

# THE SILVERBACK II 4K

Camera-Back Fiber Optic Transceiver for 4K Camera Systems (PRELIMINARY)

**MultiDyne**

Video & Fiber Optic Systems

## SilverBACK II 4K

- All signals on ONE Cable
- Four 3G-SDI paths
- 10km Operation
- Intercom with IFB/PGM inject
- 2 Mic inputs with phantom and pre-amps
- Accepts Anton-Bauer and "V-mount" Battery plates
- Integrated Tally lamps
- Camera RCP Control
- 1 additional Data path (232/422)
- 2 GPIO's
- Integrated swivel for optical connector
- Top-mounted taps for mounting viewfinder
- Optional 15mm Iris Rod bracket for mounting flexibility
- lightweight, low-profile packaging



### DESCRIPTION

#### All the Signals that You Need for 4K, Studio & Multi-Camera Production... Small and Lightweight...and Light on Your Budget

The new SilverBack-II 4K has been completely re-designed to provide a full complement of bi-directional signals for most any 4K camera on the market today.

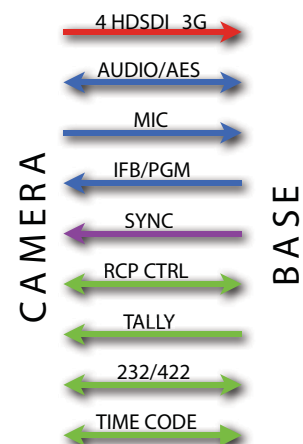
Starting with the case itself, every aspect of the new Silverback has been refined to keep overall size and weight as small as possible without sacrificing performance or operability. Each unit is milled from a block of aluminum and the result is a fiber transceiver that becomes a seamless part of your camera without angles and sharp corners. The display uses high-intensity blue LEDs that are easy for the operator to see, but not intrusive.

But as beautiful as the exterior design is, the elegance is on the inside. Inside is all the signal transport you need for video acquisition without compromises. Do you prefer a color LCD viewfinder? The return HD/SD signal is there. Do you like to have a program earpiece for your stage manager? Do you need timecode for recording in the camera? How about extra data? It's all in there!

The base unit is a standard 1RU enclosure with LED status indicators for each signal on the front and BNC, XLRs and multipin connectors on the rear for quick integration into your OB van or facility. The SilverBack-II. Your camera operators will love the size and weight. You'll love the signal quality and cost savings.

### APPLICATIONS

- D-SNG and News
- Sports and OB
- College campus
- Concert (I-Mag)
- Digital cinema
- Tele-Medicine
- 3-D Acquisition



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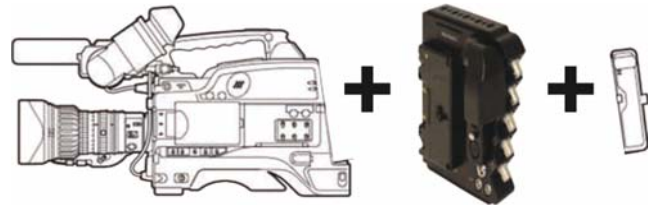
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## Dual-Purpose your camcorders for live events and multi-camera!

### POWER

The SilverBack-II mounts between a professional broadcast camera and its battery with your choice of Anton-Bauer or "V-Mount" battery plates. Being only 3" thin and 2.5 pounds in weight, the SilverBack-II will not significantly alter the total weight or the center-of-gravity of the handheld camera. And with its energy-efficient design, power consumption is minimal, too.



If the system is being used in a more stationary environment, A local 12VDC supply could be used with a 4-pin adapter plate (Anton-Bauer part # SO-XLR) to power both the SilverBack AND the camera.

### MAKE THE CONNECTION

The tactical fiber optic cable that connects the SilverBack-II to the base unit has come a long way in the last two decades. Technology has made the singlemode glass fibers stronger and has come up with ways to make it less sensitive to tight bending. Advances in the compounds used to make the exterior jackets have also resulted in stronger, more reliable cables and new connectors are available that are easier to install, use and maintain. The result is cables that are far tougher than your typical coaxial cables at a fraction of the weight, with RF and EMI immunity, no grounding issues and the ability to provide years of reliable service.

We have reels from Schill that are used around the world in the harshest broadcast and industrial environments that can hold up to 1000 ft. (311m) of fiber cable.

There are four optical connector options for the SilverBack-II:

The opticalCON DUO connector from Neutrik is a two-fiber, LC based connector that has gained popularity in recent years. This small and innovative connector has a small "door" that closes over the internal LC termini pins when the connector is not being used. The receptacles can be mounted in standard XLR cut-outs.

The Fibreco Mini is a hermaphroditic exanded beam connector that uses lenses rather than pins and sockets to pass light from one connector to another. The advantage is that these connectors are VERY easy to clean and maintain. Being hermaphroditic, multiple reels can be connected together without the need for connecting "barrels" or adapters. The Mini is completely compatible with the MX connector.

