SXU-1 Single Axis Unit

Instruction Manual

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Imprint

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Original version.

For further assistance

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Document information

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1 For your safety

Always keep this document on hand. It should be read, understood and observed by all persons using SXU-1 Single Axis Units. All other products must be handled as prescribed by their manufacturers.

1.1 Risk levels and alert symbols

Safety warnings, safety alert symbols, and signal words in these instructions indicate different risk levels:

This symbol alerts you to personal injury hazards. Obey all warnings that follow this symbol to avoid possible injury or death.

This symbol alerts you to electrical hazards. Obey all warnings that follow this symbol to avoid possible injury or death.

DANGER!
Indicates an imminent, hazardous situation which, if not avoided, **will result in** death or serious injury.

NOTICE: Explains practices not related to physical injury. The safety alert symbol is not used with this signal word.

Note: Provides additional information to clarify or simplify a procedure.

1.2 Vital precautions

NOTICE: Read and follow all instructions before using the product. Use the product only as described therein. Never open it. Never insert objects.

Never attempt to repair the product: Have it always repaired and serviced by authorized ARRI Service Centers.

Never remove or deactivate any product safety equipment (incl. warning stickers or paint-marked screws).

Always protect the product from moisture, cold, heat, dirt, vibration, shock, or aggressive substances.

1.3 General precautions

NOTICE: The product is designed for all cameras with the ARRI Lens Control System LCS or Universal Motor Controller UMC-3A. For use with other cameras, consult the respective manufacturer.

Use only the tools, materials and procedures recommended in this document. For the correct method of use, see your camera manuals.

1.4 Audience and intended use

NOTICE: The product is solely and exclusively available for commercial costumers and shall be used by skilled personnel only. Always contact ARRI preceding other uses. Every user should be trained according to ARRI guidelines.

The SXU-1 is a single-axis hand unit solely and exclusively for iris, focus or zoom control:

- Wireless via ARRI white radio modem *(see p. 11)*
- Wired via ARRI Lens Control System LCS
- **Note:** For use with other systems, consult the respective manufacturer

Never use the product for any other purpose. Always follow the valid instructions and system requirements for all equipment envolved.

1.5 System requirements

NOTICE: To tap the full potential, have all connected units updated to a Software Update Packet SUP equal or higher to those listed below.

	Basic	Torque adjust	Motor direction switch
ALEXA (XT) Plus/Studio	7.0	8.0	9.0
UMC-3A	04B	04C	
ARRICAM + LDB-ST/LT	06A		
ARRIFLEX 435 Xtreme	05A		
ARRIFLEX 416 Plus (HS)	04A		

2 Scope of delivery and warranty

On delivery, please check if package and content are intact. Never accept a damaged/incomplete delivery. A complete delivery includes:

- Single Axis Unit SXU-1
- Shoulder strap
- Plain white marking ring
- Instruction manual
- Original packaging

For scope of warranty, please ask your local ARRI representative. ARRI is not liable for consequences from inadequate shipment, improper use, or third-party products.

For spare parts and additional accessories, see p. 35.

3 Product layout

The SXU-1 is a single-axis hand unit for wireless lens motor control (iris, focus, zoom). It is compatible with ALEXA (XT) Plus/Studio models or with other cameras via the Universal Motor Controller UMC-3A.

1 Control panel
2 Internal antenna
3 Plain marking ring
4 Check mark with nut
5 Control knob
6 LCS socket
7 White radio marker
8 Grip
9 Finger rest
10 Product ID labels
11 Eyelet for shoulder strap
12 Battery compartment

3.1 Product identification

Type label and serial number (2) are on the product's back. FCC ID and IC numbers are on the CE conformity label (1).

