

High-Speed Camera QDCAM®

M&Inext

High-Speed
BOX Camera
for Sports

QDCAM®



Global Shutter
Multi-Camera Synchronizing Exposure System
Multi-Camera High-Speed Video
Synchronizing Playback System



High-Speed Box Camera for Sports QDCAM®

Affordable High-Speed Box Camera

Excellent
image
quality

Remote
camera/lens
control

High-precision
multi-camera
synchronized
shooting



Features

High-speed shooting

4x speed



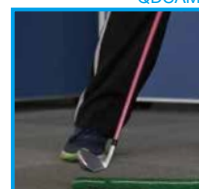
With 1920 x 1080 pixel FHD resolution, 4x speed shooting at 239.8 fps or 200 fps is possible. In combination with a slow-motion server, smooth slow-motion playback can be performed, making high-precision sports analysis possible.

Global shutter

CMOS image sensor



Rolling shutter shooting



Global shutter shooting

QDCAM

Global shutter image sensor provides excellent picture without rolling shutter distortion in a quick moving object. Global shutter sensor is suitable for sports shooting.

High-resolution shooting

4K



At a frame rate of 59.94 fps or 50 fps, 3840 x 2160 pixel UHD resolution shooting is possible. At 24 fps, 4096 x 2160 pixel DCI 4K resolution shooting is possible.

Micro four thirds lens system

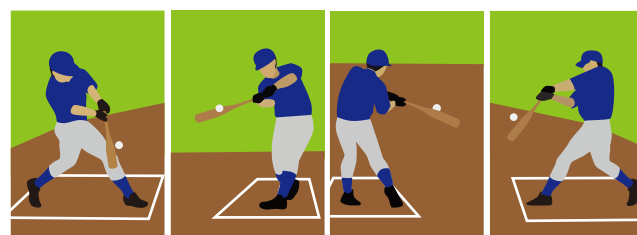


The adoption of micro four thirds allows the use of inexpensive, high-quality lenses. It also allows the use of bright lenses that are effective for high-speed shutter shooting under nighttime game lighting. The iris and focus can also be controlled remotely by electronic control using electrical contacts.

Optical transmission using a fiber optic camera cable



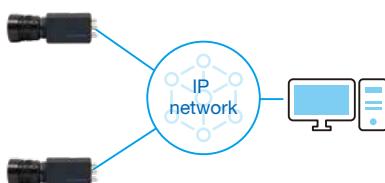
You can use optical transmission system using SMPTE standard fiber optic camera cables which are installed in stadiums and other facilities frequently used for sports broadcasting.



Multi-camera synchronizing exposure system

The exposure timing of multiple cameras can be synchronized with high-precision without being affected by differing camera cable lengths. This allows the video from multiple cameras to be frozen simultaneously, preventing any timing deviation when switching to a video from a different angle. This also can improve the calculation accuracy of automatic sports referee systems which use images from multiple cameras. (Japan patent No. 6635635)

Remote camera operation using a LAN/IP network



Box cameras for city view, weather view or other purpose, installed in a distance, can be controlled remotely by PC through an IP network.

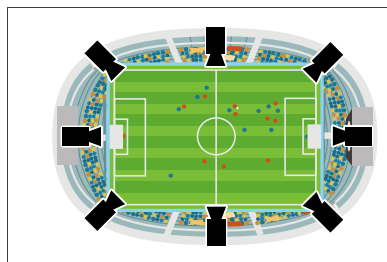
Multi-camera high-speed video synchronizing playback system

When linked with a QDVS recorder/player, high-speed video from multiple angles can be synchronized for slow-motion playback or frame-by-frame playback, allowing the video to be checked for sports referee calls.

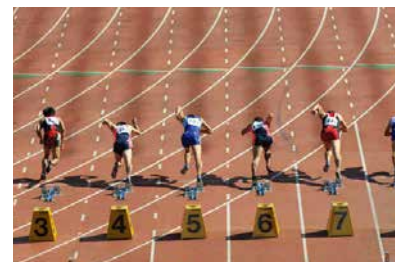


Affordable high-speed cameras **allow variety of slow-motion views.**

Sports Broadcasting and Program Production

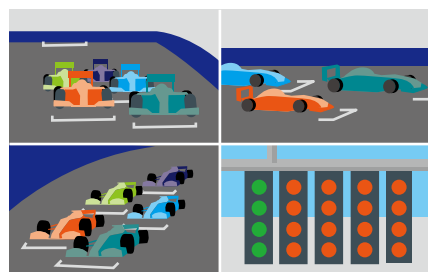


Affordable cameras are **ideal for multi-angle video or free viewpoint video production** that requires large number of cameras.

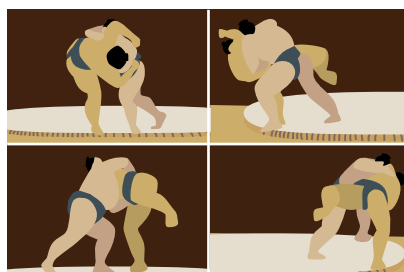


Can also be used for **UHD program production.**

Video Assistant Referee



Example: Race start and goal scenes



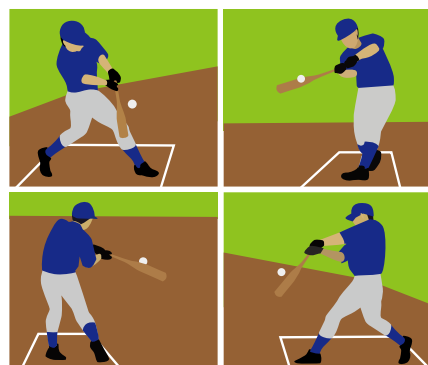
Example: Martial arts game scenes

High-precision **synchronous high-speed video shooting** and **synchronized playback** for checking the timing of a wide range of movements.

