BSI

Real Freedom Quick Start Guide

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June 11, 2019

WO#: 135680

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SUMMARY

Objective

This guide will serve as a quick set up guide for most Real Freedom applications.

Goals

User will be able to set up and operate a single camera Real Freedom System.

Basic Setup

Along with the visual Quick Start Guide, this text guide will serve as the primary document to deploy the Real Freedom system. Users will be able to do the following:

- Apply basic settings to the Real Freedom Receiver
- Connect components of the Real Freedom System including Transmitter, Down Converter(s), Fiber Remote Units, Fiber Base Unit, Data Transmitter(s), Receiver, and client supplied Remote Control Panel and powered network switch.
- Apply basic settings to the Real Freedom Transmitter
- Monitor transmitter settings including Audio, RF signals and Fiber Signals
- Connect user Laptop to a network switch for remote control of Receiver
- Troubleshoot connection issues

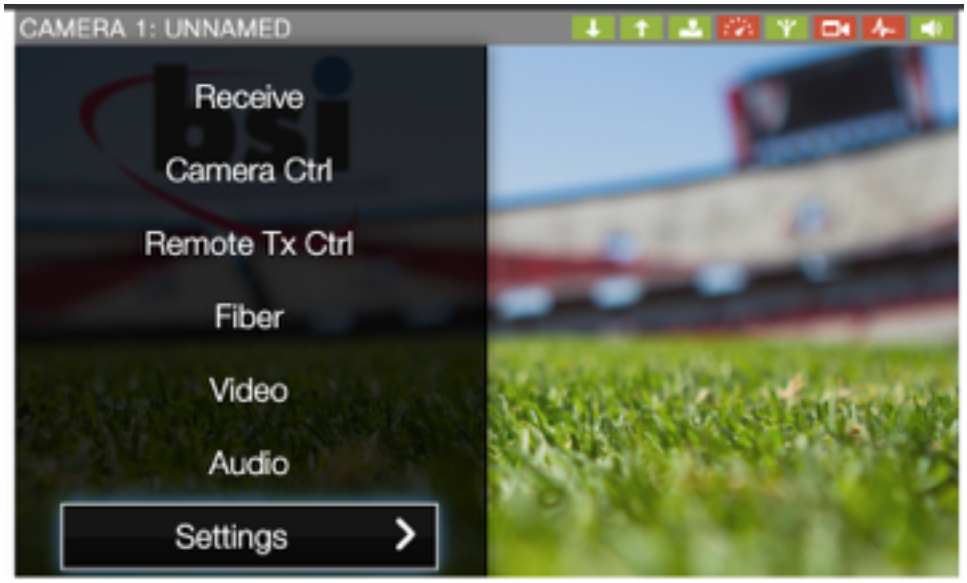
REAL FREEDOM RECEIVER INITIAL SETUP

PRESETS

Before connecting Real Freedom components to the Receiver, user is encouraged to enter initial setup information into the Receiver. After powering on the Real Freedom Receiver, the user will make the following general settings:

1. From the main screen, enter the menu by pressing the left arrow button from the front panel constellation navigation controls. This menu will allow user to preset all the essential adjustments for basic operation of the system.

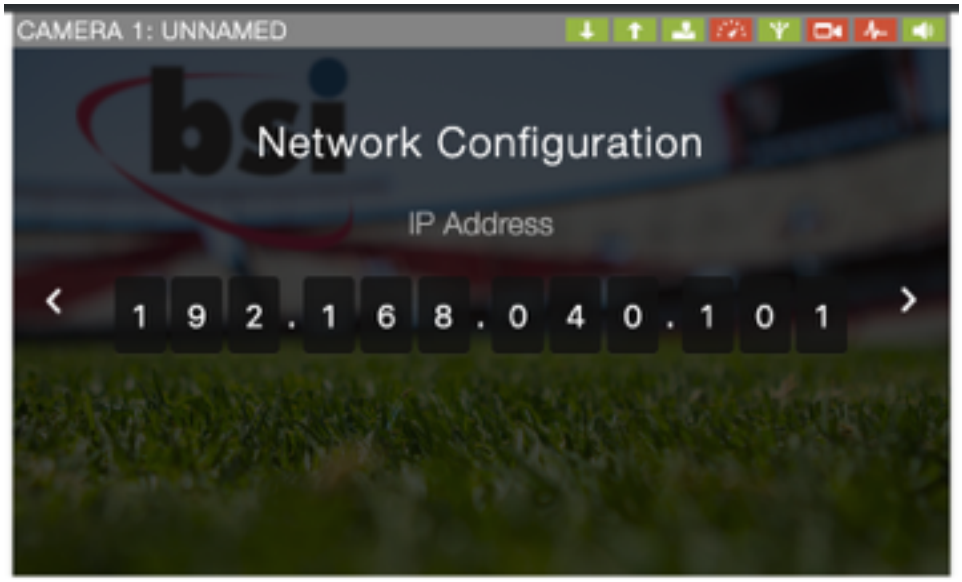
2. Chose SETTINGS from the menu and select by pressing OK



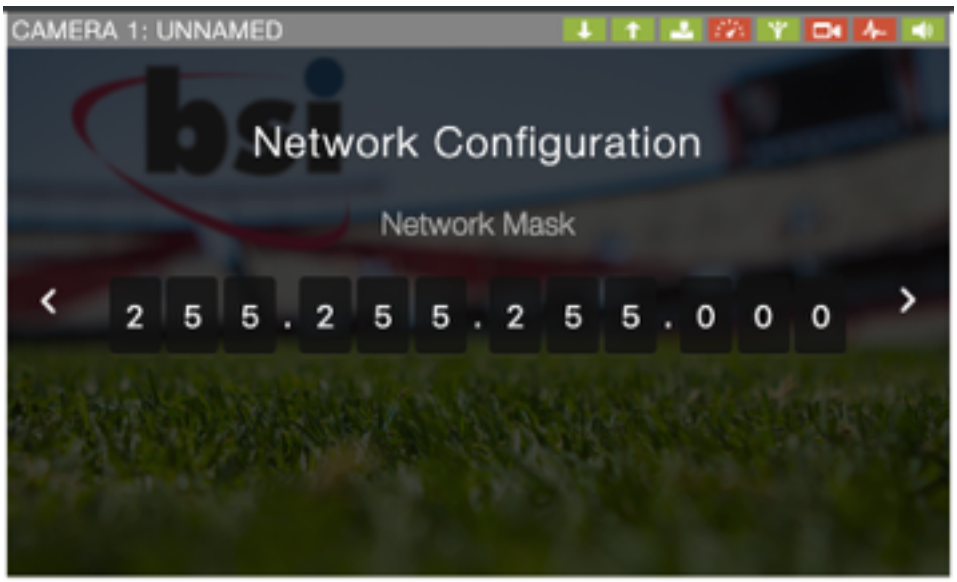
NETWORK CONFIGURATION

Choose NETWORK CONFIGURATION from the menu and select by pressing OK

1. Uncheck “Use DHCP” box
2. Enter the desired IP ADDRESS (ex. 192.169.040.101). This IP address must match the subnet of the OCP/RCP (Operator Control Panel/ Remote Control Panel). For a Sony RCP, the IP address is the same as the TARGET ADDRESS with the RCP set to bridge mode.



