



# EMC-1

**ENG Motor Controller**

**USER MANUAL**

**Date: 10<sup>th</sup> September 2014**



## Imprint

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## Scope

This instruction manual applies to the following product: ENG Motor Controller EMC-1 with Software Update Package (SUP) 1.0

## Document Information

| Version | Document No. | Date       |
|---------|--------------|------------|
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## Disclaimer

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

The ARRI ENG Motor Controller EMC-1 is only available to commercial customers. The customer grants by utilization that the EMC-1 or other components of the system are 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 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 have to heed the stated canonic use.

ARRI or its subsidiaries do not assume any responsibility for incurred losses due to improper handling or configuration of the EMC-1 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 since this manual was published, 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 foregoing clauses are not allowed by applicable law, the fullest extent permissible clauses by applicable law are validated.

## For Your Safety

Always keep this document on hand. It should be read, understood and observed by all persons using the ENG Motor Controller EMC-1. All other products must be handled as prescribed by their manufacturers.

### Risk Levels and Alert Symbols

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



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



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



**DANGER!**

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

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

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

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## **Vital Precautions**

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

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

Never remove or deactivate any product safety equipment (incl. guarantee stickers).

Always protect the product 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 EMC-1 in places where it may be subject to temperature extremes, direct sunlight, high humidity, severe vibration, or strong magnetic fields.

## **Audience and Intended Use**

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

The EMC-1 is a motor controller solely and exclusively for iris, focus and zoom control on ENG-type lenses:

- Wireless via ARRI white radio modem
- Wired via ARRI LCS connection

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

## Introduction

The ENG Motor Controller EMC-1 was specifically developed for use with ENG-type zoom lenses. The EMC-1 controls the integrated focus, iris, and zoom servo motors of such ENG lenses and provides lens data for display on the WCU-4 hand unit.

Visit [www.arri.com/ecs/EMC-1](http://www.arri.com/ecs/EMC-1) for up-to-date product information and software updates.

### How to Use This Manual

Connectors are written in all capital letters, for example, LENS.

Buttons are written in all 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.

### Scope of Delivery

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

- ENG Motor Controller EMC-1, including antenna
- Instruction manual
- Original packaging

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

## System Requirements

To tap the full potential of the device, have all connected units updated to a firmware equal or higher to those listed below.

| <b>Product</b>              | <b>Firmware</b> |
|-----------------------------|-----------------|
| Wireless Compact Unit WCU-4 | SUP 1.2         |
| Single Axis Unit SXU-1      | SUP 1.0         |
| Zoom Main Unit ZMU-3A       | SUP 02G         |

## QUICK START GUIDE

This quick start guide walks you through setting up the EMC-1 with one hand unit and an ENG-type lens for wireless lens control.

### Mounting on Camera

Mount the EMC-1 on the camera, preferably in a vertical position by using the L-Bracket, with the antenna pointing upwards and the LENS connector pointing towards the lens. Such a position makes the EMC-1 user interface easily accessible.

### Powering up

Connect the EMC-1 to a power source with one of the power cables listed on page 20. The EMC-1 will power-up automatically when connected to the power source.

### Setting the Focus Distance Unit

The WCU-4 will display the lens metadata it receives from the lens. Depending on the lens, you can switch the distance unit between metric and imperial. Press the LENS soft button on the *Home* screen to enter the *Lens* menu page. Press the UNIT soft button to toggle between metric and imperial units.

### Connecting to Hand Unit

Press the RADIO soft button on the *Home* screen and select a radio channel. Press SET to activate the selected channel. Make sure that the selected radio channel is not already in use by another motor controller.

Set the hand unit to the same radio channel (see the hand unit's user manual for further instructions). Once connected, the number of connected hand units will change from 0 to 1 on the EMC-1 *Home* screen.

You are now ready to shoot.

## Interfaces

The EMC-1 includes the following interfaces:



| <b>Interface</b>        | <b>Description</b>   |
|-------------------------|--|
| Antenna                 | Swivel antenna   |
| 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 digital cameras |
| LENS Connector          | Connects to an ENG-type zoom lens  |
| Micro SD Card Slot      | Mounts a Micro SD card   |
| 3/8" UNC Mounting Point | Mounting point for accessories like L-Bracket or V-Plate   |

## Control Panel

The EMC-1 features a user interface enabling the user to quickly configure the system. The 1.2” transfective LCD display shows vital status information and is easily readable in any ambient light conditions.



*Fig. 1: Control Panel*

### Soft Buttons

Four 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

Use the UP and DOWN soft buttons to navigate through the menu.

To access a new menu level, press the ENTER soft button. To go back, press the BACK or the HOME soft button.

