

UMC-4

Universal Motor Controller

USER MANUAL

18th October 2017



Imprint

Copyright © 2017 Arnold & Richter Cine Technik GmbH & Co. Betriebs KG. All rights reserved. No parts of this document may be reproduced without prior written consent of Arnold & Richter Cine Technik GmbH & Co. Betriebs KG. Specifications are subject to change without notice. Errors, omissions, and modifications excepted.

ARRI, ALEXA, AMIRA, Master Grip, LDS and LENS DATA SYSTEM are trademarks or registered trademarks of Arnold & Richter Cine Technik GmbH & Co. Betriebs KG. All other brands or products are trademarks or registered trademarks of their respective holders and should be treated as such. Original version.

For further assistance

ARRI Cine + Video Geräte Gesellschaft m.b.H.

Pottendorferstraße 23-25/3/1

A-1120 Vienna Austria

E-mail: service@arri.com

Website: www.arri.com

Revision history

Version	ID	Order #	Release	Date
01	10000734	K5.0003467	W01038	28.08.2014
02	10000734	K5.0003467	W01046	09.02.2014
03	10000734	K5.0003467	W01072	15.06.2015
04	10000734	K5.0003467	W01247	18.10.2017

Scope

This User Manual applies to the following product:

K2.0002058 UMC-4 with Software Update Packet SUP 2.0

Disclaimer

Before using the products described in this manual, be sure to read and understand all the respective instructions.

The ARRI Universal Motor Controller UMC-4 is/are only available to commercial customers. By utilization, the customer agrees that the UMC-4 or other components of the system are deployed for commercial use only. Otherwise the customer must contact ARRI before 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 the risk 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 heed the stated canonic use.

ARRI or its subsidiaries do not assume any responsibility for losses incurred due to improper handling or configuration of the UMC-4 or other system components.

ARRI assumes no responsibility for any errors that may appear in this document. The information is subject to change without notice.

For product specification changes after this manual was published, refer to the latest published ARRI data sheets or release notes, 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.

Neither ARRI nor its subsidiaries assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from the use of ARRI products or any other liability arising from the use of such products. No license, express, implied or otherwise, is granted under any patents, copyrights or other intellectual property right of ARRI or others.

ARRI or its subsidiaries expressly exclude any liability, warranty, demand or other obligation for any claim, representation, cause, action, or whatsoever, express or implied, whether in contract or not, including negligence, or incorporated in terms and conditions, whether by statute, law or otherwise. In no event shall ARRI

or its subsidiaries be liable for or have a remedy for recovery of any special, direct, indirect, incidental, or consequential damages, including, but not limited to lost profits, lost savings, lost revenues or economic loss of any kind or for any claim by a third party, downtime, good-will, damage to or replacement of equipment or property, any cost or recovery of any material or goods associated with the assembly or use of our products, or any other damages or injury of the persons and so on or under any other legal theory.

In the event that one or all of the foregoing clauses are not allowed by applicable law, the fullest extent permissible clauses by applicable law are validated.

Table of Contents

1	For your safety	7
2	Audience and intended use	9
3	Scope of delivery and warranty	10
4	Introduction	11
5	Quick start guide	13
6	Layout UMC-4	15
	6.1 Soft Buttons.....	18
	6.2 Optional Connector Modules.....	19
7	Home screen	20
	7.1 Radio.....	20
	7.2 Lens.....	21
	7.3 Info.....	21
	7.4 Focus / Iris / Zoom.....	21
	7.5 Info Area.....	22
8	Menu	23
	8.1 Motors.....	23
	8.2 Radio.....	25
	8.3 Lens.....	26
	8.4 Metadata.....	27
	8.5 Focus/Zoom Demands Menu.....	30
	8.6 System.....	31
	8.6.1 <i>Display</i>	31
	8.6.2 <i>Date/Time</i>	31
	8.6.3 <i>Network</i>	31
	8.6.4 <i>Settings</i>	32
	8.6.5 <i>Firmware Update</i>	33
	8.6.6 <i>LBUS update</i>	34
	8.6.7 <i>Save Log to SD Card</i>	35
	8.6.8 <i>Format SD Card</i>	35
	8.6.9 <i>System Info</i>	35
9	User	36

10	LBUS devices.....	37
11	Remote Access.....	38
	11.1 Web Interface.....	38
	11.2 VNC.....	39
12	Metadata.....	40
13	Appendix.....	42
	13.1 Antenna connector.....	42
	13.2 Part Numbers.....	42
	13.3 Compatibility.....	44
	13.4 Pinouts.....	46
	13.5 Dimensions and Weight.....	49
	13.6 Electrical Data.....	49
	13.7 Radio system.....	50
	13.8 Troubleshooting.....	51
	13.9 Service contacts.....	52
	13.10 International declarations.....	53

1 For your safety

Before use, please ensure that all users read, understand, and follow the instructions comprehensively in this document.

Risk levels and alert symbols

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

DANGER!

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

WARNING!

WARNING indicates a potentially hazardous situation, which, if not avoided, **may result in** death or serious injury.

CAUTION!

CAUTION indicates a potentially hazardous situation, which, if not avoided, **may result in** minor or moderate injury.

NOTICE

NOTICE explains practices not related to physical injury. No safety alert symbol appears with this signal word.

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

Vital precautions

DANGER!

Risk of electric shock and fire!

Short-circuits may entail lethal damage!

Before use, read and follow all valid instructions.

Use solely and exclusively as described in the instructions.

Never open. Never insert objects.

For operation, always use a power source as indicated in the instructions.

Always unplug the cable by gripping the plug, not the cable.

Never try to repair. All repair work should be done by a qualified ARRI Service Center.

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

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

General precautions

Use only the tools, materials and procedures recommended in this document. Unplug all cables during transport.

Do not store the UMC-4 in places where it/they may be subject to temperature extremes, direct sunlight, high humidity, severe vibration, or strong magnetic fields.

2 Audience and intended use

NOTICE

The product is solely and exclusively available for commercial costumers and shall be used by skilled personnel only. Every user should be trained according to ARRI guidelines. Use the product only for the purpose described in this document. Always follow the valid instructions and system requirements for all equipment involved.

The UMC-4 is solely and exclusively for use on professional camera setups.

3 Scope of delivery and warranty

NOTICE

Product and packaging contain recyclable materials. Always store, ship, and dispose of according to local regulations. ARRI is not liable for consequences from inadequate storage, shipment or disposal.

Delivery

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

- Universal Motor Controller UMC-4, including antenna
- L-Bracket
- SD card
- Instruction manual
- Original packaging

Warranty

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

4 Introduction

The Universal Motor Controller UMC-4 is an advanced 3-axis motor controller. Up to three different hand units can connect to the UMC-4 at the same time, controlling focus, iris and zoom on any camera. The intuitive user interface helps to quickly setup the system and makes it easy to use. The high-performance radio system offers reliable radio connectivity.

The UMC-4 incorporates the LDS Lens Data Archive and generates frameaccurate lens data with any lens. Lens data is used for lens mapping to pre-marked focus rings and depth-of-field display on the WCU-4 hand unit. It also enables focus tracking – setting the focus motor to continuously follow a subject by using an ultrasonic distance measurer. For VFX tasks in post, the UMC-4 records lens data with timecode and inclinometer data, helping match the virtual lens to the recorded image.

