SONY

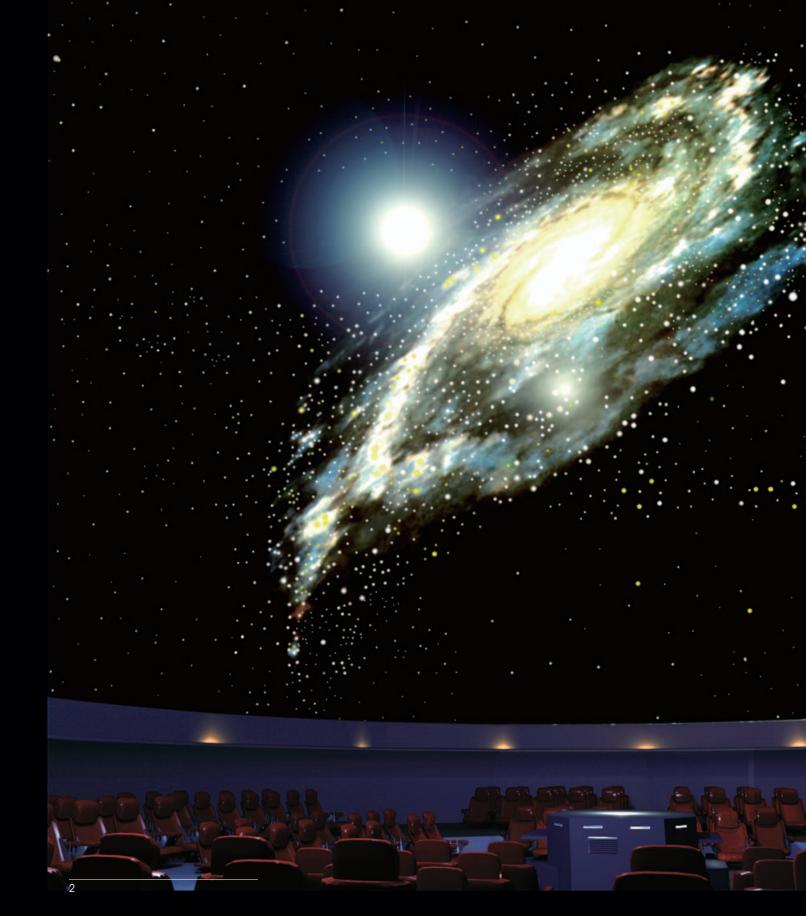


SRX-T110 SRX-T105

SXRD 4K Ultra-high Resolution Projectors



Bringing More Information and Enabling Greater Immersion

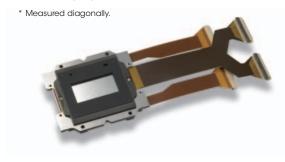




State-of-the-art Technology for High Picture Quality

Silicon X-tal Reflective Display (SXRD) Device

The SXRD device used by the SRX-T110 and SRX-T105 is a 1.55-inch* Liquid Crystal on Siliconbased display device developed by Sony using cutting-edge manufacturing technology. High-quality, accurate visuals are created using this brilliant display device.

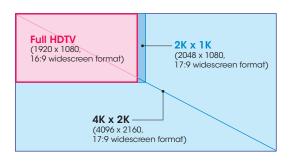


High Resolution 4K

Sony SXRD display devices deliver the exceptionally high resolution of 4K x 2K (4096 x 2160, 17:9 widescreen format), more than four times as many pixels as Full HDTV (1920 x 1080, 16:9 wide screen format).

The SXRD device helps to achieve this resolution by incorporating nearly 8.85 million pixels per device at a narrow pitch of 8.5 micrometers. These high-density pixels, which are one quarter the size of pixels projected using typical 2K x 1K resolution projection systems (2.2 million pixels), provide an amazing picture. Even in multi-screen mode, full 2K resolution per quadrant can be achieved.

The resolution available from the Sony SRX-T110 and SRX-T105 enables a new level of visual projection.