3.2 Control knob

NOTICE: Motors can be rigged either left or right of a lens. Correct control knob operation requires a properly set lens motor direction *(see p. 23).*

1. Turn the control knob to adjust focus, iris or zoom setting.

3.3 Control panel

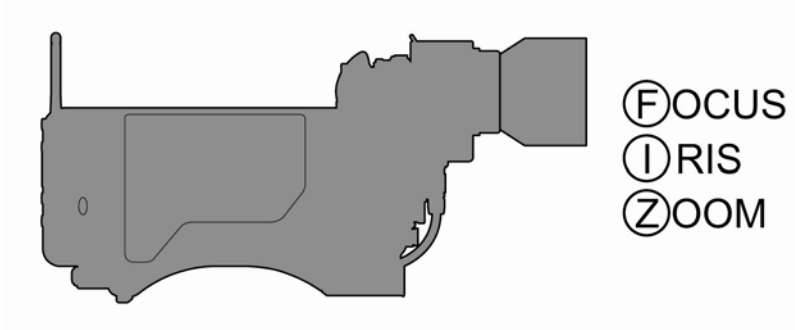
1 Recording button REC
2 LED for camera status
3 Power button
4 Navigation buttons
5 Sensor for AUTO backlight
6 Display

3.4 Control display

1 Upper navigation buttons
2 Upper navigation info
3 Lower navigation info
4 Lower navigation buttons
5 Connectivity status
6 Battery status
7 Preset lens axis
8 Radio channel number

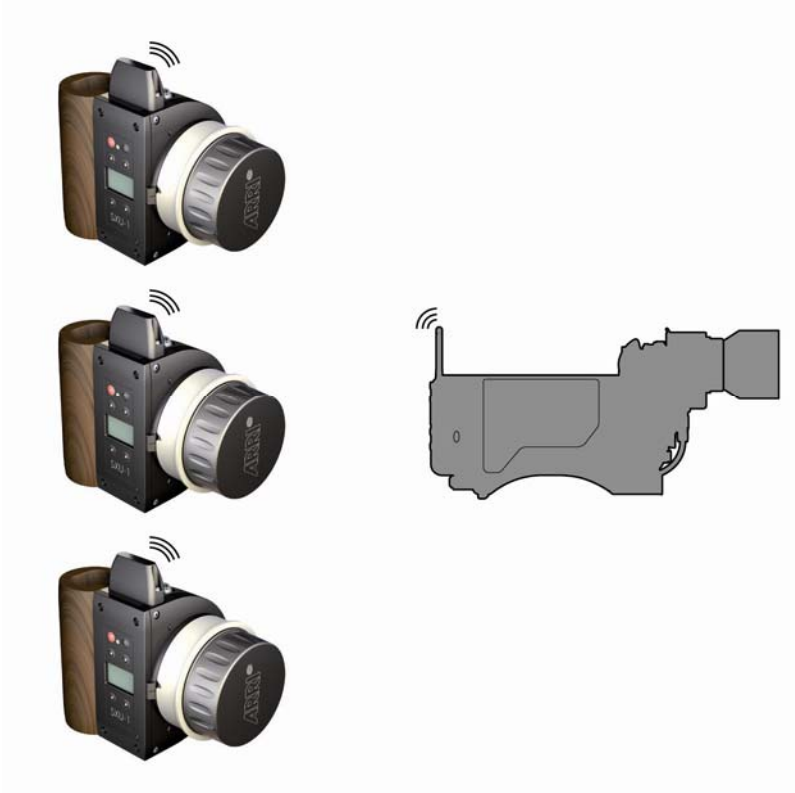
When navigating, the home screen will change to subscreens of a different structure. The navigation info for each button may change.

4 Typical operation setups



For both wireless and wired operation, all lens motors must be connected to the camera (or motor controller).

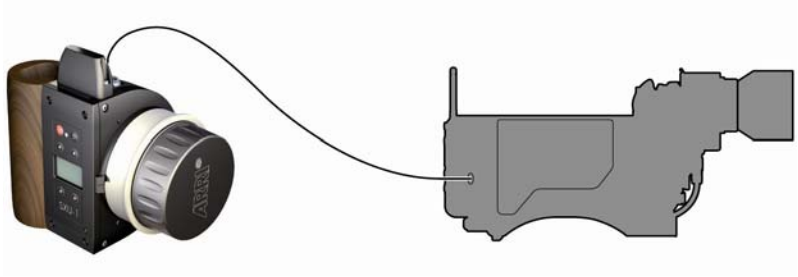
4.1 Wireless (via white radio)



For wireless operation, you can combine up to three SXU-1 per camera (or motor controller). Sync cables allow a 3D operation. Please consult your camera or controller manuals. Or ask your ARRI partner.

