# RHP-BOS-DS-IF Dual Sensor Interface User Manual







Dual Camera Interface RHP-BOS-DS-IF

RHP International - OEMCameras.com New York - USA +1-845-343-4077



PROPRIETARY - RHP INTERNATIONAL, INC. THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION TO RHP INTERNATIONAL, INC. THIS INFORMATION MUST BE MAINTIANED IN CONFIDENCE AND USED ONLY IN A MANNER CONSISTENT WITH THE DOCUMENTATION AND ANY EXECUTED NON DISCLOSURE AGREEMENT, AND MAY NOT BE DISCLOSED TO ANY THIRD PERSON WITHOUT RHP INTERNATIONALS WRITTEN CONSENT	TITLE REV DATE	RHP-BOS-DS-IF Dual Visible Thermal Camera REVISION A 11/18/2019
---	----------------------	---

RHP-BOS-DS-IF Pin-Out



------

### **Table of Contents**

\_\_\_\_\_

RHP-BOS-DS-IF Pin-Out	2
Boson Lens Compatibility	7
Attaching the FLIR Boson Thermal Camera:	8
RHP-BOS-DS-IF Connections	9
Connecting the Video signal via HD	9
6-Pin JST Connector	10
IMU	10
Connecting the 16 Ch. S-Bus: (*RC Mode)	11
RHP-BOS-DS-IF Connecting to a PC	12
Installing the RHP Controller Software:	12
Connecting the RHP-BOS-DS-IF to the Camera Controller GUI:	13
Com Ports	13
Determining a Successful Connection	14
RHP-BOS-DS-IF Thermal Functions Defined	15
Video Settings:	15
Continuous Zoom	15
Color Palette Select	16
FFC (Flat Field Correction) Settings	16
Automatic FFC	16
Manual FFC	16
External FFC	17
Silent NUC	17
Supplemental FFC	17
AGC Settings	
Tail Rejection	
Max Gain	



------

	Damping Factor	. 19
	ACE/Gamma	. 19
	Plateau Value	. 19
	Linear Percent	. 20
	Detail Headroom	. 20
	DDE (Digital Detail Enhancement)	. 20
	Smoothing Factor	. 20
	Gain Correction	. 21
	Column Filter	. 21
	Temporal Filter	. 21
V	isible Camera Settings	. 22
	White Balance	. 22
	Auto	. 22
	One Push	. 22
	Auto Trace	. 23
	One Push Trigger	. 23
	Exposure Mode	. 23
	Auto	. 23
	Manual	. 23
	Shutter	. 23
	Gain	. 23
	Iris	. 23
	Shutter Control	. 23
	Aperture	. 23
	Shutter	. 23
	Back Light Compensation (BLC)	. 24
	Front Light Compensation	. 25

\_\_\_\_\_



\_\_\_\_\_

Stal	bilizer	25
Wic	de D-Range (WDR)	25
Def	og	25
Flip		25
Mir	ror	25
AG	C Settings	26
E	Brightness	26
C	Gain2	26
C	Gamma	26
C	Color Gain	26
F	Red Gain	26
E	Blue Gain	26
PROG	RAMMING A CONTROLLER	27
RC	CONTROLS DEFINED	27
RC (	CONTROLS DEFINED	27 27
RC ( C	CONTROLS DEFINED	27 27 27
RC ( C F S	CONTROLS DEFINED	27 27 27 27
RC ( C F S	CONTROLS DEFINED	27 27 27 27 27
RC ( C F S C F	CONTROLS DEFINED	27 27 27 27 27 27 27
RC ( C F S C F S	CONTROLS DEFINED	27 27 27 27 27 27 27 27
RC ( F S C F S C C	CONTROLS DEFINED	27 27 27 27 27 27 27 27 27
RC ( F S C F S C C I	CONTROLS DEFINED	27 27 27 27 27 27 27 27 27 28
RC ( F S C F S C C II S	CONTROLS DEFINED	27 27 27 27 27 27 27 27 27 28 28
RC ( F S C F S C U S S M	CONTROLS DEFINED	27 27 27 27 27 27 27 27 27 28 28 28 28
RC ( F S C F S C C I I S S M C C	CONTROLS DEFINED	27 27 27 27 27 27 27 27 28 28 28 28 28



\_\_\_\_\_

Changing Controller Modes 29
SBUS to PWM Mode
PWM to Button Mode:
Button to SBUS Mode
Controller Assignment:
Select the switch type
Configure the function
RHP-BOS-DS-IF Controller Sample Configurations
SBUS - Controller Assignment Example
5 Button Direction Pad:
THE FINAL STEP
RHP-BOS-DS-IF Example Configurations
Programming Setup
Control with PC with Video Monitor41
Control with PC with HD Recording42
Control with 5 Button Control Pad with HD Output to Recording Device
Control with 16Ch S-BUS Tx/Rx with HD Output to Recording Device
Control with 5Ch PWM Tx/Rx with HD Output to Recording Device
Control with PC with HD Output to Wireless Video Rx/Tx Monitor

-------



Boson Lens Compatibility:

Due to lens size constraints, only the FLIR Boson Cameras listed below are compatible to connect to the RHP-BOS-DS-IF Board:

320 x 256	640 x 512
2.3mm   92° HFoV*	4.9mm   95° HFoV*
4.3mm   50° HFoV*	4.9mm   95° HFoV* – Short Lens
4.5mm  50° HFoV* – Short Lens	8.7mm   50° HFoV*
6.3mm   34° HFoV*	9.2mm   50° HFoV* – Short Lens
6.3mm   34° HFoV* - Short Lens	13.6mm   32° HFoV* – Short Lens
13.8mm   16° HFoV*	14mm   32° HFoV*
18mm   12° HFoV*	18mm   24° HFoV*
	18mm   24° HFoV* – Short Lens

\*Denotes Horizontal Field of View.

BEFORE YOU BEGIN:

This product is static sensitive. Please use proper grounding techniques while installing the RC-IF to the Boson Camera.





Attaching the FLIR Boson Thermal Camera:



Align the Board and Boson camera so that the white 80-pin Hirose connector lines up.

Press the camera and board into place until you feel them click together.





Using the four screws

provided, insert each through the back of the four inner corners on the RHP-BOS-DS-IF board and thread into the Boson camera.



NOTE: <u>DO NOT OVERTIGHTEN THE SCREWS</u> Using other than the screws provided, could damage the camera, BOS-DS-IF, or Both.



### **RHP-BOS-DS-IF** Connections

Providing power to the BOS-DS-IF: There are two ways to provide power to the BOS-DS-IF: **Micro USB** To use the Micro USB:

Insert the micro-USB connector on the side of the RHP-BOS-DS-IF Board, and then connect the other end to the power source.

The power light will illuminate within 5 seconds, indicating the unit is on.

Use this option when configuring the RHP-BOS-DS-IF with the RHP Controller Software.



