



AB507 AB512 Wireless Broadcast System



User Manual
Installation Manual
Ver. 1.5

About this Manual

Thank you for purchasing ABonAir's wireless video Link system.

Before installing the system, please read this user manual carefully, it will help you with quick and easy setup of the system and flawless operation.

This User Manual is intended for users of this systems as well as engineers working on integration of this system with other production equipment.

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General Safety Warnings

Always observe standard safety precautions during installation, operation and maintenance of this product. Only qualified and authorized personnel should carry out maintenance or repairs to the components of this system.



Danger: Electrical Shock

The power supply unit contains dangerous voltage that can cause electric shock. Disconnect the mains prior to any work on the receiver. Local regulations must be adhered to when servicing receivers.

Always disconnect the wiring at the power source before installing maintaining or modifying the system power wiring.

Outdoors Use: Wet conditions increase the potential for receiving an electric shock when installing or using electrically powered equipment.

Receivers supplied from the mains must be connected to grounded outlets and in conformity with any local regulations.



Caution: Coax Cable Bending

Allow sufficient coax cable length to permit routing of patch cords or pigtails without severe bends.



Caution: Static Electricity

Static electricity poses no risk of personal injury, but it can severely damage essential parts of the system if not handled carefully.

Parts of the printed circuit board as well as other parts of the receiver are sensitive to electrostatic discharge.

Never touch the printed circuit board or annulated conductor surfaces unless absolutely necessary.

If you must handle the printed circuit board or uninsulated conductor surfaces, use ESD protective equipment, or first touch the receiver chassis with your hand and then do not move your feet on the floor.

Never let your clothes touch printed circuit boards or uninsulated conductor surfaces. Always store printed circuit boards in ESD-safe bags.

Terms and Abbreviations

The terms, acronyms and abbreviations used in this manual are as follows:

Abbreviation	Description
MIMO	Multiple In Multiple Out
LED	Light Emitting Diode
RCP/CCU	Remote Control Panel or Camera Control Unit
INT	Intercom Beltpack

PSU	Power Supply Unit
RF	Radio Frequency
RSSI	Received Signal Strength Indication
RX	Receiver
TX	Transmitter
FCE	Fiber Coverage Extender
PTT	Push To Talk
IFB	Interruptible Feedback

Getting Help

The system has undergone extensive testing prior to shipment. All of the functions have been thoroughly tested. If you encounter any problems, please contact our support team for assistance in features, setup or troubleshooting at Support@AbonAir.com

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1. Overview

1.1. In the package

This section describes what is included in the package and the serial numbers. Part description etc.

1.1.1. Model AB507 (Portable Receiver)

The following table describes what's in the box :

#	Item Picture	Catalogue Name	Quantity	ABonAir S/N
1		Transmitter	1	
2		Receiver	1	
3		Case (Pelican)	1	CAS00003
4		Antenna 9dbi	2	ANT00003
5		Antenna 5dbi	2	ANT00002
6		N-Type to RP-SMA adapter	4	ADP00001
7		Power supply RX	1	PWS00001
8		AC cable	1	U.S-CBL00024 EU-CBL00023
9		SDI short	1	CBL00028
10		SDI long	1	CBL00027

11		Tripod	1	MEC00002
12		Audio XLR cable	2	CBL00013
13		Sector Ant.+ Mount*	2	ANT00004
14		Cable N-type 25Ft*	2	25ft -CBL00058 15ft -CBL00059 4ft -CBL00060

*The product included according to customer requirements

**Table above listed types of the cables

1.1.2. Model AB512 (Portable Receiver)

The following table describes what's in the box :

	Item Picture	Catalogue Name	Quantity	ABonAir S/N
1		Transmitter	1	
2		Receiver	1	

3		Case (Pelican)	1	CAS00003
4		Antenna 9dbi	2	ANT00003
5		Antenna 5dbi	2	ANT00002
6		N-Type to RP-SMA adapter	4	ADP00001
7		Power supply RX	1	PWS00001
8		AC cable	1	U.S-CBL00024 EU-CBL00023
9		SDI short	1	CBL00028
10		SDI long	1	CBL00027
11		Upgrade Cable	1	CBL00026
12		Audio XLR cable	2	CBL00013
13		CCU cable Rx**	1	
14		CCU cable Tx**	1	
15		Tripod	1	MEC00002
16		Sector Ant. + Mount*	2	ANT00004
17		Cable N-type 25Ft*	2	25ft -CBL00058 15ft -CBL00059 4ft -CBL00060

1.1.3. Model AB512 – 1U

The following table describes what's in the box :

	Item Picture	Catalogue Name	Quantity	ABonAir S/N
1		Transmitter	1	
2		Receiver	1	
		FCE - Fiber Coverage Extender	1	
3		Case (Pelican)	1	CAS00003
4		Antenna 9dbi	2	ANT00003
5		Antenna 5dbi	2	ANT00002
6		N-Type to RP-SMA adapter	4	ADP00001
7		Power supply RX	1	PWS00001
8		AC cable	2	U.S-CBL00024 EU-CBL00023
9		SDI short	1	CBL00028
10		SDI long	1	CBL00027
11		Upgrade Cable	1	CBL00026
12		Audio XLR cable	2	CBL00013
13		CCU cable Rx**	1	
14		CCU cable Tx**	1	

15		Headphones	2	HDS00001
16		Audio L/R Y Cable	1	CBL00047
17		Fiber adapters (LC-ST)	1	CBL00030
18		FCE mounting KIT *	1	MEC00044
19		Power supply for FCE*	1	PWS00004
20		Sector Ant.+ Mount*	2	ANT00004
21		Cable N-type 25Ft*	2	25ft -CBL00058 15ft -CBL00059 4ft -CBL00060

1.1.4. Intercom Upgrade Kit

The following table describes what's in the box :

	Item Picture	Catalogue Name	Quantity	ABonAir S/N
3		Intercom	2	
4		Case (Pelican)	2	CAS00003
13		Audio XLR cable	2	CBL00013
14		Intecom Cable Rx**	1	
15		Intecom Cable Tx**	1	
16		XLR-Headset Dongle	2	MEC00010
17		XLR-MIC Dongle	1	MEC00011
19		Headphones	2	HDS00001

2. Product orientation - Buttons, Connectors and LEDs

2.1. AB507

2.1.1. Transmitter



Front Side

1. **Anton Bauer / V-Lock Adapter & Low delay switch (side of mounting plate)**
Up position – low video delay
Down position – normal video delay
2. **LD (low delay)** - blue light on will indicate low delay mode
3. **5 led signal indicators:** Signal strength indicated by 1-5 green lights. No signal is indicated by a steady bottom red light.
4. **Power switch**
Right position turns the transmitter on, indicated by a green LED
Left position turns the transmitter and LED off.
5. **EMB/ANA Switch (Embedded / Analog)** - Audio input select
6. **Antennas** – Female N-Type Antenna ports
7. **Analog Audio Input**
Audio 1 – analog audio input (RCA female)
Audio 2 – analog audio input (RCA female)
8. **Power Input** – XLR 4 pin male to replace battery usage
9. **HD/SD** – SDI Input BNC 75 Ohm

