Products Information 2019 Vol.7

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Product and Technical Information

ASTRO

Armed with the latest 8K technology,
we will fight for a new vision of the future.

To pursue ultimate reality

To connect and be connected
by technology

To bring different technologies together

─ **I N D E X** ─

8K, to the Future Ahead

Since its founding in 1977, with high-end niche as a corporate philosophy, ASTRO has sought possibilities in a market that was underdeveloped and technically difficult for large enterprises to enter. We have developed a large array of products and expanded our business beyond expectations.

Specializing in real-time high speed digital signal processing technology, we have developed several "world's first" or "first in Japan" products, including our many 8K devices.

Now, with the advancement of technologies such as the Internet and Artificial Intelligence, the world will become increasingly convenient and prosperous, and people's demands will change accordingly.

Our company's goal is to further refine the image technology that we have cultivated up until now, actively challenging new fields, being active in various locations throughout the world.

We will continue to challenge unlimited possibilities for the future of this company.

8K Camera System

8K Camcorder
8C-B60A

8K SSD Recorder
HR-7518/HR-7518-A

8K Camera Head Adapter
AT-4812

8K Camera Control Unit
AC-4813

8K LCD Monitor
DM-3815

8K Camera System

With an ultra-high-resolution camera and realistic image reproduction, the "8K eye" which is said to be the equivalent of 4.3 or so when converted to human eyesight, makes visible what is normally invisible.

Network 5G

5G
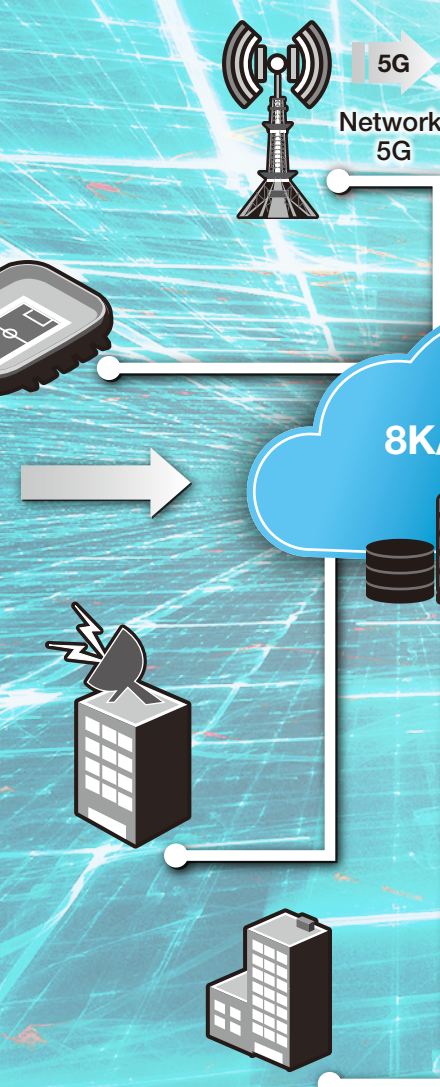
8K/Big Data

8K Server & Workstation

High Performance Computing
Tamazone Workstation

Public Viewing

DIGITAL PROJECTION
A Delta Associate Company

INSIGHT Laser 8K
Imaging by ASTRO
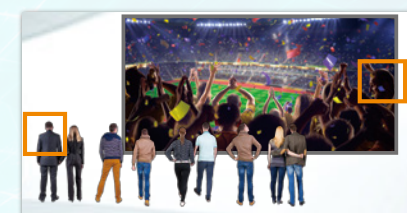
AI/Deep Learning

Big Data/AI

By utilizing high-definition 8K images for deep learning, we contribute to it's usein various industrial fields including surveillance, medical care, and entertainment.

HGX-1 GPU Expansion Box

Security

Medical

8K VR

8K VR

The VR system with the 8K camera solves both problems of insufficient HMD resolution and the complexity of the shooting system.

Super Resolution

2K

8K
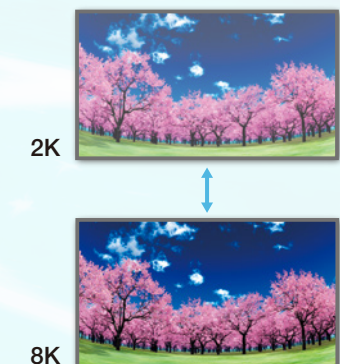
The Ultimate in Visual Beauty

INSIGHT Laser 8K Imaging by ASTRO【8K Projector】

DIGITAL PROJECTION

A Delta Associate Company

3-Chip + Laser method
Brightness of 25,000 lumens

* This product is the property of Digital Projection Limited.

8K Projector

By using a laser as a light source, our projector is able to produce an overwhelming 25,000 lumens.
It also supports HDR (HLG).

Features

- Brightness: 25,000 lumens
- HDR input compatible
- 3G-SDI × 16 / 12G-SDI × 8 input compatible
- Supports a wide input signal up to 7680 × 4320/120p
- Dynamic range: 2,000:1
- Light source: Blue laser + Yellow Phosphor
- 3 chips × 1.38"
- Dimensions: 703 (W) × 479 (H) × 1,000 (D) mm (lens, body lower handle not included)
- Weight: 132 kg
- Power Requirements: AC 200 - 240V
- Laser light source for long-lasting, stable imagery over 20,000 hours.

Multiplatform Dealing with 8K Video

Tamazone Workstation 【AW-8800】

- High-speed processing with high performance CPU and large capacity main memory
- High-speed, high-capacity built-in storage comparable to servers
- Slots and various interfaces that realize various expansion

AW-8800

Features

- CPU with up to 56 cores
- Main memory with up to 768 GB of storage
- Installation of up to 4 double height GPU cards
- Built-in storage speed capable of reading/writing 8K video in real-time (max. 64 TB)
- Thunderbolt 3 compatible
- Large capacity, redundant power supply installed

Data Flow

Main Memory

DDR4-2666RDIMM
4089 Gbps

CPU   CPU

U.2 NVMe SSD × 16

Video Bit Rate

12G-SDI × 4 48 Gbps	SDI graphic card	128 Gbps PCIe × 16
Display Port1.4 × 4 HDMI2.0 × 4 72 Gbps	Graphic card	128 Gbps PCIe × 16
Thunderbolt3 40 Gbps	Thunderbolt card	32 Gbps PCIe × 4
SAS × 2 24 Gbps	SAS card	64 Gbps PCIe × 8

PCIe × 32
Read : 223.2 Gbps
Write : 221.6 Gbps

Sequential Read/Write Function

	Sequential Read/Write speed
Read	27.9GB/s
Write	27.7GB/s
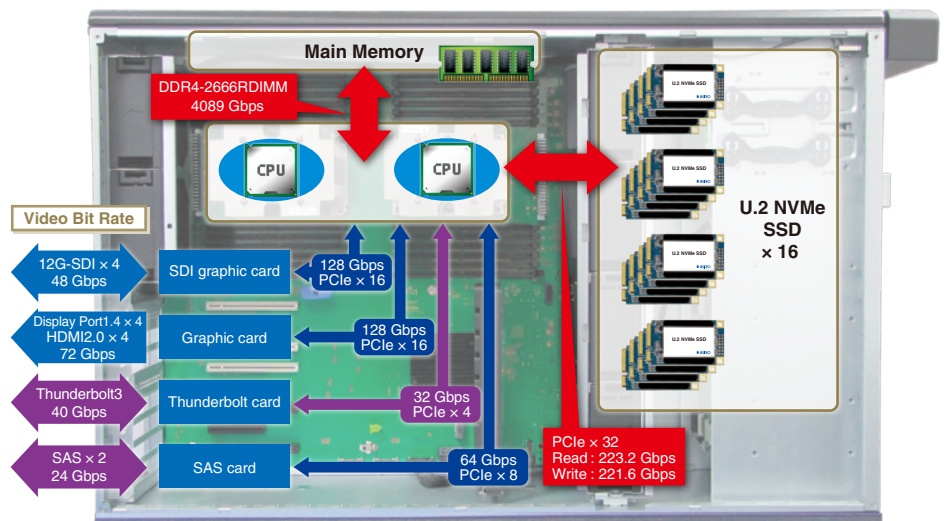
Application Example

Uncompressed 8K Real-Time Recording

Recording
- Uncompressed 4K/8K recording (YUV, 4:2:2, 59.94p)
- Import DPX/TIFF files

Playback
- Uncompressed 4K/8K playback (YUV, 4:2:2, 59.94p)
- 12G-SDI output
- Export DPX/TIFF files
- Playlist
- IN/OUT point setting

Measuring the Modulation Transfer Function (MTF) of Any Camera in Real-Time

8K Real-Time MTF Measuring Device 【IP-8030】

What is "Resolution"?

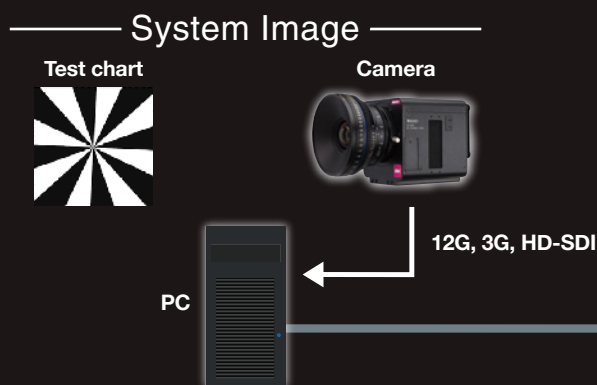"Easily", and "Accurately".

—— System Image ——

Test chart **Camera**

12G, 3G, HD-SDI

PC

RealMTF

Developed under the cooperation of the Japan Broadcasting Corporation
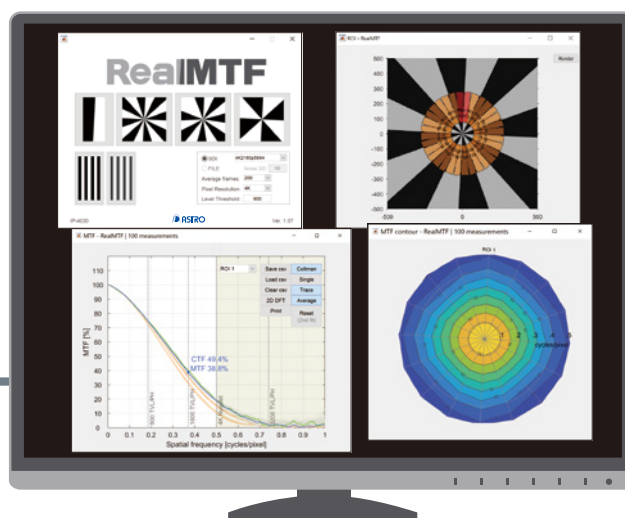
Optional Additions

OP-4030-1
Chart frame
(chart folder + tripod)

OP-4030-2
MTF chart /
chart frame case

OP-4030-3
Horizontal/
vertical common chart
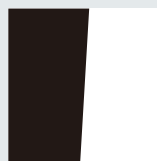
OP-4030-4
Multidirectional edge chart
(16 spokes)
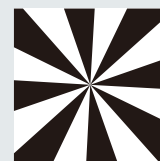
OP-4030-5
Multidirectional edge chart
(14 spokes)
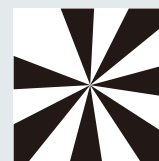
IP-8030

Features

- ● Analyzing edge response and measuring camera MTF
- ● Supports real time measurement
  - ■ Measuring while controlling focus, iris and zoom is possible
- ● Support for multi-directional simultaneous measurement
  - ■ Confirms optical positive pairing of the lens and image sensor
  - ■ Confirms MTF anisotropy through pixel arrangement and image processing
  - ■ Compares the MTF of the center and periphery of the image
- ● High precision
  - ■ Reduces camera noise by frame addition
  - ■ Analyzes curved edges by distortion aberration

RealMTF

Professional Grade 8K Camcorder
with integrated camera / recording unit for shooting, recording, playback and line output of 8K/60p video

8K Camcorder [8C-B60A]

SHARP

We highly recommend the purchase of an 8K shooting system including peripheral equipment such as lens and tripod.

* Outside of Japan, the above 8K camcorder can be purchased from SHARP CORPORATION.
* Lens, viewfinder, microphone, battery, camera supports and rigs are optional.

8C-B60A

Features

● 33 million (33M) pixel Super 35mm CMOS image sensor with PL lens mount.
● 8K/60p 4:2:2 10-bit recording capability with low CPU load CODEC, reduce the cost of post production.
  40 minutes recording when 2 TB SSD pack is used.
 * Grass Valley HQX Codec : High quality codec for high speed processing and with superior generation tolerance.

● It can output 8K/60p uncompressed video at the same time as recording (Quad Link 12G-SDI output), can be used for 8K live distribution. Also supports playback after recording.
● Built-in SSD pack slot for recording media, V-mount battery powered. One person can operate 8K shooting.

Peripheral Equipment

MM-210 (2 TB) / MM-210-1 (4 TB) SSD Pack	**HB-7517** Transfer Box	**VC-8429** Interface Converter	**DF-3516** High Definition Viewfinder	**DM-3417** 12-inch 4K LCD Monitor	**HR-7518** 8K SSD Recorder
40 minutes of recording at 2 TB, 80 minutes at 4 TB	Insert the MM-210 and transfer files to the PC at high speed (SAS connection)	8K/60p 10-bit 4:2:2 Quad Link Converting 12G-SDI to HDMI 2.0 × 4 suitable for an 8K TV connection converter	8C-B60A dedicated viewfinder. Supports camera control functions and HDR shooting	Compatible with Quad Link 3G-SDI	8K recorder equipped with Quad Link 12G-SDI input/output, using MM-210 as the recording media

Ultra Compact Cube!

The Future of Visual Beauty Condensed into One Small Cube!

16 times that of current HDTV, 3600 TV lines / 33 million pixels will expand your world.

AH-4801-E / AH-4801-G (60/120 Hz compatible)

This highly anticipated ultra-high definition camera combines recorder and optical transmission device into an ultra-compact casing that weighs only 2kg.

With unsurpassed mobility and unrivaled operational reliability, it supports 8K shooting in any and all circumstances.

Features

- 8K camera head with an adopted image sensor of 33 million pixels.
- A significant reduction in weight allows a built-in drive circuit in a casing of 100 mm squared to come in at approximately 2kg.
- Various video representations are possible in combination with lenses that have been proven in digital cinema photography etc.
- This ultra-compact 8K camera captures the hyper-realistic images and provides unlimited possibilities for filming live, filming underwater, and so much more.

Main Specifications

- Sensor: 1.7-inch type CMOS 33 million pixels, 59.94 / 119.88p
- Resolution: Horizontal 7680 × Vertical 4320
- Imaging method: Single plate color (Bayer pattern)
- Lens mount: PL mount
- ND filter: 1/4, 1/16, 1/64 (AH-4801-G only)
- Output: 12-channel parallel Optical output (SNAP 12)
- Dimensions / Weight:
  AH-4801-E: 130 (W) × 125 (H) × 137.5 (D) mm / 2.0 kg (Excluding lens)
  AH-4801-G: 146 (W) × 125 (H) × 137.5 (D) mm / 2.2 kg (Excluding lens)

8K Super Hi-Vision Camera System Diagram

With advanced functions, high quality, and easy operability, all functions from 8K shooting to recording and backing up are fully supported.

