

Device: Dream Chip - ATOM One

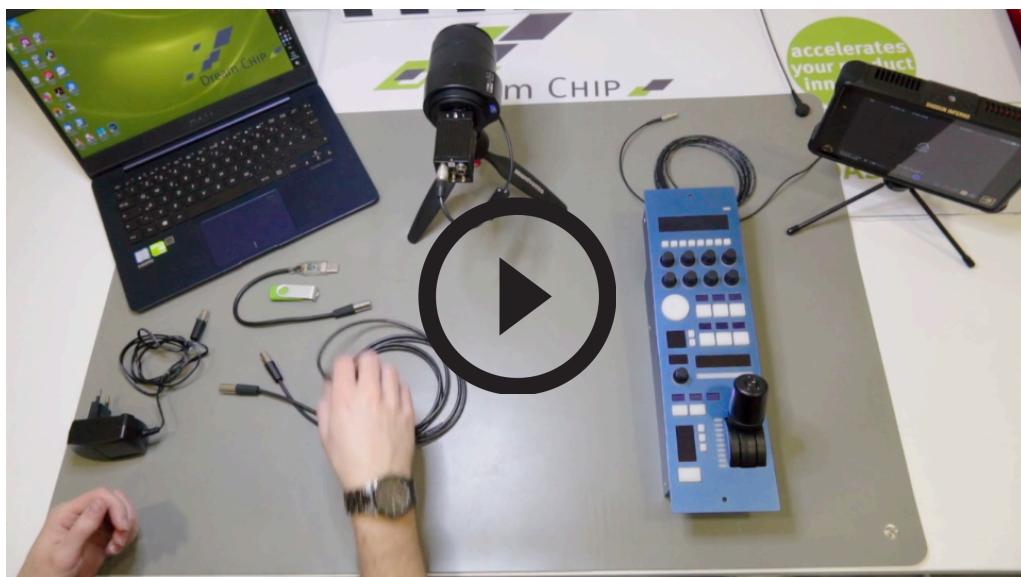


Introduction

ATOM One series from Dream Chip are small POV cameras controlled over serial. Via an ethernet to serial converter you can color control this camera using a SKAARHOJ controller. For more information about the cameras, please go to <https://www.dreamchip.de/products/atom-one-family.html>

Please use the instructions in this manual to make connection between a SKAARHOJ controller and the ATOM One Dream Chip camera.

As a extra resource please also watch this video <https://vimeo.com/358300487> from Dream Chip on how to prepare the camera.



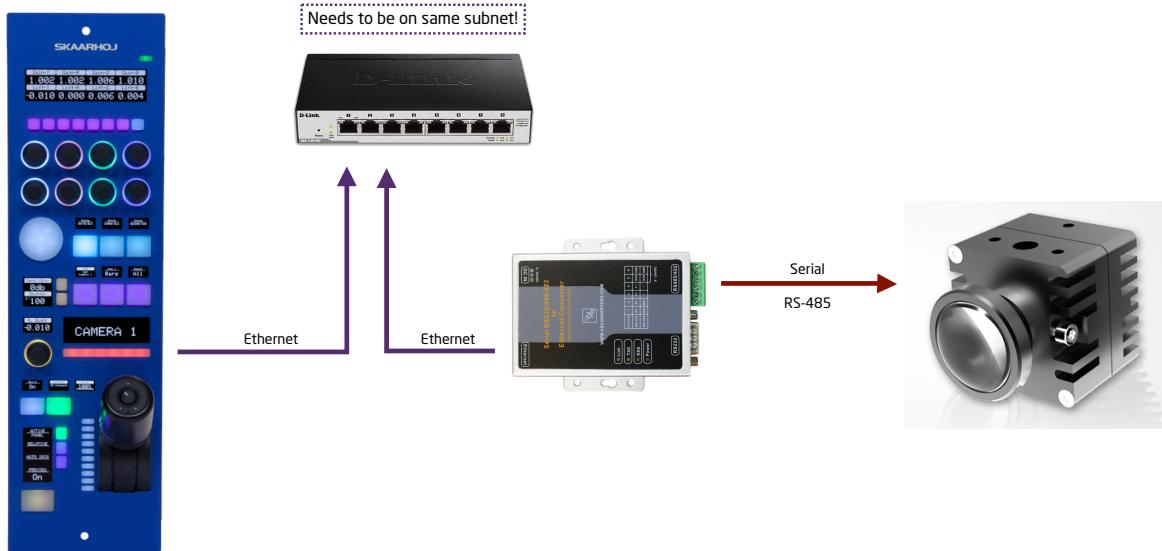
Compatibility in the ATOM One Family

We have tested successfully with the **ATOM one Mini** and the **ATOM one** camera. It us our understanding that the Atom One Mini runs a different firmware version compared to the remainder models in the series.

