



Instruction Manual

As of: July 2013

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2. Safety Instructions and Legal Disclaimer

2.1. Safety instructions

The ZMU-3A has been thoroughly tested for quality of workmanship and operating functions before leaving the factory.

To ensure optimal performance, it is essential that you acquaint yourself with this instruction manual and that you follow the operating instructions described.

Warning signs



Possible risk of injury or damage to equipment.



This symbol indicates the risk of electric shock or fire danger that could result in injury or equipment damage.

General safety instructions



Read and understand all safety and operating instructions before you operate or install the system.



Retain all safety and operating instructions for future reference.



Heed all warnings on the system and in the safety and operating instructions before you operate or install the system. Follow all installation and operating instructions.



Do not use accessories or attachments not recommended by ARRI, as they may cause hazards and void the warranty.



Do not repair any part of the system. Repairs must only be carried out by authorized ARRI repair shops.



Do not remove any safety measure of the system.



Do not operate the system in high humidity areas or expose it to water or moisture.



Do not place the system on an unstable cart, stand, tripod, bracket, or table. The system may fall, causing serious personal injury and damage to the system or other objects.




Operate the system using only the type of power source indicated in the manual. Unplug the power cord by gripping the power plug, not the cord.



Do not use solvents to clean.

Any violation of these safety instructions or the non-observance of personal care could cause serious injuries (including death) and damages on the system or other objects.

Note: *Notes are used to indicate further informations or informations from other instruction manuals.*

 **image** indicates objects which are shown in the illustration.

Product Identification

When ordering parts or accessories, or if any questions should arise, please advise your type of product and serial number.

2.2 Disclaimer

Before using the products described in this manual be sure to read and understand all respective instructions. The ARRI Wireless Lens Control System is only available for commercial customers. The customer grants by utilization, that the ARRI Zoom Control Unit (ZMU-3A) or other components of the system are only deployed for commercial use. Otherwise the customer has the obligation to contact ARRI preceding the utilization.

While ARRI endeavors to enhance the quality, reliability and safety of their products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in the products, customers must incorporate sufficient safety measures in their work with the system and have to heed the statuted canonic use.

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For actual design-in, refer to the latest publications of ARRI data sheets or data books, etc., for the most up-to-date specifications. Not all products and/or types are available in every country. Please check with an ARRI sales representative for availability and additional information.

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In the case one or all of the forgoing clauses are not allowed by applicable law, the fullest extent permissible clauses by applicable law are validated.

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3. General Description

The ZMU-3A is shaped like a classic handgrip zoom controller and has the classic zoom knob that assistants' thumbs all over the world are familiar with.

