

SKAARHOJ Eth-SDI Link

The ETH-SDI Link is used to translate UDP commands from a SKAARHOJ control panel to BMD Camera Control commands via SDI. An alternate firmware is available for bridging a long connection from an Atem to BMD cameras for sending CCU data.



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Introduction

The SKAARHOJ ETH-SDI Link mainly functions as a device that receives Blackmagic Camera Control data over UDP and embeds it on SDI ("ETH2SDI" Firmware). However, an alternate firmware is available.

"ATEM2SDI" firmware: Embeds color data on SDI in a situation where a network connection to an ATEM switcher is feasible while an SDI connection is not, for instance if there are thousands of kilometers between the ATEM and the camera and a VPN can be used to channel the network through. In such a scenario, the ETH-SDI Link would establish a network connection to the ATEM and use it to extract the data otherwise embedded on SDI out of the switcher and embed it "locally". Requires low latency network.

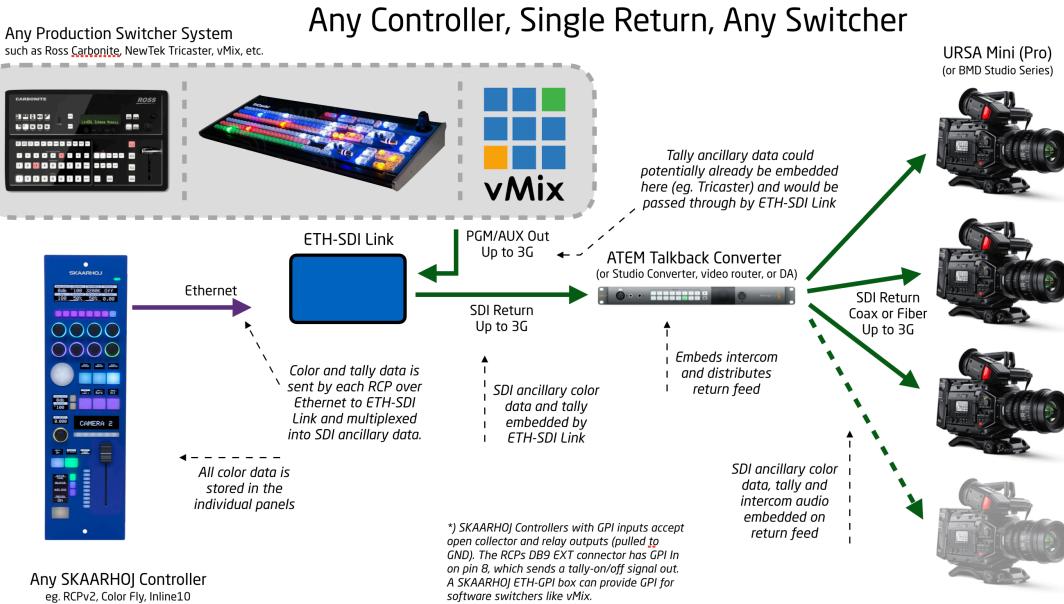
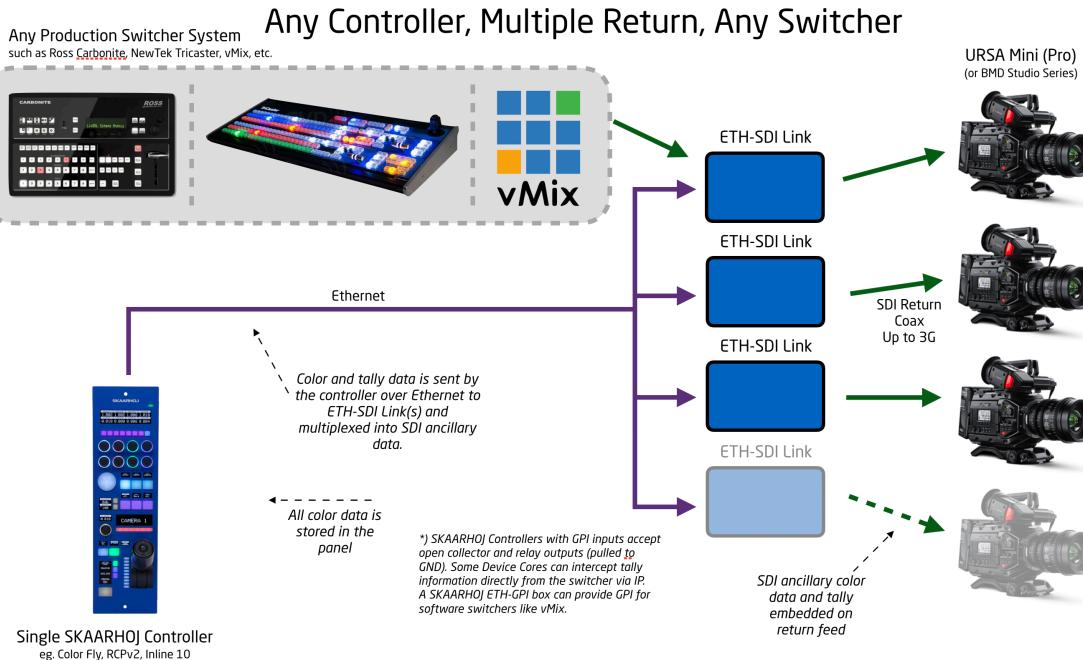
When using the Eth-SDI Link with the Eth2SDI firmware in a Blue Pill environment, it will automatically switch to receiving commands via TCP, this is not possible with the Atem2SDI firmware or in a UniSketch only environment.

