ARRI Cinematic Multicam for AMIRA and ALEXA Mini

Multi Camera Setup

Date: Jan 28, 2021
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1 Introduction

This white paper describes how to integrate the ARRI AMIRA camera into a multi camera setup.

The AMIRA can be remote controlled with standard Sony remote control panels (RCPs), allowing video engineers to use the tool they are typically familiar with. Other RCPs like the Skaarhoi RCPv2 supporting the Sony SSCP and/or the ARRI CAP standard can also be used. With the CAP interface many more camera parameters can be controlled with the RCP.

The Sony RCP is connected with a SSCP device like the Sony CNA-1 or the DTS ERI, converting RCP-proprietary commands into the SSCP Sony Simple Camera Protocol and interfacing with the AMIRA camera. The Skaarhoi RCPv2 or other RCPs supporting the SSCP or CAP protocol can be connected directly to the AMIRA.

RCPs compatible with SSCP devices like the Sony CNA-1 (or other tools), are expected to work in the described configuration. Explicitly tested have been the Sony RCP-1500, Sony RCP-750 and the Skaarhoj RCPv2.
2 Typical Multicam configurations

2.1 Simple Small Scale Setup

For small installations, it may be suitable to directly connect the video input and output to a vision mixer/switcher with standard HD-SDI cables and an additional Ethernet cable for remote control.

The tally command is part of the Ethernet network for camera remote control (see Chapter Tally Control below).

2.2 Fiber based Setup SMPTE 311

In larger setups, a fiber based transmission can be used, allowing to transport all video and data signals over a single SMPTE-311 fiber cable, which does also provide power.

The tally command is part of the Ethernet network for camera remote control (see Chapter Tally Control below).
2.3 Workflow configuration with DTS fiber system

- DTS FCA Fiber Camera Adaptor
- DTS FBS Fibre Base Station
- Remote Control Panel (RCP)
- SDI OUT, SDI Return Audio Embedded
- Genlock Timecode Camera-Control (Ethernet)
- Fiber Cable / SMPTE 311

2.4 HDR HLG workflow configuration & components

- Switcher Panel
- CG HDR
- CG SDR
- Multiviewer Monitoring Gallery
- PGM
- IN 1
- IN n
- IN MV
- IN AUX
- SDI / REC 703
- HD HRD
- HDR HLG
- HLG
- External DSK
- CG HDR
- CG SDR
- Monitor
- SDR / REC 709
- SDR Rec 709 Monitor
- HDR HLG Monitor
- HDMI
- SDI Rec 709
- SDI Rec 709 Monitor

Video OUT:
- HD Mode: 2x 1.5G/3G
- UHD Mode: 4x 3G/25D plus configurable
- 1x 100/25 or 2x 60/25 or 1x 60/25
- Mon Out: 2x 1.5G 1080
- Analog Video: 1x CVBS OUT

Video IN:
- Video Ret. 1x 1.5G 1080
- Analog Video: 1x CVBS IN
- Genlock: 1x BR or Trn Level Sync through

Intercom:
- 1x PROD IN / PROD OUT
- 1x ENG IN / ENG OUT

Tally:
- Red Tally IN
- Green Tally IN

Data:
- 1x RS485
- 1x RS232
- 1x Ethernet
2.4.1 Components

Camera:
- AMIRA or ALEXA Mini cameras
- selected look: “ARRI 2100 HLG 1K 200”
- Output Color Space for SDI: “Rec. 2020”

RCP:
- Sony RCP 1500, Skaarhoj RCPv2 (or compatible) for camera matching and painting.

External Sources:
- Character generator (lower thirds, graphics): content may need to be converted from SDR to HLG, using a converter like AJA FS-HDR
- Video feeds: SDR Rec. 709 sources need to be converted using a converter like AJA FS-HDR
- AJA FS-HDR converter: for converting SDR Rec. 709 sources to a HLG signal or, for converting HLG PGM to SDR PGM output in SDR Rec. 709

Switcher:
- No specific requirements for the switcher in this workflow
- No specific settings are needed on the switcher compared to SDR Rec. 709
- Switcher PGM output is a HDR HLG signal
- For a SDR Rec. 709 signal, the switcher PGM output is converted to SDR by a converter box like AJA FS-HDR
- Multiviewer signal is provided in HLG (SDR)

