

# SKAARHOJ Eth-Lanc Link

The ETH-LANC Link is used to translate UDP commands from a SKAARHOJ control panel to the remote A port of various Sony and Canon LANC compatible cameras.



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# Introduction

The ETH-LANC Link is used to translate commands from ethernet to the Remote A port of the camera. The ETH-LANC Link can be configured to either use the Sony LANC protocol or the Canon RC-V100 protocol. This document will give an introduction on how to configure a system and details about the the LANC and the RC-V100 Device Core Actions.

The Sony LANC and the Canon RC-V100 protocols are “simple protocols” that only allow limited amount of feedback to our controllers. Specific values will not be rendered in our displays as much of the communication is 1-way. Some things such as power indication and record state are reflected back to our controllers but many settings are set *in the blind*. A True RCP experience is not possible with these protocols.

Especially take note if mapping iris control on an analog component such as a Joystick or slider. As it is not possible to set either a specific iris value or to get iris feedback from the cameras settings iris on an analog component will always be a workaround.

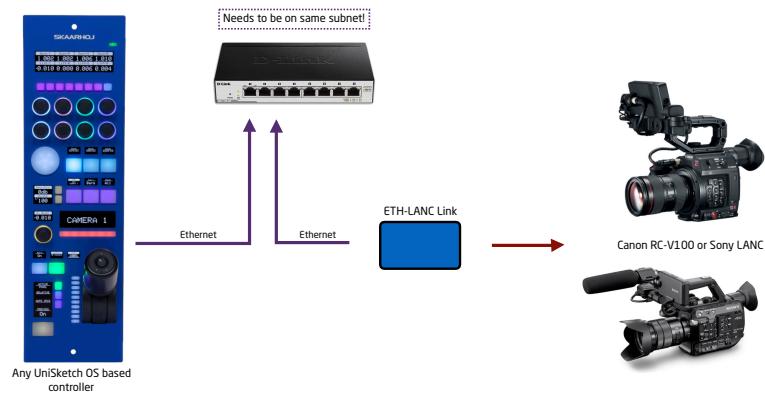
Please Note: in order to communicate with the ETH-LANC Link a UniSketch OS powered controller with either the “SONY LANC” or the “Canon RC-V100” Device Core installed is needed.

The ETH-LANC Link can *only* be controlled by one SKAARHOJ controller at a time, though one SKAARHOJ controller can control multiple Lanc Links. An ETH-LANC Link is needed per camera.

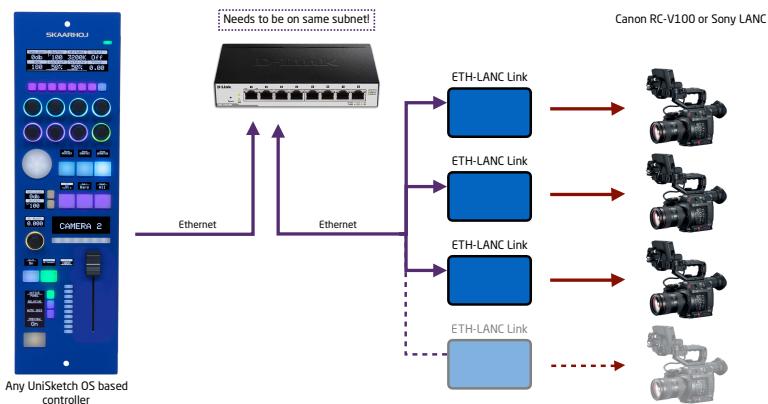
# Set Up

## Principal Networking Setups

### Single Camera



### Multi Camera



## ETH-LANC Link Configuration

### Camera Selector Dial

The ETH-LANC Link must be configured with a IP address for a SKAARHOJ UniSketch OS controller to connect to it. The IP address of the device will change depending on the DIP switch on the device.

When setting the IP of the unit, the **base IP address** is being set. If using multiple ETH-LANC Link in the same setup make sure to set them to the same base IP address.

Moving the DIP selector to a higher number the IP on the ETH-LANC Link will increment.