Automatic Judgement System

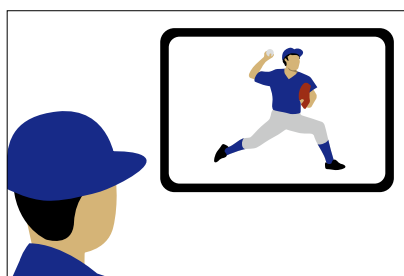


Synchronizing shooting with high-precision **improves the calculation accuracy of automatic judgement system.**



A wide range of analysis is possible using high-speed shooting synchronized with high-precision.

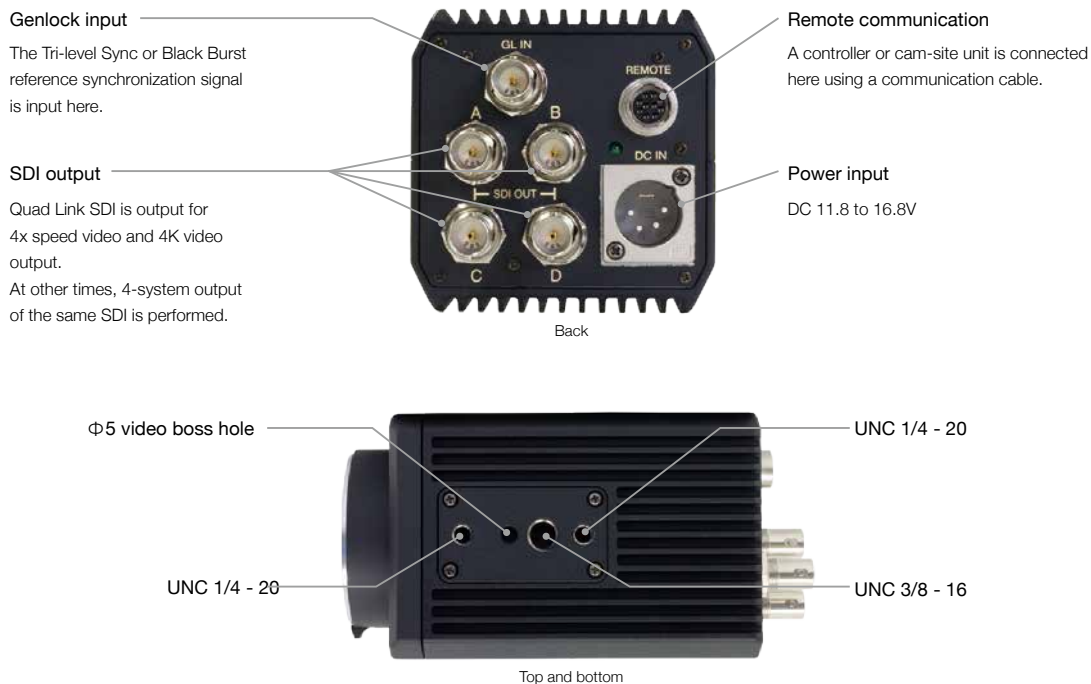
Sports Analysis and Coaching



Delayed display of video with QDVS **allows athletes to check their own form.**



Team formations and player **movements** can be analyzed for use in coaching.