Monitoring:
- Professional HDR Studio monitor like Sony X 300, Eizo CG 3145, TV Logic LUM-310R or others
- SDR Studio monitor supporting Rec. 2020 (HLG SDR signal requires a Rec. 2020 capable monitor)
- Consumer HDR (or SDR) monitor for Multiviewer Monitoring
2.5 HDR LogC workflow configuration & components for PQ and HLG

2.5.1 Components

Camera:
- AMIRA or ALEXA Mini cameras
- selected look: “ARRI 2100 PQ 1K 200” (or other PQ look depending on target nits)
- Output Color Space for SDI: “Rec. 2020”

RCP:
- Sony RCP 1500, Skaarhoj RCPv2 (or compatible) for camera matching and painting.

External Sources:
- Character generator (lower thirds, graphics): content needs to be converted from SDR Rec. 709 to Log C, using a converter like AJA FS-HDR
- Video feeds: SDR Rec. 709 sources need to be converted using a converter like AJA FS-HDR
- AJA FS-HDR converter:
  - for converting SDR Rec. 709 sources to Log C or, for converting Log C to SDR Rec. 709 or PQ

Switcher:
- No specific requirements for the switcher in this workflow
- No specific settings are needed on the switcher compared to SDR Rec. 709
• Switcher PGM output is a Log C signal
• For a SDR Rec. 709 signal, the switcher PGM output is converted to SDR by a converter box like AJA FS-HDR
• Multiviewer signal is provided in SDR Rec. 709 or PQ

Monitoring:
• Professional HDR Studio monitor like Sony X 300, Eizo CG 3145, TV Logic LUM-310R or others
• SDR Studio monitor
• Consumer HDR (or SDR) monitor for Multiviewer Monitoring

3 Supported RCP Parameters

AMIRA and ALEXA Mini camera products support remote control with Sony RCPs. With SUP 5.0 (or higher), the following parameters are supported. With other RCPs different parameters may be supported.

With devices supporting CAP like Skaarhoj RCPv2, additional camera control parameters are supported.

• Iris Control:
  ENG style PL lenses and ENG style B4 lenses via the Hirose 12/20 pin connection
  EF lenses via the lens contact on the mount and
  Cinestyle lenses using the CMotion Broadcast camin as interface between the Hirose connector and the lens motor
• Auto Iris
• Black R/G/B
• Master Black
• White R/G/B
• 5600K Override
• Auto White Balance
• ND filter selection
• Detail
• Master Gain
• Gamma R/G/B
• Master Gamma
• Master Black Gamma
• Master Knee
• Saturation
• Scene Files
• Call
• Color Bars
• Shutter
• ECS Shutter
• White Balance

Note:
Specific behavior for „Auto White Balance“:
In the AMIRA color processing signal flow, the „Auto White Balance“ function is processed before the RGB white or black processing. This is different to typical 2/3‘ cameras, and needs to be considered when using „Auto White Balance“ for „neutralizing“ the image. With AMIRA, after performing „Auto White Balance“, the RGB setting is still set and not „neutralized“.

Look support
Please make sure you have a look loaded which is editable, and not a „factory default“ look included in the camera. These looks cannot be edited. Please use the ARRI 709 Multicam look, or make a copy of a look (within the look section of the camera menu) or select an imported individual look. If a look is not editable, the RCP controls of parameters affecting the look (all color or gamma related parameters), will not change.
4 General System Setup

4.1 Required Devices
In addition to the AMIRA camera, the following hardware is required to allow remote controlling the camera by an RCP:

- RCP: Sony RCP 1500 or Skaarhoj RCPv2
- For Sony RCPs: SSCP device: Sony CNA-1 or DTS1840 Ethernet Remote Interface or equivalent
- Skaarhoj RCPv2 does not require a SSCP device
- Ethernet connection cables

For a serial RCP to SSCP device connection:
- Serial cable for connecting RCP and SSCP device

For an Ethernet RCP to SSCP device or direct connection:
- Ethernet switch supporting PoE (or PoE injector for powering SSCP device and RCP)