Optical Transmission System (ARIB standard cable configuration type)

3G-SDI 59.94p DG 3G-SDI × 8	HD-SDI 59.94p DG 1.5G-SDI × 16	3G-SDI 59.94p 4:2:2 3G-SDI × 16

12-inch 4K Monitor (DM-3417)

Headset

U-SDI connector

Full HD EVF (DF-3515)

HD-SDI

3G-SDI × 4

Intercom

PL Lens

Optical cable SNAP 12

Control Line

8K Camera Head (AH-4801-E/AH-4801-G)

8K Optical Transmission Head Adapter (AT-4812)

8K CCU (AC-4813)

Intercom

Headset

ARIB standard Camera cable Optical composite cable (Max. 1000 m)

Power supply
Optical cable Video signal
Control signal

Master Controller

8K U-SDI × 1 → 7680 × 4320 59.94p /119.88p 4:4:4 12-bit → **8K LCD Monitor (DM-3815)**

8K 12G-SDI × 8 →
- 7680 × 4320 59.94p 4:2:2 10-bit 12G-SDI × 4 2 lines
- 7680 × 4320 119.88p 4:2:2 10-bit 12G-SDI × 8 (Future Proof) Original format pixel interleave method

→ **8K SSD Recorder (HR-7518/7518-A)** * 119.88p correspondence only for HR-7518-A

4K 3G-SDI × 4 → 3840 × 2160 59.94p YC$_B$C$_R$ 4:2:2 10-bit 3G-Level A Square Division method → **4K Waveform Monitor (WM-3206B)** * HDR Function

HD HD-SDI →
- 1920 × 1080 59.94p YC$_B$C$_R$ 4:2:2 10-bit 3G-Level A/Level B
- 1920 × 1080 59.94i YC$_B$C$_R$ 4:2:2 10-bit HD-SDI

→ **HD Waveform Monitor**

AB-4815 (60/120 Hz compatible)

* RB-4816

Features

- 8K 60 Hz/120 Hz video output
- 12G-SDI output and U-SDI output
- Includes color adjustment and image quality adjustment functions while being compact and lightweight
- Supports control through remote control (optional)
- Time code input/output support
- Genlock compatible
- 2 analog audio channels supported

Bring 8K to Any Shooting Site
Simple 8K Editing, 8K Production Workflow

8K SSD Recorder 〔**HR-7518 (60 Hz Model) / HR-7518-A (120 Hz Model)**〕

HR-7518 / HR-7518-A

Features

- ● Compressed recording using Grass Valley HQX Codec
- ● Compressed recording / non-compression recording of 8K Dual Green is possible (two SSD packs are necessary for uncompressed recording)
- ● Optional expansion module allows recording of Full-Featured 8K (8K RGB 4:4:4 120p) (compressed recording only)
- ● 12G-SDI as standard input / output terminal
- ● Optical input / output terminal of U-SDI (ARIB STD-B58) is installed as a standard
- ● Dual SSD slots.
- ● Relay recording is possible (some recording formats excluded)
- ● Support for recording up to 32 channels of audio (uncompressed, 24 bits)
- ● Power supply (AC) duplex (60 Hz compatible model HR-7518 only)
- ● 2U rack mount size

Specifications

Item	Specifications
Video Format	8K (7680 × 4320) Dual Green 59.94p 8K YC$_B$C$_R$ 4:2:2 59.94p 8K RGB 4:4:4 59.94p 8K YC$_B$C$_R$ 4:2:2 119.88p * 8K RGB 4:4:4 119.88p * * HR-7518-A only
Video Input / Output	3G-SDI (SMPTE 424M / ST 425-1) × 8ch Supports ancillary data (Audio, TC)
	12G-SDI (SMPTE ST 2082-1) × 4ch
	Optical (ARIB STD-B58) × 1ch Supports ancillary data (Audio, TC)
Data Transfer	USB 3.0

To Avoid Missing a Critical Moment
Record 8K 240p for 4 Hours
Record 8K 60p for 8 Hours

8K Video Server 【SR-8428 (8K 240p Model) /
SR-8438 (8K 60p Model)】

SR-8428 / SR-8438

Features

- 4 hour continuous loop recording and playback at 8K 240p possible simultaneously
- Simultaneous 8 hour continuous loop recording and playback at 8K 60p possible simultaneously
- Grass Valley's pre-installed HQX Codec makes high-resolution recording possible for even longer periods of time
- Remote controlled slow motion playback

- Create, edit, delete and create playlists that combine multiple clips all while continuing to record
- Outputs 4K and HD down-converted images simultaneously
  4K output: Interchangeable 1 line 4 distribution of 12G-SDI × 1ch and one line 3G-SDI × 4ch
  HD output: 4 lines of HD-SDI (EE / PB / LINE / AUX)
- Assignable 4K and HD down convert signal audio channels

55-inch 8K LCD Monitor for On-site Shooting and In-studio Editing

【DM-3815: 120 Hz Model / DM-3814: 60 Hz Model】

| 55-inch LCD Panel | 8K (7680 × 4320) | 120 Hz (DM-3815) | ITU-R BT.709 |
| ITU-R BT.2020 | Contrast Ratio 1200: 1 | U-SDI, 3G-SDI Input (DM-3815) | DVI Input (DM-3814) |

8K 60 Hz / 120 Hz 55-inch LCD monitor with an 8K resolution of 7680 × 4320 pixels. Our monitor can not only be brought to almost any shooting site, but it can also be used for in-office editing and 8K video production in a wide variety of fields, such as product development, medical, and in various industrial applications as well.

DM-3815: 120 Hz model

U-SDI	RGB 4:4:4 YC$_B$C$_R$ 4:4:4 YC$_B$C$_R$ 4:2:2 YC$_B$C$_R$ 4:2:0	10-bit, 12-bit	7680 × 4320	60p, 59.94p 120p, 119.88p
	Dual Green	10-bit		60p, 59.94p
HD-SDI × 16 3G-SDI × 8	Dual Green	10-bit	7680 × 4320	60p, 59.94p
3G-SDI × 16	YC$_B$C$_R$ 4:2:2			

DM-3814: 60 Hz model

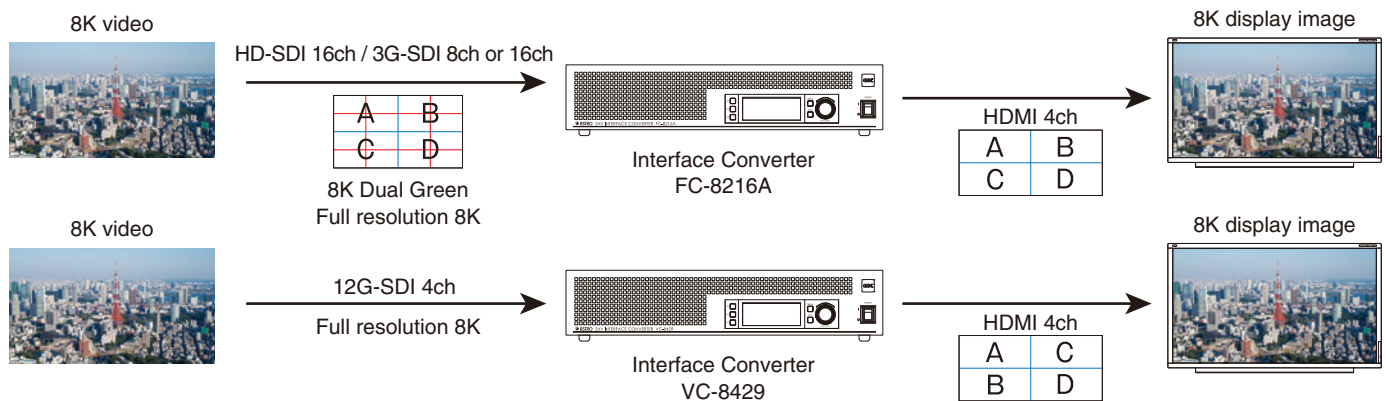|				
DVI Dual Link × 16	RGB 4:4:4	10-bit	7680 × 4320	60p, 59.94p
DVI Single Link × 16	RGB 4:4:4	8-bit	7680 × 4320	60p, 59.94p

Perfect for 8K Monitors (HDMI 2.0 × 4 ch)!
Displaying the True Value of Limitless 8K

〖FC-8216A: HD / 3G-SDI Input Model / VC-8429: 12G-SDI Input Model 12G〗

It is an interface converter that converts 8K signal to HDMI 2.0 × 4 ch.

FC-8216A / VC-8429

8K video → HD-SDI 16ch / 3G-SDI 8ch or 16ch → 8K Dual Green Full resolution 8K → Interface Converter FC-8216A → HDMI 4ch (A B / C D) → 8K display image

8K video → 12G-SDI 4ch → Full resolution 8K → Interface Converter VC-8429 → HDMI 4ch (A C / B D) → 8K display image

Specifications

Input system (FC-8216A)

Interface	Format
Full resolution 8K 3G-SDI input Level A / B compatible	BNC connector × 16 lines Square Division format 7680 × 4320 YC_BC_R 10 bits each 60 Hz / 59.94 Hz
8K Dual Green 3G-SDI input	BNC connector × 8 lines Square Division format 7680 × 4320 G1 / G2 / B / R each 10 bits 60 Hz / 59.94 Hz
8K Dual Green 1.5G-SDI input	BNC connector × 16 lines Square Division format 7680 × 4320 G1 / G2 / B / R each 10 bits 60 Hz / 59.94 Hz

Input system (VC-8429)

Interface	Format
Full resolution 8K 12G-SDI input Level A compatible	BNC connector × 4 lines 2-sample interleave division format 7680 × 4320 YC_BC_R 10 bits each 60 Hz / 59.94 Hz

Output system

Interface	Format
HDMI output	HDMI connector × 4 7680 × 4320 60 Hz / 59.94 Hz RGB 4:4:4　8-bit 7680 × 4320 60 Hz / 59.94 Hz YC_BC_R 4:2:2　12-bit 7680 × 4320 60 Hz / 59.94 Hz YC_BC_R 4:2:0　8-bit

12G / 6G / 3G-SDI Formats, with Max. 8K Resolution, Reference Input / Output Supported

## 12G-SDI Signal Generator 【VG-886】 12G

VG-886

Features

- Supports 12G / 6G / 3G-SDI signals
- REF IN × 1, REF OUT × 2
- Payload can be inserted into SDI signal
- Audio and Timecode packets can be embedded
- Phase adjustment function (SDI / Reference)
- User ID display
- "Equalizer" or "PLL" select from the check field pattern
- Pattern scroll function
- Ramp level changing function
- External control possible (LAN or RS-232C)

Timing Format

8K4K	7680 × 4320	12G-SDI Quad	YC_BC_R 4:2:2, 10-bit	60p, 59.94p, 50p, 48p, 47.95p
	7680 × 4320	12G-SDI Dual	YC_BC_R 4:2:2, 10-bit	30p, 29.97p, 25p, 24p, 23.98p
4K2K	3840 × 2160	12G-SDI Single	YC_BC_R 4:2:2, 10-bit	60p, 59.94p, 50p, 48p, 47.95p
	4096 × 2160		RGB 10/12-bit	30p, 29.97p, 25p, 24p, 23.98p
	3840 × 2160	6G-SDI Single	YC_BC_R 4:2:2, 10-bit	30p, 29.97p, 25p, 24p, 23.98p
	4096 × 2160			
	3840 × 2160	3G-SDI Quad	YC_BC_R 4:2:2, 10-bit	60p, 59.94p, 50p, 48p, 47.95p
	4096 × 2160		RGB 10/12-bit	30p, 29.97p, 25p, 24p, 23.98p
2K/HD	1920 × 1080	3G-SDI Single	YC_BC_R 4:2:2, 10-bit	60p, 59.94p, 50p, 48p, 47.95p
	2048 × 1080		RGB 10/12-bit	30p, 29.97p, 25p, 24p, 23.98p

Pattern
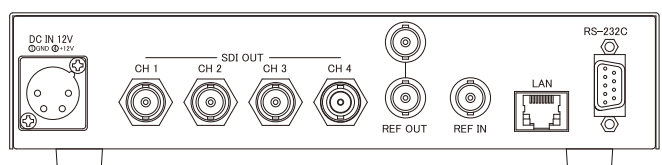
- Color bar
- Raster (White, Black, Gray)
- Check field (Pathological)
- H Ramp, V Ramp
- Crosshatch
- Multiburst
- 10-step Gray Scale

Color bar   Raster   Check field   H Ramp, V Ramp   Crosshatch   Multiburst
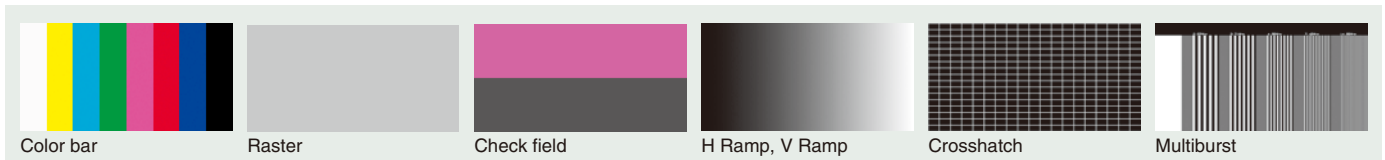
Specifications

Power Requirements	DC 12V
Power Consumption	20 W (MAX)
Dimensions	210 (W) × 44 (H) × 350 (D) mm (1U Half, Excluding Protrusions)
Weight	Approx. 2 kg

Rear View

Easily Integrate High Quality 8K, 4K, and HD! The Ultimate Converter is Finally Here!

8K Cross Converter 〔SC-8219〕 `12G`

Full resolution **8K**

HD

8K-DG

4K

4K

8K-DG
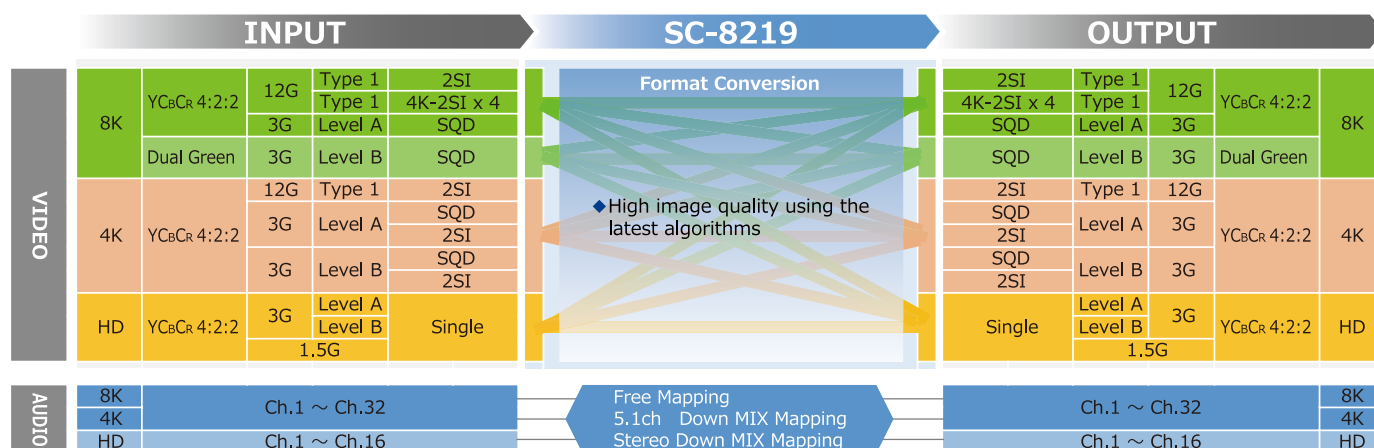
HD

Full resolution **8K**

SC-8219

This device up converts and down converts various 8K video signals YC$_B$C$_R$ 4:2:2, 8K Dual Green, 4K and HD.