The ATOM One *should* have the same firmware type as the ATOM one 4K mini 7, ATOM one 4K mini 11 and the ATOM one 4K mini 16 and therefore our integration should work with these models as well *but this have not been tested!*

Ethernet to Serial connection

To communicate via serial (RS-485) to the Dream Chip camera you need an Ethernet-Serial converter. We suggest you get a USR-TCP232-306 from USR IoT - <https://www.usriot.com/products/serial-to-ethereum-server.html> or a XS1200 from US Converters - <http://www.usconverters.com/serial-rs232-device-server>



Note: There is a quirk you should know about: The XS1200 only accepts a single TCP connection at a time and it will take some time to realize if a client disconnected silently before it allows a new connection. In essence this means if the SKAARHOJ controller was connected and is rebooted without disconnecting, the XS1200 Server may not realize this before after some time. Therefore you may need to power cycle it along with the SKAARHOJ controller to make sure it will accept a connection.

Below you will find screenshots of how to configure the USR-TCP232-306 (found on the web interface of the USR-TCP232-306).

The screenshot shows the "Local IP Config" section of the USR-TCP232-306 web interface. The "parameter" panel displays the following configuration:

IP type:	Static IP
Static IP:	192 . 168 . 10 . 29
Submask:	255 . 255 . 255 . 0
Gateway:	192 . 168 . 10 . 1
DNS Server:	8 . 8 . 8 . 8

Buttons at the bottom of the panel are "Save" and "Cancel". To the right, a "Help" sidebar provides definitions for the configuration parameters:

- IP type:** StaticIP or DHCP
- StaticIP:** Module's static ip
- Submask:** usually 255.255.255.0
- Gateway:** Usually router's ip address
- DNS IP:** DNS gateway or Router's IP

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parameter

Baud Rate: 115200 bps
 Data Size: 8 bit
 Parity: None
 Stop Bits: 1 bit
 Local Port Number: 5000 (0~65535)
 Remote Port Number: 8234 (1~65535)
 Work Mode: TCP Server
 Remote Server Addr: 192.168.0.201 [192.168.0.201]
 RESET:
 LINK:
 INDEX:
 Similar RFC2217:

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parameter

Heartbeat Packet Type: None ASCII
 Register Packet Type: None
 Short Connection:
 TCP Server-kick off old connection:
 Buffer Data Before Connected:
 UART Set Parameter:

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parameter

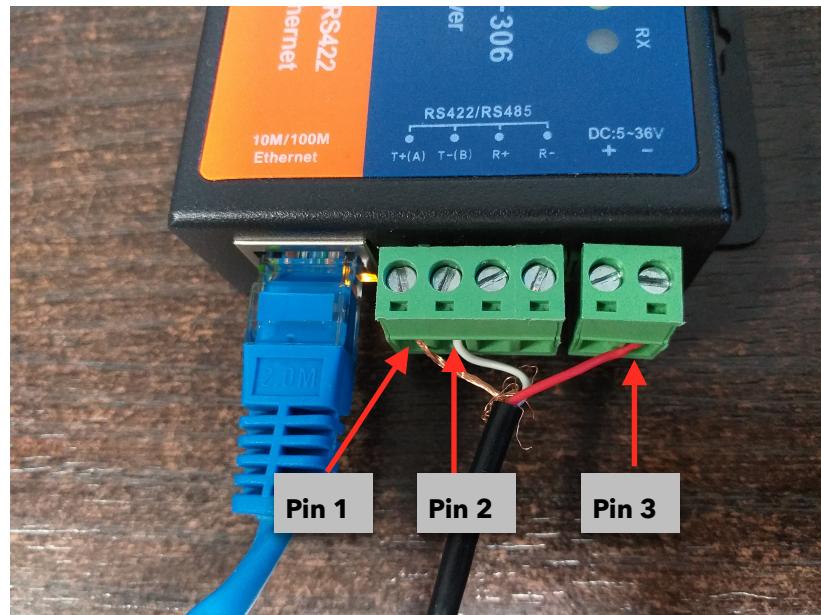
Module Name: USR-TCP232-306
 Webserver Port: 80
 Username: admin
 Password: admin
 MAC Address: 9C-A5-25-9E-DF-D4
 Max Clients Connect To TCP Server: 4 (1~16)
 Reset Timeout: 3600 | \$(0,60~65535)

