External Radio Modules for LCS
ERM-2400 SUP2.5
USER MANUAL
Date 01.05.2021
Imprint

Copyright © 2020 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 NOTE. Errors, omissions, and modifications excepted. ARRI, ALEXA, AMIRA, 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:
Arnold & Richter Cine Technik GmbH & Co. Betriebs KG
Herbert-Bayer-Str. 10
80807 München
Germany
www.arri.com

Document revision history

<table>
<thead>
<tr>
<th>Version</th>
<th>Release</th>
<th>SUP</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>F07357</td>
<td>2.3</td>
<td>06.04.2020</td>
</tr>
<tr>
<td>1.1</td>
<td>F07357</td>
<td>2.3</td>
<td>01.05.2021</td>
</tr>
</tbody>
</table>

Scope

This document describes the components and respective the setups of the K2.0037120 ERM-2400 Ext. Radio Module 2.4GHz RXD-TXD, LCS, Basic Set by FoMa Systems.

Disclaimer

Before using the products described in this manual, be sure to read and understand all the respective instructions. Otherwise the customer must contact ARRI before using the product. While ARRI endeavours 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 conditions of use.

ARRI or its subsidiaries do not assume any responsibility for losses incurred due to improper handling or configuration of the product 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
# Table of contents

1. For your safety ................................................................. 4  
2. Functions ........................................................................ 5  
3. Introduction ...................................................................... 6  
   3.1 How It Works .............................................................. 6  
   3.2 Compatibility.............................................................. 6  
   3.3 Handling Transmitter / Receiver .................................. 6  
   3.4 The basic set .............................................................. 7  
   3.5 Recommended and required optional extension cables .... 7  
   3.6 Additional LBUS extensions cables ............................ 7  
   3.7 LBUS power cables .................................................. 7  
   3.8 Spare cables .............................................................. 7  
4. Connecting the ERM via LCS, Ext. and LBUS ..................... 8  
   4.1 WCU-4 / SXU-1 ....................................................... 8  
   4.2 ALEXA Plus ............................................................... 8  
   4.3 Master Grip to ALEXA Mini, ALEXA Mini LF and AMIRA 9  
5. Third Party Cameras ....................................................... 9  
   5.1 WCU-4 / SXU-1 / cforce mini RF motor ....................... 9  
   5.2 WCU-4 / SXU-1 / AMC-1 / cforce mini motors ............. 10  
6. Connecting the DEW-1 & DEH-1 via LBUS and ERM with the SRH RCP 10  
7. Appendix ........................................................................ 11
For your safety

1.1 How to use this manual
All directions are given from a camera operator's point of view. For example, camera-right side refers to the right side of the camera when standing behind the camera and operating it in a normal fashion.

1.2 Strengthen your knowledge and get trained
The ARRI Academy courses provide unrivaled insights into the full possibilities of working with ARRI camera systems, camera stabilizer systems, lenses, lights and accessories. To learn more, please visit http://arri.com/academy.

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

**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.

**NOTE**

**NOTE** 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.
2 Functions

2.1 Functions front

Display

FS CAN Bus

Power In
LEMO 0B 2pin

USB Port

Rubber Duck Antenna

Signal Strength

RXD / TXD Status

2.2 Functions back

3/8" thread / RMB-2
mounting thread

1/4" thread

RMB-2 / RMB-3
mounting threads

M4 thread
3 Introduction

### 3.1 How It Works

An ERM-2400 LCS set of radio modules basically extends an LCS, LBUS, EXT (CAN bus) cable connection over air. As such, it can connect ARRI and cmotion hand units to cameras and motor controllers and they behave as if they were hard-wired, but with an exceptionally great wireless range.

### 3.2 Compatibility

The ERM-2400 LCS module is compatible with equipment supporting LCS, EXT and LBUS protocols.

A pair of ERM-2400 LCS modules can replace a cabled connection between two devices, for example:

- WCU-4 or SXU-1 and ALEXA Plus camera (LCS socket)
- WCU-4 or SXU-1 and ALEXA Mini camera (EXT socket)
- WCU-4 or SXU-1 and ALEXA Mini LF camera (EXT socket)
- WCU-4 or SXU-1 and UMC-4 (LCS socket)
- Master Grip or OCU-1 and cforce motor
- cmotion cPRO hand unit and cforce motor
- ARRI Wheels DRW-1 and Digital Encoder Head DEH-1

### 3.3 Handling Transmitter / Receiver

ERM-2400 LCS are supplied as an already paired set of two radio modules, including all necessary cables. Once connected to handset and camera device, they will power up and connect automatically.

The modules can be used both as transmitters and receivers. Pre-configured pairs can be identified through a matching number code at the back of each device.

### NOTICE

The external radio module ERM-2400 LCS has been developed exclusively for use with the ARRI ECS products and workflows. Any other use is not recommended and may damage the modules.

The OCU-1 / Master Grips override function is not supported with ERM-2400 LCS, because override is not possible in hardwired mode neither.

Avoid mixing individual modules with other sets of paired ERMs.