Main features

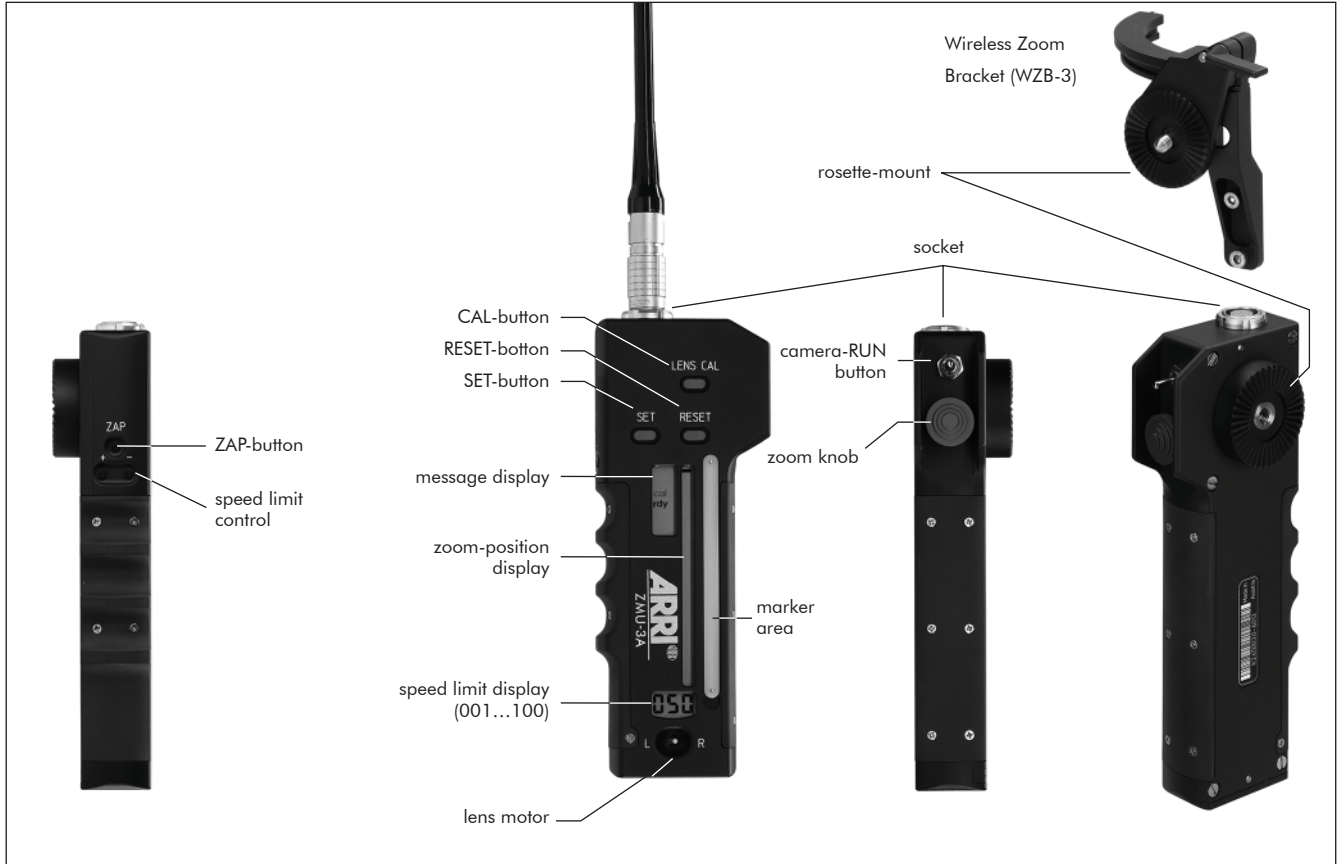
- Classic shape zoom controller for ARRI Wireless Remote System
- Film and Video/HD compatible
- Full speed lens motor drive even with 12volts video power supply
- Full speed CLM-3 support
- Flexible usage options:
 - plugs directly into video lenses
 - plugs directly into CLM motors
 - plugs into UMC for wired use
 - connects to WMU-3 for wireless use

Contrary to its classic exterior, under the hood it is equipped with the latest technology. Zoom speed can be precisely adjusted and zoom limits can be set. A large bar graph shows the zoom ring position, the zoom speed and various status messages, and a ZAP button allows for a quick focus check. A switch changes the

running direction of the attached lens motor. Of course the RUN switch can start film cameras, but the ZMU-3A can also start/stop some high end video camcorders and control the zoom motor on various video lenses. If only zoom is required, the ZMU-3A can be connected with a cable directly to an ARRI CLM-1, CLM-2 or CLM-3 lens motor and to the camera. If focus and/or iris are also to be used, the ZMU-3A can become part of the cabled ARRI Lens Control System (LCS) or of the ARRI Wireless Remote System (WRS) by being connected to a Universal Motor Controller UMC-1, Universal Motor Controller UMC-3, Lens Data Box or FEM-2.

For wireless use, the ZMU-3A becomes part of the ARRI Wireless Remote System. Via the Wireless Zoom Bracket WZB-3 it attaches to the Wireless Main Unit WMU-3. The special shape of this bracket allows the assistant to position the ZMU-3A in relation to the WMU-3 to suit his/her personal preference.

The ZMU-3A finally allows an ARRI LCS and WRS compatible zoom controller to be attached to the tripod handle. This can be done either using the ZMU-3 Pan Handle (K2.65006.0) or with the rosette on the right side of the ZMU-3A (M6 thread).