3. Enter the desired SUBNET/NETWORK MASK (ex. 255.255.255.0) NOTE: These setting must match the client supplied Remote Control Panel (RCP).
4. Exit submenu by pressing left arrow button

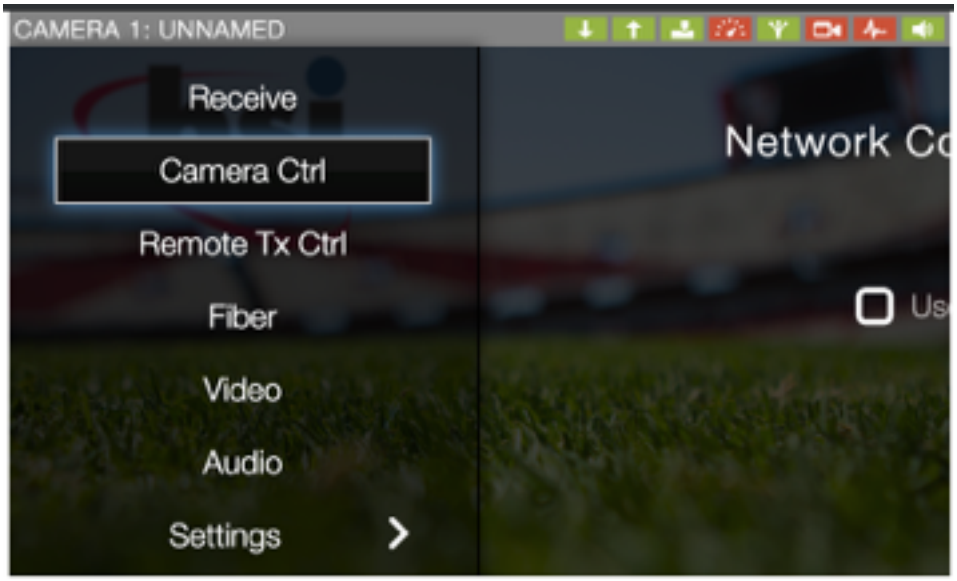


NETWORK CONFIGURATION NOTES

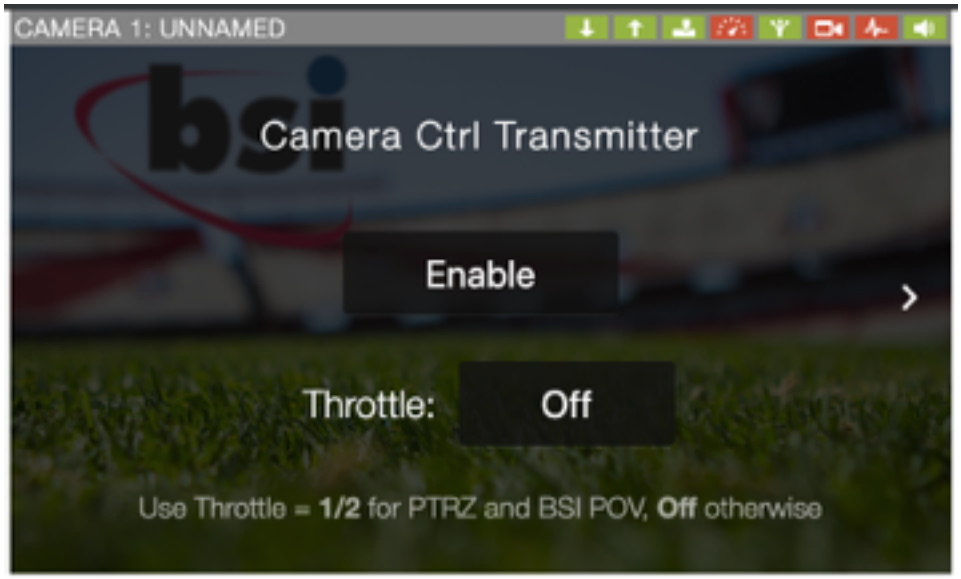
- Both Sony RCP-1500 and GV OCP-400 require that the Real Freedom Receiver and the RCP/OCP are in the same subnet and have a subnet mask of 255.255.255.0
- Sony RCP's require a Power Over Ethernet (POE) port on the ethernet switch
- GV OCP's are powered externally with a 4 PIN XLR 12VDC power supply and do not require a POE ethnic switch (there is no harm in using a POE power with the GV OCP's)
- Sony RCP-1500's require that the RCP's are set in BRIDGE mode and have the target address under BRIDGE mode set to the IP address of the associated Real Freedom receiver (ie: receiver set to 192.168.40.101, RCP set to 192.168.40.201 and the Sony RCP target address set to 192.168.40.101)
- GV OCP-400 just need to be in the same subnet and set to ETHERNET. The association between the receiver and the OCP is achieved by an auto discovery function when the CAMERA ID or the receiver and the CAMERA ID of the OCP are match.
- When an RCP/OCP associates with a Real Freedom receiver, there are two ways to monitor this
  - The third icon (RCP) in the top left of the receiver screen will turn green
  - The CAMERA CTRL PERIPHERAL STATUS screen (REAL FREEDOM RECEIVER AND REMOTE TRANSMITTER OPERATION Monitoring point 5) will report the IP address of the RCP/OCP and show CONNECTED next to RCP STATUS

CAMERA CONTROL

From the main menu select Camera CTRL



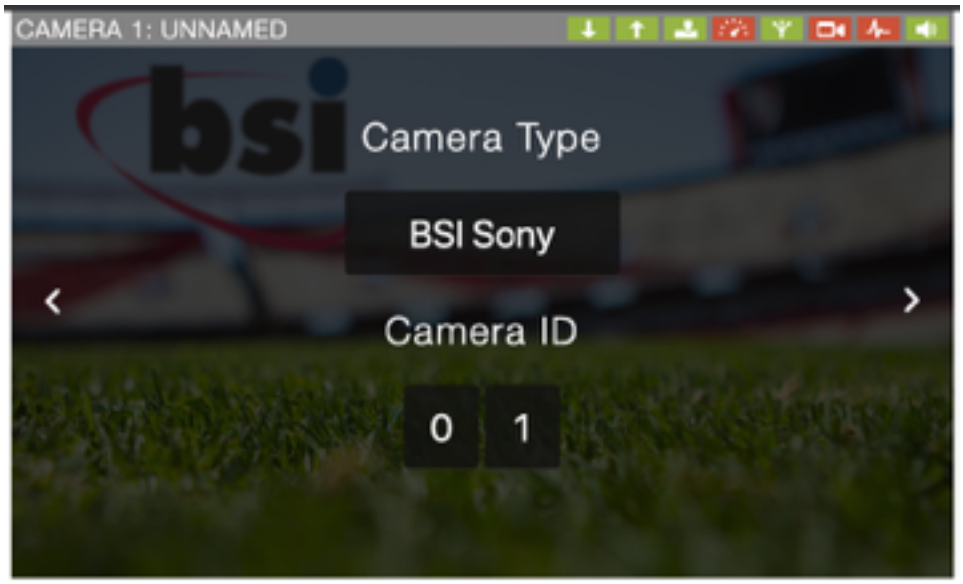
1. In the Camera Ctrl Transmitter submenu select ENABLED and Throttle OFF



2. Set SLOT A (Primary and the data transmitter attached to the downconverter connected to RF 1 on the receiver) CAMERA CTRL FREQUENCY to what is allotted for the event.

3. Select TRANSMIT POWER for camera transmitter (can be set between 250mW- 2W). Start with the lowest power and increase if a greater coverage area is required after testing. If user is not utilizing Slot B, select Off.

