

Letter Size, Digital Output 150 MHz, Analog Output 150 MHz

CE
Upon request



- High-Speed Pattern Switching
- Built-in Color Still Picture

LT 1610A PROGRAMMABLE VIDEO GENERATOR

● GENERAL

This group of two RGB generators offers dedicated analog, digital or combined analog/digital outputs to best suit application needs. Dot clock frequencies handle a wide range of applications ranging to SXGA (1200 x 1024). All in the group operate from user-replaceable ROMs making them ideal for production operations wherein parameters are not to be altered by operators. Remote control units (LT 1610-01B) extend program selection to remote control points and widen operator control to signal output conditions including sync format and polarities. Full PC control gives the operator complete control over raster architecture, signal-output conditions and selection from stock and custom patterns. Control extends to the graphic design of custom patterns and the downloading of images from digital still cameras or scanners. X-Y cursors permit the coordinates of defective pixels in the display to be accurately established and provision is made to test monitor power-saving actions spelled out in VESA standards. Fast image switching speeds production work by reducing the wait for new images to appear. Image sequencing may be programmed and scrolling window or character actions aid in gauging image decay characteristics. A factory option adds 2 MB of RAM to extend image memory to accommodate up to 6 VGA format images.

■ LT 1610A Rear Panel



● FEATURES

- PC Programming and Control Operates in Windows Environment
- ROM Setup and Control for Stand-Alone Operations
- Both Analog and Digital RGB, Clock to 150 MHz/150MHz
- Digital Outputs 8-Bit Parallel, Handles Most Flat-Panel Displays
- High Speed Switching Speeds Pattern Selection
- Power Saving Display Function as Specified in VESA Standards
- Graphic Design of Custom Test Patterns
- Stock Test Patterns Include SMPTE RP-133 & Flower Image
- X-Y Coordinates Locates Picture Faults
- Image Downloading from Scanners and Digital Cameras
- Accessories Provide LVDS Drive to LCD Panels
- Auto Pattern Switching and Scroll Gauge Image-Decay Characteristics

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Letter Size, 150 MHz Clock, Dedicated for Analog RGB

CE
Upon request



- High-Speed Pattern Switching
- Built-in Color Still Picture

LT 1611 PROGRAMMABLE VIDEO GENERATOR

● GENERAL

This group of two RGB generators offers dedicated analog, digital or combined analog/digital outputs to best suit application needs. Dot clock frequencies handle a wide range of applications ranging to SXGA (1200 x 1024). All in the group operate from user-replaceable ROMs making them ideal for production operations wherein parameters are not to be altered by operators. Remote control units (LT 1610-01B) extend program selection to remote control points and widen operator control to signal output conditions including sync format and polarities. Full PC control gives the operator complete control over raster architecture, signal-output conditions and selection from stock and custom patterns. Control extends to the graphic design of custom patterns and the downloading of images from digital still cameras or scanners. X-Y cursors permit the coordinates of defective pixels in the display to be accurately established and provision is made to test monitor power-saving actions spelled out in VESA standards. Fast image switching speeds production work by reducing the wait for new images to appear. Image sequencing may be programmed and scrolling window or character actions aid in gauging image decay characteristics. A factory option adds 2 MB of RAM to extend image memory to accommodate up to 6 VGA format images.

● FEATURES

- **PC Programming and Control Operates in Windows Environment**
- **ROM Setup and Control for Stand-Alone Operations**
- **Analog RGB, Clock to 150 MHz**
- **High Speed Switching Speeds Pattern Selection**
- **Power Saving Display Function as Specified in VESA Standards**
- **Graphic Design of Custom Test Patterns**
- **Stock Test Patterns Include SMPTE RP-133 & Flower Image**
- **X-Y Coordinates Locates Picture Faults**
- **Image Downloading from Scanners and Digital Cameras**
- **Accessories Provide LVDS Drive to LCD Panels**
- **Auto Pattern Switching and Scroll Gauge Image-Decay Characteristics**

