Real Freedom

Fiber Antenna Extender

Product Manual

Revision A

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Revision A

This manual contains important information regarding the installation and operation of the Real Freedom Fiber Antenna Extender. For safe and reliable operation, installers must ensure that they are familiar with, and fully understand, all instructions contained herein. Broadcast Sports International reserves the right to revise and improve its products as it sees fit. This publication describes the state of this product at the time of publication and may not always reflect the product in the future.

In this manual, the following symbols call your attention to important information:

CAUTION	Indicates that care is required when proceeding to avoid damage to the system.
IMPORTANT	Indicates important information that you should read before installing, configuring, or using the system.
NOTE	Used to draw your attention to additional important information.
TIP	Indicates information that may make procedures easier.
WARNING	Indicates a potentially hazardous situation.

Warranty information

All products are warranted to be free from defects in materials or workmanship for a period of 24 months. If returned within the applicable warranty period, BSI will, at its sole discretion and at no cost to the customer, repair or replace the defective product with another unit of the same or equivalent model. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alterations or repairs.

Contact details and technical support

Real Freedom Team	For product information and help with missing or damaged items. Email: EngineeringDepartment@BSINTL.COM Tel: +1-410-564-2642
Telephone Support Line	Product technical support is provided via a telephone support line. Trained technicians are available to offer setup and configuration advice and to assist in troubleshooting technical issues. Tel: +1-410-564-2642
Return Merchandise Authorization (RMA) Procedure	Problems that cannot be resolved on the telephone may require the device to be returned to BSI for repair. In such cases, the telephone operator will assist the customer in obtaining an RMA. Please note that no returns can be accepted without a valid RMA.

Hazard warning labels

The following hazard warning labels are fixed to the Real Freedom Fiber Antenna Extender for your information and safety.
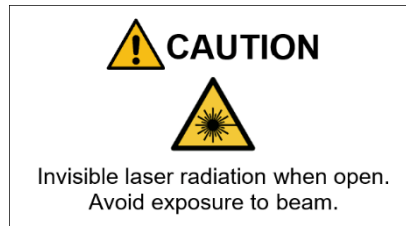
Base unit

Remote unit

About this manual

This manual contains safety information and information for installing, configuring, and operating a Real Freedom Fiber Antenna Extender.

It applies to the following products:

- IFB-3211: Real Freedom Fiber Base Unit
- IFR-3211: Real Freedom Fiber Remote Unit

Contents

The Real Freedom Fiber Antenna Extender provides unparalleled flexibility of operation. Multiple RF cameras incorporating camera control may be deployed from a single remote site utilizing just a single SMPTE hybrid fiber cable.

The system consists of a fiber base unit (IFB-3211) which integrates with a Real Freedom Receiver for command and control along with a fiber remote unit (IFR-3211). Both units are fully weatherproof and are linked together by a single SMPTE hybrid or single mode dual fiber cable.

The Real Freedom Fiber Antenna Extender incorporates an SDI/ASI return video channel from the base unit to the remote unit and allows you to simultaneously extend camera control and receive antennas by up to 2 km / 1.5 miles with a single hybrid fiber cable. Providing power to remote Real Freedom Downconverters and Data Transmitters over hybrid fiber cable, the system supports multiple RF cameras with a single SMPTE cable.

The system's intelligent connectivity notifies the Real Freedom Receiver of the presence of the Real Freedom Fiber Antenna Extender within the network, including the status and control of any attached Real Freedom Data Transmitters and Downconverters. Fiber optic signal levels and real-time health check reporting are displayed on the receiver, alerting you when RF performance is affected. Up to six Real Freedom Receivers can be simultaneously supported by a single fiber base unit when utilized with the optional Real Freedom Active UHF Splitter.

Configuration example

This example shows multiple RF cameras incorporating camera control deployed from a single remote site utilizing a single SMPTE hybrid fiber cable. Note that the base unit and splitter can be replaced with a rack mount fiber base unit incorporating the active splitter.
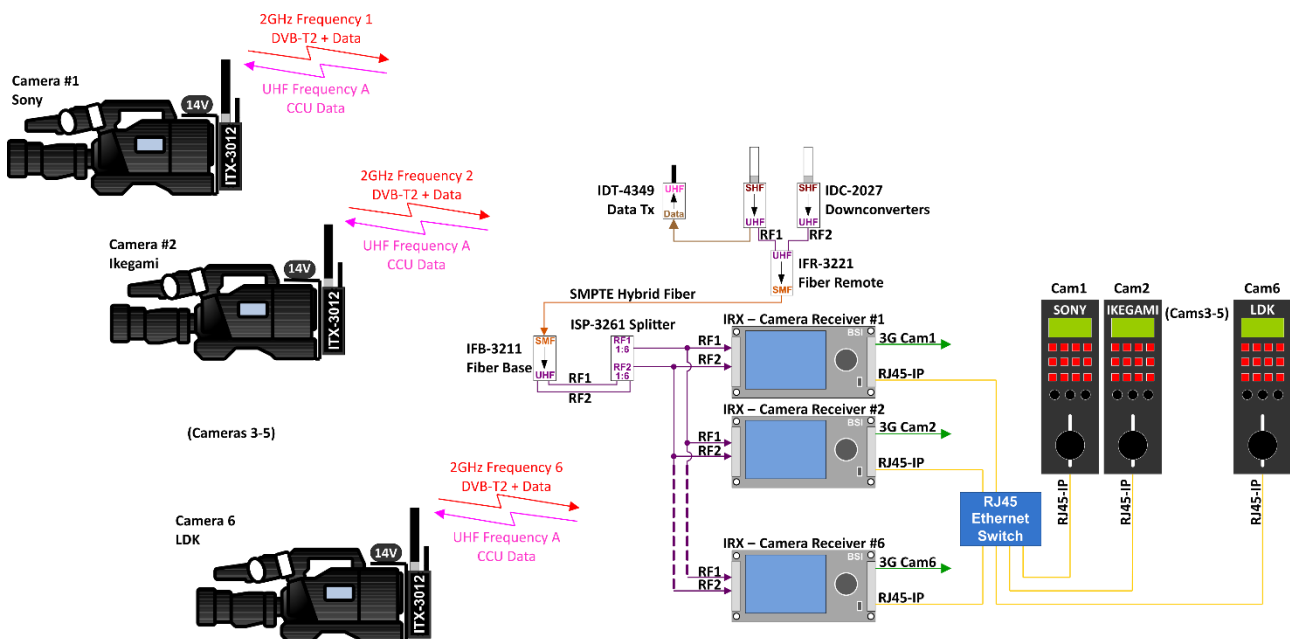
Figure 1: Networked multi camera reception with remote fiber extender and active splitter.

Installation and configuration

This chapter contains the installation and configuration instructions for the Real Freedom Fiber Antenna Extender (fiber base and fiber remote units).

Overview

The main installation and configuration steps for a Real Freedom Fiber Antenna Extender are as follows:

1. Optionally, pole mount the base and remote units.

2. Connect a Real Freedom Downconverter to the remote unit.

    To remotely control up to six Real Freedom Camera Back Transmitters and to provide camera control of most brands of broadcast camera, connect a Real Freedom Data Transmitter to one of the downconverters.