NOTICE: You cannot address two cameras simultaneously on the same radio channel.

4.2 Wired (via LCS)



For wired operation, maximum LCS cable length is 75 m (250 ft). Power is supplied via the camera (or motor controller).

NOTICE: LCS connection automatically disables the SXU-1's white radio and distributed control.

5 Power supply

5.1 Rechargeable battery

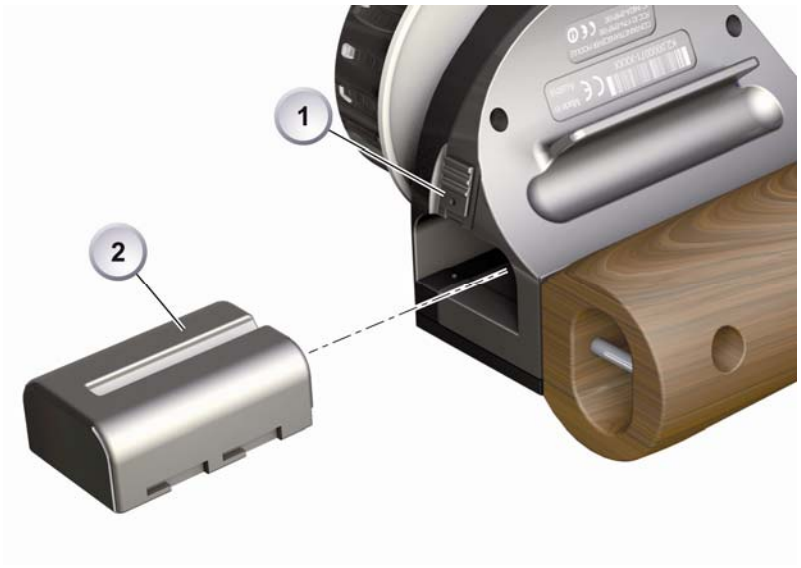
DANGER!

High voltage! Risk of electric shock!

Use only the recommended battery and charger *(see p. 35).* Read valid battery and charger manuals before use. Never expose to humidity. Never disassemble.

NOTICE: Old batteries should not be disposed of in domestic waste: Always dispose them according to valid local regulations and the information in the battery manual.

NOTICE: Normal charging is usually completed when the charge LED on the battery charger goes out *(for details, see battery and charger manuals).*



1. Charge battery according to battery and charger manuals.
2. Unlatch (1) and remove empty battery (2).
3. Insert full battery (2) until latch (1) snaps audibly.
4. Product is now ready to switch on.

5.2 AC power grid

DANGER!

High voltage! Risk of electric shock!

Use only the original AC power pack *(see p. 35)* and read its manual before use. Never expose to humidity. Never disassemble.

Via five different adapters, the optional Hand Unit AC Power Supply connects the product to AC grids worldwide.

1. Click adapter (1) onto power pack (2).
2. Connect power pack to LCS socket (3) and AC grid.
3. Product is now ready-to-switch-on.

NOTICE: Battery charging is not possible via the product. AC power supply always entails wireless (white radio) operation.

5.3 LCS hardwire

1. Connect product (1) to camera (2) via a standard LCS cable (maximum length: 75 m/250 ft).
2. Product is now supplied with power/control lines and ready-to-switch-on.

NOTICE: Battery charging is not possible via the product.

---

6 Prior to operation

6.1 Before each switch-on

NOTICE: Always prepare the camera first: Connect lens motors and motor controller with white radio according to valid camera manual. Only then, should you connect the camera to the product.

