Bluebell ✳
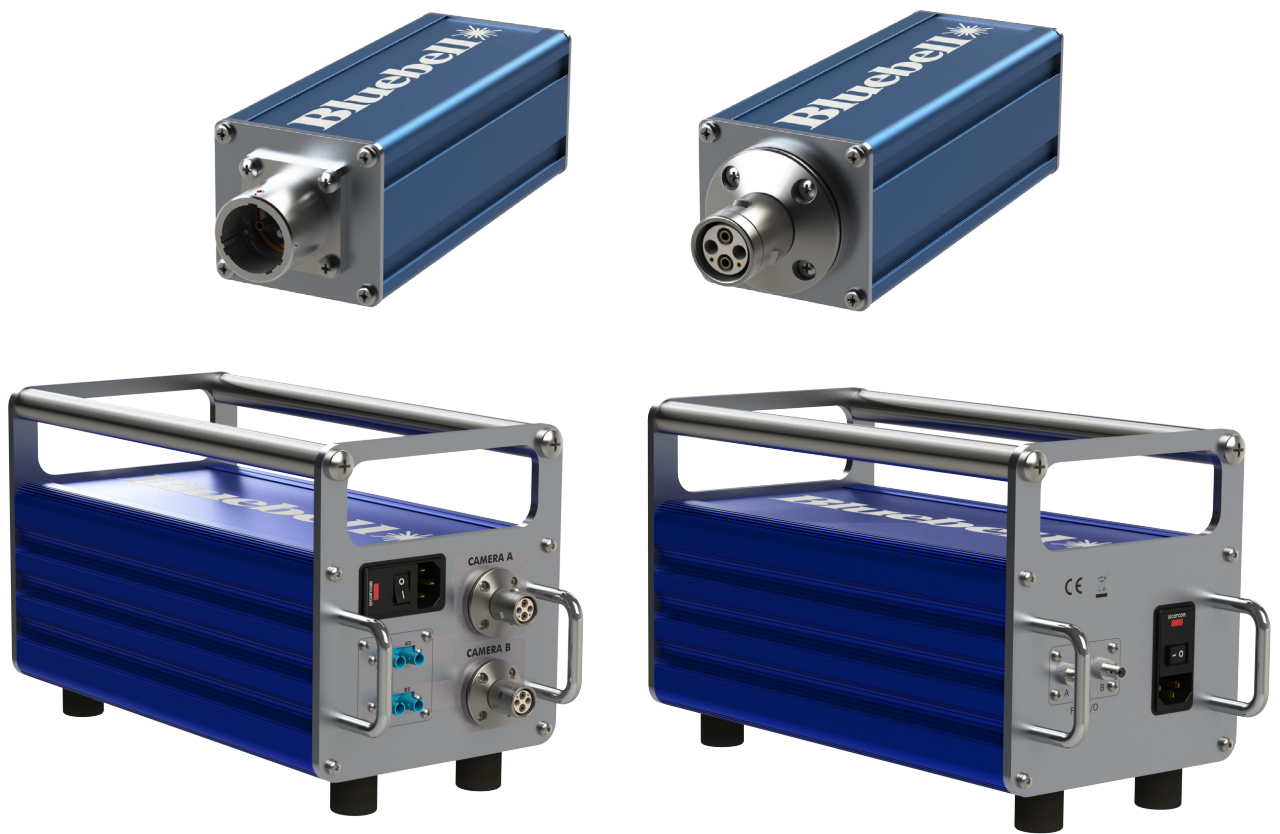
Shax
SMPTE Hybrid Alternative
Connection Kit

Quick Start Guide

Thank you for purchasing this Bluebell Opticom professional broadcast video product. A Shax fibre-optic link is simple to install and this Quick Start Guide should provide sufficient information to get you up and running in the vast majority of cases.

Should you need additional information, please contact the Bluebell Support Team at sales@bluebell.tv.

IMPORTANT SAFETY INSTRUCTIONS

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 a 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. Only use with the cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the apparatus.

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.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

It is important that the apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases shall be placed on the apparatus.

- To avoid overheating, do not install this apparatus in direct sunlight.