3. Connect the base unit to the remote unit using a fiber cable.

4. Connect the RF outputs from the base unit to a Real Freedom Receiver either directly or via an active UHF splitter.

5. From the receiver, monitor fiber optic signal levels, voltages, and currents of connected equipment, which can help to alert you when RF performance is affected. If RF levels are low, use the receiver to introduces extra gain into the system.

Preparation

When planning the installation locations for the fiber base and remote units, you should take note of the following points:

*   In general, you should install the base and remote units in areas where they can be accessed easily by support technicians. This area should also be out of reach or inaccessible to anyone that does not need to gain access, such as fans at a sporting event or attendees at a conference.

*   Install the fiber base unit close to the receiver to minimize the loss of RF signal strength.

*   Install the antenna close to the downconverter using the shortest cable length as possible to minimize cable loss.

*   Locate the remote unit as close as possible to the downconverter to minimize RF cable loss.

Environmental requirements

The following table summarizes the environmental requirements for the operation and storage of a Real Freedom Fiber Antenna Extender.

Table 1: Environmental requirements

Specification	Details
Humidity	95% non-condensing
Operating and storage temperature	14° to 149°F / -10° to +65°C

Power requirements

The following table summarizes the power requirements for a Real Freedom Fiber Antenna Extender.

Table 2: Power requirements

Specification	Details
Power	9–36 V DC
Consumption	Each fiber unit consumes about 8.5 W. Note this does not include any peripherals connected to the remote unit such as a downconverter and data transmitter.
	The recommended power supply for a SMPTE fiber base unit is Mean-Well GST90A24-P1M (24 V 90 W). This provides sufficient power for a fiber base and fiber remote with two downconverters and a data transmitter connected.

Note that the remote unit requires a power supply for fiber lengths of greater than two kilometers.

When using SMPTE, the remote unit does not need power unless the fiber length exceeds two kilometers. If you are using other fiber connectors, for example, ST or LC, then these do not include a means for power insertion over the fiber and the remote unit must be powered locally.

Unpack the fiber antenna extender

Unpack the Real Freedom Fiber Antenna Extender and refer to the packing list to ensure that all items are included. Report any missing items immediately to the Real Freedom Team.

Inspect the base and remote units for signs of damage. Report any damage to the Real Freedom Team.

Additional items required for installation

To install the Real Freedom Fiber Antenna Extender, you will require the following additional items:

- 9–36 V DC power supplies with XLR-4 male connector.
- The other components of your Real Freedom installation, which may include one or more receivers, downconverters, data transmitters, camera back transmitters and cameras, and active UHF splitters.

Cable requirements

To install the Real Freedom Fiber Antenna Extender, you will require the following cables:

- Fiber cable with appropriate connectors.
- Coaxial cables with BNC connectors.

  It is recommended that you use good quality cable with the correct impedance: All fiber connections are 75 Ohm.

Pole mount a fiber base or remote unit

The Real Freedom Fiber Base and Fiber Remote units are supplied with a removable mounting bracket which allows you to mount either unit to a pole for temporary or permanent installation. The mounting bracket can be secured to vertical or horizontal poles of between 1.44 and 2.68 inch (36.5 to 68 mm) in diameter.

Precautions

You should read these precautions before you pole mount a fiber base unit and/or fiber remote unit.

- Before attaching a fiber base or fiber remote unit to a pole or camera mount, ensure that the pole can support the weight of the unit (1.8 lb. / 0.82 kg), antenna, attached cables, and any other devices that you intend to attach to the pole. This is particularly important if you intend to attach the unit to the end of the pole.

- The fiber base or remote unit must be mounted vertically.
- When attaching the mounting bracket to the fiber base or remote unit, do not overtighten the screws as it may result in thread damage.

Temporary installation

For temporary installation, use cable ties.

1. If not already attached, attach the mounting bracket to the back of the fiber base or fiber remote unit using the four screws (M3 x 8) provided.

   Do not overtighten the screws as it may result in thread damage.

2. Pass at least two cable ties through the slots in the mounting bracket and around the pole.

3. Close and tighten the cable ties to secure the fiber base or fiber remote unit to the pole.

Permanent installation

For permanent installation, use hose clamps.

1. If not already attached, attach the mounting bracket to the back of the fiber base or fiber remote unit using the four screws (M3 x 8) provided.

   Do not overtighten the screws as it may result in thread damage.

2. Pass the hose clamps through the slots in the mounting bracket and around the pole.

3. Tighten the hose clamps to secure the fiber base or fiber remote unit to the pole.

Installation using ¼-20 UNC mounts

Mount a fiber base or fiber remote unit on a standard Manfrotto lighting stand, camera mount, repro arm, magic arm, clamp, or Dado kit using a ¼-20 camera mount screw.

> **NOTE:** Fiber units are usually supplied with a Manfrotto ¼" to 5/8" adaptor (part number: 195) to go from the ¼-20 mount to a Manfrotto super clamp (part number: 035C).

1. If not already attached, attach the mounting bracket to the back of the fiber base or fiber remote unit using the four screws (M3 x 8) provided.

   Do not overtighten the screws as it may result in thread damage.

2. Either thread a ¼-20 screw through the screw hole in the mounting bracket into the hole in the mount or screw the fiber unit onto the mounting screw.

3. Tighten to secure the fiber base or fiber remote unit.

Surface mount a fiber base or fiber remote unit

Depending on the installation type and site, you may wish to mount a fiber base or fiber remote unit onto a vertical surface, such as a wall.

1. If attached, remove the mounting bracket from the back of the fiber base or fiber remote unit.

   The bracket is secured with four screws (M3 x 8).

2. Use the unit's back plate as a template and drill four holes into the mounting surface. Insert masonry plugs into the holes, as necessary.

3. Attach the fiber base or fiber remote unit using four screws.

4. Check that the fiber base or fiber remote unit is vertical and tighten the screws.

Connections

Refer to the following drawings which show the locations of the connectors and LEDs on the fiber base and fiber remote units.

> ⚠️ **CAUTION:** To prevent damage, it is recommended that you only use BSI supplied cables and accessories with these products.

Fiber base unit

Refer to the following drawing which shows the locations of the connectors on the fiber base unit. Note for easy identification, the base unit is black to match the receiver.

Figure 2: Fiber base unit connectors and status LEDs. A Side, B Top, C Bottom.

