

PARALINX TOMAHAWK

USER MANUAL



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<http://support.paralinx.net>

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SAFETY INSTRUCTIONS

When operating this equipment, read and follow all the instructions in this manual.

Keep these instructions in a safe and accessible place for future reference.

Do not use this apparatus near water.

Clean only with a dry cloth.

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

Use only accessories specified or recommended.

Do not defeat the polarized or grounding plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of your obsolete outlet. Caution! To reduce the risk of electrical shock, grounding of the center pin of this plug must be maintained.

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

Do not block the air ventilation openings.

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

Caution! Shock Hazard. Do not open the unit.

Refer to qualified service personnel.

Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped or damaged in any way.

OVERVIEW

The Paralinx Tomahawk system is the worlds first light-weight uncompressed ultra-long-range HD wireless system, capable of sending ultra-low-latency full HD video with a range of up to 600m / 2000 feet

POWER INPUT WARNING!

The Tomahawk system accepts 7-17 volts DC maximum input current! Subjecting the system to higher voltage will result in damage or destruction!

PACKAGE CONTENTS

Please verify the following items are in the shipping box, prior to installation of the Tomahawk transmitter and Tomahawk receiver:

HDMI or HD-SDI wireless video transmitter



1x 12v Power supply



2x 5dbi OMNI directional antennas for Tx



HD-SDI wireless video receiver



1x Remote Control & IR CABLE



1x BNC Or HDMI Video Cable



1x USB to miniUSB cable



5x 2dbi OMNI directional antennas for Rx



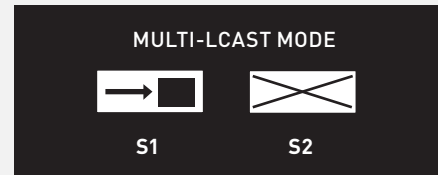
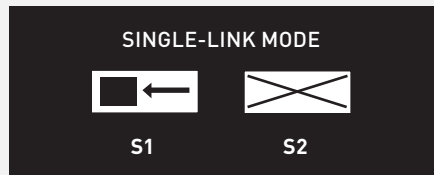
1x 18" P Tap to Lemo-Style power cable

