

Device: Dream Chip - ATOM One and SSM500



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.



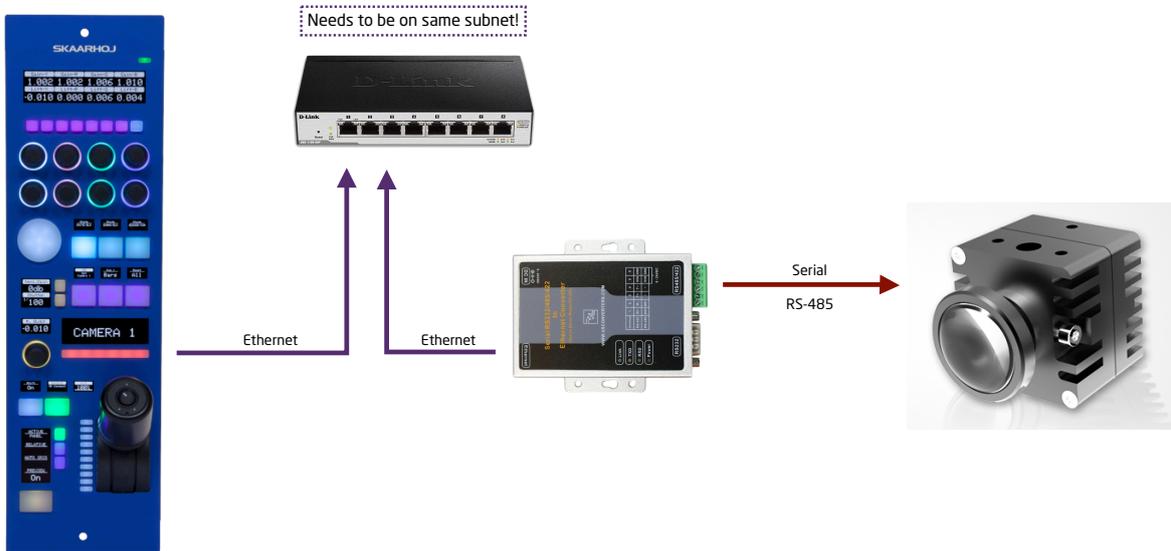
Compatibility in the ATOM One Family

We have tested successfully with the **ATOM one Mini** and the **ATOM one** camera. It is 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!*

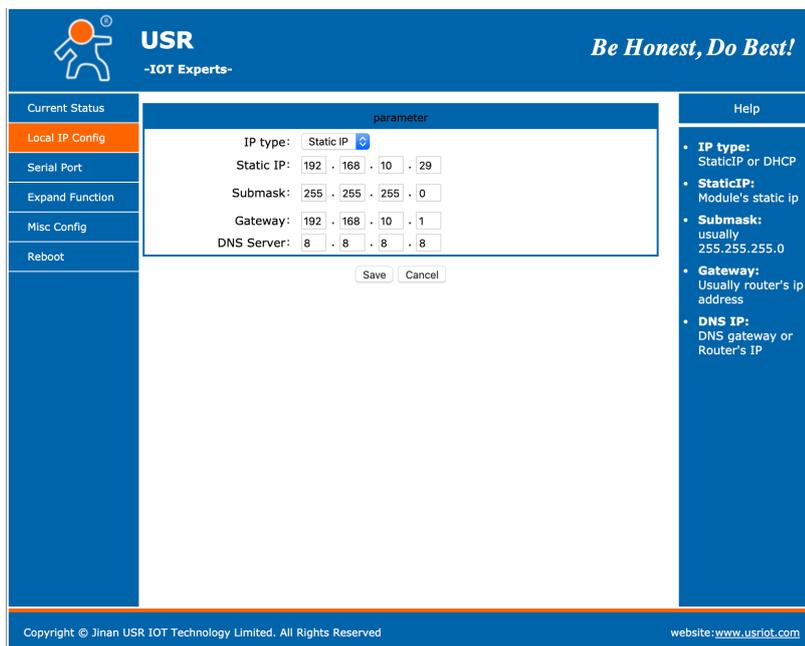
Ethernet to Serial connection

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-ethernet-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).