Key	Component	Description
1	AUX	Use for programming and firmware updates.
2	FTX	Indicates the state of the optical transmitter.
3	ATTN	Indicates whether remote attenuation is activated.
4	SDI	Indicates whether a valid SDI input has been detected.
5	SDI IN	SDI/ASI input. Use to connect an SDI or ASI source to the fiber base unit to send over the fiber link to the fiber remote unit. Note that this interface does not support 3G-SDI. Connector: BNC (F)
6	RF2	Use to connect the fiber base unit to a Real Freedom Receiver or Real Freedom Active UHF Splitter. Connector: BNC (F)

Key	Component	Description
7	Fiber connector	Use to connect the fiber cable to the base unit. The other end of the fiber cable connects to the fiber remote unit. Fiber FC/APC – S & D connectors and SMPTE are typically the most used, but other connector types are available.
8	RF1	Use to connect the fiber base unit to a Real Freedom Receiver or Real Freedom Active UHF Splitter. Connector: BNC (F)
9	RX1	Indicates whether the base unit has a comms link with the receiver (RF1).
10	PWR	Indicates whether the base unit is powered and has detected a fiber remote unit.
11	FRX	Indicates the state of the RF1 and RF2 optical receive levels.
12	RX2	Indicates whether the base unit has a comms link with the receiver (RF2).
13	10-36 VDC	DC input to power the unit. Connector: XLR-4 (M)

Fiber remote unit

Refer to the following drawing which shows the locations of the connectors on the fiber remote unit. Note for easy identification, the remote unit is grey to match the downconverter.
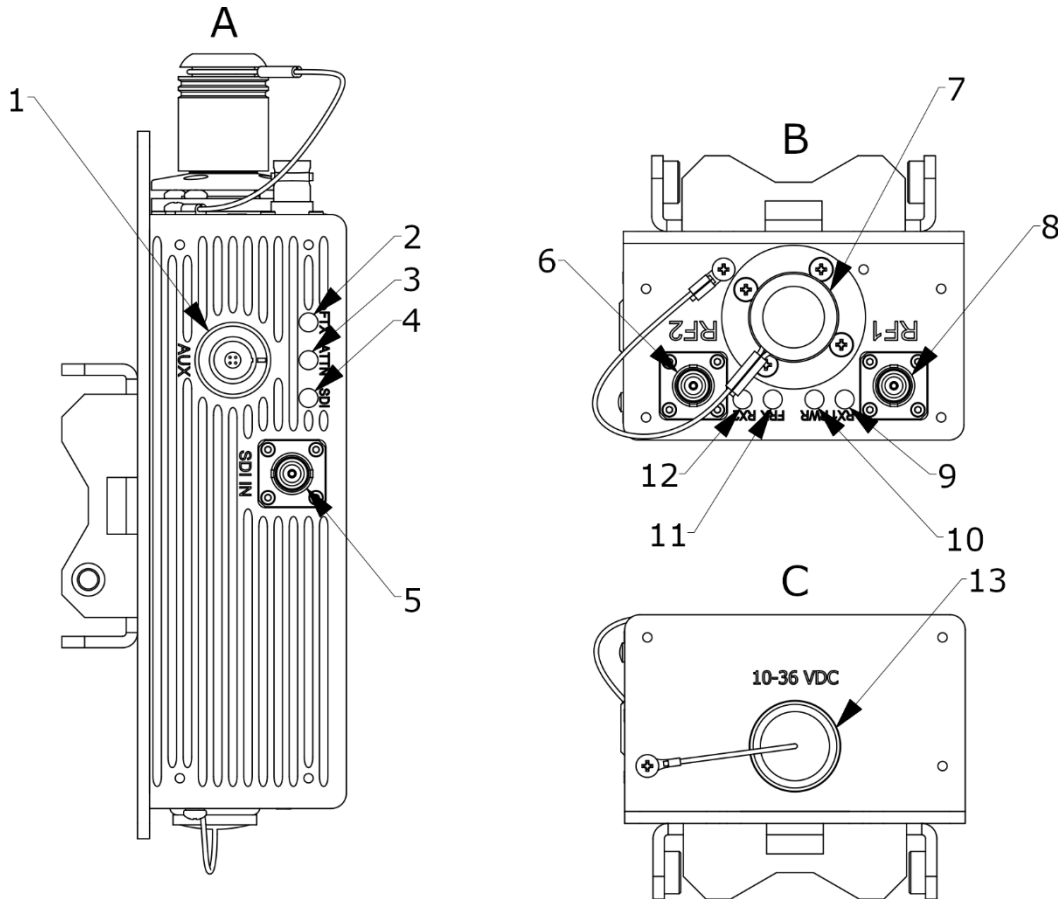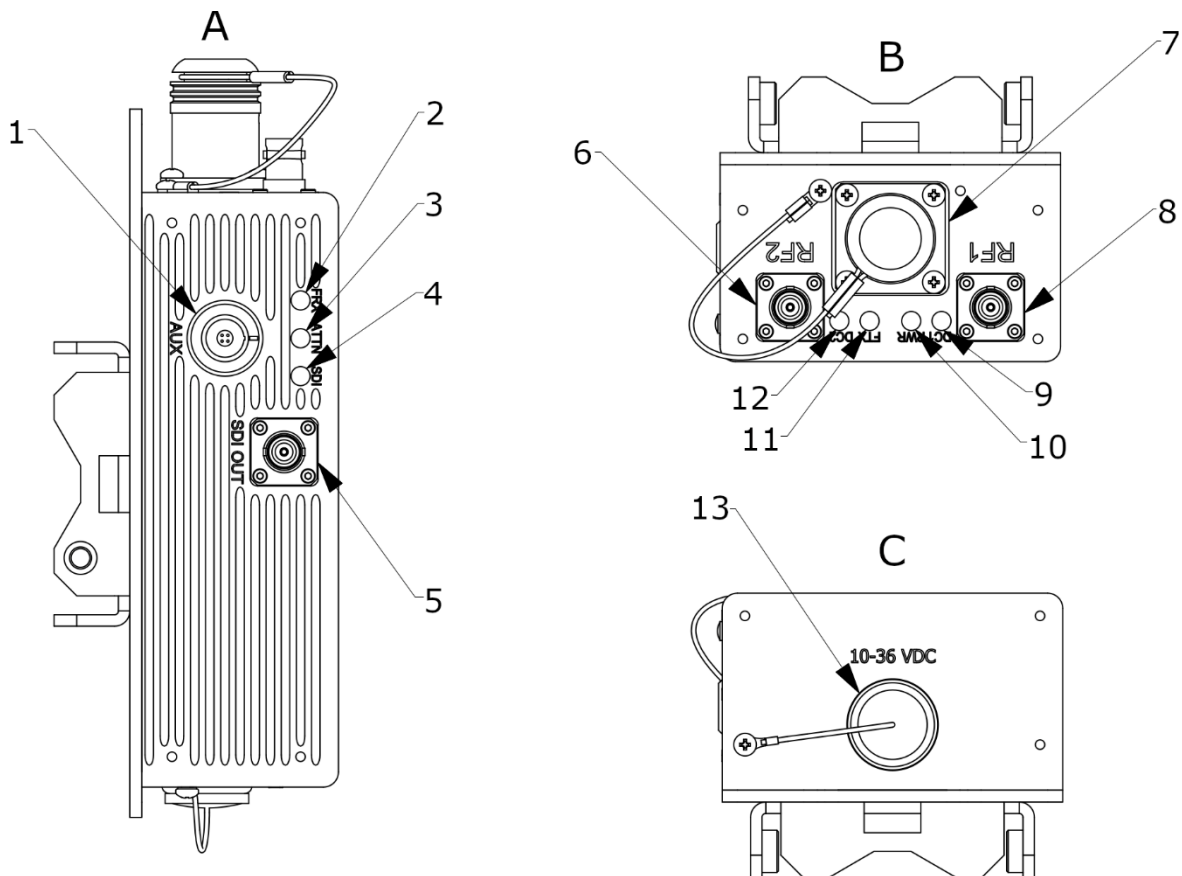

Figure 3: Fiber remote unit connectors and status LEDs. A Side, B Top, C Bottom.