Press SET to activate a setting.

## HOME

The *Home* screen is the default screen. It shows the current radio and lens status.

The *Home* screen provides four soft buttons:

- **LOCK:** Press to lock or unlock the other three soft buttons. A padlock symbol indicates that buttons are locked.
- **MENU:** Press to enter the main menu.
- **RADIO:** Press to select the radio channel.
- **LENS:** Press to enter the *Lens* menu.



Fig. 2: Home Screen

### Info Area

The info area shows the current radio status on the left side of the screen and the current lens status on the right side of the screen.

#### Radio Status

|          |                |   |
|----------|----------------|---|
| R:       | <i>Off</i>     | Indicates that the radio modem is switched off.   |
|          | <i>Init</i>    | Indicates that the radio modem is initializing.   |
|          | <i>Ready</i>   | Indicates that the radio modem is initialized and ready to connect.   |
|          | <i>Blocked</i> | Indicates that another motor controller is already using the currently selected radio channel.<br>Select another radio channel! |
| Channel: | 0 – 7          | Indicates the radio channel.  |
| Units:   | 0 – 3          | Indicates the number of connected hand units.   |

Lens Status

- L:            *Ready*            The lens is ready to use.
- None*             There is no lens connected.
  
- Imperial/*        Indicates the focus distance unit setting.
- Metric*

## RADIO

Press the RADIO soft button on the *Home* screen to enter the *Radio* menu page. Use the UP and DOWN soft buttons to select the radio channel or to switch the radio on and off. Select the same channel both on the hand unit and the EMC-1.



Fig. 3: Radio Menu

## LENS

Press the LENS soft button on the *Home* screen to enter the *Lens* menu page. The *Lens* menu page displays the currently connected lens type and its serial number.

Press the UNIT soft button to toggle between metric and imperial focus distance units to be displayed on the WCU-4 hand unit's lens data display.



Fig. 4: Lens Menu

## MENU

The *Menu* contains parameters for the basic EMC-1 setup.



Fig. 5: Main Menu

### Backlight

Select the backlight brightness of the LCD screen. The brightness can be set from 0 (backlight is off) to 10 (maximum brightness).

### Firmware

To keep your EMC-1 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. Go to the download area at [www.arri.de/ecs/EMC-1](http://www.arri.de/ecs/EMC-1).
2. Download the zip file containing the update file.
3. Unzip the file.
4. Copy EMC-1\_V####.upd to ARRI/EMC1/Firmware/ on Micro SD card (with #### being the update version number).
5. Insert the Micro SD card in the Micro SD card slot of the EMC-1.
6. Select *Menu>Firmware*. Update information appears.
7. Press both UPDATE keys simultaneously to start the update.
8. The EMC-1 will reboot after the update is completed.




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Do not switch power off and do not remove the Micro SD card during the update as this may damage the EMC-1!

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**System Info**

Select the *System Info* menu page to identify the currently installed firmware version.

## Appendix

### Antenna Connector



The radio connection is established via the antenna connected to the antenna connector. Do not leave the connector open during operation or transport. The radio module inside could be damaged by electrostatic discharge via the open connector. We recommend using the originally supplied antenna only.

### Cables and Accessories

The following accessories are compatible with the EMC-1:

|            |  |
|------------|--|
| K2.0001996 | Swivel antenna for SMC-1 and EMC-1 Motor Controllers |
| K2.0003418 | Cable EMC-1 to Fujinon ZK lenses                     |
| K2.0001606 | Cable SMC/EMC to RS                                  |
| K2.0002682 | Cable SMC/EMC to D-Tap                               |
| K2.0001999 | Cable SMC/EMC to LANC/D-Tap                          |
| K2.0001997 | Cable SMC/EMC to Sony F5/55                          |
| K2.0001998 | Cable SMC/EMC to RED EPIC/D-Tap                      |
| K2.0002727 | Cable SMC/EMC to PSC                                 |
| K2.0002725 | Cable SMC/EMC to open end                            |
| K2.0001967 | L-Bracket  |
| K2.0001758 | V-Plate  |

### **Compatible Products**

The EMC-1 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

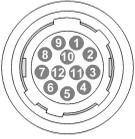
---

Note: The SXU-1 cannot control the zoom axis on an ENG-type lens!