Lens and Camera Communication Control Items

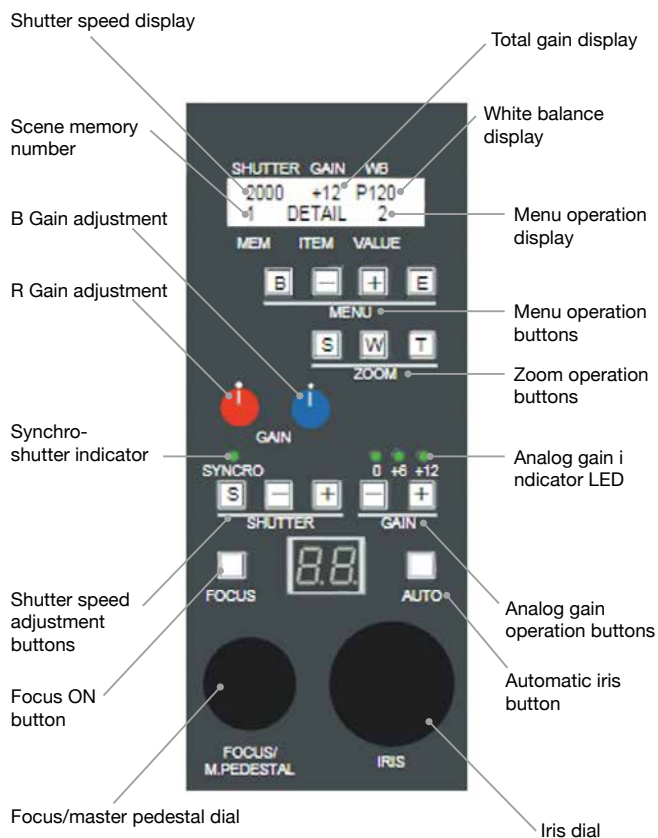
● Lens control

Focus	Iris	Zoom
Near ↔ Far	Open ↔ Close	Wide ↔ Tele-photo * Power zoom lens only

● Camera control

Video Format	DCI24/DCI23/UHD60/UHD59/UHD50/UHD24/UHD23/FHD240/FHD239/FHD200/FHD60/FHD59/FHD50/FHD24/FHD23/FHD59/FHD50i
Step Shutter	1/50, 1/60, 1/100, 1/120, 1/125, 1/200, 1/250, 1/400, 1/500, 1/750, 1/1000, 1/2000, 1/3000, 1/4000, 1/6000, 1/8000, 1/12000 sec
Synchro-Shutter	1/60.2 to 1/4096 sec
Gain Adjustment	-6 to +36 dB (1 dB steps)
Color Gain Adjustment	R_GAIN, G_GAIN, B_GAIN
Black Level Adjustment	MASTER PEDESTAL, R_PED, G_PED, B_PED
Automatic Iris	ON/OFF
Automatic Iris Response Speed	0~15
Target Luminance Level Adjustment	-12 to +12 dB (1 dB steps)
Gamma	BT.709 standard gamma * Fine adjustments are possible. BT.2100 hybrid log gamma (HLG)
Knee Mode	MANUAL/AUTO
Knee Point	100%/95%/90%/85%/80%/75%/OFF
Detail Enhancement	0 (OFF) to 7 (high)
Noise Reduction	OFF/ON
Flicker Cancel	50 Hz power lighting / 60 Hz power lighting / OFF
White Balance Mode	AUTO/MANUAL/PRESET
Manual White Balance	MAIN/CH A/CH B/CH C (Take & Load)
Preset White Balance	Color temperature 2800 to 10000K (100K steps)
Color Gamut	BT.709, BT.2020
6-Axis Color Correction	Hue and saturation of each color axis: magenta, red, yellow, green, cyan, and blue
Image Angle Selection for 4x Speed Shooting	CENTER ROI/FULL SCREEN
Scene Memory	Camera setting data can be stored to 3 sets of scene memories and can be loaded from one of scene memories.
Color Bar	ON/OFF
Blemish Compensation	Automatic blemish detection and automatic blemish compensation

ROP (Camera Controller)



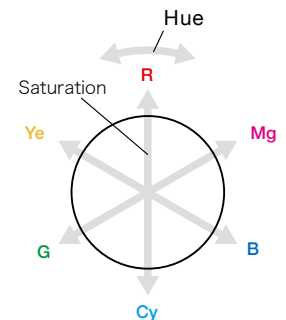
Basic Camera Functions

6-Axis Color Correction

With the QDCAM camera, it is possible to adjust the hue and saturation independently for each of 6 axis colors as shown by the vector scope, specifically red, magenta, blue, cyan, green, and yellow.

This 6-axis color correction is useful in cases such as when shooting with cameras from multiple manufacturers, or when color differences cannot be identified when the image is changed by the switcher.

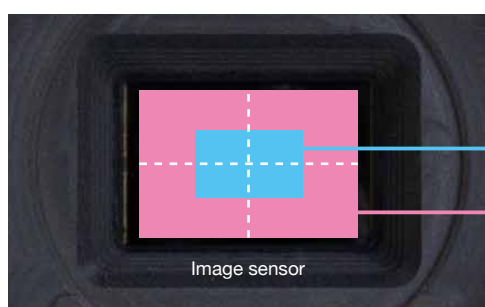
In addition, it is possible to change the overall Chroma Level by increasing or decreasing the saturation for all 6 colors without changing the hue. The latest firmware allows much more rich color; expanding saturation adjustment range.



View Angle Mode for 4X Speed Shooting

When shooting at 4X speed such as 240fps, 239.8fps and 200fps frame rate, 2.1million pixel signals out of a total 8.8million pixels are read out. Normally, 2.1million pixel signals in the center of the image sensor are read out to provide high-quality, high-speed video without jaggy. (Center ROI mode)

However, you can also use Full Screen mode, which reads out 2.1million pixel signals by thinning out evenly from the full screen, to take a wider image.



Center ROI mode

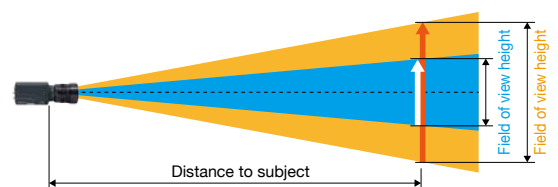


Full Screen mode



● Example of field of view height when using a micro four thirds lens with focal length $f=42.5$ mm