High 2500:1 Contrast Ratio

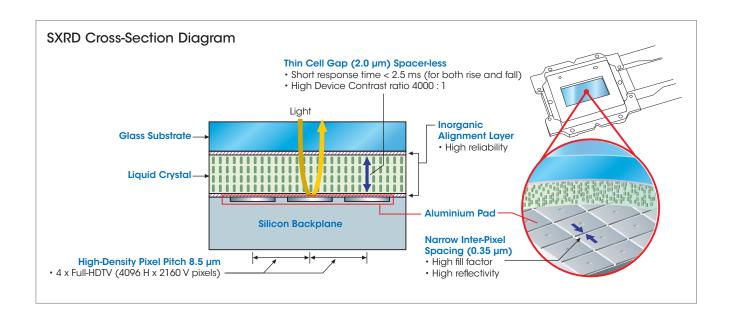
The SRX-T110 and SRX-T105 offer a high contrast ratio of 2500:1 through the use of Sony's unique SXRD device. The SXRD device itself achieves a contrast ratio of 4000:1. This stunning picture quality makes the projectors ideal for applications in which dynamic range is essential. The high contrast ratio has been achieved through two key technologies - the exclusive 'normally black mode' system and an extremely thin liquid crystal cell gap.

'Normally Black Mode' System

In every type of projector system, displaying absolute black is a major issue in order to achieve a high contrast ratio. In other words, the contrast ratio of a projector depends on how effectively the light from the source can be blocked, so it does not leak through the display device.

All Liquid Crystal Display (LCD) devices control the amount of light to be projected by applying an electric field to the liquid crystal gap. In typical LCD devices, black is produced when an electric field is applied across the liquid crystal cell gap. However, molecules near the surface of the glass substrate may not be accurately controlled due to the influence of the alignment film. This is not an issue for bright images but, when displaying dark images, light may tend to leak from the LCD device, since the molecules near the surface are less accurately controlled. This results in a creamy black instead of a deep black.

The SXRD device does not exhibit these characteristics. This is because the 'normally black mode' system displays black when the electric field is not applied and, because all molecules are in the correct alignment, the polarized light alignment is also optimized. The direct result is a far deeper black level, leading to a high contrast ratio.



Thin Liquid Crystal Cell Gap

Another important factor allowing for the high contrast of the SRX-T110 and SRX-T105 is the SXRD device's ultra thin cell gap of less than 2 micrometers. With conventional 'vertically aligned liquid crystal' systems, a thin cell gap could not be achieved. Sony has overcome this difficulty through the use of innovative planarization technology in the silicon backplane structure and an advanced silicon wafer-based assembly process.

The SXRD device also adopts a structure that does not use "spacers". These are columns found in conventional reflective liquid crystal devices to maintain a constant gap between the liquid cell floor and the top of the device. Spacers tend to both scatter and reflect light, which can impair high contrast pictures. In the spacer-less SXRD device, these artifacts are no longer seen.

Short Response Time

The thin cell gap structure in SXRD devices also contributes to an ultra-fast response time of 2.5 milliseconds (for both rise and fall). The SXRD device reacts promptly to an instantaneous change of picture content, enabling SXRD-based projectors to display smoothly. Consequently, the SRX-T110 and SRX-T105 virtually eliminate motion blur; a particularly significant benefit for visuals that include fast-moving objects.

Reliable Display Device

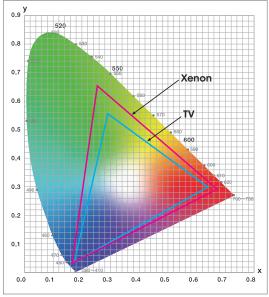
The SRX-T110 and SRX-T105 use high-power, bright lamps. As a result, special attention has been paid to the reliability of the SXRD device. The inorganic materials utilized for the alignment layer of the SXRD device are resistant to deterioration or deformities that could occur due to the intense heat and light generated by the powerful twin lamp system.

Highly Pure, Superb Color Tonal Reproduction

Xenon Lamp Provides Highly Bright and Pure Light Source

The SRX-T110 provides a high brightness of 11,000 lumens by employing two 2 kW Xenon lamps, while the SRX-T105 offers a brightness of 5,500 lumens by using two 1 kW Xenon lamps.

The Xenon lamps utilized by the SRX-T110 and SRX-T105 achieve a wide color range by dispersing a very flat and wide light spectrum.