#### Connecting the Video signal via HD:

Use the provided mini-HD cable and insert it into the HD Port on the BOS-DS-IF.

Plug the opposite HD end into your monitor or recording device.

If the power is supplied through the USB connection, the image of both cameras should appear on the screen.







### 6-Pin JST Connector To use the 6-Pin JST:

Insert the 6-Pin JST connector on the side of the RHP-BOS-DS-IF Board, and then connect to a 5-26 Volt DC power source.

The red wire connects to the positive terminal and black wire to the negative terminal.

NOTE: A Voltage of 5.2VDC or greater is recommended with the FLIR Boson 640.

The power light will illuminate within 5 seconds, indicating the unit is on.

To control the camera remotely, follow this guideline for connecting power and control:

#### IMU

The RHP-BOS-DS-IF comes with an inertial measurement unit (IMU) installed.

This will measure and report body force, angular rate, and orientation of the cameras, to a gimbal if attached.

### Connecting the 6-pin for USB and IMU:

The 6-pin connector 'pin-out' is as follows:

- Pin 1: Ground
- Pin 2: SDA (IMU)
- Pin 3: SCL (IMU)
- Pin 4: Ground
- Pin 5: D+ (Boson USB)
- Pin 6: D- (Boson USB)

The 6-pin USB and IMU cable, allows access and control of the Boson Digital Video port and 6-Axis Motion Tracking to a gimbal if connected.





Connecting the 16 Ch. S-Bus: (\*RC Mode)

The pin-out is set to RC Standards

NOTE: When connecting power, it is recommended to use both positive and negative pins to ensure proper voltage is supplied to the unit (pins 11 & 14).



PWM Mode (5 channels)	S-Bus Mode (16 Channels)
	Assignable using the RHP-BOS-DS-IF software through
	USB (PINS 7 – 10 are not used for S-Bus mode)
Pin 1: +5V Output Pin 2: Ground Pin 3: Ground Pin 4: Ground Pin 5: Ground Pin 6: PWM 1 / S-Bus Pin 7: PWM 2 Pin 8: PWM 3 Pin 9: PWM 4 Pin 10: PWM 5 Pin 11: Ground <sup>*</sup> Pin 12: Ground <sup>*</sup>	USB (PINS 7 – 10 are not used for S-Bus mode) Pin 1: +5V Output Pin 2: Ground Pin 3: Ground Pin 4: Ground Pin 5: Ground Pin 6: PWM 1 / S-Bus (required) Pin 7: PWM 2 Pin 8: PWM 3 Pin 9: PWM 4 Pin 10: PWM 5 Pin 11: Ground <sup>*</sup> Pin 12: Ground <sup>*</sup> Pin 13: +5-26VDC Input <sup>*</sup>
$\operatorname{Pin} 14: \pm 526 \operatorname{VDC} \operatorname{Input}^*$	Pin 14: +5-26VDC Input <sup>*</sup>

\*See note at top of page



### RHP-BOS-DS-IF Connecting to a PC

Installing the RHP Controller GUI Software:

NOTE: Be sure the selected computer is connected to the internet before you first connect the RHP-BOS-DS-IF.

Connect the RHP-BOS-DS-IF via the Micro USB to USB Cable. Windows will automatically find the necessary drivers and download them.

For other windows versions, download the driver at: https://bit.ly/3hSjbeE

If you have issues connecting, please contact support. (https://www.oemcameras.com/contact)

#### Installing the RHP Controller Software:

Once the software is downloaded and unzipped, run 'install.exe'.

If the security warning appears, click 'RUN'.





The application install security warning may appear. Choose **'Install'.** 



Connecting the RHP-BOS-DS-IF to the Camera Controller GUI:

#### **Com Ports**

When the driver is finished installing, open the application and select the assigned COM port.

Choose:

File > Connect > COM Ports

Select the COM Number the BOS-DS-IF is assigned to.

File	Mode Help			oem)cd	merc
	Connect	Advanced		Compete	more
	COM Ports = 2	COM4	• gs		
	Refresh COM	1000-00	Tail Rejection		0
-	HD Window Mode -	Full - Thermal	Max Gain		1.38
			Damping Factor		85
ł	Continuous Zoom	- 0	ACE/Gamma		0.97
	Color Palette	hiteHot C	Plateau Value		7
			Linear Percent		20
FFC	C Settings FFC Mode A	to 🗸	Detail Headroom		12
	FFC	Silent NUC Supplemental FEC	DDE		0.95
C	ema	ameras	Smoothing Factor		1250
			Camera Info	System Settings	
			Part Number: Serial Number: 0	Gain Correction	Refresh Thermal
-			Software Rev: 0.0.0	Temporal Filter	100203

oem) cameras

WRHP Boson Camera Controller GUI File Mode Help

NTSC

O PAL

Connect COM Ports = 3 Refresh COM

Disable Analog

Refresh GUI

### COM Port Refresh Option:

If the COM Port is not shown or unavailable, choose:

File > Refresh COM

to refresh the COM Ports.

#### **Connecting the Boson**

To connect the camera to the BOS-DS-IF software, choose *File > Connect* 

ile Mode Help			000	a)cameras
Connect	Advanced		UEI	Deamerus
COM Ports = 2	•	AGC Settings		
Refresh COM		Tail Rejection	-	0
Refresh GUI	1080p60			
HD Window Mode -	Full - Thermal	Max Gain		1.38



#### **Determining a Successful Connection:**

The green bar on the bottom of the screen will indicate that the camera is successfully connected. The program will load the current settings and camera information from the RHP-BOS-RC-HD-IF and the Boson. Once loaded, all available parameters will be enabled for adjustment, based on your configuration

Connected	OEMCameras.com © 2018 RHP-BOS-DS-IF 1.0.6 123

Once connected, the thermal and visual camera settings will be available to modify.

Once connected, the thermal and visual camera settings will be available to modify.

hermal Visible BC Control Advanced		<b>oem</b> )ca	merc
Video Settings HD Video Settings () 720p60 () 1080p60	AGC Settings Tail Rejection		0
HD Window Mode - Full - Thermal 🗸	Max Gain		1.38
Continuous Zoom - 0	Damping Factor		85
•	ACE/Gamma		0.97
Color Palette WhiteHot ~	Plateau Value	topological and the second	7
	Linear Percent	a change and a gradient of the state of the	20
FFC Settings FFC Mode Auto	Detail Headroom		12
FFC Supplemental FFC	DDE		0.95
oem) cameras	Smoothing Factor		1250
	Camera Info	System Settings	
The Highest Quality OEM Company 1-888-819-2263	Part Number: Serial Number: 0 Software Rev: 0.0.0	Gain Correction Column Filter	Refresh Thermal Values



### RHP-BOS-DS-IF Thermal Functions Defined

In this section, each setting is defined for the Thermal, Visible and RC Control tabs.