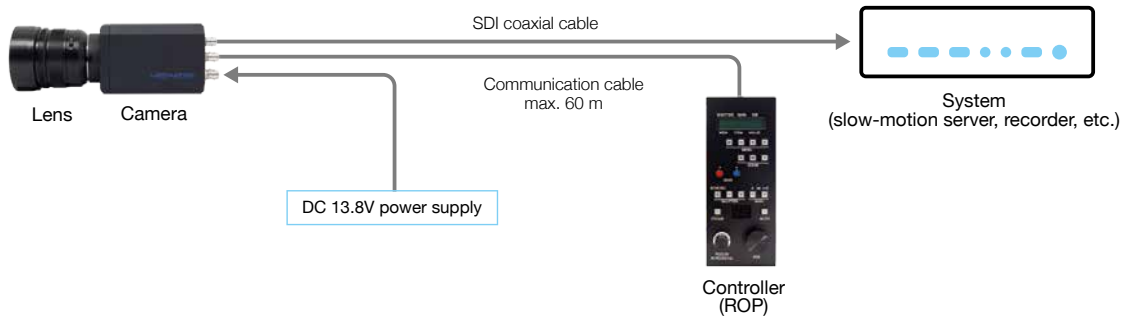
Mode	Vertical view angle	Field of view height		
		Distance to subject 7m / 20ft	Distance to subject 15m / 49ft	Distance to subject 30m / 98ft
Center ROI	4.66°	0.57m / 1.9ft	1.22m / 4.0ft	2.44m / 8.0ft
Full screen	9.30°	1.14m / 3.7ft	2.44m / 8.0ft	4.88m / 16ft



Example of System Configuration

Basic System

A simple system can be used as long as it is within the range that can be connected using a 3G-SDI coaxial cable with the maximum allowable length.



Sample uses

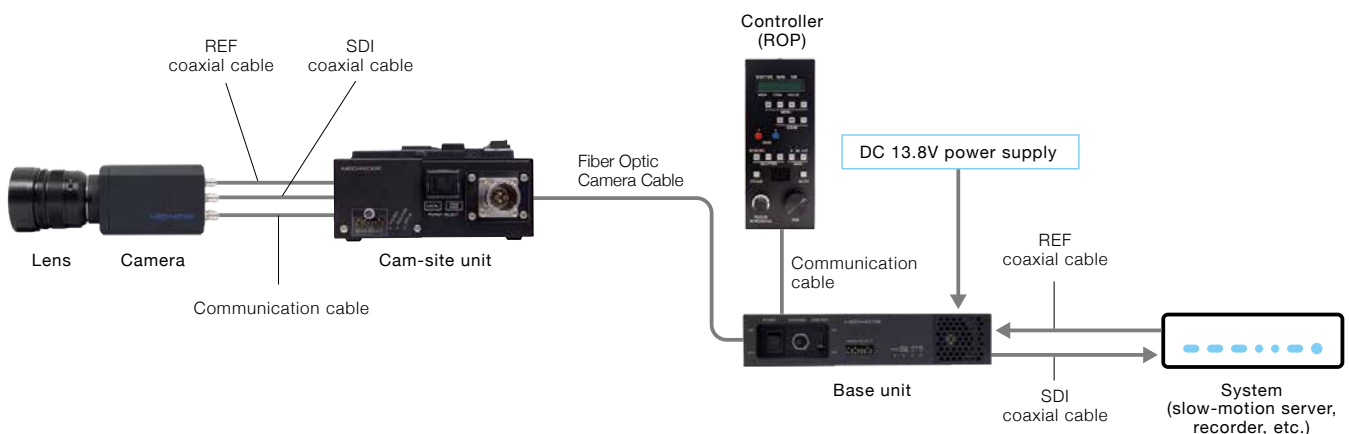
- Sports Judgement
- Sports analysis
- Video production
- ...etc.



Fiber Optic Camera Cable Transmission System

When operating in a stadium for sports broadcasting, or in cases where transmission over a large distance is required such as when using an OB van, optical transmission system can be used.

When supplying power to the camera via the optical camera cable, the maximum camera cable length is 500 m. When power is supplied directly to the cam-site unit, the maximum length can be extended to 2,000 m.



Examples of uses

- Sports Broadcasting
- Sports Judgement
- ...etc.



