



ZMU-3

# Instruction Manual

As of: September 2005

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## 2. Safety Instructions and Legal Disclaimer

### 2.1. Safety instructions

The ZMU-3 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-3) 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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### 3. General Description

The ZMU-3 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

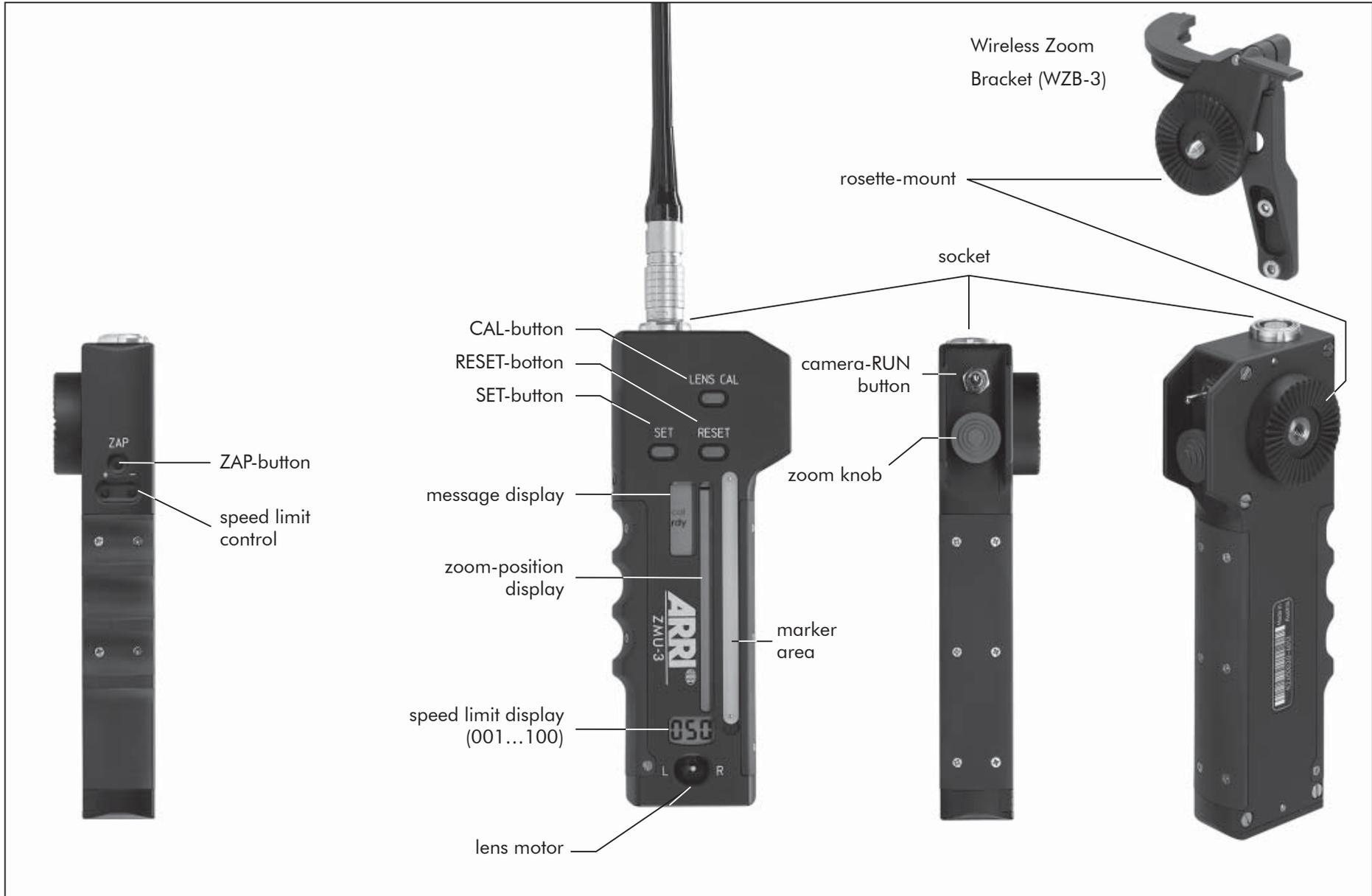
- Classic shape zoom controller for ARRI Wireless Remote System
- Film and Video/HD compatible
- Flexible usage options:
  - plugs directly into video lenses
  - plugs directly into CLM motors
  - plugs into UMC for wired use
  - connects to WMU-3 for wireless use

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-3

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-3 can be connected with a cable directly to an ARRI CLM-1 or CLM-2 lens motor and to the camera. If focus and/or iris are also to be used, the ZMU-3 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-3 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-3 in relation to the WMU-3 to suit his/her personal preference.