6.2 After each change of lens

NOTICE: Each change of lens requires a new calibration. The display will automatically prompt you: “Calibrate motor now?” **If not:** Check connection to camera. For calibration, *see p. 21.* If necessary:

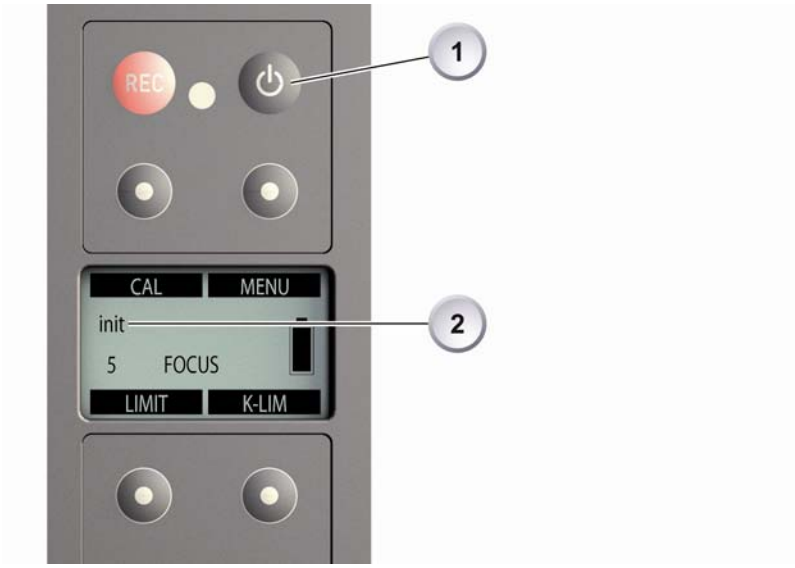
Change motor direction (left, right), *see p. 23*
Manually recalibrate, *see p. 21*
Change motor torque (1 to 4), *see p. 22*

6.3 Switching on and initialization

NOTICE: A full initializon always ends with a full automatic calibration. **If not:** Connect product properly to camera. Check for:

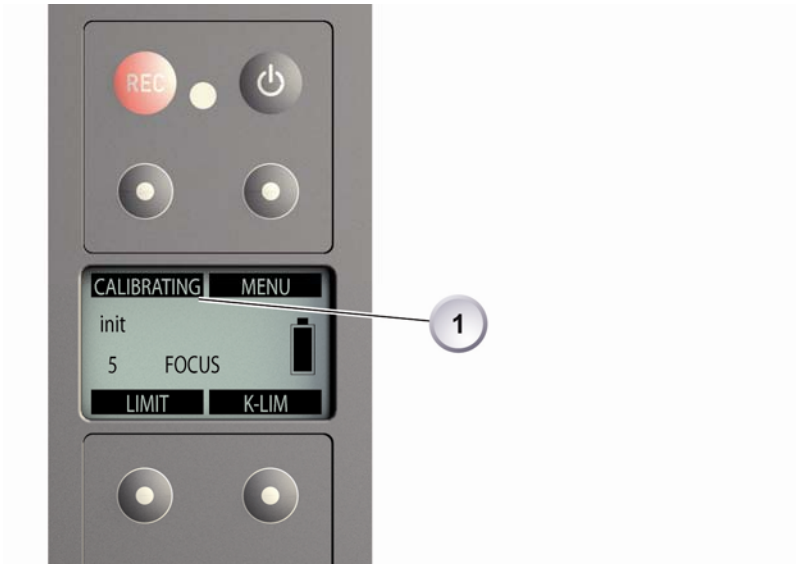
Correct white radio channel (0 to 7, or off), *see p. 18*
Correct lens axis (focus, iris, zoom, or off), *see p. 20*
Correct motor direction (left, right), *see p. 23*

If necessary, calibrate manually *(see p. 21).*



1. Ensure proper power supply and camera preparation *(see p. 16).*
2. Press power button (1).
3. Product initializes: Display blinks *init* (2).

4. Check product connectivity:
   (1) Ready-to-connect but not yet connected.
   If (1) blinks *init:* Product is still initializing.
   (2) White-radio-connected.
   If (2) is blank: White radio is off or replaced by an LCS connection, or current channel is occupied otherwise.



5. **CAL** blinks **CALIBRATING** (1).
6. Each connected lens motor moves the lens ring from the end-to-end position.
7. **CAL** reappears solid: initialization complete.

6.4 Selecting a radio channel

NOTICE: Never select a frequency that will interfere with other radio setups. When initially selecting a radio channel, do so via the camera receiver (not via the product).