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Be Honest, Do Best!

<ul style="list-style-type: none"> Current Status Local IP Config <li style="background-color: #ff9900;">Serial Port Expand Function Misc Config Reboot 	<div style="border: 1px solid #0056b3; padding: 5px;"> <p style="text-align: center; margin: 0;">parameter</p> <p>Baud Rate: 115200 bps</p> <p>Data Size: 8 bit</p> <p>Parity: None</p> <p>Stop Bits: 1 bit</p> <p>Local Port Number: 5000 (0~65535)</p> <p>Remote Port Number: 8234 (1~65535)</p> <p>Work Mode: TCP Server</p> <p>Remote Server Addr: 192.168.0.201 [192.168.0.201]</p> <p>RESET: <input type="checkbox"/></p> <p>LINK: <input checked="" type="checkbox"/></p> <p>INDEX: <input type="checkbox"/></p> <p>Similar RFC2217: <input checked="" type="checkbox"/></p> <p style="text-align: center; margin-top: 5px;">Save Cancel</p> </div>	<p style="text-align: center; margin: 0;">Help</p> <ul style="list-style-type: none"> • HTTPD URL: Module add GET/POST and HTTP/1.1 in URL automatically according to user's setting. • HTTPD Packet Header: Module add HOST automatically according to user's setting, Add "Content Length" automatically in POST mode.
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<ul style="list-style-type: none"> Current Status Local IP Config Serial Port <li style="background-color: #ff9900;">Expand Function Misc Config Reboot 	<div style="border: 1px solid #0056b3; padding: 5px;"> <p style="text-align: center; margin: 0;">parameter</p> <p>Heartbeat Packet Type: None ASCII</p> <p>Register Packet Type: None</p> <p>Short Connection: <input type="checkbox"/></p> <p>TCP Server-kick off old connection: <input type="checkbox"/></p> <p>Buffer Data Before Connected: <input type="checkbox"/></p> <p>UART Set Parameter: <input type="checkbox"/></p> <p