Key	Component	Description
1	AUX	Use for programming and firmware updates.
2	FRX	Indicates the status of optical receive level.
3	ATTN	Indicates whether remote attenuation is activated.

Key	Component	Description
4	SDI	Indicates whether a valid SDI signal is being output.
5	SDI OUT	SDI/ASI output. Provides an SDI/ASI output if an SDI/ASI source has been connected to the fiber base unit. Note that this interface does not support 3G-SDI. Connector: BNC (F)
6	RF2	Use to connect a Real Freedom Downconverter to the fiber remote unit. Connector: BNC (F)
7	Fiber connector	Use to connect the fiber cable to the remote unit. The other end of the fiber cable connects to the fiber base unit. Fiber FC/APC – S & D connectors and SMPTE are typically the most used, but other connector types are available.
8	RF1	Use to connect a Real Freedom Downconverter to the fiber remote unit. Connector: BNC (F)
9	DC1	Indicates whether the downconverter on RF1 has power and a comms link with the remote unit.
10	PWR	Indicates whether the remote unit has DC power and has detected a fiber base unit.
11	FTX	Indicates the state of the optical fiber transmitters.
12	DC2	Indicates whether the downconverter on RF2 has power and a comms link with the remote unit.
13	10-36 VDC	DC input to power the unit. Note that if you are using SMPTE fiber, then the remote unit does not require DC power. Connector: XLR-4 (M)

Connect a downconverter to a fiber remote unit

Connect downconverters to a fiber remote unit using the RF1/RF2 BNC connectors.

NOTE: The connection between the downconverter output and the fiber remote cannot exceed a reasonable distance without beginning to affect performance. The chosen system configuration will influence the placement of components and the cable lengths required.

Connect a fiber remote unit to a fiber base unit

Use an appropriate fiber cable to connect the fiber remote unit to the fiber base unit. FC/APC – S & D connectors and hybrid SMPTE are typically the most used connectors, but other connector types are available.

IMPORTANT: Practice clean fiber handling procedures and clean all fibers prior to connection. Dirt may be easily transferred from one fiber to another.

Connect a fiber base unit to a receiver

Use coaxial cables to connect the outputs (RF1 and RF2) from the base unit to the BNC connectors on the back of a Real Freedom Receiver (RF1 and RF2).

The distance between the receiver and base unit should be kept to a minimum to maintain a strong signal.

IMPORTANT: When connecting a fiber base unit to the Real Freedom Receiver, the coaxial connections must be made to sequential RF input pairs on the receiver (for example, RF1/RF2 or RF3/RF4 or RF5/RF6 or RF7/RF8) when operated in single (normal) pedestal mode. When operated in dual pedestal (single stream) mode, the connections from the fiber base to the receiver must be (RF2/RF4 or RF6/RF8).

When an incorrect connection is made, the receiver's Connection Map will not populate correctly and the RX1 and RX2 blue LEDs on the fiber base unit will flash to indicate that correct communication has not been established between the fiber base and receiver.

Configure a fiber antenna extender

Once the power is supplied, the Real Freedom Receiver automatically detects the Real Freedom Fiber Extender (fiber base and remote units) and configures itself appropriately.

NOTE: Refer to the *Real Freedom Receiver Product Manual* for more information on the fiber configuration options and how to enable Active Mode (Gain Boost) when RF levels are low.

3
Operation

Once connected to the system and configured, no further changes are required to the Real Freedom Fiber Antenna Extender during the routine operation of the system.

> **TIP:** Use the receiver's **Fiber Status** page to view fiber optic signal levels, voltages and currents of connected equipment, and real-time health check information, which can help to alert you when RF performance is affected. If the fiber levels are low or extremely low, you will see amber and red signal indicators. This usually indicates that you need to clean the fibers.

Fiber base unit status LEDs

Use the LED indicators on the fiber base to help you to determine whether the unit is operating correctly.

FTX

The FTX LED indicates the state of the optical transmitter.

Table 3: Base unit FTX LED indications

Condition	Description
SOLID AMBER	NORMAL STATE SDI/ASI fiber Tx ON. The optical transmitter (used to send camera control and SDI/ASI data over the fiber link) is ON.
FLASHING AMBER	ERROR STATE SDI/ASI fiber Tx Alarm. Optical transmitter has an alarm.
OFF	ERROR STATE SDI/ASI fiber Tx OFF. Optical transmitter has been deactivated.

ATTN

The ATTN LED indicates whether remote attenuation is activated.

Table 4: Base unit ATTN LED indications

Condition	Description
SOLID AMBER	Remote attenuation ON (Rx Control). Attenuation has been activated from the Real Freedom Receiver menu.
FLASHING AMBER	Remote attenuation ON (Manual Control). Attenuation activated but is not being controlled from the Real Freedom Receiver menu.
OFF	Remote attenuation OFF. Attenuation has been deactivated from the Real Freedom Receiver menu.

SDI

The SDI LED indicates whether a valid SDI input has been detected.

Table 5: Base unit SDI LED indications

Condition	Description
GREEN	Valid SDI/ASI input.
SOLID AMBER	SDI/ASI input ON.
OFF	SDI/ASI power OFF.

RX1/RX2

The RX1/RX2 LEDs indicate whether the base unit has a comms link with the receiver.

Table 6: Base unit RX1 and RX2 LED indications

Condition	Description
BLUE	NORMAL STATE Receiver comms OK.
SLOW FLASHING BLUE	ERROR STATE Receiver no comms.

PWR

The PWR LED indicates whether the base unit is powered and has detected a fiber remote unit.

Table 7: Base unit PWR LED indications

Condition	Description
SOLID GREEN	NORMAL STATE Power OK, remote detected.
SLOW FLASHING GREEN	ERROR STATE Power OK, remote not detected.
SOLID RED	ERROR STATE Power alarm, remote detected.
SLOW FLASHING RED	ERROR STATE Power alarm, remote not detected.
OFF	ERROR STATE No power.

FRX

The FRX LED indicates the state of the RF1 and RF2 optical receive levels.

Table 8: Base unit FRX LED indications

Condition	Description
SOLID AMBER	NORMAL STATE RF1 and RF2 optical receive levels are OK.
FLASHING AMBER (EVEN FLASH)	ERROR STATE RF2 optical receive level OK, RF1 optical receive level is low.

Condition	Description
FLASHING AMBER (ODD FLASH)	ERROR STATE RF1 optical receive level OK, RF2 optical receive level is low.
FAST FLASHING AMBER	ERROR STATE RF1 and RF2 optical receive levels are both low.
OFF	ERROR STATE RF1 and RF2 optical receivers have been deactivated.

Fiber remote unit status LEDs

Use the LED indicators on fiber remote to help you to determine whether the unit is operating correctly.

FRX

The FRX LED indicates the status of optical receive level.

Table 9: Remote unit FRX LED indications

Condition	Description
SOLID AMBER	SDI/ASI fiber Tx ON.
FLASHING AMBER	SDI/ASI fiber Tx Alarm.
OFF	SDI/ASI fiber Tx OFF.

ATTN

The ATTN LED indicates whether remote attenuation is activated.

Table 10: Remote unit ATTN LED indications

Condition	Description
GREEN	Remote attenuation OFF (0 dB).
RED	Remote attenuation ON (15 dB).