Optional components

- When using AMIRA SUP 5.0 (or higher) with the single or dual 6G output for UHD up to 60p, please make sure to update your camera at an ARRI service station with the latest SDI output board (IAOX RevH) to ensure best 6G or dual 6G Performance.
- A modified input board (IAOXM) is available which allows a separate genlock input, see details in the genlock chapter.
- A modified AMIRA media door is available as spare part, allowing the Ethernet cable connected while the door is closed
- Alternatively a flat Ethernet cable and connector may be used when using the standard media door.
- Camera On-board monitor with optional yoke for camera top back mounting position
  (The on-board monitor is not an essential requirement, but typically used for a studio-like setup, where the operator is located behind the camera and controls zoom and focus with rear camera controls.)
- AMIRA Multicam Monitor mount for Sony 740/741 monitors (K2.0010247), adapters are available for the TV Logic 7’ monitors
- Lens controls for Zoom and Focus, depending on the used lens type, or ARRI Master Grips

4.2 Camera Setup

- **SUP version:**
  It is strongly recommended to have the latest AMIRA or ALEXA MINI SUP 5.4 (or higher) installed.

- **Activate Genlock:** to synchronize the HD-SDI outputs by the studio clock, go to MENU > SYSTEM > SENSOR > GENLOCK SYNC and set to SYNC IN.
  Use GENLOCK SHIFT to compensate for a phase shift between the studio clock and the HD-SDI outputs.
  With the modified IAOXM board (see details below in the Genlock chapter), the genlock is connected to the TC I/O connector, and can be synchronized separately.

  **Note:** This function is not available on ALEXA Mini, please get back to ARRI for a potential custom modification

- **SDI Configuration:**
  Go to MENU > MONITORING > SDI and make sure that the HD-SDI outputs are configured matching to your setup.

- **Video paths configuration:**
  Select HOME > COLOR to configure the image processing for each video path.
  Set SDI to LOOK for the color adjustments by the RCP being baked in into the SDI output signals.
  **Note:** Make sure the SDI 1/2 processing is not set to ALEXA Classic 709.
Set REC to LOOK if you want the color adjustments by the RCP to be baked in into the internal recordings on the CFast card.
Select Log C for recordings or SDI outputs not having the looks been baked into the signal, but the look parameters being carried in the metadata.

- **Ramenate and Shutter**
  Select HOME > FPS to set the desired sensor frame rate, and HOME > SHUTTER to set the desired shutter or exposure time.
  Make sure the SDI output framerates are set accordingly.

- **Static IP address:**
  To enter a static camera IP address, please go to MENU > SYSTEM > NETWORK / WIFI > LAN static IP.

- **Multicam mode:**
  Go to: MENU > SYSTEM > MULTICAM:
  Set the IP address and port of the corresponding SSCP device.
  Note: when using a CNA-1, the port must be the same as the one configured on the CNA-1, under Gateway Configuration > Transport Select > LAN Port Configuration.
  Enable the Multicam mode checkbox.

- **Set Look:**
  You can select any look including HDR looks for multicam remote control. Please make sure the look can be modified. Just copy the selected look if you want to use a factory default look.

- **Power level warning in home screen**
  Depending on the provided power level by the transmission system, set the power warning settings accordingly: MENU > SYSTEM > POWER.

**Note:** Camera functions which are part of the RCP remote control, are not available on the camera, when the camera is in Multicam mode.

### 4.3 Lens Iris Control

- **ENG style lenses PL and B4 (with an attached lens servo unit):**
  The lens servo needs to be connected to the Hirose connector on the AMIRA PL mount.

- **Cine Style PL lenses:**
  a lens motor needs to be attached to the iris ring on the lens. The motor is controlled by the Broadcast Camin box from CMotion. The box is connected to the Hirose connector on the AMIRA PL mount.
  The Broadcast Camin3M must be connected with the RVI 9 cable, supporting the serial protocol.
  Note: Camin3M firmware version 3.11.20 is required, sw version 3.11.25 is not working, please use 3.11.20 or a version higher than 3.11.25.

- **EF lenses:**
  The iris control is supported by the EF mount included interface.
4.4  **Lens settings for Canon CN 7x17 lens**

In case the lens iris control does not work correctly, please check the following instructions (from the lens manual). For iris control with the RCP, the input route for the command signals needs to be set to “Cable”.

**Specifying the Input Route for Command Signals from the Camera**

There are two input routes for command signals from the camera: via the mount and via the 12-pin cable. This setting specifies the input route for command signals from the camera. The default setting is “Mount,” and in this case command signals received via the mount are given priority.

However, the command signals via the 12-pin cable are received automatically if no command signals are input via the mount. When the “Cable” setting is selected, only command signals received via the 12-pin cable are used.