Features

- Up convert, down convert 8K YC$_B$C$_R$ 4:2:2, 8K Dual Green, 4K, and HD video signals
- 12G-SDI compatible
- FS function
- Supports ancillary data
- 32-channel audio support, mapping change, downmix
- Preset functions

- Status monitoring
- Test pattern output
- Reference input (BB or tri-level sync signal), output phase adjustment function
- Remote control compatible
- Redundant power supply

	INPUT					SC-8219	OUTPUT				
VIDEO	8K	YC$_B$C$_R$ 4:2:2	12G	Type 1	2SI	**Format Conversion**	2SI	Type 1	12G	YC$_B$C$_R$ 4:2:2	8K
				Type 1	4K-2SI x 4		4K-2SI x 4	Type 1			
			3G	Level A	SQD		SQD	Level A	3G		
		Dual Green	3G	Level B	SQD		SQD	Level B	3G	Dual Green	
	4K	YC$_B$C$_R$ 4:2:2	12G	Type 1	2SI	◆High image quality using the latest algorithms	2SI	Type 1	12G	YC$_B$C$_R$ 4:2:2	4K
			3G	Level A	SQD		SQD	Level A	3G		
					2SI		2SI				
			3G	Level B	SQD		SQD	Level B	3G		
					2SI		2SI				
	HD	YC$_B$C$_R$ 4:2:2	3G	Level A	Single		Single	Level A	3G	YC$_B$C$_R$ 4:2:2	HD
				Level B				Level B			
			1.5G						1.5G		
AUDIO	8K	Ch.1 ～ Ch.32				Free Mapping 5.1ch Down MIX Mapping Stereo Down MIX Mapping	Ch.1 ～ Ch.32				8K
	4K										4K
	HD	Ch.1 ～ Ch.16					Ch.1 ～ Ch.16				HD

4K / 8K Broadcast System Multiplexer
Realize Advanced Service

MMT・TLV Multiplexer

MMT (MPEG Media Transport) has been standardized as the next generation transmission standard (ISO / IEC 23008-1) for 4K / 8K broadcast following MPEG-2 TS. By using MMT, advanced services such as content transmission are made possible through various networks such as broadcasting and communication.

Advanced BS digital · Advanced broadband CS digital broadcasting

Broadcaster

Viewing receiver
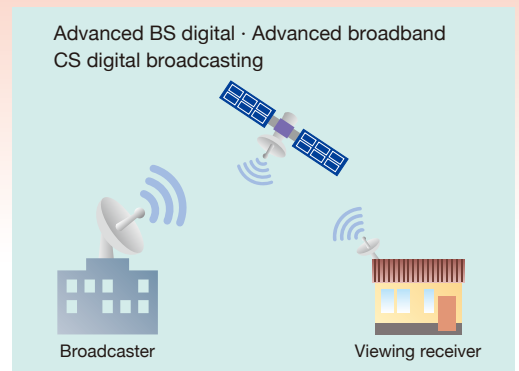
MMT Multiplexer 【CX-5545】

It is an MMT multiplexer that multiplexes encoder output and SI output.

- IP input 2 ports, IP output 1 port and monitor out 1 port
- Multiple IP data flows can be received and multiplexed into multiple IP data flows for transmission
- MMT-SI can be input and multiplexed

TLV Multiplexer 【CX-5546】

TLV multiplexer that receives the output of MMT multiplexer and multiplexes TLV.

- IP input 1 port, IP output 1 port and monitor out 1 port
- Multiple IP data flows can be received and one TV stream can be sent
- TLV-SI input and multiplexing possible

MMT-SI / TLV-SI Editor 【SP-5018】

An SI editor which creates MMT-SI and TLV-SI binary.

- New creation and editing of MMT-SI and TLV-SI are possible
- SI captured by SP-5800 can also be edited

MMT-SI · TLV-SI Editor
SP-5018

MMT-SI

TLV-SI

Encoder output
MMTP / IP

SI outgoing output
MMTP / IP

MMT-SI insertion

MUX output
MMTP / IP

TLV-SI insertion

TLV-MUX output
TLV / IP
(Single TLV)

MMT Multiplexer
CX-5545

TLV Multiplexer
CX-5546
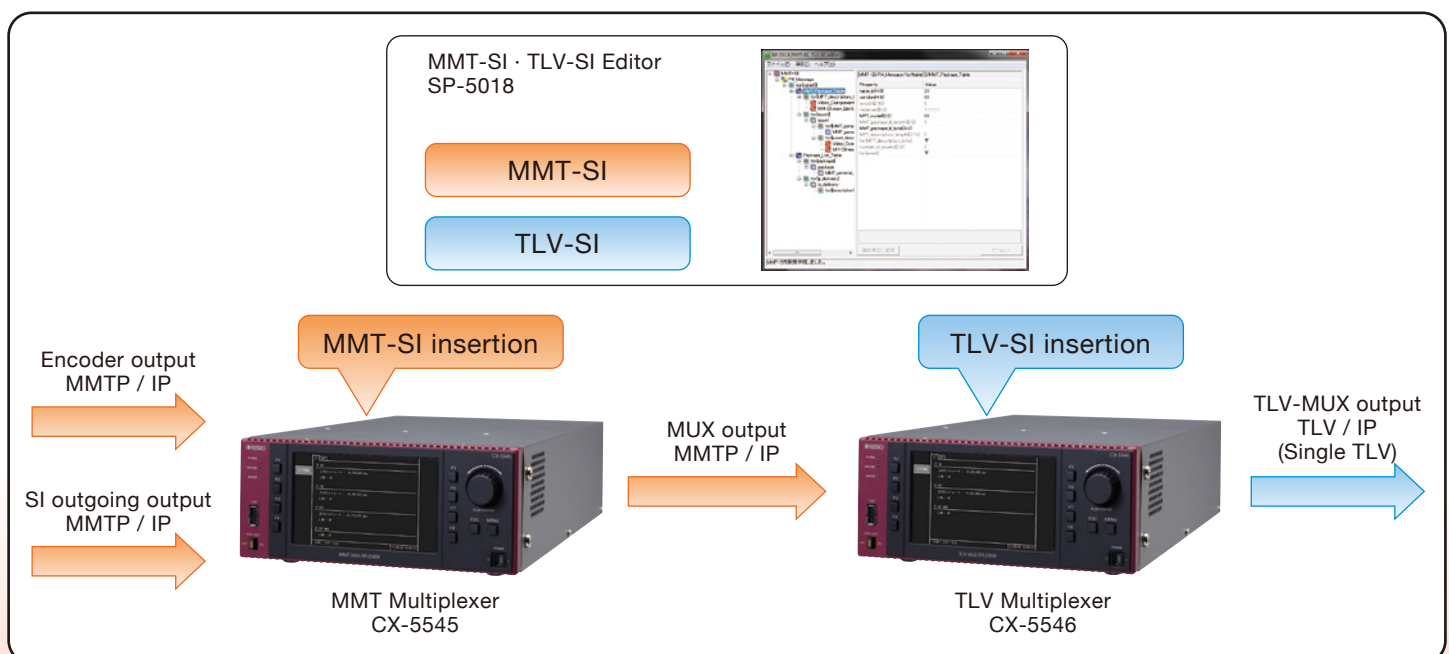
Multiplatform to Realize TS Transmission, Monitoring, Recording, and More!
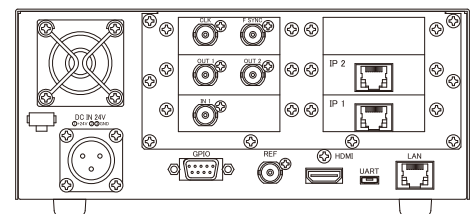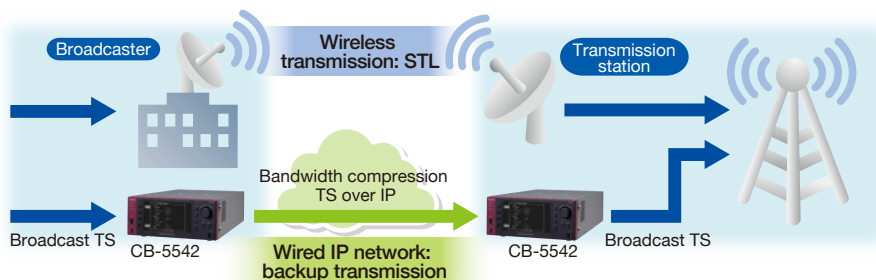
TS Multiplatform

Combining a dedicated board and mainframe firmware in a common platform unit provides various applications such as TS monitors and TS-IP transmitters.
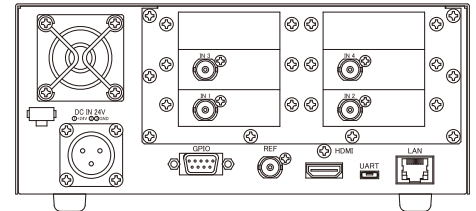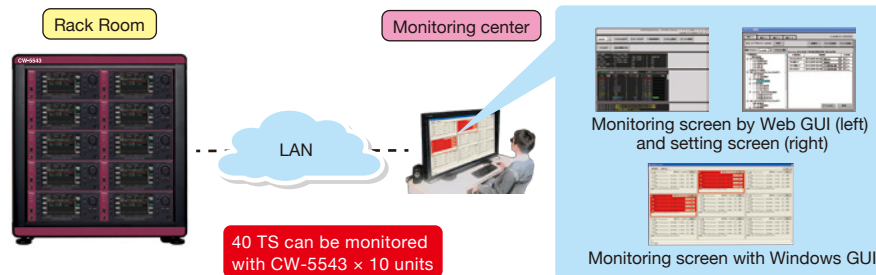
ISDB-T Backup Unit 【CB-5542】

- TS over IP transmission after compressing the bandwidth of broadcast TS
- FSYNC output and 10 MHz clock output possible
- Bidirectional transmission possible with one transmitter / receiver
- Remote operation and information acquisition are possible

Broadcaster
Wireless transmission: STL
Transmission station

Bandwidth compression TS over IP

Broadcast TS　CB-5542
Wired IP network: backup transmission
CB-5542　Broadcast TS

MPEG-2 TS Monitoring System 【CW-5543】

- Up to four TSs can be simultaneously monitored for each monitoring device
- Display PID information / PSI information / program information / PCR information
- Remote confirmation of input information via Web browser
- With the included Windows application, it is possible to check the status of multiple devices

Rack Room
Monitoring center
LAN

40 TS can be monitored with CW-5543 × 10 units

Monitoring screen by Web GUI (left) and setting screen (right)

Monitoring screen with Windows GUI

TS Monitoring / IP Transmitter 【CX-5544】

- "TS monitoring", "TS recording", and "IP transmission" all in one unit
- All functions can be operated with a Web browser
- TS recordings can be downloaded as TS over IP output in file format

Remote base / relay station
DVB-ASI
IP network
IP
Studio / Transmitter

CX-5544
■TS recording ■TS over IP

Monitoring terminal (PC)
■Remote TS monitoring ■TS download
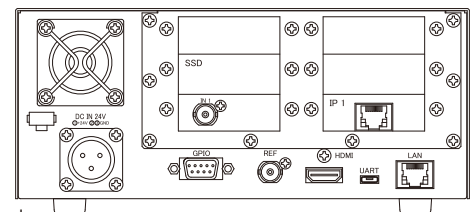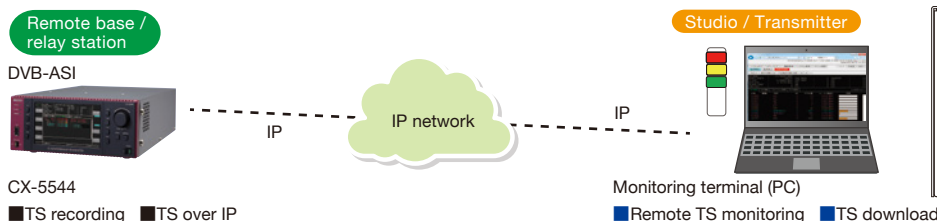
Optional Additions　Power Unit 【PS-708 · PS-708-A】

- Dual power supply unit for multi-platform use
- PS-708 provides redundant power for two units, PS-708-A for one unit

HDMI 2.1 Signal Generator
Max. 8K Timing Formats Supported

Digital Video Generator 〔VG-876 / VG-879〕 | HDMI 2.1 Compliance test

HDR

VG-876

VG-879

VG-876 / VG-879

Main Features

Synchronizing Unit

● Supports the latest digital video interfaces such as HDMI 2.1, DisplayPort 1.2a, V-by-One® HS and 12G-SDI.
● Max. 4 interface units are installed. All units are swappable by users.
● 8K/120p timing (V-by-One® HS) is output by synchronizing four VG-876 / VG-879 units. One video interface and one synchronizing unit (VM-1876-MX) should be installed in each VG.

HDMI 2.1 Unit HDCP 2.3 *HDR* NEW

VM-1876-MD   To be installed in VG-879 only
HDMI 2.1 based module. 8K/60p YC_BC_R 4:2:0, 4K/120p YC_BC_R 4:4:4 are supported. FRL and TMDS modes are supported.

HDMI 6G Unit HDCP 2.2 *HDR*

VM-1876-M8
HDMI 2.0b based module. 4K/60p YC_BC_R 4:4:4 output is available. HDCP 2.2 and 1.4 are selectable.

DisplayPort Unit

VM-1876A-M1
DisplayPort 1.2a based. 4K/60p RGB 4:4:4 transmission by SST and MST. 5.4Gbps (HBR2) is supported. HDCP is not supported.
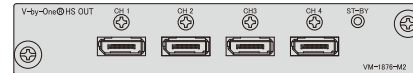
Analog Unit

VM-1876-MA
VGA, Composite (NTSC/PAL), Component and audio outputs are supported.

V-by-One® HS Unit

VM-1876-M2
4K/120p and 8K/30p are output from a single board. 8K/120p output is possible by using four VG units that each have one VM-1876-M2 and VM-1876-MX installed.

12G-SDI Unit

VM-1876-MB   To be installed in VG-879 only
4K/60p is transmitted by one 12G-SDI channel, two 6G-SDI channels, or four 3G-SDI channels.
Arbitrary setting payload is inserted. Audio can be embedded.
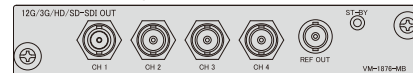
3G-SDI Unit

VM-1876-M5

iTMDS Unit

VM-1876-M9
4K/60p is supported by a single board. 4K/120p is supported by two boards. LVDS output is supported by using optional IA-1540 converter.

HDBaseT Unit

VM-1876-MC
HDBaseT 2.0 is supported. 4K/30p timing format, HDCP and EDID are supported.

Specializing in Real-Time Analysis, The Best Solution for developing HDMI 2.0b / 2.1, HDCP 2.3 Equipment!

HDMI 2.1 / HDCP 2.3

4K/120p YCBCR 4:4:4
8K/60p YCBCR 4:2:0 Support
Protocol Analyzer

【VA-1847】

HDMI 2.1 Compliance Test
HDR

HDMI 2.0b / HDCP 2.3

4K/60p YCBCR 4:4:4 Support
Protocol Analyzer
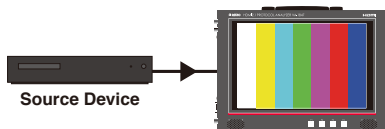
【VA-1842】

HDMI 2.0 Compliance Test
HDCP 2.3 Compliance Test
HDR

Easy and immediate start to analyze.

The above photo is VA-1847

Receiver Mode
(Sink Emulation)

Source Device

This device supports emulation operation, protocol analysis and video timing measurement for sink equipment such as TV by EDID settings.