At stadiums



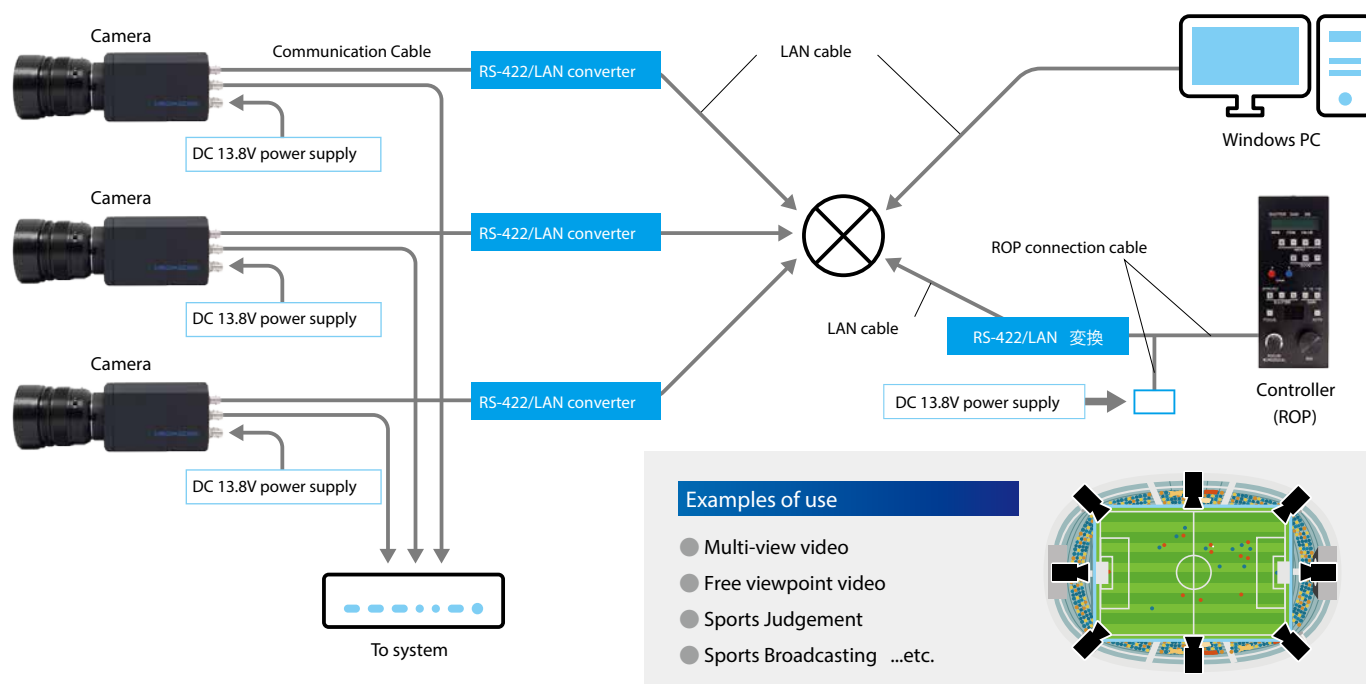
In sports arenas



Live golf broadcasts

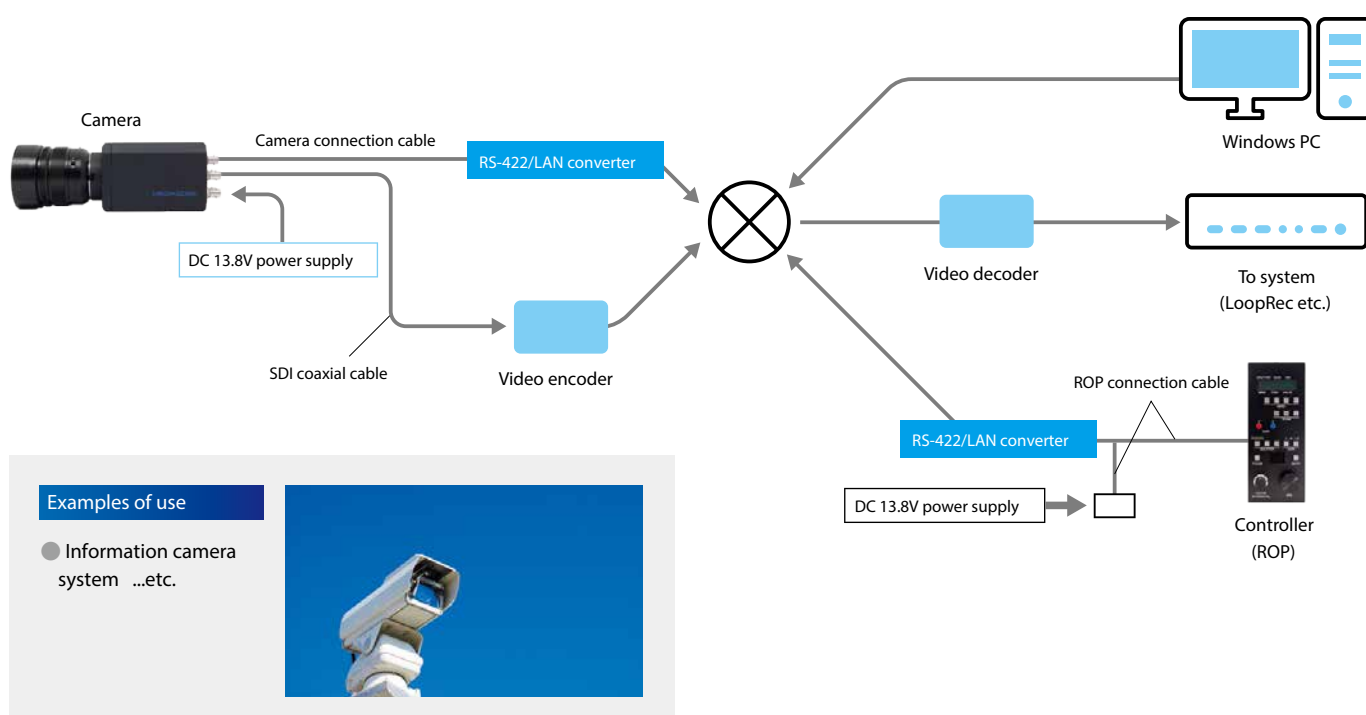
Multi-Camera Central Control System

Remote control via an IP network is possible by performing LAN conversion of the RS-422 communication line used for camera and lens control. A QDCAM control app for Windows PCs is available, and up to 99 cameras and lenses can be controlled from a single Windows PC. The QDCAM control app allows independent control of each camera, as well as central control of a specified camera group. Cameras can also be identified by IP address, and controlled using the QDCAM controller (ROP).



IP Network Remote Control System

An information camera, such as weather view camera, city view camera or traffic camera, which is installed in a distance from operation center, can be controlled via an IP network. In the same way as the multi-camera central control system, the QDCAM control app is used. When a video encoder is used, the video can also be transmitted using the same network.