The UMC-4 supports internal and external timecode that is recorded with frame-accurate lens data onto SD card, making the lens data usable for postproduction. The internal timecode clock can be jam-synced from external devices, but can output LTC timecode as well.

The UMC-4 includes multiple interfaces for maximum flexibility on set. Two serial interfaces connect peripheral equipment such as ARRI's UDM-1 distance measure. Optional connector modules interface directly with focus and zoom demands from Fujifilm and Canon. An Ethernet connector integrates the UMC-4 with standard IT equipment. All packed in a durable, splash-proved housing

NOTICE

To tap the full potential of the device, have all connected units updated to the latest available firmware.



Visit www.arri.com/ecs/UMC-4 for up-to-date product information and software updates.

How to use this manual

Connectors are all written in capital letters, for example, **LCS**.

Buttons are all written in capital letters, for example, **MENU** soft button.

Menus and screens are written in italic letters, for example *home screen*.

The appendix at the back of the manual contains useful reference material including radio frequencies, spare parts and additional accessories, connector pin-out diagrams and dimensional drawings.

5 Quick start guide

This quick start guide walks you through the required steps, to set up the UMC-4 with three motors and a wireless hand unit.

Mounting on camera

Mount the UMC-4 on the camera, by using the L-Bracket, with the antenna pointing upwards and the motor connectors pointing towards the lens. This orientation is necessary for the generation of valid tilt and roll data recorded as metadata (See "Metadata", page 40)

Powering up

Connect the UMC-4 to a power source with a designated power cable (See "Part Numbers", page 42) and power the unit up, by pressing the power button.

Setting Time and Date

The time and date of the device are factory preset for Central European Time. To set time and date, go to *Menu>System>Date/Time>Set Date/Time*. Time/date are obligatory for proper metadata and log file recording. The UMC-4 will keep time and date even if it is disconnected from a power source because of an built-in buffer battery.

Setting up Motors

Properly mount the motors to the lens. Take care for a mechanically rigid setup. Connect the motors to the related axis connectors, if cforce motors are used, select the corresponding axis on the motor. Go to one of the axis motor menu and press **CAL. ALL** to calibrate all motors. Set up the motor mounting side and torque in the dedicated motor menu. Side refers to the side of the lens the motor is mounted to (rods underneath the lens).

Torque refers to the motor torque (1=low to 4=high).

Connecting to Hand Unit

Set the radio channel on the UMC-4 in the Radio sub-page of the Home screen. Make sure that the radio power is switched on and that the selected radio channel is not already in use. Set the hand unit to the same radio channel. A successful connection is indicated by the number of connected hand units on the UMC-4 Home screen.

Selecting a Lens File

For the features listed in chapter "Lens", page 21 this step is obligatory, otherwise this step could be skipped. Go to the Lens sub-page of the Home screen. Go to Add to Favorites and select the lens you want to use from the list. Press **ADD+USE** to use the lens table and add it to your list of favorites.

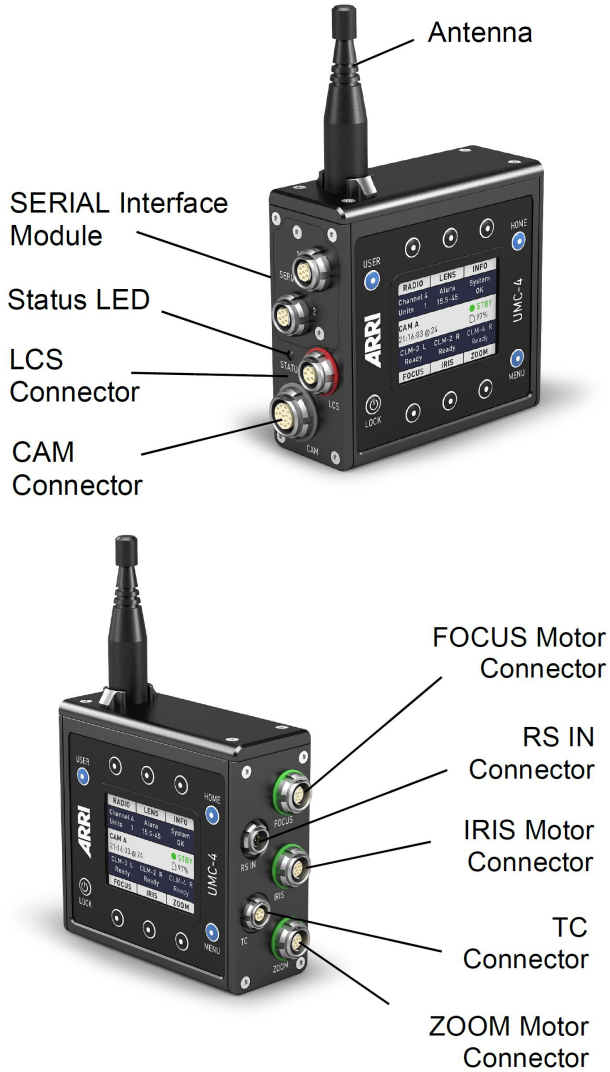
You are now ready to shoot.

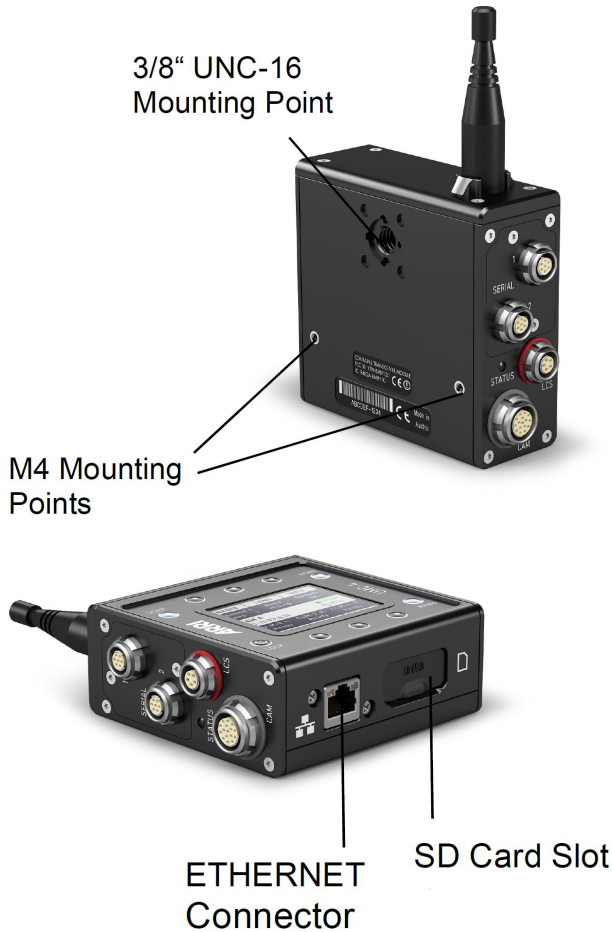
Note: After connecting a lens motor to the UMC-4 and the lens, it must be calibrated. The lens motor must be recalibrated under the following conditions:

- When the lens motor is detached from the lens
- After changing lenses
- After a change in motor position while powered down

Note: You can program a custom lens file through the ALEXA web interface or with the Wireless Compact Unit WCU-4 (SUP 2.0 onwards)

6 Layout UMC-4





Interface

Antenna

Description

Rugged outdoor antenna

SERIAL Interface
Module

Two serial interface connectors to attach peripheral equipment like Ultrasonic Distance Measure UDM-1.

