

# External Radio Modules for LCS

## ERM-2400 SUP2.5

### USER MANUAL

Date 01.05.2021



## Imprint

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Original version.

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### Document revision history

Version	Release	SUP	Date
1.0	F07357	2.3	06.04.2020
1.1	F07357	2.3	01.05.2021

### 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.

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validated.

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# 1 For your safety

## ⚠ Warning

The ERM for LCS system and related products should only be used by experienced and trained operators. This product is NOT intended for inexperienced users and should not be used without reading the manual or additional training. ARRI recommends that all users read the manual in its entirety prior to use.

### 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.

## NOTICE

The product is solely and exclusively available for commercial customers 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.

### 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

*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

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

## NOTE

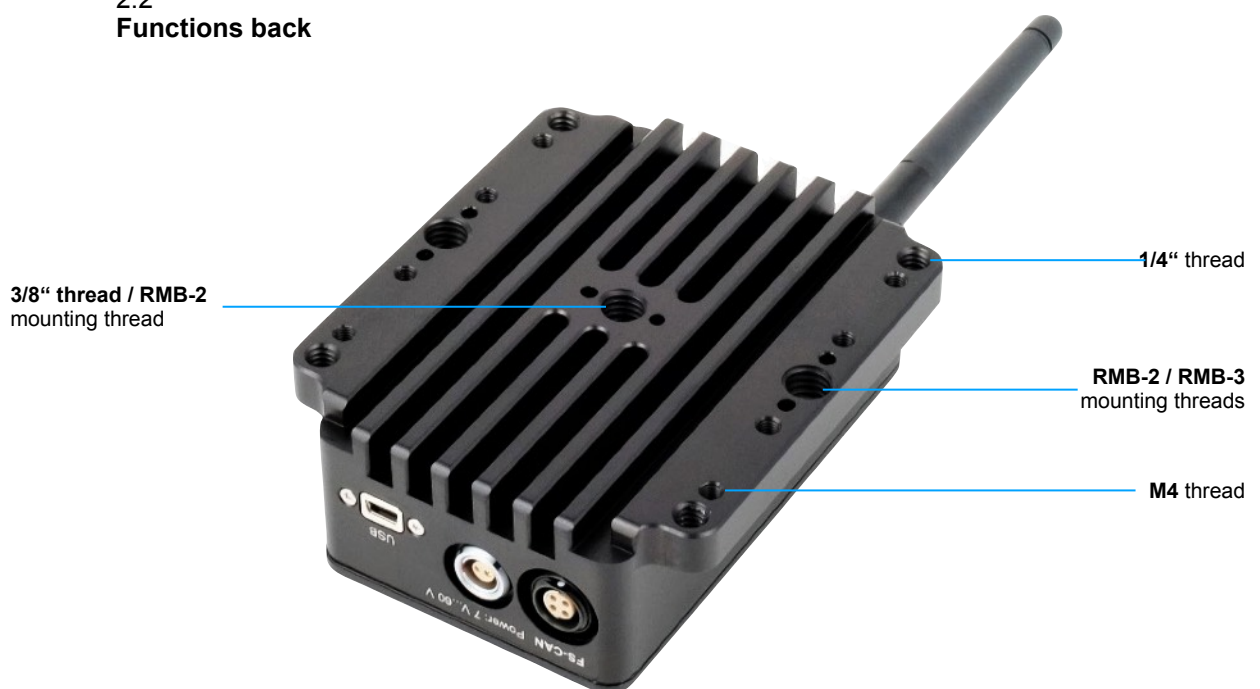
Provides additional information to clarify or simplify a procedure.

## 2 Functions

### 2.1 Functions front



### 2.2 Functions back



## 3 Introduction

### 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.

#### 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.

### NOTICE

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

#### 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

Avoid mixing individual modules with other sets of paired ERMs.