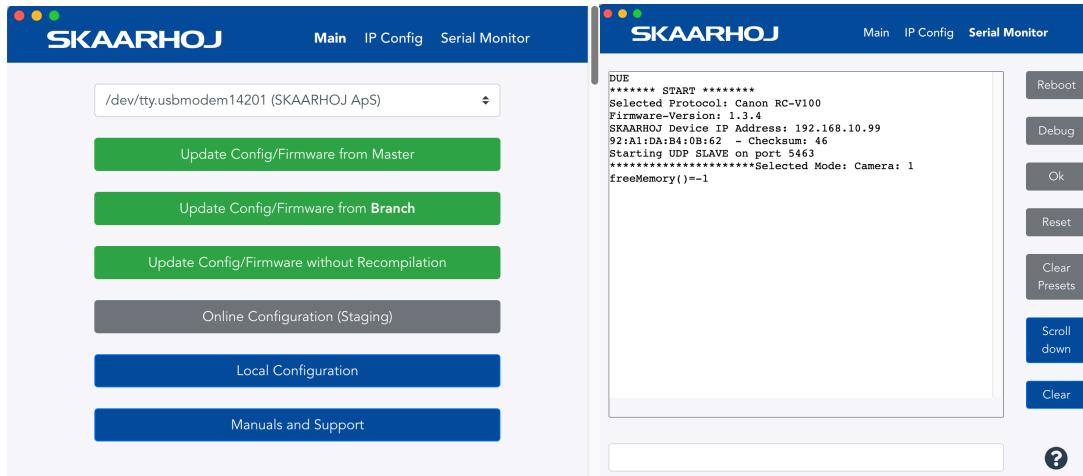
ETH-LANK Link Base IP: 192.168.10.100	
Dip Selector #	Equals IP address #
1	192.168.10.100
2	192.168.10.101
3	192.168.10.102
4	192.168.10.103
5	192.168.10.104
6	192.168.10.105
7	192.168.10.106
8	192.168.10.107

## IP Config

There are two ways of configuring the **base IP address** of the ETH-LANC Link

1) Connect the ETH-LANC Link with the USB Programming cable to a computer. Open the Firmware Updater Application and open the **Serial Monitor**. In the serial monitor is an overview of the

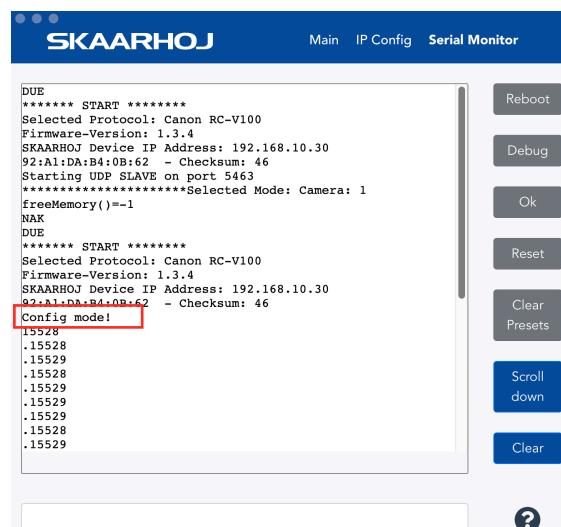
- Selected Protocol (Sony LANC or Canon RC-V100)
- SKAARHOJ Device IP address
- Selected Mode: Camera: 1-8



By using the command *ip=A.B.C.D* in the serial monitor it is possible to set the IP address.