- Do not expose this apparatus to drips or splashes.

- Do not place any objects filled with liquids on the apparatus.

- Do not install this apparatus in a confined space such as a bookcase or similar unit.

- Please ensure adequate space around the apparatus for sufficient ventilation. Ventilation should not be impeded by covering the ventilation openings with any items.

- The apparatus should be located close enough to an AC outlet so that you can easily grasp the power cord plug at any time.

- An apparatus with Class 1 construction shall be connected to an AC outlet with a protective grounding connection.

- No naked flames, such as lighted candles, should be placed on the apparatus.

IMPORTANT SAFETY PRECAUTIONS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within equilateral triangle, is intended to alert the user to the presence of an uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating instructions and maintenance (servicing) instructions in the literature accompanying the appliance.

ENVIRONMENTAL RATING: IP50
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Overview

The Bluebell Opticom Shax system allows SDI (3G/SD/HD) video cameras fitted with SMPTE 304M hybrid (fibre + copper) connectors to be deployed remotely using standard singlemode optical fibre. This reduces the field requirement for expensive and bulky SMPTE 311 hybrid cable to a maximum of two short runs: between the CCU and the Shax system in the control room or OB vehicle, and between the Shax system and the camera at the remote location.

As standard optical fibre only carries data, and not the camera power supply voltage, provision needs to be made at the camera location for camera power. This can be provided with either the manufacturer's own PSU, batteries, or ShaxX power supply units (see Shax system components below).

The camera type to be used with a Shax system must be specified at the time of ordering as, while the connectors and cable are standardised, the control protocols and supply voltages used by different camera models vary. The Shax system has been tested with the following makes and model of camera:

- Sony   Models HDC-900/950/1000/1500/2500 and F55
- Hitachi   Model CU-HD1200
- Ikegami   HDK-97GX

Please contact support@bluebell.tv to request the latest information regarding compatible camera types and any additional technical information regarding CCU configuration.

Shax system components

A Shax link requires at least two modules, a **Shax-CCU** (in the OB vehicle) and a **Shax-Camera** (at the camera location). For this reason, Shax systems are normally supplied as a pair of modules as a minimum.


Shax-Camera

Shax-CCU

The two interface modules are in the form of rugged aluminium extrusions with steel endplates which carry the hybrid and standard optical fibre connectors respectively. The module type is indicated on the casing; they may also be distinguished by the gender of the Lemo Hybrid connector:

- **Shax-Camera**   Lemo 3K.93C FXW Plug
- **Shax-CCU**   Lemo 3K.93C EDW Socket

The standard optical fibre connectors are normally of dual ST female type. Alternatively, FC or SC type connectors may be fitted, if they were specified at the time of ordering.

Part/Serial Number label

Shax-Cam-ST
001602-16

Shax-Camera module
with ST fibre connectors
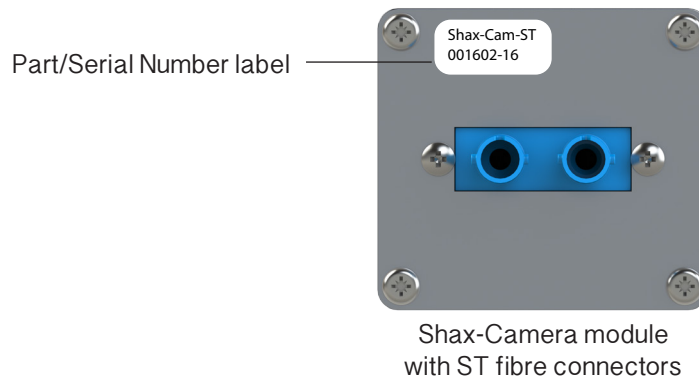
Shax-CCU modules intended for Hitachi CCUs (if ordered as such) have their SMPTE 304M hybrid socket offset to one edge of the endplate to allow direct connection onto the SMPTE 304M hybrid plug of the CCU. In other respects, the **Shax-CCU** units are the same for all camera types. **Shax-Camera** modules are not camera-specific.