3.1 ARRI Order Numbers

<p>K2.65003.A Zoom Main Unit ZMU-3A</p> <p>K2.65226.0 CLM-2/3 motor control via ZMU-3(A) (1 m / 3ft) Power supply through ARRI PSC* system connector Camera Run function with 235, all 435, 535, 16SRIII, ARRICAM replaces KC 91-S and KC 117-S in combination with the appropriate PSC* power supply cable</p> <p>K2.65237.0 Cable ZMU-3 -RED-PSC* (0,6m/2ft) Power supply through ARRI PSC* system connector Camera REC function connects ZMU-3(A) to RED camera</p> <p>K2.65159.0 Cable ZMU-3 - LCS (0,25m/0.8ft) KC 129-S connects ZMU-3(A) to LCS - Bus (WCU-3)</p> <p>K2.65009.0 Cable ZMU-3 - LCS (0,8m/2.6ft) KC 92-S connects ZMU-3(A) to LCS - Bus</p> <p>K2.65010.0 Cable ZMU-3 - LCS (10m/33ft) KC 93-S connects ZMU-3(A) to LCS - Bus</p> <p>K2.65059.0 Cable ZMU-3 - LCS (30m/100ft) KC 112-S connects ZMU-3(A) to LCS - Bus</p>	<p>K2.65036.0 Cable ZMU-3 - WRS (0,3m/1ft) KC 105-S Connects ZMU-3(A) to WMU-3</p> <p>K2.65017.0 Wireless Zoom Bracket WZB-3 for mounting the ZMU-3(A) to WMU-3</p> <p>K2.65132.0 ZMU-3(A) Zoom Bracket assy. for WCU-3 for mounting the ZMU-3(A) to WCU-3</p> <p>K2.65006.0 ZMU-3 Pan Handle cradle to attach the ZMU-3(A) to tripod pan handle (18mm diameter or smaller)</p> <p>K2.65108.0 ZMU-3 Pan Handle cradle to attach the ZMU-3(A) to tripod pan handle (20mm diameter)</p> <p>* PSC power supply cables</p> <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Order no.</th> <th style="text-align: left;">Description</th> <th style="text-align: left;">Lenght</th> <th style="text-align: left;">connects to</th> <th style="text-align: left;">Function</th> </tr> </thead> <tbody> <tr> <td>K2.65206.0</td> <td>PSC-XLR3</td> <td>1,5m/5ft</td> <td>24volts battery</td> <td>Power supply only</td> </tr> <tr> <td>K2.65207.0</td> <td>PSC-XLR4</td> <td>1,5m/5ft</td> <td>12volts battery</td> <td>Power supply only</td> </tr> <tr> <td>K2.65208.0</td> <td>PSC-DTAP</td> <td>0,6m/2ft</td> <td>Anton Bauer D-Tap socket</td> <td>Power supply only</td> </tr> <tr> <td>K2.65209.0</td> <td>PSC-HI12</td> <td>0,6m/2ft</td> <td>Hirose 12pin socket</td> <td>Power supply + RUN</td> </tr> <tr> <td>K2.65210.0</td> <td>PSC-FI11</td> <td>0,6m/2ft</td> <td>ARRIFLEX 435, SONY F23/F35</td> <td>Power supply only</td> </tr> <tr> <td>K2.65211.0</td> <td>PSC-RS</td> <td>0,6m/2ft</td> <td>ARRI RS socket</td> <td>Power supply + R/S</td> </tr> <tr> <td>K2.65212.0</td> <td>PSC-FI2</td> <td>1,5m/5ft</td> <td>ARRI OBB-2 battery</td> <td>Power supply only</td> </tr> <tr> <td>K2.65213.0</td> <td>PSC-LCS</td> <td>0,6m/2ft</td> <td>ARRI LCS bus</td> <td>Power supply + CAN</td> </tr> </tbody> </table>	Order no.	Description	Lenght	connects to	Function	K2.65206.0	PSC-XLR3	1,5m/5ft	24volts battery	Power supply only	K2.65207.0	PSC-XLR4	1,5m/5ft	12volts battery	Power supply only	K2.65208.0	PSC-DTAP	0,6m/2ft	Anton Bauer D-Tap socket	Power supply only	K2.65209.0	PSC-HI12	0,6m/2ft	Hirose 12pin socket	Power supply + RUN	K2.65210.0	PSC-FI11	0,6m/2ft	ARRIFLEX 435, SONY F23/F35	Power supply only	K2.65211.0	PSC-RS	0,6m/2ft	ARRI RS socket	Power supply + R/S	K2.65212.0	PSC-FI2	1,5m/5ft	ARRI OBB-2 battery	Power supply only	K2.65213.0	PSC-LCS	0,6m/2ft	ARRI LCS bus	Power supply + CAN
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4. Setup