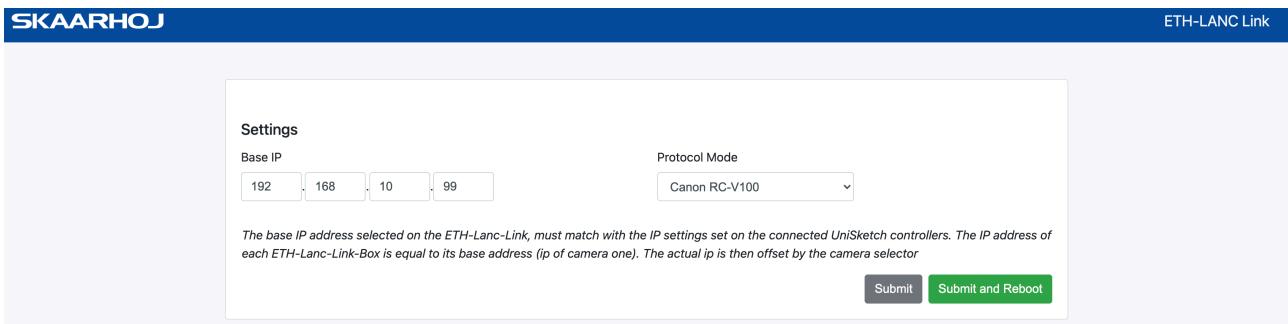
```
DUE
***** START *****
Selected Protocol: Canon RC-V100
Firmware-Version: 1.3.4
SKAARHOJ Device IP Address: 192.168.10.99
92:A1:D4:B4:0B:62 - Checksum: 46
Starting UDP SLAVE on port 5463
***** Selected Mode: Camera: 1
freeMemory()=-1
Setting IP...
DUE
***** START *****
Selected Protocol: Canon RC-V100
Firmware-Version: 1.3.4
SKAARHOJ Device IP Address: 192.168.10.30
92:A1:D4:B4:0B:62 - Checksum: 46
Starting UDP SLAVE on port 5463
***** Selected Mode: Camera: 1
freeMemory()=-1
```

2) Set the IP address on the web interface of the ETH-LANC Link it self. In order to access the web interface press and hold the "config" button on the device. The status LED will blink once and the serial monitor will report "Config mode!".



# SKAARHOJ Eth-Lanc Link

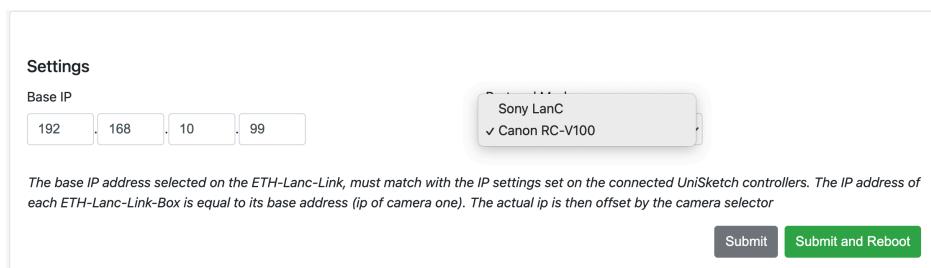
Open a browser and enter the web interface by using the base IP address of the ETH-LANC Link.



Press "Submit and Reboot" to save the settings.

## Select: Sony Lanc or Canon RC-V100 Protocol

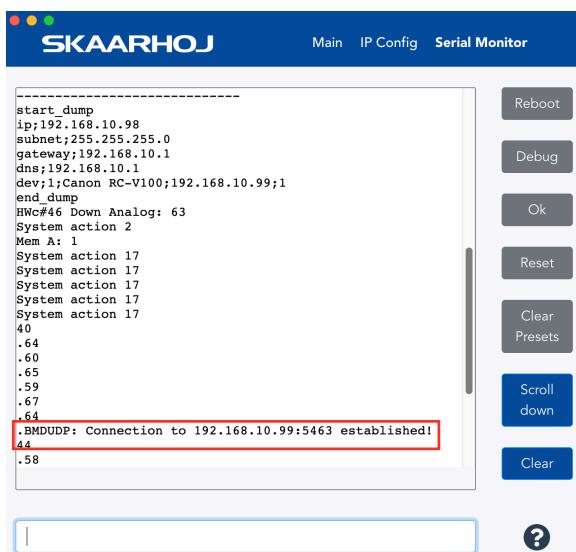
To select the protocol type go to the web interface (see section above) and chose between "Sony Lanc" or "Canon RV-V100". Press "Submit" or "Submit and Reboot" to save the settings.