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■ LT 1611 Rear Panel



● SPECIFICATIONS

LT 1610A/LT 1611

Model	LT 1610A	LT 1611
Dot Clock Frequency		
Analog	1.024 - 150.000 MHz (10 ppm)	
Digital 1/1 Clock Mode	1.024 - 75.000 MHz (10 ppm)	_____
Digital 1/2 Clock Mode	2.048 - 150.000 MHz (10 ppm)	_____
Horizontal Frequency	3.077 - 250 kHz, 8192 dots maximum (in 1 dot steps *1)	
Number of Vertical Scanning Lines	8179 maximum (interlace)	
Video Memory	(2048 dots × 2048 dots) × 4	
Patterns	Fixed Patterns: 28 (Color still picture, SMPTE RP-133, crosshatch, dots, color bars, gray scale, circle, window, character list, all-character, character pattern, etc.) Programmable Patterns [Parameter-Controlled Patterns: 15, Special Pattern: 1]	
Signal Output Level		
Analog	Video R, G, B: 0.300 - 1.200 V, Setup (conforms to RS-343-A) ON/OFF	
	HS, VS, CS, DISP (BNC): 5 V/3.3 V, selectable	HS, VS, CS, DISP (BNC): CMOS/TTL level (5 V)
	CLK (BNC): ECL amplitude, AC coupled output	
Digital	CMOS/TTL level (5 V) and	_____
	CMOS/TTL level (3.3 V)*2, selectable	_____
Equalizing Pulse	OFF/0.5H/1H, selectable	
Serration Pulse	OFF/0.5H/1H/XOR, selectable	
Composite Video Sync Signal	ON/OFF selectable (G only) Level: Conforms to RS-343-A	
Scanning	Non-interlace, interlace, interlace shrink	
Analog Output (BNC)	R, G, B, HS, VS, CS, DISP, CLK	
Analog Output Fine Adjustment	Offset level (adjustable R, G, B respectively)	
	Video level (adjustable R, G, B together)	
	RGB balance (adjustable R, B)	
Digital Output (Amphenol 57 series, 50-pin connector)		
DIGITAL OUTPUT1	R7-R0, G7-G0, B7-B0, HS, VS, CS, HD, VD, DISP, CLK, CTRL0 (AV), CTRL1 (YS), Vcc (5 V/3.3 V)	_____
DIGITAL OUTPUT2	R7-R0, G7-G0, B7-B0 (1/2 CLOCK RATE) *3 CTRL2 (YM), Vcc (5 V/3.3 V)	_____
Output Control	ON/OFF and inversion for R, G, B	
	ON/OFF and negative/positive for HS, VS, CS, HD, VD, DISP, CLK	
External Interface	RS232C (D-sub 9-pin connector)	
	REMOTE (Amphenol 57 series, 36-pin connector)	
Environmental Conditions	Operating temperature: 0 to 40°C Spec-Guaranteed temperature: 5 to 35°C	
Power Requirements	90 to 250 VAC, universal (50/60 Hz)	
Dimensions	295 (W) × 72 (H) × 210 (D) mm	
Weight	3.2 kg	2.9 kg
Accessories	User ROM...1. Windows application software (3.5" FD)...1. Power cord...1. Instruction manual...1.	

*1 Timing for H-PERIOD, H-SYNC, and H-BP can be set in 1 dot steps.

*2 CMOS/TTL level must be only 3.3 V for frequency range of 135 MHz (67.5 MHz + 67.5 MHz) to 150 MHz (75 MHz + 75 MHz)

*3 In 1/1 clock mode, signals (i.e., R7-R0, G7-G0, B7-B0) are not output. The output impedance is set to 330 Ω through a pull-down resistor connected to ground since output pin of the IC.

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Letter Size, Analog Output 260 MHz, Digital Output 200 MHz



LT 1615 PROGRAMMABLE VIDEO GENERATOR

- High-Speed Pattern Switching
- Built-in Color Still Picture (16-color, 256-color, Full color Scroll/ Rewrite function)

● GENERAL

This group of three RGB generators offers dedicated analog, digital or combined analog/digital outputs to best suit application needs. High dot-clock capabilities are featured, up to 260 MHz in analog, which allows operation in UXGA (1600 x 1200) systems. All in the group operate from user-replaceable ROMs making them ideal for production operations wherein parameters are not to be altered by operators. Remote control units (LT 1610-01B) extend program selection to remote control points and widen operator control to signal-output conditions including sync format and polarities. Full PC control gives the operator complete control over raster architecture, signal-output conditions and selection from stock and custom patterns. Control extends to the graphic design of custom patterns and the downloading of images from digital still cameras or scanners. X-Y cursors permit the coordinates of defective pixels in the display to be accurately established and provision is made to test monitor power saving actions spelled out in VESA standards. Fast image switching speeds production work by reducing the wait for new images to appear. Image sequencing may be programmed and scrolling window or character actions aid in gauging image-decay characteristics. A factory option adds 4 MB of RAM to extend image memory to accommodate up to 12 VGA format images.