style="text-align: center; margin-top: 5px;">Save Cancel</p> </div>	<p style="text-align: center; margin: 0;">Help</p> <ul style="list-style-type: none"> • Custom Heartbeat Packet: this function is not open, not do support the Chinese , and 40 bytes in length • Custom Register Packet: this function is not open, not do support the Chinese , and 40 bytes in length • TCP Server-kick off old connection : TCP Server mode, a new connection whether to kick off the old connection, • Buffer Data Before Connected: Before the TCP connection is established, whether the data sent by serial port
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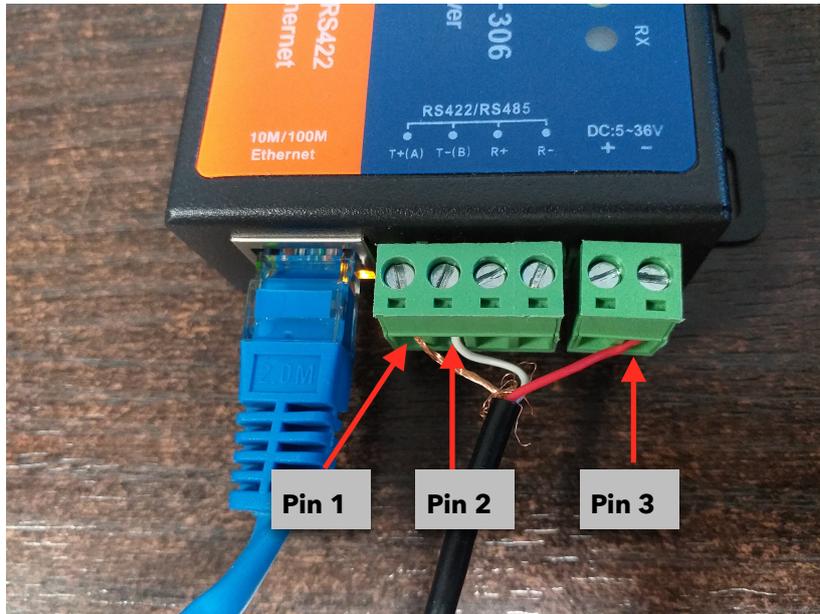
<ul style="list-style-type: none"> Current Status Local IP Config Serial Port Expand Function <li style="background-color: #ff9900;">Misc Config Reboot 	<div style="border: 1px solid #0056b3; padding: 5px;"> <p style="text-align: center; margin: 0;">parameter</p> <p>Module Name: USR-TCP232-306</p> <p>Webserver Port: 80</p> <p>Username: admin</p> <p>Password: admin</p> <p>MAC Address: 9C-A5-25-9E-DF-D4</p> <p>Max Clients Connect To TCP Server: 4 (1~16)</p> <p>Reset Timeout: 3600 (s)(0,60~65535s)</p> <p style="text-align: center; margin-top: 5px;">Save Cancel</p> </div>	<p style="text-align: center; margin: 0;">Help</p> <ul style="list-style-type: none"> • MAC Address: The module can modify the MAC address, all F's not allowed • Max Clients Connect To TCP Server: when Module is TCP Server, the max number of TCP client allowed to connect • Timeout Restart Times: When the network port without data, timeout restart, if set to 0s, function to shut down
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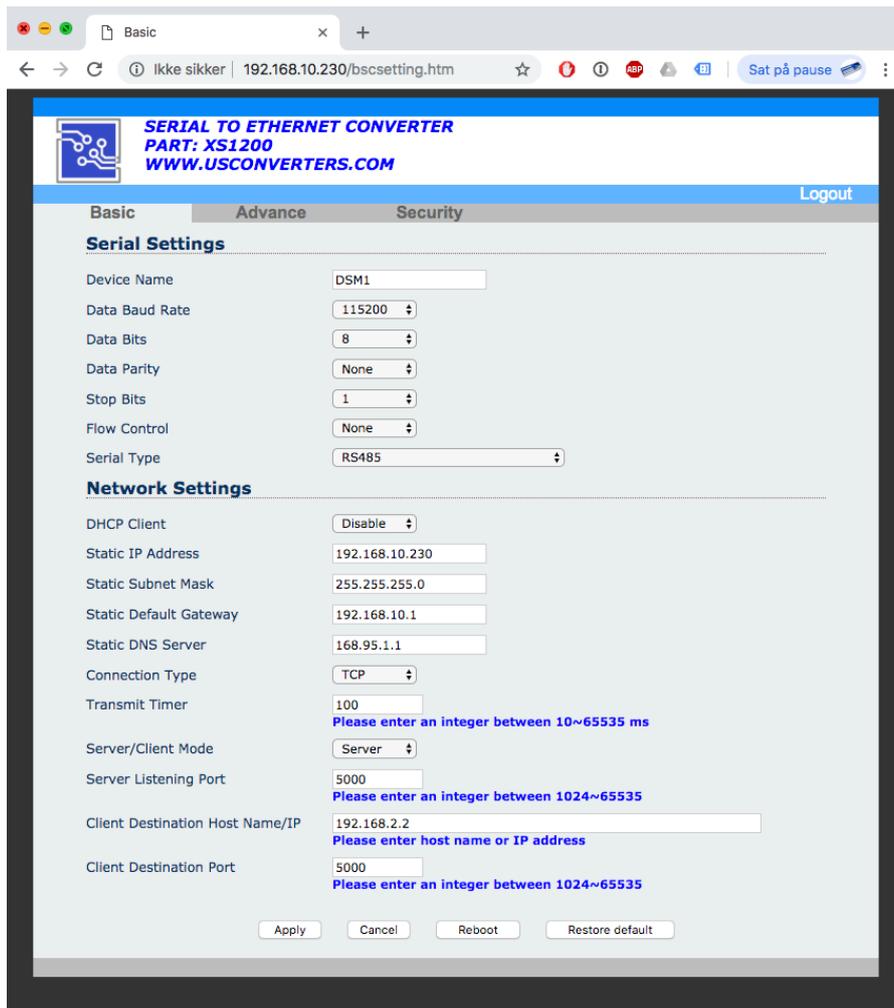
SKAARHOJ DEVICE CORES

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.

