24/7 Support: 516-238-4752

Hybrid Universal Transceiver
SMPTE Hybrid Cable Elimination System for
Broadcast Camera Systems
Product Manual

Important Safety Instructions

WARNING: To Reduce The Risk Of Fire Or Electric Shock, Do Not Expose This Apparatus To Rain Or Moisture. The apparatus shall not be exposed to dripping or splashing. Objects filled with liquids, such as vases, should not be placed on the apparatus.

1) Read these instructions.

2) Keep these instructions.

3) Heed all warnings.

4) Follow all instructions.

5) Do not use this apparatus near water.

6) Clean only with dry cloth.

7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11) Only use attachments/accessories specified by the manufacturer.

12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13) Unplug this apparatus during lightning storms or when unused for long periods of time.

14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the

apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Introduction

The SMPTE HUT system enables you to replace long runs of the bulky and expensive hybrid fiber cable that connects your camera and CCU with inexpensive fibers alone. It does this by moving the camera power injection from the CCU side to the cam side. It consists of a breakout adapter, known as the HUT-CCU, that attaches to the SMPTE connector on your CCU. This enables you to connect 2 fibers going to the cam side using ST connectors, and it also tricks the CCU into thinking that your camera is still attached by the hybrid fiber cable. At the cam side of these fibers is the CAM HUT, which takes these 2 fibers with ST connectors and routes them to a SMPTE hybrid fiber connector. It also plugs into local mains power and injects 230 VAC for your camera into that same SMPTE connector which now connects to the camera via a much shorter length of hybrid fiber cable. The CAM HUT performs the same safety checks on this cable as your CCU does, and it optionally allows remote powering down of your camera from the CCU side as well as optical repeating and remapping of the wavelengths to and from the CCU.

1. CAM HUT (cam side) unit

The CAM HUT basic version is shown in Fig. 1. There are 3 versions of the CAM HUT, described below.

Fig. 1: CAM HUT

There are 3 versions of the CAM HUT, and each has its own front panel. These are shown in Fig. 2. The basic configuration, which is the first panel, is to have the SMPTE hybrid fiber connector to the camera and the 2 ST/UPC or duplex LC fiber connectors populated on the front panel. These are labeled **A** and **B.**. Optionally, the optical connectors can be located on the rear panel instead, as shown in Fig. 3. On some camera systems, **A** could mean **FROM CCU** and **B** could mean **TO CCU** or vice-versa. In systems with the optional optical repeater, it is important that the user be sure that his uplink and downlink signals are matched to the proper connectors consistently throughout the link. In the basic system, without optical repeating, it does not matter whether **A** or **B** is from the CCU or to the CCU, since the fiber path is entirely passive. It only matters that, for a given direction, the same label is used throughout the entire link.

The front panel of the basic unit has the following standard features:

RESET: This button resets a 2A thermal circuit breaker in series with the SMPTE hybrid connector output. In the event of an overcurrent fault that causes power to the cam to be removed, as evidenced by the **HV PRES** LED being dark, and the button popped out. Pressing this button restores power after the fault is removed. Note that **RESET** does not restore functionality if a SMPTE cable fault exists.

SMPTE **CABLE** Status LEDs:

SHORT glows red upon short or leakage of hybrid fiber cable to ground. Upon power up, this LED may glow red for a few seconds even if no short exists. This is normal.
OPEN glows red when cable is open or cam not connected. If using a Hitachi camera, be sure to set the **CAM TYPE** switch to the Hitachi position, to bypass the **OPEN** cable test. Otherwise, it will always fail. For Sony or Ike, set switch for those cameras.
OK glows green indicating a properly connected hybrid fiber cable.
HV ENAB glows green when the HUT attempts to apply 230VAC to the hybrid fiber cable. This occurs only after all cable checks have been completed successfully.
HV PRES glows green when 230VAC is actually present on the hybrid cable. If **HV ENAB** is green but **HV PRES** is off, check to see if the circuit breaker has been tripped. If so, the **RESET** button may need to be pressed after removing the fault. Otherwise, there could be a failure of either the HUT relays or power transformer, and the HUT will require service.
CAM TYPE: Selects between Hitachi and Sony/Ikegami cameras.