Note: Further protocols will be added with subsequent software updates.

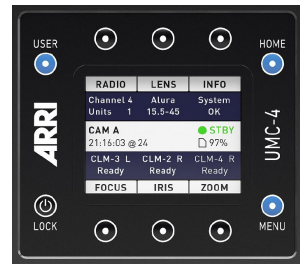
Optional modules:

(1) UMC-4 connector module to Canon focus/zoom demands CAN-1

	(2) UMC-4 connector module to Fujinon focus/zoom demands FUJ-1
Status LED	Indicates controller status:
	Blue radio connection is established, motors are calibrated, no warnings
	Green wired connection is established, motors are calibrated, no warnings
	Yellow motors are calibrated, but no controlling device connected
	Yellow flashing motors are currently calibrating
	Red motors are not calibrated, not ready to use for lens control
LCS Connector	Connects to hand units via ARRI LCS cable, for wired operation
CAM Connector	Multi-pin connector, offering a variety of protocols, providing REC and tally control for most film and digital cameras
FOCUS / IRIS / ZOOM Motor Connector	Connects to ARRI Controlled Lens Motor
RS IN Connector	Connects to power source (9.5-34 V), triggers REC and receives tally status via camera RS interface
TC Connector	LTC timecode input and output
ETHERNET Connector	Connects to Ethernet and provides access to the UMC-4 web interface
SD Card Slot	Mounts an SD card
3/8" UNC Mounting Point	Mounting point for accessories like L-Bracket or VPlate
M4 Mounting Points	Mounting point for accessories

6.1 Soft Buttons

Six soft buttons are located above and below the display. They change their behavior depending on the screen content. Two rows at the top and the bottom of the screen show the function related to each button. Buttons without a label have no function in that screen.



Menu Navigation

To access a new menu level, press the **SELECT** soft button. To go one level back up, press the **BACK** soft button. Use the up/down arrow soft buttons to navigate through the menu. A parameter has its value displayed on the right hand of the screen. Edit it with the **CHANGE** soft button. Cancel an edit action by pressing the **BACK** (or depending on the context, the **CANCEL**) soft button.

POWER/LOCK Button

Press and release to switch the UMC-4 on; to switch off the UMC-4, the button must be pressed for three seconds, and a countdown is displayed. If the button is released before the countdown has elapsed, the UMC-4 does not shut down.

Press and release the POWER/LOCK button twice to lock or unlock the user interface. A lock or unlock status symbol will be displayed.

HOME Button

Press the **HOME** button to enter the Home screen.

USER Button

Press the **USER** button to enter the User screen, providing user-definable function shortcuts. See "User", page 36 for further information.

MENU Button

Press the **MENU** button to enter the UMC-4 main menu. The main menu includes sub menus for system setup, firmware updates, Lens Data Archive, and more.

6.2 Optional Connector Modules

Two optional connector modules interface directly with broadcast-style focus and zoom demands from Fujifilm or Canon. They replace the standard **SERIAL** connector module that is delivered with the UMC-4.

The installation of the connector modules requires basic skills and knowledge of electronics. Please follow the installation instructions delivered with the modules or contact ARRI Service.



K2.0002043 Module to Fujifilm focus/zoom demands FUJ-1

K2.0002042 Module to Canon focus/zoom demands CAN-1

7 Home screen

The Home screen is the default screen. It shows the most important parameters and gives quick access to changing them through the six soft buttons:

RADIO		LENS	INFO
Channel	5	Alura	
Units	1	15.5-45	All OK
CAM A			● STBY
00:56:34 @24			
CLM-4 R	CLM-5 L	CLM-2 L	
Ready	Ready	Ready	
FOCUS	IRIS	ZOOM	

7.1 Radio

The **RADIO** soft button area displays the currently selected radio channel and the number of connected hand units. The soft button is a shortcut to *Menu>Radio*. The radio can be switched on or off and the radio channel can be selected.

Radio Status levels are:

Off	Radio modem is switched off.
Initialize...	Radio modem is initializing.
Ready	Radio modem is initialized and ready to connect to the indicated radio channel.
Units 1-3	Radio is connected between one and three hand units.
Blocked	Another motor controller is already using the currently selected radio channel. Select another radio channel!

7.2 Lens

The **LENS** soft button area displays the currently selected lens file. The soft button is a shortcut to *Menu>Lens*. The Lens menu contains the Lens Data Archive with pre-programmed lens tables for many common lenses. Select a lens file to use lens data on the WCU-4 hand unit or if you want to record lens data for postproduction.

Lens File Transfer

Received lens files from the hand unit will be automatically set active.

7.3 Info

The **INFO** soft button area displays warnings and errors. Press the soft button to open the live info screen. The live info screen displays the UMC- 4's current system state and current error messages, and provides the following sub-screens:

- **SYSTEM:** Shows the UMC-4 firmware version, the device's serial number and the voltage level of the power supply
- **SD CARD:** Shows the SD card capacity and the number of recorded metadata clips

Press the **CLEAR** soft button to reset warning and error messages.

7.4 Focus / Iris / Zoom

The **FOCUS / IRIS / ZOOM** soft buttons area is displaying the motor type, the side the motor is currently set on, and the motor status. The soft button is a shortcut to *Menu>Motors>Focus / Iris / Zoom*, where you can set the motor side and motor torque.

Motor status levels are:

None	No motor connected
Calibrate!	Motor needs to be calibrated

Calibrating	Motor is currently calibrating
Idle	Motor is not assigned to hand unit
Ready	Motor is ready to use

7.5 Info Area

The info area in the center of the Home screen shows camera index (if set), timecode (if active), the camera status (STBY, REC, PREREC, ERASE, PLAY) and SD card status.

Playback control

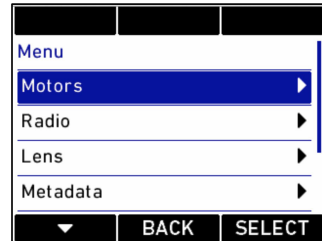
Full playback control from WCU-4 is possible with the UMC-4 connected to AMIRA or ALEXA Mini.

NOTICE

The Playback and Erasing indication is only supported on AMIRA and ALEXA Mini.

8 Menu

The Menu contains parameters for the basic UMC-4 setup. It has a tree structure and the current path in the menu is displayed in the top section of every screen.

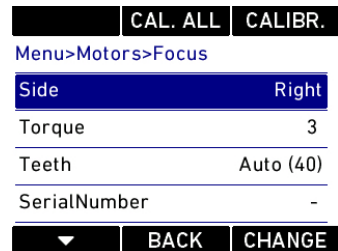
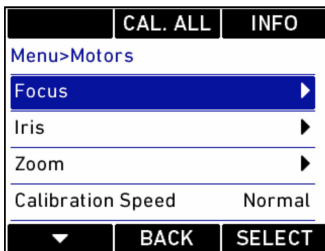


8.1 Motors

The Motors menu lets you set up the focus, iris and zoom motor, calibrate motors and select the calibration speed.

Press **CAL ALL** to calibrate all motors.

Press **INFO** to get a motor status overview.



