

# OUTSIDE BROADCAST



# VEHICLE

## MERCEDES ACTROS

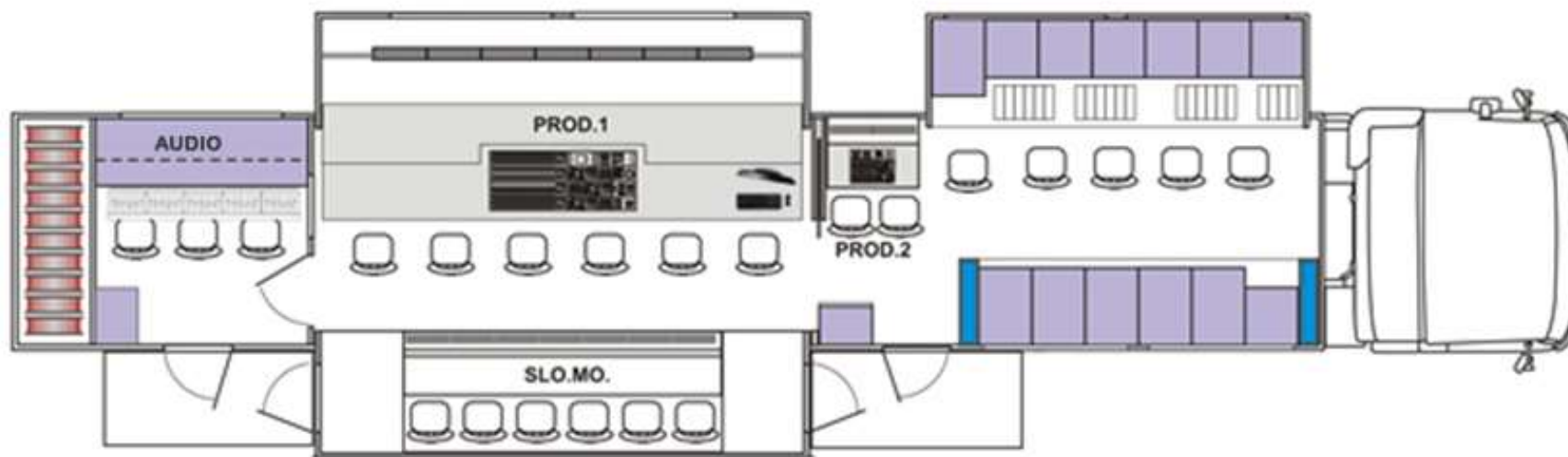
- Length: 16.5m
- Width: 2.55m (open: 4.54m)
- Height: 3.86m



The XL sized Full HD OB Truck was built in 2013, and is cabled for 22 cameras.

It has five areas: Audio Control, Production Area 1 and 2, Slow Motion Area and Vision Engineering. The Truck is fully air-conditioned, with 8 units, individual temperature controls each.

The Full HD OB Van (OB3) has comfortable large production room with 3 extendable sidewalls.



# CAMERAS



# GRASS VALLEY LDK 3000 HD CAMERA

Full HD 720p/1080i (1080p upgradable) broadcast camera system

Pickup device:	3 x 2/3" CMOS imagers
Picture elements:	1920 x 1080
Digital processing:	34-bit accurate processing
Sensitivity:	2000 lux @ F9
S/N ratio:	58 dB (typical)
Dynamic range:	>600%
Gain selection:	-6 to +18 dB in 3 dB steps (user-definable presets) or continuous master gain
Optical system:	F1.4 prism
Optical filters:	Clear, 1/4 ND, 1/16 ND, 1/64ND, 4p star
Typical cable length:	triax <ul style="list-style-type: none"><li>▪ 1,200m (3,900 ft.) (14 mm/0.55 in.)</li><li>▪ 700m (2,296 ft.) (11 mm/0.42 in.)</li><li>▪ 500m (1,640 ft.) (8 mm/0.31 in.)</li></ul>