The Shax system also includes single (**ShaxX**) and dual (**ShaxX-DUAL**) camera power supplies (PSUs) for optional use at the camera location. These connect to a local AC mains supply and interface directly between the standard fibre and the hybrid camera cable, thus minimising cable requirements and setup time. A **ShaxX** PSU at the remote location will replace a **Shax-Camera** module.


ShaxX

ShaxX-DUAL

ShaxX PSUs are constructed in rugged aluminium extrusions with steel endplates, and fitted with carrying handles and rubber feet for easy field deployment.

The PSU camera version is clearly indicated on the front end plate.

IMPORTANT:
DO NOT ATTEMPT TO USE EITHER MODEL OF A SHAXX PSU WITH A CAMERA TYPE OTHER THAN THAT FOR WHICH IT IS SPECIFIED.

System connection with Shax modules
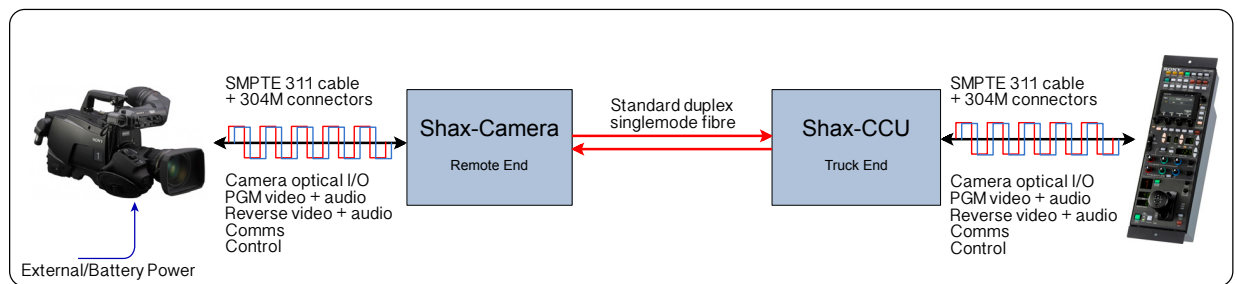
Connecting up a Shax system with only **Shax-CCU** and **Shax-Camera** interface modules will usually be simply a matter of plugging the **Shax-CCU** module directly into the hybrid port of the CCU and the **Shax-Camera** module directly into the hybrid port of the camera, and then connecting the two modules with standard singlemode dual fibre (with the appropriate optical connectors). In many venues, such fibre will already be installed between OB truck locations and remote camera positions, so only short fibre patch cables will be required between the interfaces and the venue fibre patch panels. The hybrid connector genders make it impossible to use the modules the wrong way round.

Sometimes operational circumstances may make it more appropriate to use a short SMPTE 311 hybrid cable at one or both locations – between the CCU and the **Shax-CCU** module, and/or between the camera and the **Shax-Camera** module.

CCUs check for the presence of a camera on power-up; when connected directly to a camera of the correct type with a hybrid cable, the "valid" response from the camera enables the CCU to then apply power to the camera via the hybrid cable. (With most camera types, the camera power setting must be "CCU" or equivalent for this to occur.) When a Shax system is in use, the **Shax-CCU** module mimics the camera's response, allowing the CCU to boot-up normally, even though power for the camera will be obtained locally at the camera position.

System connection with ShaxX PSUs

A ShaxX PSU (either the **ShaxX** or **ShaxX-DUAL**) replaces both the **Shax-Camera** module and any local external camera power supply at the camera location. The two models are functionally identical, but the **ShaxX-DUAL** is able to support two separate cameras, and is correspondingly equipped with two hybrid connectors and two optical fibre connectors. Note that separate fibre pairs must be used for each camera feed.

The front and rear faceplates of both the **ShaxX** and **ShaxX-DUAL** are shown in this section.

