Imprint

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Register court: Amtsgericht Nürnberg, HRB 30926
Responsible for content: Dr.-Ing. Roman Foltyn and Rainer Maertin

Document revision history

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<th>SUP</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>2.2</td>
<td>01.08.2019</td>
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Scope

This document describes the components, the setup and programming of the ERM-2400 and ERM-900 external radio modules by FoMa Systems.

Disclaimer

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

**DANGER**

The ERM in combination with the stabilized remote head SRH-3 and related products should only be used by experienced and trained operators. This product is NOT designed for inexperienced users and should not and must not be used without proper training.

ARRI recommends that all users read the manual in its entirety prior to use.

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.

1.1 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.

**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 view

- Rubber Duck Antenna
- Signal Strength
- Display
- FS CAN Bus
- Power In LEMO 0B 2pin
- USB port

2.2 Functions back view

- 3/8" thread / RMB-2 mounting thread
- 1/4" thread
- RMB-2 / RMB-3 mounting threads
- M4 thread
3 Introduction

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The external radio modules ERM-2400 and ERM-900 have been developed exclusively for use with the SRH-3 remote head. Any other use is not recommended and may damage the modules. Activating the external radio modules will deactivate the internal radio module.</td>
</tr>
</tbody>
</table>

3.1 Transmitter / Receiver Mode

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the ERMs can be used, one of the modules needs to be configured as the Transmitter and the second module as the Receiver. Please carry out the next steps precisely.</td>
</tr>
</tbody>
</table>

3.2 Multi radio use

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>For maximum performance, no more than two ERM-2400 or two ERM-900 transmitter / receiver sets should be used together in the same location. Any additional ERM transmitter / receiver set will affect the performance of all ERM transmitter / receiver sets used.</td>
</tr>
</tbody>
</table>

4 Powering the remote control panel

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>To enable a wireless connection the remote control panel needs to be powered externally with 12V.</td>
</tr>
</tbody>
</table>

Recommended power supply:

- SRH-3 RCP ext. Power Supply Set Gold-Mount K0.0024195
- SRH-3 RCP ext. Power Supply Set V-Mount K0.0024196
5 Configuration of the first ERM

5.1 Connecting the first ERM
First connect the ERM Power Cable to the remote control panel (12V out and FS CAN Bus), then connect the FS CAN Bus Cable and then connect the first ERM.

5.2 Setup the Remote Control Panel
Once the first external wireless module has been connected to the remote control, it must be configured in the GUI.

5.3 Disconnect of the first ERM
Touch External Radio Configure and wait a moment.

5.4 Reconnect the first module to put it in configuration mode and wait a moment.
5.6 Regional Settings

Once the ERM has been detected, a new window opens, where you can select the region by touching Region.

Press Apply as soon as you have made the required settings.

5.7 Finalizing the first ERM

Your settings will now be saved in the first ERM module.

When this is done, disconnect the first ERM.

6 Configuration of the second ERM

6.1 Connecting the second ERM

All settings of the first ERM are now also saved in the second ERM.

The external radio modules are now ready.
7 Positioning the ERM

7.1 Remote Control Panel

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

**NOTE:**
To increase the range, it is recommended to mount the transmitter on a stand or otherwise in an elevated position.

Longer FS CAN bus cable like:
- SRH-3, FS CAN Bus Cable, 10m/32.8ft: K2.0019302
- SRH-3, FS CAN Bus Cable, 25m/82 ft: K2.0019301
- SRH-3, FS CAN Bus Coupler, 0.2m/0.65ft: K2.0019300

allows longer distances between the remote control panel and the transmitter.

7.2 Remote Head

**NOTE:**
To increase the range, it is recommended to mount the receiver to an elevated position at the crane or rig.

Connect the **FS CAN Bus Cable** to the second **ERM** and then to the remote head.
8 Regionals limitations

The ERM-2400 can be used in Europe (CE), Canada (IC), USA (FCC) and Japan (MIC). Further markets are not intended to be certified.

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

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

The ERM-900 got IC for Canada and FCC for USA. Therefore ERM-900 can only be used and ordered from ARRI Inc. in USA.

**Note:**
Using the ERM-900 outside USA and Canada might be illegal!

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wireless region settings</strong> specify where the wireless function can be used in compliance with local regulations. It might be illegal to use the wireless function in a region other than specified in the setting. Please ensure that the region is configured correctly, e.g. when traveling.</td>
</tr>
</tbody>
</table>

<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>

§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.