# LDK 8300 HIGH SPEED HD CAMERA

Super Slo-Mo Full HD 720p/1080i broadcast camera system

Pickup device: 3-CCD 2/3"-type 16:9 HD-DPM+ CCDs

Picture elements: 9.2 million pixels 1920x4320

Operating modes: 1X, 2X, and 3X speed

## Sensitivity

- 1X speed (normal): F8.0 at 2000 lux (1080i)
- 2X speed (double): F5.6 at 2000 lux (1080i)
- 3X speed (triple): F4.5 at 2000 lux (1080i)

S/N ratio: 57 dB on combined output; 54 dB on phases 1, 2, 3

Dynamic range: >600%

Gain selection: -6 to +18 dB in 3 dB steps (user-definable presets)  
or continuous master gain

Spectrum system: F1.4 prism system

Optical filter wheels: 2x servo filter controls

- on first wheel: Clear, 4p star, 6p star, soft focus
- on second wheel: Clear, 1/4 ND, 1/16 ND, 1/64 ND

Typical cable length: Hybrid fiber (SMPTE 311)

- up to 4,000m (13,123 ft.) in portable mode
- up to 2,500m (8,202 ft.) in full studio mode



# GRASS VALLEY LDK 4000 ELITE WIRELESS CAMERA

LDK 4000 Elite HD 1080i 50/60Hz broadcast camera system

Pickup device:	3 x 2/3" 16:9 HD-DPM+ CCDs
Picture elements:	9.2 million pixels 1920 (H) x 4320 (V) effective
Digital processing:	14 bits A/D, with 34 bits DSP resolution
Sensitivity:	2000 lux @ F10 typical
S/N ratio:	60 dB (typical)
Modulation depth:	55% @ 27 MHz (typical 720p59.94)
Gain selection:	-6 to +18 dB in 3 dB steps (user-definable presets) or continuous master gain
Weight:	5.5 kg (11 lbs.) incl. 2" viewfinder and Wireless Camera Adapter
Modulation:	COFDM (based on modified 802.16 layer)
Frequency ranges:	2.203 .. 2.398 GHz for 2.2 - 2.4 GHz module
Number of channels:	181 (in steps of 1 MHz)
Emitted power:	18 dBm $\pm$ 1.5 dBm (conducted) measured at Tambient = 20° C
Bandwidth:	18 MHz per channel (at -3 dB)



# LENSES





Model	Description
<b>HJ40x10B IASE HDxs*</b> / Portable Super Telephoto Lens/	Benefits: <ul style="list-style-type: none"> <li>Optical Shift Image Stabilizer</li> <li>Digital Drive Unit, Zoom: Servo, Focus: Servo</li> </ul> Optical specifications: <ul style="list-style-type: none"> <li>Zoom Ratio: 40x</li> <li>Image size: 2/3"</li> <li>Built-in Extender: 2.0x</li> <li>Focal Length Range: 10~400 mm (with extender: 20~800 mm)</li> </ul>
<b>HJ22ex7.6B IRSE HDxs*</b> /HD ENG Lens /	Benefits: <ul style="list-style-type: none"> <li>Manual Zoom, Servo Focus</li> <li>Digital Drive With Rotary Encoder</li> </ul> Optical specifications: <ul style="list-style-type: none"> <li>Zoom Ratio: 22x</li> <li>Image size: 2/3"</li> <li>Built-in Extender: 2.0x</li> <li>Focal Length Range: 7.6~168 mm (with extender: 15.2~336 mm)</li> </ul>
<b>HJ18ex7.6B IRSE HDxs*</b> / HD ENG Lens /	Benefits: <ul style="list-style-type: none"> <li>Manual Zoom, Servo Focus</li> <li>Digital Drive With Rotary Encoder</li> </ul> Optical specifications: <ul style="list-style-type: none"> <li>Zoom Ratio: 18x</li> <li>Image size: 2/3"</li> <li>Built-in Extender: 2.0x</li> <li>Focal Length Range: 7.6~137 mm (with extender: 15.2~274 mm)</li> </ul>
<b>HJ14ex4.3B IRSE HDxs*</b> /Telephoto Field Lens/	Benefits: <ul style="list-style-type: none"> <li>Wide angle, Manual Zoom, Servo Focus</li> <li>Digital Drive With Rotary Encoder</li> </ul> Optical specifications: <ul style="list-style-type: none"> <li>Zoom Ratio: 14x</li> <li>Image size: 2/3"</li> <li>Built-in Extender: 2.0x</li> <li>Focal Length Range: 4.3~60 mm (with extender: 8.6~120 mm)</li> </ul>