SDI

The SDI LED indicates whether a valid SDI signal is being output.

Table 11: Remote unit SDI LED indications

Condition	Description
GREEN	Valid SDI/ASI output.
SOLID AMBER	SDI/ASI output ON.
OFF	SDI/ASI power OFF.

DC1/DC2

The DC1/DC2 LEDs indicate whether the downconverter on RF1/RF2 has power and a comms link with the remote unit.

Table 12: Remote unit DC1 and DC2 LED indications

Condition	Description
BLUE	NORMAL STATE Downconverter power ON, comms OK.

Condition	Description
SLOW FLASHING BLUE	ERROR STATE Downconverter power ON, no comms.
FAST FLASHING BLUE	ERROR STATE Downconverter power alarm.
OFF	ERROR STATE Downconverter power OFF.

PWR

The PWR LED indicates whether the remote unit has DC power and has detected a fiber base unit.

Table 13: Remote unit PWR LED indications

Condition	Description
SOLID GREEN	NORMAL STATE DC power levels are OK, and the remote unit has detected the fiber base unit.
SLOW FLASHING GREEN	ERROR STATE DC power levels are OK, but the remote unit has not detected the fiber base unit.
SOLID RED	ERROR STATE DC power alarm, although the remote unit has detected the fiber base unit.
SLOW FLASHING RED	ERROR STATE DC power alarm, and the remote unit has not detected the fiber base unit.
OFF	ERROR STATE No DC power present on 10–36 V DC input or from SMPTE fiber connection.

FTX

The FTX LED indicates the state of the optical fiber transmitters.

Table 14: Remote unit FTX LED indications

Condition	Description
SOLID AMBER	NORMAL STATE RF1 and RF2 optical fiber transmitters are on and OK.
FLASHING AMBER (EVEN FLASH)	ERROR STATE RF2 OK, RF1 optical transmitter has an alarm.
FLASHING AMBER (ODD FLASH)	ERROR STATE RF1 OK, RF2 optical transmitter has an alarm.
FAST FLASHING AMBER	ERROR STATE RF1 and RF2 optical transmitters both have alarms.
OFF	ERROR STATE RF1 and RF2 optical transmitters have been deactivated.

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4
Troubleshooting

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This chapter provides troubleshooting information for the Real Freedom Fiber Antenna Extender.

Use this information to help you to solve some of the problems that you may encounter when using a fiber antenna extender in a Real Freedom system.

Fiber issues

Use the information in the following table to help you troubleshoot fiber issues when using a Real Freedom Fiber Antenna Extender.

Table 15: Troubleshooting fiber issues

Symptom	Possible cause	Actions
Poor fiber signal.	Loose or dirty fiber connections.	• Check that all fiber connectors on the base and remote units are securely fastened. • Remove the fiber connection and clean the glass tip. Reconnect and verify the signal.
No fiber signal.	Fiber incorrectly connected or faulty fiber cable.	• Check that fiber is connected to the correct ports (S to S and D to D). • Turn off power to the receiver's RF ports carrying fiber. • Change the fiber cable.

RF issues

Use the information in the following table to help you troubleshoot RF issues when using a Real Freedom Fiber Antenna Extender.

Table 16: Troubleshooting RF issues

Symptom	Possible cause	Actions
Poor RF signal.	Cable runs too long.	• Ensure that you minimize the required cable lengths and RF signal loss by installing the fiber base unit close to the receivers. • Minimize the cable length between the fiber remote unit and attached downconverters.
	RF levels too low.	• Use the receiver's **Fiber & Splitter** menu to add a gain boost into the Splitter system. Note that if you add a boost when RF levels are not too low you can overload/saturate the system.

Symptom	Possible cause	Actions
	Issues with the downconverters connected to the fiber remote unit.	• Check the placement of downconverters attached to the fiber remote unit. • Verify there is no mismatch of antennas. All downconverter and transmitter antennas should match your band of operations. • Check downconverters are powered.
	Poor or no fiber signal from the remote unit to the base unit.	• Check that all fiber connectors are securely fastened. • Remove the fiber connections and clean the glass tip. Reconnect and verify the signal. • Check that fiber is connected to the correct ports on both the fiber remote and fiber base units (S to S and D to D). • Turn off power to the receiver's RF ports carrying fiber.

5
Maintenance

This chapter describes the maintenance, cleaning, and storage procedures for Real Freedom Fiber Antenna Extenders.

Routine maintenance procedures

You should perform the following maintenance procedures on a regular basis.

> ⚠️ **WARNING:** The Real Freedom Fiber Base and Real Freedom Fiber Remote units do not contain user serviceable parts. Warranty is void if the device is opened. Refer servicing to qualified BSI personnel only.

Performance monitoring

It is recommended that you periodically monitor the overall performance of the fiber antenna extender and system. If you experience failure or deterioration in the performance of the system, check cables and adapters, input, and output connectors for damage.

Visual inspection

Depending on operating environments and use, periodically inspect the fiber antenna extender components for signs of damage, dirt, or corrosion. Check that all markings and warning labels are in good condition.

Cleaning

If necessary, use low-pressure compressed air cleaning to remove small particles and debris from the surface of the fiber antenna extender components.

Clean connector surfaces with a cotton swab moistened with a small quantity of alcohol. Use a lint-free cloth to wipe connector surfaces after cleaning.

> ⚠️ **CAUTION:** Do not use abrasive cleaners.

Storage

Store Real Freedom Fiber Antenna Extender units in a safe location where they are unlikely to be disturbed. If pole or surface mounted, detach the unit before storage.

> ⚠️ **IMPORTANT:** Ensure that you attach the fiber connector cover if there is no attached fiber cable.

For long term storage:

1. Disconnect all cables from the fiber base or fiber remote unit.
2. Cover the connectors with suitable dust covers.
3. Place the unit in protective packaging and store in a cool, dry environment.

Technical drawings and connector pinouts for the Real Freedom Fiber Antenna Extender.