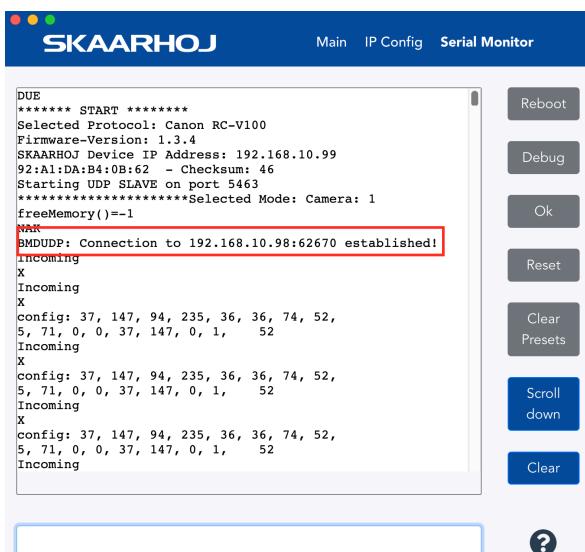
Our ETH-LANC Link is ready. All that is left to do is to connect a camera.

## Confirm Connection

The serial monitor can be used to confirm if connection have been established between a UniSketch OS controller and the ETH-LANC Link.



Serial Monitor on RCPv2 confirming connection to ETH-LANC Link



Serial Monitor on ETH-LANC Link confirming connection from RCPv2

## Confirm Connection to Camera for Sony LANC

It is recommended to use the action "Camera Power" to confirm connection to the camera have been established. This is an easy way to visually confirm if everything is set properly.



See the video here for demonstration: [https://github.com/SKAARHOJ/Support/blob/master/Manuals/Videos/ETH-LANC\\_Link\\_PowerDemo.MOV](https://github.com/SKAARHOJ/Support/blob/master/Manuals/Videos/ETH-LANC_Link_PowerDemo.MOV)



## Device Core: CANON RC-V100



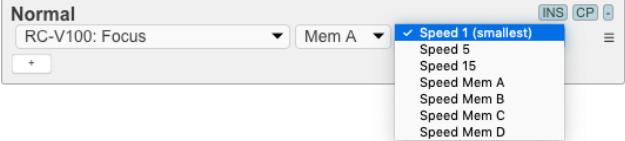
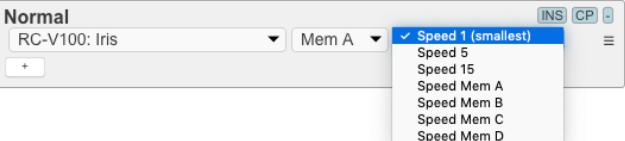
The Canon RC-V100 control panel usually uses the LANC Port [Remote A] of a Canon camera but speaks the RC-V100 Protocol, enabling many more features of the camera.

### Supported Cameras:

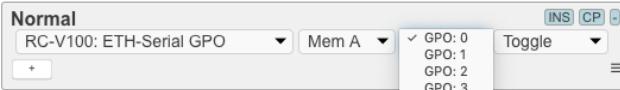
- Canon C Series
- Canon XF Series
- Canon ME Series

Please Note, new models in the C series offer support for the XC Protocol. Setting the camera to using the Remote A port only may be necessary.

## Table of Actions for Canon RC-V100 Device Core

<b>Focus</b>	<p>Change the focus of the Camera</p> <p>Focus allows different Speeds. Either set 5, 10 or 15 or use a Memory to set the Speed using a different Knob</p> 
<b>Iris</b>	<p>Change the Iris of the Camera</p> <p>Iris allows different Speeds. Either set 5, 10 or 15 or use a Memory to set the Speed using a different Knob</p> 
<b>Iris Absolute</b>	<p>Iris Absolute makes it possible to map the Iris in RC-V100 to an analog input like eg the Iris Joystick on the RCP-Mini This works by sending the right amount of up and down commands to Move the Iris from its smallest to its biggest value. Set the Iris steps in the camera menu to <b>Fine</b> (if possible) and try counting the amount of steps from fully open to fully closed using the encoder wheel on the camera. If this is not possible try to estimate. 40 seems to be a good starting point for the beginning.</p> <p>For a Canon CN7x17 KAS S Cine-Servo 17-120mm T2.95 lens, the best setting seems to be Lens Steps:20 with the second drop down for Lens Steps +250</p> <p>If assigning iris to the LED bar please remember it is an assumed value</p>
<b>Paint</b>	<p>Paint controls the paint section of the camera. There are 4 values that can be chosen:</p> <p>White Blue, White Red, Black Blue, Black Red</p> <p><b>Note:</b> All these features need a Custom Picture profile (no flat profile) to be active in the camera</p> <p>This also applies to the functions:</p> <p><b>Master Pedestal</b> <b>Knee Point</b> <b>Knee Slope</b> <b>Black Gamma</b> <b>Sharpness</b></p> 