![Diagram of input route settings](image)

1. Press once and twice. The display switches to the info screen.
2. Press five times. [FFori] is underlined.
3. Press or . Press left or right to switch the function (Cable) or (Mount).

4.5  **Lens settings for Fujinon Cabrio lenses**

Fujinon Cabrio zoom lenses can be operated in three different modes:

1. **Operation by cable**
   - Zoom control
   - Iris control (auto iris)
   - VTR (record start/stop)
   - RET (RET user button)
   - Full lens control via Master Grips and WCU-4
2. **Operation by lens mount (LDS protocol)**
   - Zoom control
3. **Operation by lens mount (Cooke /i protocol)**
   - Zoom control
   - VTR (record start/stop)
   - RET (RET user button)

**NOTE:** Operation via lens mount is not possible with a connected cable

Fujinon Cabrio dip switches:
For full functionality with AMIRA, we recommend to use the following dip switch settings:

- **QuickZoom**: ON enables QuickZoom button
- **VTR -> QuickZoom**: OFF use VTR button for recording, not for QuickZoom
- **Return > QuickZoom**: OFF use RET button as user button, not for QuickZoom
- **Iris A-M Position change**: OFF do not invert iris button settings, M = manual, A = auto
- **Camera Communications**: ON mandatory for camera communication
- **LDS, /i switch**: ON use ON for LDS protocol, OFF for Cooke /i protocol

For further information on Fujinon dip switch settings please refer to the corresponding Fujinon operation manual.

### 4.6 Compatible Fujinon ELH Large Lens Adapters

“yes” is compatible.

<table>
<thead>
<tr>
<th>Model Name</th>
<th>w/ Switch for Serial Comm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELH-112A-01AA</td>
<td>yes</td>
</tr>
<tr>
<td>ELH-112A-01AB</td>
<td>yes</td>
</tr>
<tr>
<td>ELH-112A-08A</td>
<td>yes</td>
</tr>
<tr>
<td>ELH-112A-34A</td>
<td>yes</td>
</tr>
<tr>
<td>ELH-112A-34AE</td>
<td>yes</td>
</tr>
<tr>
<td>ELH-112A-34AG</td>
<td>yes</td>
</tr>
<tr>
<td>ELH-112A-35A</td>
<td>yes</td>
</tr>
</tbody>
</table>

Compatible Fujinon ELH Large Lens Adapters

“yes” is compatible.
5 Network setup

Note: It is recommended to always proceed a factory reset before starting the setup

5.1 Settings for the RCP connected by Ethernet:

IP addresses used in the following configuration sample:

<table>
<thead>
<tr>
<th>SSCP device</th>
<th>192.168.1.1</th>
<th>CNA-1 standard after reset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sony RCP-1500</td>
<td>192.168.1.2</td>
<td></td>
</tr>
<tr>
<td>AMIRA</td>
<td>192.168.1.3</td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td>192.168.1.99</td>
<td></td>
</tr>
</tbody>
</table>

Subnet mask for all: 255.255.255.0

Note: Please make sure that all IP addresses are in the same client address space, like: 192.168.1.xxx.

5.2 Network Configuration

Instructions below are referring to Apple OS

1. System settings > Network > Ethernet (select in left column)
2. Enter these settings:

   Network settings on Apple OS

3. Confirm your settings

6 SSCP device setup

6.1 CNA-1 Basic Setup

With the standard setting after a factory reset, the IP address 192.168.1.1 is used by the CNA-1. This allows the configuration using a regular web browser and this credentials:

Login: admin
PW: password

1. To proceed a reset: push the reset button on the frontside for about 10 sec.
2. Open the browser and enter the IP address (192.168.1.1)
3. Enter Login and password
4. Click CNS tab

Note: You can configure a different IP address on the System tab.
6.2 CNA-1 Serial Cable Connection

Please use these settings for connecting the RCP with the CNA-1 by a serial connection (and not the Ethernet connection):