The ZMU-3 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-3 (M6 thread).



### 3.1 ARRI Order Numbers

		K2.65007.0	Cable ZMU-3 - Video (1m/3ft) KC 90-S Connects ZMU-3 to Video 12V
K2.65003.0	Zoom Main Unit ZMU-3		
K2.65008.0	Supply Cable ZMU-3 CLM-2 (1,3m/4.3ft) KC 91-S connects ZMU-3 to CLM-2 and camera RS connectors	K2.65017.0	Wireless Zoom Bracket WZB-3 for mounting the ZMU-3 to WMU-3
		K2.65006.0	ZMU-3 Pan Handle cradle to attach the ZMU-3 to tripod pan handle (18mm diameter or smaller)
K2.65009.0	Cable ZMU-3 - LCS (0,8m/2.6ft) KC 92-S connects ZMU-3 to LCS - Bus		
K2.65010.0	Cable ZMU-3 - LCS (10m/33ft) KC 93-S connects ZMU-3 to LCS - Bus		
K2.65059.0	Cable ZMU-3 - LCS (30m/100ft) KC 112-S connects ZMU-3 to LCS - Bus		
K2.65036.0	Cable ZMU-3 - WRS (0,3m/1ft) KC 105-S Connects ZMU-3 to WMU-3		

## 4. Setup

Prior to the operation of the ZMU-3, 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 Motors:

Use KC 91-S for the connection between ZMU-3 and a CLM-2. The power will be supplied through any ARRI RS socket.

### Video Lenses (analog controlled):

Use KC 90-S for the connection between ZMU-3 and an analog controlled Video Lens (e.g. Fujinon). ZMU-3

power supply will be provided by the Video Camera.

### WMU-3:

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

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

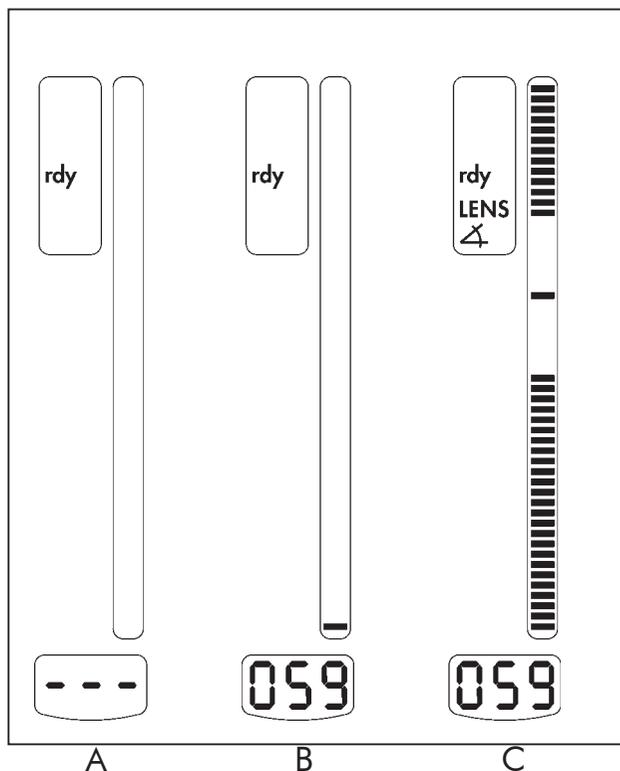


WZU-3 WMU-3 Setup example, using KC105-S and WZB-3

## 5. Operation of the ZMU-3

### 5.1 Switching on

The ZMU-3 has no dedicated power-switch. Power-on the ZMU-3 using the power switch of the connected supply source (Camera/UMC/WMU-3) or connect the appropriate ZMU-3 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-3 ⇒ **image** to calibrate the end-stops.
- Select the desired drive direction with the drive direction switch on the ZMU-3 ⇒ **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.