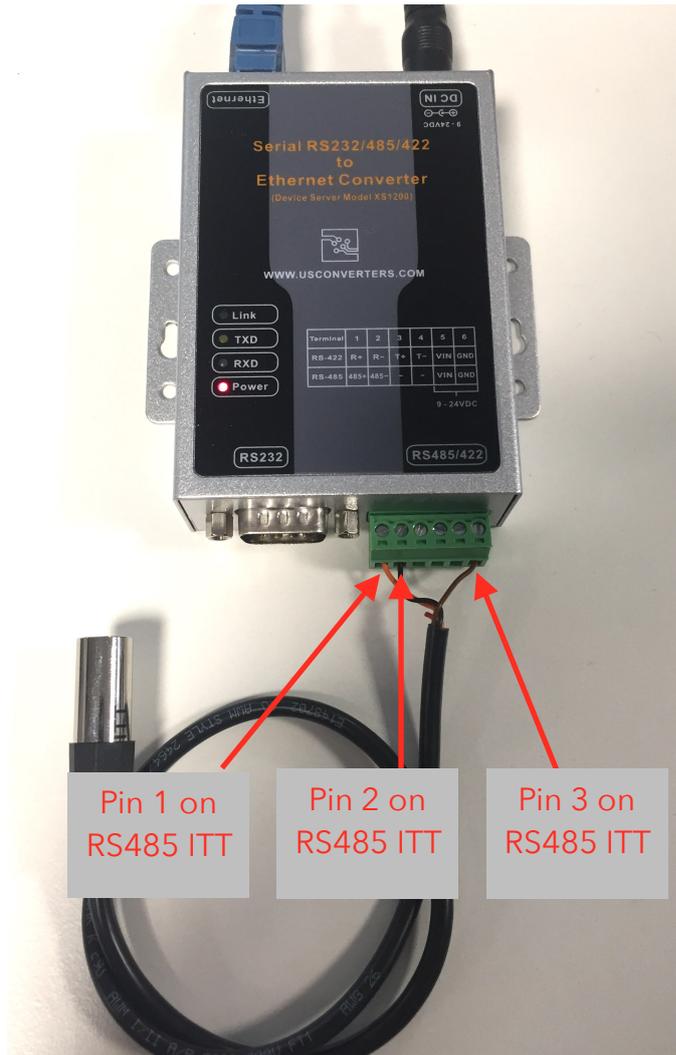
For serial commands the default for the ATOM one Mini and ATOM One is 115200 8N1 (from their manual).