# TRIPODS



Model	Description
<b>Sachtler Video 75 Plus</b>	Fluid head Video 75 Plus boasts an outstanding payload range of 12 to 75 kg / 26 to 165 lb. Suitable for a variety of camera configurations and flexible applications in both EFP and studio operation, this all-round talent offers users a broad palette of solutions.
<b>Sachtler Video 25 Plus</b>	With a maximum payload of 35 kg / 77.2 lb, the Video 25 Plus is ideally suited to HDTV and wide screen cameras. A viewfinder extension bracket is included as a standard accessory.
<b>VISION 100 Carbon</b>	For Camcorders in ENG & EFP configuration in counterbalance range 7-20kg TF drag mechanism, Illuminated controls and Repeatable balance settings Vision 100 (3466-3), Two-Stage CF Pozi-Loc (3772-3), Spreader (3363-3), Second telescopic Pan Bar and Clamp for VS100 – Black, ENG OB Skid. (125mm wheels), Tube for Vision 100 + Two-Stage Tripod
<b>VISION 250 Alu</b>	For Studio Cameras and EFP configurations, e.g. larger lenses, viewfinders in counterbalance range 10-33kg Vision 250 (3465), Dual Telescopic Pan Bars (3219-91), Two-Stage Aluminum Pozi-Loc Tripod (3880), Spreader (3363-3), Tube for Vision 250 + EFP Tripod, ENG OB Skid. (125mm wheels)
<b>VECTOR 90</b>	For Studio Cameras and EFP configurations, e.g. larger lenses, viewfinders and Heavy Duty operation, counterbalance range 10-90kg HDT – 1 Single stage heavy duty tripod with mid-level spreader, HD Skid, OB for HDT-1, Short Pan Bar & Clamp for Vector 90 – Black, Standard Wedge Plate for Vector 90
<b>VECTOR 750</b>	Professional Fluid Heads for ENG/Studio The Vector 750 features a centre of gravity range span of 8 to 25 cm, which with its maximum payload of 75 kg allows a greater use of camera accessories such as talent monitors and spotlights.

# VISION MIXER





# SONY MVS7000X MULTI FORMAT PRODUCTION SWITCHER

CCP-8000 Center Control Panel

MKS-9012A Second Control Panel

## Key Features:

- Flex Config of M/Es for 1, 2, or 3 M/E with up to 8 Keyers per M/E (1080i/720p)
- Multi Program 2 support can double the number of Mix Effect banks
- Internal DME option for 2 or 4 channels of Digital Effects
- 80 Inputs and 48 Outputs
- Source Patching
- Internal 2.5D Resizers
- 16 Frame Memory Outputs
- Simplified 3D Utility
- System Solution with 3D Box and CG Effector
- 8 Channel Input and 4 Channel Output Format Converter



## Current Configuration:

- 4 Keyers per M/E
- Center Control Panel: PP and 2 M/E
- Second Control Panel: 2 M/E
- 60 INPUTS (up to 80 inputs)
- 20 OUTPUTS (up to 48 outputs)





# INFRASTRUCTURE



# HARRIS X50 FRAME SYNCHRONIZER AND CONVERTER

## Key features

- Frame sync/delay, proc amp, noise reduction, clipping and color correction
- Line sync and time base corrector (TBC) and “lock to input” modes
- Two switchable auto-sensing 3G/HD/SD inputs
- Up/down/cross/aspect ratio conversion with two simultaneous, independent output formats

## Video Interfaces:

- Analog composite 3D adaptive comb filter 12-bit color decoder
- Analog component YPrPb input and output (HD and SD)
- RGB output
- Auto-sensing for SD-SDI, HD-SDI, 3G-SDI
- EDH/CRC error monitoring and insertion
- HDMI output for video



## OPENGEAR CONVERTER OPTICAL FIBER

- Convert SDI to Optical Fiber, and Optical Fiber to SDI simultaneously.
- OpenGear Optical Fiber auto switches between any SD, HD, 3 Gb/s HD-SDI video standards and each direction is completely independent.