1. Press **MENU** (A).
2. Menu opens on **Radio Channel** (B).
3. Press **ENTER**.

4. Submenu opens (C) on preset channel *(in this case: 5).*
5. Scroll **UP** or **DOWN** to select new channel (*for frequencies see p. 37),* or to switch white radio **OFF.**
6. Confirm with **SET** (D).
7. Exit with **HOME.**

6.5 Switching the radio off/on

1. Enter **Radio Channel** *(see A to C above).*
2. To deactivate: Scroll **UP** until **OFF** and press **SET** (E).
3. To (re)activate: Press **ON,** then **SET.**
4. Exit with **HOME.**

6.6 Selecting a lens axis

1. Press **MENU** (A).
2. Menu opens (B).
3. Scroll **DOWN** until **Lens Axis.**
4. Press **ENTER**.

5. Submenu opens (C).
6. Check preset lens axis (**n/a** indicates non-availability).
7. Scroll **UP** or **DOWN** to select **Focus, Iris, Zoom** or **off** (D). **Note:** Select **off** to deactivate all lens axes.
8. Confirm with **SET** (all other axis are off now).
9. Exit with **HOME.**

NOTICE: Deactivating all lens axes with **off** helps you “freeze” a lens in its position and avoid accidental lens action.

6.7 Calibrating to lens

NOTICE: Each change of lens requires new calibration, including torque and sometimes motor direction. To avoid damage, always calibrate motors to a new lens.

1. Press **CAL** (A) for at least three seconds.
2. Display will count down to zero (B).

3. **CAL** blinks up **CALIBRATING** (C).
4. Lens motor moves lens ring from one end to the other.
5. **CAL** (D) reappears solid.
6. Calibration complete.

NOTICE: To interrupt calibration, release **CAL** button during count-down.

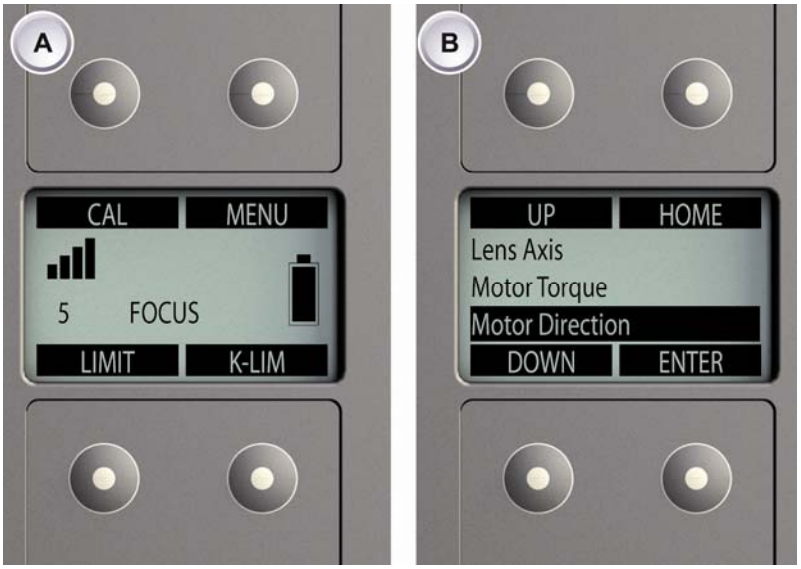
6.8 Changing the lens motor torque

NOTICE: High torque can damage the lens. Always set a torque appropriate to the lens. **Rule of thumb:** Small lens, small torque. Always increase the torque in small steps.

1. Press **MENU** (A).
2. Menu opens (B).
3. Scroll **DOWN** until **Motor Torque.**
4. Press **ENTER**.

5. With **UP** or **DOWN** (C), select iris, focus or zoom motor (**n/a** means: motor not connected).
6. Press **CHANGE** for each selection.
7. With **UP** or **DOWN** (D), select a torque (4=max).
8. Confirm and exit with **HOME.**

6.9 Changing the lens motor direction



1. Press **MENU** (A).
2. Menu opens (B).
3. Scroll **DOWN** until **Motor Direction.**
4. Press **ENTER**.

5. With **UP** or **DOWN** (C), select focus, iris or zoom motor.
6. Press **CHANGE** for each selection
7. Confirm with **SET** (D)
8. Confirm and exit with **HOME.**