Slow-Motion Video Production

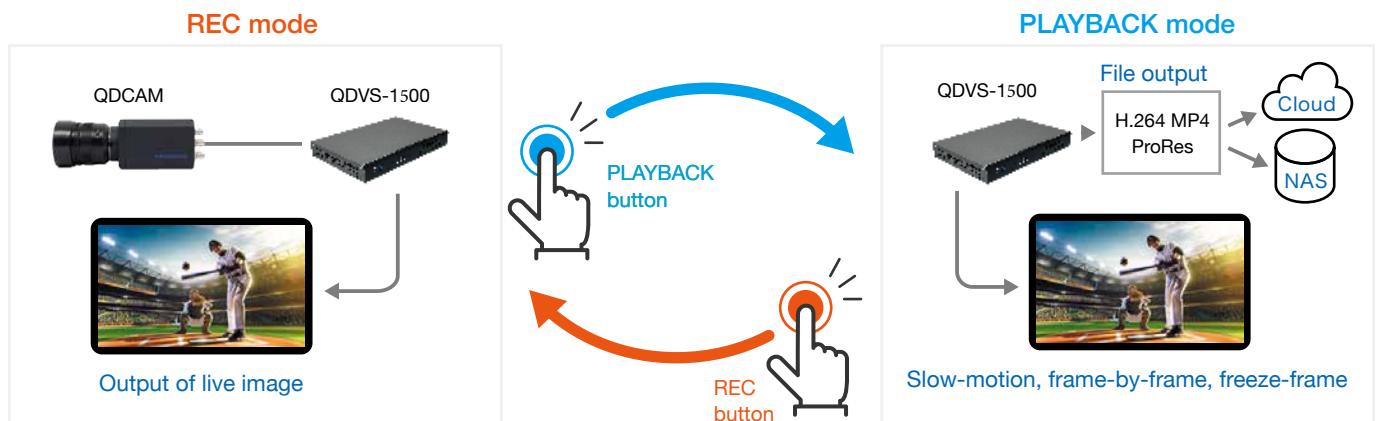
Connecting to a Video Production Server

By connecting to a video production server or similar device, it is possible to perform slow-motion playback of live sports and to edit the highlights.



Connecting to the Slow-Motion Recorder/Player QDVS

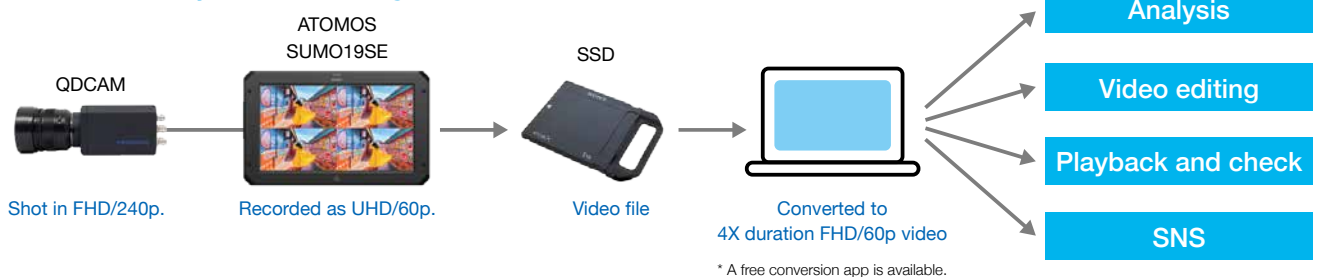
Loop recording is performed using the QDVS-1100 internal memory, and when a scene which you want to play again occurs, you can switch to playback mode and perform slow-motion playback, frame-by-frame playback, and freeze-frame display.



Recording to a Portable Recorder and Offline Conversion

FHD/240p high-speed video can be recorded as UHD/60p 4K video, and the video file can be converted on a PC to 4X duration FHD/60p slow-motion video.

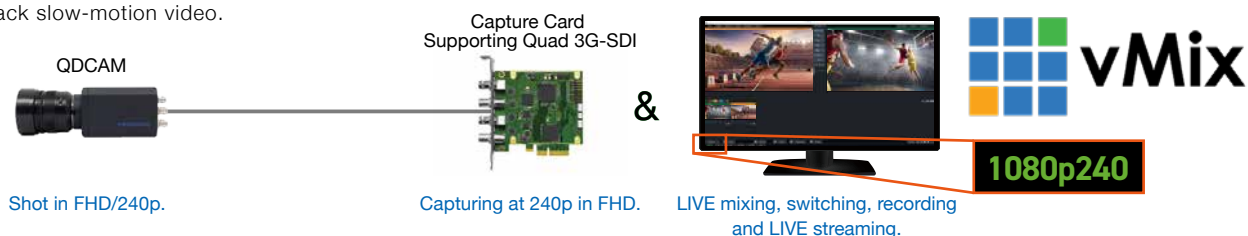
Video is recorded at the sports site, and the recording media is brought back to the office for analysis or uploading to SNSs.



* A free conversion app is available.

Connecting to Live Production and Streaming Software

Using a capture card, you can seamlessly capture 240fps video directly into vMix. This allows you to easily and cost-effectively capture and play back slow-motion video.