ShaxX Front Panel
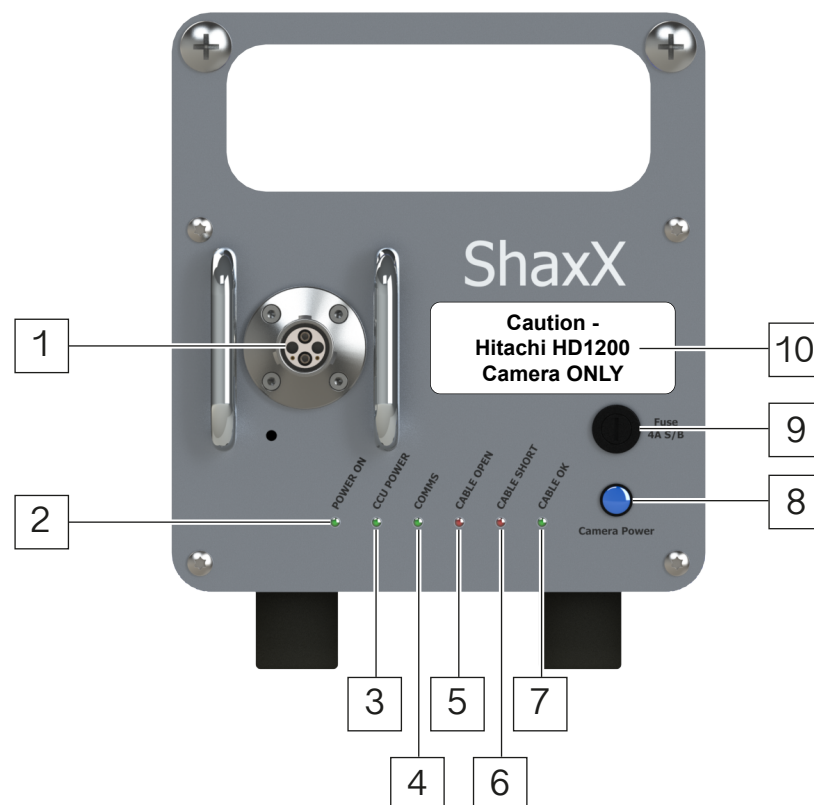
1. SMPTE 304M hybrid connector – connect to camera with SMPTE 311 cable.

2. **POWER ON LED** (green) – indicates that the unit is powered on.

3. **CCU POWER LED** (green) – indicates that the ShaxX is powering the camera. Note that Sony cameras will need to be set to "CCU" to be powered from the ShaxX; in 'OFF' and 'EXT' settings, the camera will only receive low voltage standby power.

4. **COMMS LED** (green) – function varies with camera type. With Sony cameras, COMMS illuminates when the camera is set to 'EXT'; in this state, the camera is not fully powered by ShaxX (but could be by another method), but the comms functions are active. COMMS will go off when the camera is set to centre or 'CCU', i.e., it only illuminates when the ShaxX is used for comms but not power.. With Hitachi and Ikegami cameras, COMMS is always illuminated while ShaxX is powered.

5. **CABLE OPEN LED** (red) – illuminates if ShaxX cannot sense a camera via the main power pins of the hybrid connector.

6. **CABLE SHORT LED** (red) – illuminates if ShaxX detects a short-circuit across the main power pins of the hybrid connector.

7. **CABLE OK LED** (green) – illuminates when neither **CABLE OPEN** nor **CABLE SHORT** is red.

8. **Camera Power** indicator (blue) – confirms that the camera is being powered by ShaxX. (Depending on camera type, standby power may still be supplied to the camera when this indicator is off).

9. Camera power fuse

10. Camera type label

ShaxX Rear Panel
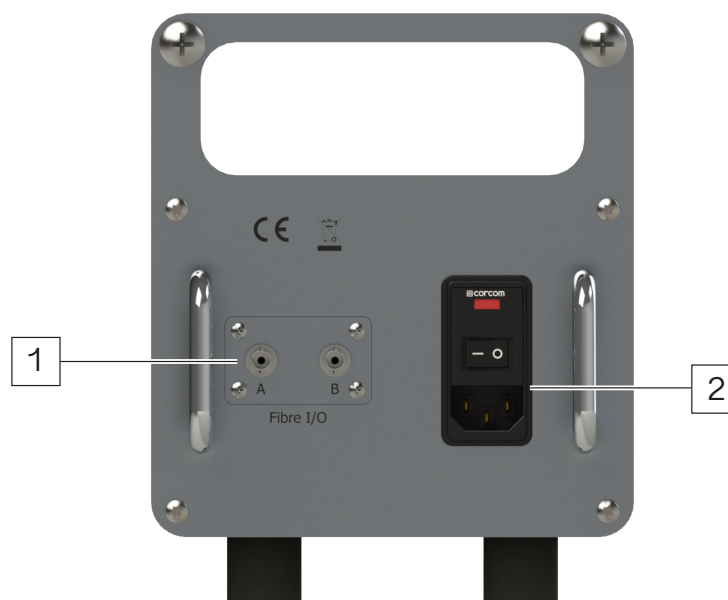
1. **Fibre I/O A** and **B** - dual optical fibre connector, type specified at time of ordering (ST, SC or FC). Connect to structural fibre system