#### Video Settings:

Once connected, the thermal camera settings will be available to modify.

#### HD Video Settings:

This option lets you choose between 720p or 1080p60 fps.

····· RHP	Boson	Camera Co	ontroller GUI
File	Mode	Help	
Thermal	Visible	RC Contro	l
- Video - HD V	Settings Video Set	tings 720p60	O 1080p60

**HD Window Mode**: Select how the HD output will be viewed. The options are:

> Full – Thermal Full – Visible Split – IR/Visible Picture in Picture – Visible/IR Picture in Picture – IR/Visible

**Continuous Zoom**: The electronic provides an optional interpolation of a subset of the field of view to the 640x512 resolution of the output stream. To adjust the zoom level, simply move the slider from left to right. This will digitally zoom the thermal camera image.

👓 RHI	Boson	Camera Co	ontroller GUI
File	Mode	Help	
Thermal	Visible	RC Contro	1
- Video - HD	Settings Video Set	ttings 720p60	O 1080p60
H	ID Windo Continu	w Mode - uous Zoom	PiP - Visible-IR Full - Themal Full - Visible Split - IR/Vis PiP - Visible-IR
Ţ			PIP - Thermal-Vis

Continuous Zoom - 0	
	τ.



#### Color Palette Select:

The FLIR Boson provides several factoryinstalled palettes, changing the parameter Color Palette causes the applied palette to change. The factory-default value is "white hot".

Select a color palette from the drop down menu as shown. There are 14 options available.

#### FFC (Flat Field Correction) Settings:

There is a shutter between the camera sensor and the lens. This shutter is used to perform a flat-field correction, or FFC. During FFC, the shutter presents a uniform temperature source to each detector element in the array. While imaging the flat-field source, the camera



FFC Settings	
FFC M	lode External 🗸
550	Silent NUC
FFC	Supplemental FFC

updates the offset correction coefficients, resulting in a more uniform image after the process is complete.

**Automatic FFC**: The camera does not load the stored NVFFC map but always performs automatic FFC instead. If the option of a faster start-up is desired, the power-on default FFC mode should be set to manual mode instead.

**Manual FFC**: If the stored NVFFC map was generated in the same NUC table as the start-up NUC table, then it is loaded and applied. Otherwise, an automatic FFC takes place under the assumption that the stored map is invalid for the current conditions (i.e., will result in suboptimal image quality). If the map is loaded, the value of "Camera temperature at last FFC" will be set to the value stored with the NVFFC map, and the value of "Frame counter at last FFC" will be set to 0. Note that the FFC Desired flag may be set immediately after the NVFFC map is loaded, assuming the difference between current camera temperature and "Camera temperature at last FFC" exceeds the value of FFC Delta Temp.



**External FFC**: If the stored NVFFC map was generated in the same gain state as the start-up gain state (see Sections 6.2 and 7.5), then it is loaded and applied. Otherwise, no FFC offset is applied (and the FFC Desired flag will be set) under the assumption that the stored map is invalid for the current conditions. If the map is loaded, the value of "Camera temperature at last FFC" will be set to the value stored with the NVFFC map, and the value of "Frame counter at last FFC" will be set to 0. Note that the FFC Desired flag may be set immediately after the NVFFC map is loaded, assuming the difference between current camera temperature and "Camera temperature at last FFC" exceeds the value of FFC Delta Temp.

NOTE: Generally speaking, it is always preferred to generate a fresh FFC map at start-up rather than relying on a stored, potentially stale NVFFC map. The NVFFC feature is intended primarily for the case in which a camera has only been powered down briefly since the previous FFC. Use of the NVFFC feature does not replace the recommendation to perform FFC at start-up, even for shutterless configurations.

**Silent NUC**: A filter intended to minimize random spatial noise.

**Supplemental FFC**: This calibration can compensate for image effects caused by the changing temperature of large lenses or other optical components. It may also help with effects from heat sources in camera housings.

*This calibration is documented by the Supplemental FFC Application Note, FLIR document number 102-PS242-100-05.* 



#### AGC Settings:

Automatic gain correction (AGC) is the process whereby the 16-bit resolution of the signal pipeline is converted to an 8-bit signal, suitable for a display system.

Boson provides a sophisticated AGC algorithm which is highly customizable via many parameters. It is a variant of classic histogram equalization (HEQ), which uses the cumulative histogram as the transfer function.

percentage of the histogram "tails" which are not ignored when generating the mapping function. The scene outliers which comprise the histogram tails are consequently mapped to either the minimum or maximum grayshade (0 or 255). A large value

consequently mapped to either the minimum or maximum grayshade (0 or 255). A large value of Tail Rejection will dedicate more 8-bit grayshades to the central portion of the histogram, resulting in more contrast therein, but as a result, a small cold object or small hot object in the scene may appear completely washed out (no variation in grayshades).

**Max Gain**: Limits the maximum slope of the mapping function. In a relatively uniform image, a high Max Gain value increases the contrast of the image at

Tail Rejection: Determines the

the risk of over-exposure and more apparent noise in the image. Lower values of Max Gain result in a less grainy, lower contrast display.







**Damping Factor**: As new objects enter the scene, or the camera field of view changes, the AGC algorithm will be forced to update accordingly. Damping Factor increases or

Damping Factor		85
----------------	--	----

decreases the update rate of all AGC algorithms. A small value of Damping Factor allows a faster remapping in response to a change in the scene, but in some cases, this can result in the background appearing to "flash" as it is quickly remapped to new 8-bit grayshades. A larger value of Damping Factor minimize flashing in response to a change in scene but at the expense of requiring more time to optimize the mapping function for the new scene content.

**ACE/Gamma**: ACE provides contrast adjustment dependent on relative scene temperature.



The scale of values ranges from 0.5-4.0. In

white-hot polarity, an ACE value less than one darkens the image, increasing contrast in hotter scene content, while an ACE value greater than one will do the opposite.

Plateau Value: Limits the population of any single histogram bin. Increasing values allow the

mapping function to allocate more grayshades to dominant scene content, as seen in traditional HEQ. Smaller values of



Plateau Value clip the heavily populated bins, reserving more 8-bit grayshades for less heavily populated bins.



20

12

**Linear Percent**: Most histogram based AGC methods do not preserve the relative temperature of objects in the scene.

Increasing values of Linear Percent more accurately preserves the visual representation of an object's temperature by mapping the data in a more linear fashion. For example, in a scene where the two hottest objects in the scene are a human and a heated stovetop, setting Linear Percent to zero will display the stove only slightly brighter than the human because no 8-bit grayshades are dedicated to the empty portion of the histogram between the two. With a high value of Linear Percent, the stove will appear much brighter than the human (as one would expect from a hot stove). However, this enhancement is at the cost of decreased contrast throughout the image because some of the available 8-bit grayshades are allocated to portions of the histogram which are not present in the scene.