Repeater Mode
(Repeater Emulation)

Source Device → Sink Device

The output device operates correctly as a repeater.

* No input video display on VA-1847

Generate Mode
(Source Emulation)

Sink Device
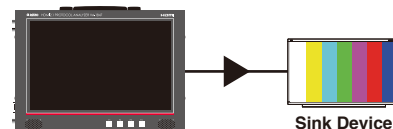
This device supports behavior and protocol analysis while emulating a source device. Standard signal is output as a simple signal generator.

VA-1847 / VA-1842

It is a protocol analyzer that can analyze protocol layers in the development of transmitters with a HDMI 2.0b / 2.1 interface.
Equipped with a 12-inch LCD panel and built-in speaker, it can analyze video, sound, protocol, video timing in real-time. In addition, it is possible to check receipt of sink equipment and check the communication line by the generator (signal sending) function.

Main Functions

Analyzer (measurement) function
Measuring HDMI 2.0b / 2.1, video timing and contents of each packet, check the difference with the standard value.

Receiver (monitor) function
HDMI 2.0b / 2.1 can be received.

Through function * VA-1842 only (optional)
Analyzing the direct communication between the source device and the sink device by making the input / output pass through.

Emulation function
EDID information can be changed to the performance of various other monitors.

Video and audio monitoring function
Check the video of 8-bit, 10-bit, 12-bit HDMI 2.0b / 2.1 on 12-inch LCD monitor. Moreover, it can easily monitor the linear PCM sound with built-in speaker.

Program function
You can manage the data used for emulating the monitor in this program. With the push of a button, you can easily change the performance of various monitors. There is also a group function that picks up only what you want to use out of many programs.

Data storage function
Data such as analysis log and emulation setting can be saved on a USB.

Log trigger function
You can set the trigger to capture the analysis data, and you can check the transmission and reception of commands on the control line.

Compliance test function
As a simulation of the certification test standard, you can perform a part of the compliance check and display the results item by item.
HDMI, CEC, HDCP

What is HDMI 2.1

HDMI (High-Definition Multimedia Interface) 2.1 is a standard for transmitting digital video and audio for consumer devices such as LCD TVs and BD players over a single cable. It was announced as the HDMI standard in November 2017.

The bandwidth of data transfer has been extended from 18Gbps to 48Gbps, differeing from conventional bandwidth, enabling the transmission of 8K 60p with a single cable.

New features include
• DynamicHDR
• Support of up to 10K resolution using DSC 1.2a
• eARC, an expanded standard of ARC
• Enhanced refresh rate for VRR, QMS, and QFT
• ALLM

Also, since connectors and cables are the same as before, they can be used as they are.
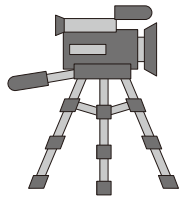
Being backwards compatible, it is also possible to, for example, connect the HDMI 2.1 TV with an old HDMI BD player.

We participated in the HDMI Forum that developed HDMI 2.1 and cooperated as a manufacturer of measuring instruments from the beginning of standardization.
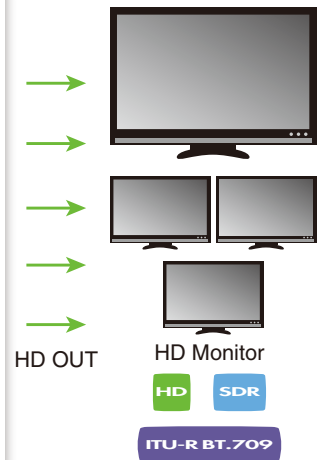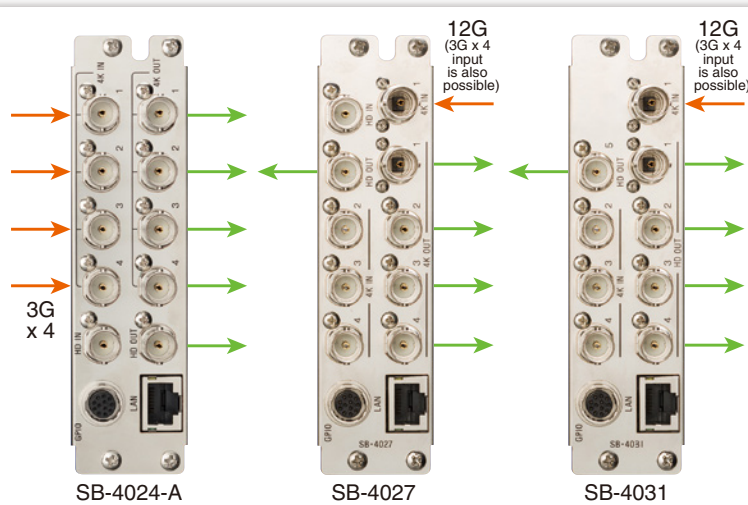
High Image Quality, Multi-Functional, Space Saving. An All-in-One Response to the Various Challenges of 4K HDR Production Sites

12G-SDI Compatible 4K Converter Board 〔SB-4027〕 `12G`

HDR

SB-4027

Features

- **4K ⇔ HD** Up-Conversion, Down-Conversion
- **ITU-R BT.2020 ⇔ ITU-R BT.709** Colorimetry Conversion
- **HDR ⇔ SDR** Dynamic Range Conversion

INPUT	SB-4027	OUTPUT

VIDEO

INPUT:
- 4K
  - 1.5G — SQD / 2SI
  - 3G — Level A — SQD / 2SI
  - 3G — Level B — SQD / 2SI
  - 12G — Type 1 — 2SI
- HD
  - 1.5G
  - 3G — Level A / Level B — Single

SB-4027:
- Color Space Conversion
- Format Conversion
- UP↑
- DOWN↓

OUTPUT:
- 4K
  - SQD / 2SI — 1.5G
  - SQD / 2SI — Level A — 3G
  - SQD / 2SI — Level B
  - 2SI — Type 1 — 12G
- HD
  - Single
  - 1.5G
  - Level A / Level B — 3G

AUDIO

| Ch.1 ～ Ch.32 | Free Mapping 5.1Ch Down MIX Mapping Stereo Down MIX Mapping | Ch.1 ～ Ch.16 |

ex. Color Space Conversion

1D LUT / 3D LUT

- EOTF: HDR / SDR
- Gain Offset Gamma
- OETF: SDR / HDR
- Knee
- BT.709 / BT.2020

Application Example of 4K Converter HDR

4K → HD mode

- 4K Source
- 4K IN
- 3G x 4
- **4K**
- **HLG** **Camera Log**
- **ITU-R BT.2020**
- SB-4024-A
- SB-4027
- SB-4031
- 12G (3G x 4 input is also possible)
- HD OUT
- HD Monitor
- **HD** **SDR**
- **ITU-R BT.709**

HD → 4K mode

- HD Source
- HD IN
- **HD** **SDR**
- **ITU-R BT.709**
- SB-4024-A
- SB-4027
- 3G x 4
- 12G (3G x 4 output is also possible)
- 4K OUT
- Switcher
- **4K**
- **HLG** **Camera Log**
- **ITU-R BT.2020**
- HD OUT
- HD Monitor

4K → 4K mode

- 4K Source
- 4K IN
- **4K** **Camera Log**
- **ITU-R BT.2020**
- 3G x 4
- 3G x 4
- SB-4024-A
- SB-4027
- 12G (3G x 4 input is also possible)
- 12G (3G x 4 output is also possible)
- 4K OUT
- Switcher
- 4K Monitor
- **4K** **HLG**
- **ITU-R BT.2020**
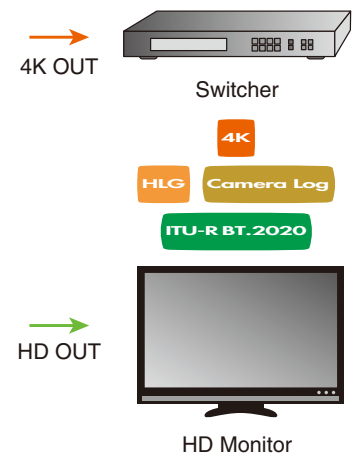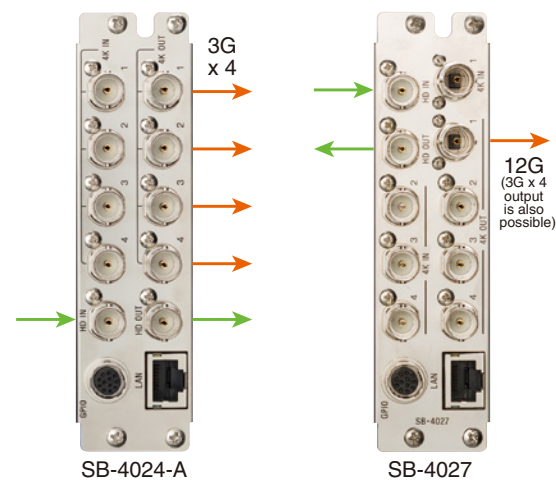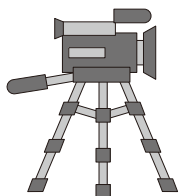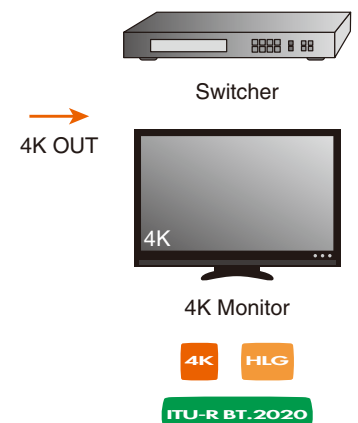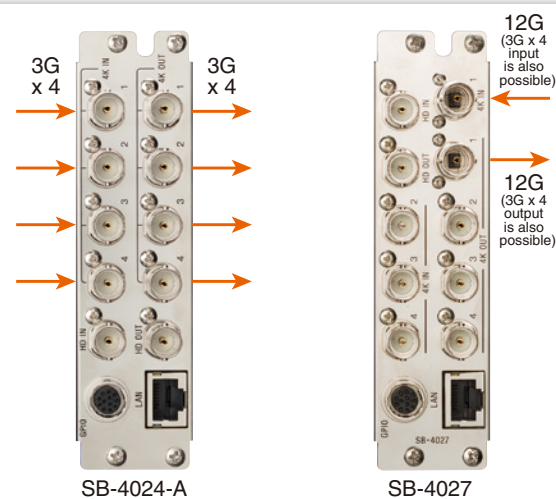
HD × 4 → HD × 4 mode, HD (IP) → HD × 4 mode, and bypass mode available as well
・HD × 4 → HD × 4 mode, HD (IP) → HD × 4 mode compatible models: SB-4024-A / SB-4027
・Bypass mode compatible models: SB-4024-A / SB-4027 / SB-4031

Definitive Edition: 4K 12G-SDI Compatible Downstream / Upstream Keyer

4K DSK [HD-1679] 12G

8 ch Superimposed text input
DSK / USK for two lines
Combine up to 8 captions on screen

HD-1679

A downstream keyer (DSK) and upstream keyer (USK) that supports two 4K line inputs, up to eight 4K super lines, and two 4K preview output lines.

Features

- SDI I / O compatible with 12G-SDI / 3G-SDI / HD-SDI
- Line and preview input / output supports 12G to 3G conversion, 3G Level A ↔ B conversion
- Can also be used as DSK / USK for HD
- Two lines (LINE A, LINE B) can be individually set as DSK / USK
- AVDL for line and FS for superimposed text
- Supports NAM / linear / priority synthesis

- BMP / TGA still image files registered as internal superimposed data
- Reduction of superimposed text, up / down / left / right cropping, display position specification

Optional Additions HDR
- Down convert the preview output (12G-SDI, 3G-SDI × 4 2SI only)
- Superimposed text input up conversion, color gamut conversion, EOTF / OETF conversion

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RB-1679 / -A

Desktop Type Remote Controller
RB-1679 (5-pin specification)
RB-1679-A (3-pin specification)

RB-1679-D

Small Remote Controller
RB-1679-D

TB-1678 / -A

Take Box
TB-1678 (5-pin specification)
TB-1678-A (3-pin specification)

8K2K Supported
MULTI VIDEO PROCESSOR

Multimedia Scan Converter 〔MC-2085 / MC-2086〕

High Resolution Image

Uses:
Video conferencing, R&D,
High-quality simulations

Benefits:
● Dot by Dot image display.
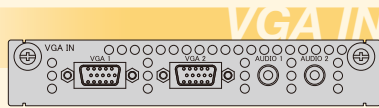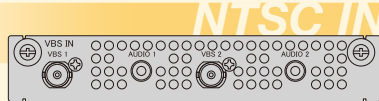● Image quality comparison available.

Entertainment

Uses:
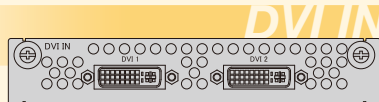Indoor / Outdoor digital signage,
Stadiums

Benefits:
● Displaying at the optimum sizes
depending on LED pitches.
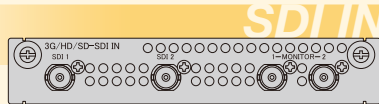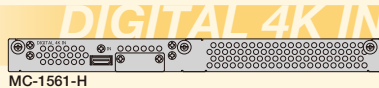● Joint point and blending area are
selectable.

VGA IN
MC-1561-A

NTSC IN
MC-1561-C

DVI IN
MC-1561-D

SDI IN
MC-1561-S

DIGITAL 4K IN
MC-1561-H

MC-2085

MC-2086

VGA OUT
MC-1562-A

DVI OUT
MC-1562-D

SDI OUT
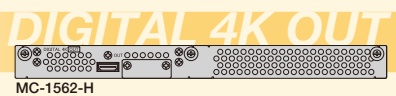MC-1562-S
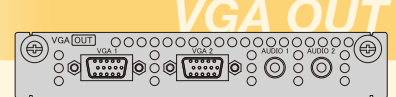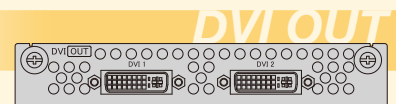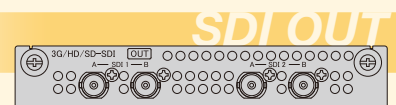
DIGITAL 4K OUT
MC-1562-H

Security Monitoring

Uses:
Infrastructure monitoring,
Security, Transportation

Benefits:
● Able to handle multiple images
simultaneously.

Medical Monitoring

Uses:
Surgical operation,
Academic conference

Benefits:
● Picture-in-picture with 4K available.

MC-2085 / MC-2086

Flexible high-resolution video system for multi-window and large scale display indoor or outdoor.

The MC-2085 / MC-2086 is a multi-video processor that can process 8K2K high resolution size in real-time.
With a slot type input / output interface board, it will always correspond to the latest connector.
For external control, by mounting LAN / RS-232C / remote contacts, it becomes possible to control from various control devices.

Main Functions

● Original zoom algorithm / Motion adaptive IP conversion algorithm
and adopted 10-bit Arithmetic processing
● HDCP compatible (MC-1561-D / MC-1562-D only)
● Aspect mode selection, input EDID rewrite (duplication output /
selected fixed value)

● Image rotation, key synthesis, fade switching
● Joint / blending area setting
● Web browser setting
● Audio support (embedded / main unit output)

'8K Super Hi-Vision (SHV)' is a next-generation video technology that provides an overpowering sense of realism and strong visual impact. ASTRODESIGN has been working on 8K SHV technology since its very beginning, resulting in the development of the variety of SHV equipment that is still being used today.