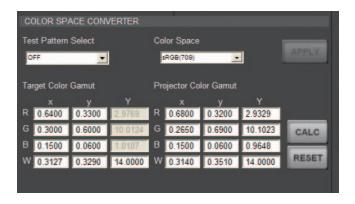
CIE Chart

Color Space Conversion (CSC) Function

The SRX-T110 and SRX-T105 feature a CSC function to help users easily adjust the projector's color space to that defined by the ITU*-R BT.709-3 standards for digital HDTV studio color space, the DCDM (Digital Cinema Distribution Master) color space, or the Adobe RGB color space**. The target color gamut parameters satisfying the ITU-R BT. 709-3 standards, or DCDM or Adobe RGB specifications are automatically calculated from settings on the supplied SRX Controller software, and then applied to the projector.

The internal test generator simplifies adjustment and lets the operator align the projector in minutes. White point and color primary points can be aligned to either of these standards or to the customer's application needs.

- * International Telecommunication Union
- ** The Adobe RGB color space is covered by 95%.



12-bit SXRD Panel Driver

The SRX-T110 and SRX-T105 utilize a 12-bit SXRD panel driver that reproduces extremely natural-looking images. This eliminates quantizing and edge errors that take away from the real resolution that these projectors can achieve.

Gamma Curve Selection

The SRX-T110 and SRX-T105 provide three preset gamma curve values. Users can select an optimum value from 2.2, 2.6, or user-defined values according to the desired gray scale.

Operational Versatility

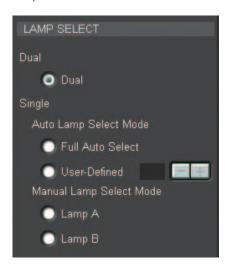
Dual-lamp System with Selectable Lamp Modes

The SRX-T110 and SRX-T105 adopt a unique lamp system that uses two lamps for reliable, flexible, and efficient use of light sources. With this duallamp system, users can operate the projector using both lamps for full brightness, or can select single-lamp operation.

The dual-lamp mode provides maximum lamp power, and at the same time enables virtually fail-safe operation; if one bulb burns out, the other can keep projecting images.

In single-lamp mode, users can select either of the two lamps manually, or the projector can automatically select a lamp based on each lamp's operating time.

Another automatic mode is provided to make the lamps operate alternately at user-defined intervals selectable from four hours to twelve hours (in increments of one hour). This feature is useful when lamp life needs to be maximized. The lamp power can be set between 100% and 51%, in eight steps. This function, combined with the selectable lamp modes, contributes to achieving longer lamp life.



Variety of Lenses

Five optional zoom lenses and a short throw prime lens are available for the SRX-T110 and SRX-T105. They are designed to project images of extreme resolution and contrast with minimal chromatic aberration. The short throw lens works in special applications, such as rear projection, where minimal space behind the screen is desired.

Zoom/Focus Memory Function

The SRX-T110 and SRX-T105 are equipped with Zoom and Focus Memory functions that make it easy to switch the projection between two types of aspect ratios.

When used with the optional LKRL-Z117 and LKRL-Z122 Zoom Lenses, any seven zoom and focus positions can be memorized and instantly recalled via the SRX Controller software. This allows

full screen display regardless of the aspect ratio. An electronic vertical alignment feature is included in the same memory to compensate for vertical changes in the image, should the projector be mounted at a down angle.



LKRL-Z122 Zoom Lens

Multiple Screen Capability

The SRX-T110 and SRX-T105 offer a choice of single-mode, dual-mode, and quad-mode display. In quad mode, four quadrants of images are projected.

At maximum resolution, these four quadrants can project four different 2K (2048 x 1080) images simultaneously or a single 4K (4096 x 2160) image made up of four 2K images*.

* For 4K projection, it is necessary to divide an entire image into four quadrants, and to input the signals of all quadrants simultaneously.



Single-mode



Dual-mode



Quad-mode

Simulated images

Operational Versatility













LKRI-001Analog Input Board

LKRI-002 HD-SDI (4:2:2) Input Board

LKRI-003Dual-link HD-SDI Input Board

LKRI-005 HDCP DVI Board

Input Signal Flexibility

To increase the configuration flexibility of the SRX-T110 and SRX-T105, slots are available to accommodate four different optional boards that connect to various types of signal formats.