Fiber base unit dimensions

The following drawings show the dimensions of the Real Freedom Fiber Base unit and the positions of the holes used to pole mount the unit.
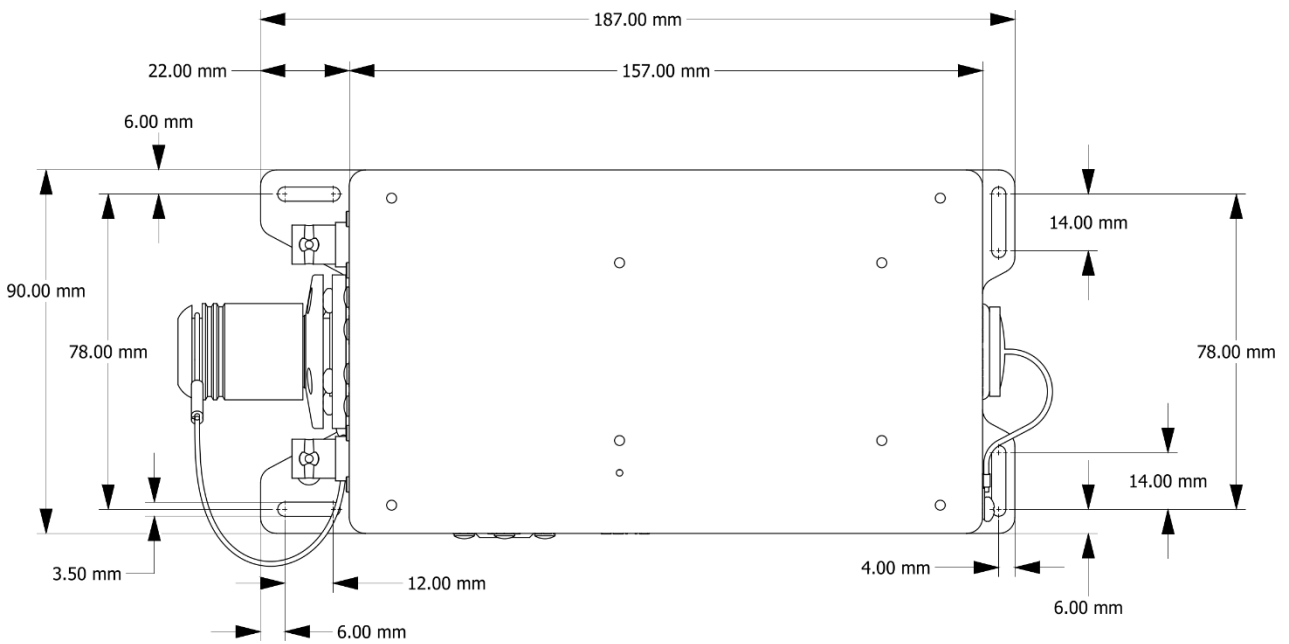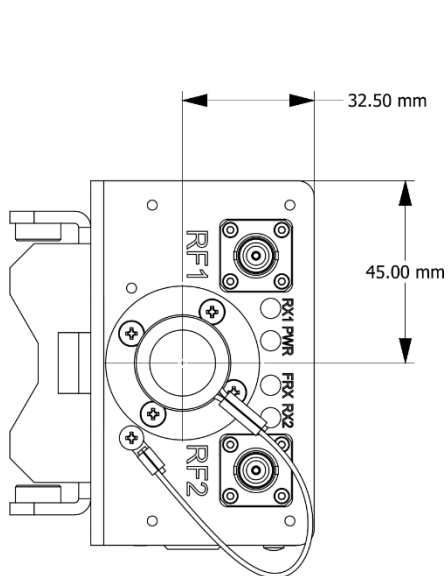

Figure 4: Fiber base unit

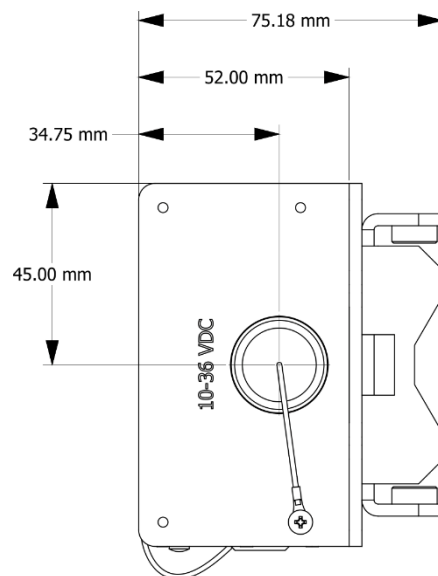

Figure 5: Fiber base unit top view

Figure 6: Fiber base unit bottom view
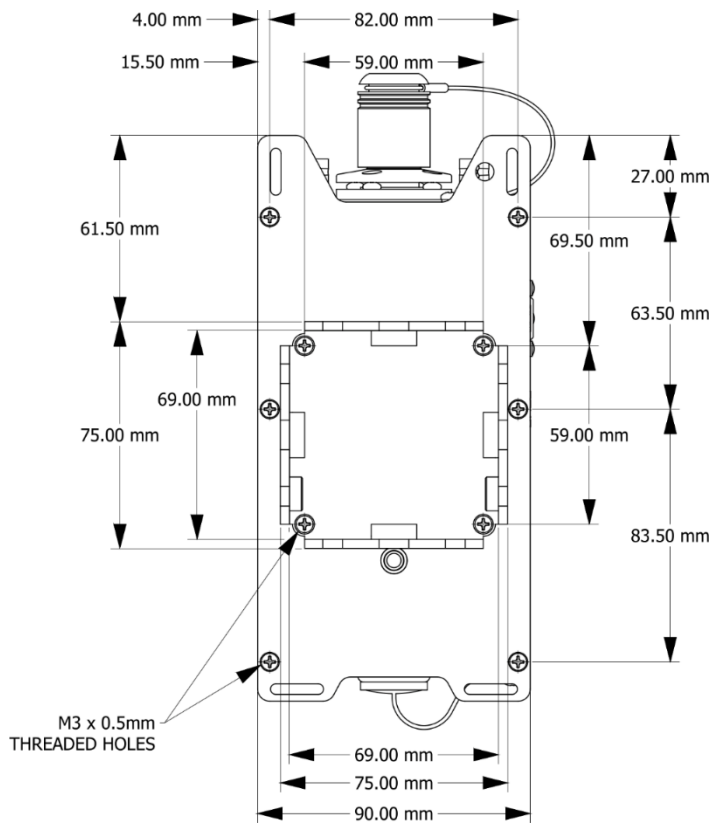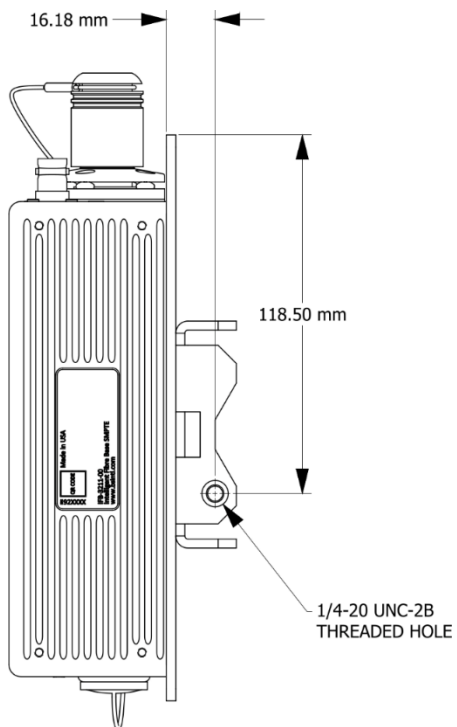
Figure 7: Fiber base unit mounting bracket
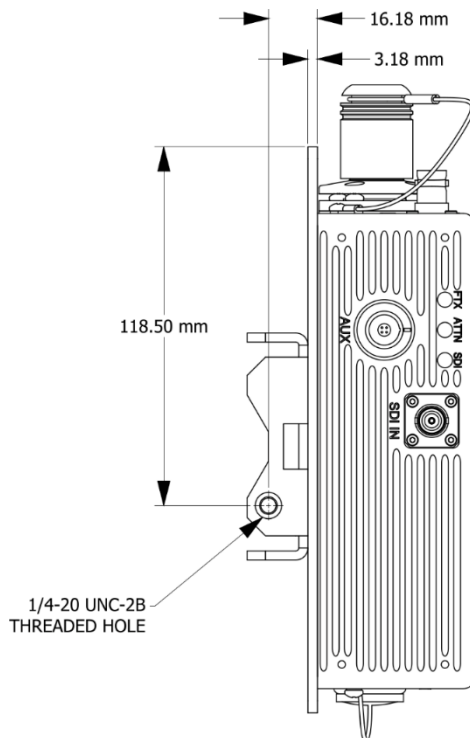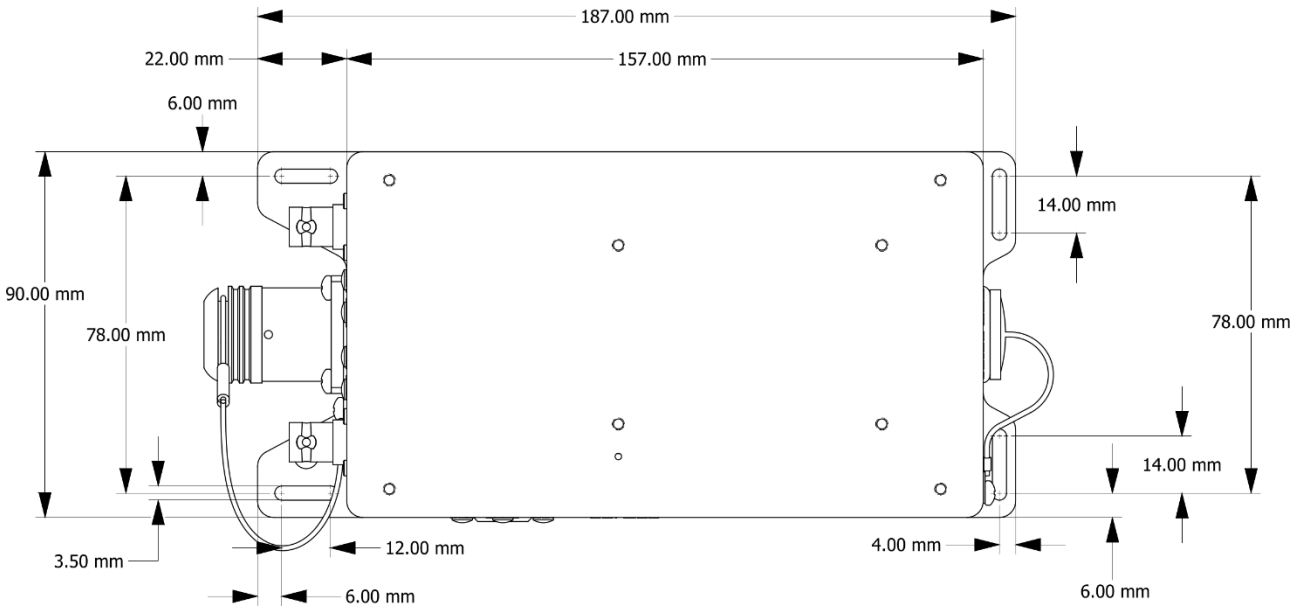