8K (8K Super Hi-Vision)
7680
4320
4K 3840 (4096)
FULL HD 1920
SD 720

Photo：Satoru Kikuchi

Japan Broadcasting Corporation (NHK) has been conducting R&D on UHDTV television format, which is called Super Hi-Vision in Japan. 8K SHV boasts a resolution of 7680 × 4320 or 16 times the pixels of the current HD format.

This video is viewed at 60fps in progressive video format. The feeling of immersion is impressive, with objects being displayed with a far more natural sense of depth.

ASTRODESIGN has been collaborating with NHK since the advent of SHV leading to the development of many necessary pieces of equipment to the SHV catalog.

The new 4K 8K satellite broadcast began in December 2018 here in Japan, and we are creating a steady stream of innovative equipment and technology from an intensive focus in R&D.

AH-4801-E / G (60 Hz / 120 Hz)
8K Camera Head

Single plate type, ultra-compact Cube 8K Super Hi-Vision camera.

For Further Details ➡ See P8, P9

AC-4813
8K SHV CCU

8K SHV Camera head CCU camera control unit.
8K output, 4K, HD output is possible for monitoring.

AT-4812
8K SHV Optical Transmission Head Adapter

This is a device that transmits the 8K SHV signal produced by the camera head over long distances to a CCU using an optical camera cable.
You can transmit and receive audio, video, tally, intercom, and microphone signals to and from the camera, as well as control the lens and supply power.

DF-3515
Native HD Electronic View Finder

【Installation example】

■ **Native HD 1920 × 1080 Resolution OLED Installed**

For Further Details ➡ See P33

HR-7518 / HR-7518-A
8K SSD Recorder

From 8K Dual Green, full resolution 8K (YC_BC_R 4:2:2 10-bit 60p), full spec 8K (RGB 4:4:4 12-bit 120p) can be recorded / played using only one unit.

For Further Details ➡ See P10

SR-8438
8K Video Server

NEW

＜Features＞
- 8K 60p video can be input and playback video can be output while simultaneously recording video.
- Equipped with a large capacity recording medium, continuous recording is possible for up to 8 hours.
- 8K 60p variable speed slow playback (equal magnification to 1/60) is possible by using a remote controller.
- It is possible to save any IN/OUT point as a clip while recording a continuous loop.
- Editing the IN/OUT point of a clip and deleting clips can be done while recording a continuous loop.
- Create and play back playlists combining multiple clips while recording a continuous loop.
- I/F of 8K input/output is 1 line of 12G-SDI × 4 ch (SMPTE ST 2082-1)
- For 4K output I/F, select 1 line 4 distribution of 12-SDI × 1 ch (SMPTE ST 2082-12) or 3-SDI × 4 ch (SMPTE 424 M)
- HD output I/F is divided into 4 lines (EE / PB / LINE / AUX) of HD-SDI × 1 ch (SMPTE 292 M)

For Further Details ➡ See P11

HB-7517
Transfer Box

NEW

With this device, 8K data can be quickly and easily transferred between our 8K recorder's dedicated SDD pack and a PC. The transfer BOX is connected to a PC with two SAS (6 Gbps) cables and operation is possible with a dedicated GUI.

For Further Details ➡ See P26

HR-7512-C
8K / 4K SSD Recorder

■ **Up to 16 TB of Loaded, Uncompressed Video Recording / Playback**

This device is an uncompressed SSD recorder capable of recording and playing 8K / 4K video signals compatible with 3G-SDI.

＜Features＞
- 4K recording (YC_BC_R 4:2:2/30PsF) with a maximum capacity of 16TB or 400 minutes, and uncompressed 8K recording (8K-DG / 60p) of up to 100 minutes
- Select input / output I/F when requesting from 3G-SDI, DVI
- Easily operated repeat playback
- HD monitor (YC_BC_R 4:2:2/60i) equipped with down conversion output
- Support for reading and writing video from PC via eSATA port
- 24V DC input enables battery operation (2U size)
- Support for 8K recording (RGB 4:4:4/60p) by synchronous operation of 4 units

DM-3814 (60 Hz)
DM-3815 (120 Hz)
55-inch 8K LCD Monitor

■ **60 Hz / 120 Hz Compatible**

For Further Details ➡ See P12

FC-8213
8K Interface Converter

8K YC_BC_R, 8K-DG Converted to Dual Link DVI 16 ch

<Features>
● Connection with DM-3814 is possible.

FC-8216A (HD / 3G-SDI)
VC-8429 (12G-SDI)
Interface Converter

8K YC_BC_R, 8K-DG to HDMI 2.0 Conversion

For Further Details ➡ See P13

SC-8212
FULL SHV CONVERTER

Upconverts 8K-DG to full-resolution 8K (RGB 4:4:4 12-bit). Input interface is HD-SDI × 16ch or 3G-SDI × 8ch. Output interface is U-SDI (ARIB STD-B58).

SC-8214
DUAL SHV UPCONVERTER

This device upconverts 2 lines of 4K video to 8K-DG video. It performs optimally when up converting the 4K subtitle fill / key to 8K-DG fill / key.

SC-8217
SHV LUT COLOR CONVERTER

8K YC_BC_R 4:2:2, 8K Dual Green, 4K signal down conversion, HDR to SDR conversion, 3D gamut conversion using 3D LUT.

SC-8219
8K Cross Converter

8K YC_BC_R 4:2:2, 8K Dual Green, 4K, and HD video signals can be up converted and down converted. Supports 12G-SDI and can be incorporated in a 12G-SDI system.

For Further Details ➡ See P15

SC-8220
8K 12G-SDI to U-SDI Converter

NEW

Converts 12G-SDI (8K 60p YC_BC_R 4:2:2 10-bit) to U-SDI (8K 120p/60p RGB 4:4:4 12-bit, 8K 60p YC_BC_R 4:2:2 10-bit).

SC-8221
8K U-SDI to 12G-SDI Converter

A down converter that can convert U-SDI (8K 120p/60p RGB 4:4:4 12-bit) to 12G-SDI (8K 60p YC_BC_R 4:2:2).

SC-8222
8K 120Hz CONVERTER

NEW

Converts 12G-Quad (8K 60p YC_BC_R 4:2:2) Odd/Even and 12G-Dual (4K 120p YC_BC_R 4:2:2) × 4 to 8K 120p YC_BC_R 4:2:2 is.

DB-3817
8K INTERFACE CONVERTER

This device intakes super Hi-vision signals and displays them on an 8K liquid crystal panel. The optical interface is (U-SDI) compliant with ARIB STD-B58 and an input terminal of 3G-SDI × 8 ch. It can receive Full-Featured 8K signals, full resolution 8K signals and 8K-DG signals.
It also outputs V-by-One® HS signal to drive the liquid crystal panel. Image adjustment supports changes to gamma, contrast and brightness.

DP-3818
8K INTERFACE CONVERTER

This device intakes Super Hi-Vision signals and displays 8K video on a 4 division sheet type organic flexible EL display.
It has an optical interface (U-SDI) compliant with ARIB STD-B58 and an input terminal of 3G-SDI × 8 ch and can also receive full specification 8K signals, Full-Featured 8K signals and 8K-DG signals. It outputs a V-by-One® HS signal, + 12V power supply and + 24V power supply to a drive seat type display. Adjustment of the sheet type display corresponds to gamma, contrast and brightness.

VP-8427
Full-Featured 8K Color Grading Equipment

A Color Grading Device That Uses Various Processes and Corrections in Real-time for High-speed Full-Featured 8K (120p) Color Correction

A full-featured 8K corrector equipped with optical interface (U-SDI) input/output conforming to the ARIB STD-B58.
You can correct flaws, details, lens aberrations, chromatic aberrations, and color grade.

<Features>
● Real-time full-featured 8K signal processing
● Scratch correction and chromatic aberration functions to fix problems during shooting
● Contour correction functions capable of parameter setting for image quality adjustment
● Two types of color adjustment functions (12 axes correction for simple operations, 3D LUT for detailed color tones)
● Input / output gamma LUT setting function that enables SDR / HDR processing and conversion
● Immediately reflects new settings in video
● 4K signals can be output in real-time
● Area settings for 4K video area can be set freely

TB-8103
LTO-7 8K Backup Device

A system that backs up and restores 8K content to LTO-7 tape media.
8K-RAW data (our proprietary format) and HQX data recorded in an SSD pack can be backed up to LTO-7 tape media. You can also restore from LTO-7 tape media to an SSD pack.

<Features>
● Back up to LTO-7
● Restore to SSD pack
● Operation through "Astra 8K" software
● Possible to edit while accessing the tape from an external server

⟫⟫⟫ 8K Video Production Workflow

In order to make 8K video production proceed as smoothly as possible, we at ASTRODESIGN propose a consistent file-based workflow beginning from shooting all the way to screening.
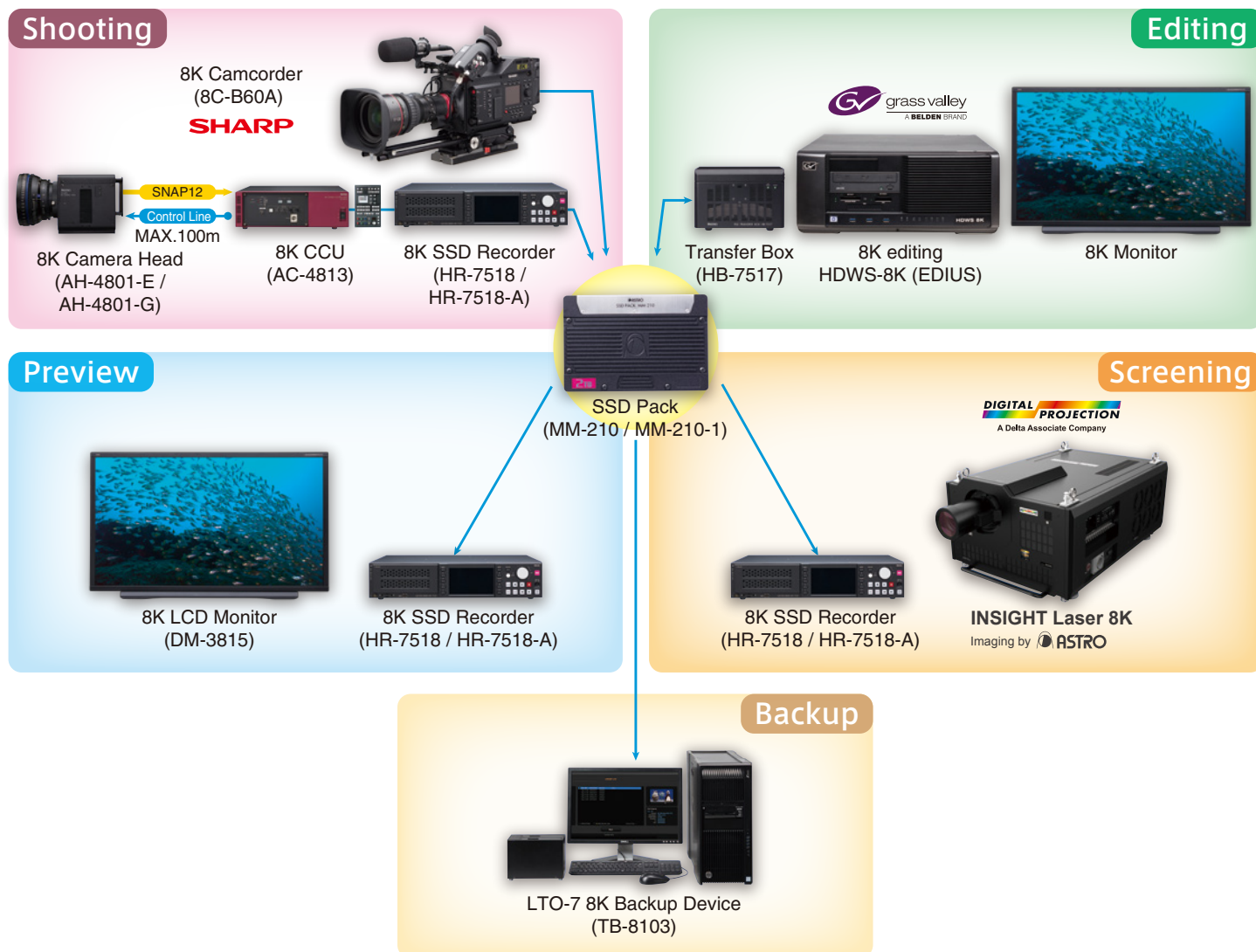
To bring a comfortable and high-quality video production workflow and environment to life, the following aspects must be taken into account:

- **· High quality compression technology that can withstand practical use**
- **· Development of a real-time 8K recording device**
- **· A comfortable editing environment**

By considering all of the above during production, we have managed to create the ideal workflow.

During the development of our 8K recorder "HR-7518/HR-7518-A", by adopting Grass Valley's HQX codec and revising our recording media and operability, we have succeeded in dramatically improving the speed and efficiency of 8K video; bringing the reality of a world of 8K production one step closer.

We hope you look forward to future developments by ASTRODESIGN that will turn conventional reality on it's head.

Shooting

8K Camcorder
(8C-B60A)
SHARP

SNAP12
Control Line
MAX.100m

8K Camera Head
(AH-4801-E /
AH-4801-G)

8K CCU
(AC-4813)

8K SSD Recorder
(HR-7518 /
HR-7518-A)

Editing

grass valley
A BELDEN BRAND

Transfer Box
(HB-7517)

8K editing
HDWS-8K (EDIUS)

8K Monitor

SSD Pack
(MM-210 / MM-210-1)

Preview

8K LCD Monitor
(DM-3815)

8K SSD Recorder
(HR-7518 / HR-7518-A)

Screening

DIGITAL PROJECTION
A Delta Associate Company

8K SSD Recorder
(HR-7518 / HR-7518-A)

INSIGHT Laser 8K
Imaging by ⟁ASTRO

Backup

LTO-7 8K Backup Device
(TB-8103)

8K Showroom

Experience Super-high Definition 8K Video with 22.2 channel Audio

In addition to equipment such as our 8K camera and recorder, we also have several other products with the latest 8K technology.

One of which is our 8K theater that is equipped with a impactful 170-inch screen perfect for playing 8K 3D or 8K 120Hz video.

It is ideal for demonstrations and previews for clients, screenings and more.

We hope you can enjoy a wide variety of impactful 8K content.

Video Content Library

VT-7002
4K Video Content
`4K`

■ The Ryukyu Sea

Approx. 4 min. 40 sec.

VT-7003
4K Video Content
`4K`

■ Ogasawara Sea

VT-7003-1 (OGASAWARA Island) : Approx. 5 min. 28 sec.
VT-7003-2 (Ogasawara ocean FISH) : Approx. 5 min. 9 sec.
VT-7003-3 (Ogasawara ocean MARINE LIFE) : Approx. 5 min. 46 sec.
VT-7003-4 (Chichijima OGASAWARA) : Approx. 4 min. 35 sec.
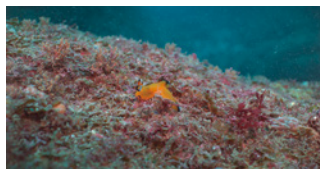
VT-7005
4K Uncompressed Video Content
`4K`

■ Saipan

VT-7005-1 (Island Sunset) : 3 min. 33 sec.
VT-7005-2 (Managaha) : 3 min. 25 sec.
VT-7005-3 (Summer Vacation) : 1 min. 58 sec.
VT-7005-4 (Fire Dance) : 3 min. 38 sec.

VT-7006
"Pacific Sea near Japan" 8K uncompressed content
`8K`

■ The Sea of Kushimoto

Recording Time: 3 min. 42 sec.