Back Side

1. **Anton Bauer / V-Lock Adapter** – Camera mount adapter transfer power to camera



2.1.2. Receiver



Front Side

1. **LD (low delay)** - blue light on will indicate low delay mode
2. **5 led signal indicators:** Signal strength indicated by 1-5 green lights. No signal is indicated by a steady bottom red light.
3. **Power switch**
Right position turns the transmitter on, indicated by a green LED
Left position turns the transmitter and LED off.
5. **HD/SD** – SDI Output BNC 75 Ohm
6. **Antennas** – N-Type Female Antenna ports
7. **Analog Audio Input**
Audio 1 – analog audio input(RCA female)
Audio 2 – analog audio input(RCA female)
8. **Power Input** – XLR 4 pin male to replace battery usage



Back side

1. **Anton Bauer / V-Lock Adapter** –
Camera mount adapter transfer power
to camera

2.2. AB512

2.2.1. Transmitter

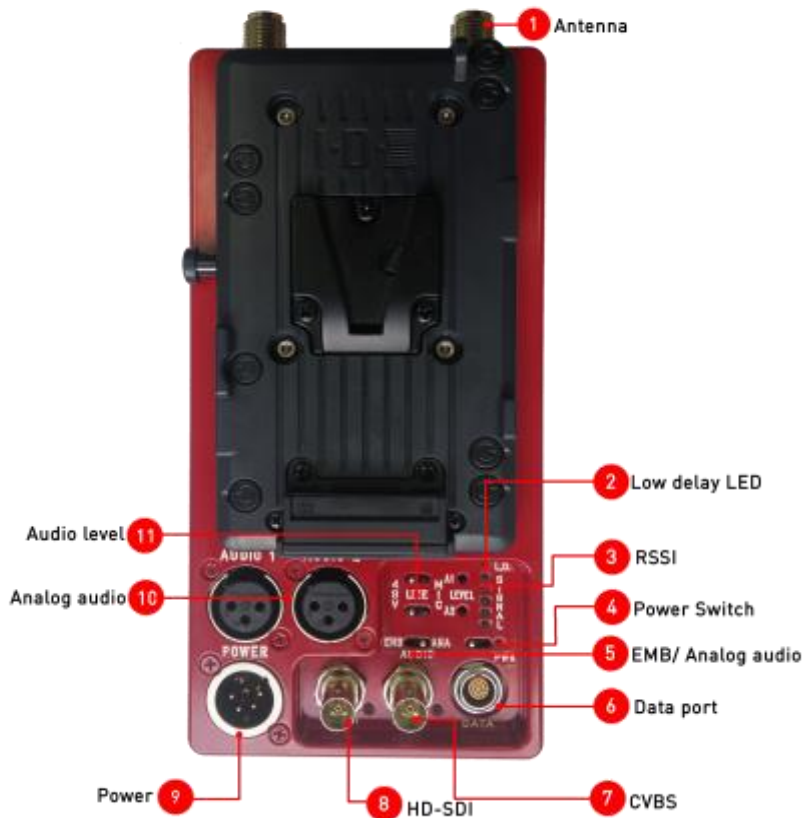


Figure 1: AB512 Transmitter with V-Lock mounting

1. **Antenna** – N-Type Female Antenna ports
2. **LD (low delay)** - blue light on will indicate low delay mode
3. **5 led signal indicators:** Signal strength indicated by 1-5 green lights. No signal is indicated by a steady bottom red light.
4. **Power switch**
Right position turns the transmitter on, indicated by a green LED
Left position turns the transmitter and LED off.
5. **EMB/ANA Switch (Embedded / Analog)** - Audio input select
6. **Data** – 16 pin female to be used with: CCU upgrade cables, intercom.
7. **CVBS** – Input BNC 75 Ohm
8. **HD/SD** – SDI Input BNC 75 Ohm
9. **Power Input** – XLR 4 pin male to replace battery usage
10. **Analog Audio Input**
Audio 1 – analog audio input (3 pins XLR female)
Audio 2 – analog audio input (3 pins XLR female)
11. **Analog audio input three mode selection switches:**
Left – 48V Phantom Power Microphone
Middle – Line level input
Right – Microphone level input
Analog audio trimmers for adjusting internal gain - to be used with precision screwdriver only (trimming is not required in most cases).



Back Side

1. **V-Lock / Anton Bauer Adapter-**
Camera mount adapter transfer
power to camera.
2. **Low delay switch (side of mounting
plate)**
Up position – low video delay
Down position – normal video delay



Right Side

1. **Tally connector** – 3.5 mm for tally light LED, two channels for two colors.

2.2.2. Receivers

Portable Receiver



1. **Antenna** – N-Type Female Antenna ports
2. **LD (low delay)** - blue light on will indicate low delay mode
3. **5 led signal indicators:** Signal strength indicated by 1-5 green lights. No signal is indicated by a steady bottom red light.
4. **Power switch**
Right position turns the transmitter on, indicated by a green LED
Left position turns the transmitter and LED off.
5. **Data** – 16 pin female to be used with: CCU upgrade cables, intercom.
6. **CVBS** – Input BNC 75 Ohm
7. **HD/SD x2** – SDI Input BNC 75 Ohm
8. **Power Input** – XLR 4 pin male to replace battery usage
9. **Analog Audio Output**
Audio 1 – analog audio input (3 pins XLR Male)
Audio 2 – analog audio input (3 pins XLR Male)



Back Side

1. **V-Lock / Anton Bauer Adapter-**
Camera mount adapter transfer power to camera.

Right Side

2. **Tally connector** – 3.5 mm for tally light LED, two channels for two colors.

1U Receiver

Front Panel



- | | |
|--|--|
| <p>1. Power - On/Off switch</p> <p>2. LED - Status display:</p> <ul style="list-style-type: none">Signal strengthFrequencyCCU Mode: Sony/Panasonic/etc.FCE / Local modeLow delay: On/OffVideo format: 720p/1080i/etc. <p>3. Frequency selector Knob – Manual selection of operating frequency, within the 5 GHz operating range. The selector has an automatic mode to enable the system to select the clearest frequency to operate.</p> <p>4. FCE (Fiber Coverage Extender) / Local - A switch that toggles between operation via fiber extender or two local</p> | <p>5. Intercom Volume - Intercom headset or 4W output volume</p> <p>6. Call - Intercom call Indicator. Received call signal will trigger a 5 seconds blinking blue light. To send a signal request call, press the call button.</p> <p>7. PTT (Push to Talk) - Indicated by a green light when activated.</p> |
|--|--|