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNS Mode</td>
<td>Legacy</td>
</tr>
<tr>
<td>MCS Mode Configuration</td>
<td></td>
</tr>
<tr>
<td>Master Mode</td>
<td>Disable</td>
</tr>
<tr>
<td>Master IP Address</td>
<td><em>not relevant</em></td>
</tr>
<tr>
<td>Bridge Mode Configuration</td>
<td></td>
</tr>
<tr>
<td>Target IP Address</td>
<td><em>not relevant</em></td>
</tr>
<tr>
<td>Device No.</td>
<td><em>not relevant</em></td>
</tr>
<tr>
<td>Gateway Mode</td>
<td>enable</td>
</tr>
<tr>
<td>Transport Select</td>
<td>LAN</td>
</tr>
<tr>
<td>LAN Port Configuration</td>
<td></td>
</tr>
<tr>
<td>TCP Port</td>
<td>7800</td>
</tr>
<tr>
<td>Emulation Mode</td>
<td>CAM</td>
</tr>
<tr>
<td>Panel Active function</td>
<td>Disable</td>
</tr>
<tr>
<td>Transport Converter Mode</td>
<td>Disable</td>
</tr>
</tbody>
</table>

Sony CNA-1 web configuration interface with RCP connected with serial cable

6.3 CNA-1 Ethernet Cable Connection

Please use these settings for connecting the RCP with the CNA-1 by an Ethernet connection (and not the serial connection):

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNS Mode</td>
<td>Bridge</td>
</tr>
<tr>
<td>MCS Mode Configuration</td>
<td></td>
</tr>
<tr>
<td>Master Mode</td>
<td>Disable</td>
</tr>
<tr>
<td>Master IP Address</td>
<td><em>not relevant</em></td>
</tr>
<tr>
<td>Bridge Mode Configuration</td>
<td></td>
</tr>
<tr>
<td>Target IP Address</td>
<td>RCP IP Address</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Device No.</th>
<th>not relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gateway Mode</td>
<td>enable</td>
</tr>
<tr>
<td>Transport Select</td>
<td>LAN</td>
</tr>
</tbody>
</table>

**LAN Port Configuration**

<table>
<thead>
<tr>
<th>TCP Port</th>
<th>7800</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Emulation Mode</th>
<th>CAM</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Panel Active function</th>
<th>Disable</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Transport Converter Mode</th>
<th>Disable</th>
</tr>
</thead>
</table>

---

Sony CNA-1 web configuration interface with RCP connected with Ethernet cable

### 6.4 CNA-1 –Master Control Unit (MCU) setup

Please use these settings for connecting the MCU with the CNA-1 by a serial connection:

<table>
<thead>
<tr>
<th>CNS Mode</th>
<th>MCS</th>
</tr>
</thead>
</table>

**MCS Mode Configuration**

<table>
<thead>
<tr>
<th>Master Mode</th>
<th>Disable</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Master IP Address</th>
<th>MCU IP address</th>
</tr>
</thead>
</table>

**Bridge Mode Configuration**

<table>
<thead>
<tr>
<th>Target IP Address</th>
<th>RCP IP address</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Device No.</th>
<th>as desired</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Gateway Mode</th>
<th>enable</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Transport Select</th>
<th>LAN</th>
</tr>
</thead>
</table>

**LAN Port Configuration**

<table>
<thead>
<tr>
<th>TCP Port</th>
<th>7800</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Emulation Mode</th>
<th>CAM</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Panel Active function</th>
<th>Disable</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Transport Converter Mode</th>
<th>Disable</th>
</tr>
</thead>
</table>
6.5 DTS 1840 Ethernet Remote Interface setup
Please proceed likewise, following the DTS manual instructions (available separately).

Note:
A RCP Ethernet connection with the DTS 1840 ERI is only available with the appropriate ERI option, please make sure you have this installed.
You may also use a CNA-1 instead of the DTS ERI, together with the DTS fiber system.

7 Sony RCP-1500 Setup
The following settings are required to setup the RCP with an Ethernet (not serial) connection:

7.1 Firmware version
Functionality is tested with fw version 2.91. It is recommended to update a previous RCP firmware version to this version. The actual firmware can be found here: https://www.servicesplus.sel.sony.com/sony-software-model-RCP1500.aspx

7.2 Activate Engineer Mode

![Screenshot of Sony RCP-1500 – Home Menu](image)

Push MENU button > push Config button > push RCP button > push Security button > push Engineer Mode button: Orange for ON > push Exit button push > Network button

7.3 LAN I/F Menu Settings
Push LAN I/F button

<table>
<thead>
<tr>
<th>LAN I/F</th>
<th>OFF (grey, not orange)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negotiation</td>
<td>Auto (orange)</td>
</tr>
</tbody>
</table>