The LEMO SMPTE hybrid connector or plain ST's can also be specified.

All come with integrated caps with lanyards and a pedigree of durability and reliability.



### SMALL CONVENIENCES MAKE HUGE DIFFERENCES

One big issue with some modern camcorders is that there is no way to externally access or trigger the tally lights. On a crowded set or busy news shoot, this can be a big problem. The Silverback-II solves this with simple LED tally indicators on the userpanel and on the rear of the unit above the battery, that is triggered from a GPI at the base unit.

To facilitate mounting the SilverBack-II onto any current camera, the bottom of the camera unit can incorporate an optional dovetail with threads which allows existing accessories to be attached directly to the Silverback. The 15mm iris rod bracket is compatible with industry standard 60x15 rods.



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## CAMERA I/O



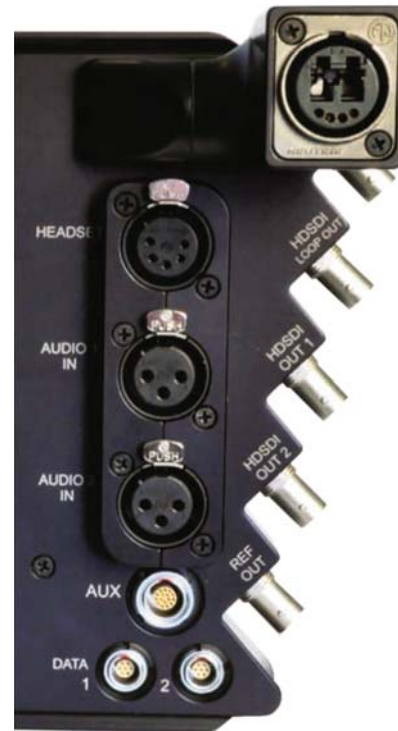
The operator control panel provides a simple interface by which the camera operator can quickly and easily check on system link and signal status and adjust audio and intercom levels.

Soft-touch buttons and blue LED back-lighting make these adjustments fast and easy.

Mic inputs 1 & 2 pre-amps and phantom power are controlled here via convenient soft switches and the levels are easily monitored with the VU meters.

Intercom talk and listen levels as well as the IFB/PGM listen level are located near the top. The LOCAL/REMOTE button allows the operator to trigger his mic via the VTR button on the lens.

Two LED tally indicators, one located near the bottom of the user panel and another above the battery, are triggered through the TALLY data path.



At the rear of the unit are XLR's for Audio MIC inputs 1 and 2 and a 5-pin XLR for Intercom.

Three Lemo data connectors provide 232/422 data, GPIO information and extra audio.

There is also a 1/8" mini for Talent IFB/PGM.

Video connectors\*\* include:

- 4 SDI in
- 2 SDI loop out
- Sync out

*\*\*these can be factory customized*

## BASE I/O

The 1 RU base station front panel has LEDs to indicate the status for POWER and LINK as well as for video, audio and data presence.



Rear Connectivity for Video signals includes BNC connectors for SDI IN and OUT and SYNC/REF IN and LOOP OUT, TIMECODE IN and OUT, XLRs for MIC OUT and PGM AUDIO IN, as well as multipin connectors for 4-wire intercom, data, tally and GPIO's.

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## SPECIFICATIONS

### Video, SDI (bi-directional)

Interface SMPTE 259M, 292M, 310M  
Data Rate 5Mb/sec to 3Gb/sec  
Input Level 800mV peak to peak  
Impedance (In/Out) 75 Ohms  
Bit-error rate  $10^{-12}$   
Jitter (pathological) <280 pico secs

### AES Audio

Input/Output Balanced, AES3/AES3id  
I/O Impedance 110 Ohm/75 Ohm (DIP Sw)  
+/-20%, 0.1MHz-6.0MHz  
Min/Max Input 2-7 Vpp into 110 Ohms  
Rise/Fall time 5-30ns for 10 Ohm  
Jitter < 20ns

### Intercom/IFB

# of Channels 1 icom + 1 PGM listen  
Interface 4-wire  
Freq Response 200Hz-15kHz +/- 3dB  
Max Distortion <= 0.5%  
Noise < -60dBu  
Max Gain >= +24dB  
Min Gain <= -45dB

### Analog Audio

# of Channels 2 w/ pre-amps  
S/N >90db  
Frequency Response < +/-0.1db  
(20Hz - 20kHz)  
Distortion < 0.05%  
Level Adjust 28,16,10,4 dBu  
Max I/O Level 28 dBu  
Impedance In (bal) 600 Ohms +  
Impedance Out (bal) <10 Ohms  
Icom level 4 dBu FS  
Icom Impedance In 10 K Ohm  
Icom Impedance Out <50 Ohm