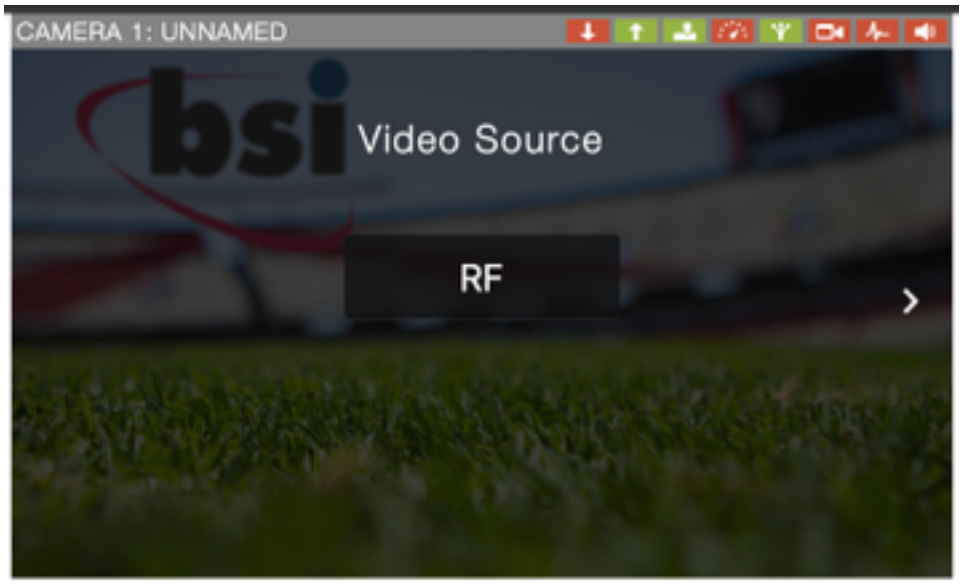
4. Select CAMERA TYPE as either BSI SONY or BSI GV. By selecting BSI SONY or BSI GV, this will allow user remote control of the TX from the RX when the full control infrastructure is established with an associated RCP/OCP. Enter CAMERA ID number. This will be the show number on the RCP.



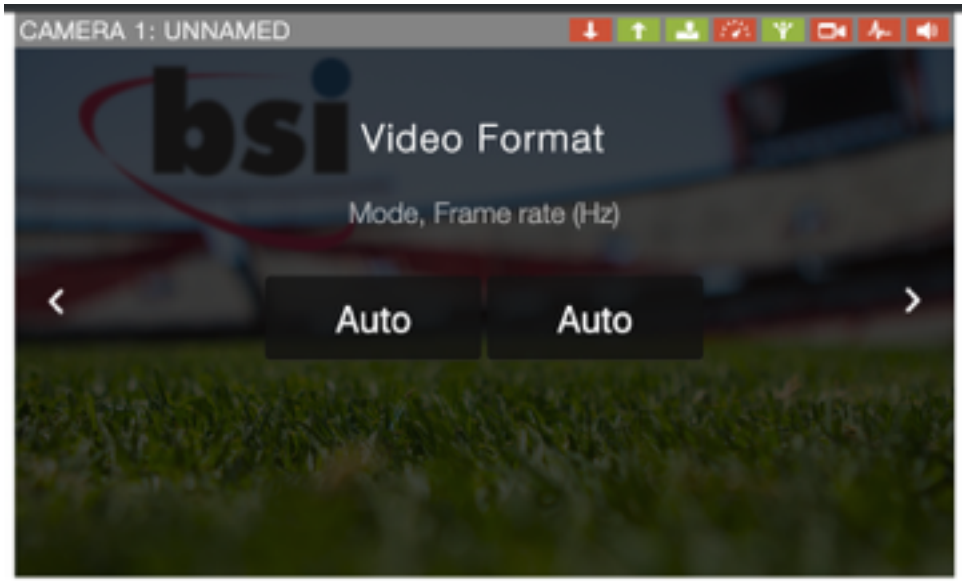
Alternative Selection:

BSI GV

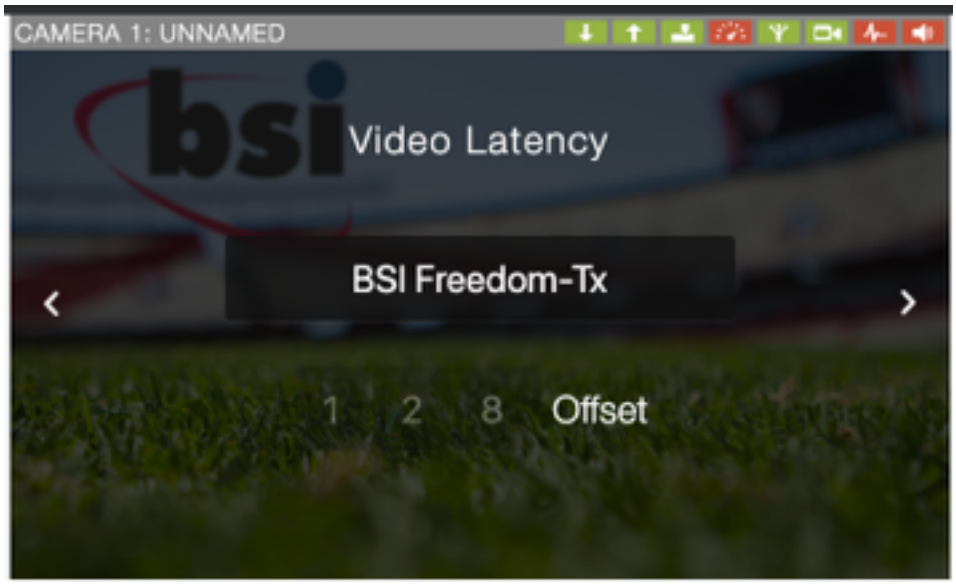
5. Select VIDEO SOUCRE, choose RF.



6. Set VIDEO FORMAT to AUTO, AUTO.



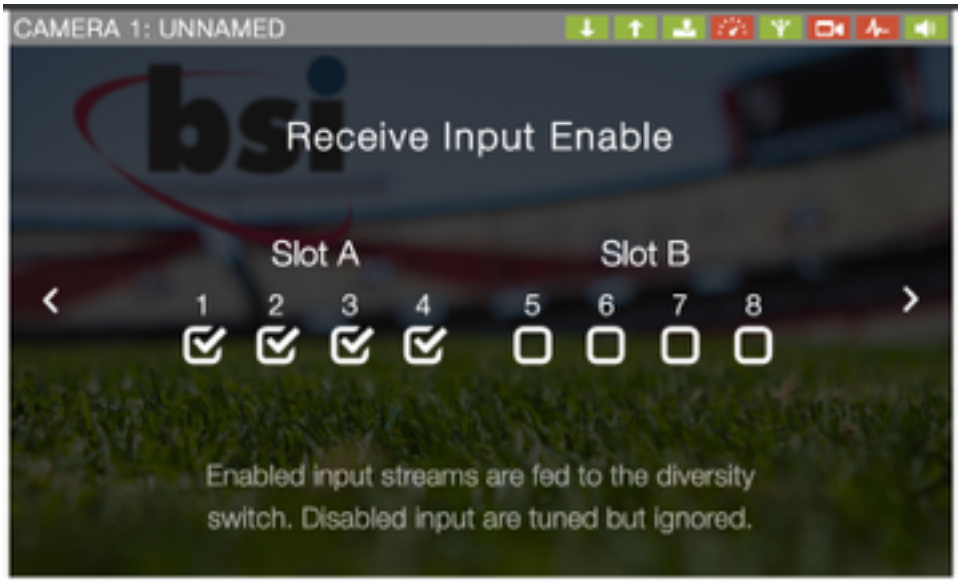
7. Set VIDEO LATENCY to BSI FREEDOM TX (this is required). Return to main menu by pressing the left arrow key.