7 Operation

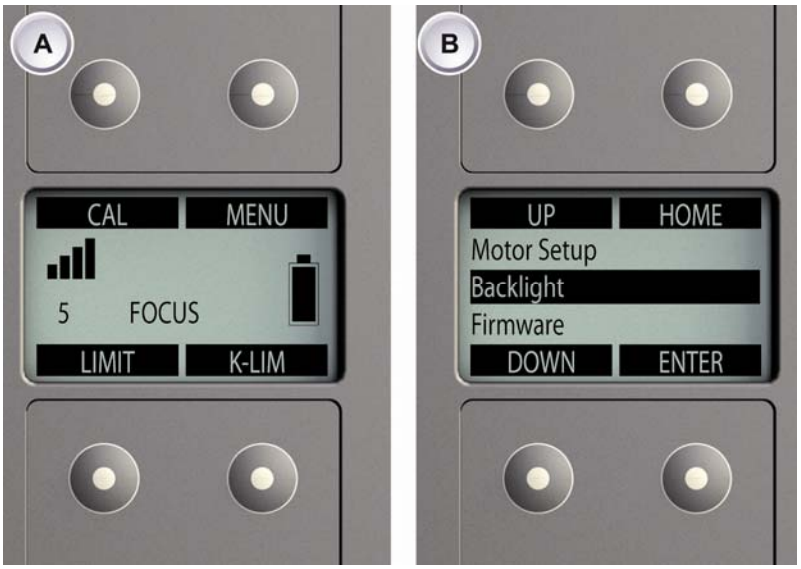
NOTICE: Conduct all prior-to-operation preparations *(see p. 16).*

7.1 Changing the backlight

The display and control knob backlight can be dimmed to a preset maximum. You can toggle between two modes:

AUTO Backlight automatically on/off via sensor.

FIX Steady backlight.



1. Press **MENU** (A).
2. Menu opens (B).
3. Scroll **DOWN** until **Backlight.**
4. Press **ENTER**.

5. Display opens: here on **AUTO** (C).
6. Toggle with **MODE:** here onto **FIX** (D).
7. Scroll **UP** or **DOWN** for backlight intensity (0=off).
8. Confirm and exit with **HOME.**

7.2 Limiting the motor range

Limiting the motor range allows a more sensitive lens control.

1. With control knob (A), turn lens axis to desired start position.
2. Press **LIMIT** once (B) until blinking.

3. With control knob (C), turn lens axis to desired end position.
4. Press **LIMIT** (D) again.
5. Blinking changes to an icon: Limits are set.
6. To reset: Press **LIMIT** (D) again.

NOTICE: To set motor limits, you can also keep **LIMIT** pressed from start to end position. Motor and knob limits can be combined.

7.3 Limiting the control knob range

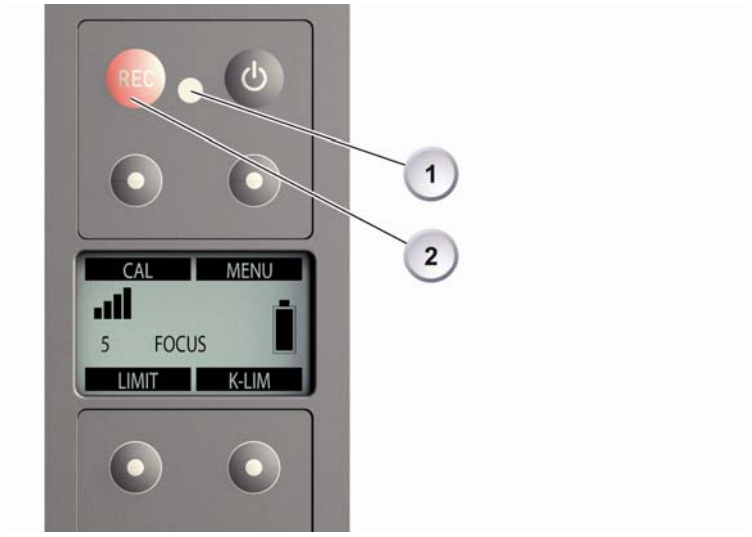
Limiting the control knob range allows faster lens reactions.