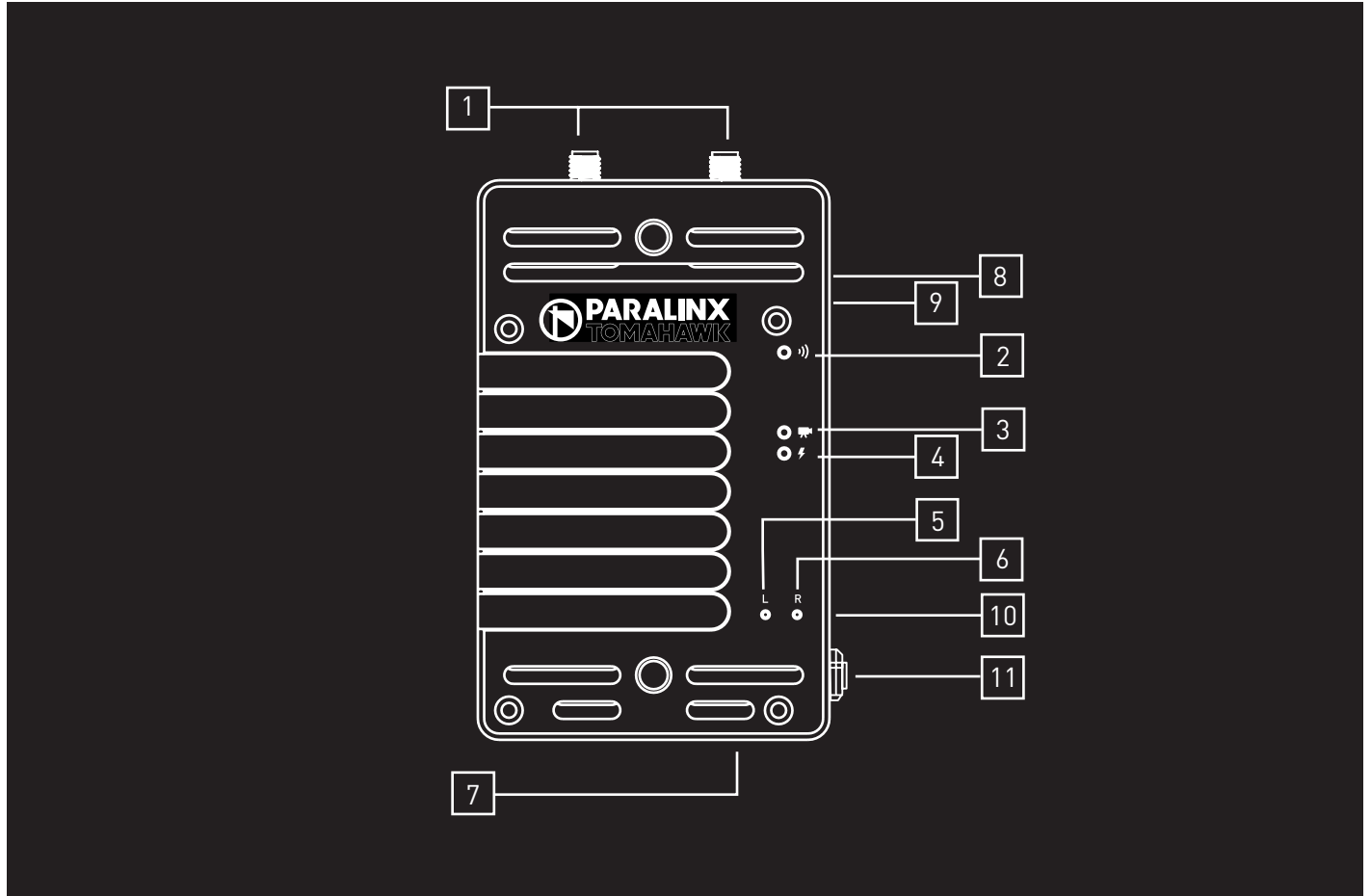


TRANSMITTER

- 1 **Dual RP-SMA**
Type Antenna Connectors
- 2 **Connection status LED**
Indicates the wireless network status.
- 3 **VIDEO status LED**
indicates the video connection status.
- 4 **Low battery LED**
Indicates the battery voltage status.
- 5 **Link button**
For linking the transmitter to additional receivers
- 6 **Reset button**
- 7 **USB Port**
The USB port can be used for firmware updates.
- 8 **S1 Slide Switch**
Left position: Single-link mode
Right position: Multicast mode
- 9 **S2**
Not used
- 10 **HDMI Input port**
- 11 **7-17v LEMO power input connector**
Pin 1 Hot, Pin 2 Ground