Canada:
Contains IC: 9482A-EMIP400
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.
9 Technical Data

8.1 Pinout

**AUX Pwr 12V**

FS-CAN

Fischer DGP 103 A053 - 140

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

**RC-Data (PLC)**

Lötseite Buchse

LEMO ECP.0S.304.CLN

1 = RX (DATA IN FROM WHEELS)
2 = N / C
3 = TX (DATA OUT TO WHEELS)
4 = GND

**RS 12V**

Fischer DBP 102 A052 - 130

1 = GND
2 = 12V
3 = 12V OUT

**AUX Pwr 12V**

Fischer DGP 103 A053 - 140

1 = GND
2 = 12V OUT

**FS-CAN**

Fischer DBP 102 A053 - 140

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

8.2 Dimensions without antenna ERM-2400 / ERM-900

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>11 cm / 4.33”</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>9 cm / 3.54”</td>
<td></td>
</tr>
<tr>
<td>Hight</td>
<td>4 cm / 1.57”</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>380 gr / 0.83 lb</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to 85°C / -40°F to 185°F</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>5% to 95% non-condensing</td>
<td></td>
</tr>
</tbody>
</table>

8.3 ERM-2400 Specifications Electrical / General

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

8.4 ERM-900 Specifications Electrical / General

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

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

- 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;

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 23.07.2019

Roman Foltyn
CEO
FCC and ISED Canada Testing of the FoMa Systems GmbH

Model: ERM-P2400

In accordance with FCC 47 CFR Part 15B and ICES-003

Prepared for: FoMa Systems GmbH
Oskar-Sembach-Ring 11
91207 Lauf

FCC ID: ---
IC: ---

COMMERCIAL-IN-CONFIDENCE

Date: 2019-07-01
Document Number: TR-25880-63178-01 | Issue: 01

<table>
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<th>DATE</th>
<th>SIGNATURE</th>
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<tr>
<td>Project Management</td>
<td>Michael Ingerl</td>
<td>2019-07-01</td>
<td></td>
</tr>
<tr>
<td>Authorised Signatory</td>
<td>Matthias Stumpe</td>
<td>2019-07-01</td>
<td></td>
</tr>
</tbody>
</table>

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15B and ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR | NAME          | DATE       | SIGNATURE |
-----------------|---------------|------------|-----------|
Testing          | Michael Ingerl| 2019-07-01 |           |

Labour Accreditation
DAkkS Reg. No. D-PL-11321-11-02
Laboratory recognition
Registration No. BNetzA-CAB-16/21-15
ISED Canada test site registration
ISED Canada test site registration
3050A-2

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15B and ICES-003:2017 and 2016.

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**Prüfbericht / Test Report**  

<table>
<thead>
<tr>
<th>Auftraggeber</th>
<th>FoMa Systems GmbH</th>
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<tr>
<td>Geräteart</td>
<td>External Radiomodule</td>
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<tr>
<td>Typenbezeichnung</td>
<td>ERM-P2400</td>
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<tr>
<td>Seriennummer / Serial number</td>
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<td>Auftragsnummer / Order No.</td>
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**Prüfggrundlage / Test standards**  

- Draft ETSI EN 301 489-1:V2.2.0 (2017-03)  
- Draft ETSI EN 301 489-17:V3.2.0 (2017-03)
Summary

Prüfergebnisse / Test Results

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<th>Durchgeführte Prüfung</th>
<th>Prüfergebnis</th>
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<td>Radiated Emissions (Enclosure Port)</td>
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<tr>
<td>Immunity to Radio Frequency Electromagnetic Field (Enclosure Port)</td>
<td>Pass</td>
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<tr>
<td>Immunity to Electrostatic Discharge (Enclosure Port)</td>
<td>Pass</td>
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Bemerkungen / Remarks:

Die Prüfergebnisse beziehen sich ausschließlich auf das zur Prüfung vorgestellte Prüfmuster. Ohne schriftliche Genehmigung des Prüflabors darf der Prüfbericht auszugsweise nicht vervielfältigt werden. The test results relate only to the individual item which has been tested. Without the written approval of the test laboratory this report may not be reproduced in extracts.