Figure 8: Fiber base unit mounting bracket (right side)

Figure 9: Fiber base unit mounting bracket (left side)

Fiber remote unit dimensions

The following drawings show the dimensions of the Real Freedom Fiber Remote unit and the positions of the holes used to pole mount the unit.
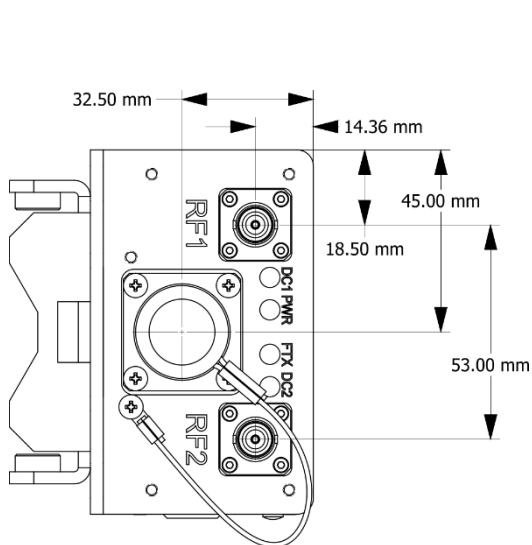

Figure 10: Fiber remote unit
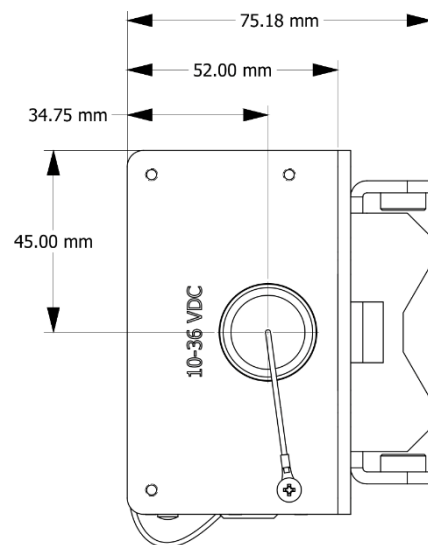

Figure 11: Fiber remote unit top view
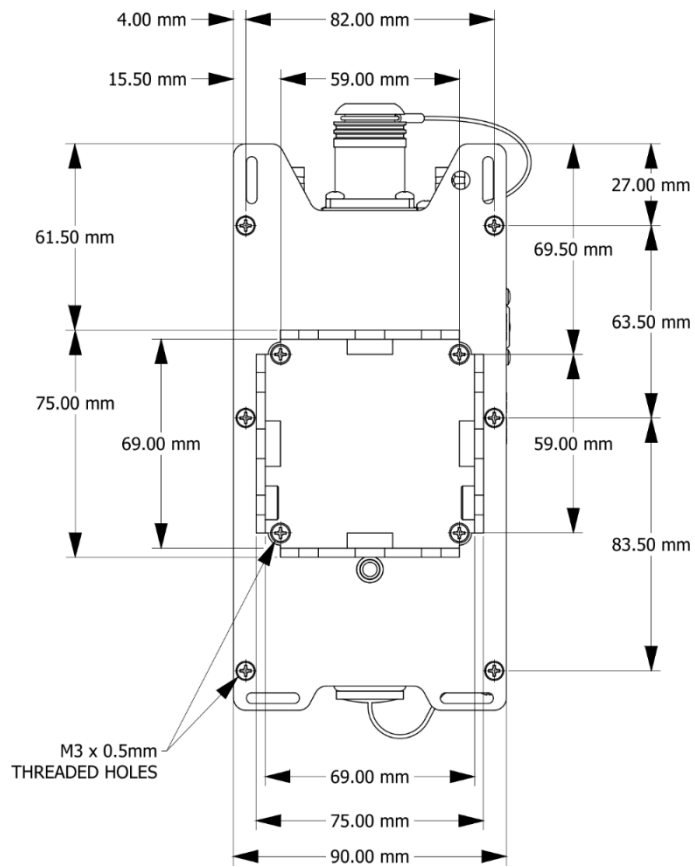

Figure 12: Fiber remote unit bottom view

Figure 13: Fiber remote unit mounting bracket
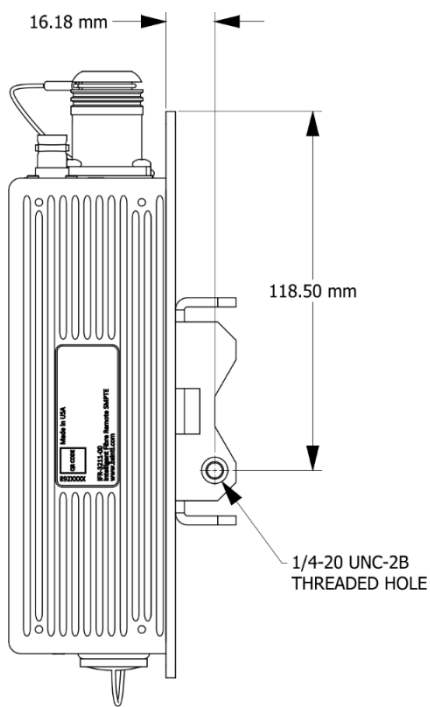