Linear Percent

**Detail Headroom**: Defines the amount of 8bit dynamic range is allowed for use by the LP filter data (the histogram equalized

data). Increasing values will increase the number of 8bit shades—at the top and bottom of the dynamic range—to be reserved for the HP data.

Detail Headroom

### DDE (Digital Detail Enhancement):

Attenuates or gains the HP content of the scene. Reduces the appearance of graininess but blurs the scene when set to

values less than 1 and sharpens the details but increases the appearance of noise when set to values greater than 1.

**Smoothing Factor**: Defines the cut off for the HP filter. Lower values of Smoothing Factor result in less data being included in

the HP portion of the image. In other words, a low value of Smoothing Factor decreases the portion of the scene considered to be the more-heavily-weighted details. Smoothing Factor also affects which portion of the scene is attenuated or enhanced via DDE.







**Gain Correction**: This automatically determines whether the Boson sets the optimum gain state based on current scene conditions.

**Column Filter**: Spatial column noise reduction (SCNR). This filter is intended to minimize column noise.

Gain Correction	Refresh
Column Filter	Thermal
	Values
Temporal Filter	

**Temporal Filter**: This feature is intended to minimize temporal noise.

Note: While the spatial filtering algorithms described above are intended to minimize residual non-uniformity, FLIR always recommends using either Boson's internal shutter or an external shutter design to perform periodic FFC for highest image quality.



### Visible Camera Settings:

#### Digital Zoom:

The camera employs a digital zoom function allowing you to zoom up to 16X.

File	Mode	Help		
Thermal	Visible	RC Control	Advanced	
Zoo	m Position			

#### White Balance:

To perform one-time white balance calibration, place a reference white sheet in front of the

camera and click the Auto button. The camera will then find the correct white balance settings for the current light conditions and keep them active until instructed otherwise.

white Bal	ance		
Auto	One Push	Auto Trace	One Push Tric

### Auto:

The RHP-BOS-DS-IF can perform Auto White Balance. It is enabled continuously and will function when changes in lighting conditions are expected.

### One Push:

The One Push White Balance mode is a fixed white balance mode that may be automatically readjusted only at the request of the user (One Push Trigger).

This is used in conditions where Auto white balance is unable to detect and use a white image to auto set the white balance.

For best results, fill the frame with a white object (even under colored lighting), this is saved as the camera's "white" reference and camera now auto-white-balances using the new reference "white" instead of its internal reference.

Under controlled lighting conditions, one push white balance calibration is the recommended approach.

Note: One Push White Balance data is lost when the power One Push White Balance data is lost when the power is turned off. If the power is turned off, simply reset the One Push White Balance.



**Auto Trace**: The camera is equipped with the Auto Tracing White Balance function automatically traces the white balance of images according to the lighting conditions and selects the best white balance option for you.

**One Push Trigger**: The One Push White Balance mode is set, and the scene changes, the white balance may be readjusted with the One Push Trigger, assuming a white example, in correct lighting conditions and occupying more than 1/2 of the image, is in the frame.

Exposure Mode: The variety of AE functions, which allow video signal to output the optimum

image for subjects from low light conditions to bright light conditions, are available.

boodie i				
Auto	Manual	Shutter	Gain	Iris

**Auto**: Auto Iris and Gain, Fixed Shutter Speed are set automatically.

Manual: When set, Aperture and shutter control can be adjusted manually with the sliders. *See Shutter Control.* 

**Shutter**: The shutter speed is set automatically according to the brightness of the subject.

Gain: The gain is set automatically according to the brightness of the subject.

**Iris**: The Gain and Shutter speed are both set automatically according to the brightness of the subject.

**Shutter Control**: When the Exposure Mode is set to Manual, the Aperture and Shutter sliders allow for manual fine tuning of the image.

**Aperture**: Aperture control is a function which adjusts the enhancement of the edges of objects in the picture. There are 16 levels of adjustment,

				1			
Shutter							

starting from "no enhancement." When shooting text, this control may help by making the text sharper.

**Shutter**: With a faster shutter speed, the time the image sensor is exposed to light is shorter; A slow shutter speed, allows a longer time the image sensor is exposed to light.



### Advanced Options:

#### IR Mode / Auto IR Mode:

An IR filter (IR cut filter), is a color filter blocking the infrared light. There are several good reasons for using an IR-cut filter.

To achieve realistic colors in white light, using a color camera, requires an IR-cut filter.

Advanced Options			
IR Mode	Auto IR Mode		
BLC	HLC		
Stabilizer	Wide D-Range	Defog	
Flip	Mirror		

The color spectrum seen by the human eye is quite limited compared to the spectrum seen by a CMOS or CCD camera.

In the near infrared region of the spectrum, the difference in sensitivity is significant. This is important since many light sources, including the sun, emit infrared light. A CMOS or CCD color camera in daylight, without an IR-cut filter, will therefore see a significant amount of infrared light resulting in strange colors.

Another reason for using an IR-cut filter is the limited color correction for many lenses. It is difficult to design imaging optics covering both the visible spectrum and the near infrared spectrum at the same time. Therefore, many lenses have different depths of focus for the visible and the infrared spectrum.

The IR-cut filter blocks a significant amount of the overall collected light and thereby affects the sensitivity in a negative way. In general, color cameras are one factor less sensitive compared to monochrome (depending on the CCD chip). This is primarily due to the IR-cut filter.

#### Back Light Compensation (BLC):

This function compensates for excessive light directed at the camera which causes the video to bloom or causing the images in front of the light to be unusable.





**Front Light Compensation**: This function will adjust the strong hot spots (over-exposure of image) and reduce the brightness of that area to improve the overall image.

**Stabilizer**: Reduces distracting vibrations by smoothing the transition from one frame to another. This does not affect the noise level of the image, except in the extreme borders when the image is extrapolated.

#### Wide D-Range (WDR):

When enabled, the camera can handle bright and dark conditions and improve quality of the output.

Wide Dynamic Range (WDR) technology uses two shutter speeds in alternative video fields, high and normal, and combines these two fields into one frame. It allows every detail to be captured accurately even if one portion is bright while other portions are dark. As a result, combined fields yield a frame of high-quality images. The image shows a



comparison of camera technologies with its video images of Backlight Compensation (BLC), and Wide Dynamic Range (WDR).

**Defog**: This function dramatically improves visibility in foggy conditions compared to a standard IR camera without this feature.

**Flip**: The image output by the camera is flipped upside down, and the direction of Pan/Tilt movements are reversed when enabled.

**Mirror**: This produces a mirror-image of the video output. The normal image is flipped horizontally.



**AGC Settings**: The AGC is responsible for ensuring that optimal auto settings of exposure and gain are computed and updated every frame.