<b>White Balance</b>	<p>The White Balance function can be mapped to a button or encoder.</p> <p>When mapped to a Button: Use the dropdown to select what mode is triggered on a button press</p> <p>When mapped to an encoder:</p> <p><b>left/ right</b> for switching setting between A / B / Preset (K/3200/5600)</p> <p><b>long press in preset</b> to cycle through preset modes (K/3200/5600)</p> <p><b>long press in A or B</b> to trigger a WhiteBalance Measurement</p> <p><b>short press</b> for selecting WB in preset mode (When selected use left right to increase/decrease)</p>
<b>ISO/Gain</b>	<p>The ISO/Gain function can be mapped to a button or encoder.</p> <p>When mapped to a Button: Use the dropdown to select what mode is triggered on a button press</p> <p>When mapped to an encoder:</p> <p><b>left/ right</b> for up/down, <b>short press</b> for select</p>
<b>Shutter</b>	<p>The Shutter function can be mapped to a button or encoder.</p> <p>When mapped to a Button: Use the dropdown to select what mode is triggered on a button press</p> <p>When mapped to an encoder:</p> <p><b>left/ right</b> for up/down, <b>short press</b> for select</p>
<b>Menu Move</b>	<p>The Menu Move function can be mapped to a button or encoder.</p> <p>When mapped to a Button: Use the dropdown to select what function is triggered on a button press</p> <p>When mapped to an encoder:</p> <p><b>long press</b> to enter/exit the menu <b>left/ right</b> for moving, <b>short press</b> for enter</p>
<b>On Screen</b>	<p>On screen allows an operator to enable on screen display with a single button press remotely. This is great for changing things in the menu and then switch the camera back to a clean output again for live production.</p> <p>If it does not work right away please check the "Display out" setting in the camera menu. This has to be enabled first for the panel to control this feature.</p>
<b>Assignable Button</b>	<p>This action triggers one of the Camera's assign buttons.</p> <p><b>Note:</b> RC-V100 only allows the control of the first 4 assign buttons. LanC mode allows to control the first 6</p>

<b>ETH-Serial GPO</b>	The ETH-Serial Box has 4 GPOs on its connector (For Pinout see below) These can be triggered using this function.
	Note: ETH-Serial Link Firmware 1.1.0 is required, for update instructions see here: <a href="https://www.skaarhoj.com/support/firmware-updater/">https://www.skaarhoj.com/support/firmware-updater/</a>
<b>Camera Power</b>	Camera Power toggles or sets the power of the Camera  This needs the camera's hardware power switch to stay on ON
	
<b>Other Functions</b>	There are several other functions which are not documented yet. Most of them can easily be understood when checking out the original Dokumentation of the RC-V100 Panel

# Device Core: CCU Sony LANC



The LANC Protocol is usually used for camera accessories like the Manfrotto Zoom controllers. In their RM-30BP Panel Sony introduced a handy little controller for their own cameras. In addition to covering all the basic LANC functions we can also do everything the RM-30BP can do, including Sony's Tally feature

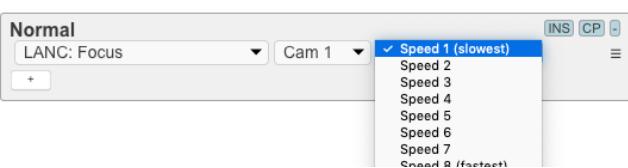
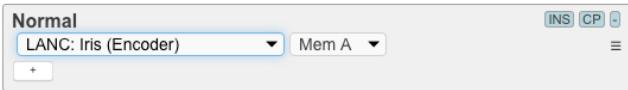
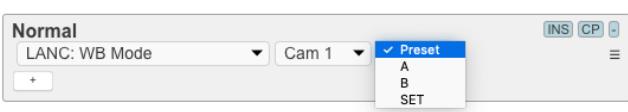
## Supported Cameras