Prior to the operation of the ZMU-3A, make sure that

- the support rods are securely fastened to the camera,
- the motor units are securely fastened to the support rods
- and the motor drive gear engages the lens gear ring with as little play as possible.

LCS Bus:

Use cables KC 92-S (0,8m), KC 93-S (10m) or KC 112-S for the connection between ZMU-3 and LCS bus devices like CLM-1, UMC-1, UMC-3, ARRICAM Lens Data Boxes LT/ST or 435 FEM-2. Power will be provided through the LCS-bus.



The ARRIFLEX 435 Advanced/Xtreme must not be connected with the following cables:

LC-S1, LC-S2, LC-A1, LC-A2, LC-A3, LC-C1, LC-C2

CLM-2/-3 Motors:

Use K2.65226.0 ZMU-3 CLM PSC cable and the appropriate PSC power cable for the connection between ZMU-3A and a CLM-2 or CLM-3. The power will be supplied through selected power source.



When using the CLM-3 lens motor, set the torque suitable for the kind of lens used.
Refer to chapter 6.4 for details

WMU-3:

Use KC 105-S for the connection between ZMU-3A and a WMU-3 Wireless System. The WZB-3 bracket enables ergonomic mount of the ZMU-3A in this application.

Note: *WMU-3 Software version 1.02 or above is necessary for wireless operation of the ZMU-3A with all display functions.*



ZMU-3A WMU-3 setup example, using KC105-S and WZB-3

WCU-3:

Use KC 129-S for the connection between ZMU-3A and a WCU-3 Wireless Control Unit. The WCU-3 bracket K2.65132.0 enables ergonomic mount of the ZMU-3A in this application.



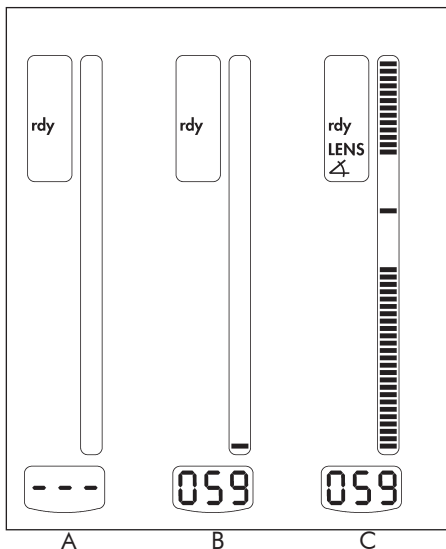
ZMU-3A WCU-3 setup example, using KC129-S and WCU-3 bracket

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5. Operation of the ZMU-3A

5.1 Switching on

The ZMU-3A has no dedicated power-switch. Power-on the ZMU-3A using the power switch of the connected supply source (Camera/UMC/WMU-3) or connect the appropriate ZMU-3A cable to the unit.



After connecting to the RS/LCS socket three lines briefly flash up in the speed display (⇒ **image A**).

The zooming speed previously used is then shown on the display. The status display indicates ready with the **rdy** display (⇒ **image B**).

In case a zoom range was previously stored this is now shown on the marking display (⇒ **image C**).

- The lens motors must be calibrated in case this had not been done before, or the lens settings have been changed while switched off. Press the **LENS CAL**-button on the ZMU-3A ⇒ **image** to calibrate the end-stops.
- Select the desired drive direction with the drive direction switch on the ZMU-3A ⇒ **image**.

Note: *If operated together with a FEM-2/UMC/LDB the drive direction can also be changed on these units.*

5.2 Calibration

The end stops of the zoom ring are defined and stored during the automated calibration process in order to prevent driving the lens ring up against the lens' end stops. Previously set values are thereby erased.