Datum / Date | Geprüft von / Tested by            | Freigabe durch / Checked by |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>2019-07-01</td>
<td>Michael Ingerl</td>
<td>Matthias Stumpe</td>
</tr>
<tr>
<td></td>
<td>Responsible for testing</td>
<td>Reviewer</td>
</tr>
</tbody>
</table>

Prüfergebnis / Test Result

Pass
## TEST REPORT

### Audio/video, information and communication technology equipment

#### Part 1: Safety requirements

<table>
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<th>Description</th>
<th>Details</th>
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<tr>
<td>Report Number</td>
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</tr>
<tr>
<td>Date of issue</td>
<td>2019-07-31</td>
</tr>
<tr>
<td>Total number of pages</td>
<td>63</td>
</tr>
<tr>
<td>Applicant's name</td>
<td>FoMa Systems GmbH</td>
</tr>
<tr>
<td>Address</td>
<td>Oskar-Sembach-Ring 11, 91207 Lauf, Germany</td>
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<tr>
<td>Test procedure</td>
<td>Standard</td>
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<td>Non-standard test method</td>
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<tr>
<td>Test Report Form No.</td>
<td>IEC62368_1B</td>
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<td>Master TRF</td>
<td>2014-03</td>
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**General disclaimer:**

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Testing Laboratory.
Test Item description: External Radiomodule
Trade Mark: FoMa
Manufacturer: FoMa Systems GmbH
Model/Type reference: ERM-P2400
Ratings: 14.4 - 36 Vdc, max. 4A

Testing procedure and testing location:

<table>
<thead>
<tr>
<th>Testing Laboratory:</th>
<th>TÜV SÜD Product Service GmbH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testing location/ address:</td>
<td>Äußere Frühlingstraße 45, D-94315 Straubing, Germany</td>
</tr>
<tr>
<td>Tested by (name + signature):</td>
<td>Alexander Fischer</td>
</tr>
<tr>
<td>Approved by (name + signature):</td>
<td>Stefan Weiherer</td>
</tr>
</tbody>
</table>

Contains:
FCCID: NS9P2400  IC: 3143A-14P2400

This device complies with Part 15 of the FCC Rules. 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.

Contains:
FCCID: NS9P2400  IC: 3143A-P2400

Cet appareil est conforme à la partie 15 des règles de la FCC. Son fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne doit pas causer d'interférences nuisibles et (2) cet appareil doit accepter toute interférence reçue, incluant les interférences qui peuvent provoquer un fonctionnement indésirable.
FCC and ISED Canada Testing of the FoMa Systems GmbH

Model: ERM-N900

In accordance with FCC 47 CFR Part 15B and ICES-003

Prepared for: FoMa Systems GmbH
Oskar-Sembach-Ring 11
91207 Lauf

Date: 2019-07-01
Document Number: TR-25880-61293-01 | Issue: 01

COMMERCIAL-IN-CONFIDENCE

Responsibilities and Signatures

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ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15B and ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15B and ICES-003:2017 and 2016.

DISCLAIMER AND COPYRIGHT

This non-binding report was prepared by TÜV SÜD Product Service with all reasonable skill and care. The document is confidential to the potential Client and TÜV SÜD Product Service. No part of this document may be reproduced without the prior written approval of TÜV SÜD Product Service. © 2019 TÜV SÜD Product Service.

ACCREDITATION

Our BNetzA Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our BNetzA Accreditation. Results of tests not covered by our BNetzA Accreditation Schedule are marked NBA (Not BNetzA Accredited).
Important User Information (continued)

Regulatory Requirements

To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 23cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended. The antenna being used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

This device can only be used with Antennas listed in Appendix C/D. Please contact Microhard Systems Inc. if you need more information or would like to order an antenna.

WARNING

MAXIMUM EIRP

FCC Regulations allow up to 36dBm Effective Isotropic Radiated Power (EIRP). Therefore, the sum of the transmitted power (in dBm), the cabling loss and the antenna gain cannot exceed 36dBm.

WARNING

EQUIPMENT LABELING

This device has been modularly approved. The manufacturer, product name, and FCC and Industry Canada identifiers of this product must appear on the outside label of the end-user equipment.

WARNING

FCCID: NS908P24
IC: 3143A-08P24

This device complies with Part 15 of the FCC Rules. 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.

FCCID: NS908P25
IC: 3143A-08P25

This device complies with Part 15 of the FCC Rules. 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.

For n920S/F/BD Nano Series OEM

For n920T Nano Series OEM

For n2420

FCCID: NS911P31
IC: 3143A-11P31

This device complies with Part 15 of the FCC Rules. 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.

n920X2

FCCID: NS9N920X2
IC: 3143A-N920X2

This device complies with Part 15 of the FCC Rules. 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.