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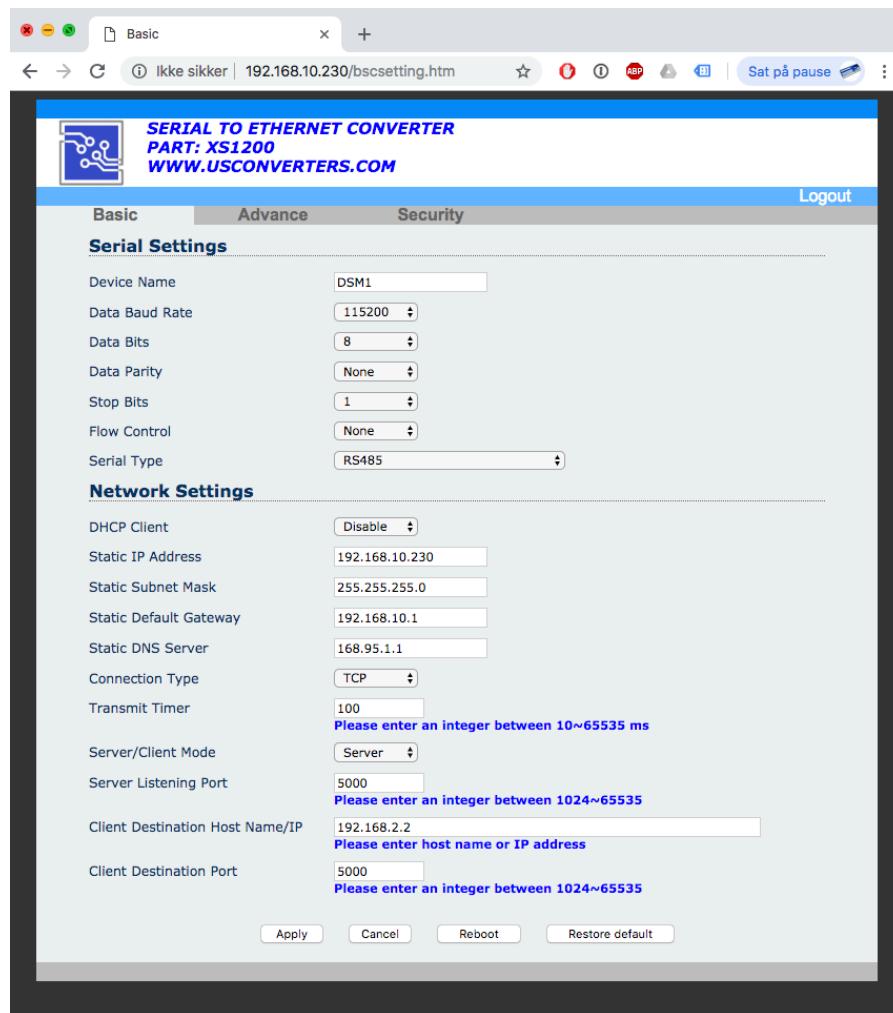
website:www.usriot.com

Make sure to set up an IP address in your range here. This is the IP address you must also set up inside the SKAARHOJ controller for the Device Core! Here it is set to 192.168.10.29 and corresponding subnet mask. For serial parameters the default for the ATOM one Mini and ATOM One is 115200 8N1 (from their manual).

Cabling to the USR-TCP232-306 is via the RS-485 connector. 3 wires are necessary. GND and then T+(A) and T-(B).



Below you will find screenshots of how to configure the XS1200 converter (found on the web interface of the XS1200).



Make sure to set up an IP address in your range here. This is the IP address you must also set up inside the SKAARHOJ controller for the Device Core! Here it is set to 192.168.10.230 and corresponding subnet mask. Please see section "Transmit Timer on XS1200" for adjustments to this value.