RECEIVE

From the main menu choose Receive

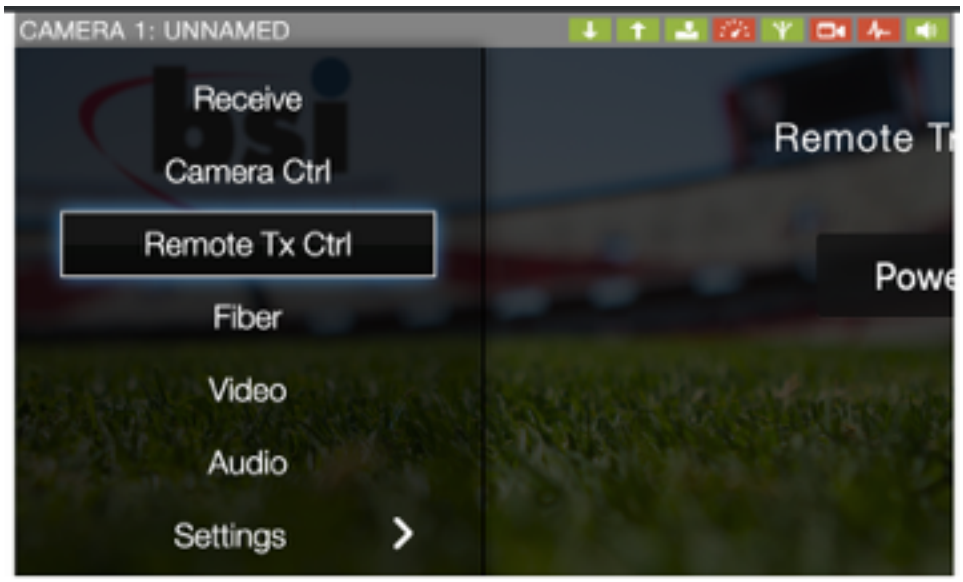
1. Ensure receive inputs are enabled for any RF live port with a downconverter attached.



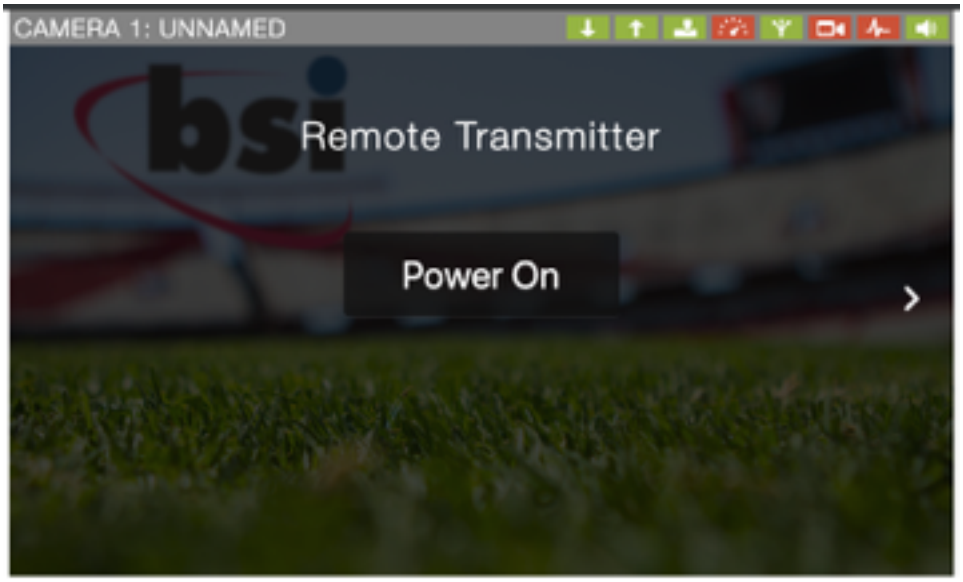
2. Best practice: Turn off BNC power to unused ports. Down Converters connected directly by coax cable require power, down converters connected through the Real Freedom fiber system do not.

REMOTE TX CONTROL

From main menu Choose REMOTE TX CONTROL



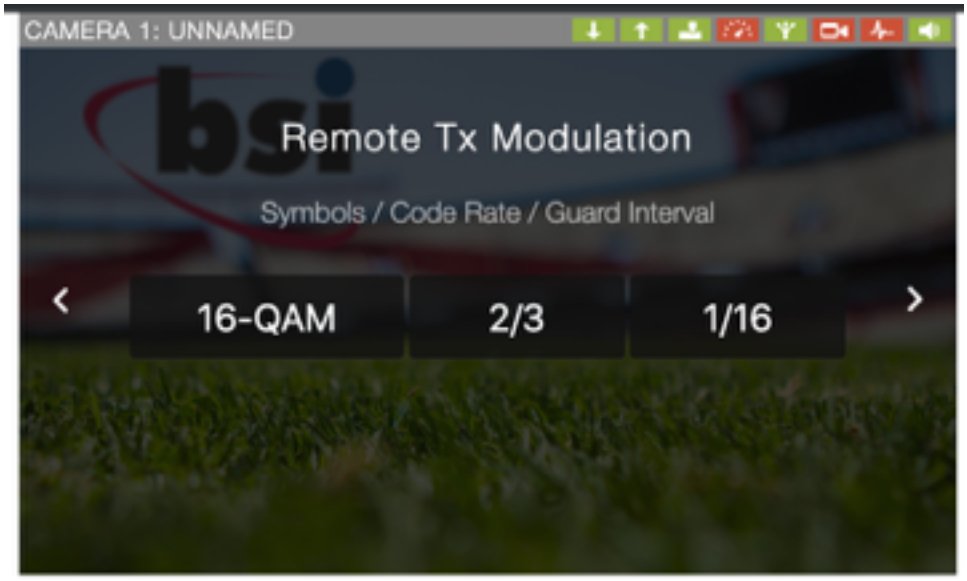
1. REMOTE TRANSMITTER should be set to POWER ON.



2. Select REMOTE TX FREQUENCY to the transmit frequency assigned for your event. Select update receive frequency to update the RX and TX simultaneously.

3. Choose REMOTE TX TRANSMIT POWER output from 10mW- 250mW (Optimal receive strength is between -50dB and -20dB). Start with the lowest power output and increase only if the RSSI (Received Signal Strength Indicator) is low. If the power is set too high for your application you will see a reduction in CNR as the downconverters become overloaded.

4. Set the REMOTE TX MODULATION scheme (Most common: 16 QAM, 2/3, 1/16 guard band).



5. Optional: Select checkboxes for RECEIVE GAIN BOOST of 20db for extra long cable runs where signal loss is anticipated.

This is the end of the Receiver presets. Power down receiver by removing power cable from the rear of the chassis.

REAL FREEDOM RECEIVER AND CAMERA CONTROL CONNECTIONS

Appendix A

Appendix A is a graphical drawing showing a hybrid system of both fiber and coax connections.

Appendix B

Appendix B is a visual diagram with the recommended component connections where no fiber connections are required.

Appendix C

Appendix C is a visual diagram with the recommended component connections where fiber connections are required.