![Screenshot of Sony RCP-1500 – LAN I/F Menu](image)
Push "Set" button > push Exit button

### 7.4 Settings CNS Menu
Push CNS button > push Bridge > push Edit and enter these settings:

<table>
<thead>
<tr>
<th>Connection mode</th>
<th>Active</th>
<th>SSCP device IP Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target</td>
<td>192.168.1.1</td>
<td></td>
</tr>
</tbody>
</table>

![Screenshot of Sony RCP-1500 – CNS Menu](image)

![Screenshot of Sony RCP-1500 – CNS- Bridge Mode Set Menu](image)

Push Set button > push Exit button

### 7.5 Settings TCP/IP Menu
Push TCP/IP button and enter these settings and confirm each with enter:

<table>
<thead>
<tr>
<th>IP Address</th>
<th>192.168.1.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subnet Mask</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>0.0.0.0.</td>
</tr>
</tbody>
</table>
7.6 Operational RCP settings

7.6.1 PANEL ACTIVE, IRIS/MB ACTIVE and ABSOLUTE buttons

Please make sure you have the PANEL ACTIVE buttons activated for all RCP operation. For iris and master black control you need to activate the IRIS/MB ACTIVE button. The ABSOLUTE button for RGB white and black should be set to the intended mode. Please note: the manual Kelvin dial for white balance cannot be adjusted with the ABSOLUTE button active.

7.6.2 Activation of the extended Pain Menu:

In order to get access to all paint parameters available (22 pages), e.g. like manual White Balance setting, the RCP must be configured accordingly:
- Activate the engineering mode (see further above) and go to MENU > CONFIG > RCP > CUSTOMIZE > CUSTOM MENU SW:
- Push one of the CUSTOM buttons 1 or 2 above the PAINT button.
- Select „Paint“ with the left rotary control below the menu display and confirm by pushing “Enter” on the touchscreen
- On the touchscreen display push „Save“
- You will find the extended paint menu when pushing the selected CUSTOM button

7.6.3 SHUTTER OFF behavior

In SHUTTER OFF mode, the exposure time is referring to the SDI 1 Output framerate and is 1/double framerate (where possible).

Progressive formats:
25fps -> 1/50 or 30fps -> 1/60
50fps -> 1/100 or 60fps -> 1/120

Interlaced format behave adequate (even though the sensor runs on double framerate):
50i or 50psf -> 1/50,
60i or 60psf -> 1/60.

Please note: the reference for the framerate is the framerate set at the SDI 1 output.

7.6.4 AUTO IRIS mode

When AUTO IRIS is active, the iris cannot be changed with the joystick on the RCP.

7.6.5 Shutter On/Off

When changing framerates on the camera, the shutter will only be updated on the RCP after the Shutter on the RCP has been switched Off and On.

→ Fixed with SUP 6.1
7.6.6 Master Gain - ASA

With the selected gain levels on the RCP, the equivalent ASA levels are set in the camera:

-6 dB = 400 ASA
-3 dB = 640 ASA
0 dB = 800 ASA
+3 dB = 1280 ASA
+6 dB = 1600 ASA
+9 dB = 2560 ASA
+12 dB = 3200 ASA

8 Skaarhoj RCPv2 setup

Skaarhoj RCPv2 supports direct Ethernet connection and does not need an additional tool. For general configurations, please follow the Skaarhoj manual instructions (available separately). Default password for the CAP interface is “skaarri”.

9 Camera Remote Control by CAP

The camera can be fully remote controlled with the CAP interface available through Ethernet or WiFi connection. Amongst all typically required camera control functions, CAP also supports the tally command and the return switch trigger.

Access to the CAP protocol is available through the ARRI partner program. Please contact the ARRI service or an ARRI sales representative for further information.

10 Synchronization (Genlock)

The AMIRA by default has a single BNC connector for return-in and genlock. When syncing to a studio clock, the return in (PGM) signal is used to sync the camera to the studio clock, so that the HD-SDI outputs of the AMIRA are in sync to the studio clock.

The input for the sync input signal can be selected in the camera menu: MENU > SYSTEM > SENSOR > GENLOCK SYNC.

The AMIRA provides a genlock phase shift, so that the output signal can be adjusted to the studio clock.

10.1 Separate genlock input

For specific requirements, the AMIRA can be modified with a specific (IAOXM-A1, K3.0016910) input board, which provides a separate genlock input at the TC I/O connector. This allows for a separate sync shift without affecting the return input.