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

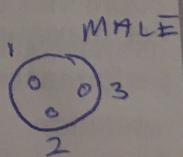
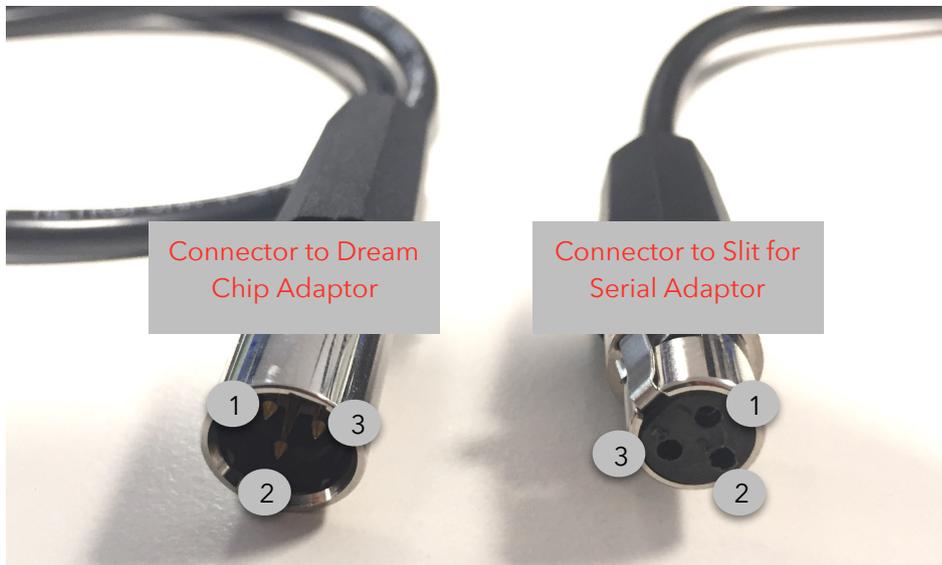
3.1 Power / RS485 Connector

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

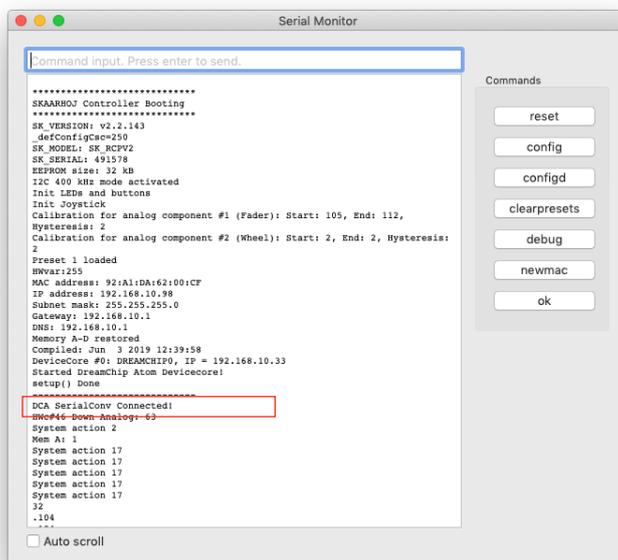
The HD-BNC output is SMPTE 292M / 424M compliant.

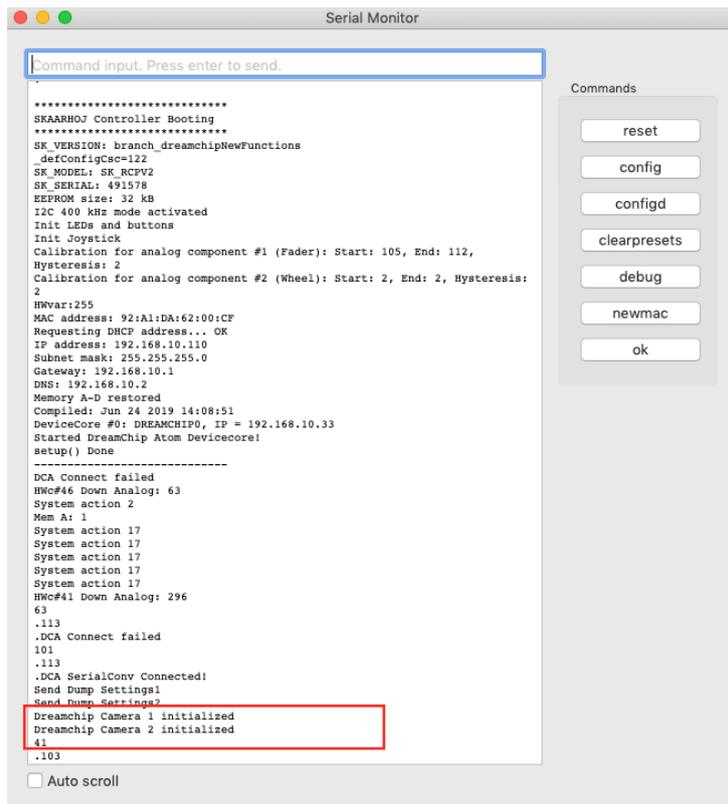


Confirm Connection

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 means that connection to the camera have also been established. This can be confirmed if actions on the controller gets populated. A action such as the "CamTemperature C" can be used to monitor connection.