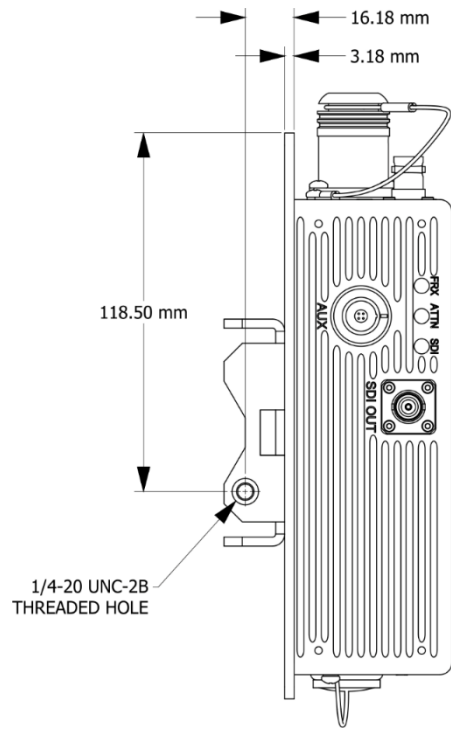*Figure 14: Fiber remote unit mounting bracket (right side)*

Figure 15: Fiber remote unit mounting bracket (left side)

Connector pinout assignments

Pinouts for the connectors on the Real Freedom Fiber Antenna Extender (fiber base and fiber remote).

AUX connector

Use for programming and firmware updates.
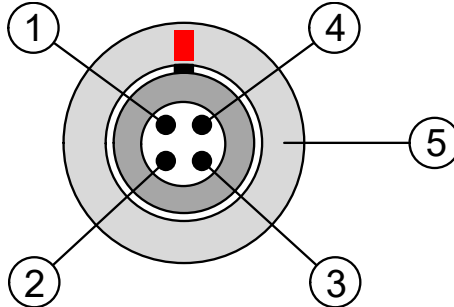
Connector: LEMO 0K 4-Pin CLL.0K.304.CLLP

Figure 16: Front face of LEMO AUX connector

Pin	Purpose
1	RS-232 RXD
2	RS-232 TXD
3	+9 to 36 V DC
4	Return
5	Shield

DC power input connector

DC input to power the unit.

Connector: XLR-4 male
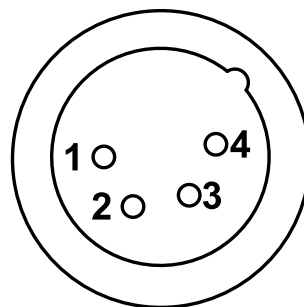
Figure 17: Front face of DC power connector

Pin	Purpose
1	Ground
2	No connection
3	No connection
4	+10 to 36 V DC
Case	Shield

RF input/output connector

Use to connect a Real Freedom Downconverter to the fiber remote unit (input) or to connect the fiber base unit to a Real Freedom Receiver or Real Freedom Active UHF Splitter (output).
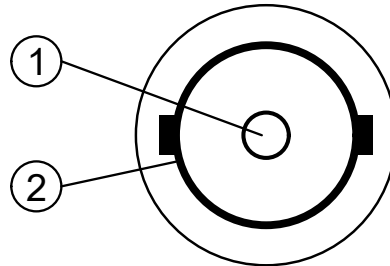
Connector: BNC female (75 Ohm)

Figure 18: Front face of BNC (F) connector

Pin	Purpose
1	RF input/output
2	Ground/Shield

SDI input/output connector

Use to connect an SDI or ASI source (input) to the fiber base unit to send over the fiber link to the fiber remote unit and provide an SDI/ASI output if an SDI/ASI source has been connected to the fiber base unit.
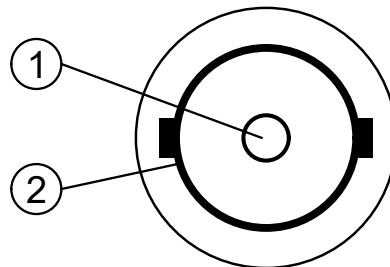
Connector: BNC female (75 Ohm)

Figure 19: Front face of BNC (F) connector

| Pin	Purpose
1	SDI/ASI input/output
2	Ground/Shield

Safety and regulatory compliance

Important safety and electromagnetic compatibility information.

Safety notice

It is extremely important to read and understand all safety information and instructions before using a Real Freedom Fiber Antenna Extender. Specific warnings and cautions are found throughout this product manual, and you should follow this guidance during the routine use of a Real Freedom Fiber Antenna Extender.

Hazard warning labels

The following hazard warning labels are fixed to the Real Freedom Fiber Antenna Extender for your information and safety.

Base unit

Remote unit
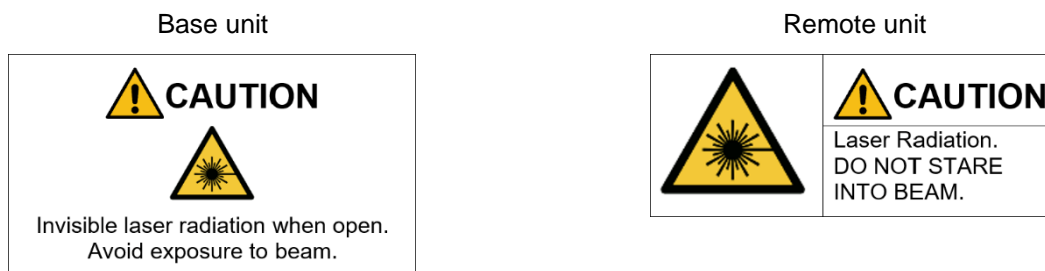
Electromagnetic compatibility – Class A

Information about the Real Freedom Fiber Antenna Extender's electromagnetic compatibility.

Compliance statement (United States)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions, however, set forth in Section 15.5 of the FCC Rules: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by Broadcast Sports International could void the user's authority to operate the equipment.

Disposal and recycling – European Union

This product is required to comply with the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC and 2012/19/EU) and is marked with the following symbol:

This symbol indicates that this product is not to be disposed of with household waste, according to the WEEE Directive and your national law. This product should be handed over to a designated collection point or to an authorized collection site for recycling waste Electrical and Electronic Equipment (EEE).

Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substance that are generally associated with EEE and products of this type. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about recycling this product, please contact BSI.