Optional Front Panel Features:

If ordered with the optional Optical repeater, besides the features of the basic unit, the front panel will have these additional features as shown in the second panel:

OPTical Status Leds:

There are 2 LEDs labeled **A** and **B** for the 2 optical fibers. Each glows red if the received optical strength of its fiber is less than -18db, and green if greater.

REMOTE enable switch: Set to on to enable the Cam HUT to prevent HV from being applied to the camera if fiber **A** is not illuminated. Fiber **A** is assumed to be the fiber uplinking from the base to the camera. This effectively places the camera in standby, as only standby voltage can be applied. If fiber **A** is illuminated, the Cam HUT will enable the application of HV if all other cable checks have been passed. If the **REMOTE** switch is set to off, this feature is bypassed and the application of HV will be determined by the cable checks alone. Functionality will then be identical to the basic unit.

If ordered with the optional OLED display, the front panel will look like the third panel in Fig. 2. All the status LEDs for optical strength and cable status are deleted, and replaced with the display, and a single **STATUS** LED. The **STATUS** LED is normally green, but if there is a problem, such as a cable open or short, or insufficient optical signal, it glows red, prompting the user to consult the display to determine the exact fault. The **CAM TYPE** switch is also eliminated as it is now selected via the display menu.

The display will show a screen saver upon power up. After a few minutes, the screen will go dark if the **SELECT** button has not been touched. If touched, the display will again become active and will display status information. The **SELECT** joybutton is used to navigate the display. Push on the upper or lower edges to choose between screens, once within a screen, push the left or right edge to choose parameters within the screen, and push straight in to select a parameter. Doing this exits you to the next screen. You can choose screens showing cable status, optical signal status, and camera type, amongst others.