Appendix D

Appendix D is a connections checklist with the cable types required for each component of the system.

NOTE: Once all connections for your particular set-up are made power up the Real freedom receiver and check system status as per MONITORING (section REAL FREEDOM RECEIVER AND REMOTE TRANSMITTER OPERATION)

INDIVIDUAL COMPONENT INDICATORS

- Downconverter - green LED indicates connected and powered
- Data Transmitter - Red indicated powered by the downconverter, green indicates receiving data to transmit from the Real Freedom Receiver
- Fiber Base and Remote Modules - At either end flashing lights indicate an issue. When all lights are solidly illuminated connections are correct and system is operational (refer to troubleshooting for more information)
- Active Splitters - Flashing green lights indicate the splitter is powered and in active mode (adding gain for splitter loss). Flashing red indicate the splitter are powered and in passive mode (no additional gain being added for splitter loss)

REAL FREEDOM TRANSMITTER

Presets

After connecting the Real Freedom System Components, which includes attaching the Real Freedom Transmitter (TX) and camera mount to the user camera, the user will make the following general settings:

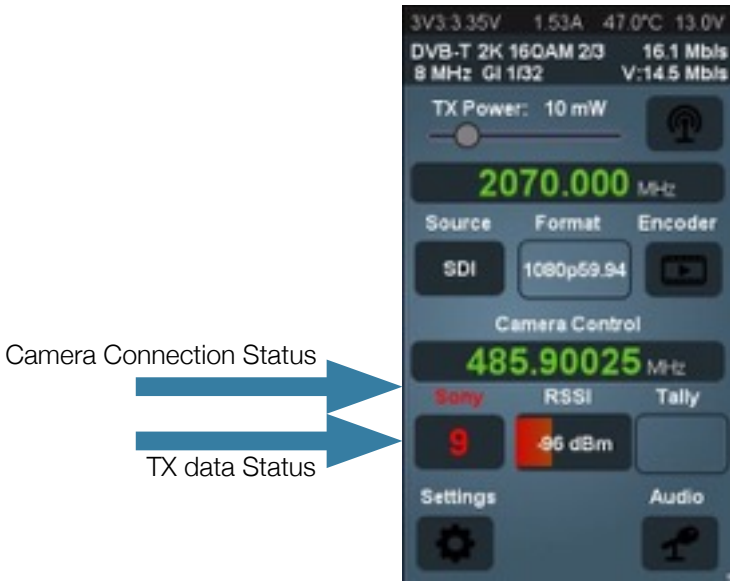
Note: If screen is dark and has timed out user must touch all four quadrants of the screen within 1sec to wake display. Trace a **U** or **X** pattern on the display to wake. All menus on the TX are touch enabled.

1. From the main screen, touch CAMERA CONTROL.Select camera control frequency by touching the boxes to scroll through the numbers and select frequency assigned to the event. Touch DONE to save settings.

2. From the main screen, view/touch SOURCE. Source must be SDI (Serial Digital Interface)

3. From the main screen touch the CAMERA ID NUMBER to change the camera type and camera number.

4. Verify the connection to the camera. The camera type label above the camera number will be solid green if TX is communicating with camera. Red indicates no communication.
5. Verify the TX is receiving data from the RCP. The camera ID number will either be green or change between green and red.



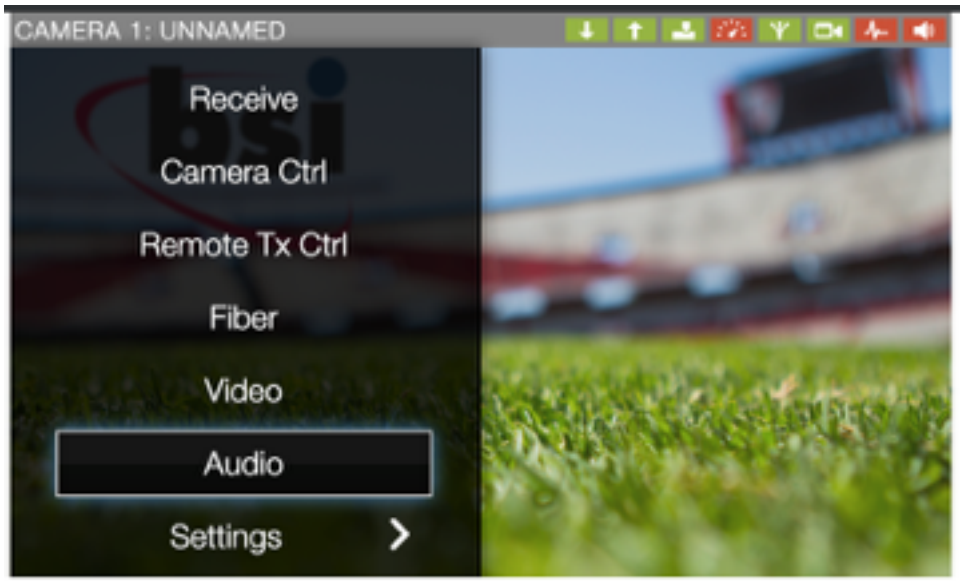
6. From the main screen touch AUDIO. If user is using audio at the TX the audio settings must be assigned at the TX.
    1. Select STREAM A. Set to either ANALOG 1-2 *or* SDI 1-2 (embedded)
    2. Turn off STREAM B.
    3. Touch CH1 and set to MIC *or* LINE
    4. Touch CH 2 and set to MIC *or* LINE
    5. Touch PHANTOM to enable 48V phantom power by channel if required by mic.

REAL FREEDOM RECEIVER AND REMOTE TRANSMITTER OPERATION

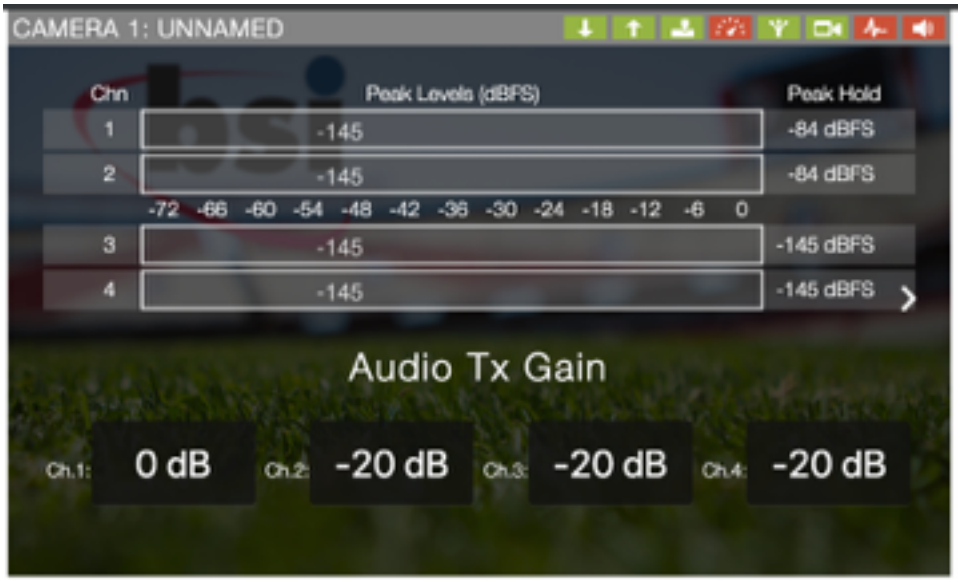
AUDIO

After connecting the Real Freedom System components, the user will make the following general audio settings:

1. From the main screen, enter the menu by pressing the left arrow button from the front panel navigation controls. This menu will allow user to preset all the essential adjustments for basic operation of the system.
2. Chose AUDIO from the menu and select by pressing OK



3. User can monitor audio levels on up to four channels of camera audio. AUDIO TX GAIN settings can be further adjusted on each channel.