### Serial Data

232,422,485 DC-3Mbps  
232 In V +/- 25V max, 2V min  
232 Out V +/- 5V @ 3Kohm, 1.6V  
Sens.  
422,485 In V -7V to 12V, 0.2V diff min  
GPIO's Normally Open, Form 1  
SPST

### Electro-Optical

Operating Wavelengths 1271-1591nm  
TX Laser output power -2 - 0dBm, Class 1  
Receiver Sensitivity -18 dBm  
Fiber Compatibility singlemode  
Optical Connector ST, SC, OpticalCon DUO  
or Fibreco EXB Mini, 311M  
Distance limit 10 km

### Mechanical, Environmental

Cam Unit  
Dimensions (LxWxH) 6" x 5" x 1.1"  
Weight 2.5 lbs.  
Base unit  
Dimensions (LxWxH) 17.5" x 10" x 1.75"  
Weight 3 lbs.  
Power Input (Base) STD. IEC  
Power Consumption Base 6.5 watts @100-240 VAC  
Cam Unit 6.5 watts @12VDC  
Temperature Range -0° to +70°C  
Humidity Range 0 to 95% RH  
Noncondensing

## ORDERING INFORMATION

Camera End	Select -AB for Anton Bauer battery mount or -V for V-plate battery mount
SLB2-4K-TX-ST	SilverBACK-II Camera Back Fiber Transceiver: Four 3G HD-SDI Camera Video, 4-Ch Audio, 2-Ch 4 Wire Intercom, Camera Control & Tally. Anton-Bauer battery mount and MIL ST Connector
SLB2-4K-TX-NOC	SilverBACK-II Camera Back Fiber Transceiver: Four 3G HD-SDI Camera Video, 4-Ch Audio, 2-Ch 4 Wire Intercom, Camera Control & Tally. Anton-Bauer battery mount and Neutrik OpticalCon DUO fiber connector
SLB2-4K-TX-EXB	SilverBACK-II Camera Back Fiber Transceiver: Four 3G HD-SDI Camera Video, 4-Ch Audio, 2-Ch 4 Wire Intercom, Camera Control & Tally. Anton-Bauer battery mount and Expanded Beam fiber connector
SLB2-4K-TX-311	SilverBACK-II Camera Back Fiber Transceiver: Four 3G HD-SDI Camera Video, 4-Ch Audio, 2-Ch 4 Wire Intercom, Camera Control & Tally. Anton-Bauer battery mount and SMPTE 311M Connector
SLB2J...	Juice options: SilverBack and Camera power sent over Hybrid cable. Requires SMPTE 311 or SMPTE Neutric opticalCon cable and Juice option in base unit. Replace par number prefix with SLBJ....
Base Unit	select ST, SC, NOC, EXB or 311
SLB2-4K-RX-ST	The SilverBACK Fiber Transceiver: Four 3G HD-SDI Camera Video, 4-Ch Audio, 2-Ch 4 Wire Intercom, Camera Control & Tally. Stand-alone/portable or rack mountable. Select optical connector type.
SLB2J...	Juice options: SilverBack and Camera power sent over Hybrid cable. Requires SMPTE 311 or SMPTE Neutric opticalCon cable and Juice option in camera unit. Replace par number prefix with SLBJ....
Interface Cable Kits	
SLB2-RCP-SON	Lemo to 8 Pin Hirose for Sony RCP Panels (RMB). Camera and RCP Side
SLB2-RCP-IKE	Lemo to 8 Pin Tajimi for Sony RCP Panels (RMB). Camera and RCP Side
SLB2-RCP-PAN	Lemo to 10 Pin Hirose for Panasonic RCP Panels (RMB). Camera and RCP Side
SLB2-RCP-HIT	Lemo to 4 Pin Hirose for Hitachi RCP Panels (RMB). Camera and RCP Side
SLB2-RCP-JVC	Lemo to 6 pin DIN for JVC RCP Panels (RMB). Camera and RCP Side
Accessories	
AUX-LEMO-BO	Breakout cable for AUX connector on CAM unit. Lemo (ECG.1B.316.CLN) to bare wire
AUX-DATA2-BO	Breakout cable for Data2 connector on CAM unit. Lemo (ECG.0B.307.CLN) to bare wire
Fiber Cables	(contact factory for information about reels and custom cable lengths)
TAC-NOP2-500	500 feet (150m) of fiber cable terminated with Neutrik OpticalCon DUO connectors
TAC-EXP4-500	500 feet (150m) of fiber cable terminated with Fibreco Expanded Beam MINI connectors
TAC-ST-500	500 feet (150m) of fiber cable terminated with Militarized ST connector
REC-NOB2-ST-2M	2m Neutrik OpticalCon receptacle to ST's or SC's
REC-EXB4-ST-3M	3m Fibreco Expanded Beam MINI receptacle to ST's or SC's

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