■ LT 1615 Rear Panel



● FEATURES

- Image Downloading from Scanners and Digital Cameras
- Accessories Provide LVDS Drive to LCD Panels
- Auto Pattern Switching and Scroll Image Gauge Decay Characteristics
- External Clock Input
- PC Programming and Control Operates in Windows Environment
- ROM Setup and Control for Stand-Alone Operations
- Both Analog and Digital RGB, Clock to 260 MHz/200MHz
- Digital Outputs 8-Bit Parallel, Handles Most Flat-Panel Displays
- High Speed Switching Speeds Pattern Selection
- Power Saving Display Function as Specified in VESA Standards
- Graphic Design of Custom Test Patterns
- Stock Test Patterns Include SMPTE 133 & Flower Image
- Image Downloading
- X-Y Display Function Locates Pixel Coordinates (to Locate Display Faults)
- Auto Display Functions (Pattern Switching & Scroll)
- X-Y Coordinates Locates Pixel Faults

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● SPECIFICATIONS

LT 1615

Dot Clock Frequency

Analog:	1.024 - 260.000 MHz (10 ppm)
Digital 1/1 Clock Mode:	1.024 - 100.000 MHz (10 ppm)
Digital 1/2 Clock Mode:	2.048 - 200.000 MHz (10 ppm)
Horizontal Frequency:	3.077 - 250 kHz, 8192 dots maximum (in 1 dot steps *1)

Number of Vertical Scanning Lines:

8179 maximum (interlace)
(2048 dots x 2048 dots) x 8

Video Memory:

(2048 dots x 2048 dots) x 8

Patterns:

Fixed Patterns: 33
(Color still picture, SMPTE RP-133, crosshatch, dots, color bars, gray scale, circle, window, character list, all character, character, pattern, etc.)
Programmable Patterns
[Parameter-Controlled Patterns: 15, Special Pattern: 1]

Signal Output Level

Analog: Video R, G, B: 0.300 - 1.200 V (5 mVstep)
Sync: 0.000 - 0.600 V (5 mV step)
Setup 0.000 - 0.250 V (1 mV step)
HS, VS, CS (BNC): CMOS/TTL level (5 V/3.3 V), selectable
DISP(SMA): CMOS/TTL level (5 V/3.3 V), selectable.
CLK OUT (SMA): ECL amplitude, AC coupled output

TTL: CMOS/TTL Level (5 V)

Digital: CMOS/TTL level (5 V) and low voltage CMO/TTL level (3.3 V) *2, selectable.

Equalizing Pulse: OFF/0.5 H/1 H, selectable

Serration Pulse: OFF/0.5 H/1 H/XOR, selectable

Composite Video Sync Signal: ON/OFF, selectable adjustable R, G, B

Scanning: Non-interlace, interlace, interlace shrink

Dot Clock Input(SMA): EXT CLK IN: 116 dBμ (50 Ω)
Input range: 1.024 - 260.000 MHz

Analog Output (BNC): R, G, B, HS, VS, CS

(SMA): DISP

(SMA): CLK OUT: Output range 1.024 - 260.000 MHz

Analog Output Fine Adjustment: Offset level (adjustable R, G, B individually)
Video level (adjustable R, G, B interlocked)
RGB balance (adjustable R,B only)

TTL Output (Amphenol 57 Series, 24-pin connector):

HS, VS, CS, (HD), (VD), (I), (I'), CLK
(HD), (VD) can be selected by setting of DIP SW 1.

Option 71 : R, G, B, R', G', B', (I), (I')
can be selected. *3

Digital Output (Amphenol 57 series, 50-pin connector)

Digital Output 1: R7-R0, G7-G0, B7-B0, HS, VS, CS, HD, VD, DISP, CLK, CTRL0, CTRL1, Vcc (5 V/3.3 V)

Digital Output 2: R7-R0, G7-G0, B7-B0, FIELD
(1/2 CLOCK RATE) *4
CTRL2, Vcc (5 V/3.3 V)

Output Control: ON/OFF and inversion for R, G, B
ON/OFF and negative/positive for HS, VS, CS, HD, VD, DISP, CLK

External Interface: RS232C (D-sub 9-pin connector)
REMOTE (Amphenol 57 series, 36-pin connector)

Environmental Conditions

Operating temperature: 0 to 40°C

Spec-Guaranteed temperature: 5 to 35 °C

Power Requirements: 90 to 132 VAC, 180 to 250 VAC, universal (50/60 Hz)

Dimensions & Weight: 295 (W) × 139 (H) × 210 (D) mm, 4.8 kg

Accessories: User ROM 1
Windows application software 1
Power cord 1
Instruction manual 1

*1 Timing for H-PERIOD, H-SYNC, H-BP, HD-START, and HD WIDTH can be set in 1 dot steps.