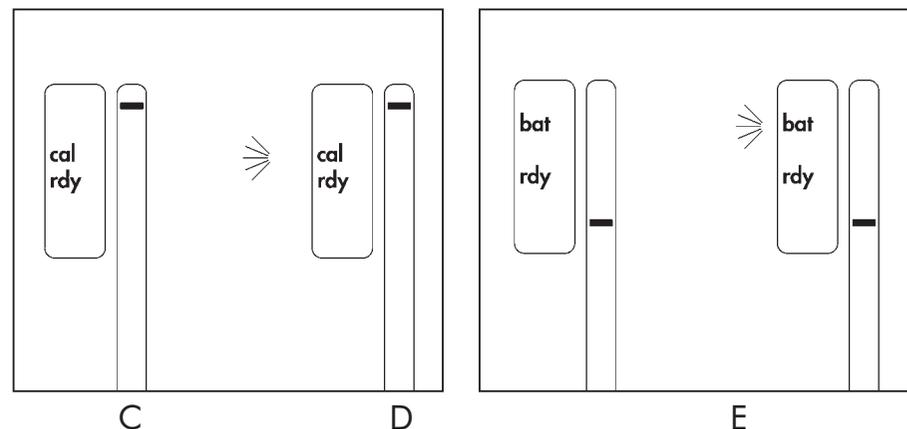
Calibration must be carried out

- 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-3 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)

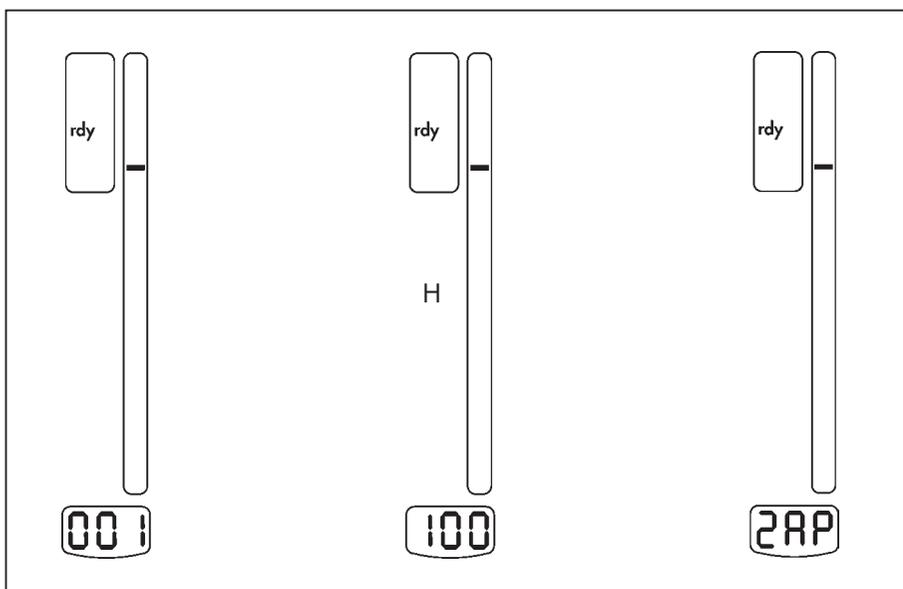
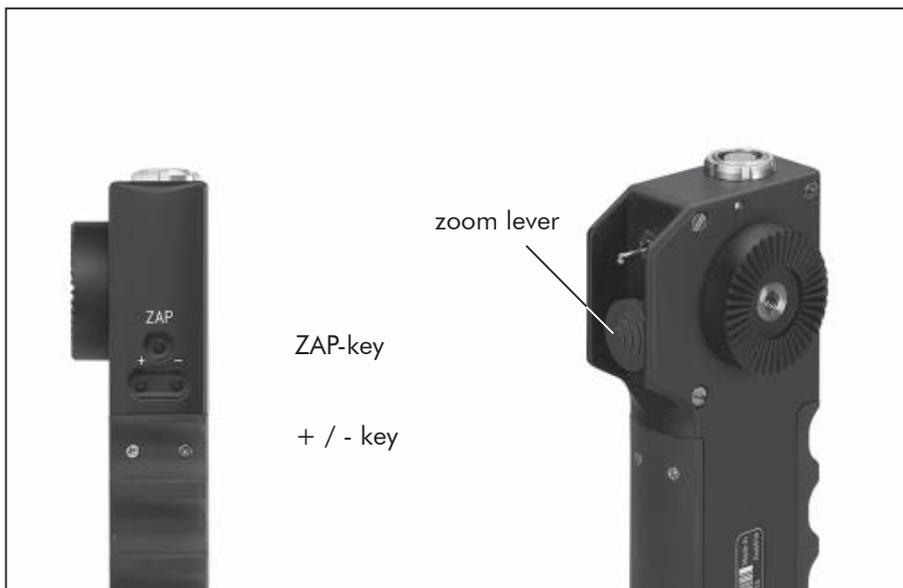
An illuminated or flashing **bat** symbol on the status display of the ZMU-3 indicates that the battery must be exchanged or recharged (⇨ **image** E).