MONITORING

The Real Freedom System provides on-screen Status reports.. With no menus or status displayed on the receiver screen Press OK to enter the monitoring screens. As the particular status screen is displayed the top row icons will enlarge to indicate what status you are monitoring. A red icon indicates that the particular item is currently inactive and a green icon indicates it is active and functioning properly. Navigate through the Status screens using the left and right arrow keys.

1. RECEIVE STATUS can be viewed by selecting the DOWN ARROW ICON.

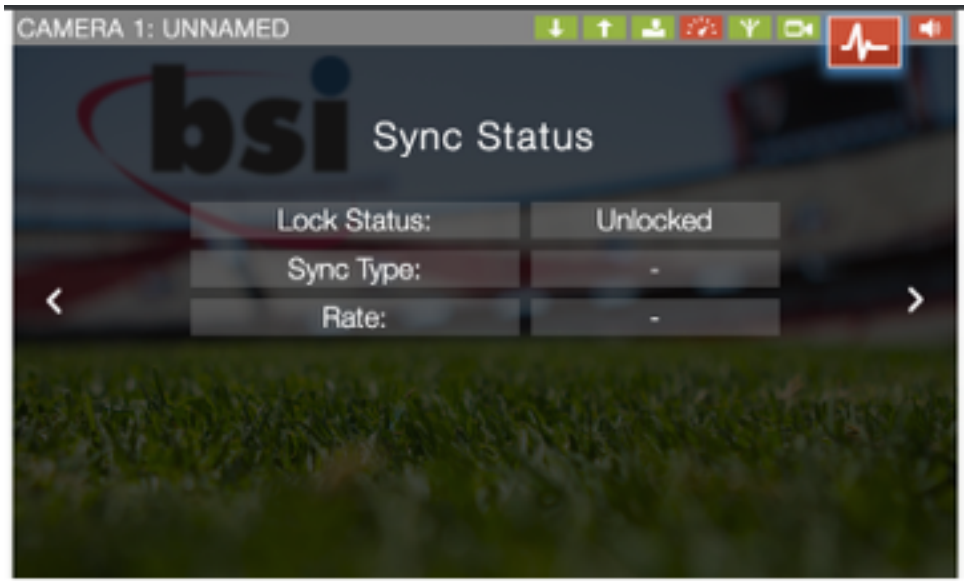
2. CONNECTION STATUS can be viewed by selecting the UP ARROW ICON.

3. CAMERA CONTROL can be viewed by selecting the RCP ICON.

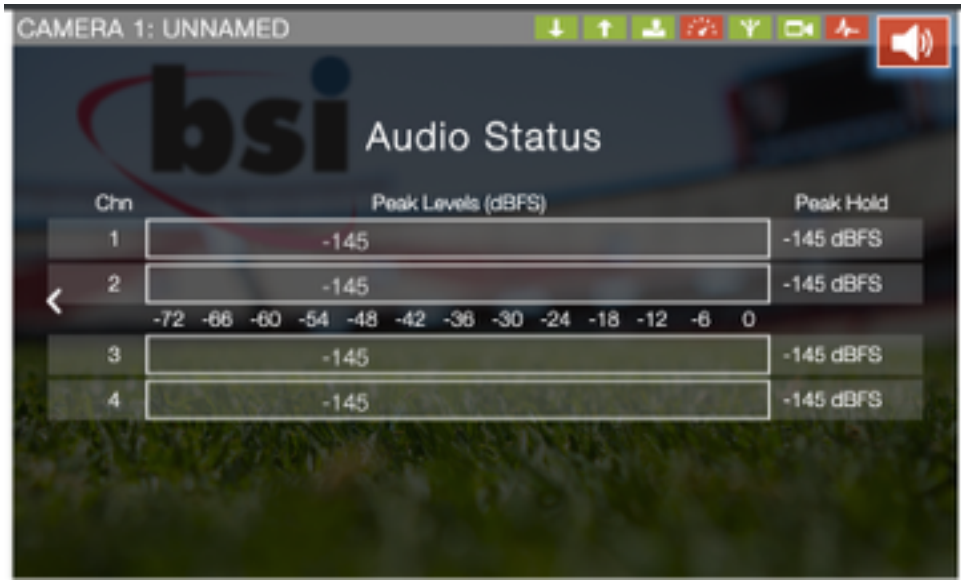
4. FIBER STATUS can be viewed by selecting the FIBER ICON.

5. VIDEO STATUS can be viewed by selecting the VIDEO CAMERA ICON.

6. SYNC STATUS can be viewed by selecting the HEARTBEAT ICON.



7. AUDIO STATUS can be viewed by selecting the SPEAKER ICON.



REMOTE WEB BASED GUI

Operation

After fully configuring a Real Freedom System, users can monitor Receiver menus via a web based GUI (graphical user interface) using a laptop computer with a ethernet port connected to the receiver/RCP network switch:

1. Connect CAT5 network cable to a port on the ethernet switch.
2. Navigate to computer's network settings and choose the wired connection.
3. Enter an **available** IP address and the same subnet mask of the Real Freedom Receiver which was previously assigned in the menu pictured below.(ie: 192.168.40.10)

4. Open a Chrome browser window and navigate to the IP address of the desired receiver you wish to monitor/control. If viewing more than one Real Freedom receiver, user must open a tab/window for each receiver and select the IP address of the receiver they wish to control/monitor.
5. Use keyboard ARROW and ENTER keys to navigate the on-screen GUI. This navigation mirrors the constellation interface on the receiver.

TROUBLESHOOTING

TRANSMITTER

No Remote Control from Receiver

- Remote control is only possible when data is active AND the receiver is properly coded and connected to client RCP

Connection Error

- Verify frequency settings on RX and TX match. Alternatively check the box to enable automatic frequency updates (See Receiver Step 6.2)

Dark Screen/Display

- If screen is dark and has timed out user must touch all four quadrants of the screen within 1sec to wake display. Trace a **U** or **X** pattern on the display to wake. All menus on the TX are touch enabled.

FIBER

Poor Fiber Signal

- Check that all fiber connectors are securely fastened.
- Remove fiber connection and clean glass tip. Reconnect and verify signal.