Focus, Iris, Zoom Menu

The Focus, Iris and Zoom menu pages allow the setting of motor mounting side and motor torque.

Side:

Select the side on which the motor or lens data encoder is mounted to the lens.

Torque:

Set the torque level for CLM-3, CLM-4, CLM-5 and cforce mini/plus motors.

Torque setting is not available for the CLM-2 and LDE-1 lens encoder motor.

NOTICE

Ensure that the motor torque level matches the lens to avoid lens damage. Stiff, hard-to-move lenses require a higher torque level.

Teeth:

Set the teeth counts. Select between automatic gear detection or manual gear selection (40, 50 or 60 teeth).

NOTICE

The correct teeth count setting is crucial for lens metadata generation as well as correct displayed lens data on hand units. Currently, only ARRI gears with 40, 50 or 60 teeth are supported.

Any manual gear selections remains persistent until changed again.

Calibration

Press **CAL ALL** to calibrate all motors.

Press **CALIBR.** to calibrate the current lens motor.

NOTICE

Select Low calibration speed for mechanically delicate lenses.

To manually calibrate a Lens Data Encoder LDE-1, proceed as follows:

- 1 Attach the LDE-1 to the lens and connect it to its respective motor connector on the UMC-4 (e.g. if it encodes the focus scale, connect it to the FOCUS motor socket).
- 2 Press **CALIBR.** or **CAL. ALL** to activate calibration mode. Turn the encoded lens scale to its limits. After reaching both limits, leave the lens encoder still for at least three seconds. The motor status will change from Calibrating to Calibrated. The calibration is now completed.

Note: The Side setting for lens motors and lens data encoders refers to mounting on standard support rods on the bottom of the camera.

Note: The Side setting for the LDE-1 lens data encoder refers to mounting it with the tying knob facing away from the lens.

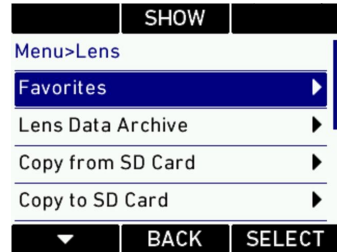
8.2 Radio

The Radio menu lets you switch the radio on and off and select the radio channel. Select the same channel both on the hand unit and the UMC-4. The Region Info indicates the currently active region setting of the optionally installed EMIP300 radio module. The setting can be changed by ARRI Service only. It may be illegal to use the wireless function in a region other than specified in the setting. Please ensure that the region is configured correctly and contact ARRI Service if it needs to be changed.



8.3 Lens

The Lens menu contains the Lens Data Archive with a set of pre-defined lens tables, including ARRI/ZEISS Master Primes, Ultra Primes, Master Anamorphics, Super Speeds, ARRI/FUJINON Alura Zooms and the ARRI Ultra Wide Zoom. Commonly used lenses (e.g. during a specific job) can be added to a user-generated Favorites list for quick access. Press SHOW to display live lens data.



Favorites

To add a lens table to the Favorites list, select Add to Favorites from the Lens menu. This opens the Lens Data Archive including a library of predefined lens tables.

Select a lens type, then a lens model and, in case of Zeiss lenses, a lens class (letter engraved on the lens). The lens class can be found on the lens barrel below the infinity symbol of the focus scale.

To add the lens table to the Favorites list press **ADD**; to use it without adding it to Favorites press **USE**; or to do both press **ADD+USE**.

Press **REMOVE** to delete the currently selected lens table from the Favorites list. Press **REM. ALL** to delete all lens tables from the Favorites list.

Copying Lens Tables from SD Card

Custom lens tables can be added to the Lens Data Archive's Custom folder via SD card. To add a new lens table to the UMC-4, copy the lens table on the SD card and insert the SD card into the UMC-4.

Go to *Menu>Lens>Copy from SD Card*. Navigate the SD card's file system until you reach the desired lens table, then press **SELECT** to select the specific one lens table or press **SEL. ALL** to select all lens tables in the SD card folder. A popup message will appear offering to instantly add the selected lens table(s) to the favorites list as well. Press **YES** to add the table(s) to the Favorites list, press **NO** to not add the table(s) to the Favorites list or press **CANCEL** to cancel the whole operation.

Custom lens tables can be deleted in the Delete Custom Lens Tables menu.

NOTICE

You can program a custom lens file through the ALEXA web interface or with the Wireless Compact Unit WCU-4 (SUP 2.0 onwards)

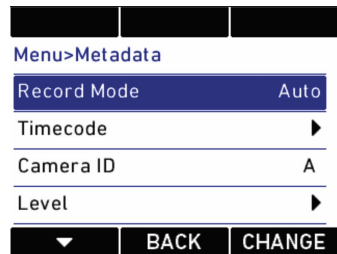
Copying Lens Tables to SD Card

Lens tables located in the UMC-4 Custom folder of the Lens Data Archive can be copied to the SD card.

Go to *Menu>Lens>Copy from SD Card* to copy all lens tables from the Custom folder to the SD card's /ARRI/ALEXA/LDA directory.

8.4 Metadata

The Metadata menu handles the metadata that is recorded onto SD card.



Record Mode

Set Record Mode to Auto if you want metadata to be recorded to SD card each time the UMC-4 gets a tally (recording) feedback from the camera it is connected to.

Set to Manual if you want to start metadata recording to SD card manually. Manual metadata recording can be activated by a **USER** button. Press the **USER** button to enter the User screen and assign Record Metadata to one of the **USER** buttons (see the **USER** menu section). Start manual recording by pressing the assigned **USER** button.

NOTICE

We recommend using high quality SD cards with the UMC-4. We also recommend formatting each card before use, as this will avoid issues with excessive fragmentation on the card's file system.

Timecode

The UMC-4 can sync to an external LTC timecode. The precise crystal oscillator in the UMC-4 will count accurately with +/- 1 ppm stability. It is recommended to jam-sync after every shooting break to avoid the risk of losing timecode sync during a shot.

The Timecode menu allows the setup and display of timecode. Timecode is recorded with the metadata onto SD card and can be used to synchronize metadata with the images in postproduction.

Select Show in Home Screen to switch the timecode display in the info area of the Home screen on and off.

Select Frame Rate to change the time base (23.97, 24, 25, 29.97, 29.97DF, 30, 30DF).

Select Jam to change the jam sync mode:

- **Off:** Jam sync is not active. The UMC-4 continuously generates timecode itself and functions as a timecode master clock.

- **Once:** The UMC-4 synchronizes its timecode with the external LTC source and continues counting on its own. After synchronization, a pop-up will appear to indicate the operation was performed.
- **Cont.:** The UMC-4 continuously reads the LTC-timecode signal at the TC connector as long as it is present. Upon disconnection or loss of signal, the UMC-4 continues counting on its own. When the external signal is reconnected, the UMC-4 uses the values of the external signal again.

Select **Set Timecode** to set the timecode. Use the arrow soft buttons to navigate the timecode values. Press the **OK** soft button to set the timecode. Press the **CANCEL** soft button to cancel the timecode setting.

Press the **SHOW** soft button to display the current timecode. Press any soft button to return to the menu.

NOTICE

It is recommended to jam-sync after every shooting break to avoid the risk of losing timecode sync during a shot.

The UMC-4 will keep its timecode for at least 30 minutes, even after disconnection from the power source or if it is switched off.