When setting the H-WIDTH in 1 dot steps, the dot clock frequency should be 75 MHz or lower.

When setting the H-WIDTH in 2 dot steps, the dot clock frequency should be 150 MHz or lower.

When setting the H-WIDTH in 3 dot steps, the dot clock frequency can be used.

*2 CMOS/TTL level must be only 3.3 V for frequency range of 135 MHz (67.5 MHz + 67.5 MHz) to 200 MHz (100 MHz + 100 MHz)

*3 TTL video signal output is factory option. (R, G, B, I, R', G', B', I')

*4 In 1/1 clock mode, signals (i.e., R7-R0, G7-G0, B7-B0) are not output. The output impedance is set to 330 Ω through a pull-down resistor connected to ground since output pin of the IC.

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Built-in color still picture



When select display mode to upper-left corner

LT 1610A/1611	<ul style="list-style-type: none"> • One VGA size 640(H) x 480 (V) 256-color built-in
LT 1615	<ul style="list-style-type: none"> • One XGA size 1024 (H) x 768 (V) 256-color built-in(rewritable) • There are three modes: 16-color, 256-color, or full color. Up to 1024(H) x 1024(V) size full color pictures can be output. The dot clock frequency is up to 65 MHz for analog output. The 1/1 clock mode is only provided for digital output, and dot clock frequency is up to 50 MHz.

Color still Picture by Model

Color still Picture mode	LT1610A/1611	LT1615
Built-in color still picture (internal ROM area)	• One Leader original VGA size 640(H) x 480(V) 256-color still picture built-in (not rewritable)	• One XGA size 1024(H) x 768(V) 256-color built-in. • Rewritable up to SXGA size 1280(H) x 1024(V) 256-color. Up to four 640(H) x 480(V) 256-color pictures can be rewritten.
Display color and maximum displayable number of dots	• 256-color: 2048(H) x 1024(V)	• 16-color : 4096(H) x 2048(V) • 256-color : 2048(H) x 2048(V) See "Limit of color still picture" • Full color : 1024(H) x 1024(V)
Display mode	• Upper left corner	• Selectable mode : Upper-left corner, center, tiled
Scroll	• Impossible	• Color still pictures can be scrolled up, down, left, or right in 1 to 25 steps in each vertical sync period.
Color still picture display in direct mode	• Direct pattern display by sending data in bit map format from a personal computer. (Optional RAM not required. Display only ; not stored)	• Color still picture can be directly displayed by sending data in bit map format from a personal computer. (Optional RAM not required. Display only ; not stored)
Optional color still picture, RAM rewrite function (factory option)	• When color still picture backup RAM (2 MB) is built-in, color still picture can be displayed and stored by sending data in bit map format from a personal computer.	• When color still picture backup RAM (4 MB) is built-in, color still picture can be displayed and stored by sending data in bit map format from a personal computer.
Optional color still picture, number of pictures storable to RAM	• Up to six VGA size 640(H) x 480(V) 256 color still picture can be stored. • Up to two XGA size 1024(H) x 768(V) 256 color still picture can be stored.	• Up to 13 VGA size 640(H) x 480(V) 256 color still picture can be stored. • Up to five XGA size 1024(H) x 768(V) 256 color still picture can be stored.
Others		• Sample data of color still picture with major number of dots is stored in the accessory CD-ROM.
Limit of color still picture	• For only 256-color, the dot clock frequency is up to 150 MHz for analog output ; up to 150 MHz for digital output.	• For 16-color and 256-color, the dot clock frequency is up to 260 MHz for analog output ; up to 200 MHz for digital output. • For full color, the dot clock frequency is up to 65 MHz for analog output ; up to 50 MHz for digital output.

Introducing Optional Equipments for LT 1610 series

Remote Controller LT 1610-01B



[Function]

1. Program memory selection
2. Usable range setting for Program address
3. Program address selection
4. Output pattern selection
5. Directly controlling the output signal
6. Program data copy
7. High-speed pattern switching mode selection

Still picture Backup RAM (Factory option)

[Function]

With the multiple still picture suitable for the display characteristic evaluation allows quick pattern evaluation.

[For LT 1610A,1611]

- Still picture backup RAM (2 MB)
- Up to six VGA size patterns can be registered.
- Up to two XGA size patterns can be registered.

[For LT 1615]

- Still picture backup RAM (4 MB)
- Up to 13 VGA size patterns can be registered.
- Up to five XGA size patterns can be registered.