ERM-2400 for LCS and ERM-2400 for SRH are NOT compatible with one another.
3.4 The basic set

ERM-2400 Ext. Radio Module 2.4GHz RXD-TXD, LCS, Basic Set K2.007120

Includes:
2 x ERM-2400 Ext. Radio Module 2.4 GHz RXD-TXD LCS (incl. antennas)
2 x ERM LCS to FS CAN Bus Adapter Cable, 0.2m/0.65ft
2 x ERM LBUS to FS CAN Bus Adapter Cable, 0.2m/0.65ft
1 x ERM EXT to FS CAN Bus Adapter Cable, 0.2m/0.65ft
1 x ERM D-Tap Power Cable, 0B Lemo 2pin to D-Tap, 1m/3.2ft

**NOTICE**

The basic set is only supplied with adapter cables. However, FS CAN bus and / or LBUS extension cables are required for use. These extension cables have to be ordered separately!

3.5 Recommended and required optional extension cables

SRH FS CAN Bus Cable, 1m/3.2ft K2.0033762
SRH FS CAN Bus Cable, 10m/32.8ft K2.0019302
SRH FS CAN Bus Cable, 25m/82ft K2.0019301

**CAUTION**

To exclude any health risk, the minimum distance between the ERM transmitter and the operator must be at least 1 m.

3.6 Additional LBUS extensions cables

Cable LBUS - LBUS (0.8m/2.6ft) K2.0006752
Cable LBUS - LBUS (1.5m/5ft) K2.0006753
Cable LBUS - LBUS (3m/10ft) K2.0006754
Cable LBUS - LBUS (6m/20ft) K2.0006755
Cable LBUS - LBUS (15m/49ft) K2.0006756

3.7 LBUS power cables

Cable LBUS - D-Tap (0.8m/2.6ft) K2.0006758
Cable LBUS - D-Tap (1.2m/4ft) K2.0006757
Cable LBUS - XLR (4p) (0.8m/2.6ft) K2.0006760

3.7 Spare cables

ERM LCS to FS CAN Bus Adapter Cable, 0.2m/0.65ft K2.0036900
ERM LBUS to FS CAN Bus Adapter Cable, 0.2m/0.65ft K2.0036903
ERM EXT to FS CAN Bus Adapter Cable, 0.2m/0.65ft K2.0036901
ERM D-Tap Power Cable, 0B Lemo 2pin to D-Tap, 1m/3.2ft K2.0036902
4 Connecting the ERM via LCS, Ext. and LBUS

4.1 WCU-4 / SXU-1

Required optional extension cables
- SRH FS CAN Bus Cable, 1m/3.2ft K2.0033762
- SRH FS CAN Bus Cable, 10m/32.8ft K2.0019302
- SRH FS CAN Bus Cable, 25m/82ft K2.0019301

4.2 ALEXA Plus

Required optional extension cables
- SRH FS CAN Bus Cable, 1m/3.2ft K2.0033762
- SRH FS CAN Bus Cable, 10m/32.8ft K2.0019302
- SRH FS CAN Bus Cable, 25m/82ft K2.0019301
4.3 Master Grip to ALEXA Mini, ALEXA Mini LF and AMIRA

5.0 Third Party Cameras

5.1 WCU-4 / SXU-1 / cforce mini RF motor
5.2  WCU-4 / SXU-1 / AMC-1 / cforce mini motors

Connecting the DEW-1 & DEH-1 via LBUS and ERM with the SRH remote control panel

Required optional extension cables
- SRH FS CAN Bus Cable, 1m/3.2ft  K2.0033762
- SRH FS CAN Bus Cable, 10m/32.8ft  K2.0019302
- SRH FS CAN Bus Cable, 25m/82ft  K2.0019301

6

Connecting the DEW-1 & DEH-1 via LBUS and ERM with the SRH remote control panel

Required optional extension cables
- SRH RCP ext. Power Supply Set Gold-Mount  K0.0024195
- SRH RCP ext. Power Supply Set V-Mount  K0.0024196
- 12V Battery Power Cable, D-Tab, 4pin XLR  K2.0021422

- SRH FS CAN Bus Cable, 1m/3.2ft  K2.0033762
- SRH FS CAN Bus Cable, 10m/32.8ft  K2.0019302
- SRH FS CAN Bus Cable, 25m/82ft  K2.0019301
7 Technical Data

7.1 Pinout

ERM-2400 / ERM-900 Specifications Electrical/General

7.2 ERM-2400 Specifications Electrical/General

<table>
<thead>
<tr>
<th>Supported Frequency</th>
<th>2.400 - 2.4835 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spreading Method</td>
<td>Frequency Hopping, DTS</td>
</tr>
</tbody>
</table>

7.3 ERM-900 Specifications Electrical/General

<table>
<thead>
<tr>
<th>Supported Frequency</th>
<th>902 - 928 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spreading Method</td>
<td>Frequency Hopping, DTS</td>
</tr>
</tbody>
</table>

7.4 Dimensions without antenna ERM-2400 / ERM-900

<table>
<thead>
<tr>
<th>Length</th>
<th>11 cm / 4.33&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>9 cm / 3.54&quot;</td>
</tr>
<tr>
<td>Hight</td>
<td>4 cm / 1.57&quot;</td>
</tr>
</tbody>
</table>