Slow-Motion Recorder/Player

QDVS-1500

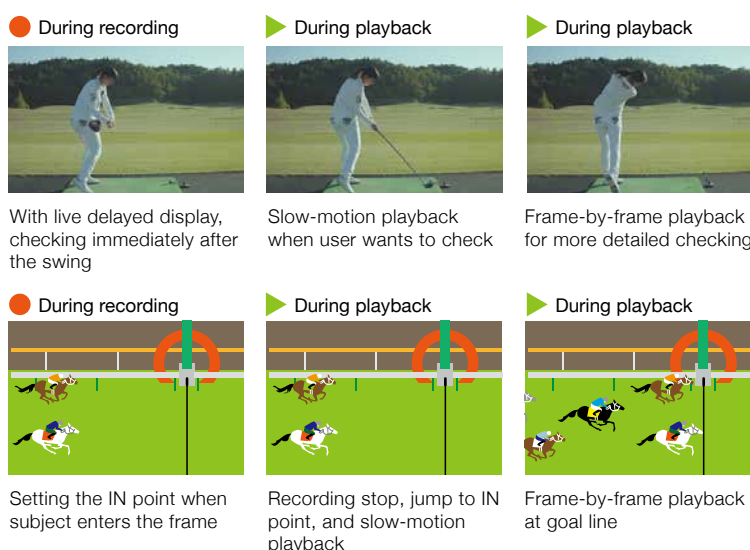
The QDVS-1100 slow-motion server (recording/playback switching type) captures uncompressed QDCAM 240/200 fps high-speed video and records it by loop-recording in internal memory. When recording is stopped, it can perform FHD 60/50 fps slow-motion playback, frame-by-frame playback, or still-frame display. The playback speed and frame-by-frame playback can be operated as needed by keyboard operations or by using the optional jog controller or T-bar.



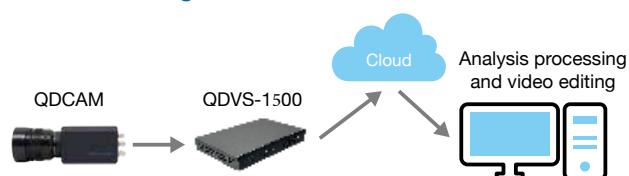
■ Live or delayed display during recording → Stop recording → Slow-motion, frame-by-frame, or still-frame display



While recording, both live display and delayed display are possible. A wide range of display settings are available that support all of the following: recording time, operation when recording is stopped while recording with delayed display, file transfer destination after encoding, still image settings, settings for divided memory use, and live display, as well as overlay display of a still image, drawn lines, or other image during slow-motion playback.

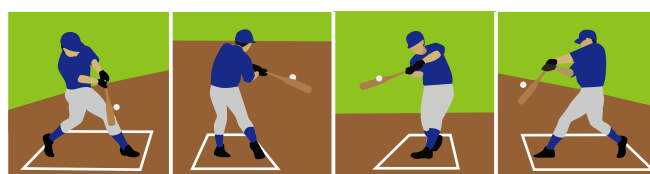


■ MP4 encoding function



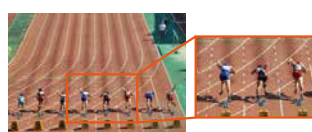
A preset time of recorded video, or the time between the IN and OUT points, can be encoded in H.264-MP4 or MOV format and transferred to NAS or cloud storage. In addition to slow-motion playback, files can also be created for editing and analysis purposes.

■ Multi-camera simultaneous recording function



Simultaneous recording is supported. It is possible to use multiple sets of QDCAM and QDVS to synchronize recording and playback. Even with frame-by-frame playback of multi-angle high-speed video, multiple images can be displayed with precision synchronized timing.

■ Wide range of display functions



Zoom-in display during playback

The magnification function can be used during playback for a zoomed-in display centered on the desired location.



Picture overlay

Picture data can be overlaid to display sponsor logo, coaching assist lines, etc.



QDCAM Camera

- Box camera

Model ME-BXC-CM100

Price **825,000** yen

* Lens and AC adapter are sold separately.



QDCAM Controller

- ROP (operation panel)

Model ME-BXC-RC100

* With 5 m communication cable and connector



QDCAM Transmission System

- Cam-site unit (Tajimi)

Model ME-BXC-CU100T

Price **OPEN**

- Cam-site unit (LEMO)

Model ME-BXC-CU100

Price **OPEN**

* With 3 m communication cable /
Optical camera cable is sold separately and
includes installation bands.
Can also be used as an ordinary 12G-SDI
video transmission system.



QDCAM Transmission System

- Base unit (Tajimi)

Model ME-BXC-BU100T

Price **OPEN**

- Base unit (LEMO)

Model ME-BXC-BU100

Price **OPEN**

* Optical camera cable and AC adapter are
sold separately.
Rack mounting kit MSR-BU100-W1UH:
Can also be used as an ordinary 12G-SDI
video transmission system.