No Fiber Signal

- Check Fiber is connected to the correct ports on both the Fiber Remote and Fiber Base Unit. (S to S and D to D)
- Turn off power to the receiver RF ports carrying fiber. (See Receiver Step 5.1)

RF

Poor RF Signal

- Ensure cable run limits have not exceeded recommended lengths (400’ for LMR240 or 200’ for other high quality cable).
- In Receiver menu: Select checkbox for Receiver gain boot of 20db for extra long cable runs where signal loss is anticipated. (See Receiver Step 6.5)

- Check placement of Down Converters. Microwave (especially at higher frequencies) is best when line of site to a downconverter is maintained. Coverage may not be sufficient.
- Adjust the output power of the transmitter (See Receiver Step 5.3), however if the CNR's fall as you increase the power of the transmitter more power is not the solution.
- Ensure that power is enabled on BNC ports connected to Down Converters. Down Converters require BNC power. The Down Converters should have green illuminated LEDs.
- Verify there is no mismatch of antennas. All down converter and transmitter antennas should match your band of operations (ie: 1.4, 2 and 7 Ghz)
- Note: Carrier to Noise Ration (CNR) is dependent on frequency band. Typically a good CNR at 1.4 Ghz is 25-30 db, 2 Ghz is 23 - 27 db and 7 Ghz is 20-25 db

AUDIO

Poor Audio Signal

- Monitor incoming audio channels and determine if gain should be applied or reduced. (See Receiver Operations Step 3)

No Audio Signal

- Check all physical connections. Analog audio is available at the 3-Pin XLR's on the back of the receiver and embedded audio is always available on the SDI 1 and 2 outputs.
- Check TX audio settings. (ex. Analog, SDI embedded, Mic/Line, phantom power)

IP CONNECTION

No IP Connection

- Verify the IP address assigned to RCP
- Verify the IP address is in the same subnet as the IP address and subnet on the Receiver.
- If using a Sony RCP, the switch must supply power over ethernet (POE).
- Sony RCP requires that the TARGET ADDRESS is set to RX IP
- GV OCP requires that the subnet and Camera ID Number must match between the OCP and Real Freedom Receiver Camera ID Number.