VT-7008
"BUDO" - Japanese Martial Arts
`4K` `8K`

■ BUDO

Recording Time: 3 min.

VT-7011
8K Video Content
`8K`
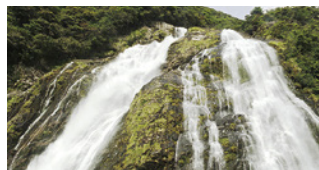
■ Yakushima

4 min. 5 sec.

The ancient natural beauty of Yakushima, one of 22 world heritage sites in Japan.

Video information

Format	AVI file (HQX codec)
Recording time	4 min. 5 sec.
Resolution	7680 × 4320
Frame rate	59.94 p
Dynamic range	HLG or PQ
Audio	Stereo in Japanese or English

* For anything other than the above format please contact our sales department.

VT-8400
8K Video Content
`8K`

■ Motocross

4 min. 56 sec.

Digital Broadcasting MMT (MPEG Media Transport) · MPEG-2 TS

*Japanese market only

ASTRO can provide transmission facility solutions such as next-generation multiplexing system MMT compatible products for 4K / 8K broadcasting, MPEG-2 TS multiplexers, OFDM modulators etc.

CX-5545 · CX-5546
MMT Multiplexer / TLV Multiplexer

For Further Details ➡ See P16

CP-5541A
MMT Recorder & Player

Recording and Playback of MMT Multiplexing Method Streams

＜Features＞
- SSD 256GB installed (max. 3 hours at 200 Mbps recording time)
- 200 Mbps stream can be recorded and played back without loss
- Time stamp changeover output
- The file corresponds to two types of pcap and proprietary format

CX-5539
TS Multiplexer

NEW

TS Multiplexer for Broadcast Main Line Equipment

＜Features＞
- Supports IP × 2 input and multiplexing
- DVB-ASI × 12 lines of input and multiplexing possible
- It is possible to set four priority levels for each PID
- Output is DVB-ASI × 4 lines (distribution)
- Dual power supply support
- 3U rack mount size
- Slot input can be configured according to the application and system

SP-5800
MMT Analyzer
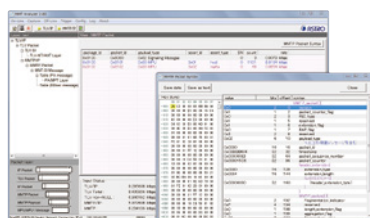
Analysis of MMT Multiplexing Method Streams

＜Features＞
- Analysis of MMT and TLV is possible
- Supports real-time analysis and offline analysis
- Syntax analysis
- Stream recording is possible
- MMTP distribution time stamp and NTP jitter analysis
- Use as a monitoring device is possible in combination with a PC

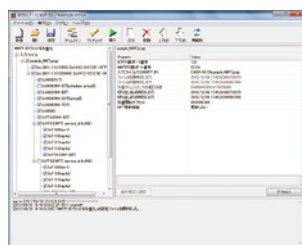## SP-5018
MMT-SI · TLV-SI Editor
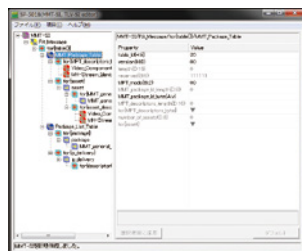
＜Features＞
- MMT-SI and TLV-SI can be created and edited
- Standard check functions
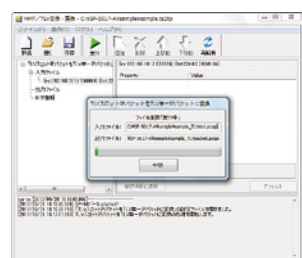
SP-5017
MMT Simulator

■ MMT Test Stream Creation / Editing

＜Features＞
- MMTP / IP file and MMT-SI multiplexing is possible
- File cutting
- IP address and packet ID can be changed

SP-5017-A
TLV / MMT Conversion Application

■ File Format Conversion

＜特長＞
- MMTP / IP, Single TLV, Composite TLV can be mutually converted
- Replacement of service configuration information of synthetic TLV is possible

CX-5528A-S
Multi-Route TS Splicer

Seamless TS Switching Regardless of Transmission Path

＜Features＞
- Switch specified TS for one service
- Switchable TS with delay difference
- TSs with different bit rates can also be switched
- Multiple transmission TS can also be switched
- 4 TS (DVB-ASI) inputs, 2 outputs

CX-5528A-F
TS Multiplexer for Relay Transmission

Connect and Go! Multiplexer for TS Multiplex Relay

＜Features＞
- Automatically follows the PAT / PMT configuration of input TS and reconfigures PAT / PMT and PID of output TS
- Output program_number is automatically reconfigured in the multiplexer
- TS (DVB-ASI) inputs four lines, outputs two (distribution)

CM-5609C
OFDM Signal Generator

Memory Built-in OFDM Modulator

＜Features＞
- Built-in 32GB CF card in the main body
- MUX · ReMUX · OFDM modulation possible with external ASI input (3 lines) and built-in memory playback TS (1 line)
- Section insertion possible (up to 20 types, interval minimum 100 ms)
- Automatically update and output time information when TOT / TDT section is inserted
- External input TS recording and playback possible (up to 35 Mbps)

* MMT ... MPEG Media Transport. It was standardized as next-generation media transmission standard (ISO / IEC 23008-1) following the MPEG-2 Transport Stream

By using the MPEG-2 TS I / O board, you can combine various applications. Offline applications are also available.

TS-7815D
TS Analyzer

■ Ideal for On-Site Stream Checking

<Features>
- Compact design of portable TS analyzers
- Available immediately after powering on
- Monitoring, analysis, and information display of major packets and section headers included in the TS stream
- Setting trigger conditions according to usage
- TS data recording with automatic trigger, log output, and alarm output possible

CB-5542-E/F
IPass

■ Transmits UDP / IP Data over TS Transmission Path

<Features>
- High bit rate IPDC (IP over TS) realized
- Supports UDP / IP data input over 200 Mbps
- CB-5542-E is used on the transmitting side, CB-5542-F on the receiving side, both used in opposition

CB-5542
ISDB-T Backup Unit

■ STL Backup Using an IP Network

CW-5543
MPEG-2 TS Monitoring System

■ Simultaneous Monitoring of Up to 40 TS Series

CX-5544
TS Monitoring / IP Transmitter

■ An All-in-One Unit for Monitoring TS, Stream Recording of Abnormality Detection, and TS over IP Transmission of Recording Streams

CX-1531
MPEG-2 TS Multiplexer Board
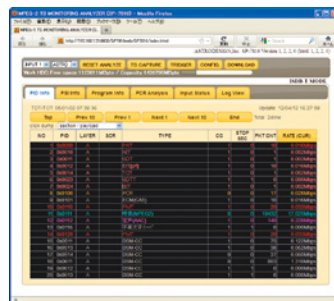
■ Low Profile Compatible Compact System Construction Possible

<Features>
- Low Profile board compatible with PCI-Express standard
- Two TS inputs, one output
- Input 2 is a selection formula with external CLK input

## SP-7816
MPEG-2 TS Monitoring Analyzer

■ Specialized Analyzer for TS Monitoring

<Features>
- Results can be remotely monitored with a general Web browser
- Real-time simultaneous analysis of two TS series
- PID specific information display, PCR analysis (Interval / Jitter), PSI / SI section detailed analysis function etc.
- Alarm notification by log output and SNMP trap according to trigger condition
- ETSI TR 101 290 First Priority and Second Priority Monitoring and Alarm Notification
- Analyzed TS can be recorded
- Description analysis display of IPTV · ISDB-Tmm

SP-5008-REC
### MPEG-2 TS Recorder
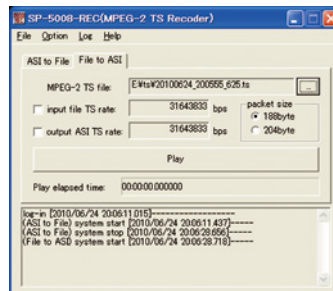
■ Use Your PC as a TS Recorder & Player

<Features>
- TS recording and playback possible via CX-1531
- TS recording can be performed using the received SNMP TRAP as a trigger
- Size of recorded TS file can be set arbitrarily
- Optional TS files can be repeatedly sent
- Broadcast TS (ISDB-T) can be played
- Pre-trigger recording is possible

SP-5002A-TSMUX
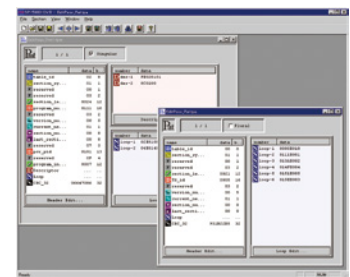### Software TS Multiplexer
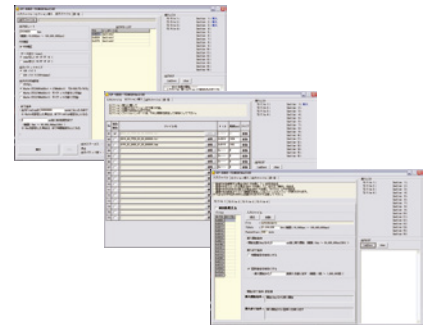
■ Ideal for Offline TS Editing

<Features>
- Up to four TS files can be output, one TS file can be output by multiplexing section files (max. 256)
- Through / Discard / Replace for each PID of input TS file can be specified
- Supports multi-section
- Sections and PID filter settings can be written to / read from files

SP-5000-ARIB
PSI / SI Editor for ARIB

■ Applications Essential for Test Stream Creation

<Features>
- Highly flexible data editing with intuitive GUI
- Supports multiple sections (sub-table)
- Compatible with private section, nonstandard tables, and nonstandard descriptor screens
- CRC_32 automatic calculation function

Video Signal Generators and Options

Video Signal Generators

VG-870B · VG-871B VG-873 · VG-874
(HDMI 300 MHz supported model)

Supports Various Video Standards Slot Type Interface

＜Features＞
- HDMI 300 MHz supported (VG-873/874)
- HDMI, DisplayPort/eDP, DVI, SDI, V-by-One® HS, LVDS and Parallel signals are supported.
- 4K/120p, 1080/120p and 1080/240p are supported.
- Full HD double speed (120 Hz)
- Uncompressed 10-bit video playback

＜Interface Units＞

＜PC Analog Unit＞ VM-1811
BNC, D-Sub 15-pin, DVI
Notes: 10-bit RGB output for signals other than DVI

＜TV Encoder Unit＞ VM-1812
BNC, D-Sub 15-pin, D-terminal, S-Video, VBS, SCART × 2CH, audio L/R

＜DVI Unit＞ VM-1814
DVI × 2CH (Single/Dual Link), Max. 330 MHz output

＜LVDS Unit＞ VM-1815
LVDS × 4CH, Max. 340 MHz output

＜Parallel Unit＞ VM-1816
Parallel × 2CH, Max. 200 MHz output

＜[4K] HDMI 300 MHz Unit＞ VM-1823
HDMI × 2CH, audio out for ARC (coaxial), audio input (coaxial)
3D, HEAC, ARC and CEC functions
Installed in VG-873/874 only

＜HDMI unit＞ VM-1822
HDMI × 2CH, audio out for ARC (coaxial), audio input (coaxial)
Max. 165 MHz dot clock. 3D, ARC and CEC functions

＜HDMI unit＞ VM-1817
HDMI × 2CH, audio L/R, audio input (coaxial)
Max. 165 MHz dot clock. CEC function

＜[4K] 4K iTMDS Unit＞ VM-1824
iTMDS × 2CH (Dual Link), digital output only

＜[4K] 4K iTMDS Unit＞ VM-1824-A
iTMDS × 4CH (Single Link), digital output only

＜[4K] V-by-One® HS Unit＞ VM-1825
MDR 26-pin × 2CH (4 lanes each)

＜[4K] DisplayPort/eDP Unit＞ VM-1826
DisplayPort 1.1a/eDP × 2CH, control signal, four power supply lines, external power supply input

＜DisplayPort Unit＞ VM-1820A
DisplayPort 1.1a × 2CH, audio input (coax)

Options for Video Signal Generator

VT-7013
HDR10+ Evaluation Contents Library (VG-876 and VG-879 Option)

NEW

＜Features＞
- Test Instruments introduced in the HDR10+ Adapter Site.
- Sample programs based on 350cd luminance test are saved in the USB flash. Users need to change program data depends on the luminance and test patterns they select in specifications.
- VSI InfoFrame and Dynamic Range and Mastering InfoFrame can be edit by users.

VT-7012
Dolby Vision Evaluation Contents Library (VG-876 and VG-879 Option)
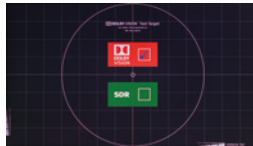
＜Features＞
- By executing the test patterns with metadata for Dolby Vision, users can evaluate their device by monitoring the check marks position and its color.
- The Program data with the appropriate Vendor Specific InfoFrame is provided.
- 1920 × 1080 and 3840 × 2160 resolutions are supported.

VT-7009
8K and 4K HDR Picture Library (VG-876 and VG-879 Option)
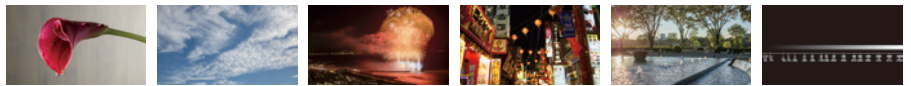

＜Features＞
- 8K (7680 × 4320) and 4K (3840 × 2160) images with 10 and 12-bit versions available to choose from.
- SMPTE ST 2084 (1000nits, 4000nits) in HDR standards, HLG and SDR formats.
- ITU-R BT.2020 (Rec.2020) color space is supported.
- 14 various images of nature scenes and scale patterns.

VT-7007
Ultra-High Definition/Wide-Color-Gamut Standard Test Images Library (VG-876 and VG-879 Option)
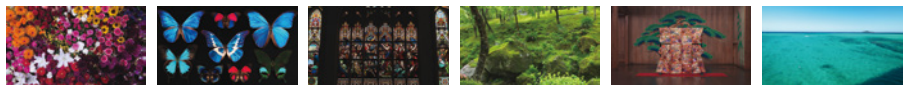
＜Features＞
- 8K (7680 × 4320) and 4K (3840 × 2160) with WCG (Wide Color Gamut) of ITU-R BT.2020 (Rec.2020) compliant (12 bits).
- 2K (1920 × 1080) with ITU-R BT.709 (Rec.709) compliant (10 bits)
- 10 images for each three kinds of resolutions

*Copyright: Institute of Image Information & TV Engineers・Association of Radio Industries & Businesses
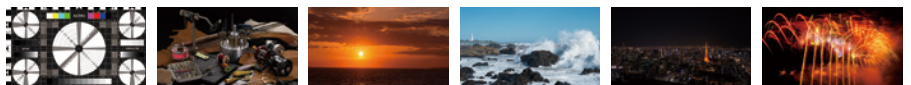*Source: Institute of Image Information & TV Engineers
*It is necessary to obtain a permission from ITE before using VT-7007 in exhibitions, etc.
  http://www.ite.or.jp/content/mta

VT-7004 · VT-7004-A
4K Still Picture Library (VT-7004 for VG-870B, VT-7004-A for VG-876, 879 Option)


＜Features＞
- 20 uncompressed 8, 10 and 12-bit nature scenes and three 4K test patterns (2 types of monoscope patterns and a "Circular Zone Plate" pattern)
- 4K output formats: DCI, DCI 16:9 and QFHD (3840 × 2160).
- With A reference manual that indicates proper evaluation of resolution, gradation, texture, color and solidity.