Back Panel



Figure 3: AB512 1U Receiver – Back Panel

1. **VOX (Voice Operated Exchange)** - Voice level PTT activation adjustment for the intercom (PTT from receiver to transmitter)
2. **Null** - Null adjustment for two-wire partyline interface
3. **Intercom Config.** - Intercom Configuration switches
4. **IFB – (Interruptible Feedback Microphone)** - XLR 3 pins female IFB microphone/line level input connector. Doesn't work with 48V.
5. **4 Wire Intercoms or Intercom Headset** - XLR 4 pins male 4-wire intercom connector, optional headset digital
6. **2 Wire Intercoms** - XLR 3 pins female two-wire analog party-line intercom connector
7. **Link indicator** for three fiber connectors (#3 is not used). Top LED replicates the FCE / Local LED on the front panel
8. **FCE (Fiber Coverage Extender) ST Connector** – Dual duplex FCE connectors
9. **Remote Control** - RJ 45 Ethernet connector for control and updates.
Ethernet Connector R/A RJ45
10. **Tally** - 3.5 mm female Tally signal input connector, 2 lights.
Can be connected to switch between 3 modes (Off, Red light, Orange Light)
Phone Connectors 3.5mm PCB STEREO JAK 3P
11. **CCU (Camera Control Unit)/RCP (Remote Control Panel)** - 16 pins female Remote control
12. **Audio left/right** - 5 Pins female Analog Audio output. Can be used with ABonAir supplied adapter for two XLR male 3 pins
13. **HD-SDI out 1 (High Definition Serial Digital Interface BNC 75 OHM** - Video HD-SDI output
14. **HD-SDI out 2 (High Definition Serial Digital Interface BNC 75 OHM** - Video HD-SDI output
15. **CVBS out (Color Video Blank Sync) BNC 75 OHM connector** - Video CVBS output

-
16. **Ant.1 & Ant.2** – N-type female antenna connector 5-6GHz, local mode (connected to system as opposed to FCE)
 17. **Power Connector** - Input power 4 pins XLR male.
Power input 12V DC.

2.3. Intercom

2.3.1. Transmitter & Portable Receiver



Figure 4: Intercom backpack

1. **Intercom call button** - Sends a paging message to the receiver intercom, indicated by 5 seconds blue blinking light on the 1U.
2. **Intercom call Indicator** - Call signal received is indicated by a 5 seconds blinking blue light. Press the call button to send a signal request call.
3. **Intercom PTT button (Push to Talk)** - Pressing the button opens the intercom channel, indicated by green light. Pressing and holding for 5 seconds opens the audio channel. A short press releases Push to Talk function
4. **Intercom PTT Indicator** - Green light is on when the audio channel is open.
5. **On/Off volume trimmer** - Powers the Intercom and controls headset volume.
6. **Power LED indicator** - Green light is on when the intercom is active.



-
7. **IFB Vol.** - Controls IFB volume level

8. **IFB Ear** - Socket for IFB earpiece.
9. **IFB Mic** - To be used only with portable receiver. 3 pin female input for IFB microphone or line level input.



- 10. **Intercom headset** - 4 pin female input for intercom headset. Requires an XLR adapter.

11. **Configuration Switch** - See configuration chart.

PIN #	Switch is ON switch down	Switch is OFF switch up
1	Enable side-tone	Disable side-tone
2	Disable Vox	Enable Vox
3	Fixed PTT	PTT based on button
4	IFB Mic level	IFB Line level
5	Intercom Mic level	Intercom Line level
6	N/A	N/A
7	N/A	N/A
8	N/A	N/A
9	N/A	N/A
10	Always On side tone	PTT Based side tone

12. **Tx/Rx** - 8 pin female input socket for AB512 transmitter and/or portable receiver.

- Vox potentiometer - Controls voice activation level for intercom transmission. Can be trimmed using precision screwdriver only.

2.4. FCE

Fiber Coverage Extender, outdoor box (Multizone)



- **Power Led** - 12volt DC input indicator. Plugged-in power is indicated by a green light.
- **Power** - XLR 4 pin DC 12v input.
- **Ant 1** - N-Type Antenna connector.
- **Ant 2** - N-Type Antenna connector.
- **Fiber optics connector 1** - LC Fiber connector.
- **Fiber LED Link Indicator 1** - Link indication between FCE and receiver or next FCE in daisy chain.
- **Fiber optics connector 2 (Multizone only)** - LC Fiber connector.
- **Fiber LED Link indicator 2 (Multizone only)** - Link indication between FCE and receiver or next FCE in daisy chain back panel – see installation instructions.



3. Installation and connection

3.1. Transmitter

3.1.1. Connection to the camera

The transmitter has a battery side plate. Based on the model ordered this can be V-Lock or Gold Mount. Attached the transmitter to the camera battery plate like a battery. Attach battery to the other side of the transmitter. The battery will power the transmitter and the camera.

In cases of camera without battery plate, the transmitter can be held mounted manually on the camera with a battery. A D-Tap to XLR cable (not supplied) can be used to power the camera from the battery.

3.1.1. Video & Audio connection

Connect short SDI cable from the camera output to the SDI input in the transmitter. A green LED next to the connector will turn on once a valid SDI signal is present. The transmitter accepts HD-SDI and SD-SDI. Another option is to connect CVBS signal (PAL or NTSC). A green LED next to the CVBS connector will turn if the CVBS input is used. The SDI input has precedence over the CVBS.

The transmitter accepts analog or embedded audio. Use the switch on the transmitter to select between embedded and analog. When using analog audio input, the transmitter can select Line level, Mic level and Phantom power microphone (48v powered). Each channel has a separate selector for its analog input. In rare cases the input audio level can be trimmed using trimmer screw driver at the holes marked "A1" and "A2". A1 is for audio 1 (left channel) and A2 is for the right channel.

3.1.2. Installation of the Antennas

The system includes 3 dBi short antennas and 9 dBi long antennas. Heavy duty antennas can also be purchased. In most cases the heavy duty antennas or the 5 dBi will provide the best results. The 9 dBi antenna will provide slightly more range on the expense of camera tilting or elevation difference between the receiver and transmitter (in cases the receiver antennas are located on higher location such as high roofs).

3.1.3. CCU Connection (AB512 only)

The transmitter will automatically identify the cable being used and will configure its protocol to the following major camera vendors:

1. Sony
2. Panasonic
3. Ikegami
4. Grass Valley
5. Hitachi

For Ikegami and Hitachi a small adapter box is placed between the camera and the transmitter, such that the cable (either Y type or straight) goes to the adapter and then from its other side to the camera.

The Y cable has label "AB320INT-TX-ODU-XXX", where xxx stands for the camera vendor. The straight cable is labeled "AB310CCU-TX-ODU-XXX" again with camera vendor. The Ikegami and Hitachi have another cable labeled "TX-ODU-IKEGAMI-CAM" (or Hitachi as appropriate), that connects the adapter box to the camera. Connect the cables to the "data" port on the transmitter and to the "remote" connector on the camera.

3.1.4. PTZ Connection (AB512 only)

PTZ connection is done with a special cable made for the specific camera. The transmitter has to be pre-configured for the specific camera. Consult ABonAir for your specific camera.

3.1.5. Intercom connection (Upgrade kit only)

Use the Y cable labeled "AB320INT-TX-ODU-XXX" (xxx stands for camera vendor) to connect the beltpack to the transmitter. Connect the 16 pin circular connector (the root of the "Y") to the transmitter data port. On the other side the long cable goes for the intercom system connector on the belt pack.