TRANSMITTER SLIDE SWITCH SETTINGS

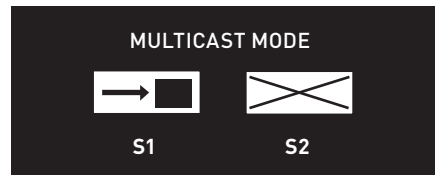


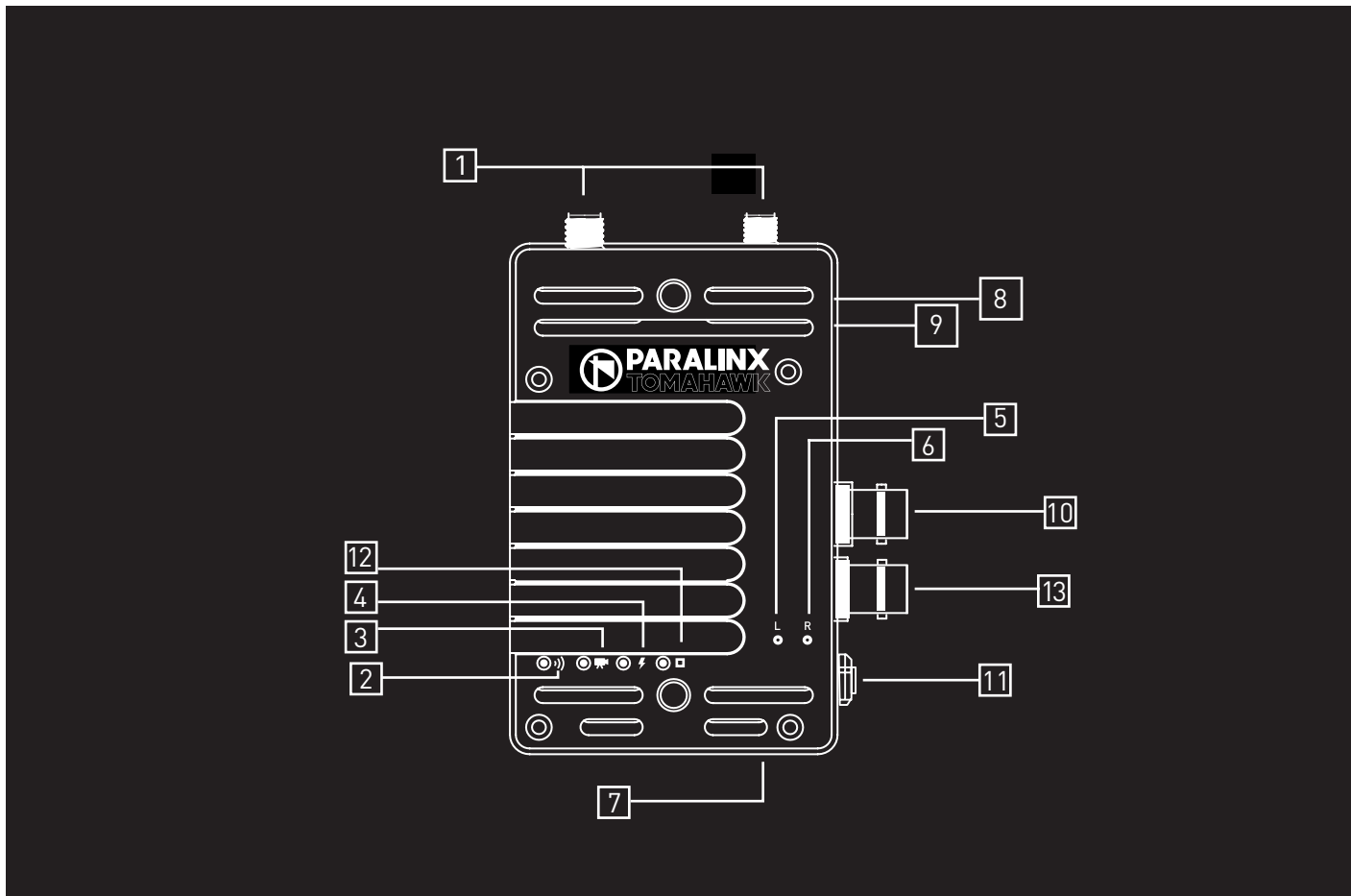


3G-SDI TRANSMITTER

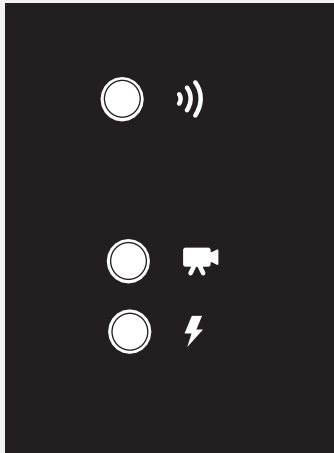
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- 7 **USB Port**
The USB port can be used for firmware updates.
- 8 **S1 Slide Switch**
Left position: Single link mode
Right position: Multicast mode
- 9 **S2**
Not used
- 10 **3G-SDI Pass-through connector**
- 11 **7-17v LEMO power input connector**
- 12 **Diagnostic LED**
- 13 **3G-SDI input connector**

TRANSMITTER SLIDE SWITCH SETTING





TRANSMITTER LED STATUS



NETWORK LED CONNECTION



Solid

When a connection to Rx is established

Slow blinking

Device is in listen mode

Normal blinking

During link setup mode.

Normal blinking

During registration (Reg button was pressed)

Fast blinking (With Video LED)

System Error.

VIDEO LED CONNECTION



Solid

Video link established and locked in

Normal blinking

Video source is not supported

Fast blinking (With Network LED)

System Error.