Basically all Cameras that support LANC in one or another way are supported. Of course not all features will work on all cameras. The best support is for Sony Cameras. Check the RM30-BP compatibility guide to find out if a particular feature is available on a specific Sony camera

[https://pro.sony/s3/2017/11/09110526/RM30BP\\_compatibility\\_Rev7.pdf](https://pro.sony/s3/2017/11/09110526/RM30BP_compatibility_Rev7.pdf)

Please Note, the Sony FS5, FS7, FX6, and FX9 may have some trouble with connectivity. Please check the camera settings that the camera is set to use the Remote A port only.

## Table of Actions for CCU Sony LANC Device Core

<b>Focus</b>	<p>Change the focus of the Camera</p> <p>Focus allows different Speeds. Either set 5, 10 or 15 or use a Memory to set the Speed using a different Knob</p> 
<b>Iris (Button)</b>	<p>Change the iris of the camera using a button</p> <p>Choose the direction using the dropdown</p> 
<b>Iris (Encoder)</b>	<p>Change the iris of the camera using a Encoder</p> 
<b>Iris Absolute</b>	<p>Iris Absolute makes it possible to map the Iris in LanC to an analog input like eg the Iris Joystick on the RCP</p> <p>This works by sending the right amount of up and down commands to move the Iris from its smallest to its biggest value.</p> <p>Set the Iris steps in the camera menu to <b>Fine</b> (if possible) and try counting the amount of steps from fully open to fully closed using the encoder wheel on the camera. If this is not possible try to estimate. 40 seems to be a good starting point for the beginning.</p> <p>Movement with either a joystick or a slider should <i>not</i> be too rapid otherwise the camera will not pick up the change.</p> <p>If assigning iris to LED bar please remember it is an assumed value</p>
<b>WB Mode</b>	<p>The white balance mode buttons can be mapped to a button (not an encoder)</p> <p>When mapped to a Button: Use the dropdown to select what mode is triggered on a button press</p> <p>White Balance (see below) is needed to be activated in order to set the different WB modes.</p> 
<b>White Balance</b>	<p>Equivalent to pressing the "White Balance" button on the camera. Works on a button press. The White Balance mode on the camera is needed to setting the WB Mode (above)</p> 

<b>Gain</b>	The Gain function is meant to be mapped to a button and does exactly the same as the Gain button on the RM30BP would do. It selects gain. Then it is adjustable by using the Menu Move function.  Commands with a similar behavior are:  <b>Shutter</b> <b>White Balance</b> <b>Select</b> <b>Picture Profile</b> <b>Thumbnail</b>  If unsure about their exact function check Sony's Documentation
<b>Menu Move</b>	The Menu Move function can be mapped to a button or encoder.  When mapped to a Button: Use the dropdown to select what function is triggered on a button press  When mapped to an encoder:  <b>long press</b> to enter/exit the menu <b>left/ right</b> for moving, <b>short press</b> for enter
<b>Assignable Button</b>	This action triggers one of the Camera's assign buttons.  <b>Note:</b> LanC allows to control the first 6 assign buttons of the camera.
<b>ETH-Serial GPO</b>	The ETH-Serial Box has 4 GPOs on its connector (For Pinout see below) These can be triggered using this function.  <b>Note:</b> ETH-Serial Link Firmware 1.1.0 is required, for update instructions see here:  <a href="https://www.skaarhoj.com/support/firmware-updater/">https://www.skaarhoj.com/support/firmware-updater/</a>
<b>Camera Power</b>	Camera Power toggles or sets the power of the Camera  This needs the camera's hardware power switch to stay on ON
<b>Counter Reset</b>	This function resets the internal timecode Counter on the Camera. It can be used to sync several camera's timecode
<b>Sony Tally</b>	The Sony Tally action allows for setting a color boarder (green or red) inside the viewfinder of certain cameras. It can be used like a normal tally function and linked to other actions or virtual hardware component