The SRX-T110 and SRX-T105 are pre-installed with an LKRI-005 HDCP DVI Board, which can accept DVI signals and provides a digital copy protection capability. In addition to the standard HDCP DVI input, three slots are available for the installation of optional boards. This allows simultaneous accommodation of up to four input/interface boards in the side panel of the projector. Users can select from single, dual, and quad screen modes, and assign the appropriate signal board to each quadrant.

Signal Chart for the LKRI-005

Signal Resolution	fV (Hz)	HDCP
1024 x 768P (XGA)	60	No
1280 x 960P (Quad-VGA)	60	No
1280 x 720P	60	Yes
1280 x 720P	50	Yes
1280 x 1024P (SXGA)	60	No
1400 x 1050P (SXGA+)	60	No
1600 x 1200P (UXGA)	60	No
1920 x 1200P (WUXGA)	60	No
1920 x 1080P	60	Yes
1920 x 1080P	50	Yes
1920 x 1080P	24	Yes
2048 x 1080P	60	No
2048 x 1080P	48	No
2048 x 1080P	24	No

- The LKRI-001 Analog Input Board utilizes 5 BNC connectors that can accept 0.7 volt analog signal levels as RGBS, RGB sync on G, RGBHV, or YUV formats.
- The **LKRI-002** HD-SDI (4:2:2) Input Board can accept both SMPTE 259M SD digital 525/625 line video and SMPTE 292M 1080 4:2:2 Y · Pb · Pr serial picture data. Switching is automatic by detection of the input signal frequency.
- The **LKRI-003** Dual-link HD-SDI Input Board can accept any of the following signals: SMPTE 372M dual-link HD-SDI (4:4:4), SMPTE 292M HD-SDI (4:2:2), dual-link DC-SDI (RGB 4:4:4), DC-SDI (YPbPr 4:2:2), or 12-bit (X'Y'Z' 4:4:4) signals. With four LKRI-003 boards, the SRX-T110 and SRX-T105 can project 4096 x 2160 4K images.
- The LKRI-005 HDCP DVI Board can accept DVI signals up to 2048 x 1080P and offers a digital copy protection capability compliant with the HDCP specification to 1920 x 1080P and 1280 x 720P signals.

Installation Flexibility

The SRX-T110 and SRX-T105 can be tilted 90 degrees upward or downward. In addition, they can turn projected images upside down. This flexibility allows the projectors to be used in several different ways, including a rear projection system. To aid effective cooling at 90-degree tilt installation, an optional LKRA-001 exhaust duct adaptor is required, which allows the projectors to be easily connected to a common 8-inch-type duct system.

Quiet Operation by the Intelligent Cooling Fan System

The SRX-T110 and SRX-T105 adopt an intelligent cooling system that automatically controls multiple cooling fans incorporated in the unit. This system automatically adjusts the rotating speed of the fans according to the heat generated inside the unit, which varies depending on the brightness level of the lamps. In addition, when single-lamp mode is selected, this system automatically stops operation of the fans for the unused lamp.

Simple Remote Controller Unit

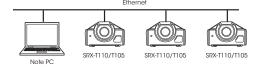
The SRX-T110 and SRX-T105 are supplied with a remote controller unit that can perform various simple functions such as turning the lamp power on/off, adjusting the zoom/focus, and controlling the lens shift.

Easy Setup on a PC Using Supplied Software

The SRX-T110 and SRX-T105 come equipped with the SRX Controller software that allows easy setup and adjustments via its intuitive GUIs on a PC*. These projectors can be controlled through either Ethernet or RS-232C interfaces, and up to four projectors can be controlled on the same GUI from a single PC**.



Installation Setting





A comprehensive range of setup parameters including input configurations, colorimetry controls, installation adjustments and maintenance settings can be controlled via this software. These setup parameters can be saved to a PC as a data file and reused for another SRX-T110 or SRX-T105 projector.

- * System requirements for the setup software OS : Microsoft Windows XP Professional SP2.
- ** When using an Ethernet connection.