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.

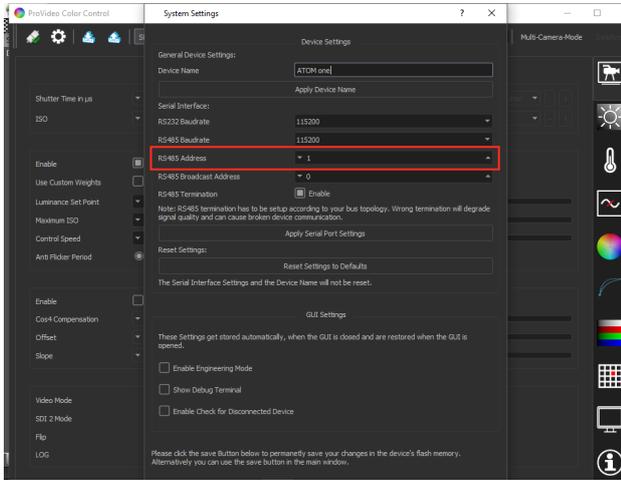


Connection Lost

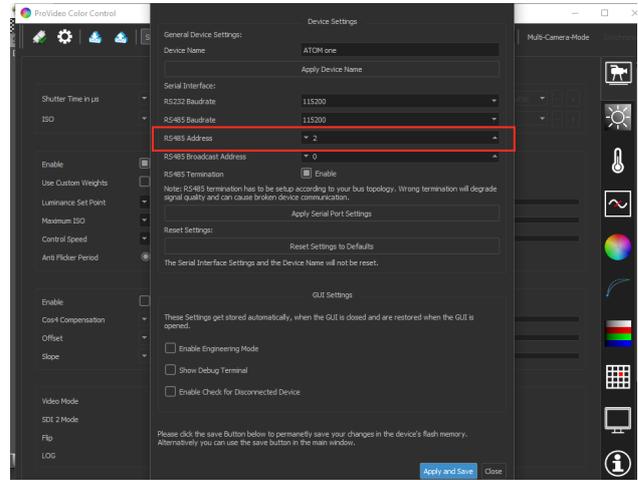
Please notice if you are controlling multiple cameras and a connection to a single camera is lost, the SKAARHOJ controller will momentarily (~10 seconds) stop controlling the remaining cameras, until it have realized the camera is disconnected. After that it will resume control of the *remaining* cameras 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 has 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

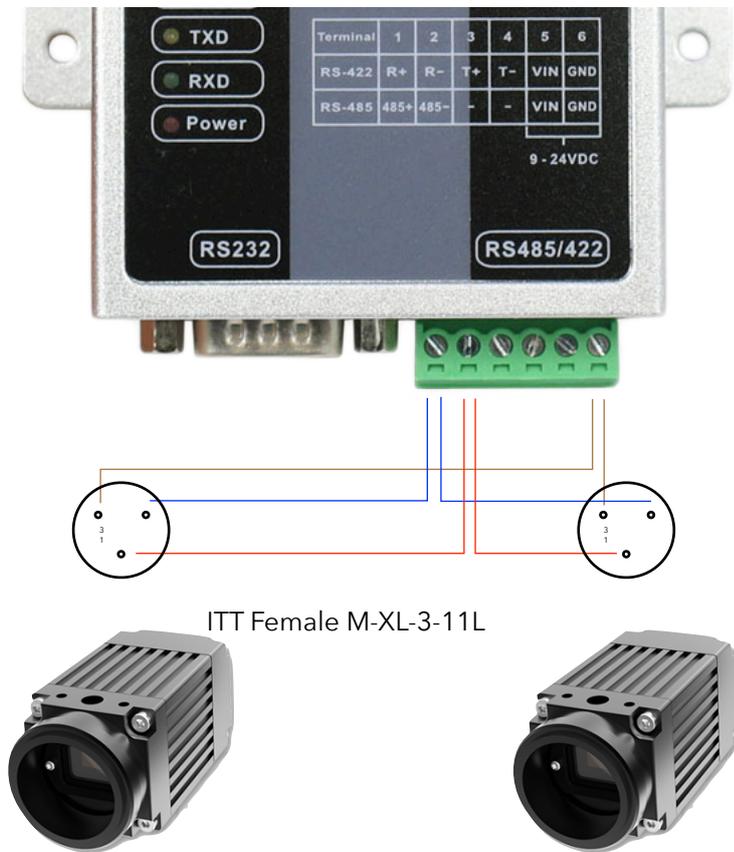
Brightness Adjustment with an Analog Component such as a T-bar