## XVP-1801-DC FOR HIGH QUALITY SD OUTPUTS

- Downconverter with frame sync
- Advanced adaptive video de-interlacing for higher image quality
- Dolby E compatible and Metadata insertion
- Automatic ARC, using AFD (SMPTE-2016), video index (RP-186) and WSS



## LAWO V\_PRO 8

- Video Frame Synchronization for each channel
- RGB Color Correction & Proc Amp for all video channels
- Up to 2 (3) channels Up/Down/Cross Format & AR Conversion
- Embedding and de-embedding for 8 video channels
- Integrated Sample Rate Converters
- Two 5.1 to stereo Downmixer per Embedder
- Variable audio delay of up to 320 ms for each mono channel
- Variable video delay of up to 8 frames for each channel
- Time Code Insertion, Test Pattern Generator and Video ID Generator per video output
- Multi-Format Video Output



# FIBER NETWORK EQUIPMENT

- 3x Riedel Mediornet Compact pro units

1x Internal Unit, with:

- 12x HD-SDI inputs-integrated with the Miranda video router
- 4x HD-SDI outputs
- 4x Mic/Line inputs
- 4x Line outputs
- 4x AES inputs
- 4x AES outputs
- 2x Madi port with 64 inputs and outputs integrated with the audio system



2x External Units, each:

- 12x HD-SDI outputs and 4x HD-SDI inputs
- 8x HD-SDI outputs and 8x HD-SDI inputs
- 4x Mic/Line inputs
- 4x Line outputs
- 4x AES inputs
- 4x AES outputs
- 2x Madi port with 64 inputs and outputs integrated with the audio system







# DISPLAYS

Vutrix





**19 x VUT24VXP11Q**

24" Quad TFT display, SDI, HDSI, 3G inputs 1920 x 1200

**14 x VUT19VXP11Q**

19" Quad TFT display, SDI, HDSI, 3G inputs 1366 x 768

**6 x VUT19VXP11F**

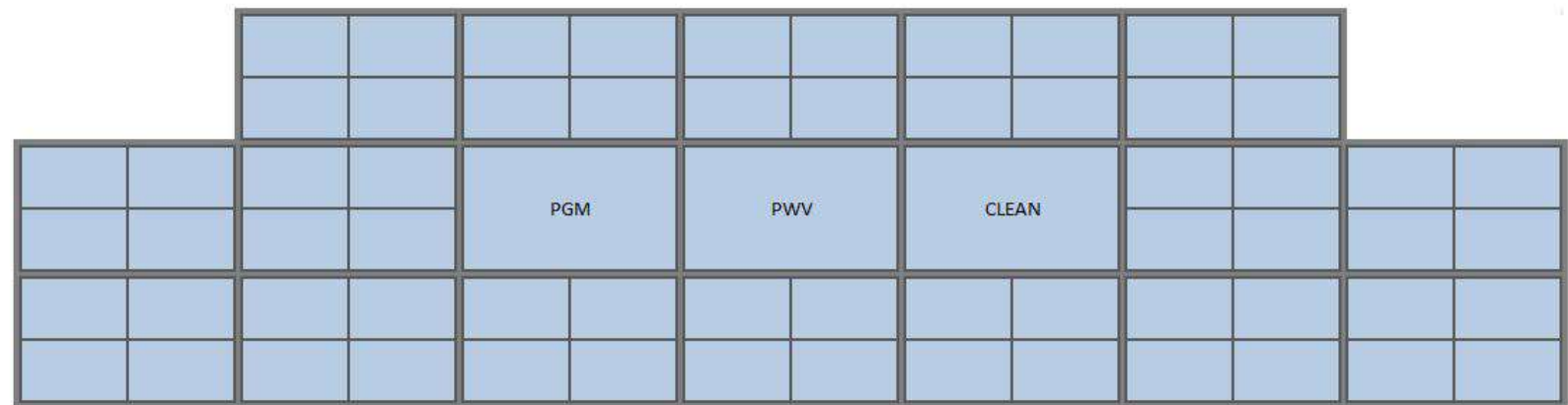
19" Single TFT Display, SDI, HDSDI 3G input