---

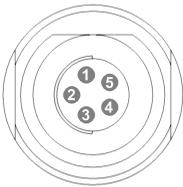
## Connector Pin-Outs

### LENS

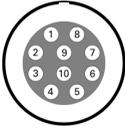


|    |             |                                |
|----|-------------|--------------------------------|
| 1  | n.c.        |                                |
| 2  | n.c.        |                                |
| 3  | GND         | Ground                         |
| 4  | n.c.        |                                |
| 5  | n.c.        |                                |
| 6  | +12V        | Regulated 12 V/1 A lens supply |
| 7  | n.c.        |                                |
| 8  | n.c.        |                                |
| 9  | n.c.        |                                |
| 10 | n.c.        |                                |
| 11 | CAM to LENS | Serial connection              |
| 12 | LENS to CAM | Serial connection              |

### LCS

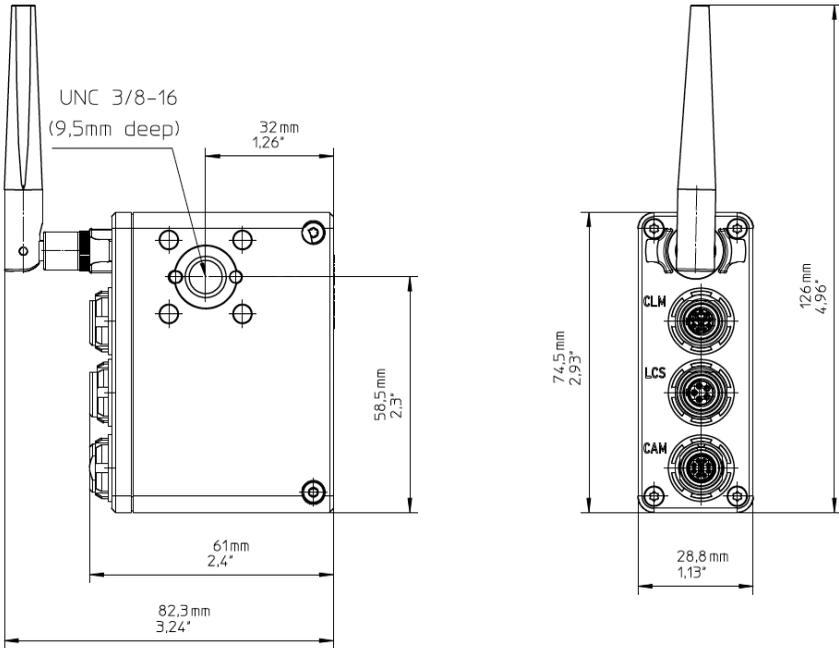


|   |        |                       |
|---|--------|-----------------------|
| 1 | GND    | Ground                |
| 2 | n.c.   |                       |
| 3 | CAN-L  | CAN bus               |
| 4 | CAN-H  | CAN bus               |
| 5 | +V-BAT | Battery supply output |

CAM

|    |         |   |
|----|---------|---|
| 1  | GND     | Ground  |
| 2  | +V-BAT  | 9.5 V to 34 V DC IN   |
| 3  | RxD     | RS232   |
| 4  | TxD     | RS232   |
| 5  | R/S     | ARRI R/S  |
| 6  | RUN-SW2 | Opto switch, connects to pin 8 @REC (max. 100 mA/50 V)                    |
| 7  | ACAM    | Tally, analog input, active high (default value: 1.25 V transition level) |
| 8  | RUN-SW1 | Opto switch, connects to pin 6 @REC (max. 100 mA/50 V)                    |
| 9  | DAC-CAM | REC, analog output, active high (default value @REC: 3.3 V)               |
| 10 | D-CAM   | TALLY, digital input, active low, 3.3 V logic signal level                |

### Dimensions and Weight



Weight (including antenna): 173 g

**Electrical Data**

|                        |   |
|------------------------|---|
| Supply Voltage:        | 9.5 V to 34 V DC  |
| Current Consumption:   | 100 mA@12 V (radio on/ready)<br>50 mA@24 V (radio on/ready) |
| Operating Temperature: | -20 to +50 °C (-4 to +122 °F)                               |

**Radio System**

The EMC-1 contains a radio unit that enables wireless lens control and lens data communication with a white coded radio module. A white ring at the base of the antenna mount point identifies it. It offers 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 camera and hand units. It is possible to use both systems in parallel within different radio networks.

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## **International Declarations and Certifications**

### EC Declaration of Conformity

The product **ENG Motor Controller EMC-1** conforms with 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/EC 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 proved by the application of the following harmonized standards:

- EN 55022; EN 55103-1; EN 55103-2; EN 301 489-1; EN 301 489-17; EN 62479; EN 60950-1; DIN EN 50581



**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 his own expense.

Contains Transceiver module FCC-ID: Y7N-EMIP100

**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. 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.

Contains Transceiver Module IC-ID: 9482A-EMIP100