**Brightness**: The bright control function adjusts both the gain and iris using an internal algorithm according to a brightness level freely set by the user. Exposure is controlled by gain when dark and by iris when bright. As both gain and iris are fixed, this mode is used when exposing at a fixed camera sensitivity. When switching from Full Auto or Shutter Priority Mode to Bright Mode, the status will be retained for a short period of time.

Digniness			
_	 	_	 
Gain			
Gamma			
Cidinina			
<b>Y</b>			1.2
Color Gain			
Red Gain			
-			
Blue Gain			

**Gain**: This controls the amplification of the signal from the camera sensor. It should be noted that this amplifies the whole signal, including any associated background noise.

**Gamma**: Gamma controls the grayscale amount reproduced on the image. Primarily used to control the signal to noise ratio.

NOTE: You can set each color value manually by using the sliders for red and blue gain. The control is performed in the sensor and allows you to fine tune the image.

Color Gain: This can raise or lower the overall gain in the color spectrum.

Red Gain: This can raise or lower the gain in the red color spectrum.

Blue Gain: This can raise or lower the gain in the blue color spectrum.



### **PROGRAMMING A CONTROLLER**

#### **RC CONTROLS DEFINED**:

**Calibration Mode**: In the event a calibration is necessary, click the Calibrate RC button. It will be necessary to move all buttons on the RC Controller from the starting position to the maximum position.

Once the calibration is complete, press the **Stop** button located in the same position where the Calibrate RC was.



#### Clear:

Clears settings in the setup configuration.

#### Refresh:

Reloads the last settings for the channel you have selected.

Note: If there is no assignment, it will be reset to the default program setting. i.e., (Vari "0" Down; Max Function: None; Center/Center Function: None; Min Function: None)

#### Save:

Saves the settings for the channel you are currently working on. This will save the settings to the controller simultaneously.

#### **Clear All Channels**:

Will reset all channels below to the base line.

#### **Refresh All Channels:**

The channel will revert to the currently saved channel settings from the controller. This will overwrite any changes currently in the Channel Table.

#### Save All Channels:

Will send the Channel Table settings to the controller.

**Channel:** The number of channels is based on the mode you are in. In 'SBUS' mode, Channels 1-16 are available to modify. In the 'PWM' & 'Button' modes, channels 1-5 will be available.



Select the channel on the lower list first, then assign a function to that channel.

#### Examples are in the Controller Assignment section.

**Invert Channel:** This is an easy way to reverse the function that has been programmed for a particular channel.

**Switch Type:** This lets the program know what type of switch will control the channel chosen.

**Max Function / Maximum**: Tells the program what the channel will do when the knob or switch type is at its maximum.

**Center Function / Center**: This is used for switches (3 position switch) that have a center position. If a switch has two center positions (4 position switch), then the Center Function 2 can be programmed. A momentary switch will not have a center position and may not be active for editing.

**Min Function / Minimum**: Tells the program what the channel will do when the knob or switch type is at its minimum.



Changing Controller Modes:

#### SBUS to PWM Mode:

When connected, the RHP Controller Software is set to **S-BUS** by default.

File	Mod	le Help			oer	n)cal	merc
Them	nal Visit	RC Cont	rol		UCI	Juca	nore
	RC	Chann	el Statu	S SBUS Mode:	Connected	Calibrate RC	
	Ch	annel 1	-100	Channel 1		hannel	
	Ch	annel 2 annel 3	-100			i di li lei	
	Ch	annel 4	-100	Switch Type	Vari "0" Dow	n v	
	Ch	annel 5 annel 6	-100	Max Function	None	~	
	Ch	annel 7 annel 8	-100	Center Function	None	~	0-100%
	Ch	annel 9	-100	Center Function	2 None	~	
	Ch	annel 11	-100	Ma Carati	AL.		
	Ch	annel 12 annel 13	-100	Min Function	None	4	
	Ch	annel 14	-100	Clear	Refresh	Save	
	Ch	annel 16	-100		Tierreart	0010	
1	Clear	All Channels		Refresh All Chan	nels	Save All	Channels
СН	Invert	Name	Туре	Maximum	Center	Center	Minimum
1	No	Channel 01	Vari "0" Down	None I	None	None	None
2	No	Channel 02	Vari "0" Down	None I	None	None	None
2	No	Channel 03	Vari "0" Down	None	None	None	None
3							
4	No	Channel 04	Vari "0" Down	None I	None	None	None
3 4 5	No No	Channel 04 Channel 05	Vari "0" Down Vari "0" Down	None I None I	None None	None None	None None
3 4 5 6	No No No	Channel 04 Channel 05 Channel 06	Vari "0" Down Vari "0" Down Vari "0" Down	None I None I	Vone Vone Vone	None None None	None None None
3 4 5 6 7	No No No	Channel 04 Channel 05 Channel 06 Channel 07	Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down	None         I           None         I           None         I           None         I	Vone Vone Vone Vone	None None None None	None None None None
3 4 5 6 7 8	No No No No	Channel 04 Channel 05 Channel 06 Channel 07 Channel 08	Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down	None     I       None     I       None     I       None     I       None     I	None None None None	None None None None None	None None None None None
4 5 6 7 8 9	No No No No No	Channel 04 Channel 05 Channel 06 Channel 07 Channel 08 Channel 09	Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down	None     I       None     I       None     I       None     I       None     I       None     I	Vone Vone Vone Vone Vone	None None None None None	None       None       None       None       None       None
3 4 5 6 7 8 9 10	No No No No No No	Channel 04 Channel 05 Channel 06 Channel 07 Channel 08 Channel 09 Channel 10	Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down	None     I	Vone Vone Vone Vone Vone Vone Vone Vone	None None None None None None None None	None       None       None       None       None       None       None       None
3 4 5 6 7 8 9 10 11	No No No No No No No	Channel 04 Channel 05 Channel 06 Channel 07 Channel 08 Channel 09 Channel 10 Channel 11	Vari "0" Down Vari "0" Down	None         1	Vone Vone Vone Vone Vone Vone Vone Vone	None None None None None None None None	None
3 4 5 6 7 8 9 10 11 12	No No No No No No No No	Channel 04 Channel 05 Channel 06 Channel 07 Channel 08 Channel 09 Channel 10 Channel 11 Channel 12	Vari "0" Down Vari "0" Down	None         I	Vone Vone Vone Vone Vone Vone Vone Vone	None None None None None None None None	None
3 4 5 6 7 8 9 10 11 12 13	No No No No No No No No	Channel 04 Channel 05 Channel 06 Channel 07 Channel 08 Channel 09 Channel 10 Channel 11 Channel 12 Channel 13	Var "0" Down Var "0" Down	None     I	Vone Vone Vone Vone Vone Vone Vone Vone	None None None None None None None None	None
3 4 5 6 7 7 8 9 10 11 12 13 14	No No No No No No No No No	Channel 04 Channel 05 Channel 06 Channel 07 Channel 08 Channel 09 Channel 10 Channel 11 Channel 12 Channel 13 Channel 14	Vari "0" Down Vari "0" Down	None         1	Vone Vone Vone Vone Vone Vone Vone Vone	None None None None None None None None	None
3 4 5 6 7 8 9 10 11 12 13 14 15	No No No No No No No No No No No	Channel 04 Channel 05 Channel 06 Channel 07 Channel 08 Channel 09 Channel 10 Channel 11 Channel 12 Channel 13 Channel 14 Channel 15	Vari "0" Down Vari "0" Down	None         1           None         1	Vone Vone Vone Vone Vone Vone Vone Vone	None None None None None None None None	None           None

To change from S-BUS to PWM, Choose: *Mode > RC Mode* and select *PWM*.