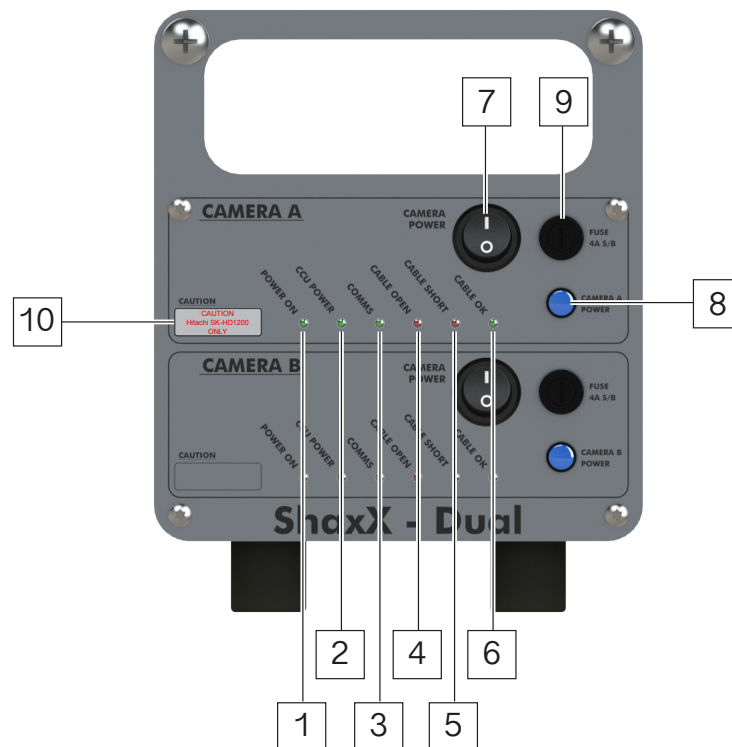2. Mains inlet connector (IEC) with integral power on/off switch and mains fuse.

⚠ **IMPORTANT:** The switch at [2] is the means of disconnecting the ShaxX unit from the AC mains supply.

ShaxX-DUAL Front Panel

CAMERA A

1. **POWER ON LED** (green) – indicates that the unit is powered on.

2. **CCU POWER LED** (green) – indicates that the ShaxX-Dual is powering Camera A. Note that Sony cameras will need to be set to "CCU" to be powered from the ShaxX-Dual; in 'OFF' and 'EXT' settings, the camera will only receive low voltage standby power.

3. **COMMS LED** (green) – function varies with camera type. With Sony cameras, COMMS illuminates when the camera is set to 'EXT'; in this state, the camera is not fully powered by ShaxX (but could be by another method), but the comms functions are active. COMMS will go off when the camera is set to centre or 'CCU'. With Hitachi and Ikegami cameras, COMMS is always illuminated while ShaxX is powered.

4. **CABLE OPEN** LED (red) – illuminates if ShaxX-Dual cannot sense a camera via the main power pins of the Camera A hybrid connector.

5. **CABLE SHORT** LED (red) – illuminates if ShaxX-Dual detects a short-circuit across the main power pins of the Camera A hybrid connector.

6. **CABLE OK** LED (green) – illuminates when neither **CABLE OPEN** nor **CABLE SHORT** is red.

7. Camera power switch – enables the high voltage supply to camera A. When off ('O'), the camera continues to receive its low voltage standby supply.