### NOTICE

**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



### 4.2 ALEXA Plus





### 4.3 Master Grip to ALEXA Mini, ALEXA Mini LF and AMIRA

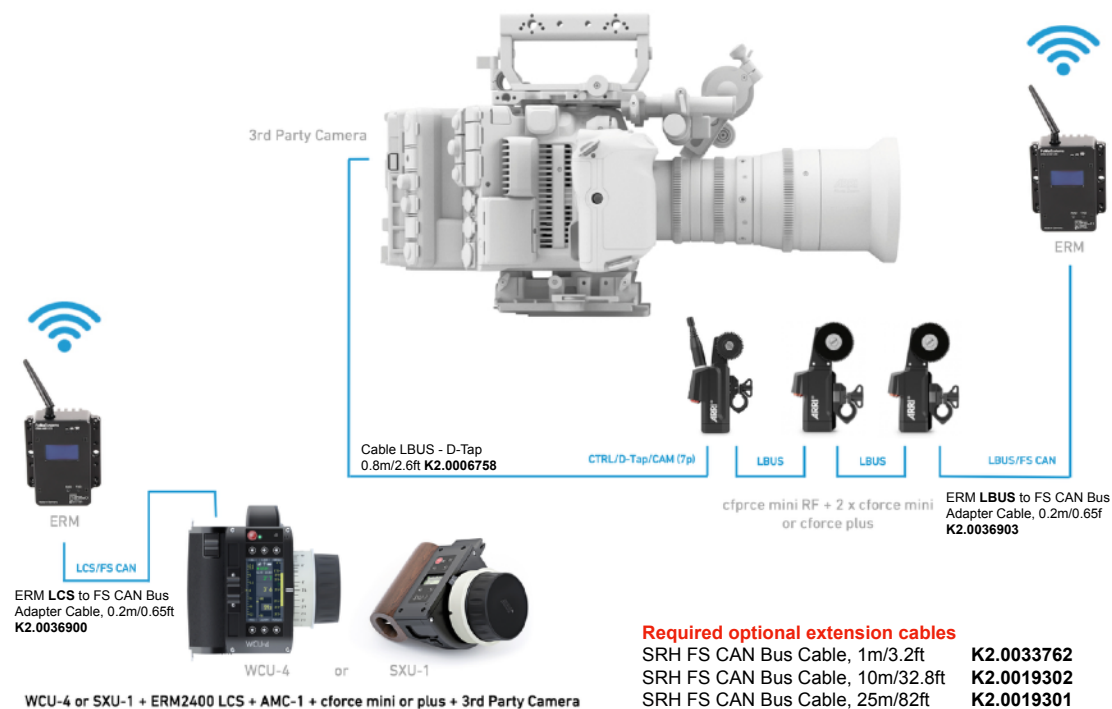


OCU-1 or Master Grips + ERM2400 LCS + cforce mini/plus motors + ALEXA Mini/ALEXA Mini LF

**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**

## 5.0 Third Party Cameras

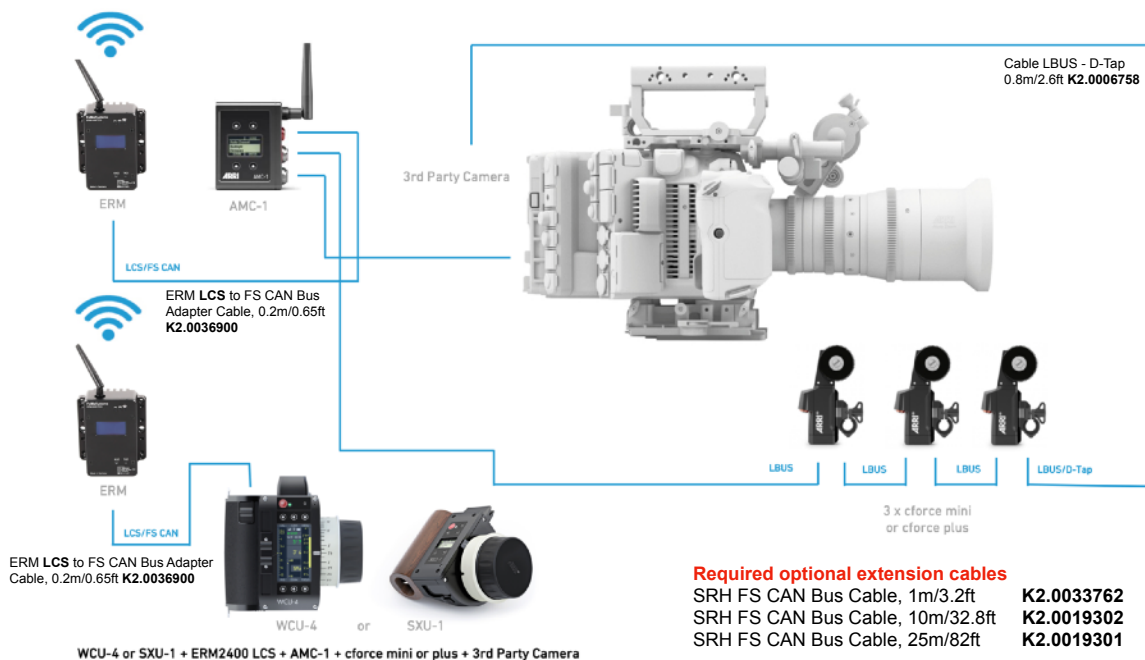
### 5.1 WCU-4 / SXU-1 / cforce mini RF motor



**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**

5.2

WCU-4 / SXU-1 / AMC-1 / cforce mini motors



6

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



## 7 Technical Data

### 7.1 Pinout

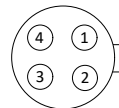
AUX Pwr 12V



LEMO ECG.0B.302.CLN

1 = GND  
2 = 12V

FS-CAN



Fischer DGP 103 A053 - 140

1 = GND  
2 = CAN1 L  
3 = CAN2 H  
4 = 12V OUT

### 7.2 **ERM-2400** Specifications Electrical/General

Supported Frequency      2.400 - 2.4835 GHz  
Spreading Method          Frequency Hopping, DTS