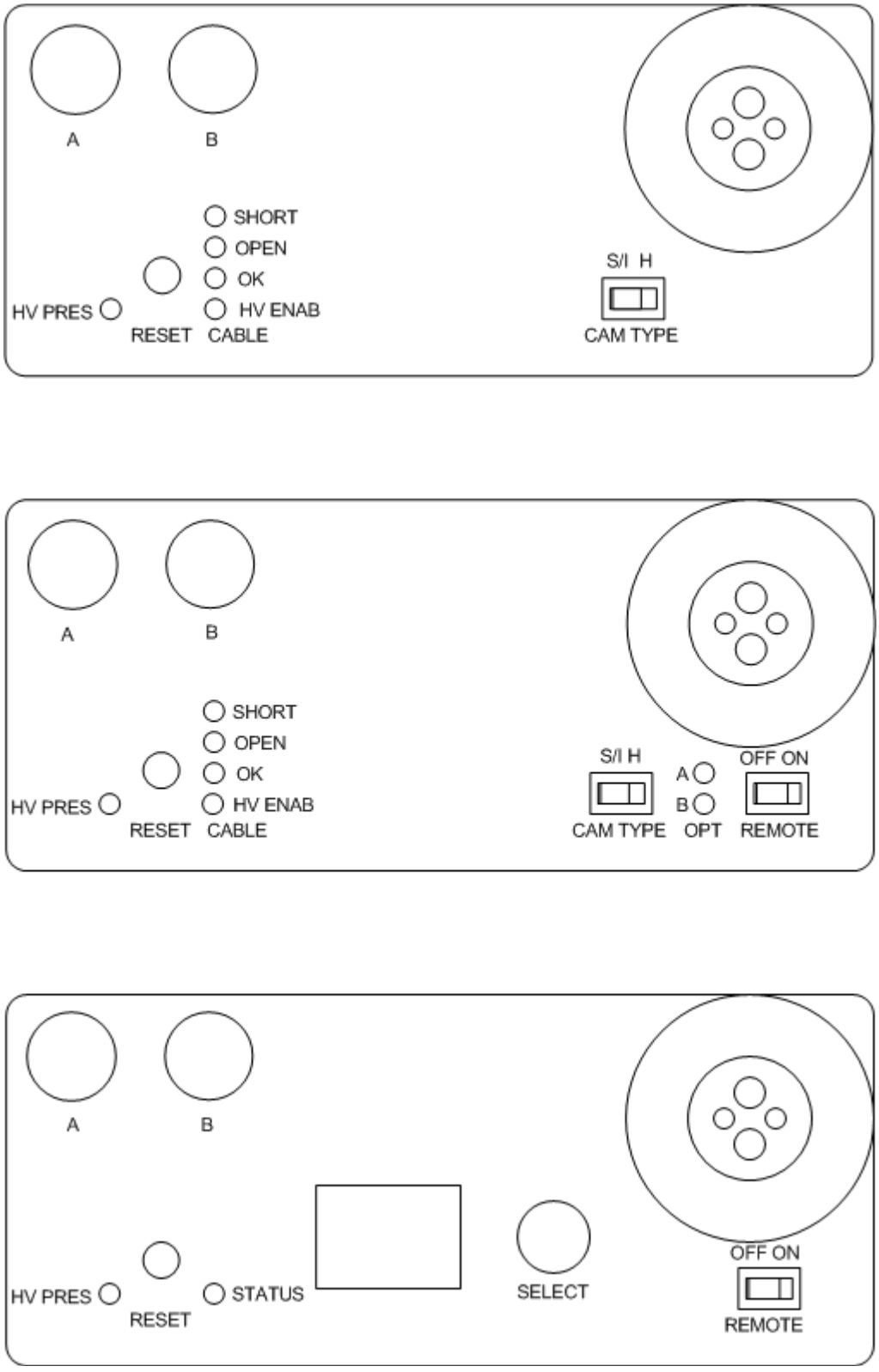

Fig. 2: CAM HUT front panels

The rear panel is shown in Fig. 3. This drawing shows an optional location of the optical connectors on the rear. The same considerations concerning the fiber optic connectors should be observed as on the front panel. Also on the rear is a fused, filtered power entry module that accepts an IEC cord and a primary power switch. If the optical connectors are located on the front panel as shown in Fig. 2, then the rear would be completely blank except for the power entry. If pressing the RESET button after an overcurrent fault has occurred does not restore power, please check the fuse.