Connect the 4 pin XLR dongle (labeled intercom headset) to the beltpack headset connector. Connect the headset to its other side XLR connector.
Connect a 3.5mm earpiece to the IFB ear connector on the beltpack.

3.2. Receiver

3.2.1. Connection of the Monitor/Screen

The receiver outputs two SDI signals concurrently. If the video format is SD the output is also available on the CVBS port (2 SD-SDI and 1 CVBS). Audio is provided both embedded and analog regardless of the input selected.

Warning:

Do not place phantom power from Audio equipment on the analog audio output. Phantom power is generated in transmitter if required by the microphone.

3.2.2. Connection of the Battery/Power supply

Portable receive can be powered from battery like the transmitter. Place the battery on the battery mount. The receiver is powered from V-Lock or Gold Mount battery according to the purchased receiver model.

3.2.3. Installation of the Antennas

If working in local mode (without FCE), two antennas should be attached to the 2 antenna ports. RF coax cable can be used to place the antenna a little away from the receiver. Make sure to use good quality RF cable (such as LMR-400 type), with no more than 30 feet length (10 meters).

3.2.4. CCU cable Connection (AB512 only)

The receiver identifies the cable being attached to it and selects the appropriate protocol to use. The system supports the major camera vendors:

1. Sony
2. Panasonic
3. Ikegami
4. Grass Valley
5. Hitachi

For a portable system with intercom (AB512) there is Y cable connecting the receiver to the intercom beltpack and to the camera control panel. This cable is labeled "AB320INT-RX-ODU-XXX", where xxx stands for the camera vendor. For the other systems there is a straight cable connecting the receiver to the panel labeled "AB310CCU-RX-ODU-XXX" again with camera vendor.

Also in the receiver there is an adapter for Ikegami and Hitachi control panels. Connect the above cable from the receiver to the adapter black box. Connect a cable labeled "RX-ODU-IKEGAMI-CCU" from the other side of the adapter to the RCP.

3.2.5. PTZ Connection (AB512 only)

PTZ connection is done with a special cable made for the specific camera and control panel. The receiver has to be pre-configured for the specific camera.
Consult ABonAir for your specific camera.

3.2.6. Intercom connection (Upgrade kit only)

Portable Receiver

Use the Y cable labeled “AB320INT-RX-ODU-XXX” (xxx stands for camera vendor) to connect the beltpack to the receiver. Connect the 16 pin circular connector (the root of the “Y”) to the receiver data port. On the other side the 8 pin circular connector goes for the intercom system connector on the beltpack.

Connect the 4 pin XLR dongle (labeled intercom headset) to the beltpack headset connector. Either connect headset directly to the beltpack or connect it to 4 wire interface according to the pinout provided in the pinout section.

Connect the 3 pin IFB dongle to the IFB mic connector on the beltpack. Connect a microphone or other IFB audio input to the 3 pin XLR connector.

You can choose line or mic level input for IFB and intercom, as well as other settings using the DIP switches. See intercom section above.

Note: the intercom cannot provide phantom power to microphones.

1U Receiver

3.2.6.1. Intercom 2Wire / 4Wire

There are two intercom systems options:

1. **4 Wire interface:** used when connected to digital intercom matrix. In addition it can be used as standalone intercom system where the headset is connected directly to the receiver, using the **4W Int connector**.
 - Configure Switch #6 to upper position (4W Interface)
 - Set the remaining switches as appropriate for your configuration. Note that for matrix connection you should select the line level input
2. **2 Wire interface:** used when connected to analog Party Line. Using the 2W int connector.
 - Configure Switch #6 to lower position (2W Interface)

3.2.6.2. IFB Audio Stream

IFB Mic. Connector - Connect Microphone or line level.

AB512 doesn't provide 48V for phantom-powered IFB microphones.

Config. - Switch down (Off), up (On) IFB Mic level (#4).

IFB channel is always on.

1U rack mount DIP switch

The 1U rack mount receiver has a DIP switch for configuration. The *Off* state is straight (up). *On* state is pressed (down).

Functions:

- **Side tone** – this switch enables self-hearing. On rack mount that is connected to matrix or party line intercoms it must be set to *Off* to prevent the receiver from loopback of the matrix audio.

- **VOX** – Voice activation. This switch enables PTT voice activation. This can be used to send audio to the cameraman only, when audio is present. VOX is disabled in the *On* State. If required, the threshold level can be adjusted in the small hole on the side of the unit using a miniature flat screwdriver.
- **PTT** – Push To Talk. On the fixed setting the audio line is always open. With PTT based activation, press the PTT button to enable talking. It is usually set to fixed mode to let the cameraman hear the director all the time. In a PTT button-based mode, a constant press of 3 seconds on the PTT button will stick it in *On* state, a short press will release it.
- **IFB input level** - This switch distinguishes between microphone input and line level input from a matrix. *On* means MIC level.
- **Intercom input level** - This switch selects the input level of the intercom. *On* state means MIC level for connecting headset to the unit. *Off* state means line level input for connecting a matrix to the unit.
- **Two wire interface** – This switch toggles between 2 wire and 4 wire connection to the matrix. For connection to analog party line matrix set this switch to *On*. For connection to 4 wire matrix set this switch to *Off*. The appropriate connector on the back panel should be used for each of the modes.

Summary table

Number	On state	Off state
1	Enable Side-tone	Disable side-tone
2	Disable VOX	Enable VOX
3	Fixed PTT	PTT-based <i>On</i> button
4	IFB MIC level	IFB Line level
5	Intercom MIC level	Intercom Line level
6	2 wire connection	4 wire connection

2 Wire interface:

2W Int. - Connect to base station:

Suggested and recommended configurations:

- **On switch:**
 - Disable Vox (#2)
 - Fixed PTT (#3)
 - Two wire connection (#6)
- **Off switch:**
 - Disable Side Tone (#1)
 - IFB Line Level (#4)
 - Intercom Line Level (#5)



Please note that a receiver does not require power (dry connection). However, it can handle power input

Recommended setting based on installation:

No.	Digital matrix	2 wire analog matrix	Standalone intercom
1	Off - Disable side-tone	Off - Disable side-tone	On – Enable side tone
2	NA	NA	As required - VOX
3	On - Fixed PTT	On - Fixed PTT	As required - PTT
4	Off –line level IFB	Off –line level IFB	On – mic level IFB
5	Off –line level Intercom	Off –line level Intercom	On – Mic level intercom
6	Off – 4 wire	On – 2 wire	Off – 4 wire

3.2.7. Tally Connection (AB512 only)

There are two options for connecting tally to our system:

1. Embedded tally – depending on the camera vendor and OCP model used, the tally can pass as OCP command through ABonAir system.
2. In other cases, an external tally LED can be controlled from close contact at the receiver