You will be prompted for confirmation.

Click OK.





#### **PWM to Button Mode:**

The page will refresh and is now in PWM Mode.

hem	Mod nal Visib	e Help le RC Cont	lor		oen	DCa	mero
	RC	Chann	el Statu	S PWM Mode:	Connected	Calibrate R	C
	Chi	annel 1 annel 2	N/A N/A	Channel 1 Setup	Invert C	hannel	
	Chi	annel 3 annel 4	N/A N/A	Switch Type	Vari "0" Dow	n v	
	Chi	annel 5 annel 6	N/A N/A	Max Function	None	~	
	Chi	annel 7 annel 8	N/A N/A	Center Function	None	~	0-100%
	Cha	annel 9 annel 10	N/A N/A	Center Function	2 None	~	
	Chi Chi	annel 11 annel 12 annel 13	N/A N/A N/A	Min Function	None	~	
	Chi Chi Chi	annel 14 annel 15 annel 16	N/A N/A N/A	Clear	Refresh	Save	
	~	All Channels		Refresh All Chann	els	Save Al	Channels
[	Clear						
CH	Invert	Name	Туре	Maximum	Center	Center	Minimum
СН	Invert	Name Channel 01	Type Vari "0" Down	Maximum None I	Center Vone	None	None
CH	Invert No No	Name Channel 01 Channel 02	Type Vari "0" Down Vari "0" Down	Maximum None I None I	Center Vone Vone	None None	None None
CH 2 3	Invert No No No	Name Channel 01 Channel 02 Channel 03	Type Vari "0" Down Vari "0" Down Vari "0" Down	Maximum None I None I None I	Center None None None	None None None	None None None
CH 2 3	No No No No	Name Channel 01 Channel 02 Channel 03 Channel 04	Type Vari "0" Down Vari "0" Down Vari "0" Down Vari "0" Down	Maximum I None I None I None I	Center None None None None	None None None None	None None None None None

The same principal applies when changing to Button Mode. Choose: *Mode > RC Mode* and select *Button*.

You will be prompted for confirmation.

Click OK.

The page will refresh and is now in Button Mode.









#### Button to SBUS Mode:

To revert to SBUS Mode, select:

Mode > RC Mode and select SBUS

File	Mode H	Help			oem)	CO	mero
Therma	RC M	lode 🕨	SBUS		ocni	cu	
F	Adva Prese	enced +	PWM Button	Mode:	Connected	alibrate R0	2
	Channel Channel	1 -100 2 -100	UART	Ji Setup	Invert Channel		
	Channel Channel	3 -100 4 -100	Swite	ch Type	Vari "0" Down	~	
	Channel Channel	5 -100 6 -100	Max	Function	None	¥.	
	Channel	7 -100		-	Fee:		

#### You will be prompted for confirmation.

Click OK.

The page will refresh and is now in SBUS Mode.



Mode Help al Visible RC Co	ntrol		oem	ca	me
RC Chan	nel Stat	US SBUS Mode: Co	onnected	Calibrate R	C
Channel 1 Channel 2	-100 -100	Channel 1	Invert Chann	el	
Channel 3 Channel 4	-100	Switch Type	Vari "0" Down	~	
Channel 5 Channel 6	-100	Max Function	None	Ŷ	
Channel 8	-100	Center Function	None	~	0-100%
Channel 9 Channel 10	-100 -100	Center Function2	None	~	
Channel 12 Channel 13	-100	Min Function	None	~	
Channel 14 Channel 15	-100	Clear	Refresh	Save	



### Controller Assignment:

#### Select Channel:

To assign a Function on the RHP-BOS-DS-IF to a switch type on the RC Controller follow these steps:

1. Choose a channel from the Channel Table in the lower portion of the screen.

NOTE: When in PWM Mode, only five (5) Channels will show.

	Clear	All Channels		Refresh All Ch	annels	Save	All Channels
СН	Invert	Name	Туре	Maximum	Center	Center	Minimum
1	No	Channel 01	Vari "0" Down	None	Continous Zoom	None	None
2	No	Channel 02	Vari "0" Down	None	None	None	None
3	No	Channel 03	Vari "0" Down	None	None	None	None
4	No	Channel 04	Vari "0" Down	None	None	None	None
5	No	Channel 05	3 Pos Switch	Do FFC	None	None	Do FFC
6	No	Channel 06	3 Pos Switch	Lava	Graded Fire	None	Rainbow
7	No	Channel 07	Vari "0" Down	None	None	None	None
8	No	Channel 08	Vari "0" Down	None	None	None	None
9	No	Channel 09	Vari "0" Down	None	None	None	None
10	No	Channel 10	3 Pos Switch	Smoothing Fac	None	None	Smoothing Fac
11	No	Channel 11	Vari "0" Down	None	None	None	None
12	No	Channel 12	Vari "0" Down	None	DDE	None	None
10	M.	A1 12	1/ "O" D	Mana	Marca	Mana	Mana

SBUS Mode: Connected

Channel 10 Setup

2. Select the switch type:

- *2 position* switches will only show the Max Function and the Min Function.

- *3 position* switches will show Max Function, Center Function and Min Function.

- *Variable +/-* will only show the Center Function.
- Variable with Center will show Max Function, Center Function, Center Function and Min Function

#### **Configure the function:**

Choose a function and assign a command to that function. i.e., Max Function: Smoothing Factor + adjust the smoothing factor to 100% when activated.

NOTE: Functions are dependent on the switch type selected. Therefore, some functions may not be available for every switch type. Channel 1 Setup Switch Type Max Function Center Function Min Function Cear Refresh Save

oem) cameras

Calibrate RC

Invert Channel

Function None v 0%

Min Function Smoothing Factor - v -100%

Clear Refresh Save

Switch Type 3 Pos Switch  $\checkmark$ Max Function Smoothing Factor +  $\checkmark$  100%

**Click save.** The channel parameters will reflect the changes in the channel table and save to the RC Controller.

NOTE: Be sure to save your work on each channel. Changing channels before saving will reset the settings for that previous channel.



### **RHP-BOS-DS-IF Controller Sample Configurations**

#### SBUS - Controller Assignment Example:

In our example, we have modified and saved channels 12, 13 and 16.