Port Information

Protocol	Communication Port
UDP - UniSketch + ATEM2SDI	5463
TCP- Blue Pill environment only	5463

Set Up

Principal Networking Setups

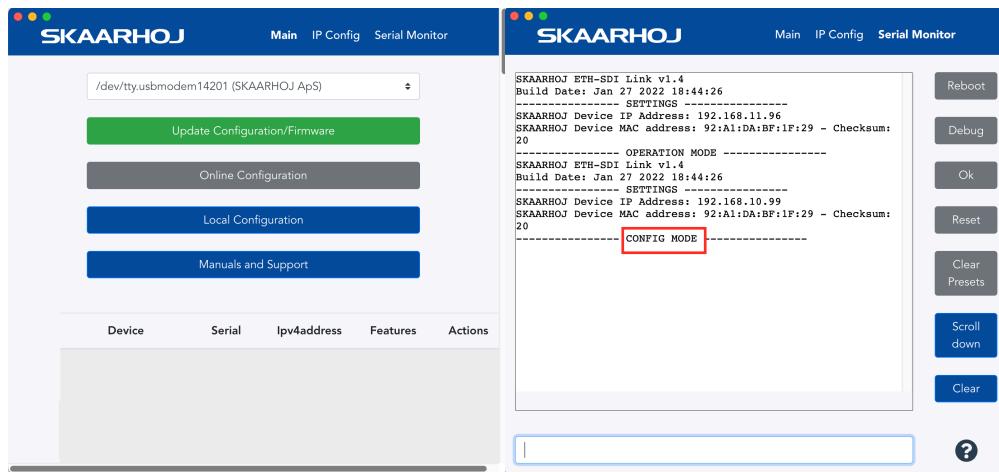


ETH-SDI Link Configuration

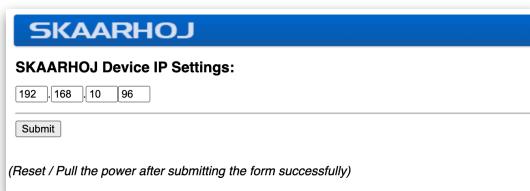
Configuration for the ETH2SDI Firmware

IP Config

Set the IP address on the web interface of the ETH-SDI Link. In order to access the web interface press and hold the "config" button on the device, about 10 seconds. The status LED will blink red once and the serial monitor will report "Config mode".