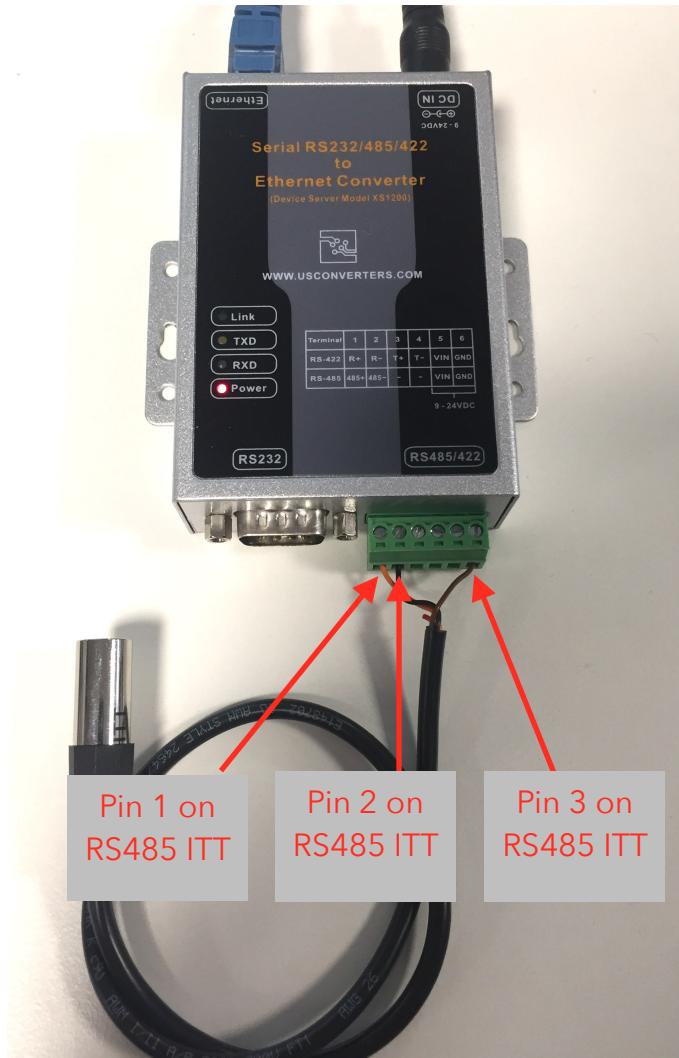
For serial commands the default for the ATOM one Mini and ATOM One is 115200 8N1 (from their manual).

Transmit Timer on XS1200

The transmitter timer value on a XS1200 will typically be 100 ms per default. We recommend lowering the value to 10 ms for obtaining a more smooth user experience. In particular brightness adjustment will be more fluent with the value set to 10 ms.

SKAARHOJ DEVICE CORES

Cabling to the XS1200 is via the RS-485 connector. 3 wires are necessary. GND and then 485+ and 485-.



Look in the ATOM One mini/ATOM One manual for cabling instructions. For the RS485 ITT Female M-XL-3-11L connector the 3 wires are indicated as GND, RS485_TX_N and RS485_TX_P.

The coloration between these and the USR-RCP-232-306 is the following:

RS485_TX_N = T-(B)	In the ATOM One manual this is referred as RS485_B
RS485_TX_P = T+(A)	In the ATOM One manual this is referred as RS485_A

The coloration between these and the XS1200 is the following:

RS485_TX_N = 485-	In the ATOM One manual this is referred as RS485_B
RS485_TX_P = 485+	In the ATOM One manual this is referred as RS485_A

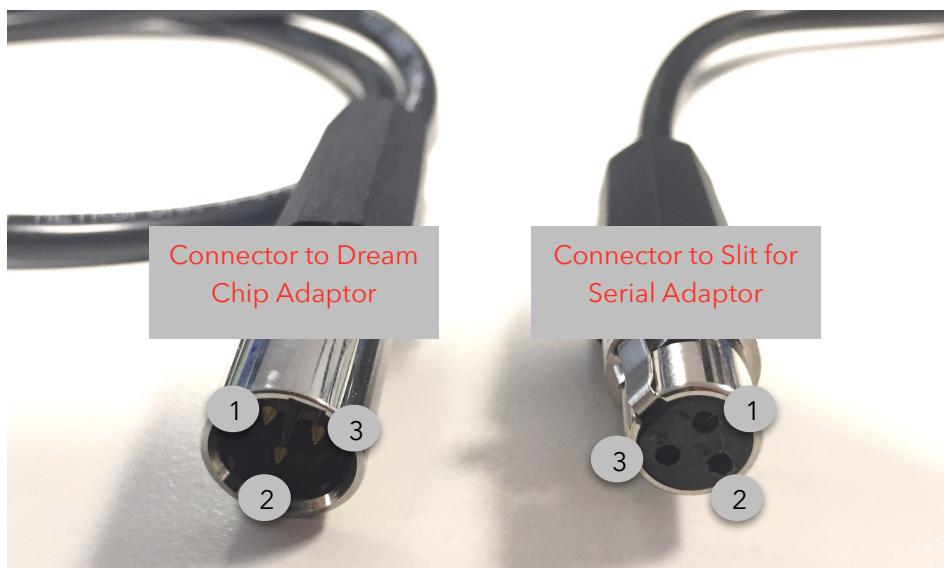
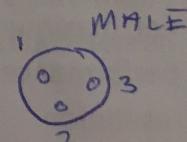
3.1 Power / RS485 Connector