LOW BATTERY LED



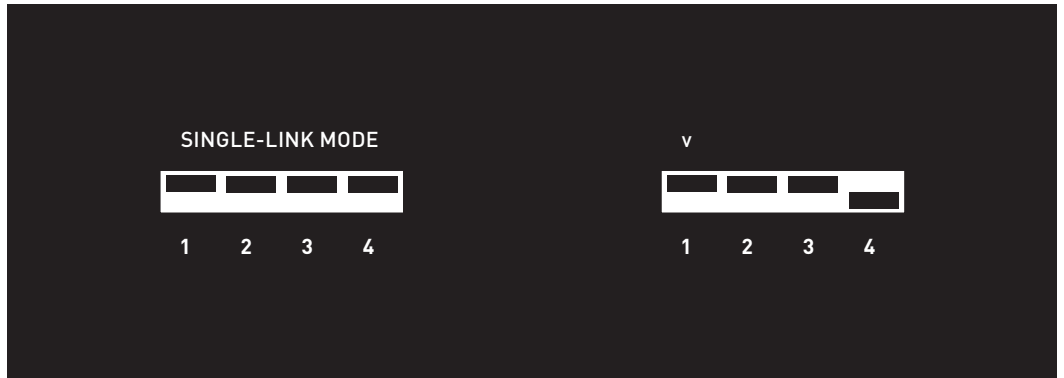
Solid

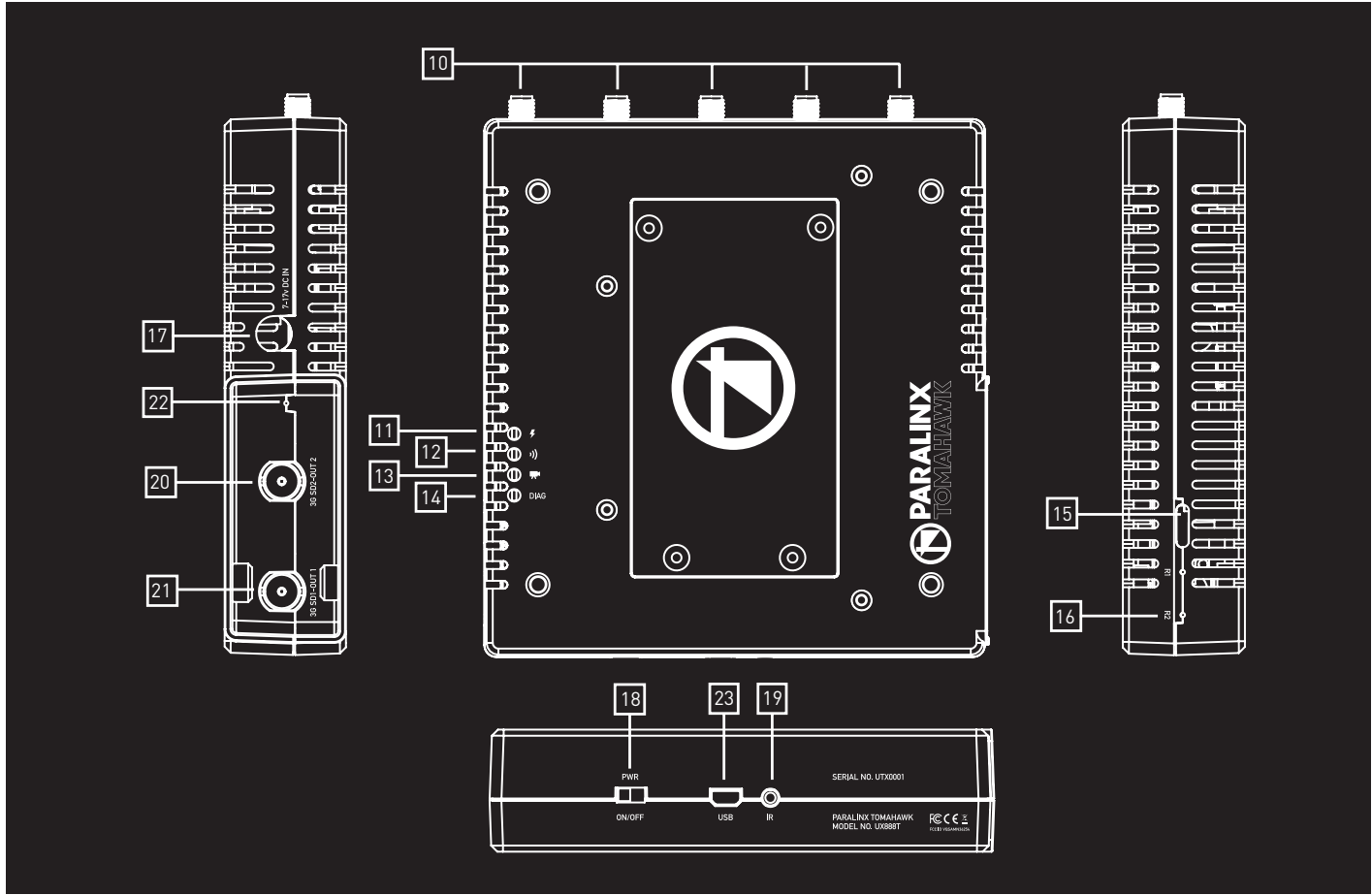
Low Battery, when voltage is less than 7v