**22 x VUT10X2VX**

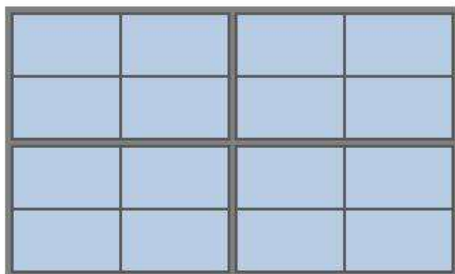
Dual 10" LCD monitor 1024 x 768

# DISPLAY SYSTEMS

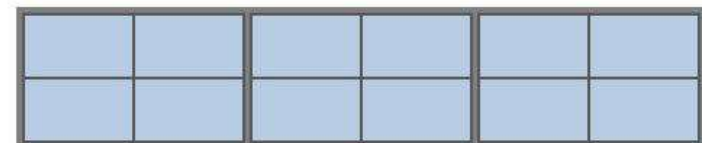
HDOB-3 DIRECTOR MONITOR WALL



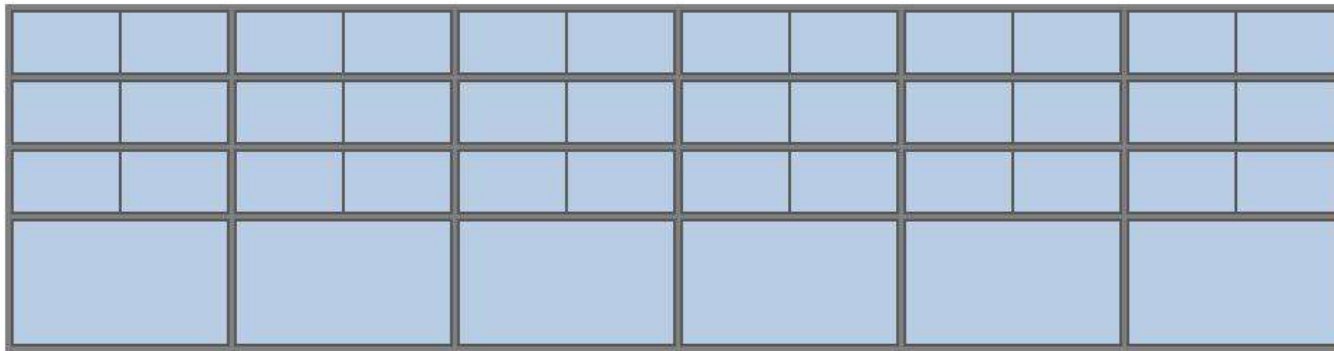
HDOB-3 PROD2 MONITOR WALL



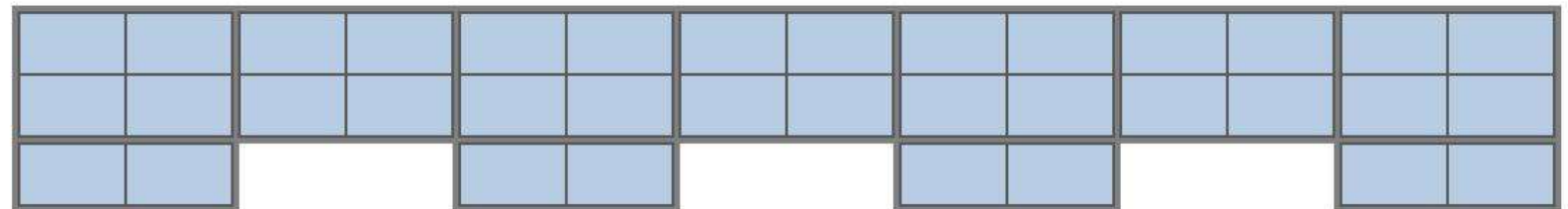
HDOB-3 SOUND MONITOR WALL



HDOB-3 CCU MONITOR WALL



HDOB-3 EVS MONITOR WALL





# AUDIO





# LAWO MC2 56 MK II

mixing console with integrated audio router

## Key Benefits

- HD Core with 3 DSP cards, redundant power supply, and redundant fibre connections
- 3x 16 faders
- Up to 144 DSP Scalable Channels with 124 inputs, sums, auxes, busses
- 2x remote Dallis Stageboxes, 24 inputs - 8 outputs each (redundant PSU, DSP, and fibre connection)
- Dedicated MADl ports for interconnecting other facilities
- Integrated video router control
- Easy 2 operators mode
- Total integration with Riedel Artist Talkback system