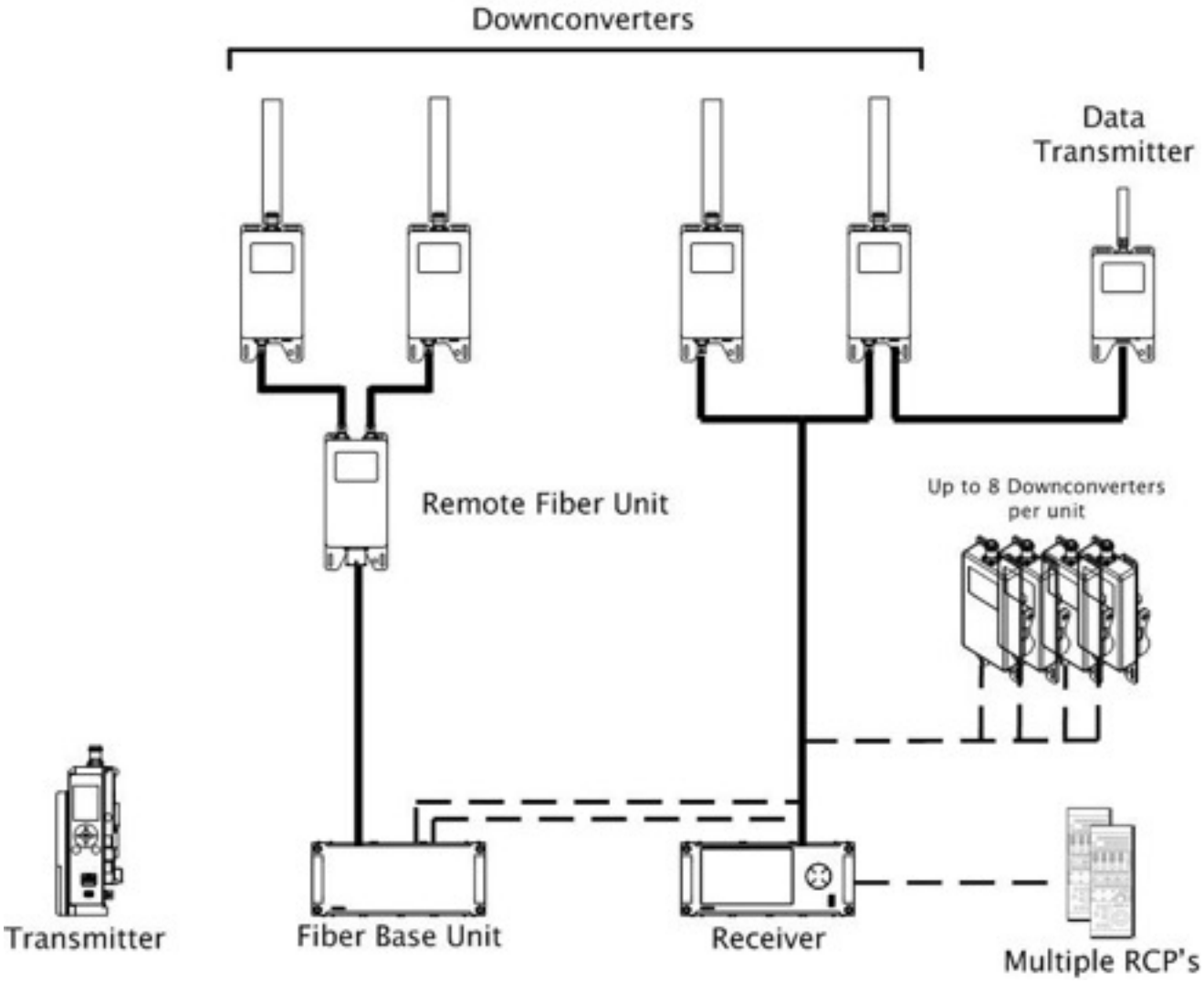
RCP

Blinking ALARM on Sony RCP

- This is normal operation of the alarm button in the Real Freedom System

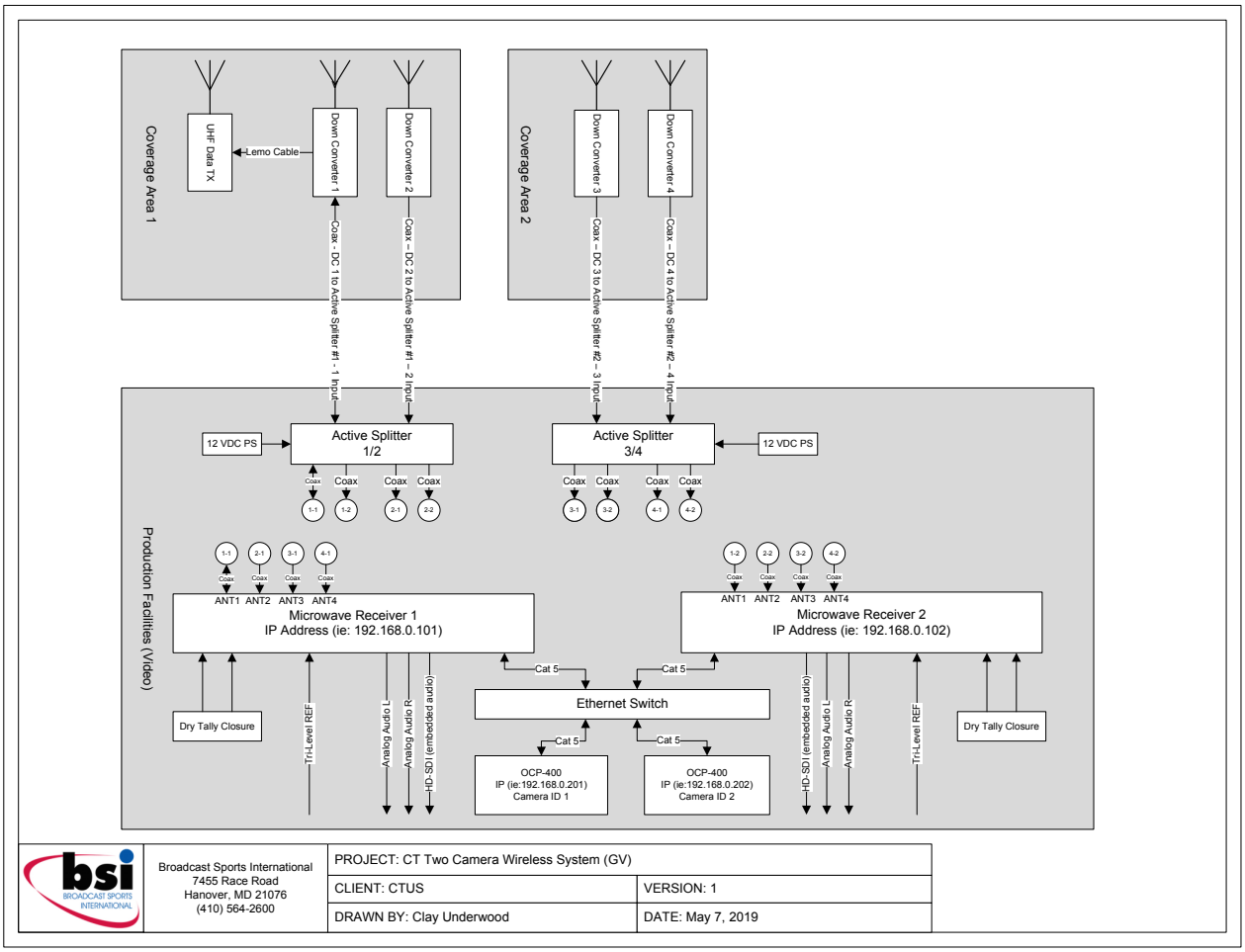
NOTES

APPENDIX A



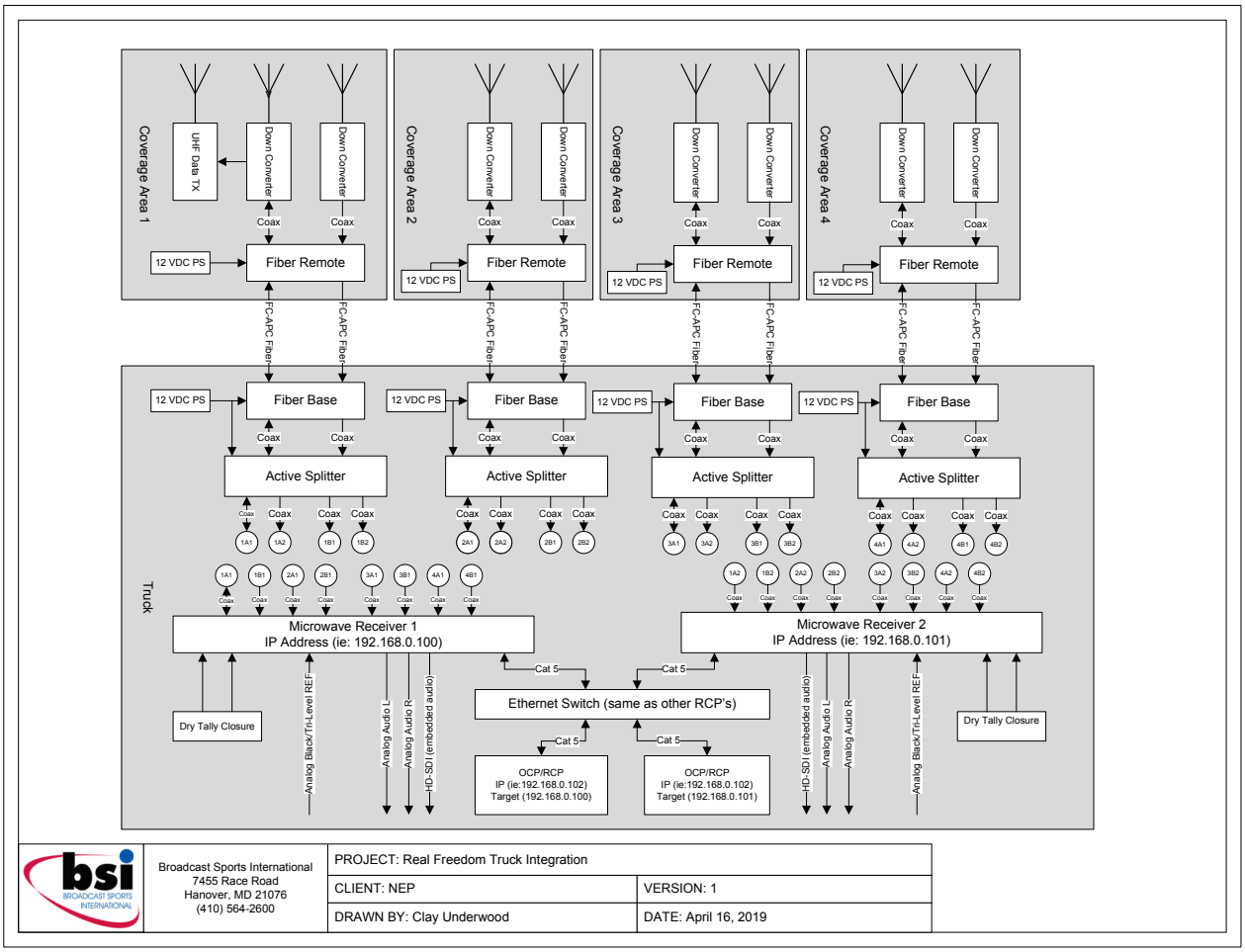
Appendix A is a Real Freedom system drawing showing 2 coverage areas. This is a hybrid system consisting of both coax and fiber connections from the down converters to the receiver.

APPENDIX B



Appendix B shows a sample coax only system consisting of a camera system with two separate coverage areas. Each down converter is connected via coax to an active splitter (which may or may not be a necessary part of user's setup). If active splitter is not present in user's application, then coax will be directly connected to the receiver.

APPENDIX C



Appendix C shows a sample system consisting a camera system with four separate coverage areas. These coverage areas are serviced with individual fiber remotes which are connected to separate fiber bases. Each fiber base is then connected via coax to an active splitter (which may or may not be a necessary part of user's setup). If active splitter is not present in user's application, then coax will be directly connected to the receiver.

APPENDIX D

CONNECTIONS CHECKLIST

Yes/No	Component	Cable Type	Notes
☐	Down Converter UHF	BNC out to receiver ANT (Antenna inputs 1-4)	Up to 8 Down Converters per Camera
☐	Down Converter UHF	BNC out to receiver ANT (Antenna inputs 5-8)	
☐	Down Converter Antenna	Standard N-Type connector	Must use BSI antenna
☐	Data Transmitter	LEMO 4 pin out to Down Converter LEMO power control connector	Connect data transmitter to the 1st Down Converter (ANT1)
☐	Receiver Signaling/ Tally	DB9 Dry Tally Closure to client supplied equipment	(optional)
☐	Receiver REF	BNS SYNC out to client supplied Tri Level REF	(optional)
☐	Receiver Analog Audio	XLR-3 (L/R) out to client supplied equipment	(optional)
☐	Receiver Digital Audio	BNC SDI out	Embedded SDI audio
☐	Receiver Network Control	CAT5 control out to ethernet switch	
☐	Receiver Power	IEC mains cable	Only use included cable
☐	Transmitter Power	LEMO 2 pin to battery pack	
☐	Transmitter Audio	(2) XLR-3 or BNC	
☐	Transmitter Control	LEMO 5 pin to camera control tally and paint	
☐	Transmitter Video	BNC to camera SDI	
☐	Transmitter Antenna	Standard N-Type connector	Must use BSI antenna
☐			