TRANSMITTER
SLIDE SWITCH





RECEIVER
DIP SWITCH





RECEIVER LED STATUS



VIDEO LED CONNECTION 	Solid Fast blinking (With Network LED)	Video link established and locked-in <hr/> Video Source Error.
POWER LED 	Solid	The LED is ON when the power is applied and the ON/OFF switch is ON

QUICK START GUIDE

TRANSMITTER

- 1 Turn on your video source.
- 2 Connect your Parallax Tomahawk to a 12v power source via the lemo input.
- 3 Connect your Tomahawk transmitter to the source camera using a video cable.

RECEIVER

- 4 For optimal results set the dual antennas in the form of a "V" and maintain unobstructed line of sight between transmitter and receiver.
- 5 Connect your Tomahawk Receiver to a monitor using an HD-SDI cable.
- 6 Connect your Tomahawk Receiver to a 12v power source using the lemo input, or integrated battery plate.
- 7 For optimal results antennas should be arranged in the form of an open hand and maintain unobstructed line of site between transmitter and receiver.

NOTES

For maximum range

*Note that high-output wireless systems (EPV, Radio Control Systems) can interfere with the Tomahawk & reduce the overall range.

Keep line of sight between the transmitter and the receiver. Maintain proper air ventilation for transmitter and receiver.

Avoid placing any obstacles between transmitter and the receiver.

If you lose signal bring the transmitter and receiver closer together.

Position both transmitter and receiver in an upwards position, for enhanced antenna performance.

If using multiple receivers, keep a minimum of 6 feet between receiver units.

REMOTE CONTROL



- | | | | |
|----------|--|----------|-----------------------|
| <u>1</u> | MENU - Enter the main menu | <u>5</u> | OK - Press to confirm |
| <u>2</u> | EXIT - Return to previous menu | | |
| <u>3</u> | SOURCE - [Select Video Source] | | |
| <u>4</u> | ARROWS - Operate for up, down left and right directions on the menu screen | | |

REMOTE CONTROL HOTKEYS

“ADD” hotkey button

Direct access for starting the registration process on the receiver.

“Delete” hotkey button

This hotkey button is open the “Remove Video Source” in the OSD menu which allow the user to choose which device to remove.

Input Devices Key

This hotkey buttons “1, 2 or 3” keys will switch the receiver to work with the first, second or third source, registered to the receiver, as appeared on the registered sources list.

TOMAHAWK LINK MODES

Linking Tip:

Single-link mode enables DFS (Dynamic Frequency Selection).

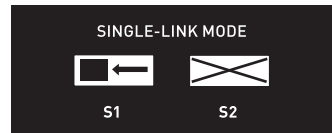
DFS allows the Tomahawk to utilize more channels and to automatically find the channel with the least amount of interference.

The transmitter should be kept within 150 feet of range of the receiver until DFS is activated (60 seconds).

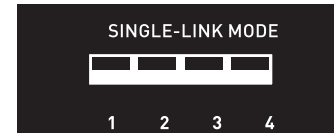
This will help the Tomahawk coexist better with other wireless systems in the area

The Paralinx Tomahawk supports the linking multiple receivers to a single transmitter as well as the linking of multiple transmitters to a single receiver. The following guide illustrates different modes and options for linking transmitters and receivers:

SINGLE-LINK MODE: Offers the best practice for operating a maximum number of Tomahawk systems within the same environment. Also allows for re-linking at longer distances.

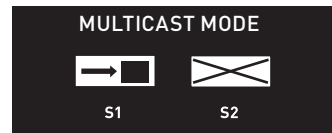


transmitter slide switch



receiver DIP switch

MULTICAST MODE: Allows the linking of up to four Tomahawk receivers to a single transmitter. Linking can only be established within close proximity.