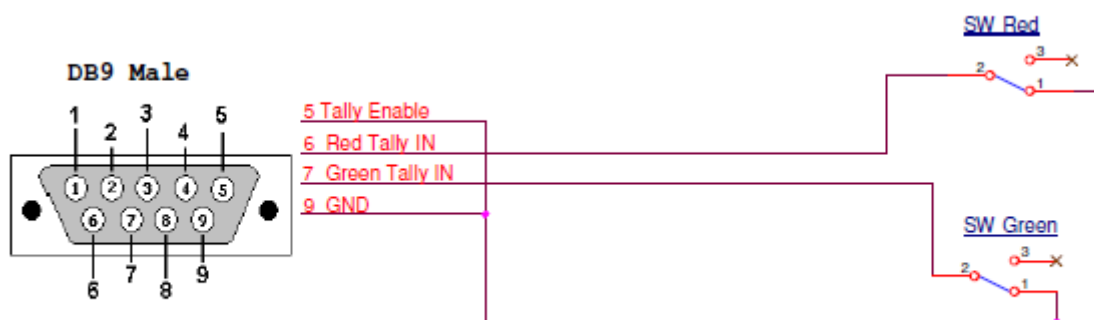
3.2.7.1. Embedded tally

Sony camera and OCP connection:

RCP 1000 / 1500 and similar have a female D-sub 9 pin external I/O connector. Its pin assignment is as follows:

- 5 - Tally Enable
- 6 - R Tally IN
- 7 - Preview IN/G Tally IN
- 9 – GND

Connect pin 5 to 9 to enable tally feature. Connect pin 6 and 7 to red and green close contact on the switcher. They should be closed contact with the GND signal (pin 9) as shown in the diagram below:



Ikegami camera and OCP connection:

On the OCP there is there is a female D sub 15 connector marked as “EXT-2 (preview)”. Make a cable to connect this connector to the switcher close contact outputs as follows: Connect pin 7 to GND (pin 8) to enable the tally feature. Activation of red tally is done by closing contact between pin 4 and 8. **Pin 5 and 6 for green and yellow tally need first to be configured for tally input in the panel setting.** The configuration is done in the

panel config / external IO menu. After that they work the same way as the red tally. See below table for the proper connection.

External input

Pin No.	Name	Function	External interface
4	R TALLY	R tally output	
5	G TALLY	G tally output	
6	Y TALLY	Y tally output	
7	ENABLE	Enable input	
8	GND	Signal grounding	

Grass Valley camera and OCP connection:

There's a D-Sub 9 pin male connector labeled preview connector on the OCP. Close contact between pin 8 and 9 to indicate on air. Use the OCP setup to configure the tally function.

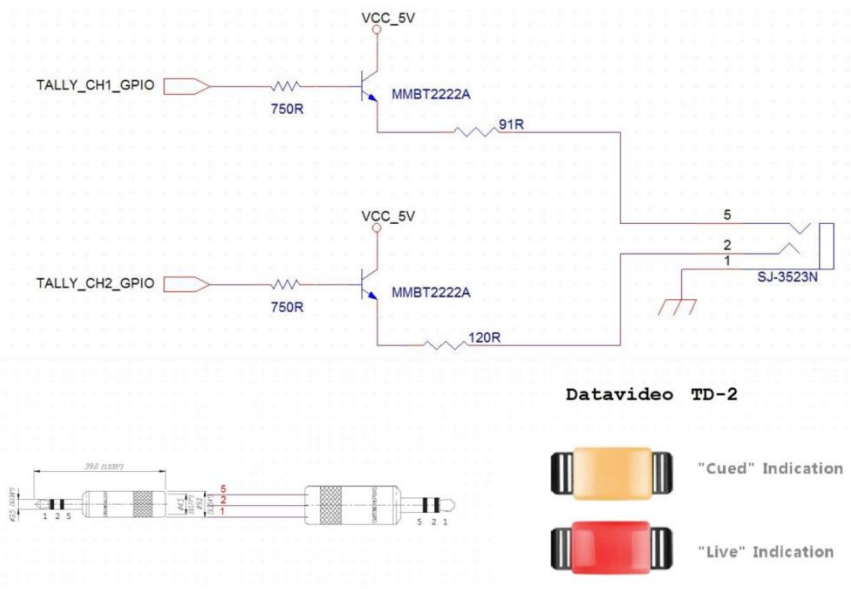
3.2.7.2. External tally connection

AB512 Transmitter connected to Tally LED such as *DataVideo* TD-2 with 3.5mm connector (not supplied).

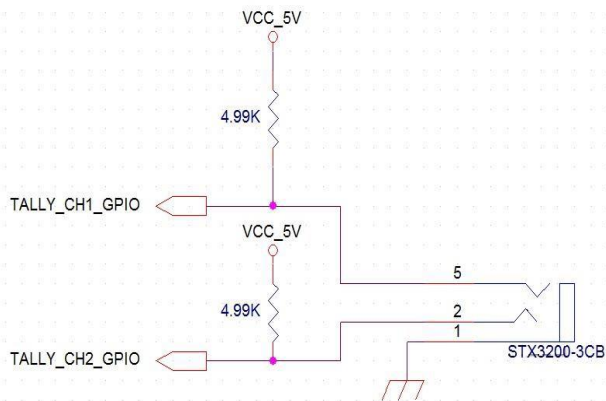
AB512 Receiver connected to 2 *close-contact* inputs from the video switcher.

Transmitter side: Schemes

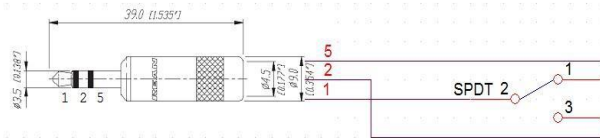
Tally Light Driver / Transmitter Side



Reciever Side



Analog switch



4. Operation

4.1. Wireless Video

Connect SDI input from the camera to the transmitter. Turn on the transmitter and receiver (and FCE if installed). The system will work automatically

4.2. CCU (AB512 only)

Turn on the receiver to get power to the remote panel. Turn on the transmitter and then the camera. Wait for video link. Once you have a video link the camera can be controlled from the panel.

Use the panel to control your camera based their manufacturer instructions. For example, set auto IRIS on the camera to be able to control the IRIS from the panel.

If the panel is operated while the link is down the commands will not pass to the camera. In some cases functions may need to be synched. For example, moving the IRIS sync its new setting.

In a few cases with specific camera and panel models, the remote panel should be power cycled after battery is replaced on the camera.

4.3. Tally (AB512 only)

Once a link is active Tally is propagated to the camera or to the external tally light. See the tally installation section for more details on the connection

4.4. Intercom (Upgrade Kit only)

The intercom provides a way for 2 way communication between the camera man the rest of the production crew (using the production Intercom Matrix). It also provides a mean to send IFB to the talent near the cameraman.

The call button is used to signal the other side. A press on the call button will flash an LED on the partner unit.

4.4.1. Beltpack operation

The belt pack has two interfaces: Intercom and IFB earpiece. Each one of them has its own Volume control. Use the intercom volume to power the beltpack and set according to the cameraman preferences.