The power connector is a Hirose male HR10 6 pin connector. The following table shows required plugs. Dream Chip offers a mini XLR adapter.

	Female HR10A-7P-6S(73)	Signal	Dream Chip 4-wire Power Cable	Power ITT Male M-XL-3-12L	RS485 ITT Female M-XL-3-11L
6		Power in	red	1	
5		GND	brown	3	3
4		RS485_TX_P			
3		RS485_TX_N			
2		RS485_TX_N	black		2 brown
1		RS485_TX_P	orange		1 white

3.2 SDI Output

The HD-BNC output is SMPTE 292M / 424M compliant.





Confirm Connection

Connection to the USR-RCP-232-306 or XS1200 can be confirmed from the serial monitor with the message "DCA SerialConv Connected!". This means connection between a SKAARHOJ unit and the serial converter have been established, however it does not necessarily mean that connection to the camera have also been established. This can be confirmed if actions on the controller gets populated. An action such as the "CamTemperature C" can be used to monitor connection.

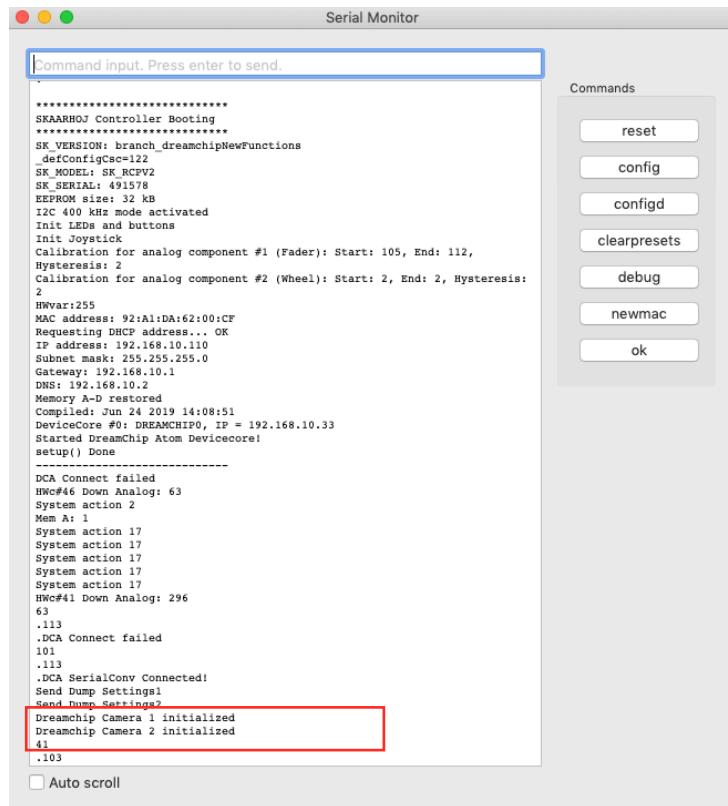
```

Serial Monitor

Command input. Press enter to send.

*****
SKAARHOJ Controller Booting
*****
SK VERSION: v2.2.143
defconfig:scs+250
SK_MODEL: SK_RCPV2
SK_SERIAL: 491578
EEPROM_size: 32 kB
I2C: 400 kHz mode activated
Init LEDs and buttons
Init Joystick
Calibration for analog component #1 (Fader): Start: 105, End: 112,
Hysteresis: 2
Calibration for analog component #2 (Wheel): Start: 2, End: 2, Hysteresis: 2
Preset 1 loaded
HWvar:255
MAC address: 92:A1:D4:62:00:CF
IP address: 192.168.10.99
Subnet mask: 255.255.255.0
Gateway: 192.168.10.1
DNS: 192.168.10.1
Memory A=freeend
Component: 3 2019 12:39:58
DeviceCore #01: DREAMCHIP0, IP = 192.168.10.33
Started dreamChip Atm Devicecore!
setup() Done
*****
DCA SerialConv Connected!
DCA44-Dreamchip Analog - 63
System action 2
Mem A: 1
System action 17
32
.104
-->
 Auto scroll
    
```