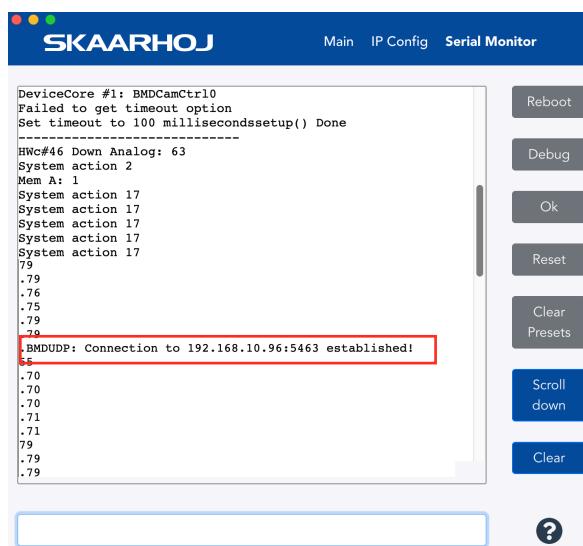
Open a browser and enter the web interface by using the base IP address 192.168.10.99. This is the default and config IP address of the ETH-SDI Link, even if the IP address was changed for operation mode.



Press "Submit" to save the settings.

Confirm Connection

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



Serial Monitor on RCPv2 confirming connection to ETH-SDI Link



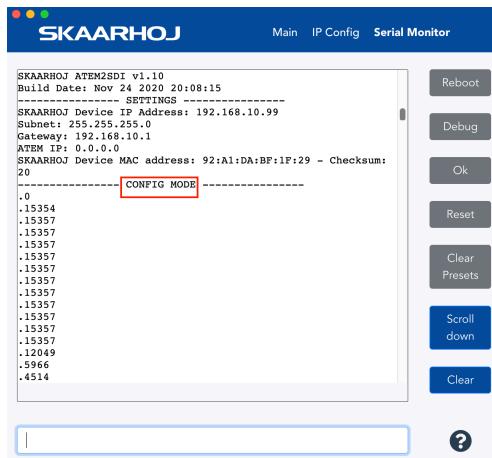
Serial Monitor on ETH-SDI Link confirming connection from RCPv2

Atem2SDI Link Configuration

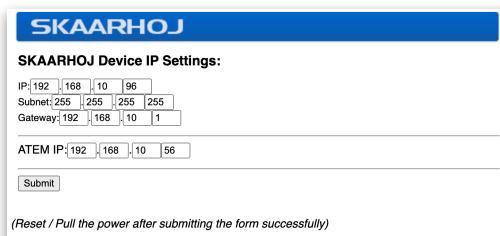
Configuration for the Atem2SDI Firmware

IP Config

Set the IP address on the web interface of the Atem-SDI Link. In order to access the web interface press and hold the “config” button on the device, about 10 seconds. The status LED will blink red once and the serial monitor will report “Config mode”.



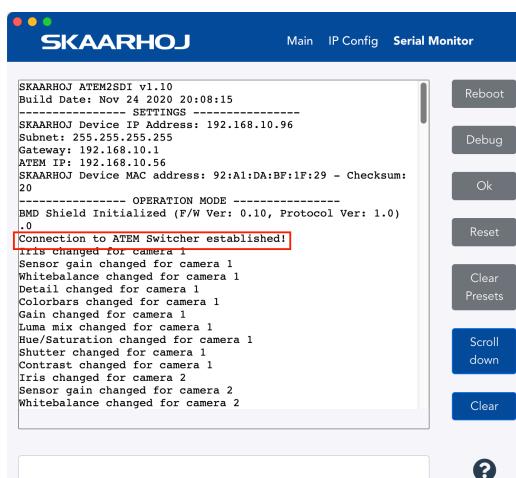
Open a browser and enter the web interface by using the base IP address 192.168.10.99. This is the default and config IP address of the Atem-SDI Link, even if the IP address was changed for operation mode.