1. With control knob (A), turn lens axis to desired start position.
2. Press **K-LIM** once (B) until blinking.

3. With control knob (C), turn lens axis to desired end position.
4. Press **K-LIM** (D) again
5. Blinking changes to an icon: Limits are set.
6. To reset: Press **K-LIM** (D) again.

NOTICE: To set control knob limits, you can also keep **K-LIM** pressed from start to end position. Knob and motor limits can be combined.

7.4 Recording

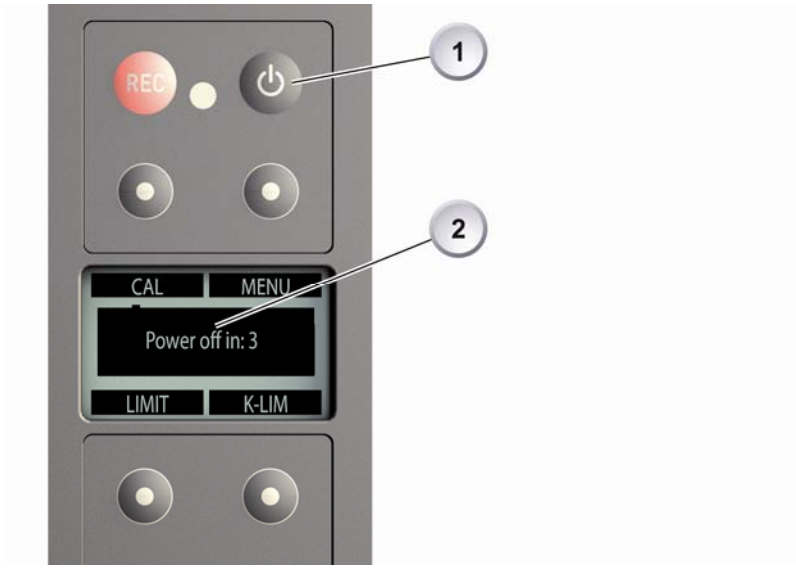


1. Check LED (1) for camera standby:

Solid green	**Ready-to-roll**
Flashes red	**Pre-recording**
Solid red	**Recording**
Flashes green and red	**Error**
Out	**Disconnected**

2. Press **REC** (1) to start or stop.

7.5 Switching off



1. Press power button (1) for at least three seconds.
2. Display (2) will count down to zero and go out.
3. Product is now switched off.

NOTICE: To interrupt switch-off, simply release power button during count-down.

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8 Accessories

8.1 Marking ring

Plain white marking rings allow you to scale the control knob with simple board markers. You can also change the rings.

1. Pull off old marking ring (1).
1. New ring must align properly (2, *see detail)* and snap audibly.

8.2 Shoulder strap

1. Insert the shoulder strap’s snap hook (1) into bottom eyelet (2).

8.3 Optional rigger grip

1. With a 3 mm Allen key, unscrew standard grip (1). **Note:** Screws are secured from falling into the grip.
1. Attach rigger grip (2).
2. Product is now ready-to-rig.

9 Maintenance

NOTICE: Never attempt to repair the product. Never open it. Never insert objects. Have it always repaired and serviced by authorized ARRI Service Centers.

Never remove or deactivate any product safety equipment (incl. warning stickers or paint-marked screws).

Always protect the product from moisture, cold, heat, dirt, vibration, shock, or aggressive substances.

9.1 Firmware update

NOTICE: Update the product consistently. Prior to update, battery must be fully charged *(see p. 13)*. Never press any button while update is running.

Required tools (not included):

- 3 mm Allen key
- Access to www.arri.de/pca/sxu-1
- SD/SDHC memory card (FAT):

1. Go to download area at www.arri.de/pca/sxu-1.
2. Download zip file containing SXU-1.upd.
3. Unzip file.
4. Copy SXU-1.upd to ARRI/SXU1/Firmware/ on SD card.
5. Switch off product.
6. Unscrew grip (1). **Note:** Screws are secured from falling into grip.
7. Insert card (2); switch on product.