Connection to the cameras themselves can be confirmed with the messages "Dreamchip Camera x initialized " from the Serial Monitor (see below)



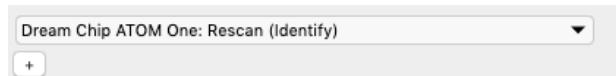
Connection Order / Reestablishing Connection to Cameras

Connection Order

If the SKAARHOJ controller and the XS1200 have been powered prior to the cameras being turned on the XS1200 might not initialize properly and there will be no control of the camera(s). A reboot of the SKAARHOJ controller will typically solve this or using the Rescan action (see below). We recommend the Dream Chip cameras being powered prior to turning on SKAARHOJ controller/XS1200.

Reestablishing Connection

If a camera have lost connection to the XS1200 (power loss etc) the connection can be reestablished by using the action. This will scan the serial bus again and identify cameras. Will take some seconds to complete.

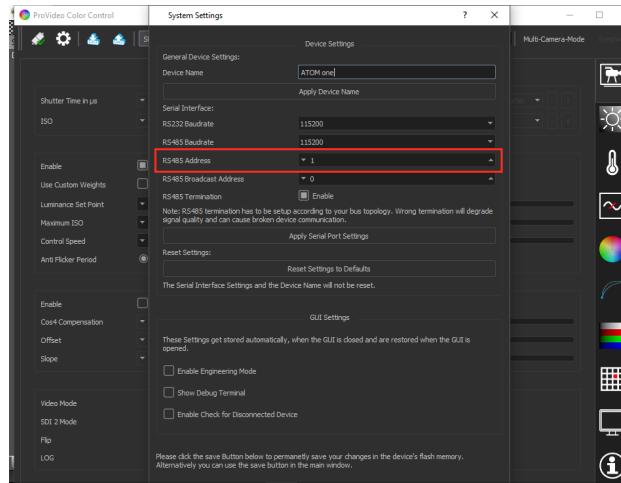


Connection Lost

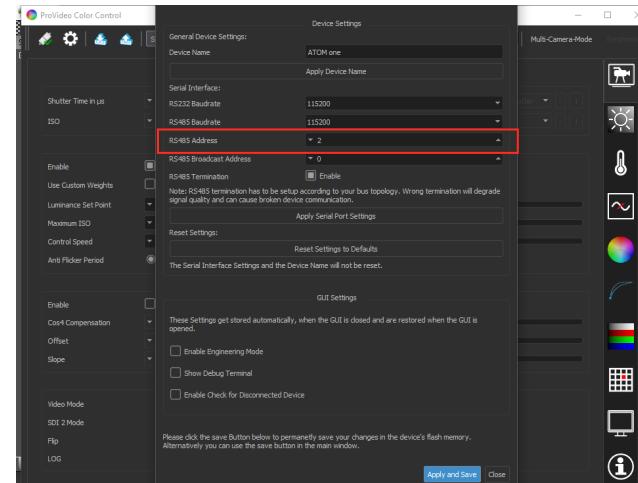
Please notice if you are controlling multiple cameras and a connection to a single camera is lost, the SKAARHOJ controller will momentarily (~10 seconds) stop controlling the remaining cameras, until it have realized the camera is disconnected. After that it will resume control of the *remaining* cameras on the bus. If the missing camera is reconnected onto the serial bus the Rescan action as described above.

Controlling Multiple Cameras

We have only tested controlling two ATOM One cameras in a daisy chain configuration. Our implementation allows for control of up to 10 cameras from the same Device Core, but this have never been tested. In order to control multiple cameras the RS485 address on the camera itself must be set by the software provided by Dream Chip. See example below.