The kit includes a dongle for connecting the beltpack to standard 4 pin XLR headset and also for portable receiver dongle for connecting to standard 3 pin XLR microphone.

Below are few functions that can be configured using the beltpack DIP switches. See the installation section for the detailed switch list:

1. Side tone (self-hearing) – side tone can be enabled or disabled. When enabled it can be active only while PTT is active or all the time.
2. PTT – use the PTT button to activate the audio transfer from the camera man to the director side. If PTT is held pressed for 3 or more seconds it will be latched on. To release it press it again shortly. Another option for activating the PTT is VOX. If VOX is enabled and camera man microphone

audio level is above threshold the PTT is activated. The threshold can be trimmed using a tiny screw driver.

3. Intercom level – The intercom input signal level can be set to MIC and Line level. If you are using audio equipment that provides line level audio instead of headset microphone, select line level for the intercom.
4. IFB level (for portable RX) – if the portable RX is connected to an audio equipment providing line level IFB set the appropriate switch to line level.

4.4.2. 1RU Receiver intercom operation

In most cases there is no need to do any specific operation after receiver installation. The installation instructions are sufficient for most use cases. DIP switches can be changed according the list in the installation section is specifically required.

Appendix 1 - Common trouble shooting

No Power	1. Verify charged battery (If Tx). 2. Check the Tx with XLR power supply. 3. Exchange Rx power supply with power supply from FCE.
No Link	1. Confirm Tx is powered on. 2. Confirm Rx is powered on 3. Check Tx antennas are assembled correctly. 4. In order to test the link in a local mode follow these steps: a. Connect antennas to Rx. b. Switch Rx to local mode. c. Move Tx closer (max Five (5) meters or sixteen (16) feet) to Rx.
Operating in Local Mode While FCE Mode is not Functioning:	1. Verify that the FCE is powered on. 2. Verify that the Rx is powered on. 3. Verify that the FCE antennas is assembled correctly and pointed to Tx. 4. Check for blinking FCE link LED. If the LED is not blinking, the Tx/Rx are not aligned properly (switch Left and Right, Tx/Rx). 5. Repeat the above test on the second FCE and Rx fiber. 6. Make sure your fiber is broken (Can pass light). 7. Move the Tx closer (max Five (5) meters or sixteen (16) feet) to the FCE.
Wireless Link is alive, yet there is no video stream:	1. Verify that the camera output video signal is connected to the monitor. 2. Verify that the SDI input LED on the Tx is On. 3. Verify that the SDI output led on the Rx is On. 4. On the Rx, try to swap outputs HD-SDI 1 with HD-SDI 2 5. Power cycle TX 6. Power cycle FCE 7. Power cycle RX
Low Intercom Volume	Check Rx & Tx: 1. Verify that the headset output volume potentiometer is set to max. 2. Verify that the intercom is configured to Mic level

CCU/RCP not functioning	1. Verify that the CCU cables are connected to the camera and CCU. 2. Power cycle CCU – verify link 3. Turn off all equipment. 4. Turn on the ABonAir devices, wait to establish link, then turn on the camera and CCU. 5. Verify that the CCU and camera are operating with direct cable connection
Low Wireless Signal Strength	1. Check that a line of sight is available between the TX antennas and receiver/FCE antennas. 2. Check alignment of the antennas. The sector antenna should be tilted to point to the center area of interest 3. Check that the antennas are assembled correctly. 4. Try to check the system in local mode with antennas on Rx. 5. Try changing TX antennas from 5db to 9db. 6. Power cycle the TX.
No audio	1. If you are working in embedded audio mode, check that the Tx audio switch is in EMB position. 2. Check if audio is available on either analog audio outputs or embedded in HD-SDI. 3. If you are working with a microphone, check that the audio switch is in ANA position. 4. Check that the working channel gain is configured correctly. 48V for phantom microphone, MIC for microphone or LINE for line level signal.

Appendix 2 - Health & Safety - Exposure to None Ionizing Radiation / Safe Working Distances

ABonAir's AB507 and AB512 can be used without specific SAR testing, according to EN62311 and EN62479:2010 Annex B Harmonized Standard under the R&TTE directive.

The various applicable electromagnetic field exposure limits contain different types of exposure parameters as a function of frequency and as a function of the type of limit reference level. Section 7.2 of IEC/EN 62311 provides a procedure for performing the EMF assessment.

The Transmitter Far-Field condition is satisfied if the distance between antenna and operator is larger than the far-field distance. The far-field distance of radiating structures depends on the dimension of the radiating structure (D) in relation to the wavelength of the radiated field (λ). For small Antenna with respect to the wavelength ($D \leq \lambda$) which are typically Omni-directional, the Far-Field region is reached at a distance of one-sixth of the wavelength ($R_{Far Filed} = \lambda / 2\pi$).

At 5Ghz frequency, the Wavelength is 60 mm. The Antenna Radiation element size is 20mm, hence shorter then the wavelength, hence Near filed is < 1 cm and Far Filed is > 1 cm. ($R_{Far Field} = 6/2*3.14=0.95$ cm)

At 6Ghz frequency the Wavelength is 50 mm. The Antenna Radiation element size is 20mm, hence shorter then the wavelength, hence Near filed is < 0.8 cm and Far Filed is > 0.8 cm. ($R_{Far Field} = 5/2*3.14=0.8$ cm)

Exposure levels are based on the exposure limits for the general public given by the ICNIRP guidelines [B.6.1]. In our case, Localized SAR 2W/kg for head and trunk over 10 gram tissue.

Based on a study of dipole antennas of different lengths and at different distances, a simple equation was developed for predicting higher values of the low-power exclusion levels (P_{max}'):

$$P_{max}' = \exp \left[A s + B s^2 + C \ln(BW) + D \right] \quad (\text{Eq. E.1})$$

where s represents the nearest separation distance between the wireless device and the user's body, BW is the free-space antenna bandwidth, and A, B, C and D are third-order polynomials of frequency.

The bandwidth defined as the ratio between the stored and the radiated energies of the antenna. In the equation (E.1), s is expressed in mm and BW is expressed in percent. The frequency dependent parameters A, B, C and D can be found from the following equations, where f is the frequency in GHz. For compliance with the SAR limit of $SAR_{max} = 2$ W/kg averaged over m = 10 g in ICNIRP Guidelines [1] and IEEE Std C95.1-2005 [4], use Equations (E.2) to (E.5) in Equation (E.1):

$$A = \left(-0,4588 f^3 + 4,407 f^2 - 6,112 f + 2,497 \right) / 100 \quad (\text{Eq. E 6})$$

$$B = \left(0,1160 f^3 - 1,402 f^2 + 3,504 f - 0,4367 \right) / 1000 \quad (\text{Eq. E 7})$$

$$C = (-0,1333 f_3 + 11,89 f_2 - 110,8 f + 301,4) / 1000 \quad (\text{Eq. E 8})$$

$$D = -0,03540 f_3 + 0,5023 f_2 - 2,297 f + 6,104 \quad (\text{Eq. E 9})$$

In AB512 and AB507 the conditions for these equation are as follow:

Antenna BW: 1Ghz (20% at 5Ghz)

Frequency of operation: 5-6Ghz.