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 physical position has a drawback. If one is setting brightness to 20% on CAM1 and changing the controller for CAM2 which currently has 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 component such as one of the encoders.

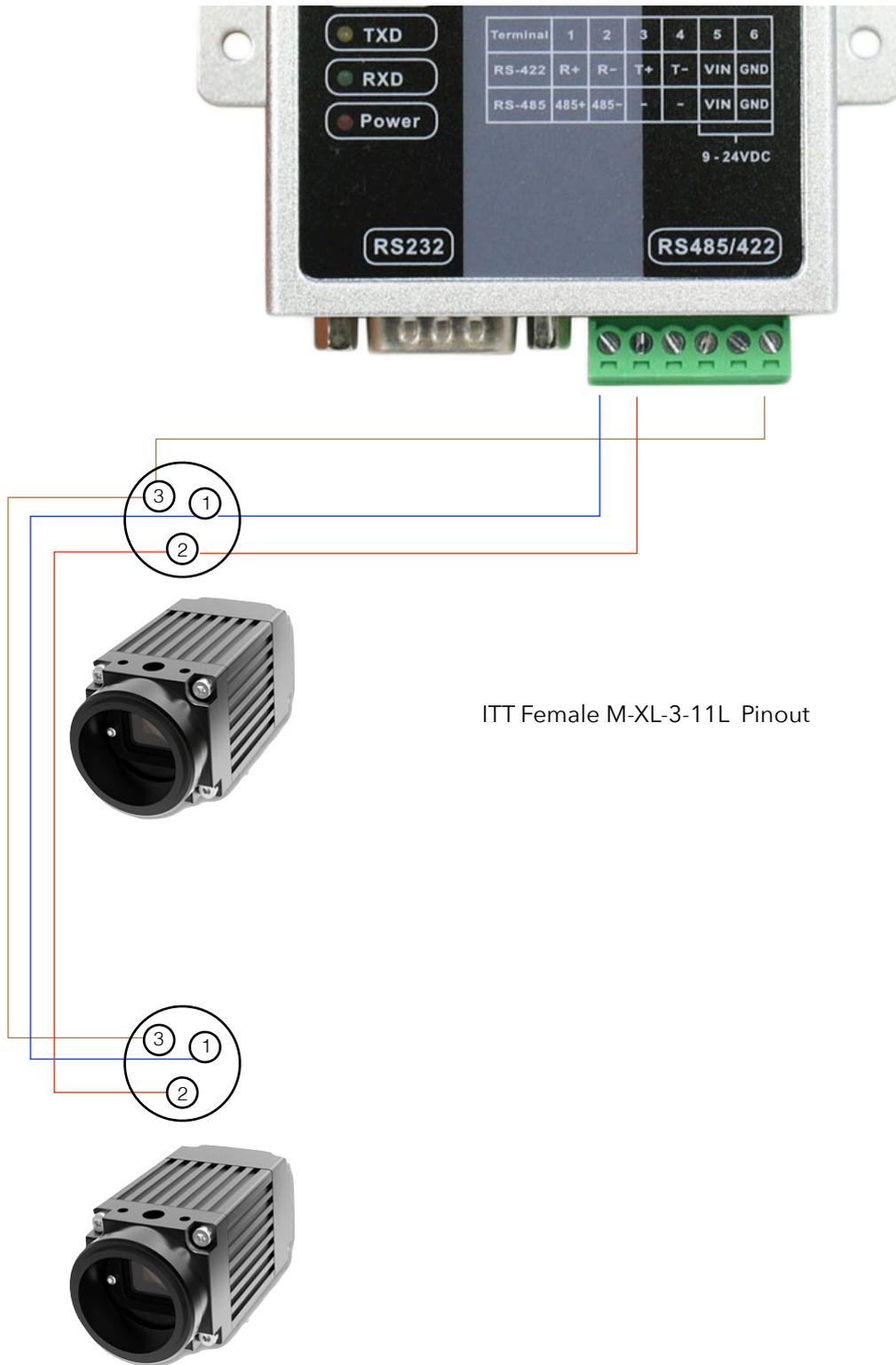
Setup for controlling two ATOM One cameras - star configuration from XS1200 Converter