Colorimety Setting

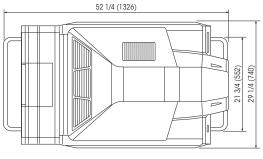
Easy Maintenance

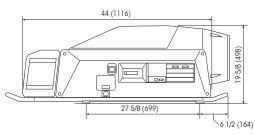
Special consideration was given to maintenance issues when developing the SRX-T110 and SRX-T105. The supplied setup software is a convenient tool for maintenance that allows operators to easily verify each lamp's operating time. Automatic email alerts from the projector provide operators with maintenance reminders as well as error messages.

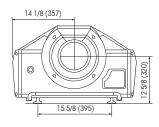


Mail Report Setting

Dimensions







Unit: inches (mm)

Optional Accessories



LKRL-90 Fixed Focus Lens Throw ratio*: 0.9:1



LKRL-Z115 Short Focus Zoom Lens Throw ratio: 1.48:1 to 1.81:1



LKRL-Z117 Middle Focus Zoom Lens Throw ratio: 1.72:1 to 2.39:1



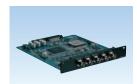
LKRL-Z119 Middle Focus Zoom Lens Throw ratio: 1.81:1 to 2.94:1



LKRL-Z122 Middle Focus Zoom Lens Throw ratio: 2.23:1 to 4.03:1



LKRL-Z140 Long Focus Zoom Lens Throw ratio: 3.81:1 to 7.12:1



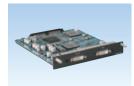
LKRI-001 Analog Input Board



LKRI-002 HD-SDI (4:2:2) Input Board



LKRI-003 Dual-link HD-SDI Input Board



LKRI-005 HDCP DVI Board



LKRX-110 2kW Xenon Lamp Bulb (for SRX-T110)



LKRX-B110 2kW Xenon Lamp House Unit (for SRX-T110)



LKRX-105 1kW Xenon Lamp Bulb (for SRX-T105)



LKRX-B105 1kW Xenon Lamp House Unit (for SRX-T105)



LKRA-001 8-inch Exhaust Duct Adaptor

^{*} The throw ratio denotes the ratio that the projection distance is divided by the screen width.

Table of Available Lenses

(all measurements are in inches)

	Fixed Focus Lens
	LKRL-90
Zoom Ratio	-
Throw ratio*	0.9:1
F-number	2.8
Screen width Throwing Distance	
70 7/8	61
88 5/8	77 1/8
131 7/8	116 7/8
177 1/5	158 1/4
220 1/2	198
267 3/4	241 3/8



	Short Focus Zoom Lens Middle Focus Zoom Lens		Middle Focus Zoom Lens		Middle Focus Zoom Lens		Long Focus Zoom Lens			
	LKRL	-Z115	LKRL-Z117		LKRL-Z119		LKRL-Z122		LKRL-Z140	
Zoom Ratio	1.	.2x	1.4x		1.6x		1.8x		1.9x	
Throw ratio*	1.48:1 1	to 1.81:1	1.72:1 to 2.39:1 1.81:1 to 2.94:1		2.23:1 to 4.03:1		3.81:1 to 7.12:1			
F-number	2	.8	2	.8	2.8		2.8		2.8	
Screen width Throwing Distance	Wide	Tele	Wide	Tele	Wide	Tele	Wide	Tele	Wide	Tele
177 1/5	258	317 1/6	310 7/8	418 5/8	320	526 1/5	402 1/4	700	666 4/5	1,257 3/5
236 2/9	345 3/5	424 2/5	411	555	423	698 2/5	532 3/8	929 7/8	885 8/9	1,673 2/3
315	462 1/3	567 2/5	544 3/8	737	560 1/3	928	706	1,236 1/4	1,178	2,228 1/2
393 5/7	579	710 2/5	677 7/8	918 7/8	697 2/3	1,157 5/8	879 1/2	1,542 3/4	1,470 1/7	2,783 2/7
472 4/9	695 5/6	853 2/5	811 3/8	1,100 3/4	835	1,387 1/4	1,053 1/8	1,849 1/8	-	-
630	929 1/3	1,139 3/8	1,078 3/8	1,464 5/8	1,109 3/4	1,846 1/2	1,400 1/4	2,462	-	_