**Channel 12** is a 3-position switch. At maximum, the switch is assigned to show HD FULL Screen of the Thermal Image. The center function is assigned to show Thermal/Visible Picture in Picture. The Min Function is set to show HD FULL Visible Camera.

**Channel 13 (highlighted)** is a Variable "0" Center POT which is assigned to cycle up through the color palettes when turned to the right. When turned to the left, it will cycle down through the color palettes.

**Channel 16** is a Variable "0" Center POT which is assigned to zoom in (+) when turned to the right and zoom out (-) when turned to the left.

File	Mod	e Help			OP	noca	mero
Them	nal Visit	ne RC Cont	rol		UCI	Jucu	
	RC	Chann	el Statu	S SBUS Mode:	Connected	Calibrate R0	
	Ch	annel 1	-100	Channel 13 Setu	P		
	Ch	annel 2	-100			hannel	
	Ch	annel 3 annel 4	-100	Switch Type	Vari "0" CTF	۲ ۲	
	Ch	annel 5	-100	Max Function	Palette +	~	100%
	Ch	annel 7	-100	Center Function	None	~	0%
	Ch	annel 9	-100	Contra Forma			01
	Ch	annel 10	-100	Center Function	None	~	0%
	Ch	annel 12	-100	Min Function	Palette -	~	-100%
	Ch	annel 13 annel 14	-100				
	Ch	annel 15	-100	Clear	Refresh	Save	
	Chi		-100				
	Clear	All Channels		Refresh All Chan	nels	Save All	Channels
CH	Invert	Name	Туре	Maximum	Center	Center	Minimum
1	No	Channel 01	Vari "0" Down	None	None	None	None
2	No	Channel 02	Vari "0" Down	None	None	None	None
3	No	Channel 03	Vari "0" Down	None	None	None	None
4	No	Channel 04	Vari "0" Down	None	None	None	None
5	No	Channel 05	Vari "0" Down	None	None	None	None
6	No	Channel 06	Vari "0" Down	None	None	None	None
7	No	Channel 07	Vari "0" Down	None	None	None	None
8	No	Channel 08	Vari "0" Down	None	None	None	None
9	No	Channel 09	Vari "0" Down	None	None	None	None
10	No	Channel 10	Vari "0" Down	None	None	None	None
	No	Channel 11	Vari "0" Down	None	None	None	None
11	No	Channel 12	3 Pos Switch	HD Full - Ther	HD Split - Ther	None	HD Full - Visible
11 12	1.00	Channel 13	Vari "0" CTR	Palette +	None	None	Palette -
11 12 13	No	1	Vari "0" Down	None	None	None	None
11 12 13 14	No No	Channel 14	Vali U DOWII				
11 12 13 14 15	No No No	Channel 14 Channel 15	Vari "0" Down	None	None	None	None



### 5 Button Direction Pad:

This example will walk through setting up a 5 Button Direction Pad. Two of the buttons will zoom in and zoom out. Another two will change palettes. The final button will perform a manual Flat Field Correction (FFC).

This walkthrough is designed to show how a channel is selected, switch type is defined, and

function is assigned and saved to the channel. Ensure that you have Button Mode active.

Select Channel 1 from the bottom list.

In our example, each channel will be chosen in succession.

Next, Assign a function. We have assigned the 'L	ong
Click' to Zoom in on Channel 1 of our 5 button Pa	ad.





File	Mode	Help			oer	normer
hermal	Visible	RC Control			UCI	Jucarnen
R	CC	hannel	Status	Button Mode	Connected	Calibrate RC
	Chann Chann	el 1 100 el 2 100		Channel 1 Setu	Invert C	hannel
	Chann	el 3 100 el 4 100		Switch Type	Button	~
	Chann	el 5 100		Single Click	None	~
	Chann	el 7 0 el 8 0		Double Click	None	~
	Chann	el 10 0		Tripple Click	None	$\sim$
	Chann Chann	el 11 0 el 12 0		Long Click	None	~
	Chann	el 13 0			None	^
	Chann Chann	el 14 0 el 15 0 el 16 0		Clear	Zoom In Zoom Out Zoom 0%	

hem	Mod nal Visit	e Help ble RC Cont	rol		OE	m)CC	amerc
	RC	Chann	el Status	Button Me	ode Connected	Calibrate	RC
	Ch	annel 1 annel 2	100 100	Channel 1 S	ietup	rt Channel	
	Ch	annel 3 annel 4	100	Switch Typ	Button	~	
Channel 5 100 Channel 6 0 Channel 7 0				Single Click	None	~	
	Ch	annel 7 annel 8	0	Double Clic	k None	~	·
Channel 8 0 Channel 9 0 Channel 10 0			0	Tripple Click None		~	
	Ch Ch Ch	annel 11 annel 12 annel 13	0	Long Click	Zoom In	Ŷ	
	Ch Ch Ch	annel 14 annel 15 annel 16	0	Clea	r Refresh	Save	
	Clear	All Channels		Refresh All (	Channels	Save	All Channels
СН	Invert	Name	Туре	Single	Double	Tripple	Long
	No	Channel 01	Button	None	None	None	Zoom In
	No	Channel 02	Button	None	None	None	None
	No	Channel 03	Button	None	None	None	None
	No	Channel 04	Button	None	None	None	None
	Ma	Channel OF	D. Han	None	None	Mana	None



Select Channel 2 from the bottom list.

We have assigned the 'Long Click' to Zoom out o	on
Channel 2.	

Next, click Save and the function will be saved to the channel (channel 2).

CH	Invert	Name	Туре	Single	Double	Tripple	Long
1	No	Channel 01	Button	None	None	None	Zoom In
		Channel 02	Button	None	None	None	None
3	No	Channel 03	Button	None	None	None	None
4	No	Channel 04	Button	None	None	None	None
5	No	Channel 05	Button	None	None	None	None
		Conr	nected	OFMO	`ameras.com © ?	018 RHP-BOS-	DS-IF   1.0.11   123



	Ch	annel 4 annel 5	100	Single Click	None		
	Ch	annel 7 annel 8	0	Double Click	None	~	-
	Ch	annel 9 annel 10	0	Tripple Click	None	~	·
	Ch	annel 12	0	Long Click	Zoom Ou	t ~	
	0000	annel 14 annel 15 annel 16	0	Clear	Refresh	Save	
	CI	driffer TO	0				
[	Clear	All Channels		Refresh All Ch	nannels	Save	All Channels
CH	Clear	All Channels Name	Туре	Refresh All Ch Single	nannels Double	Save . Tripple	All Channels Long
СН 1	Clear Invert No	All Channels Name Channel 01	Type Button	Refresh All Ch Single None	Double None	Save / Tripple None	All Channels Long Zoom In
CH	Clear Invert No No	All Channels Name Channel 01 Channel 02	Type Button Button	Refresh All Ch Single None None	Double None None	Save / Tripple None None	All Channels Long Zoom In Zoom Out
CH I	Clear Invert No No	All Channels Name Channel 01 Channel 02 Channel 03	Type Button Button Button	Refresh All Ch Single None None None	Double None None None	Save / Tripple None None None	All Channels Long Zoom In Zoom Out None
CH 1 2 3 4	Clear Invert No No No	All Channels Name Channel 01 Channel 02 Channel 03 Channel 04	Type Button Button Button Button	Refresh All Ch Single None None None None	Double None None None None None	Save / Tripple None None None None	All Channels Long Zoom In Zoom Out None None



Select Channel 3 from the bottom list.