Do not begin any new takes!

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

Operating mode	<b>bat</b> 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

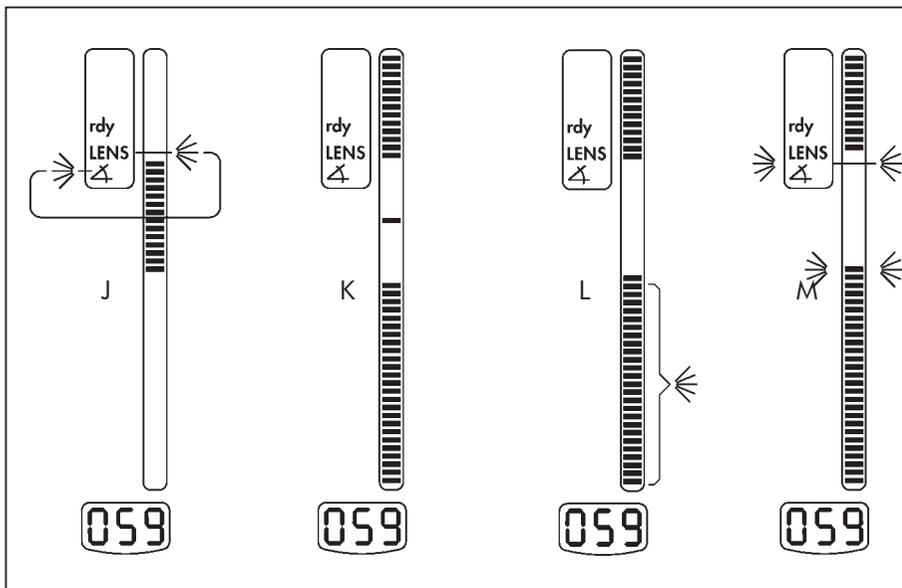
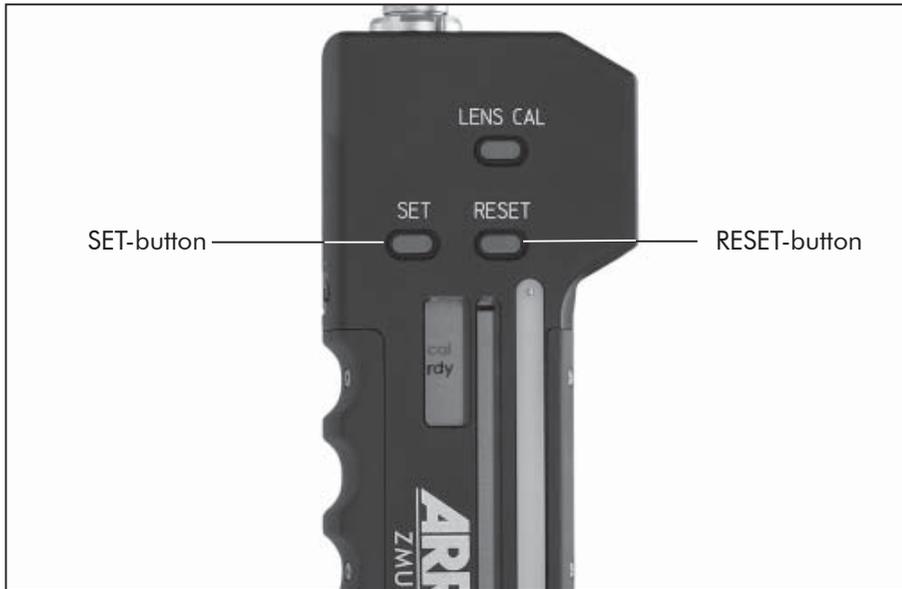
The sensitivity of the zoom lever (zoom speed) can be adjusted and is indicated on the speed display of the ZMU-3. The smaller the value the lower the maximum zoom speed will be.