^{*} Distance between the center of the projector lens and the screen, divided by the screen width

Preset Data of Input Signals

Preset Signal		fH (kHz)	fV (Hz)	Aspect Ratio	
VIDEO 60	VIDEO 60	15.73	59.94	4:3	
VIDEO 50	VIDEO 50	15.63	50.00	4:3	
HDTV 1080/60i	1080/60i	33.75	60.00	16:9	
1024 x 768	VESA 60	48.36	60.00	4:3	
1024 x 768	VESA 70	56.48	70.07	4:3	
1024 x 768	VESA 75	60.02	75.03	4:3	
1024 x 768	VESA 85	68.68	85.00	4:3	
1280 x 960	VESA 60	60.00	60.00	4:3	
1280 x 1024	VESA 60	63.97	60.01	5:4	
1280 x 1024	VESA 75	79.98	75.03	5:4	
1280 x 1024	VESA 85	91.15	85.02	5:4	
1600 x 1200	VESA 60	75.00	60.00	4:3	
720/60p	720/60p	45.00	60.00	16:9	
720/50p	720/50p	37.50	50.00	16:9	
1080/48i (24psf)	1080/48i (24psf)	27.00	48.00	16:9	
1080/50i	1080/50i	28.13	50.00	16:9	
1080/24p	1080/24p	27.00	24.00	16:9	
DC2048 x 1080	DC2048 x 1080/48i	27.00	48.00	17:9	
DC2048 x 1080	DC2048 x 1080/24p	27.00	24.00	17:9	
1400 x 1050	1400 x 1050/60p	65.30	60.00	4:3	
1920 x 1080	1920 x 1080/60p	67.50	60.00	16:9	
1920 x 1200	1920 x 1200/60p	74.038	60.00	16:10	
2048 x 1080	2048 x 1080/48p	54.00	48.00	17:9	
2048 x 1080	2048 x 1080/60p	67.50	60.00	17:9	

Specifications

SXRD Device Main Sp	pecifications
Display device	SXRD (Silicon X-tal Reflective Display)
Size	1.55-inch across Diagonal
Resolution	4128 (H) X 2176 (V) pixels
Reflectivity	72 %
Contrast (as device)	4000 : 1
Pixel pitch	8.5 μm
Width (between pixels)	0.35 μm
Response speed	2.5 ms (for both rise and fall)
Liquid crystal mode	Normally Black Mode
Alignment layer	Inorganic Thin Film
Backplane process	0.35 µm MOS Process
Liquid crystal cell gap	Less than 2 µm

	SRX-T110		SRX-T105			
Optical						
Projection system	3-SXRD panel, 1 lens projection sy	stem				
Imaging device	SXRD, 1.55-inch (diagonal), 4096(H) x 2160(V) pixels on each chip					
• •	(8,847,360 pixels)	, , ,				
Lamp	2 kW Xenon lamp x 2 (not supplied)					
Light output	11,000 lumens	5,500 lum	ens			
General						
White reference	Xenon white reference					
		Χ	Υ			
	White reference	0.3140	0.3510			
Contrast	2500:1					
Resolution	600 TV lines (SDI input/SMPTE-259	M)				
	1920 x 1080 pixels (HD-SDI input,	1920 x 1080 pixels (HD-SDI input, SMPTE-292M)				
	2048 x 1080 pixels (with LKRI-003	or LKRI-005))			
	3840 x 2160 pixels (with LKRI-003 x 4 or LKRI-005 x 4)					
	4096 x 2160 pixels (with LKRI-003	4096 x 2160 pixels (with LKRI-003 x 4 or LKRI-005 x 4)				
Signal specifications	Video: Component (Y • Cb • Cr), HD (G • B • R/Y • Pb • Pr)					
	Computer: XGA, SXGA, UXGA					
	DVI-D: XGA, Quad-VGA, 1280 x 720, SXGA, SXGA+, UXGA, WUXGA,					
	1920 x 1080, 2048 x 1080					
Power requirements	AC 200 to 240 V, 50/60 Hz	AC 100 to	240 V, 50/60 Hz			
Operating temperature	+41 °F to +95 °F (+5 °C to +35 °C	3)				
Storage temperature	-4 °F to +140 °F (-20 °C to +60 °C)					
Operating humidity	35 % to 85 % (no condensation)					
Storage humidity	10 % to 90 %					
Dimensions (W x H x D)	29 1/4 x 19 5/8 x 52 1/4 inches (7	29 1/4 x 19 5/8 x 52 1/4 inches (740 x 498 x 1326 mm)				
Weight	Approx. 265 lb (120 kg) (excluding	the optiona	l lamps and lens)			
Input/Output						
Input A	LKRI-005 pre-installed (removable)					
Input B	Open for optional signal interface board					
Input C	Open for optional signal interface I	ooard				
Input D	Open for optional signal interface I	ooard				
Remote interface	RS-232C : D-sub 9-pin (female) x 1					
	10BASE-T/100BASE-TX Ethernet : RJ45 x 1					