Camera ID

The Camera ID entry allows the selection of a camera ID. Use the selection list to assign a letter from A to Z as per the setting of your camera. This information will be shown on the Home screen and will be recorded in the metadata file. By selecting “—“ the camera ID information will be disabled, both from the Home screen and the metadata file.

Level

Shows the tilt and roll of the UMC-4 in degrees, as measured by the internal inclinometer. This sensor can be reset if it appears to have an offset. Press the **RESET** soft button to reset the sensor.

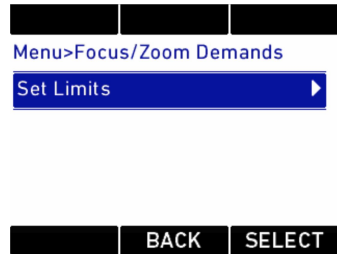
NOTICE

Mount the UMC-4 on the camera in a defined position. If possible, use the L-Bracket.

The inclinometer can only be reset while both axes are within a threshold of +/- 10 degrees around 0.

8.5 Focus/Zoom Demands Menu

The Focus/Zoom Demands menu allows the calibration of the broadcaststyle focus and zoom demands.

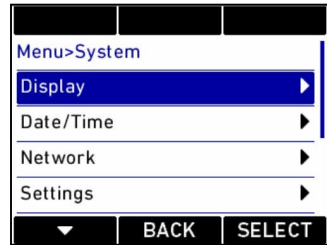


To calibrate the limits for a demand, connect the demand to the UMC-4 and set the zoom speed control knob to the highest speed setting ('Fast' or 'Max').

Select *Menu>Focus/Zoom Demands>Set Limits*. Press the **FOCUS** or **ZOOM** button and start turning the demand's control knob to its limits to activate calibration mode. After reaching both limits, leave the demand still for at least three seconds. The text on the screen will change from *Calibrating...* to *Calibrated*. The calibration is now completed.

8.6 System

The System menu contains a series of submenus that allows you to configure the UMC-4 to better suit your needs.



8.6.1 Display

The Display menu allows you to set the preferences for the display:

Color Theme offers various color themes for the UMC-4 display.

Display Backlight lets you set the backlight intensity for the LCD screen.

Button Backlight lets you set the backlight intensity for all UMC-4 control buttons.

Select Enter Sleep After to set the sleep mode timing.

Sleep Mode lets you set whether the sleep mode will apply to only buttons or display and buttons.

8.6.2 Date/Time

By selecting the Date/Time menu you can either show the current date and time on the screen, or set the current date and time of the UMC-4:

Press the **SHOW** soft button to display the current time.

Press any soft button to return to the menu.

Enter the Set Time/Date submenu to set the current time and date. Use the arrow soft buttons to navigate through the time and date settings. Press the **OK** soft button to save your settings.

Press the **CANCEL** soft button to abort the setting and return back to the menu.

8.6.3 Network

The network menu includes the following entries:

Show Parameters: All the relevant parameters of the network interface are shown in this screen.

Configuration Source: Pressing this button toggles between DHCP and Manual. If DHCP mode is selected, the UMC-4 will search for a DHCP server on the LAN to provide all the required network parameters. If Manual mode is selected, then the next menu Set Parameters will become active and should be used to manually configure the network parameters.

Set Parameters: This menu is accessible only if the menu entry Configuration Source is set on Manual. You can set here the IP Address, the Network Mask, the Gateway Address and the DNS address. Use the right and left arrows to select a specific parameter and the up and down arrows to modify their values.

NOTICE

The UMC-4 supports Apple's Bonjour® protocol; its Bonjour name is similar to "UMC4-#####.local", where "#####" stands for the UMC-4 serial number. For simple setups consisting of a PC and one or more UMC-4 units, connect the PC to the UMC-4 using a standard Ethernet cable. Make sure that your PC supports Bonjour protocol (e.g. by installing Apple's Safari browser) and select the Bonjour name of the unit you want to access in the Bonjour bookmarks, or type it in the browser's URL edit box. Set the Configuration Source in UMC-4 to DHCP.

8.6.4 Settings

The Settings menu allows users to save the current settings of the UMC-4, to load some previously saved settings or to load the factory default settings.

Select the Save Settings menu to save the current settings onto the SD card (a writable SD card must be inserted in the card slot). The settings file will be saved in the directory /ARRI/UMC4/settings. If the directory does not exist, it will be automatically created.

Select Load Settings and navigate to the previously saved settings on the SD card (normally /ARRI/UMC4/settings). Select the settings file. The settings in the file will replace the current settings in the UMC-4.

Select Factory Defaults to load the factory defaults into the UMC-4.

NOTICE

The current settings in the UMC-4 will be lost after loading a settings file!

The current settings in the UMC-4 will be lost after loading the factory defaults!

8.6.5 Firmware Update

To keep your UMC-4 up-to-date, you may need to update its firmware. Please check ARRI's website for the latest firmware packages. To update the device, proceed as follows:

- 1 Copy the firmware update package onto an SD card.
- 2 Insert the SD card in the SD card slot of the UMC-4.
- 3 Select *Menu>System>Firmware Update*, and navigate to the update package on the SD card.
- 4 Select the package. A list of modules will be shown on the screen.
- 5 Press **UPDATE**. A new warning screen will be displayed. Proceed by simultaneously pressing the two **UPDATE** buttons. The screen will blackout and the status LED starts blinking red and green. The unit is being updated. This can take up to 30 seconds.
- 6 The UMC-4 will reboot after the update is completed. Depending on the update package content, additional modules might need to be updated after reboot; this is done automatically and is clearly indicated on the screen of the device. The second phase of the update procedure may take several minutes.

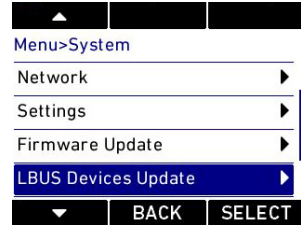
⚠ CAUTION!

Do not switch power off and do not remove the SD card during the update as this may damage the UMC-4! In case of problems, see the troubleshooting section.

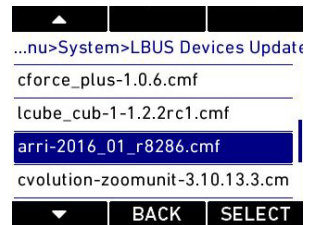
8.6.6 LBUS update

The UMC-4 is capable of updating LBUS devices. Insert a FAT32 formatted SD card into the UMC-4. To connect the devices a **LCS** to **LBUS** cable is required. Also an additional power supply cable is mandatory. See "Part Numbers", page 42

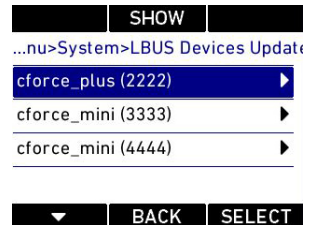
Go to *Menu>System>LBUS Device Updated.*



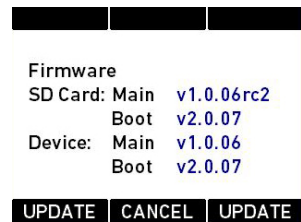
In this sub-menu, all suitable **LBUS** update files are displayed. Use the soft buttons to navigate through the folder structure on the SD card. Select the software package with the **SELECT** soft button.



All LBUS devices which are covered by the selected software package are displayed. **SHOW** displays the current firmware version of the selected device. Use **SELECT** on the desired device.