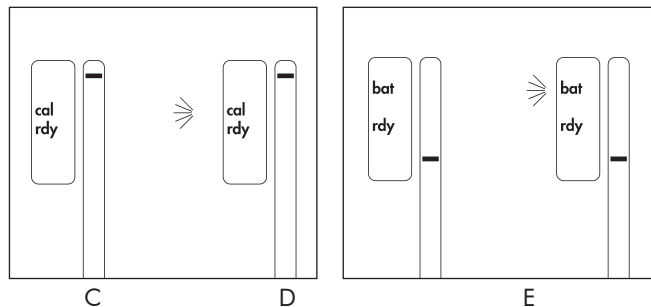
Calibration must be carried out

- during initial set-up,
 - after a lens change,
 - after the lens ring has been manually moved while the units were disconnected from the power, e.g. after an extended break
 - after the motor drive gear has been removed from the lens control ring.
- Press the **LENS CAL** -button ⇒ **image** on the ZMU-3A to start the calibration process.

During calibration the **cal**-symbol is illuminated on the display (⇒ **image** C).



The **cal** symbol flashes:
 Lens end stops are not yet defined, or the lens has been moved while the LCS was switched off and then driven against the end-stops.
 Recalibrate! (⇒ **image** D)



5.3 Battery control (BAT)

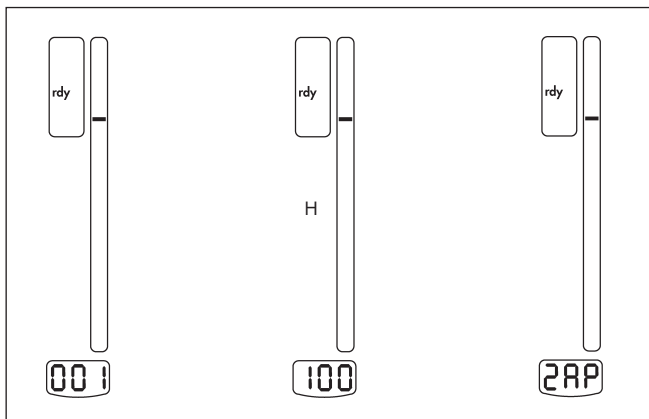
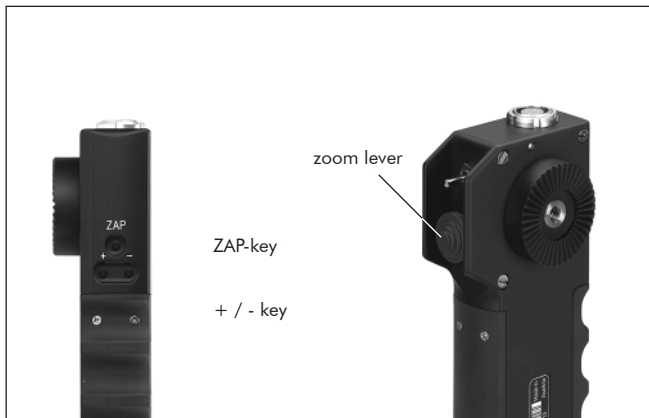
An illuminated or flashing **bat** symbol on the status display of the ZMU-3A indicates that the battery must be exchanged or recharged (⇒ **image** E).



Do not begin any new takes!

The **bat** sign signals the following voltage levels:

Operating mode	bat Symbol	Voltage
24V	illuminated	<21V
12V	illuminated	<10V
7.2V (wireless)	illuminated	<6.8V
	flashes	<6.3V



5.4 Zooming

- Press the zoom lever ⇒ **image** in the desired direction. The focal length will be altered. The greater the force, the faster the zoom will react.