Input Boards					
LKRI-001	BNC x 5, HD/SD analog video input, RGB/Y • Cb • Cr selectable				
Analog input board					
	Computer signals				
	R	0.7 Vp-p ±2 dB positive, 75 Ω			
	G	0.7 Vp-p ±2 dB positive, 75 Ω			
	В	0.7 Vp-p ± 2 dB positive, 75 Ω			
	Sync				
	HD Horizontal	TTL level, high impedance, sync positive/negative			
	HD Vertical	TTL level, high impedance, sync positive/negative			
	Standard definition video [Y • Cb • Cr]				
	Υ	1.0 Vp-p ±2 dB sync negative, 75 Ω			
	Cb	0.7 Vp-p ±2 dB positive, 75 Ω			
	Cr 0.7 Vp-p ± 2 dB positive, 75 Ω				
	High definition vide	eo [RGB]			
	R	0.7 Vp-p ±2 dB positive, 75 Ω			
	G with sync	1.0 Vp-p ±2 dB, 75 Ω, Tri-level sync: ±0.3 Vp-p /			
	,	Bi-level sync: 0.3 Vp-p			
	В	0.7 Vp-p ±2 dB positive, 75 Ω			
	High definition video [Y • Pb • Pr]				
	Y	1.0 Vp-p ±2 dB, 75 Ω, Tri-level sync: ±0.3 Vp-p /			
		Bi-level sync: 0.3 Vp-p			
	Pb	±0.35 Vp-p ±2 dB, positive 75 Ω			
	Pr	±0.35 Vp-p ±2 dB, positive 75 Ω			
LKRI-002	BNC x 2 (Input x 1, Loop-through out x 1)				
HD-SDI (4:2:2) input board		MPTE-292M / ITU-R.BT709 / BTA-S004)			
()	SDI (SMPTE-259M / ITU-R.BT601)				
LKRI-003		Loop-through out x 2)			
Dual-link HD-SDI input board	,				
	DC-SDI (Single-link, DC-SDI/4:2:2):Y • Pb • Pr,				
	Dual-link HD-SDI (Dual-link HD-SDI/4:4:4,SMPTE-372M):RGB,				
	Dual-link DC-SDI (Dual-link DC-SDI/4:4:4):RGB				
LKRI-005		,			
DVI Board with HDCP	XGA, Quad-VGA, 1280 x 720 ,SXGA, SXGA+, UXGA, WUXGA, 1920 x 1080, 2048 x 1080				
Others	1720 X 1000, 2040	5 x 1000			
Safety regulations	[] [hateil 0200A III]	cUL60950], [FCC Class A], [IC Class A], [VCCI Class A			
outery regulations		ass A], [C-tick], [GB4943], [GB9254], [K60950],			
Supplied accessories	Remote Commander (1), Size AA (R6) batteries (2), SRX Controller (1),				
опрриси иссеззонез	Ethernet cable (1), M8 screws for lens mounting (4),				
	Operating Instructions (for SRX-T110/T105) (1),				
	Operating Instructions (for LKRI-005) (1), Installation Manual (1)				
	Operaling marrach	ons (for ERRI-000) (1), installation wantal (1)			