An overview of the software versions in the package and device is displayed. To start the update press both **UPDATE** keys simultaneously.



During update process: Do not switch off the UMC-4 or the LBUS devices. Do not unplug the LBUS cable or remove the SD card.

8.6.7 Save Log to SD Card

Select the Save Log to SD Card menu if you want to save the log file to the SD card. This may be required when you contact the ARRI support staff. The log file will be saved immediately and can be found in the /ARRI/UMC4/logs directory.

8.6.8 Format SD Card

Select Format SD Card to format the SD card and add the ARRI specific directory structure:

```
/ARRI/UMC4    /Firmware
               /Logs
               /Metadata
               /Settings
```

Note: All the data on the SD card will be lost after formatting the card!

8.6.9 System Info

Select the System Info menu to identify the current firmware version, the serial number, and the power source's current voltage.

9 User

Pressing the **USER** button opens the User screen, providing quick links to important functions/settings. Pressing the **USER** button a second time will switch to a configuration screen, where each button can be assigned to one of the pre-defined functions.

On delivery the UMC-4 comes with factory-programmed functions on each user button. To change them, enter the configuration screen by pressing the **USER** button twice. Select the button from the list, and assign the desired function. Proceed in a similar way for all user buttons you wish to reconfigure.

USER 1	USER 2	USER 3
Show Lens Data	Select Lens	Calibrate all Motors
Press USER to edit		
Show Timecode	Jam Timecode	Level Sensor
USER 4	USER 5	USER 6

USER assignable functions include:

- None
- Select Lens
- Show Lens Data
- Calibrate Motors
- Set Display
- Show Timecode
- Jam Timecode
- Focus Tracking
- Show Network
- Radio On/Off
- Record Metadata
- Level Sensor

10 LBUS devices

To connect the LBUS devices, a LCS to LBUS cable is necessary. It's hardly recommended to use an additional power supply, because of the limited power output of the LCS connector. See "LBUS cables", page 43

LBUS motors will be overruled by passive motors connected to the UMC-4. Make sure, to disconnect passive motors on those axis on which you want to use LBUS motos.

LBUS hand-units will be overruled by wireless connected hand units.



11 Remote Access

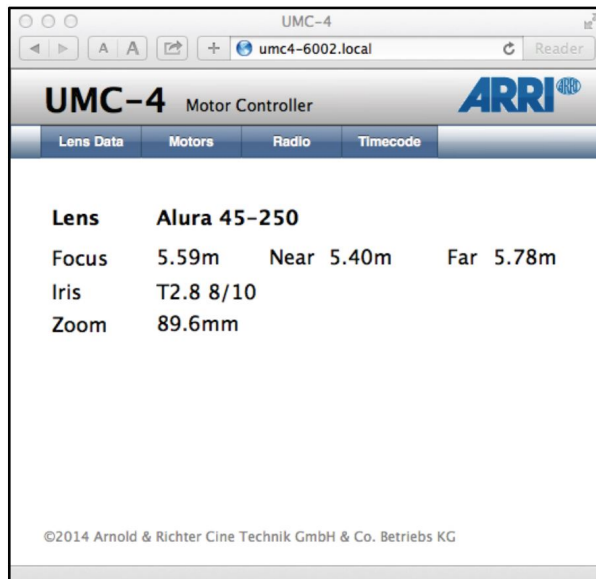
The UMC-4 offers several possibilities to control the device from afar.

11.1 Web Interface

The UMC-4 includes an embedded web server that can be accessed through a web browser using Apple's Bonjour® protocol.

To access the UMC-4 web interface, connect the UMC-4 to a computer with a standard Ethernet cable. Open the web browser on the computer. Enter address `umc4-####.local`, with `####` being the UMC-4 serial number.

The web interface displays the current lens data as well as the current motor, radio and timecode status. Further functions will become available with subsequent software updates.



11.2 VNC

The UMC-4 includes a VNC® server that can be accessed through a VNC Viewer. The UMC-4 screen can be remotely displayed and settings can be remotely changed through the VNC Viewer.

There are many VNC clients for virtually all operating systems that can be used with the UMC-4. As an example, the VNC Viewer can be downloaded from <https://www.realvnc.com/download/viewer/>. Please follow the installation instructions from the RealVNC website.

To access the UMC-4 VNC server, connect the UMC-4 to a computer with a standard Ethernet cable. Open the VNC Viewer on the computer. Enter address `umc4-#####.local`, with ##### being the UMC-4 serial number. Set Encryption to “Let VNC Server choose”. Press the CONNECT button in the VNC Viewer to connect with the UMC-4. The VNC Viewer will display the UMC-4 screen.

- Press M to enter the Menu.
- Press U to enter the User screen.
- Press H to return to the Home screen.
- Use the cursor of the VNC viewer to push the virtual soft buttons or use the up/down, left/right and ENTER keys on your computer keyboard.

Embedded GUI - VNC Viewer		
RADIO	LENS	INFO
Channel 5 Ready	Alura 45-250	All OK
CAM A 10:35:06 @24		● STBY ☐ 96%
LDE-1 R Ready	None	None
FOCUS	IRIS	ZOOM

12 Metadata

The UMC-4 records a metadata file when the camera is recording a clip as long as the UMC-4 receives a tally signal from the camera.

⚠ CAUTION!

Make sure to insert a write-enabled SD card with enough free space into the UMC-4. Set the UMC-4 to automatic recording mode (*Menu>Metadata>Recording Mode>Auto*) to trigger metadata recording from the camera.

The metadata is recorded in a character-separated values (CSV) file to SD card. The CSV values are separated by tab stops.

The file name contains the UMC-4 serial number and the date and time of clip generation.

(e.g. UMC4-06001_201420140822T192628.csv)

The following metadata is being recorded:

Name	Description	Example
Index	Sequential number	1
Master TC	Timecode	10:08:56:23
Camera Index	Camera index	A
Lens	Lens being used	AZ45-250_6045
Lens Distance Unit	Lens scale	Feet
Lens Focus Distance	Focus distance (in 1/1000 m/ft)	14.358
Lens Focal Length	Focal length (in 1/1000 mm)	50.000
Lens Iris	T-stop	T2.8+7/10
Lens Linear Iris	Linear iris value	3725
RawEncoderFocusRawMotor	Encoder value of focus motor	11251

RawEncoderFocalRawMotor	Encoder value of zoom motor	9436
RawEncoderIrisRawMotor	Encoder value of iris motor	4027
EncoderLimFocusMotorMin	Minimum encoder limit of focus motor	0
EncoderLimFocusMotorMax	Maximum encoder limit of focus motor	21122
EncoderLimFocalMotorMin	Minimum encoder limit of zoom motor	0
EncoderLimFocalMotorMax	Maximum encoder limit of zoom motor	21122
EncoderLimIrisMotorMin	Minimum encoder limit of iris motor	0
EncoderLimIrisMotorMax	Maximum encoder limit of iris motor	4585
UMC-4 Tilt	Tilt angle of UMC-4 (degree)	0.1
UMC-4 Roll	Roll angle of UMC-4 (degree)	0.1

13 Appendix

13.1 Antenna connector

The radio connection is established via the antenna connected to the antenna connector. The radio module inside could be damaged by electrostatic discharge via the open connector. We recommend using the originally supplied antenna only.