8. **CAMERA A POWER** indicator (blue) – confirms that Camera A is being powered by ShaxX-Dual. (Depending on camera type, standby power may still be supplied to the camera when this indicator is off).

9. Camera power fuse
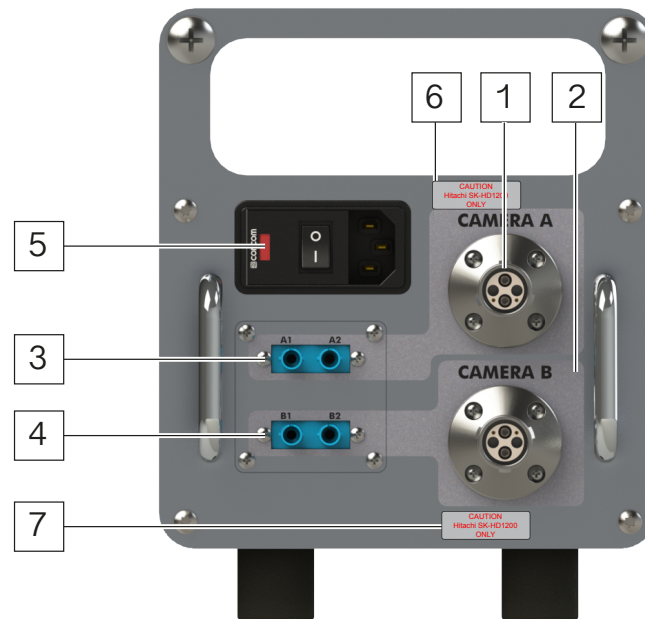
10. Camera type label
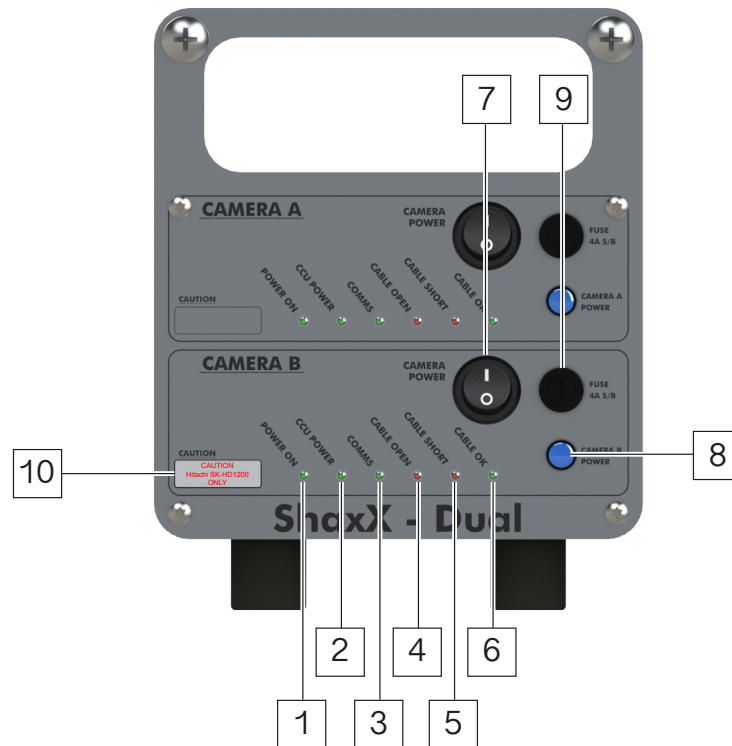
CAMERA B

(All Camera B functions are identical to those for Camera A above)

1. **POWER ON** LED (green)

2. **CCU POWER** LED (green)

3. **COMMS** LED (green)

4. **CABLE OPEN** LED (red)

5. **CABLE SHORT** LED (red)

6. **CABLE OK** LED (green)

7. Camera power switch

8. **CAMERA B POWER** indicator (blue)

9. Camera power fuse

10. Camera type label

ShaxX-DUAL Rear Panel

1. **CAMERA A** - SMPTE 304M hybrid connector – connect to camera A with SMPTE 311 cable

2. **CAMERA B** – as [1] for second camera

3. **A1** and **A2** - dual optical fibre connector for Camera A, type specified at time of ordering (ST, SC or FC). Connect to structural fibre system

4. **B1** and **B2** - as [3] for second camera

5. Mains inlet connector (IEC) with integral power on/off switch and mains fuse

6. Camera type label - Camera A

7. Camera type label - Camera B

⚠️ **IMPORTANT:** The switch at [5] is the means of disconnecting the ShaxX-Dual unit from the AC mains supply.