HDMI 2.1 Compliance Test
(VG-879 Option)

An option enabled VG-879 can perform HDMI 2.1 Compliance Test (Sink Test) by using SP-8870 software.

PC(SP-8870)   VG-879   DUT (Sink)
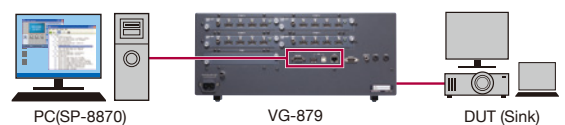
VT-8500-0006
HDMI High Bit Rate Audio (VG-870B, VG-876 and VG-879 Option)

This option provides compressed audio programs including High Bitrate audio and One bit audio.
Supported formats:
- DTS-HD Master Audio
- DTS-HD High Resolution Audio
- Dolby Digital Plus
- DSD (One Bit Audio)
- DTS Express (DTS-HD LBR)
- DTS Digital Surround
- Dolby True HD

HDMI Compliance tests can be performed as an option.

In order to view beautiful images, a high-definition display is necessary, but equipment needed to transmit the image cannot project clears images unless it itself is of high quality.
As a pioneer in this field, ASTRODESIGN supports R&D and the production of digital AV equipment.

Protocol Analyzer

VA-1847 HDMI 2.1 / HDCP 2.3 Protocol Analyzer
VA-1842 HDMI 2.0b / HDCP 2.3 Protocol Analyzer

VA-1847 (HDMI 2.1 / HDCP 2.3)
The latest HDMI 2.1 / HDCP 2.3 functions can be inspected and measured

＜Features＞
- Supports HDMI 2.1 and HDCP 2.3
- Fixed Rate Link (FRL) Supports signal analysis and signal output at CTA-861-G Video Identification Code (VIC) timing using 4 lane mode 48 Gbps.
- Supports 4K / 120p YC_BC_R 4:4:4 and 8K/60p YC_BC_R 4:2:0 timing
- Video timing, audio timing, InfoFrame measurement, HDCP 1.4 and 2.3 analysis, SCDC analysis possible.
- InfoFrame (Dynamic range etc.) log information retrievable with individual timestamped frames.
- Equipped with eARC/ARC transmission/reception functions.
- Equipped with EDID emulation and DDC/CEC monitoring function.
- 12-inch touch panel.
- HDMI 2.1 compliance test funtion.
- Supports three test modes: Receiver mode, Generate mode, and Repeater mode

VA-1842 (HDMI 2.0b / HDCP 2.3)
The latest HDMI 2.0b / HDCP 2.3 functions can be inspected and measured

＜Features＞
- Supports HDMI 600 MHz
- Supports HDCP 2.3
- Upto 4K format analysis, ITU-R BT.2020 compatible
- Status display of each InfoFrame such as 3D, HDCP 2.3 / 1.4, CEC, EDID
- CEC and DDC line capture and log acquisition
- Receiver mode (Sink Emulate)
  Analysis of HDMI / HDCP protocols and video timing
- Through function (optional)
  Real-time test of CEC, DDC communication between Source and sink device, saving log data
- Generate mode (Source Emulate)
  It can also be used as a signal generator which supports HDMI 4K and HDCP 2.3 / 1.4.
- Compliance test function
  Compliance test function for HDMI 2.0b and HDCP 2.3

VA-1839
GVIF Protocol Analyzer

Display, measure each function of GVIF* (Gigabit Video Interface).
You can evaluate the HDCP functions of GVIF compatible equipment.
* GVIF is a trademark of Sony Corporation.

＜Features＞
- Video Timing Measurement, Picture Display
  Measures the video timing output from the inspected device and display images. Audio signal measurement and playback are also possible.
- Signal generation function
  Any video signal can be output. Supports HDCP ON / OFF and audio signal output.
- HDCP CTS function
  It is possible to evaluate each item copyright protection item function defined by HDCP.

Automatic Testing Systems

VA-1845
HDMI 4K Source Tester

■ Automatic Inspection

This device in an automatic inspection device for production lines compatible with HDMI 2.0b and HDCP 2.2.
It is possible to measure / analyze HDMI output equipment via PC, and set test items freely by command.

＜Features＞
- HDMI 2.0b / HDCP 2.2 compatible
  4K/60p RGB 4:4:4 measurement up to 8 bits possible
- Video output check
  Checks the video data transmitted by the HDMI output device
- Audio output check
  Checks the level of audio output, frequency check, waveform acquisition
- Read confirmation of Packet/InfoFrame
  Performs HDMI protocol check and allows pass/fail judgment
- DDC line check
  Performs access check of EDID, HDCP, SCDC.
- CEC line check
  Performs access check of CEC command.
- Self-check mode equipped

## HDMI Tester

VA-1844A
HDMI Tester

A lightweight HDMI tester thin enough to be carried
Quickly confirms the latest functions of HDMI 2.0b · HDCP 2.2
Confirms connectivity between devices and implements cable test functions

＜Features＞
- 7-inch touch panel
- Compact size: 269 (W) × 182 (H) × 41 (D) mm
- Weight 1.25 kg
- 2 units synchronous mode (optional)
- HDMI 2.0b output (optional)
- Repeater mode (optional)
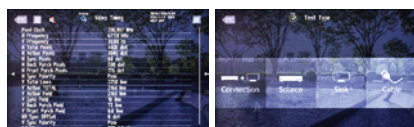
Analysis screen

Test (troubleshooting) screen

Receiver Mode (Sink Emulation)
It is possible to measure video timing, confirm the status of HDCP 1.4 / 2.2, check the SCDC status, confirm the InfoFrame and Packet, set the EDID or emulate it from the target sink device, and save all data in the log.

Source Device

Generate Mode (Source Emulation)
Upto 4K/60p 4:4:4 output is possible when emulating a source device.

Sink Device

Through Mode (Cable Emulation)
By connecting VA-1844A between the source device and the sink device, you can check the direct communication of the DDC/CEC line.

Source Device
Sink Device

Repeater Mode (Repeater) (optional)
Confirm that the output device operates correctly as a repeater.

Source Device
Sink Device

■ Compatible Function Comparison

◎ : Dedicated

	Receiver mode	Through mode	Repeater mode	Generate mode	Standard	4K2K	8K4K	HDCP	CTS	R&D	Production line	Field Service
VA-1847	○	×	△	○	HDMI 2.1	30Hz/60Hz/120Hz	60Hz	2.3/1.4	○	◎	×	○
VA-1842	○	Option		○	HDMI 2.0	30Hz/60Hz	×	2.3/1.4	○	◎	×	○
VA-1839	○	×	×	○	GVIF	×	×	1.4	×	◎	×	○
VA-1844A	○	○	Option	Option	HDMI 2.0	30Hz/60Hz	×	2.2/1.4	×	○	○	◎
VA-1845	○	×	×	○	HDMI 2.0	30Hz/60Hz	×	2.2/1.4	×	△	◎	△

ASTRODESIGN has been working on high vision video since the dawn of HD and we strongly support digital broadcasting standards that create images that are fit to be called high resolution.

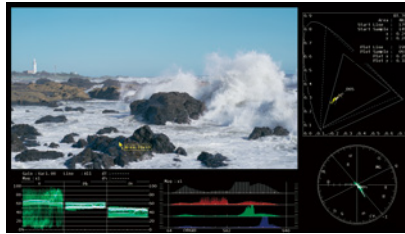## WM-3206B · WM-3206B-A
4K Waveform Monitor

4K
HDR

■ 4K Compatible Waveform Monitor

＜Features＞
- 2K and 4K compatible
- HD-SDI (Dual/Single Link) and 3G-SDI (Level A/B) supported
- Square Division and 2-sample interleave division supported
- HDR (HLG, PQ, S-Log and Canon Log) scale waveform
- Free layout
- DC 12V type available (WM-3206B-A)

Layout setting example

DM-3021-G · HW-7066
17-inch LCD Monitor / Closed Caption Checker
* Japanese market only

Monitors Specialized for Monitoring Materials with Closed Captions or Rasterization

Displays HD subtitles, SD subtitles, mobile subtitles, and analog closed captions.
Also supports external characters (DRCS).
In addition to subtitle display, it supports decode display of inter-station control signals (conforming to ARIB STD-B39) and CM code (conforming to ARIB TR-B23).

＜Features＞
- HD subtitles, SD subtitles, analog closed captions, and portable subtitles
- CS packet (Clear Screen) monitoring function
- History display
- Ancillary data display
- CM code (conforming to ARIB TR-B23) and inter-station control signal (Compliant with ARIB STD-B39) decode display
- Log management software (optional)

AM-3807 · AM-3807-A
Audio Loudness Meter

7-inch Color Liquid Crystal Mounted with Emphasis on Visibility and Operability

Implements loudness range, surround waveform, Lissajous waveform, needle meter, spectrum analyzer display, demultiplex function.
Measure the loudness value of an audio signal of embedded SDI / AES input.
It is possible to manage the surround sound level, the phase monitoring between the channels, and the sound image management easily.

＜Features＞
- Overwrite re-measurement functions with time code management
- Log storage / reading function to USB memory
- Loudness range display
- Spectrum analyzer function
- Needle meter function
- Demultiplex function

AM-3805
Audio Monitor

Loudness Function Standard Equipped Audio Monitor

This is an advanced audio monitor that separates the audio signal embedded on each 3G / HD / SD SDI signals from the video signal and can simultaneously monitor up to 2 channels with built-in speakers or headphones.

＜Features＞
- HD and SD-SDI signal input supported
- External audio input/output: 8 channels each for AES/EBU input and output signals (total of 16 channels),
- 8 channels each for analog balanced input/output signals
- Stereo speakers (for left and right channel signals) provided
- Loudness meter functions compliant with the ARIB TR-B32 standards (ITU-R BS.1770 standards) featured
- 5.1 multichannel down-mixing function: Computation formula of ISO/IEC 13818-7:1997(E) standards and ARIB STD-B21 standards supported
- 1U rack-mounting size

HW-7069
3G/HD-SDI Rasterizer

■ The New VE Desk Monitor

On the modern VE's desk, it is common to see several monitors, ID display machines, and waveform monitors.
ASTRODESIGN proposes a product that combines these into one unit.

＜Features＞
- Up to 4 systems of video and waveform are displayed on one screen
- Layout of information such as images, waveforms, vectors can be changed easily
- Interlocking with CCU and switcher is possible
- 3G-SDI compatible

SD-7822
HD/3G-SDI PID CHECKER

NEW

4K

＜Features＞
- Equipment for displaying HD / 3G-SDI signal format information, presence / absence of audio packets, time code information, etc.
- Compact, lightweight, battery-driven, single hand operation, ideal for signal confirmation at relay sites

DM-3417
12-inch 4K LCD Monitor

4K

HDR

Compact and Lightweight 4K LCD Monitor

This small and lightweight monitor uses a 12-inch 4K resolution LCD to display full screen 4K.

＜Features＞
- Dot-by-Dot 4K display on a 12-inch monitor
- Supports 4K (3840 × 2160/59.94p YC_BC_R 4:2:2 10-bit, Square Division, 2-sample interleave division) input
- Supports 12G-SDI × 1 input, 3G-SDI × 4 input 2 lines of 12G-SDI × 1 input, 1 line of 3G-SDI × 4 inputs available
- Through-output of each SDI format
- Compatible with HDR (Hybrid Log-Gamma [HLG: ITU-R BT.2100], Perceptual Quantizer [PQ: SMPTE ST 2084], S-Log 3)
- ITU-R BT.2020, ITU-R BT.709 compatible
- Supports registration and reading of two user configurable 1D LUTs and 3D LUTs
- Zoom (MAG) function. 2 times magnification. After enlargement, enlarged portions of the 5 stages can be specified horizontally and vertically
- Test pattern output to monitor (SMPTE color bar, gray scale, window, 50% flat field)
- Focus assist function

DF-3515
Native HD Electronic View Finder

HDR

【Installation example】

Native HD 1920 × 1080 Resolution OLED Installed

＜Features＞
- HDR display function
- Supports HD-SDI multi-format input
- HDMI input
- Low latency
- Peaking, upside-down function, × 2 × 4 magnification display
- HDMI to SDI conversion function (2K only)
- Mono, Blue Only function

MEMO

4K / HD Production Studio, OB Van Products, CG Delivery System

Through the power of ASTRODESIGN's technology and with four times as many pixels as Full HD, 4K allows the viewer to enjoy an exceedingly realistic video experience.

SB-4024-A · SB-4027 · SB-4031
4K Converting Board

NEW **4K** **HDR**

SB-4024-A: 3G-SDI Compatible 4K-HD Cross Converter
SB-4027: 3G / 12G-SDI Compatible 4K-HD Cross Converter
SB-4031: 3G / 12G-SDI Compatible 4K-HD Down Converter

For Further Details ➡ See P20, P21

BE-4028
Board Enclosure

4K **HDR**

＜Features＞
- Up to two 4K converter boards can be mounted simultaneously
- Redundant power supply
- 1U rack size

SD-7073
4K Interface Converter

4K

A device that converts four SDI signals (3G / Dual / HD-SDI) and HDMI signals in both directions.

＜Features＞
- Frame Rate Conversion
- Color correction function (GBR gain · offset · contrast / brightness · color temperature), marker multiplexing function, audio headphone output, magnification display function
- Asynchronous input support (± 0.5 V lead-in)
- Built-in test pattern display (color bar, grayscale)

HD-1679
4K DSK

NEW **4K** **HDR**

For Further Details ➡ See P22

HD-1678
HDTV / 4K DSK

4K

HD DSK / USK: 2 Lines, Super 8 Lines *
4K DSK: 1 Line, Super 2 Lines *

＜Features＞
- 3G-SDI / HD-SDI compatible
- Supports asynchronous input between each super *
- AVDL function
- Connect up to 2 remote controllers
- Redundant power supply

* Super: Super-imposed data

VC-7063 · VC-7063-1
Stereo Composer (VC-7063-1: with 3D Keyer)

3D Synthesis · Separation, Format Interface Conversion, Condensing Every Function, from On-site Shooting to Control Room

3G / HD-SDI, HDMI compatible 3D composer.
Two input signals can be multiplexed by a single 3D signal Side by Side or vice versa into two L / R systems and further Outputted. 3G / HD-SDI ⇔ HDMI interface and format conversion is also available

＜Features＞
- Compatible with several conversion methods such as Side by Side, Top and Bottom, Line by Line, Field Sequential, Frame Packing (* HDMI only), Supports
- Alignment function
- Mirror function
- Color correction function
- Frame synchronization function
- Enlargement / reduction function
- Multiple Marker Function
- Audio recombination / delay function
- Alarm output terminal (VC-7063-1 only)
- 3D keyer function (VC-7063-1 only)

GG-167-4K
4K Frame Memory Board

4K

A Frame Memory Board with Real-time 4K Output

＜Features＞
- High-speed data transfer in compliance with PCI Express 2.0 standard × 16 (electrical × 8)
- 4K/59.94p real-time video output with 3G-SDI × 4 lines output
- Image synthesis to 4K input image is possible by using optional input / output expansion board
- Extensive support system with SDK standard attachment, sample code provision etc.

GG-167-HD
HD Frame Memory Board

Real-Time Transmission, Full Frame Video Display

A frame memory board which can simultaneously output HD-SDI × 4 lines (fill or key selection).

＜Features＞
- High-speed data transfer in compliance with PCI Express 2.0 standard × 16 (electrical × 8)
- Capture input signal and synthesize output within board
- HD FILL + KEY 2 lines simultaneous output and simultaneous FILL 3 lines output etc. is possible
- Extensive support system with SDK standard attachment, sample source code provision, etc.