Transmit power: 100-300mW.

Placing these numbers into the above formulas derives the minimum operation distance between Camera operator and Antenna to be 1.3cm.

Operating instructions:

In order to operate AB507 or AB512 safely, please follow these rules:

1. Do not touch the antennas while the system is working
2. Do not open the system case.
3. Camera Operator should keep a 1 cm distance between antenna and operator in 100mw power transmit mode, 1.3 cm in case of 200mw transmit power and 1.6 cm in case of 300mw transmit power. This is based on EN62479 Far/near field calculation.

Appendix 3 - CE Marking



CE declaration of Conformity

Product name:
AB512, AB507 Wireless Video Link system

Design and manufactured by:
AB on Air Ltd. Based in Israel, Kfar Saba, 17 Atir Yeda st. 4464313.

Represented in France by:
Metracom, 348 rue He'le'ne Boucher CS44040 78535 BUC cedex, France

AB on Air is hereby confirmed to comply with the requirements set out in the Directive:

- Electromagnetic Compatibility (EMC) Directive - 2004/108/EC.
- Low-Voltage Directive - 2006/95/EC.
- Radio and Telecommunication Terminal Equipment Directive - 1999/5/EC
- Limitation of exposure - 1999/519/EC
- RoHS Directive - 2011/65/EC

For the evaluation regarding the Directives, the following harmonised standards have been used:

- ETSI EN 301 489-1 V1.8.1 (2008)
- ETSI EN 301 489-4 V1.4.1 (2009)
- ETSI EN 61000-4-2:2009
- ETSI EN 61000-4-3:2006
- ETSI EN 61000-4-4:2012
- ETSI EN 61000-4-5:2006
- ETSI EN 61000-4-6:2009
- ETSI EN 61000-4-8:2010
- ETSI EN 61000-4-11:2004
- ETSI EN 55022
- ETSI EN 55024

This equipment is intended to work in all countries.
Authorized signatory of manufacturer:



Name of signatory: Eran Igler
Position in company: CEO
Place: Israel
Date: 11.11.16
Signature: 

אבונאיר בע"מ
AB on Air Ltd.

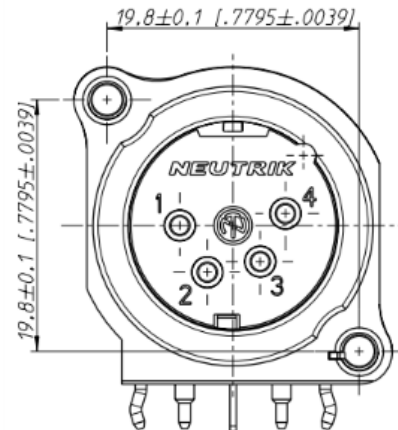
Appendix 4 - Connectors pin descriptions

Power Connector - Input power 4 pins XLR male.

Power input 12V DC.

MFG Part#: Neutric NC4MAH

PIN #	TYPE	DESCRIPTION
1	IN	GND
2	NC	-
3	NC	-
4	IN	VCC 12V DC



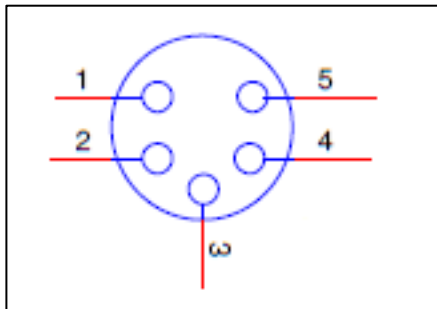
Ant.1& Ant.2 – N-type female antenna connector 5-6GHz, local mode
(connected to system as opposed to FCE)

HD-SDI out 1/out 2 (High Definition Serial Digital Interface BNC 75 OHM -
Video HD-SDI output

CVBS out (Color Video Blank Sync)
BNC 75 OHM connector - Video
CVBS output

Audio left/right - 5 Pins female Analog Audio output. Can be used with ABonAir
supplied adapter for two XLR male 3
pins

MFG Part#: Lemo ECG-1B-305-CLV



PIN #	TYPE	DESCRIPTION
1	OUT	AUDIO_R+
2	OUT	AUDIO_R-
3	OUT	GND
4	OUT	AUDIO_L-
5	OUT	AUDIO_L+

CCU (Camera Control Unit)/RCP (Remote Control Panel) - 16 pins female Remote control

MFG Part#: Lemo ECG-1B-316-CLV



PIN #	TYPE	DESCRIPTION
1	OUT	GND
2	IO	Reserved
3	IO	Reserved
4	IO	Reserved
5	IO	Reserved
6	OUT	VCC 12V DC
7	IN	RS485INP_RS232IN
8	IN	RS485INN
9	OUT	RS485OUTP
10	OUT	RS485OUTN_RS232OUT
11	IN	Maint ID
12	NC	-
13	NC	-
14	IN	CCU TYPE 0
15	IN	CCU TYPE 1
16	OUT	GND

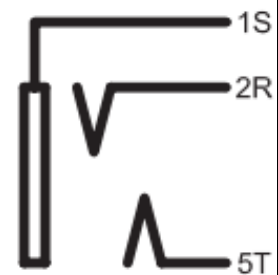
Tally - 3.5 mm female Tally signal input connector, 2 lights.

Can be connected to switch between 3 modes (Off, Red light, Orange Light)

Phone Connectors 3.5mm PCB STEREO JAK 3P

MFG Part#: Kycon STX-3200-3CB

PIN #	TYPE	DESCRIPTION
1	OUT	GND
2	IN	TALLY_CH2
5	IN	TALLY_CH1

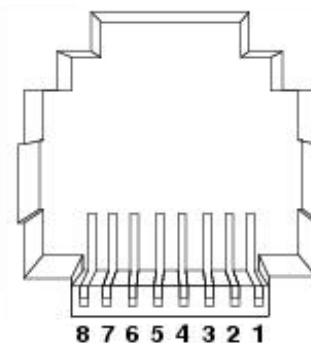


Remote Control - RJ 45 Ethernet connector for control and updates.