8. Press **MENU** (A).
9. Menu opens (B).
10. Scroll **DOWN** until **Firmware.**
11. Press **ENTER.**

12. Update information appears (C).
13. Press both **UPDATE** keys simultaneously.
14. LED flashes red and green: update running.
15. LED stops, product restarts (D).
16. Update complete.

17. Switch off product.
18. Remove SD card (2).
19. Reattach grip (1).

9.2 System information

1. Press **MENU** (A).
2. Menu opens (B).
3. Scroll **UP** or **DOWN** until **System Info.**
4. Press **ENTER.**

5. System information appears (C).
6. For menu: Go **BACK.**
7. Exit via **HOME.**

10 Storage, shipment, disposal

NOTICE: Always store, ship and dispose of the product according to local regulations. ARRI is not liable for consequences arising from inadequate storage, shipment or disposal.

11 Order numbers

K2.0000071 Single Axis Unit SXU-1

11.1 Included accessories

K2.72117.0 Plain White Marking Ring
K4.0000711 Shoulder Strap
K5.0000418 Instruction Manual (English)

11.2 Optional accessories

K2.0000425 Hand Unit AC Power Supply HPS-1
K2.0000849 Rigger Grip
K2.0000848 Calibrating Ring

11.3 Recommended charger and battery

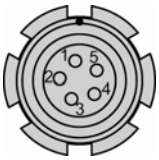
K2.47851.0 SONY NP-FM 500H Li-Ion Battery
K2.47852.0 SONY BC-VM10 Charger
05.20369.0 Power Cord UK
05.20370.0 Power Cord US
05.20368.0 Power Cord EU

11.4 LCS cables

K4.41395.0 K-LC-Z1-S LCS Cable 3.5 m (11 ft)
K4.41397.0 K-LC-M1-Sp-S LCS Spiral Cable
K2.41389.0 LC-E1 LCS Cable Drum Extension 75 m (250 ft)

12 Appendix

12.1 LCS connector pin-out



1 GND
2 NC
3 CAN-L
4 CAN-H
5 Battery +10.4 to 34 V DC

12.2 Dimensions and weight

W 148 mm
H 139 mm
D 89 mm

Weight without straps and battery: 592 g / 20.9 oz.

12.3 Electrical data

AC power input	100 to 240 V~ / 50 to 60 Hz / 300 mA
DC output (no battery charge!)	12 V= / 6 W max.
Battery power supply	7.2 V Li-Ion, 11.8 Wh
LCS power supply	10.4 to 34 V DC
Power consumption	220 mA at 7.6 V 70 mA at 24 V
Operating temperature	-20 to +50 °C (-4 to +122 °F)

12.4 ARRI white radio channels (ISM B)

0	2.410 GHz
1	2.415 GHz
2	2.430 GHz
3	2.435 GHz
4	2.450 GHz
5	2.455 GHz
6	2.470 GHz
7	2.475 GHz

12.5 Declarations of conformity

EC Declaration of Conformity

The product **Single Axis Unit SXU-1** conforms with the specifications of following European directives:

- Directive 2004/108/EC Community directive for the adaptation of legal regulations of member countries regarding electromagnetic compatibility
- Directive 199/05/EC Radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity
- Directive 2011/65/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment

The compliance with the requirements of the European Directive was proved by the application of the following harmonized standards:

- EN 55103-1:2009 / EN 55022:2010
- EN 55103-2: 2009
- EN 301 489-1:2011
- EN 301 489-17:2012
- EN 62479:2010
- EN 60950-1:2006 +A11:2009 +A12:2011 +A1:2010 +AC:2011
- DIN EN 50581:2013-02

Munich, 06 Feb 2014

Signature in the original: W.Trauninger / J.Althammer

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Contains Transceiver module FCC-ID: Y7N-EMIP100

Canadian Compliance Statement

Complies with the Canadian ICES-003 Class A specifications.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

This device complies with RSS 210 of Industry Canada.

This Class A device meets all the requirements of the Canadian interference-causing equipment regulations.

Cet appareil numérique de la Classe A respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

Contains Transceiver Module IC-ID: 9482A-EMIP100

For further assistance

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