13.2 Part Numbers

K2.0001967	L-Bracket (supplied with UMC-4)
K2.0001758	V-Plate
K2.0002007	Outdoor Antenna (straight) for UMC-4 Motor Controller (supplied with UMC-4)
K2.0001637	Cable Fi m3p to Fi f3p Provides power and RUN/STOP function. Can be used to power a UMC-4 from a camera.
K2.0002668	Cable UMC-4 RS IN to D-Tap
K2.0002672	Cable UMC-4 RS IN to PSC (additional PSC cable required)
K2.0002674	Cable UMC-4 RS IN to open end
K2.0005951	Cable UMC-4 to ALEXA
K2.0001604	Cable UMC-4 to AMIRA / ALEXA Mini
K2.0002919	Cable UMC-4 to LANC (additional RS IN cable required)
K2.65205.0	Cable UMC-3/4 to Sony F35/PSC (additional PSC cable required)
K2.0000321	Cable UMC-3/4 to Sony F55/PSC (additional PSC cable required)
K2.0002620	Cable UMC-4 to F55 (additional RS IN cable required)
K2.0002656	Cable UMC-4 to F65 (additional RS IN cable required)

K2.65186.0	Cable UMC-3/4 to RED ONE/PSC (additional PSC cable required)
K2.0002855	Cable UMC-4 to EPIC (additional RS IN cable required)
K2.65235.0	Cable UMC-3/4 to Video-RS/PSC (additional PSC cable required)
K2.65012.0	Cable UMC-3/4 to Cooke/i (supported with UMC-4 SUP 1.1)
K2.65063.0	Cable UMC-3/4 to Cine Tape Measure (coiled)
K2.0003252	Cable TC IN/OUT (Ambient)
K2.0003254	Cable TC OUT BNC (Ambient)
K2.0003253	Cable TC IN BNC (Ambient)
K2.0003255	Cable TC OUT for EPIC (Ambient)
K2.0002043	UMC-4 connector module to Fujifilm focus/zoom demands FUJ-1
K2.0002042	UMC-4 connector module to Canon focus/zoom demands CAN-1
K2.0002046	UMC-4 connector module with two serial connectors (supplied with UMC-4)

LBUS cables

K2.0006749	Cable LBUS 0,2 m/8" LCB-3
K2.0006750	Cable LBUS 0,3 m/1 ft LCB-4
K2.0006751	Cable LBUS 0,5 m/1.6 ft LCB-A
K2.0006752	Cable LBUS 0,8 m/2.6 ft LCB-1
K2.0006753	Cable LBUS 1,5 m/5 ft LCB-5
K2.0006754	Cable LBUS 3 m/10 ft LCB-1-01
K2.0006755	Cable LBUS 6 m/20 ft LCB-2
K2.0006756	Cable LBUS 15 m/49 ft LCB-1-15
K2.0007318	Cable LBUS to LCS 0,8 m/2.6 ft
K2.0006757	Cable LBUS to D-Tap 1,2 m/4 ft LPS-7-01
K2.0006758	Cable LBUS to D-Tap 0,8 m/2.6 ft LPS-7

K2.0006759	Cable LBUS to RS 0,8 m/2.6 ft LPS-1
K2.0006760	Cable LBUS to XLR-4 0,8 m/2.6 ft LPS-6
K2.0012630	Cable LBUS (2x angled), 0,8 m/2.6 ft
K2.0013042	Cable LBUS (angled, straight), 0,35 m/1.15 ft
K2.0013041	Cable LBUS (angled, straight), 1 m/3.3 ft
K2.0013040	Cable LBUS (2x angled), 0,6 m/2 ft
K2.0013043	Cable LBUS (angled, straight), 0,8 m/2.6 ft
K2.0013044	Cable LBUS (angled) to LCS 0,8 m/2.6 ft
K2.0012785	Cable LBUS (2x angled), 0,2 m/8"
K2.0009643	Cable AMIRA/ALEXA MINI EXT to LBUS (straight) 0,8 m/2.6 ft
K2.0012628	Cable AMIRA/ALEXA MINI EXT to LBUS (angled) 0,8 m/2.6 ft

⚠ DANGER!

Risk of fire!

Short-circuits and back currents to power supplies/batteries may entail lethal damage!

Always use original ARRI/cmotion LBUS cables to external power sources (D-Tap, XLR)! ARRI/cmotion LBUS cables to external power sources provide a protection circuit to prevent back currents to power supplies/batteries.

13.3 Compatibility

The UMC-4 supports the following products:

- Wireless Compact Unit WCU-4
- Single Axis Unit SXU-1
- Zoom Main Unit ZMU-3A
- Wireless Zoom Extension WZE-3
- Wireless Compact Unit WCU-3

- Wireless Main Unit WMU-3
- Wireless Focus Unit WFU-3
- Wireless Zoom Unit WZU-3
- Controlled Lens Motor CLM-2
- Controlled Lens Motor CLM-3
- Controlled Lens Motor CLM-4
- Lens Data Encoder LDE-1
- Ultrasonic Distance Measure UDM-1
- cforce plus
- cforce mini
- LCUBE CUB-1 - LBUS to SERIAL converter
- LCUBE CUB-2 - LBUS to ENG converter
- Master Grips
- ARRI ALEXA and AMIRA cameras
- 3rd party cameras
- cmotion cfinder III

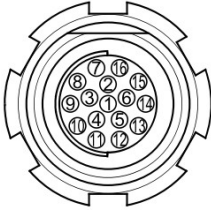
NOTICE

Use only one lens motor per lens axis.

Up to three hand units can be connected to one UMC-4 in parallel to form a radio network.

13.4 Pinouts

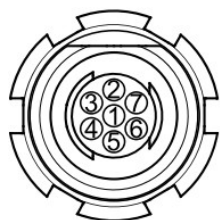
CAM connector



1	GND	Ground
2	+V-BAT	9.5V to 34V DC IN
3	CAM-TYPE	Camera type sense, analog input
4	Rx-	RS422 line
5	RUN-SW1	Opto switch 1 connects to pin 13 @REC (max. 100 mA/50V)
6	Tx+	RS422 line
7	CAN-L	CAN bus
8	n.c.	
9	TALLY	Tally, analog input, active high (default value: 1.25V transition level)
10	D-CAM TALLY	Tally, digital input, active low
11	DAC-CAM	REC analog output, active high (default value @REC: 3.3V)
12	R/S	ARRI R/S
13	RUN-SW2	Opto switch 2 connects to pin 5 @REC (max. 100 mA/50V)
14	RxD/Rx+	RS232/RS485 – RS422 together with pins 4, 6, 15
15	TxD/Tx-	RS232/RS485 – RS422 with pins 4, 6, 14

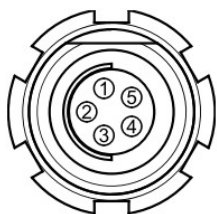
16	CAN-H	CAN bus
----	-------	---------

Serial connector



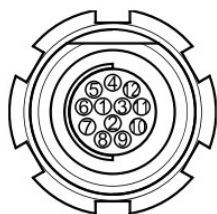
1	GND	Ground
2	V-IN	Battery supply in-/output
3	TxD Tx- RXTX-N	RS232 RS422 RS485
4	RxD RX+ RXTX-P	RS232 RS422 RS485
5	TX+	RS422
6	RX-	RS422
7	CABLE-ID	Analog input