Press “Submit” to save the settings. Power cycle the device for the changes to take effect.

Confirm Connection

The serial monitor can be used to confirm if connection have been established between the Atem-SDI Link and the BMD Atem. The serial monitor will report: Connection to ATEM Switcher establish! followed by the current camera ccu settings in the atem to be pushed to the cameras.



Updating Firmware

Finding the Latest Firmware

The firmware for the Eth-SDI 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-SDI Link uses, please email a picture of the ports with not 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-SDI Link.

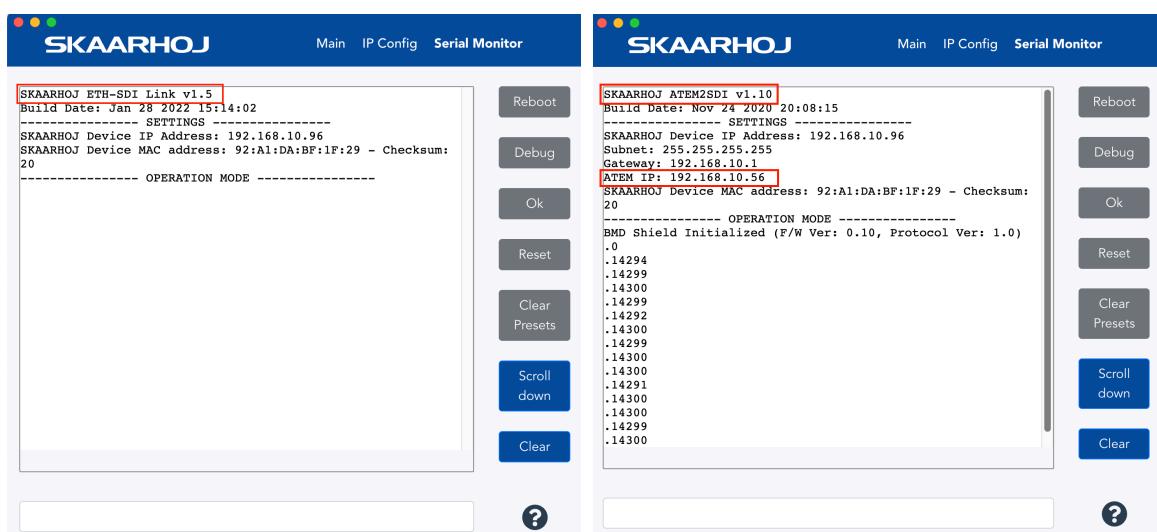
Please note that though the SKAARHOJ Firmware Updater is needed to do firmware updates, DO NOT use "Update Firmware" in the Firmware Application as this will render the firmware on the device useless. If "Update Firmware" have been pressed, please re-upload the proper firmware .hex file found in the



section "Stand Alone Firmwares" from <https://www.skaarhoj.com/support/firmware-updater/>

Confirm Firmware Type and Version

The current firmware and firmware version loaded onto the Eth-SDI Link can be seen in the serial monitor when the device boots up.



ETH-SDI Link Firmware with version 1.5

ATEM2SDI Firmware with version 1.10
Note the availability of an Atem IP address

Eth2SDI Firmware Change Log

v1.5

- Added TCP mode

v1.4

- Prevent firmware-updater from uploading wrong file

v1.3

- Increased maximum number of cameras to 20 on DUE

v1.2

- Added support for DUE

v1.1

- Added hardcoded ethernet 100 mbps full duplex mode setting, auto-negotiation disabled for better support for Linksys Switches
- Included version and product name printout in boot sequence

v1.0

- Initial release

Atem2SDI Firmware Change Log

v1.10

- Update to latest ATEM library

v1.9

- Prevent firmware-updater from uploading wrong file

v1.8

- Added support for ATEM 8.1

v1.7

- Correct handling of relative focus values from ATEM Switcher

v1.6

- Focus fix

v1.5

- Added statically defined ethernet mode for better compatibility with Linksys switches