ShaxX PSUs are connected in the same manner as Shax-Camera modules, with the exception that they also require an AC mains supply. The camera's power is supplied via the hybrid cable.
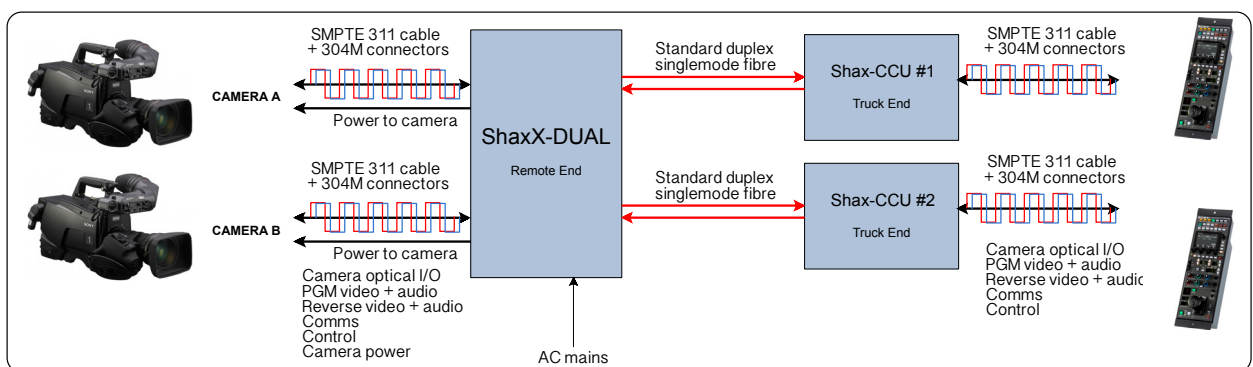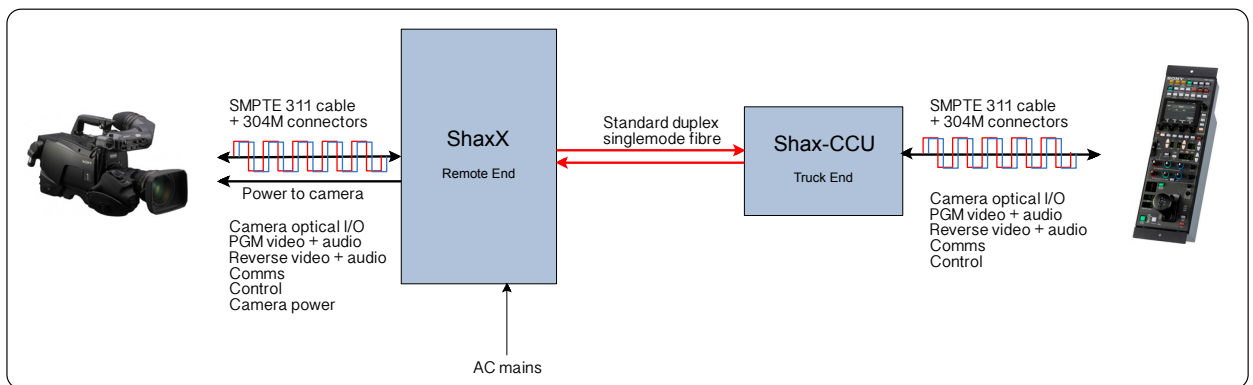
Fuse data

On both models, the AC mains fuses are integral with the IEC mains inlet connector on the rear panel. The camera fuses are accessible on the front panel.

		115 V	230 V
AC Mains	20 mm or 1.25"	10A 250V T (slo-blo)	10A 250V T (slo-blo)
Camera	20 mm	4A 250 V T (slo-blo	4A 250 V T (slo-blo)

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