5.4.1 Setting zoom speed

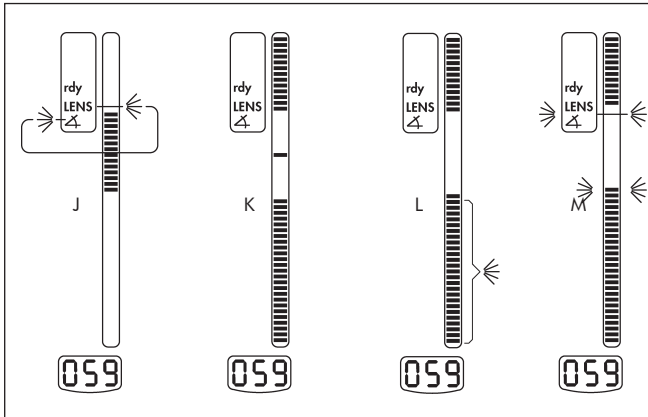
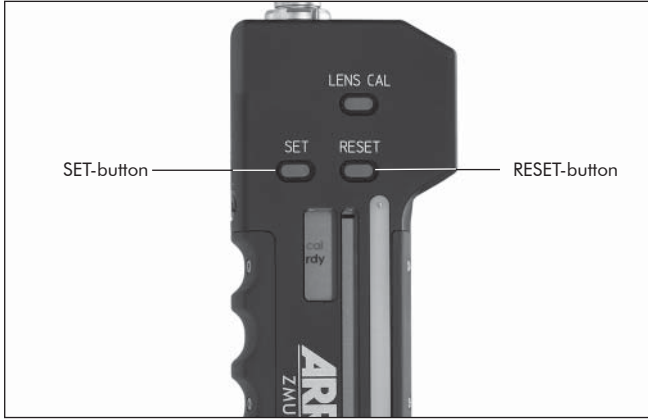
The sensitivity of the zoom lever (zoom speed) can be adjusted and is indicated on the speed display of the ZMU-3A. The smaller the value the lower the maximum zoom speed will be.

- The + and - buttons on the ZMU-3A are used to set the zoom speed. Pressing the + or - button briefly will change the speed setting in increments of 1, pressing the buttons longer will alter the speed in increments of 10. The zooming speed can be set within a range of 1 and 100 (⇒ **image** G, H).

Note: Various modes of joystick responding behaviour are available. Please see section 6.3 and 6.4 for details.

5.4.2 ZAP-function

- The ZAP button ⇒ **image** switches to maximum zoom speed – independently of the speed setting. The display indicates ZAP.



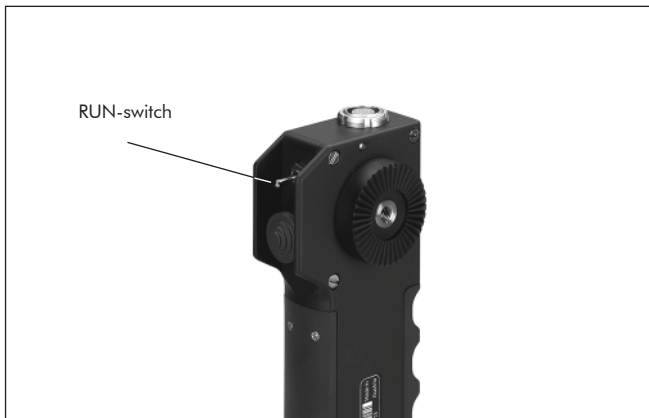
5.4.3 Defining the zoom range

For zooming, a defined range can be selected and stored.

- Drive the zoom to one end of the selected range.
- Press the **SET**-button ⇒ **image** and keep it held down. The **LENS** and **ANGLE** symbols are flashing (⇒ **image J**).
- Drive the zoom to the other end of your selected range and release the **SET**-button. The **LENS** and **ANGLE** symbol will now be illuminated. The zooming range is indicated on the marker display (⇒ **image K**).
- When one end stop is reached (zooming lever not pressed) the complete bar of the marker display flashes towards the end of the reached range (⇒ **image L**).
- If one of the defined end stops is reached while zooming (zooming lever is pressed), the **LENS** and **ANGLE** symbol and the position marker will be flashing (⇒ **image M**).

5.4.4 Erasing the zoom range

- Press the **RESET**-key ⇒ **image** and hold it briefly. The **LENS** and **ANGLE** symbols will disappear.