## Audio equipment

- Dynaudio BM 5 Compact 5.1 Loudspeaker System
- TC M3000 Effect processor
- Marantz PMD-580 nonlinear audio recorder
- Denon DN-C635 CD player
- Tannoy, Fostex additional monitoring system
- Miranda Dolby E encoder

## Microphones

- Sennheiser wireless microphones
- Sennheiser IEM wireless monitoring system
- Sennheiser, Neumann, Electrovoice microphones
- Rycote windshield systems





# COMMUNICATION AND TALKBACK SYSTEM



# MATRIX TALKBACK SYSTEM

- Riedel Artist 64 Mainframe
- 1x RCP 1028 keypanel
- 3x RCP 1012 keypanel
- 7x RCP 2016 keypanel
- 3x DCP 1016 desktop keypanel
- 3x DCP 2016 desktop keypanel
- 12x Additional Ext keypanels
- Connect Trio ISDN/Telephone interface



# WIRELESS TALKBACK SYSTEMS

- RiFace G2 2 way radio interface
- 16x Motorola CP 140/GP 300 walkie-talkies
- Riedel Acrobat CC-8 full duplex wireless talkback system
- 4x Riedel Acrobat WB-2 beltpacks
- CA-6 antennas



EVS



# LSM XT[2] 6 CHANNELS HD SLOW MOTION

2 x with Super Slow Motion Option

- non-stop recording process in loop mode guaranteeing constant availability to content.
- Hybrid networking system combining highly-secured live media sharing and media transfer/streaming with third-party systems
- Extended range of controllers for advanced live replay, content control and editing operations
- Flexible ingest and playout channel configuration
- Extensive multi-codec support
- No hardware change for switching from one codec to another
- Scalable storage capabilities
- Native support HD codec: Avid DNxHD® codec, Apple ProRes, Panasonic DVCPRO HD, AVC-Intra Class 100, XDCAM HD

# LSM XT[3] 8 CHANNELS HD SUPER SLOW MOTION

I-Movix Hyper Slow Motion Option

- 6 Full 3D/1080p video channels
- Up to 550 Mbps Bitrate per video channel
- Mix on one channel capabilities
- 2 chassis versions 6RU & 4RU for maximum flexibility
- Full live replay capabilities: Live Slow Motion, Super Motion, 3D Super Motion, Hyper Motion, Ultra Motion
- Native support HD codec: Avid DNxHD® codec, Apple ProRes, Panasonic DVCPRO HD, AVC-Intra Class 100, XDCAM HD
- Ready for 3G SDTI network
- Up to 96 audio input capabilities





# IP DIRECTOR – PRODUCTION CONTROL

## CAPABILITIES

- Content production management suite
- Easily ingest, log, manage, search, browse
- Track, edit, create clips and highlights
- Play out any video or audio content instantly
- Complete and instant overview on the media sharing network, XNet2 (XT3, XS, EVS storage platforms, video tape recorders)
- Control and organize any recording and live streaming actions of feeds from cameras, satellite or video tape recorders, either in high or low resolution
- Metadata can be transferred to and from third-party and post-production equipment via export of XML files

## FEATURES

- Multiple camera ingest
- Rough cut editing
- Clip transfer and streaming to craft editor and storage
- Highlights import from craft editors
- Graphics import from graphical devices
- Online storage and nearline storage control
- Instant clip review
- Multifeeds ingest
- Metadata management
- Network control (high/low-resolution)
- Transfer/Streaming to post-production



A close-up, black and white photograph of a computer keyboard. The focus is on the keys labeled 'A', 'S', 'X', 'Y', and 'Z'. The keys are dark with white lettering. The background is bright and out of focus.