Transmitter slide switch



Receiver DIP switch

LINKING A TRANSMITTER TO A SINGLE RECEIVER

If there is no transmitter registered to the receiver, you should see a menu on the monitor. These modes are set by the toggle switches.

- 1 *Connect an HD-SDI cable from the Paralinx Tomahawk receiver to the HD display.
- 2 Turn on the transmitter and receiver.
- 3 Use the remote control at the Paralinx Tomahawk receiver and Press the "Add" Hotkey button.
- 4 The message "Please Activate the Registration on Transmitter Unit" will appear on the monitor.
- 5 Pressing the registration button on the transmitter until the "Network" LED starts blinking.
- 6 Wait for the message of "Adding [Tx name] Press OK to continue or Exit to cancel".
- 7 Press the "OK" button on the Remote control to confirm the new Paralinx Tomahawk transmitter.
- 8 Wait until the registration process is completed. The message of " Adding [Tx name]..."and progress bar will be shown during the process.
- 9 Connect the HD Source to the Paralinx Tomahawk transmitter.
- 10 Video should be displayed on your monitors..

NOTE

Once the registration process has started on the receiver, there is 30 Sec to start registration on the transmitter side. If the registration process on the transmitter was not started on time, re-start the registration process by going back to step 4 listed above.

*The registration process can be done without HD source; the message will notify you there is "no video source detected."

LINKING A TRANSMITTER TO MULTIPLE RECEIVERS

The Paralinx Tomahawk transmitter has the ability to connect up to 4 receivers at a time.

NOTE: Before Pairing, both Transmitter and Receiver must be set to Single-Link Mode. (see page 19)

- 1 There is a need to make sure the transmitter is not transmitting video to other receivers, so all other receivers which are registered to the transmitter should be powered down while registering an additional receiver.
 - 2 Using HD-SDI cables connect each Tomahawk receiver to a HD display.
 - 3 Power on **ONLY ONE** transmitter and receiver **AT A TIME**.
 - 4 Connect the IR Cable to your receiver. Press the "Add" Hotkey button on the remote control while pointing the remote at the sensor on the IR Cable {
 - 5 The message "Please Activate the Registration on Transmitter Unit" will appear on the monitor.
 - 6 Press the registration button on the transmitter until the "Network" LED starts blinking.
 - 7 Wait for the message of "Adding [Tx name] Press OK to continue or Exit to cancel".
 - 8 Press the "OK" button on the IR Remote to confirm the addition of the receiver.
 - 9 Wait until the registration process is completed. A message of " Adding [Tx name]... "and progress bar will be displayed during the process.
 - 10
 - 11 In order to add additional receiver to the transmitter, **Power down all other Tomahawk receivers, except the new one.**
 - 12 Repeat steps 5 through 12 for each receiver.
 - 13 When all the receivers have been registered to the transmitter power on all the receivers one by one.
 - 14 *Connect the video source to the Tomahawk transmitter
 - 15 The video should be displayed on all monitors.
-

NOTES FOR BETTER RANGE

1. ALLOW THE SYSTEM TO ACTIVATE DFS WHILE THE TRANSMITTER IS WITHIN 50 FT OF THE RECEIVER. WHEN STARTED, THE OSD WILL READ: "PLS. WAIT 60 SEC. ACQUIRING DFS FREQ." AFTER 60 SECONDS THE OSD WILL EITHER SAY "READY," MEANING THE TOMAHAWK SYSTEM IS TRANSMITTING, OR, "PLS. WAIT 60 SEC. ACQUIRING ALTERNATIVE FREQ," MEANING THE TOMAHAWK IS SWITCHING TO A CHANNEL WITH LESS INTERFERENCE.

PLEASE WAIT 60 SECONDS FOR DFS FREQUENCY. YOU SHOULD HAVE ALL OTHER WIRELESS SYSTEMS ON AND WITHIN 50 FT OF THE RECEIVER UNTIL THIS PROCESS IS COMPLETE. THIS CYCLE SCANS FOR INTERFERENCE FROM OTHER DEVICES, AND FINDS A CHANNEL WITH THE LEAST AMOUNT OF NOISE. PLEASE NOTE THAT SOME HIGH-POWERED RADIO SYSTEMS, INCLUDING FLIGHT CONTROL, FPV, ETC., CAN ACT AS A JAMMER TO THE TOMAHAWK.