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: Video Mode
Dream Chip ATOM One: Image Flip	Dream Chip ATOM One: Downscale
Dream Chip ATOM One: Iris Position	Dream Chip ATOM One: Audio enable
Dream Chip ATOM One: Zoom Position	Dream Chip ATOM One: AutoExposureControl enable
Dream Chip ATOM One: Focus Position	Dream Chip ATOM One: Reboot Camera
Dream Chip ATOM One: Filter Position	Dream Chip ATOM One: Settings
Dream Chip ATOM One: Aperture Position	Dream Chip ATOM One: Rescan (Identify)
Dream Chip ATOM One: CamTemperature C	Dream Chip ATOM One: Genlock enable
Dream Chip ATOM One: Exposure time	Dream Chip ATOM One: Genlock Crosslock
Dream Chip ATOM One: SDI Black	Dream Chip ATOM One: Genlock Offset
Dream Chip ATOM One: SDI White	Dream Chip ATOM One: Genlock Term
Dream Chip ATOM One: Brightness	Dream Chip ATOM One: Select Out Chain (SSM500)
Dream Chip ATOM One: Contrast	Dream Chip ATOM One: FPS (SSM500)
Dream Chip ATOM One: Hue	Dream Chip ATOM One: Replay: Count
Dream Chip ATOM One: Saturation	Dream Chip ATOM One: Replay: RecMode
Dream Chip ATOM One: Single Shot White Balance	Dream Chip ATOM One: Replay: Rec
Dream Chip ATOM One: White Balance Preset	Dream Chip ATOM One: Replay: RecStop
Dream Chip ATOM One: Continous Auto White Balance	Dream Chip ATOM One: Replay: Status
Dream Chip ATOM One: Auto White Balance Speed	Dream Chip ATOM One: Replay: PlayMode
Dream Chip ATOM One: Color Gain	Dream Chip ATOM One: Replay: Play
Dream Chip ATOM One: Black Master	Dream Chip ATOM One: Replay: Pause
Dream Chip ATOM One: Black	Dream Chip ATOM One: Replay: StopMode
Dream Chip ATOM One: Flare	Dream Chip ATOM One: Replay: Stop
Dream Chip ATOM One: Filter Detail	Dream Chip ATOM One: Replay: Seek
Dream Chip ATOM One: Filter Denoise	Dream Chip ATOM One: Replay: Mark In
Dream Chip ATOM One: Filter enable	Dream Chip ATOM One: Replay: Mark Out
Dream Chip ATOM One: Knee Point	Dream Chip ATOM One: Replay: Marks Reset
Dream Chip ATOM One: Knee Slope	Dream Chip ATOM One: Replay: Free
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	