<b>NDFilter</b>	ND Filter allows the control of the Variable ND Filters in some Sony Cameras using an encoder.
<b>Custom Code</b>	Custom Code can be used to trigger a custom selectable LanC code with a button. Select the Header Byte using the first selector (18/28/D8) and the command byte using the second. (First byte is hex, second is decimal)  Some great documentation about LanC can be found here: <a href="http://www.boehmel.de/lanc.htm">http://www.boehmel.de/lanc.htm</a>
<b>Player Play/Pause/Stop</b>	LanC also supports a few player commands that can control some Camera's built in player. This might be useful for on the fly play-out hacks
<b>Other Functions</b>	There are several other functions which are not documented yet. Most of them can be understood when checking out the original documentation of the RM 30 BP

# Updating Firmware

## Finding the Latest Firmware

The firmware for the Eth-Lanc Link can be found in the section "Stand Alone Firmwares" from <https://www.skaarhoj.com/support/firmware-updater/>

Please use the picture below to determine the microprocessor type in the product. It is important to upload/update with a firmware file that matches the microprocessor type, the two are not compatible.

If unsure of which type the Eth-Lanc Link uses, please email a picture of the ports with no cables attached to: support@skaarhoj.com



## Load Firmware from File

The function "Load Firmware from File" is in the Options tab in the Firmware Application. The function is used to for the Eth-Lanc Link.



Please note that though the SKAARHOJ Firmware Updater is needed to do firmware updates, DO NOT use "Update Firmware" in the Firmware Application as this will render the firmware on the device useless. If "Update Firmware" have been pressed, please re-upload the proper firmware .hex file found in the section "Stand Alone Firmwares" from <https://www.skaarhoj.com/support/firmware-updater/>

## Change Log

v1.3.6

- Fixes LANC power and reconnection issue

v1.3.5

- Make the 0 setting useful, it acts as 'Any' mode now, needs UniSketch v2.5.14 update or later

v1.3.4

- Prevent firmware-updater from uploading wrong file

v1.3.2

- proper randomized for mac generation

v1.3.1

- Critical bug fix for Iris and focus

v1.3.0

- New Web interface
- Lots of value improvements, proper checksum and so on

v1.2.0

- Added Support for ETH-LANC-Link (different compilations necessary)

v1.1.0

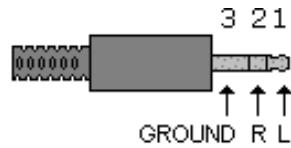
- Added support for GPIO Command

v1.0

- Initial release

# Pinout

The LANC port cable needs to be a simple 2.5mm Connector without any cross out in the cable



# Splitting the Signal?

Is it possible to control the camera via the ETH-LANC Link *and* have a local "remote" control by using a jack splitter? No this is not possible. The ETH-LANC Link will not work in such a setup.



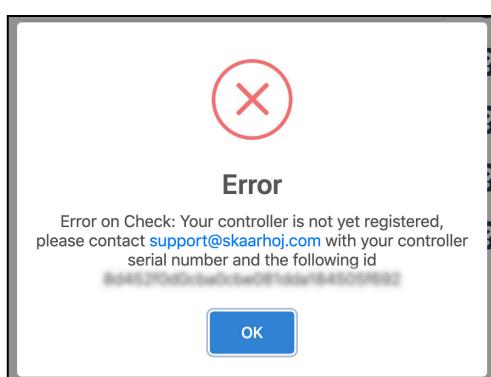
# Troubleshooting

## Error on Check: Your controller is not yet registered

After pressing Update Firmware a message from the Firmware Updater stating that the connected controller is not fully registered yet may pop up. The Eth-Lanc Link uses Stand Alone firmware and is not updated through the "Update Firmware" button on the firmware updater.