VC-7063 Application Example

3D format and Interface Conversion.
Solution for both Medical and Broadcasting market.

Medical Applications

3D medical endoscope
Medical microscope

SDI Simultaneous

VC-7063

HDMI Side by Side

3D Monitor

System Integration Processor

ASTRODESIGN's proprietary image conversion algorithm makes up / down scaling in real time and resolution conversion at high speed while maintaining high image quality possible.

MC-2085 · MC-2086
Multimedia Scan Converter

MC-2085

MC-2086

8K2K High Resolution Support Multi Video Processor

For Further Details ➡ See P23

MI-2100
Media Integrator

Multi-function Digital Multi-switcher

Scan converter built-in multi-screen is compatible with the processor.
As well as supporting HDCP, it is ideal for a multi-display system such as monitoring, signage, and for use conference rooms.

＜Features＞
- I / O up to 68 channels
- 8.4-inch touch panel capable of intuitive operation
- Audio support (embedded / main unit earphone)
- Aspect mode selection
- EDID emulation (output copy)
- Joint / blending area setting

SC-2065A/B
Flexible Scan Converter

Best Entry Model for a Presen-tation or Events System

Format conversion, interface conversion, aspect ratio conversion compatible with HD / SD-SDI, DVI-D digital interface, analog YP_BP_R / Y (R-Y) (B-Y) / RGB, VBS analog interface video standards are all made possible.
As well as up-converting and down-converting with one unit, you can extract only the necessary part of the input video and set the output position freely, so it performs well in a variety of situations such as recording / editing, presentation, events and output to special equipment.

＜Features＞
- HDCP compatible (DVI)
- Various input / output interfaces
- "TERA" high image quality scaling processing (12-bit operation processing)
- "Astrosnap" high image quality I/P conversion processing (12-bit operation processing)
- Intuitive front menu operation
- WebUI, command control, SNMP monitoring via Ethernet connection

RB-1650C
Remote BOX

- 16-button learning function BOX allows registration of commands for each button
- RS-232C (9600 bps, 19200 bps, 38400 bps auto detection)
- DC 5V power supply (AC adapter included)
- Dimensions: 160 (W) × 40 (H) × 110 (D) mm

SC-2067B
Flexible Scan Converter

3D-SDI, Audio Compatible Top Model

SC-2067B is a universal type video processor covering a wide range of analog interfaces, including Component YP_BP_R / Y (R-Y) (B-Y), Composite VBS, RGB and digital, as well as DVI-D, HDMI, and SDI from SD-SDI to 3G-SDI.
It supports not only video but also audio, SDI embedded audio, HDMI digital audio, and external analog audio.
It also supports SNMP monitoring via LAN connection and can be used safely as a baseband or transmission equipment as well as standalone.

＜Features＞
- HDCP compliant (HDMl / DVl)
- Audio support (input selection, optional delay setting possible)
- Various input / output interface
- "TERA" high image quality scaling processing (12-bit operation processing)
- "Astrosnap" high image quality I/P conversion processing (12-bit operation processing)
- Intuitive front menu operation
- WebUl with Ethernet connection, command control, SNMP monitoring

RB-1636A
Remote BOX

- By pressing key switches 1-16, you can to switch the corresponding 1-16 mask tables. (MC-2085 / MC-2086 compatible)
- No power supply required
- Dimensions: 85 (W) × 30 (H) × 120 (D) mm

MEMO

8K Camera System 【CM-9010-B】

This uniquely designed camera has a seperated but connected camera head and CCU.

This allows it to support a wide range of shooting environments and not be subject to typical shooting restrictions.
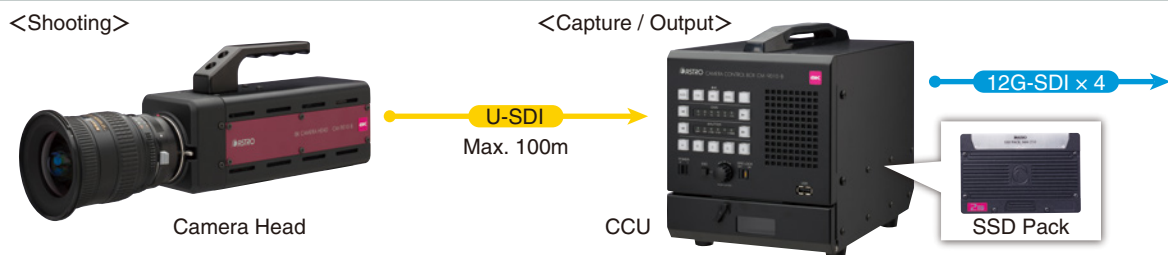
The connection between the camera head and CCU can be extended up to 100 meters by using a U-SDI cable.

We hope that this design will inspire new ways of shooting and production.

CM-9010-B

Connection Diagram

<Shooting>   <Capture / Output>

U-SDI
Max. 100m

12G-SDI × 4

Camera Head   CCU   SSD Pack

Specifications

Camera

Item	Specification
Sensor	Super 35mm equivalent single plate CMOS image sensor 24.576 mm × 13.824 mm
Number of effective pixels	Approximately 33 million pixels
Lens Mount	Micro Four Thirds
Latitude	12 Stop
Electronic shutter	·1/24, 1/48, 1/50, 1/60, 1/100, 1/120, 1/240, 1/480, 1/960, 1/1920 ·Variable shutter (1/24sec. to 1/10000sec.)
Frame frequency	24, 25, 50, 59.94, 60 Hz
Gain	-3, 0, +3, +6, +9, +12, +18 dB
Gamma curve	·HLG (Dynamic range 100, 200, 250, 400%) ·Log gamma ·SDR
Color gamut	ITU-R BT.2020 / BT.709

Recording function

| Item	Specification
Storage	SSD Pack（MM-210)
Recording time	40 minutes (2 TByte), 80 minutes (4 TByte)
Video Codec	Grass Valley HQX Codec (7680 × 4320 4:2:2 10-bit)

Output

Item
8K video output: 12G-SDI × 4
4K video output: 3G-SDI × 4
HD video output: HD-SDI × 1

General Specifications

Item	Specification
Power Requirements	TBD
Weight	Camera Head: 1kg CCU: 5kg
Dimensions	Camera Head: 75 (W) × 72 (H) × 210 (D) mm (Excluding Protrusions) CCU: 120 (W) × 160 (H) × 180 (D) mm (Excluding Protrusions)

Application Example – VR –

With only a fisheye lens with an 8K camera, you can shoot at an extreme wide angle in high resolution and with no stitching.

By connecting with editing / distribution server, real-time 8KVR distribution is also possible.

Edit / Distribution
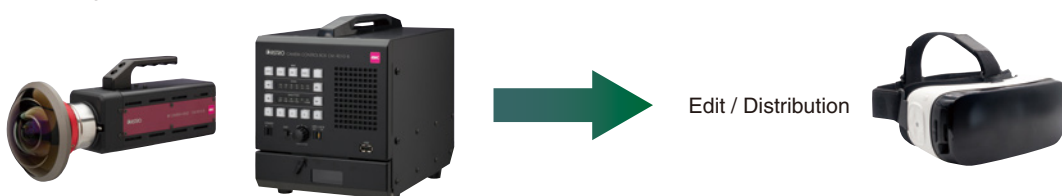
Next-Generation Innovative Microscope
Calling all researchers,
ASTRODESIGN has a new challenge for you!

Laser Scanning Optical Pupil Extension Microscope 【LM-9001】

La SCOPE

Laser Scanning Optical Pupil Extension Microscope

LM-9001 is a transmission type laser scanning microscope like never seen before.

Unique stereoscopic aperture technology and signal processing technology make possible unstained super-resolution observation of transparent objects as well as the observation of intensity, phase, polarization, and reflection information from the same point at the same time, which has been impossible up until now with the conventional microscope. Real-time observation is also possible.

(3 patents in the US, 1 in Europe, 9 in Japan. Patent pending in several other countries)

LM-9001

Features

● Real-time multi-method observation
Using the LM-9001, intensity, phase, polarization, and other information can be observed at 15 frames per second.
Simultaneous comparative observation of various information was made a reality by imaging a plurality of optical information from the same laser scan point using high speed digital signal processing.
With this, a new observation method has been born.

● Super-resolution imaging beyond the optical diffraction limit (patented)
By combining unique expansion aperture technology (optics) and high-speed digital signal processing technology (electronics) at which ASTRODESIGN is an expert, we were able to realize a resolution equivalent to NA 1.20 (water immersion) with a dry lens of NA 0.95.
This will provide a release from the troublesome maintenance of immersion lenses.

● Worlds first! Complete separation of intensity information and phase information
In conventional phase contrast microscopes, observations are made by converting the phase into intensity information when the intensity information and phase information were mixed.
The LM-9001 can completely separate intensity information and phase information and observe each.
We would like to propose this new observation method to the world.
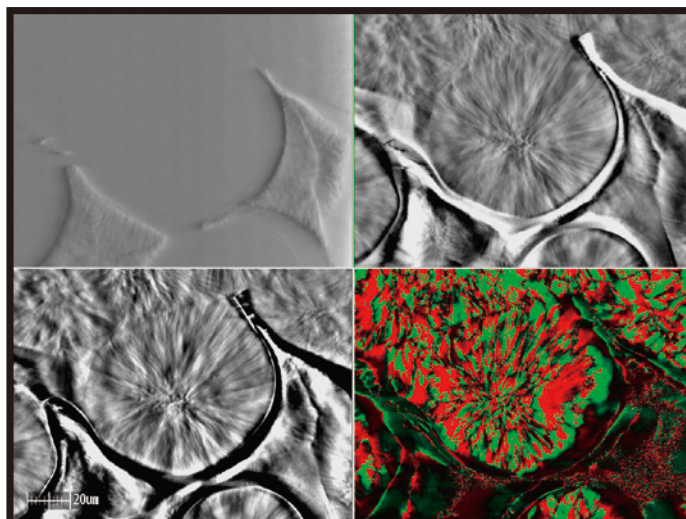
*La SCOPE is a registered trademark of ASTRODESIGN,Inc.

Corporate Profile

|	
Company Name	ASTRODESIGN,Inc.
Established	February 15, 1977
Capital	72 Million Yen
President and CEO	Shigeaki Suzuki
Officers	Vice President Tsutomu Mihara
	Director Yoshiaki Tochimoto / Yoshihito Manabe / Lai Wayne / Yasuhiro Yoshida / Keiji Kimura
	Auditor Minoru Hosaka
	Executive Officer Kunihiro Shimazaki
Employees	155
Business	Drawing on expertise in high-speed digital signal processing, ASTRODESIGN,Inc. develops manufactures, and sells imaging and video equipment, software, HDTV studio equipment, digital broadcast equipment, and display testing in addition to sales of communication, control, and testing modules and systems.

Company History

Year	Event
1977	Established in Tokyo, specializing the design and development of electronic equipment
1979	Developed the world's first programmable video signal generator
1985	Invited to participate in joint HDTV development with NHK
1986	In response to growth, relocated to a new facility in Kawasaki
1987	Kansai office opened in Osaka, serving Western Japan
1990	Capital increased to 72 million yen
1993	Kawasaki Technology Center opened (merged into head office in 2007)
1996	ISO 9001 certified (registration no.: JET-0056)
1998	Tottori R&D Center opened
1999	ISO 14001 certified (registration no.: E99-102)
2002	Merger with affiliate NPS, head office relocated to Meguro-ku, Tokyo
2005	UHDTV processor jointly developed with NHK for Expo 2005 in Aichi
2007	Head office relocated to Ota-ku, Tokyo; consolidation of three Tokyo offices
2010	Expanded 4K product lines (including cameras and recorders) in anticipation of UHDTV market growth
2012	Subsidiary ASTRODESIGN,Inc. established in Silicon Valley, California
2013	Expanded 8K product lines in anticipation of 8K trial broadcasting
2016	Open "8K Suite" as 8K production facility
2017	Developed world's first DLP 8K projector image processing board and supplied to Digital Projection Limited (A Delta Associate Company). Both companies are in charge of the projector.
2018	LaSCOPE (Laser Scanning Optical Pupil Extension Microscope) Product Announcement

Head Office
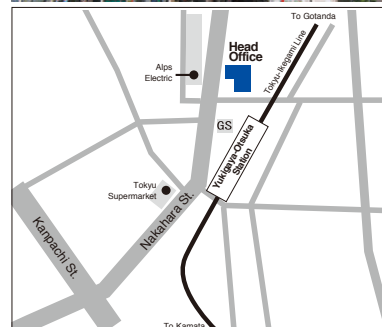
2-minute walk from Yukigaya-Otsuka Station, Tokyu-Ikegami Line

1-5-2 Minami-Yukigaya, Ota-ku, Tokyo 145-0066 Japan
Tel +81-3-5734-6300 Fax +81-3-5734-6101
www.astrodesign.co.jp

Osaka Sales Office

1-18-27-1010 Higashi Nakajima, Higashi Yodogawa-ku,
Osaka 533-0033 Japan
Tel +81-6-6328-8558 Fax +81-6-6328-5058

Tottori R&D Center

1015-21 Ohara, Houki, Saihaku, Tottori 689-4102 Japan
Tel +81-859-39-8200 Fax +81-859-39-8201

USA Office

780 Montague Expressway, Suite 302, San Jose CA 95131 USA
Tel +1-408-435-7800 Fax +1-408-435-7900
info@astro-americas.com   www.astro-americas.com

ASTRODESIGN, as a manufacturer who pushes the creation of new 8K video production environments, has continued to develop the theme of "Optimizing Total Production Workflow" from shooting to end production.

On the other hand, the conventional video production environment is not necessarily the ideal collaboration between the development of shooting equipment and post-production facilities such as computers and workstations. From the creator's point of view, "optimization" is missing. Particularly in 4K and above, the signal density is high and it will inevitably become an important task in future work to increase the processing speed and storage capacity.

Even 8K, which is said to be the ultimate in "Optimizing the Performance" of video, this is the biggest problem that must be solved in order to gain customer satisfaction and trust in all QCDs.

We, ASTRODESIGN, have recently released an optimized 8K video production workflow, and in the future, we plan to focus on content creation itself, spreading it to the world, and other support activities, as well as all those involved in video production.

## 8K Equipment Rental and Support System Open for Business!

In December 2018 the 8K satellite broadcasting began in Japan, and further 8K public viewing etc. is planned for the near future.

With this anticipated increase in demand, ASTRODESIGN has begun a rental program for various equipment like our 8K camcorder, projector, editing system, and peripheral items as well as facilities to support content production. It is our goal to deliver 8K video to people all around the world and create new value through the fusion of 8K and other technologies.

8K technology is not just an extension of HD, 4K, it is an innovative, top quality way of expression through video technology.

We at ASTRODESIGN are proud 8K pioneers and we will continue to strive to enrich society through further research and development.
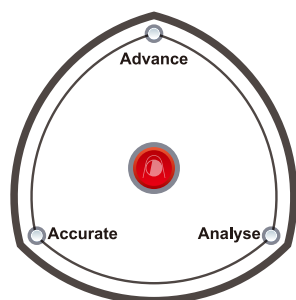
Advance

Accurate   **Analyse**

contents

ASTRODESIGN,Inc.

URL http://www.astrodesign.co.jp

● For more information, please contact us :

TOKYO Headquarters
TEL +81-(0)3-5734-6320   FAX +81-(0)3-5734-6102
1-5-2 Minami-yukigaya, Ota-ku, Tokyo, Japan 145-0066

USA OFFICE
TEL +1-408-435-7800   FAX +1-408-435-7900
780 Montague Expressway, Suite 302, San Jose CA 95131 USA
URL http://www.astro-americas.com

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