7.5 Weight 380 gr / 0.83 lb

7.6 Operating Temperature -40°C / -40°F to 85°C / 185°F

Humidity 5% to 95% non-condensing
7.7 Dimensional Drawings
8 Declarations of Conformity

8.1 Approval Information

The products offered by ARRI are approved for use in a number of countries. Product-specific information on approval can be found in the respective operating instruction manuals. Import and use in countries other than those mentioned in the respective operating instructions may be subject to legal, regulatory, or official requirements and regulations. Before the products are imported into these countries or used in these countries, compliance with the existing legal, regulatory, and administrative requirements and regulations must be ensured. It is the importer's or the user's responsibility, prior to importation or use, to inform themselves of the applicable legal, regulatory, and administrative requirements and regulations and to ensure compliance with these requirements and regulations, including applying for and obtaining any necessary approvals or registrations.

As far as reasonable and legally possible, ARRI will support requests in relation to such applications by providing technical documents or declarations. As an importer or user, you confirm that you are familiar with and comply with the legal, regulatory, and administrative requirements and regulations that apply in the countries to which you ship or use the products. You further confirm that you will arrange for any necessary registrations, enrolments, or authorisations that are required in such countries.

You release ARRI from all obligations resulting from any legislative, regulatory, or administrative requirements regarding import or use of the products, except in countries where ARRI has obtained a registration or certification. You agree to indemnify, defend, and hold ARRI harmless from any and all claims, damages, losses, liabilities, costs, and expenses (including reasonable fees of attorneys and other professionals) that may arise out of a demand on ARRI in connection with your obligations mentioned above.
Declaration of Conformity

Product Type: External Radiomodule
Brand Name: FoMaSystems
Product Name: FoMaSystems ERM-P2400
Address: FoMa Systems GmbH
Oskar-Sembach-Ring 11
D-91207 Lauf

The product complies with the requirements of the following European directives:

2014/53/EU
Compliance was proved by the application of the following standards:
Draft ETSI EN 301 489-1:V2.2.0 (2017-03)
Draft ETSI EN 301 489-17:V3.2.0 (2017-03)
EN 300 328 V2.1.1

2011/65/EU
Compliance was proved by the application of the following standards:
EN 50581 : 2012

FoMaSystems GmbH
Oskar-Sembach-Ring 11
D-91207 Lauf / Deutschland

Contact:
Tel: +49 (0) 9123-107-39 80
Fax: +49 (0) 9123-107-88 75
info@foma-systems.com
www.foma-systems.com

Vorstandsmitglieder:
Dr.-Ing. Roman Rupelt
Rainer Maier

Firma: FoMaSystems GmbH
Geschäftsführender Gesellschafter: Dr.-Ing. Roman Rupelt
Rainer Maier

Anteiliger: Nürnberg
Kontaktperson: FoMaSystems GmbH

German: Deutscher Bank AG
IBAN: DE29 7007 0012 0443 2500 00
BIC: DEUTDEDD790

ERM for LCS
SUP 2.5
14 of 16
Die Übereinstimmung mit den Richtlinien erfolgte unter Anwendung nachfolgend genannter Normen:
The compliance with the requirements of the European Directives was proved by the application of the following standards:

Grundlegende Anforderungen zu Nr. 1. Essential Requirements regarding No 1
- Draft ETSI EN 301 489-1:V2.2.0 (2017-03)
- Draft ETSI EN 301 489-17:V3.2.0 (2017-03)
- EN 300 328 V2.1.1

Grundlegende Anforderungen zu Nr. 2. Essential Requirements regarding No 2
- EN 50581:2012;

Exposition von Personen gegenüber elektromagnetischen Feldern - Exposure of people to electromagnetic fields
- EN 62479:2010;

Für die Ermittlung der entsprechenden Normen haben wir die folgende Quelle verwendet:
To evaluate the respective information, we used:
Jahr der Anbringung des CE-Zeichens / Year of affixed CE-marking: 2019

Lauf, den 19.04.2021
Roman Follyn
CEO
8.3
FCC Statement / IC Statement

USA

ERM-2400 contains:  **FCCID: NS9P2400**

The ERM-2400 will be shipped with readjusted 0.1 Watt transmission power to be complaint in all addressed markets.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>For USA and Canada the transmission power can be changed locally by the ARRI service to <strong>1 Watt</strong> transmission power.</td>
</tr>
</tbody>
</table>

§15.19(a)
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Part 15 Clause 15.21
Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make sure that you select the proper area you are operating the device in. All available region settings comply with Part 15 of the FCC rules.</td>
</tr>
</tbody>
</table>

Canada

ERM-2400 contains: **IC 3143A-14P2400**

This device complies with Industry Canada’s licence-exempt RSSs.
Operation is subject to the following two conditions:
(1) This device may not cause interference; and
(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d’Industrie Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes :  
1) l’appareil ne doit pas produire de brouillage;  
2) l’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.

84
Australia / New Zealand

8.5
Japan