TRY TO AVOID USING 5 GHZ SYSTEMS WITHIN 6 FT OF THE TOMAHAWK TRANSMITTER OR RECEIVER. SOME HIGH-POWERED 2.4 GHZ SYSTEMS MAY CAUSE INTERFERENCE AS WELL. PLEASE NOTE THAT YOU SHOULD KEEP THE TOMAHAWK RECEIVER CASE CLEAR OF RF BLOCKING MATERIALS AS THE DFS ANTENNA IS LOCATED INSIDE THE RECEIVER CASE.

2. MAKE SURE YOUR POWER SOURCE IS CAPABLE OF PROVIDING THE TOMAHAWK WITH 2A (RECEIVER) OR 1.5A (TRANSMITTER) IN ADDITION TO THE AMPERAGE NEEDED FOR OTHER DEVICES ON THE SAME CIRCUIT.

3. THE ARROW-X DEFAULT ANTENNAS SHOULD BE SPLAYED ORTHOGONALLY FACING EACH OTHER. THE TRANSMITTER ANTENNAS SHOULD FORM A "V" AND THE RECEIVER ANTENNAS SHOULD BE ADJUSTED TO LOOK LIKE THE SPLAYED FINGERS ON A HAND.

4. USING CIRCULAR POLARIZED (CLOVER-LEAF) ANTENNAS ON THE TRANSMITTER WILL ALLOW REFLECTED WAVES FROM THE EMITTER TO MAINTAIN THEIR POLARIZATION WHEN REFLECTING OFF SURFACES IN THE ENVIRONMENT. THIS HELPS WITH PROPAGATION OF THE SIGNAL. IT IS BEST TO USE TRANSMITTER AND RECEIVER ANTENNAS WITH MATCHING POLARIZATION.

TROUBLE SHOOTING

1. IF THE MONITOR DISPLAYS A BLACK SCREEN WITH A RED, FOUR-BAR SIGNAL ICON IN THE CORNER, THE SIGNAL HAS BEEN LOST, AND THE SEARCH PROCESS MUST MANUALLY BE RESTARTED. THERE ARE SEVERAL WAYS OF DOING THIS:

- THE RECEIVER MAY BE POWER CYCLED VIA THE ON/OFF SWITCH

- THE RECEIVER MAY BE POWER CYCLED VIA THE REMOTE (THE IR CABLE MUST BE PLUGGED INTO THE RECEIVER):

- USING THE "GUEST" BUTTON ON THE SUPPLIED REMOTE: PRESS ONCE TO GO TO STANDBY, PRESS ONCE MORE TO RESUME

- PRESS THE "MENU" BUTTON, SELECT "DISCONNECT WIRELESS LINK", THEN RECONNECT EITHER BY PRESSING THE

APPROPRIATE "INPUT DEVICES" HOTKEY, OR BY PRESSING THE "SOURCE" HOTKEY, AND SELECTING THE APPROPRIATE INPUT SOURCE

2. IF THE RECEIVER AND TRANSMITTER ARE BOTH POWER-CYCLED, BUT ONLY A BLACK SCREEN IS SHOWN, FIRST CHECK THAT YOU SOURCE IS OUTPUTTING SOMETHING OTHER THAN A BLACK SCREEN, THEN UNPLUG THE SOURCE FROM THE TRANSMITTER AND RE-INSERT THE VIDEO SOURCE CABLE.

3. THE TOMAHAWK SHOULD BE ABLE TO FIND A DFS FREQUENCY WITHIN 60 SECONDS IN NORMAL CONDITIONS, BUT IT MAY TAKE LONGER IN AREAS WITH MORE INTERFERENCE. IF THIS PROCESS IS NOT IDEAL, DFS CAN BE TURNED OFF BY SWITCHING BOTH TRANSMITTER AND RECEIVER TO MULTI-LINK MODE (SEE PAGE 19 OF INSTRUCTION MANUAL)

**FOR ADDITIONAL INFORMATION AND SUPPORT VISIT OUR KNOWLEDGE BASE AT:
WWW.PARALINX.NET/HELP**

TROUBLE- SHOOTING (CONT'D)

4. IF THE "SEARCHING" MESSAGE APPEARS ON THE OSD FOR AN EXTENDED PERIOD OF TIME WITHOUT MAKING A LINK, PLEASE TRY THESE TROUBLESHOOTING PROCEDURES:

- A LINK WILL ONLY BE MADE IF THE TRANSMITTER IS IN RANGE OF THE RECEIVER. IT IS RECOMMENDED TO KEEP THE TRANSMITTER WITHIN 50 FT LINE-OF-SIGHT OF THE RECEIVER UNTIL A LINK IS ESTABLISHED.