RS485 Address: 1



RS485 Address: 2

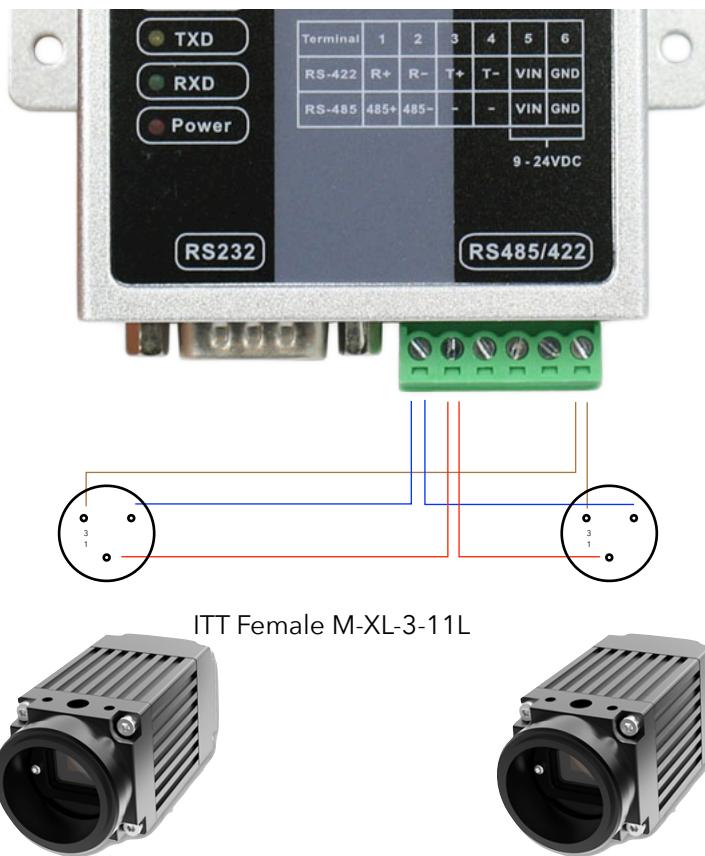
Brightness Adjustment with a Analog Component such as a T-bar

Controlling multiple cameras from a RCPv2 with a Joystick is possible however controlling a parameter such as brightness from a component as a joystick with a fixed psychical position have a drawback. If one is setting brightness to 20% on CAM1 and changing the controller for CAM2 which currently have a brightness of 80%, then when a small adjustment is made on the joystick, the brightness value will jump from its current setting (80%) to ~20%.

For multiple camera control we recommend the RCPv2 with slider/wheel instead. If the RCPv2 with joystick is the preferred way, then assign the brightness action to another another component such as one of the encoders.

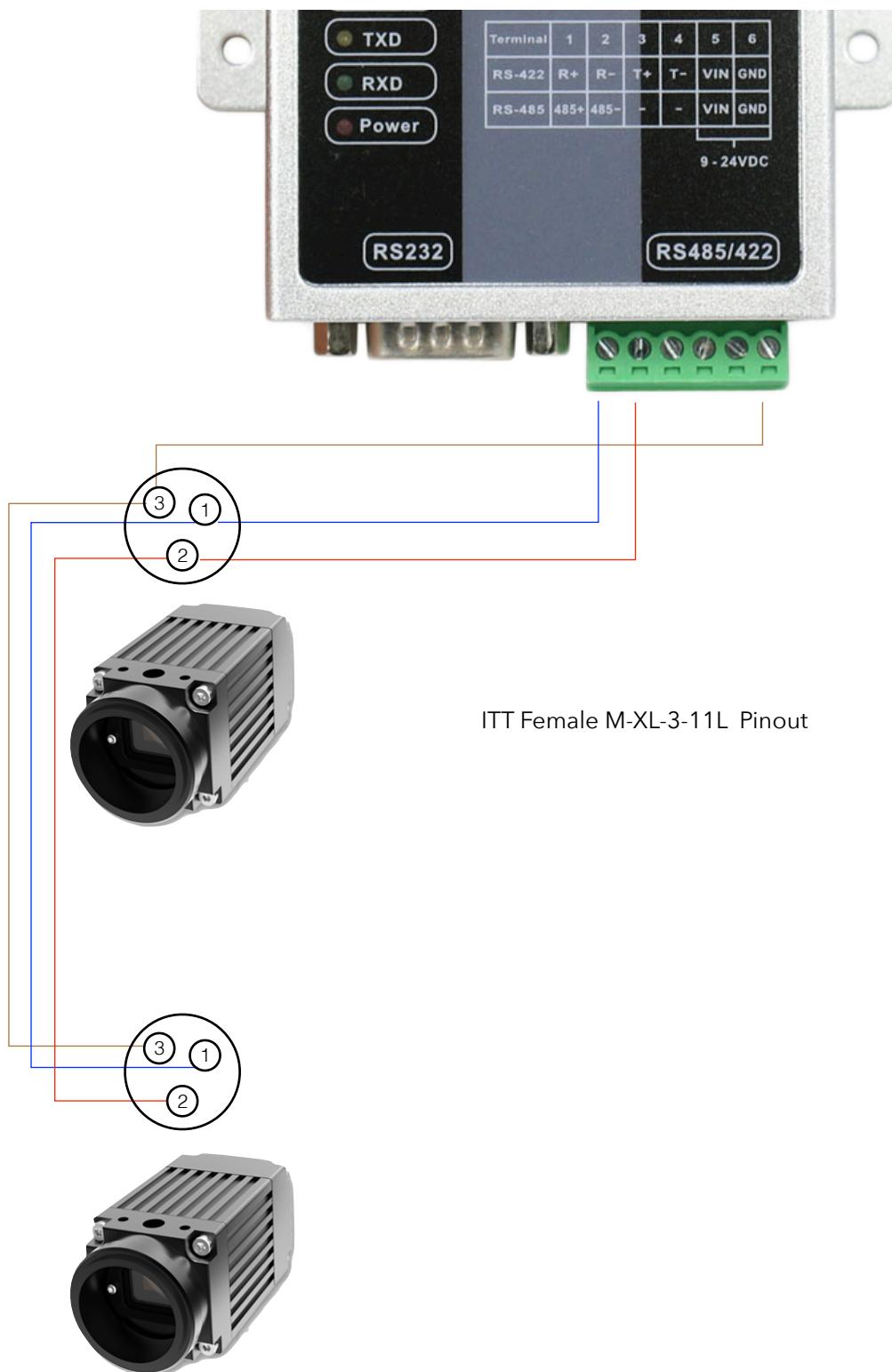
Setup for controlling two ATOM One cameras - star configuration from XS1200 Converter