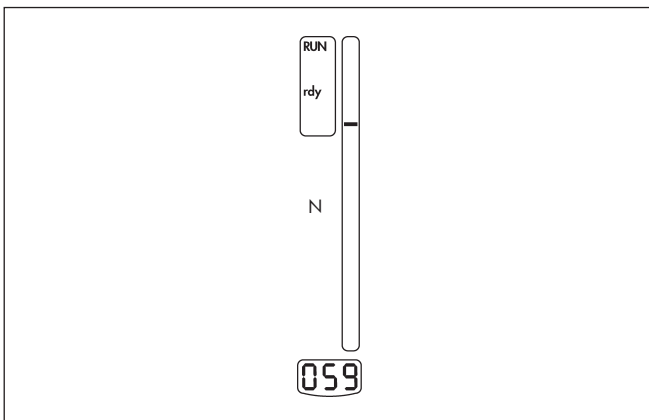
5.5 Camera RUN

The camera can be started with the camera RUN switch. This switch has three positions:

- middle OFF
- intermediate switching ON
- permanent switching ON

24V ARRI cameras are started with the intermediate switching on function. In camera RUN this is indicated on the status display of the ZMU-3A.

Note: *The permanent switch-on function is available on the ZMU-3A socket. Please contact your ARRI Service Center for details.*



5.6 Video lenses

The ZMU-3A can be connected to video lenses with the cable KC-107 (K2.65041.0).

In this mode the marker display indicates the zooming speed starting from the middle position.

6. Special Functions Mode

6.1 Recall software version

Hold the **SET** and **RESET** buttons depressed while powering the ZMU-3, until all display segments light up. Then release the keys and press **RESET** once. In the bargraph display one bar will be displayed. The speed limit display then shows **SW**, Version # prefix (e.g. **01_**) and Version # suffix (e.g. **100**) sequentially.

Note: After entering the Special Functions Mode it is possible to step through the different functions by repeatedly pressing the **RESET** button. To leave the Special Functions Mode, disconnect the unit.

6.2 Selection of the joystick pressure delay

Hold the **SET** and **RESET** buttons depressed while powering the ZMU-3 until all display segments light up. Then release the buttons and press **RESET** repeatedly, until three bars will be displayed in the bargraph display. The ZMU-3 provides several steps of joystick response delay selectable by the + and - keys. This delay smoothes the joystick pressure in respect to the rise in motor speed.

- off ... delay off
- 1-6 ... delay 1 (short) ... 6 (long)

The value will be saved when pressing the **SET** button. The successful execution will be confirmed by **rdy** displayed. The ZMU-3 will remember this setting even when powered down.

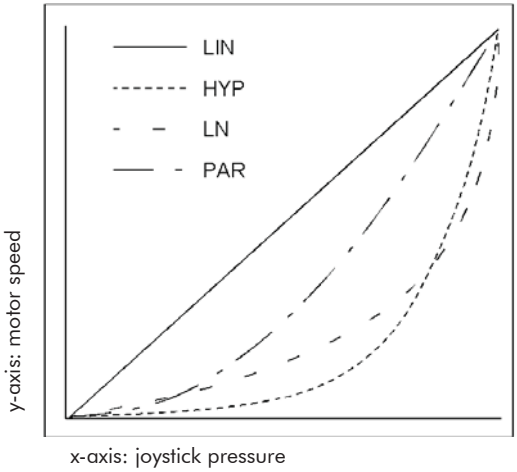
Note: Display value **rdy** shows the actually saved smoothing value.

6.3 Selection of the Joystick response mode

Hold the **SET** and **RESET** buttons depressed while powering the ZMU-3, until all display segments light up. Then release the buttons and press **RESET** repeatedly, until four bars will be displayed in the bargraph display. The ZMU-3 provides four response modes selectable by the + and - buttons.

- **HYP** ... hyperbolic
- **Ln** ... logarithmic
- **PAr** ... parabolic
- **Lin** ... linear

In the picture left the correlation between the joystick pressure and the motor speed is shown. The selected mode will be saved when pressing the **SET**



The ZMU-3A provides four torque settings for the CLM-3 selectable by the + and - buttons.