- MAKE SURE THAT ALL THE ANTENNAS ARE ATTACHED AND SECURED TO THE TOMAHAWK TRANSMITTERS AND RECEIVERS.

- YOU MAY BE IN AN ENVIRONMENT WITH HEAVY RF INTERFERENCE. MOVE TO A NEARBY LOCATION THAT IS SHIELDED FROM OTHER RF SIGNALS (INSIDE A METAL OR CONCRETE STRUCTURE, BASEMENT, ETC.), AND START THE CONNECTION PROCESS OVER AGAIN.

FAQ

WHY DOES THE RECEIVER HAVE 5 ANTENNAS?

THE TOMAHAWK UTILIZES MIMO TECHNOLOGY. MIMO OFFERS SIGNIFICANT INCREASES IN DATA THROUGHPUT AND LINK RANGE WITHOUT ADDITIONAL BANDWIDTH OR INCREASED TRANSMIT POWER. IT ACHIEVES THIS GOAL BY SPREADING THE SAME TOTAL TRANSMIT POWER OVER THE ANTENNAS TO ACHIEVE AN ARRAY GAIN THAT IMPROVES THE SPECTRAL EFFICIENCY (MORE BITS PER SECOND PER HERTZ OF BANDWIDTH) AND/OR TO ACHIEVE A DIVERSITY GAIN THAT IMPROVES THE LINK RELIABILITY (REDUCED FADING).

IF THE TOMAHAWK LOSES ITS SIGNAL, HOW LONG DOES IT TAKE TO REGAIN CONNECTION?

TYPICALLY, THE TOMAHAWK WILL RECONNECT WITHIN TEN SECONDS OF RETURNING WITHIN RANGE. THIS TIME MAY BE AFFECTED BY RF INTERFERENCE IN THE SURROUNDING ENVIRONMENT.

IS THERE A TOMAHAWK RECEIVER WITH AN HDMI OUTPUT?

NOT AT THIS TIME, BUT AN ATOMOS CONNECT MAY BE DOCKED ONTO THE TOMAHAWK RECEIVER VIA AN OPTIONAL SONY NP-F BATTERY PLATE.

HOW LONG DOES IT TAKE TO LINK THE SYSTEMS TOGETHER?

THE LINKING TIME BETWEEN A TOMAHAWK TRANSMITTER AND RECEIVER TYPICALLY TAKES LESS THAN 60 SECONDS, BUT MAY INCREASE IN AREAS WITH HEAVY RF INTERFERENCE. IT IS RECOMMENDED THAT LINKING BE DONE IN AN ENVIRONMENT WITHOUT HEAVY RF INTERFERENCE.

ON WHAT FREQUENCY BAND DOES THE TOMAHAWK OPERATE?

THE TOMAHAWK OPERATES WITHIN THE LICENSE-FREE 5 GHZ BAND (5.1-5.8 GHZ). THE EXACT CHANNELS USED DEPENDS ON OPERATING MODE AND REGION.

SUPPORTED FRAMERATES / RESOLUTIONS*

1080P/50,	720/50P
1080P/60	525I/59.94
1080/59.94I	625I/50I
1080/50I	1080/24P
1080/29.97P	1080/24PSF
1080/23.98P	1080/23.98PSF
720/59.94P	1080/25PSF

*The Tomahawk system supports Interlaced, Progressive, and Progressive Segmented Frame Signals

AUDIO FORMATS

I2S, PCM, SPDIF, AC-3, DTS, DOLBY 5.1

FREQUENCIES

EU CHANNELS - 5.19 ~ 5.23 GHZ,
US CHANNELS - 5.19 ~ 5.23 GHZ AND 5.755~5.795 GHZ

DFS FREQUENCIES

5.27 ~ 5.55 AND 5.67 GHZ

OPTIONAL ACCESSORIES

GO TO **WWW.PARALINX.NET/STORE** TO CHECK OUT ALL ACCESSORIES AND BUILD YOUR CUSTOMIZED KIT