# GRAPHICS



# HARRIS INSCRIBER G7

for two channels HD graphics system

Highlights of the high-performance features and workflow benefits of the G7™

Full 2D and 3D graphics creation and playout with two video inputs per channel, up to 32 channels of discrete audio, and support for 2D and 3D HD DVE.

G-Scribe+™ 2D/3D creation and playout software, which delivers sophisticated capabilities such as video capture, charting, simultaneous playback, automation interface for real-time data display connection and intelligent graphics transitions.

G-3D™, a design module that elevates broadcast graphics design with illuminating, true 3D graphics and animations in both HD and SD.

Network Manager for G-Series™, which bi-directionally manages graphics across a LAN or WAN by publishing content across a local network or through the Internet.

G-Scribe™ support for custom applications written in RTX.NET. Real-time sports, news and weather data can be streamed and graphically displayed using RTX ports on all G-Series™ systems, including the G7™.



# CABLES



# CABLES

## DRAKA

- 12 x 200m Draka Triflex Trax Cable  
Connectors: Fischer HD PRO+
- 12 x 150m Draka Triflex Trax Cable  
Connectors: Fischer HD PRO+

## LEMO

- 8 x 150m Hybrid Fibre Camera Cable  
Connectors: FUW.3K.93C.TLMC96 and PUW.3K.93C.TLCC96



## HUBER SUHNER

- 2x400m FiberOptic Cable - single-mode (9/125) - 8 fiber  
Connectors: LC/PC
- 1x230m FiberOptic Cable - single-mode (9/125) - 8 fiber  
Connectors: LC/PC
- 4x96m FiberOptic Cable - single-mode (9/125) - 2 fiber  
Connectors: LC/PC
- 4x150m FiberOptic Cable multi-mode (50/125) - 4 fiber  
Connectors: ODC4

# REFERENCES

## EUROSPORT

- UEFA Women's Champions League MTK Hungária FC – FFC Turbine Potsdam (Round of 32) in Budapest (Hungary), 10 October 2013
- UEFA Under-19 European Championship in Hungary, 19 - 31 July 2014
- UEFA Women's Champions League MTK Hungária FC – NÖSV Neulangbach (Round of 32) in Felcsút (Hungary), 8 October, 2014
- UEFA Under-19 European Championship in Greece, 6 - 19 July 2015
- UEFA Futsal Euro Final 2016 Belgrade Arena (Serbia), February 2016

## MTVA

- Matches of the Hungarian national football team
- soccer, futsal, ice hockey, basketball, handball, water polo, athletics, boxing, horse racing, music events, conferences, theatre productions
- FIE World Fencing Championships in Budapest (Hungary) August 2013
- ISU European Figure Skating Championships 2014 in Budapest (Hungary), 15-19 January 2014
- the Group A matches of the Women's EHF Handball European Championship 2014, in Győr (Hungary), 7-11 December 2014
- the semi-finals, placement matches and finals of the Women's EHF Handball European Championship 2014, in Budapest (Hungary), 19-21 December 2014

# REFERENCES

CHELLO CENTRAL EUROPE and AMC NETWORKS (Czech, Hungarian and Slovakian Sport TV Channel)

- matches of Hungarian Professional Football League, Hungarian League Cup and Hungarian Cup
- Kontinental Hockey League (KHL) – the Seasons 2013-14, 2014-15 (home matches of Slovan)
- the 2014 KHL Legends Game and All Star Game in Bratislava (Slovakia), 10-11 January 2014

NIPPON TV

- Senior Wrestling World Championships in Budapest (Hungary), 16-22 September 2013 for the Japanese NTV

CONCERTS

- Concert of Ákos in Pécs (Hungary), 6-7 December 2013
- Concert of Zsuzsa Koncz in Budapest (Hungary), 14 March 2014
- „Az ének iskolája” (Hungarian Master Class) music talent show, 2014, 2015
- Concert of Ákos in Budapest (Hungary), 12-13 December 2014 and 16-17 December 2015

PAGEANT

- Miss Universe Hungary 2014, Budapest (Hungary), 15 September 2014
- Miss Universe Hungary 2015, Budapest (Hungary), 6 June 2015