LCS connector



1	GND	Ground
2	n.c.	
3	CAN-L	CAN bus
4	CAN-H	CAN bus
5	+V-BAT	Battery supply output

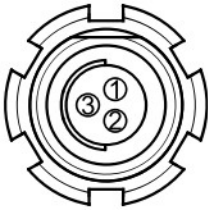
CLM connector



1	GND	Ground
2	MTYPE-A	Motor type sense
3	MTYPE-B	Motor type sense
4	MTYPE-C	Motor type sense
5	+5V	Encoder supply
6	Encoder-A	Encoder input A

7	Encoder-B	Encoder input B
8/9/10	n.c.	
11	Motor +	Motor drive output
12	Motor -	Motor drive output

RS IN



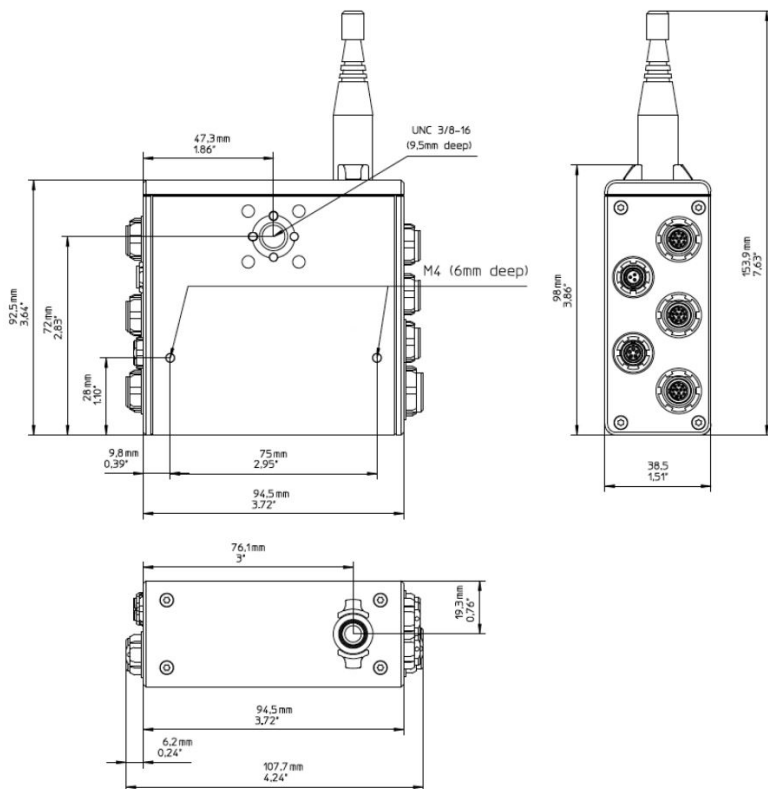
1	GND	Ground
2	+V-BAT	9.5 V to 34 V DC IN
3	R/S	ARRI R/S

TC



1	GND	Ground
2	LTC-IN	Timecode input
3	n.c.	n.c.
4	n.c.	n.c.
5	LTC-OUT	Timecode output

13.5 Dimensions and Weight



Weight (including antenna): 428 g / 15.1 oz

13.6 Electrical Data

Supply Voltage:	9.5V to 34V DC (full motor speed)
Current Consumption:	135 mA@12V (radio on/ready) 70 mA@24V (radio on/ready)
Operating Temperature:	-20 to +50 °C (-4 to +122 °F)

13.7 Radio system

The UMC-4 contains a radio unit that enables wireless lens control with a white coded radio module. A white ring at the base of the antenna socket identifies it. There are 8 channels to choose from:

Channel	Frequency
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

White radio and legacy yellow radio cannot be mixed in the same radio network of the camera and its hand units. However, both systems can be used parallel in different radio networks.

13.8 Troubleshooting

Problem	Symptom	Remedy
Software update failed	During the update, the status LED ceases to blink (is solid green), or it blinks with a constant duty cycle and the unit does not re-start by itself.	Restart the UMC-4 manually by pressing the POWER button for 6 seconds or more, until the LED goes off; wait 3 seconds and restart the unit. If it still doesn't start, contact ARRI Service.
UMC-4 does not power up	The UMC-4 does not boot up after pressing the POWER button.	The internal lithium battery might be empty. Press the power button for 3-5 seconds to power up the UMC-4. Have the internal battery replaced by ARRI Service.

13.9 Service contacts

Munich, Germany

ARRI Cine + Video Technik

+49 89 3809 2121

service@arri.de

Business hours:

Mo. - Fr. 9:00 - 17:00 (CET)

London, Great Britain

ARRI CT Limited

+44 1895 457 051

service@arri-ct.com

Business hours:

Mo. - Thu. 9:00 - 17:30

Fr. 9:00 - 17:00 (GMT)

Burbank, USA

ARRI Inc. West Coast

+1 877 565 2774

service@arri.com

Business hours:

Mo. - Fr. 8:15 - 17:00 (PST)

Mississauga, Canada

ARRI Canada Limited

+1 416 255 3335

service@arri.com

Business hours:

Mo. - Fr. 8:30 - 17:00 (EDT)

Beijing, China

ARRI China Co. Limited

+86 10 5900 9680

service@arrichina.com

Business hours:

Mo. - Fr. 9:00 - 18:00 (CST)

Vienna, Austria

ARRI Cine + Video Geräte
Ges.m.b.H.

+43 1 8920107 30

service@arri.at

Business hours:

Mo. - Fr. 9:00 - 17:00 (CET)

Milan, Italy

ARRI Italia S.r.l.

+39 (02) 262 271 75

info@arri.it

Business hours:

Mo. - Fr. 9:00 - 18:00 (CET)

New York, USA

ARRI Inc. East Coast

+1 877 565 2774

service@arri.com

Business hours:

Mo. - Fr. 8:00 - 17:30 (EST)

Hong Kong, China

ARRI Asia Limited

+852 2537 4266

service@arriasia.hk

Business hours:

Mo. - Fr. 10:00 - 18:30 (HKT)

Sydney, Australia

ARRI Australia Pty Ltd

+61 2 9855 4305

service@arri.com.au

Business hours:

Mo. - Fr. 8:00 - 18:00 (AEST)

13.10 International declarations

EC Declaration of Conformity

The product UMC-4 conforms to the specifications of the following European directives:

- Directive 2014/30/EU of the European Parliament and the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility
- Directive 1999/5/EU of the European Parliament and the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity
- Directive 2011/65/EU of the European Parliament and the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

The compliance with the requirements of the European Directives was proven by the application of the relevant harmonized standards.

FCC 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 their own expense.

Industry Canada 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. Cet appareil est conforme à CNR-210 d'Industrie 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 Règlement sur le matériel brouilleur du Canada.

Japan MIC Statement

Complies with Ministry of Internal Affairs and Communications notification Article 88, Annex 43.

Radio Module

The UMC-4 contains the following radio module:

FCC ID: Y7N-EMIP300

IC ID: 9482A-EMIP300

MIC ID: 011-150023

NOTICE

It may not be legal to operate Universal Motor Controller UMC-4 in a country/region other than the country/region selected in the UMC-4 region menu. Switch radio off and use the device in hardwired mode if you are not sure of the correct region setting.