- 1 ... lowest e.g. for video lenses
- 4 ... highest e.g. for heavy movie zoom lenses at low ambient temperatures and/or fastest zoom speed



As the CLM-3 lensmotor is VERY strong, adequate torque adjustment is advisable, especially to prevent accidental damage to more delicate lenses

Note: The torque setting menu will be displayed only in conjunction with a connected CLM-3 lens motor.

button. The successful execution will be confirmed by **rdy** displayed. The ZMU-3 will remember this setting even when powered down..

Note: Display value **rdy** shows the active saved mode.

6.4 Lens Motor Torque setting (CLM-3 only)

Hold the **SET** and **RESET** buttons depressed while powering the ZMU-3A, until all display segments light up. Then release the buttons and press **RESET** repeatedly, until five bars will be displayed in the bargraph display.

6.5 Reset to factory defaults

Hold the **LENS CAL** and **RESET** buttons depressed while powering the ZMU-3. The display will show **DEF**. Then release the buttons. After a short delay the ZMU-3 resets automatically to its default values:

- Joystick response mode **HYP**
- Joystick pressure delay **2**

7. Specifications

Operating temperature
-20 to +50 °C (-4 to +122°F)

Operating voltage
10 to 30 V DC
ARRICAM compatible
WCU-3/WMU-3 compatible

Typ. current consumption without lensmotor
0,05A (24V) / 0,07A (12V)

Dimensions (h * w * d) w/o (with) connector
178 * 66 * 37 mm
3.8 * 2.6(3.3) * 8.8 in

Weight 400 g (5 oz)

Information to the user:

Class A Statement:

Note: 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.



Declaration of Conformity

This declaration is valid for following product:

Equipment: Zoom Controller

Type: ARRI ZMU-3A

Hereby the equipment is confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility (2004/108/EEC).

The following company is responsible for this declaration:

ARRI Austria
Cine + Video Geräte GmbH.
Pottendorfer Str. 25 27
1120 Wien
Austria

The measurements were carried out in an accredited laboratory.

For the evaluation of above mentioned Council Directives for Electromagnetic Compatibility following standards were consulted:

DIN EN 55103-1: 1997-06
DIN EN 55103-2: 1997-06

Straubing, December 07, 2009
Date / Place


Signature of responsible Person

ARRI Service Contacts

Zone	Availability	Service Center	E-Mail	Telephone Hotline
1	Monday – Friday: 09:00 – 17:00 (CET)	Munich, Germany Arnold & Richter Cine Technik	service@arri.de	+49 89 3809 2121
	Monday – Friday: 09:00 – 17:30 (CMT)	London, Great Britain ARRI CT Limited	service@arri-ct.com	+44 1895 457 051
	Monday – Friday: 09:00 – 18:00 (CET)	Rome, Italy ARRI Italia S.r.l.	service@arri.it	+39 335 749 00 70
	Monday – Saturday: 09:00 – 18:00 (MSK)	Moscow, Russia Bars-Pro Ltd.	arri@bars-pro.ru	+7 (495) 415-98-13 +7 (495) 415-98-14 +7 (495) 415-98-15
	Monday – Saturday: 10:00 – 18:00 (IST)	Mumbai, India CINEOM Broadcast India Pvt. Ltd.	service@cincom.com	+91 22 42 10 9000
2	Monday – Friday: 08:15 – 17:00 (PST)	Burbank, USA ARRI Inc. West Coast	service@arri.com	+1 877 565 2774
	Monday – Friday: 08:00 – 17:30 (EST)	New York, USA ARRI Inc. East Coast	service@arri.com	+1 877 565 2774
	Monday – Friday: 08:30 – 17:00 (EDT)	Mississauga, Canada ARRI Canada Limited	service@arri.com	+1 416 255 3335
3	Monday – Friday: 09:00 – 18:00 (HKT)	Hong Kong ARRI Asia Limited	service@arriasia.hk	+852 2537 4266
	Monday – Friday: 09:00 – 18:00 (CST)	Beijing, China ARRI China Co. Limited	service@arrichina.com	+86 10 5900 9680
	Monday – Friday: 08:00 – 18:00 (AEST)	Sydney, Australia ARRI Australia Pty Limited	service@arri.com.au	+61 2 9855 4305

technical data are subject to change without notice

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ARRI Order no. K5.65998.A



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