Notice this set up has not been tested with the USR-TCP232-306 Converter but it should work the same.



Setup for controlling two ATOM One cameras - daisy chain configuration from XS1200 Converter

Notice this set up has not been tested with the USR-TCP232-306 Converter but it should work the same.



Actions

An excerpt of the actions in the Dream Chip Device Core

```
Dream Chip ATOM One: Gain
Dream Chip ATOM One: Image Flip
Dream Chip ATOM One: Iris Position
Dream Chip ATOM One: Zoom Position
Dream Chip ATOM One: Focus Position
Dream Chip ATOM One: Filter Position
Dream Chip ATOM One: CamTemperature C
Dream Chip ATOM One: Exposure time
Dream Chip ATOM One: SDI Black
Dream Chip ATOM One: SDI White
Dream Chip ATOM One: Brightness
Dream Chip ATOM One: Contrast
Dream Chip ATOM One: Hue
Dream Chip ATOM One: Saturation
Dream Chip ATOM One: Single Shot White Balance
Dream Chip ATOM One: White Balance Preset
Dream Chip ATOM One: Continous Auto White Balance
Dream Chip ATOM One: Auto White Balance Speed
Dream Chip ATOM One: Color Gain
Dream Chip ATOM One: Black Master
Dream Chip ATOM One: Black
✓ Dream Chip ATOM One: Flare
Dream Chip ATOM One: Filter Detail
Dream Chip ATOM One: Filter Denoise
Dream Chip ATOM One: Filter enable
Dream Chip ATOM One: Knee Point
Dream Chip ATOM One: Knee Slope
Dream Chip ATOM One: Knee WhiteClip
Dream Chip ATOM One: Knee enable
Dream Chip ATOM One: LUT Mode
Dream Chip ATOM One: LUT Preset
Dream Chip ATOM One: LUT Fast Gamma
Dream Chip ATOM One: LUT Fixed Mode
Dream Chip ATOM One: LUT Enable
Dream Chip ATOM One: Video Mode
Dream Chip ATOM One: Audio enable
Dream Chip ATOM One: AutoExposureControl enable
Dream Chip ATOM One: Reboot Camera
Dream Chip ATOM One: Settings
Dream Chip ATOM One: Rescan (Identify)
Dream Chip ATOM One: Genlock enable
Dream Chip ATOM One: Genlock Crosslock
Dream Chip ATOM One: Genlock Offset
Dream Chip ATOM One: Genlock Term
```