v1.4

- ATEM 7.5.1+ compatibility

v1.3

- Added Irisf support

v1.0

- Initial release

SDI Shield

The Eth-SDI Link uses the Blackmagic Design 3G-SDI Shield. The Blackmagic 3G-SDI Arduino Shield supports the following formats using SDI Level B: 720p50, 720p59.94, 720p60, 1080i50, 1080i59.94, 1080i60, 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50 (output only), 1080p59.94 (output only) and 1080p60 (output only), but the camera doesn't have to be running the same video format as the program input, so you can use cameras in Ultra HD while the camera protocol is sent over HD signal to the camera.



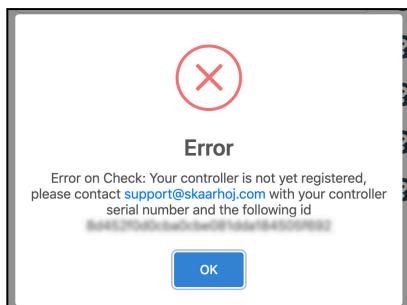
Troubleshooting

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-SDI Link uses Stand Alone firmware and is not updated through the "Update Firmware" button on the firmware updater.

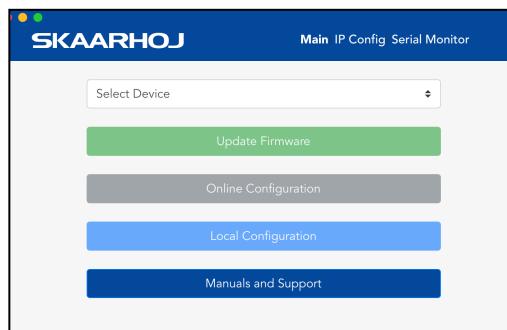
To upload the latest Eth-SDI Link firmware please see the "Updating Firmware" section of this manual.

If trying to change the IP address for the Eth-SDI 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:

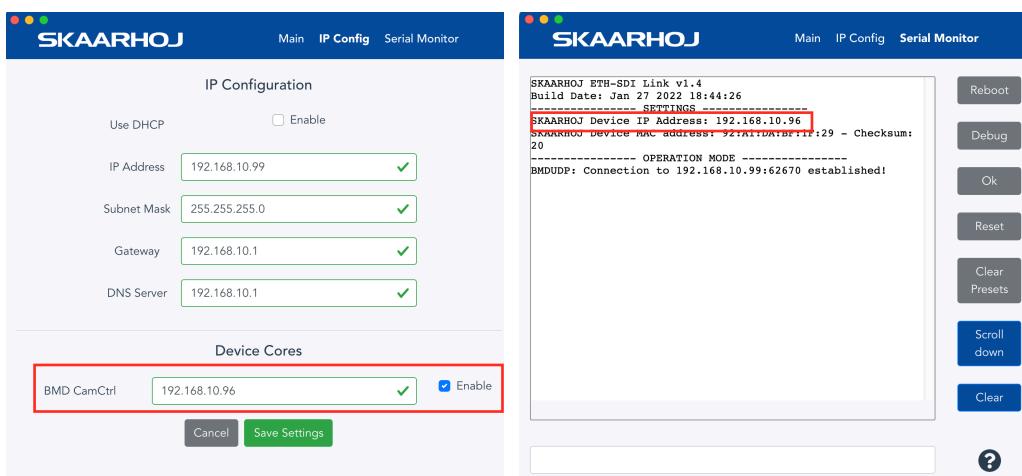
- Open the controller carefully and locate the SKAARDUINO main board (the one with the ethernet plug)
- Locate the flat cable connector in the corner of this board. Next to this connector you will see a tiny button.
- Power on the controller and press this tiny button for a second and release. You may 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-SDI 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-SDI 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

For private households: Information on Disposal for Users of WEEE



Figure 1

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.