Communication Cables



- 3m

Model ME-BXC-CC3M

Price **OPEN**

- 5m

Model ME-BXC-CC5M

Price **OPEN**

- 10m

Model ME-BXC-CC10M

Price **OPEN**

- 30m

Model ME-BXC-CC30M

Price **OPEN**

- 50m

Model ME-BXC-CC50M

Price **OPEN**



RS-422/LAN Converter Connection Cable

- Camera connection cable

Model ME-BXC-SCA

Price **OPEN**

- ROP connection cable

Model ME-BXC-SCB

Price **OPEN**

* For connecting a MOXA NPort5130

QDVS Slow-Motion Recorder/Player



- Recording time: 25 sec

Model ME-QDVS-1500 (NEW)

Price **OPEN**

* Includes keyboard, special compact keyboard,
and mouse

● Box camera (ME-BXC-CM100)

Image Pickup Device	1/1.1" 8.8 megapixel CMOS imaging element with global shutter
Imaging Method	Single image sensor with Bayer color configuration
Lens Mount	Micro four thirds system
Output Video Format	4096 × 2160/24p, 23.98p (Quad 1.5G-SDI) 3840 × 2160/60p, 59.94p, 50p (Quad 3G-SDI) 3840 × 2160/24p, 23.98p (Quad 1.5G-SDI) 1920 × 1080/240p, 239.8p, 200p (Quad 3G-SDI) 1920 × 1080/60p, 59.94p, 50p (3G-SDI) 1920 × 1080/24p, 23.98p (1.5G-SDI) 1920 × 1080/59.94i, 50i (1.5G-SDI)
Genlock Reference	Tri-level Sync or Black Burst
Communication Interface	RS-422 (using communication cable)
Gain Setting	-6 dB to +36 dB
Shutter Speed Setting	Shutter OFF to 1/12000 sec
Gamma Setting	BT.709 gamma / BT.2100 HLG
Color Gamut Setting	BT.709 / BT.2020
White Balance	Manual / Auto / Preset (2800K to 10000K)
Flicker Cancel	OFF / 50Hz / 60Hz
Operating Temperature	-5 to 45°C (23 to 113°F)
Operating Humidity	20 to 80% RH (Must be no condensation.)
Weight	690g (1.52 lb)
Dimensions	75 (W) × 127 (D) × 75 (H) mm (excluding protrusions) 3.0" (W) × 5.0" (D) × 3.0" (H) (excluding protrusions)
Power Voltage	DC 13.8V (DC 11.8 to 16.8V)
Power Consumption	10W (excluding power supply to lens and controller)

● Slow-Motion Recorder/Player (ME-QDVS-1500)

USB Port	USB3.0 standard	Type A × 2 on front
	USB2.0 standard	Type A × 2 on front, 4 on back
LAN Port	RJ-45	1000Base-TX × 1 Conforms to Ethernet/IEEE802.3 frame format.
Video Output	HDMI	HDMI 2.0 × 1
Operating Temperature		0 to 50°C (32 to 122°F)
Operating Humidity		10 to 90% RH (Must be no condensation.)
Weight		
Dimensions		
Power Voltage	AC adapter	Input: AC 100 to 240V, 2.5 A max. Output: DC 19.5V, 9.23 A
	Main unit	Input: DC 19.5V, 9.23 A
Power Consumption		60W (during normal operation)

● Camera Controller (ME-BXC-RC100)

Communication Interface	RS-422 (using 10-pin communication cable)
Operating Temperature	0 to 40°C (32 to 104°F)
Operating Humidity	20 to 80% RH (Must be no condensation.)
Weight	850 g (1.87 lb)
Dimensions	92 (W) × 226 (D) × 36 (H) mm (excluding protrusions) 3.6" (W) × 8.9" (D) × 1.4" (H) (excluding protrusions)
Power Voltage	DC 13.8V (DC 11.8 to 16.8V) * Power is supplied through the communication cable.
Power Consumption	1W
Accessories	5 m communication cable, cable connector, mounting bracket

● Transmission System Cam-Site Unit (ME-BXC-CU100)

Compatible Camera Cable	SMPTE 311 camera cable with SMPTE 304 connectors
Cable Length	Max. 500 m (when power is supplied to the camera through the camera cable) Max. 2000 m (when local power supply is used for the camera unit)
Operating Temperature	-5 to 45°C (23 to 113°F)
Operating Humidity	30 to 90% RH (Must be no condensation.)
Weight	1.26 kg (2.78 lb)
Dimensions	150 (W) × 150 (D) × 60 (H) mm (excluding protrusions) 5.9" (W) × 5.9" (D) × 2.4" (H) (excluding protrusions)
Power Voltage	DC 13.8V (DC 12 to 17V: when local power supply is used)
Power Consumption	14W (not including camera power supply)

● Transmission System Base Unit (ME-BXC-BU100)

Compatible Camera Cable	SMPTE 311 camera cable with SMPTE 304 connectors
Cable Length	Max. 500 m (when power is supplied to camera through the camera cable) Max. 2000 m (when local power supply is used for the camera unit)
Operating Temperature	0 to 40°C (32 to 104°F)
Operating Humidity	30 to 90% RH (Must be no condensation.)
Weight	1.60 kg (3.53 lb)
Dimensions	200 (W) × 200 (D) × 42 (H) mm (excluding protrusions) 7.9" (W) × 7.9" (D) × 1.7" (H) (excluding protrusions)
Power Voltage	DC 13.8V (DC 12 to 17V: when local power supply is used)
Power Consumption	Max. 60W (including power supply to cam-site unit and cable loss)

* Specifications may be changed without notice.



株式
会社

M&Inext

<https://minext.jp/>

Kannai Flex Building 210, 2-7-10 Okinacho, Naka-ku, Yokohama City, Kanagawa Prefecture 231-0028

Tel: 045-415-0203 Fax: 045-415-0255 mail: contact@minext.jp