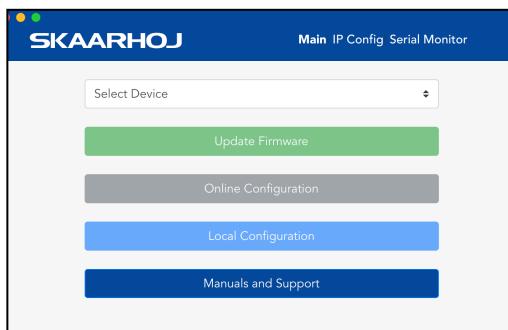
To upload the latest Eth-Lanc Link firmware please see the "Updating Firmware" section of this manual.

If trying to change the IP address for the Eth-Lanc Link please see the "IP Config" section of this manual.



## Controller does not show up under Port in Firmware Application

If the controller doesn't show up under ports, try these things first:



- Make sure you have attached your controller with a micro USB cable to your computer. Check the micro USB is fully inserted into the USB plug on the controller
- Is the controller turned on?
- Reboot your computer
- Change the USB cable for another one
- Avoid using USB adapters to eliminate point of failures
- Try to use a different USB port on your computer
- Boot the controller in config mode: Disconnect the controllers power, then hold the config button under the power plug down with a pen tip, power on the controller and hold the button until it lights blue, then release.

If none of the above brings up the USB port, you may try this procedure **but only after clearing it with the SKAARHOJ support team!**:

- Locate the small hole just below the config button
- Power on the controller and press this tiny button for a second and release. You may repeat this. (Pressing this button while the controller is on should reset it completely).
- Turn off the controller, then turn it on again. Now you should see the USB port in the firmware application.



Old method if no hole below config button are present:

- Open the controller carefully and locate the SKAARDUINO main board (the one with the ethernet plug)
- Locate the flat cable connector in the corner of this board. Next to this connector you will see a tiny button.
- Power on the controller and press this tiny button for a second and release. You may repeat this. (Pressing this button while the controller is on should reset it completely).
- Turn off the controller, then turn it on again. Now you should see the USB port in the firmware application.

## Controller Not Confirming Connection

Try power cycling the Eth-Lanc Link. It can connect better when powered after the other Skaarhoj controller.

### Check the IP Settings

Make sure the IP for the Device Core in the connected SKAARHOJ controller is set to the same IP address as the Eth-Lanc Link.

# Network Recommendations

## Facts

- SKAARHOJ controllers have a 100 mbps network interface
- Network switch must have Auto-MDI/MDIX
- Network switch must support 100 mbps
- PoE: IEEE 802.3af
- SKAARHOJ controllers only support Half Duplex mode without Auto-Negotiate

When connected to a network switch, the yellow LED (lower left) at the ethernet jack will be on. If the device in the other end supports TX/RX auto detection you may be able to connect the SKAARHOJ controller directly to your device, otherwise use a crossed cable or a network switch (the supported setup). Remember a SKAARHOJ controller and client must be on the same subnet (192.168.10.\* or one you set up in the controller). If you have multiple SKAARHOJ units connected to the same network they need to have different IP addresses!

## Power over Ethernet (PoE) Specifications

We use the PoE industry standard 48V IEEE 802.3af. If you want to power our controllers using PoE it is important your switch supports this standard. Please notice some manufacturers such as Ubiquity have their own non-standard 24V type of PoE which is incompatible with our controllers. Especially pay attention to the standard if you use a PoE injector.

## Troubleshooting

If you experience no network activity at all try one or more of the following suggestions:

- Use a managed network switch
- Force network switch port to 100 mbps
- Try a different network switch

1GB or 10 GB switches can have issues with our 100 mbps interface if not properly managed. The iMac Pro with 10 GB have issues if connected directly to our controller. Try with a USB to ethernet adapter in this case.

# WEEE Information



Figure 1

#### **For private households: Information on Disposal for Users of WEEE**

This symbol (figure 1) on the product(s) and / or accompanying documents means that used electrical and electronic equipment (WEEE) should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge.

Alternatively, in some countries, you may be able to return your products to your local retailer upon purchase of an equivalent new product.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

#### **For professional users in the European Union**

If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.

#### **For disposal in countries outside of the European Union**

This symbol is only valid in the European Union (EU). If you wish to discard this product please contact your local authorities or dealer and ask for the correct method of disposal.