Ethernet Connector R/A RJ45

MFG Part#: Amphenol RJHSE-5381

Pin	Label
1	RD+
2	RD-
3	TD+
4	NC
5	NC
6	TD-
7	NC
8	NC



FCE (Fiber Coverage Extender) ST Connector – Dual duplex FCE connectors

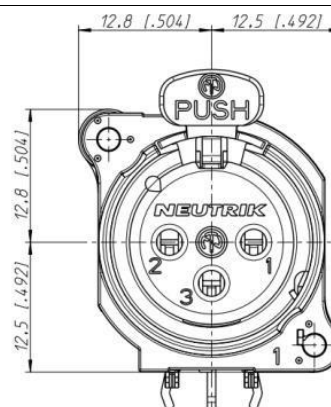
PIN #	TYPE	DESCRIPTION
1	OUT	TX FCE 1
2	IN	RX FCE 1
3	OUT	TX FCE 2
4	IN	RX FCE 2

Link indicator for three fiber connectors (#3 is not used). Top LED replicates the FCE / Local LED on the front panel

2 Wire Intercoms - XLR 3 pins female two-wire analog party-line intercom connector.

MFG Part#: Neutric NC3FBH1

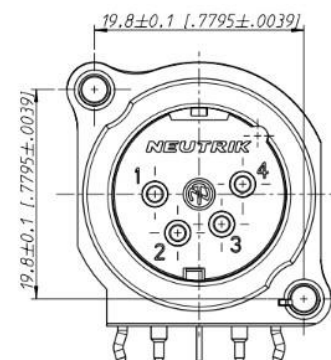
PIN #	TYPE	DESCRIPTION
1	OUT	GND
2	NC	-
3	IN/OUT	Audio



4 Wire Intercoms or Intercom Headset - XLR 4 pins male 4-wire intercom connector, optional headset digital

MFG Part#: Neutric NC4MAH

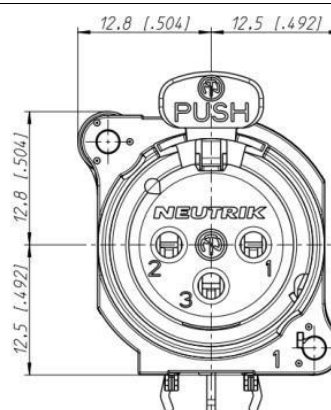
PIN #	TYPE	DESCRIPTION
1	IN	Audio/MIC IN-
2	IN	Audio/MIC IN+
3	OUT	AUDIO_OUT-
4	OUT	AUDIO_OUT+



IFB – (Interruptible Feedback Microphone) - XLR 3 pins female IFB microphone/line level input connector. Doesn't work with 48V.

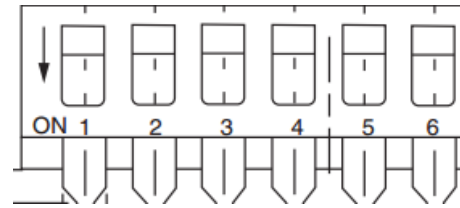
MFG Part#: Neutric NC3FBH1

PIN #	TYPE	DESCRIPTION
1	OUT	GND
2	IN	IFB_In+
3	IN	IFB_In-



Config. - Intercom Configuration switches

PIN #	Switch is ON(DOWN)	Switch is OFF(UP)
1	Enable Side-tone	Disable Side-tone
2	Disable Vox	Enable Vox
3	Fixed PTT	PTT based on button
4	IFB Mic level	IFB Line level
5	Intercom Mic level	Intercom Line level
6	2W interface	4W interface



Null - Null adjustment for two-wire partyline interface

VOX (Voice Operated Exchange) - Voice level PTT activation adjustment for the intercom (PTT from receiver to transmitter)

Appendix 5 - Technical Specifications

Performance AB-MultiZone Technology: Full Support FCE: Full Support Distance: Up to 3 km Low Delay Mode: 7 msec CCU/RCP: Yes Data Link: 1 Mbps Encryption: AES 128 Bit Antenna constellation: MIMO Received Signal: Indication LCD display Tally Light: Yes Intercom: Yes IFB: Yes Radio Modulation: OFDM, BPSK, QPSK, 16QAM, 64QAM FEC: 1/2, 2/3, 3/4, 5/6, 7/8 Frequency Range: 5Ghz band - 4.9 - 5.875 Ghz RF Output Power: Preset: 50 mW to 300 mW Antenna Connector: N-type or fiber (SM or MM) Video Video Formats: 1080p, 1080i, 720p, NTSC, PAL (59.94Hz, 60Hz, 50Hz, 30Hz, 25Hz, 24Hz, 23.97Hz) Frame Size: HD - 1920 x 1080, 1280 x 720 SD - 720 x 576, 720 x 480 Codec: HIGH PROFILE H.264 CODEC GOP Size/Types: IP Frame Connector: SD/HD-SDI, Composite: 75 Ohm BNC connector	Audio Channels: Mic./+48v Mic./line stereo pair Analog Range: -60 dBm to +18 dBm Sampling Rate: Analog 48 KHz Embedded SDI at 48 kHz Crosstalk: Better than 60 dB CCU / Data Channel CCU/RCP: Sony, Panasonic, Ikegami, Hitachi, Grass-Valley RS422/RS485: Bidirectional full duplex data link at 1 Mbps Intercom ABonAir integrated Intercom belt-pack and receiver: Supported 4-Wire or 2-Wire configurations, including Analog Party-line, Digital Matrix and Headset Power Input Voltage Range: 10 to 14 Volts DC Under/Over voltage protection Power Consumption: 12 Watts Mechanical Size: 23.5cm x 10cm x 4cm Weight: .1 Kg (2.4 lb) Environmental: Operating range: - 10°C to +45°C Humidity: 95% Form Factor: Receiver - 1U Rack-mount Transmitter - Camera mount, Battery operated, V-lock or Gold-Mount (VL/GM)
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Appendix 6 - Quick Installation guide

AB512 1U Receiver Basic installation

1. Put the receiver into the rack.
2. Tighten to the rack with 4 screws.
3. Connect BNC 75ohm cable to SDI out 1 or SDI out 2 and to the Video switcher/Monitor.
4. Connect the fiber optic cable to the FCE connector on the back and check for fiber link LED.
5. Connect CCU/RCP cable to CCU connector on the back and to the remote controller.
6. Connect intercom headset to 4W Int. connector on the back.
7. Set the configuration switches in the following position (111110) 1-down, 0-up (left to right).
8. Connect power supply to the Power socket on the back panel.
9. Press the Power switch.
10. Check that the power indicator is on.
11. Press the FCE/Local switch.
12. Check that FCE/Local indicator is on.
13. Check CCU/RCP receiving power.

FCE Basic installation

1. Install 2 sector antennas pointing to the required cover area.
2. Connect N-type RF cables from FCE to the sector antennas.
3. Connect fiber cable to the Fiber Optics connector.
4. Plug in the power supply into the Power socket
5. Check that the Power led is on.
6. Check that the Fiber link is on.

AB512 Transmitter Basic installation

1. Install 2 spring omni-directional antennas.
2. Attached transmitter on the back of the camera.
3. Mount battery to the transmitter to feed both Transmitter and Broadcast Camera.
4. Connect BNC 75ohm cable to HD-SDI video input on the transmitter, and to HD-SDI video output on the camera.
5. Make sure Low delay switch is in *Up* position.
6. Turn-on the transmitter by moving the power switch to ON (right).

7. Check that the green power indicator is on.
8. Check that the blue low-delay indicator is on.
9. Turn on the camera.
10. Check that HD-SDI LED indicator in Transmitter appears green.
11. Wait for ± 1 minute for RSSI LED indicators to turn green (signal level can be from 1-5).
12. Make sure Receiver is power-on, and has HD-SDI output in back to your Monitor.
13. Check that video signal is displayed on the monitor.