We have assigned the 'Palette +' to cycle forward through the available palettes with a single click on the FLIR Boson on Channel 3.

Next, click Save and the function will be saved to the channel (channel 3).

3	No	Channel 03	Scroll	None	None	None	None
4	No	Channel 04	Scroll	None	None	None	None
5	No	Channel 05	Button	None	None	None	None
_							

Channel 3 Setup

Switch Type

Single Click Double Click Tripple Click

Long Click Clear

Single

None

RC Channel Status Button Mode Lonnected

Clear All Ch

No

Channel 01 Buttor

Channel 02 Button

Save All Channels

Calibrate HL

Long

Zoom Ou

Invert Channel

Button





### -----

em)cameras.cor

#### Select Channel 4 from the bottom list.

CH	Invert	Name	Туре	Single	Double	Tripple	Long
1	No	Channel 01	Button	None	None	None	Zoom In
2	No	Channel 02	Button	None	None	None	Zoom Out
3	No	Channel 03	Button	Palette +	None	None	None
4	No	Channel 04	Scroll	None	None	None	None
5	No	Channel 05	Button	None	None	None	None
		Con	nected	OFMC	ameras.com © 2	018 RHP-BOS-	DS-IE 1.0.11

	Ch	annel 5 annel 6	0	Single Clic	*	Palette -	~	
	666666666666	annel 7 annel 8 annel 9 annel 10 annel 11 annel 12 annel 13 annel 14 annel 15 annel 16		Double Cli Tripple Cli Long Click	ick ck ar	None Zoom In Zoom Out Zoom 0% Zoom 25% Zoom 75% Zoom 75% Zoom 100% Palette + Palette -	^	
	Clear	All Channels		Refresh All	Channel	WhiteHot BlackHot Rainbow		Channels
CH	Invert	Name	Туре	Single	Do	RainbowHC Ironbow1		Long
1	No	Channel 01	Button	None	No	Lava		Zoom In
2	No	Channel 02	Button	None	No	Arctic		Zoom Out
3	No	Channel 03	Button	Palette +	No	Graded Fire		None
4	No	Channel 04	Scroll	None	No	HD Zoom In		None
5	No	Channel 05	Button	None	No	HD Zoom Out HD Stabalizer On		None
		Carr		OFMC		HD Stanablizer Off		15 1 1 0 11 1 12

saved to the	Channel 5         100           Channel 6         0           Channel 7         0           Channel 8         0           Channel 10         0           Channel 11         0           Channel 12         0           Channel 13         0           Channel 14         0           Channel 15         0           Channel 15         0				Single Click Double Click Tripple Click Long Click Clear	Palette - None None None	~ ~ Save
		Clear	All Channels		Refresh All Ch	annels	Save A
	CH	Invert	Name	Туре	Single	Double	Tripple
	1	No	Channel 01	Button	None	None	None
	2	No	Channel 02	Button	None	None	None
	3	No	Channel 03	Button	Palette +	None	None

el 05 Butt

OFMCam

ras.com @ 2018 RHP-ROS-DS-IE 1.0.11 12

the palettes with a single click on the on Channel 4.

We have assigned the 'Palette - ' to reverse through

Next, click Save and the function will be saved to the channel (channel 4).



# em)cameras.cor

el 03 Button

Select Channel 5 from the bottom list.

-	
Flat Field Correction event on press on Channel 5.	

We have assigned the 'Do FFC' command to initiate a

Next, click Save to store on channel (channel 5).

THE FINAL STEP:

Once the channels have been assigned and saved, the last step is done by clicking Save All Channels located below the Channel Setup Save button.

This will write the settings to the RHP-BOS-DS-IF.

	Channel 13 Channel 14 Channel 15 Channel 16		0000	Cle	Clear Refresh Save						
1	Clear	All Channels		Refresh All	Channels	Save	All Channels				
CH	Invert	Name	Туре	Single	Double	Tripple	Long				
1	No	Channel 01	Button	None	None	None	Zoom In				
2	No	Channel 02	Button	None	None	None	Zoom Out				
3	No	Channel 03	Button	Palette +	None	None	None				
4	No	Channel 04	Button	Palette -	None	None	None				
5	No	Channel 05	Button	Do FFC	None	None	None				

Chevent	annel 10 annel 11 annel 12 annel 13 annel 13 annel 14 annel 15 annel 16 All Channels	0 0 0 0 0 0	Tripple Click Long Click Clear Refresh All Cha	nnek	HD BLC On HD BLC Off HD HLC On HD HLC Off HD Defog Off HD Defog Off HD WideD On HD WideD Off FFC Auto FFC Manual Do FFC		I Channels
00000	annel 10 annel 11 annel 12	0000	Tripple Click Long Click		HD Stanabilzer Off HD BLC On HD BLC Off HD HLC On		
000	annel 7 annel 8	0	Double Click		HD Zoom Out HD Stabalizer On	^	
30000	annel 3 annel 4 annel 5 annel 6	100 100 100 0	Switch Type Single Click		Button Do FFC	~	

Single Click

Double Click

Tripple Click Long Click

Refresh All Channele

OFMCa

Class All Cha

Do FFC

None

Clear Refresh Save

Save All Channels

ras.com © 2018 | RHP-ROS-DS-IF | 1.0.11 | 12

Zoom Qu





### **RHP-BOS-DS-IF Example Configurations**





**RHP-BOS-DS-IF Rear View** 



### RHP-BOS-DS-IF Example Configurations

**Programming Setup** 





### RHP-BOS-DS-IF Example Configurations

Control with PC with Video Monitor





### RHP-BOS-DS-IF Example Configurations

**Control with PC with HD Recording** 





### RHP-BOS-DS-IF Example Configurations

Control with 5 Button Control Pad with HD Output to Recording Device





**RHP-BOS-DS-IF** Example Configurations

Control with 16Ch S-BUS Tx/Rx with HD Output to Recording Device





**RHP-BOS-DS-IF** Example Configurations

Control with 5Ch PWM Tx/Rx with HD Output to Recording Device





RHP-BOS-DS-IF Example Configurations

Control with PC with HD Output to Wireless Video Rx/Tx Monitor