To modify an existing camera with this board, please contact ARRI service for the modification. For new cameras, please order the board with your camera order.

The input for the sync input signal can be selected in the camera menu: MENU > SYSTEM > SENSOR > GENLOCK SYNC > SYNC IN or TC IN or REF IN/ANALOG. The REF IN/ANALOG option is available in the menu, if an IAOXM-A1 board is included in the camera. The naming label of the connector shows (TC IO / REF IN) accordingly.

The latest generation of the IAOXM board includes a 75Ohm terminating resistor on the TC IO/REF IN connector. This improves the reliability of a Trilevel Sync input, but limits the TC input on the other side (see next chapter for details).
10.1.1 Timecode synchronization with the IAOXM board:
With the IAOXM board included, the timecode sync is not fully supported, you will see the error message “LTC signal is missing”. Nevertheless, the timecode values are taken over which you may use for syncing your CFast card recordings.
Please connect the timecode source directly to the camera, as timecode signals connected through the fiber system may not work. Preferably just use a timecode generator with steep amplitudes, like models from Ambient Recordings.

In order to support timecode synchronized recordings on the CFast card, the following “jam-sync style” workflow is suggested.
Connect the timecode source, on home screen click TC > OPTIONS > TC BNC MODE and set to TC IN, then click (TC > OPTIONS >) MODE > REGEN.
After completion, disconnect the TC source and connect the genlock source to the TC I/O connector, and make sure it is set to: MENU > SYSTEM > SENSOR > GENLOCK SYNC > REF IN/ANALOG.

Note:
Please contact the ARRI service or an ARRI sales representative for further information.

11 Tally support
In addition to modify image parameters with an RCP, AMIRA can also receive green and red tally information. The AMIRA displays the tally by lighting up the integrated tally lights on the EVF (red only) and on the camera back (red only), plus a red and green tally overlay in the lower third part of the MVF is displayed as well as on the SDI outputs (if configured to “processed”).
There are two ways to send a tally command to the camera:

11.1 Tally by CAP
The Tally commands are included in the CAP protocol, starting with SUP 5.2. CAP is a protocol interface for remote access to the camera, and it is available within the ARRI partner program.
The Ereca CAM Racer supports this function.

11.2 Tally by Telnet command
A second path for the tally commands are telnet commands:
To display the tally on an AMIRA, the AMIRA provides a telnet interface on port 40000 that can be accessed via Ethernet or WiFi. The command “tallyengage <parameter>” controls the tally output on the AMIRA, where <parameter> may be 1 to activate tally, and 0 to deactivate tally.

As an example, the communication with an AMIRA with IP address 192.168.0.104 is given below. The bold texts are entered by the commanding system, the regular texts show the responses sent by the camera.
First, a connection to the camera is established. Then the command “tallyengage 1” is sent, which activates the red tally on the AMIRA. Next, the command “tallyengage 0” is sent, which disables the tally on the AMIRA.
The command “tallyengage 2” activates the green tally.

```
$ telnet 192.168.0.104 40000
Trying 192.168.0.104...
Connected to 192.168.0.104.
Escape character is '^]'.
tallyengage 1
Response: TallyEngage
Result: c "Done."
tallyengage 0
Response: TallyEngage
Result: c "Done."
```
A tally injector is available as a reference model from ARRI. This is connected to the mixer (providing a close contact command) on the one end, and to the Ethernet on the other end, providing a Tally command for the camera by Ethernet. Other providers (like DTS) or system integrator may provide their own solution here.

A tally injector can be easily done:
Just connect the inputs of an Arduino or Rasberry Pie with the outputs of the mixer, program some lines of code for the telnet command triggering the camera tally (see details above, please contact ARRI if more info is requested), and use the Ethernet network to send the command to the camera.
The DTS1840 Ethernet Remote Interface supports this function.

12 Web Remote

It may be useful to have a laptop attached to the Ethernet network. This allows using the web remote interface (with a web browser) of each camera to check and modify camera parameters, and to e.g. trigger internal recording on cameras.

The web remote can be accessed with a web browser by entering the IP address of the camera and is also available by WiFi access.
Alternatively, the AMIRA can be remote controlled with the CAP protocol.

13 Contact

If you have any questions regarding AMIRA Multi Camera Setups, please feel free to contact your local ARRI sales representative or the ARRI camera service.