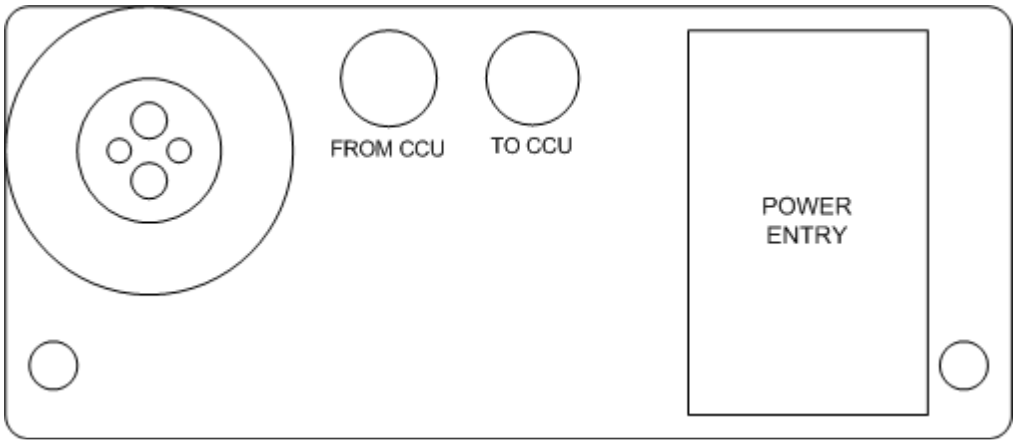

Fig. 3: CAM HUT Rear Panel

2. Base (CCU side) Unit

The Base unit, known as HUT-CCU, has a SMPTE hybrid receptacle panel mount connector for connection to the CCU and 2 ST/UPC or duplex LC connectors for the fibers to the CAM HUT. The base unit is shown here in Fig. 4 with ST connectors As on the CAM HUT, the ST or LC connectors are labeled either **FROM CCU** and **TO CCU** or **A** and **B**. The same considerations concerning the fiber labels should be observed, as on the CAM HUT.

Fig. 4: Base Unit

The HUT-CCU acts as a breakout for the optical ports in the CCU SMPTE connector. It also tricks the CCU into thinking a camera is attached by a SMPTE hybrid fiber cable. This is necessary to enable the CCU to leave standby mode so that it can accept video from the camera. It has 2 LEDs located on the panel with the ST connectors, labeled Power and HV. The Power LED is green when the CCU is supplying power to the HUT-CCU, and the HUT-CCU is attempting to spoof the CCU. The HV LED is green when the CCU is supplying high voltage. This means that the HUT-CCU has successfully spoofed the CCU into thinking a camera is attached. Otherwise, the CCU will not leave standby mode. The HUT-CCU comes configured for use with Sony, Hitachi, or Ikegami CCUs. However, the Ike CCUs need to be configured for “single fiber mode” to work with the HUT-CCU in its default configuration, otherwise the Ike CCU will report an open cable and will not leave standby mode. Note that the HV LED on the HUT-CCU will remain off in single fiber mode, even during normal operation.

To avoid having to set the Ikegami CCUs for single fiber mode, you can configure the HUT-CCU specifically for your Ike. To do this, one must open the HUT-CCU and set a dip switch as follows:

	Sony/Hitachi	Ikegami
SW1	off	on
SW2	off	on
SW3	on	off
SW4	off	off

Either approach to enabling Ikegami CCU operation is valid. The choice is up to you, although single fiber mode may make some camera system features unavailable.

Note that with some Sony camera systems, the CCU may report an open cable condition. Despite this, the system will work normally, so you can safely ignore this warning.

3. Specifications

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SDI Standards Supported, repeater	SMPTE 259M/292M/297M/425M, DVB/ASI
SDI Added Jitter, repeater	< .03 UI, < 1 MHZ
Laser Safety, repeater	Class 1
Optical Connectors, CAM HUT	SMPTE 311 Plug + 2 ST/UPC or LC
Optical Connectors, HUT-CCU	SMPTE 311 Receptacle + 2 ST/UPC or LC
Optical Wavelengths, nm, repeater	1310. 1550 or CWDM optional
Optical Sensitivity, repeater	-18 dBm
Optical Output Power, repeater	-2 ~ -8 dBm
Fiber Optic cable length, standard	Limited by camera/CCU
Fiber Optic cable length, repeater	Up to 20km
Indicators, CAM HUT Unit, standard	Cable open/short, HV/status
Indicators, CAM HUT Unit, repeater	As above + optical power ok/bad/laserfail
Electrical Output, CAM HUT Unit	230VAC @ up to 250VA, active, 24VAC @ up to25VA, standby
Power Requirement, CAM HUT Unit	115/230VAC, 50/60HZ, 260VA
Power Requirement, HUT CCU Unit	Steals power from CCU
Operating Temperature	0 to 70 deg C
Certifications	FCC class A and UL/CE
Dimensions, CAM HUT unit	3.5” H x 5.5” W x 10.5” D
Weight, CAM HUT unit	10 pounds
Dimensions, Base unit	2.0” H x 2.5” W x 7.0” D
Weight, Base unit	0.5 pound