° F
30 minute warm-up

Temperature Range at Control:
0-40° C, 32-104° F

Relative Humidity: Up to 95% (non-condensing)

Dimensions

Control Panel

Height: 27.1 cm, 10.66 inches

Width: 73.7 cm, 29.0 inches

Depth: 44.3 cm, 17.42 inches

Weight: 21.8 kg, 48 lbs.

Electronics Frame

Height: 6 RU, 26.0 cm, 10.25"

Width: 43.2 cm, 19.0" Rack

Depth: 63.0 cm, 24.8"

Weight: 36.3 kg, 80 lbs.

Inputs

1 Reference video NTSC / PAL

Looping Color black

Up to 16 Primary Video

Inputs BNC / 25 pin D

Outputs

Program Video

Max 2 Digital (Serial/Parallel)

Max 1 set CAV (YUV or RGB)

Program Key

Max 2 Digital (Serial/Parallel)

Clean Feed Output

Max 1 with preview option

Preview Video

Max 1 Digital (Serial or Parallel)

Max 1 CAV (YUV or RGB)

Aux bus

Max 1 each per aux bus

Digital only (Serial or Parallel)

Interfaces

Tally Connection:

For 16 primary inputs, 25-pin D female connector

GPI:

8 inputs and 8 outputs, fully programmable, 25-pin D female connector

Modem:

RS422/RS232 9-pin D female connector

DPM:

RS-422 9-pin D female connector

TekCare Service Products

TekCare is a comprehensive portfolio of software and hardware support services designed to ensure that you get the best performance from your Tektronix Video and Networking Products.

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WARRANTY

- Tektronix warrants that the Video and Networking Division hardware products that it manufactures and sells, will be free from defects in materials and workmanship for a period ending at the earlier of one (1) year from the date of installation or fifteen (15) months from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product or part without charge for parts and labor, or will provide a replacement in exchange for the defective product or part.
- In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product or part to the service center designated by Tektronix, with shipping charges prepaid by Customer. Tektronix shall pay for the return of the product to Customer.
- During the first ninety (90) days of the warranty period, warranty service will include (i) reasonable telephone support during Tektronix normal business hours to assist with advanced level problem resolution and (ii) replacement of defective modules by advance shipment.
- This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to reimburse Customer for service provided by personnel other than Tektronix representatives or to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; or c) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.
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