### 7.3 **ERM-900** Specifications Electrical/General

Supported Frequency      902 - 928 MHz  
Spreading Method          Frequency Hopping, DTS

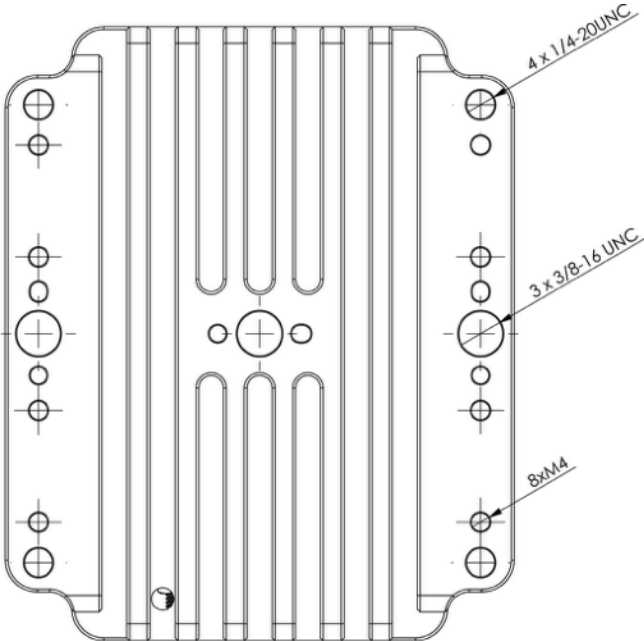
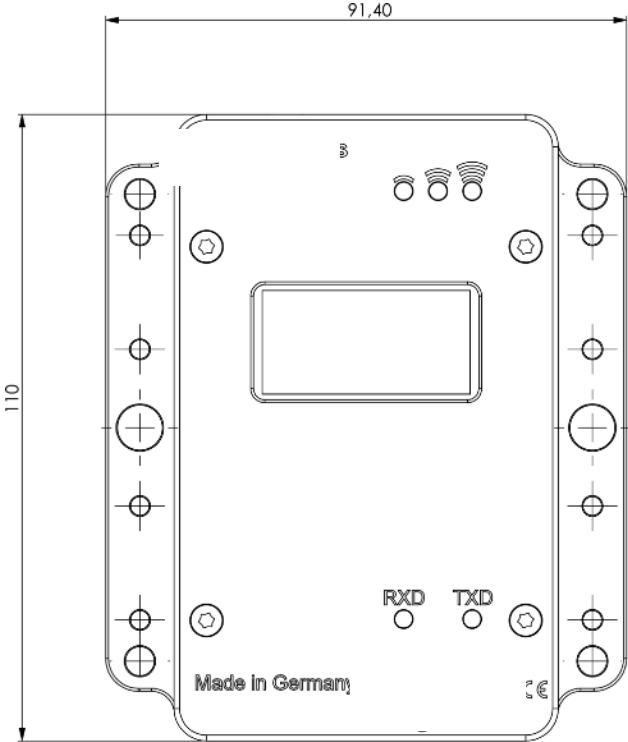
### 7.4 **Dimensions without antenna ERM-2400 / ERM-900**

Length                      11 cm / 4.33"  
Width                        9 cm / 3,54"  
Hight                        4 cm / 1,57"

7.5 **Weight**                      380 gr / 0.83 lb

7.6 **Operating Temperature**    -40°C / -40° 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.

8.2  
CE

FoMaSystems GmbH • Oskar-Sembach-Ring 11 • 91207 Lauf • Germany



## 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** DIRECTIVE 2014/53/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC

Compliance was proved by the application of the following standards:

**EN 62368-1:2014 + AC:2015**  
**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** Directive of the European Parliament and of the council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Compliance was proved by the application of the following standards:

**EN 50581 : 2012**

**Eigentumsvorbehalt:** Die gelieferte Ware (Vorbehaltsware) bleibt bis zur vollständigen Erfüllung der Kaufpreisforderung Eigentum des Verkäufers. Es gelten die AGB der FoMaSystems GmbH (einsehbar unter [www.foma-systems.com](http://www.foma-systems.com)).

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 BIC: DEUTDE33HAN



Year of the first marking: **2019**

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

- EN 62368-1:2014 + AC:2016
- 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:

[http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/index\\_en.htm](http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/index_en.htm)

Jahr der Anbringung des CE-Zeichens / Year of affixed CE-marking: 2019

Lauf, den 19.04.2021  
*Roman Foltyn*

A handwritten signature in blue ink, appearing to read "Roman Foltyn".

CEO

## 8.3

**FCC Statement / IC Statement****USA**

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

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

**NOTICE**

For USA and Canada the transmission power can be changed locally by the ARRI service to **1Watt** transmission power.

**§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.

**NOTICE**

**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.**

**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**

R-NZ

## 8.5

**Japan**

**R** 210-114971