- The + and - buttons on the ZMU-3 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.



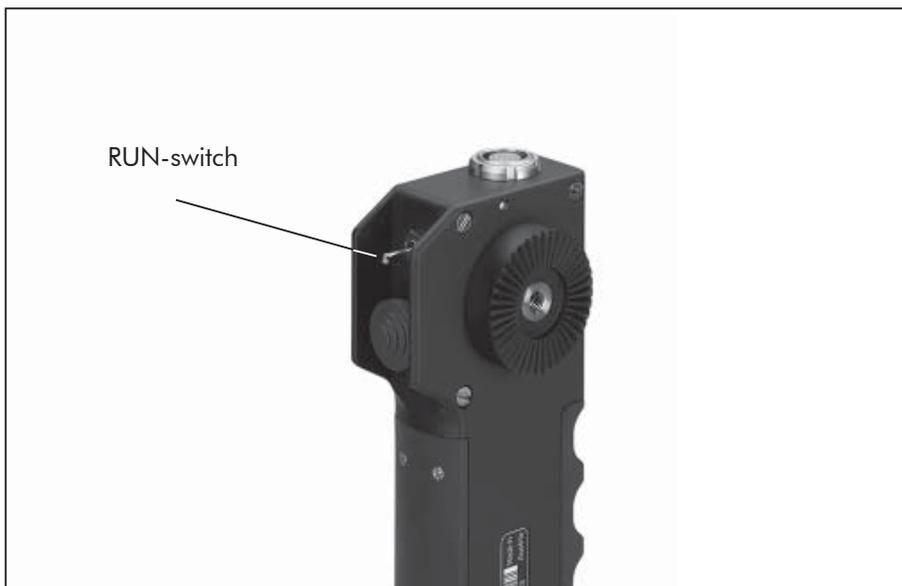
### 5.4.3 Defining the zoom range

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.



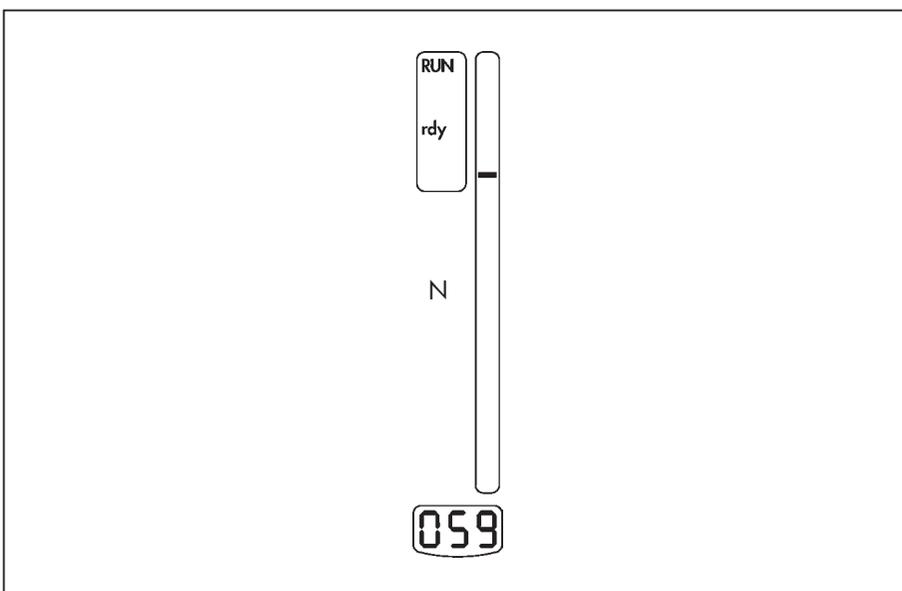
## 5.5 Camera RUN

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-3.

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



## 5.6 Video lenses

The ZMU-3 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 Null balancing of analog video lenses

This mode is only available with an analog video lens connected.

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** twice. In the bargraph display two bars will be displayed.

Leave the joystick in the center position and push the + and - buttons repeatedly, until the lens ZOOM ring

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

**Note:** *Display value **rdly** shows the actually saved offset value.*

### 6.3 Selection of the joystick pressure delay

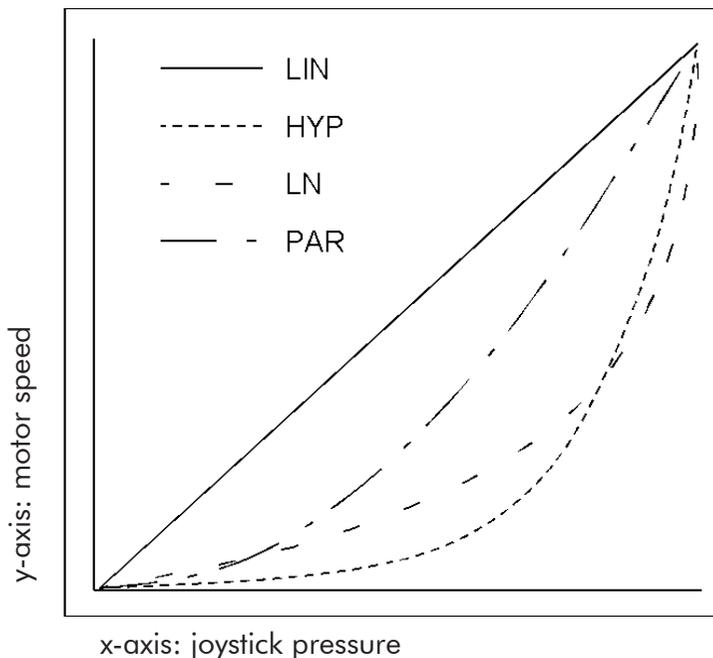
Hold the **SET** and **RESET** buttons depressed while powering the ZMU-3 until all display segments light up. Then release the buttons and press **RESET** repeatedly, until three bars will be displayed in the bargraph display.

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 **rdly** displayed. The ZMU-3 will remember this setting even when powered down.



- **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** 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.

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

### 6.4 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.

### 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	<b>HYP</b>
Joystick pressure delay	<b>2</b>

## 7. Specifications

Operating temperature

-20 to +50 °C ( -4 to +122°F )

Operating voltage

10 to 30 V DC in two ranges (12/24V nominal)  
ARRICAM compatible

Typ. current consumption

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 )

## Declaration of Conformity

We, Manufacturer  
ARRI CINE + VIDEO GERÄTE GmbH  
Mariahilfer Strasse 136  
A-1150 Wien  
declare that the product  
Zoom Main Unit  
ZMU-3

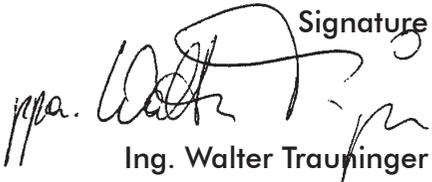
is in conformity with

EN 55103-1: 1997-06  
EN 55103-2: 1997-06  
EN61000-4-2: 2001-12  
EN61000-4-3: 2001-12

EN61000-3-2: 2001-12  
EN61000-3-3: 2002-05

EN 60065: 2003-01

Date:  
2005-02-08

 Signature  
Ing. Walter Traubinger

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technical data are subject to change without notice

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ZMU-3 User Manual

ARRI Order no. K5.65998.0



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