

# LCUBE CUB-2

## LBUS to ENG Protocol Converter

USER MANUAL

Date: 17th February 2017



## Imprint

Copyright © 2016 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](mailto:service@arri.com)

Website: [www.arri.com](http://www.arri.com)

## Scope

This User Manual applies to the following product:

KK.0013217      LCUBE CUB-2 with Software Update Packet  
(equals to      SUP 1.0.0  
K0.0012983)

## Revision history

Version	ID	Order #	Release	Date
01	10001998	K5.0013264	F06071	21.02.2017

## Disclaimer

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

The ARRI LBUS to ENG Protocol Converter LCUBE CUB-2 is/ are only available to commercial customers. By utilization, the customer agrees that the LCUBE CUB-2 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 LCUBE CUB-2 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

<b>1</b>	<b>For your safety</b> .....	<b>6</b>
<b>2</b>	<b>Audience and intended use</b> .....	<b>8</b>
<b>3</b>	<b>Scope of delivery and warranty</b> .....	<b>9</b>
<b>4</b>	<b>LBUS</b> .....	<b>11</b>
<b>5</b>	<b>Introduction</b> .....	<b>12</b>
	5.1 Sample setup.....	13
<b>6</b>	<b>Layout</b> .....	<b>14</b>
	6.1 Status.....	14
	6.2 Setup button.....	15
<b>7</b>	<b>Operation</b> .....	<b>16</b>
<b>8</b>	<b>Software update</b> .....	<b>17</b>
<b>9</b>	<b>Appendix</b> .....	<b>18</b>
	9.1 Part numbers.....	18
	9.2 Pinouts.....	22
	9.3 Compatibility.....	24
	9.3.1 <i>Cameras and lenses</i> .....	24
	9.3.2 <i>Hand units</i> .....	24
	9.4 Specifications.....	25
	9.4.1 <i>Dimensions and weight</i> .....	25
	9.5 Service contacts.....	26
	9.6 International declarations.....	27

# 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.

### **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.

## 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 LCUBE CUB-2 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:

- LCUBE CUB-2
- LCUBE bracket
- User 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 LBUS**

LBUS is an ARRI/cmotion bus standard designed to allow multiple lens motors and control devices to communicate with each other.

## 5 Introduction



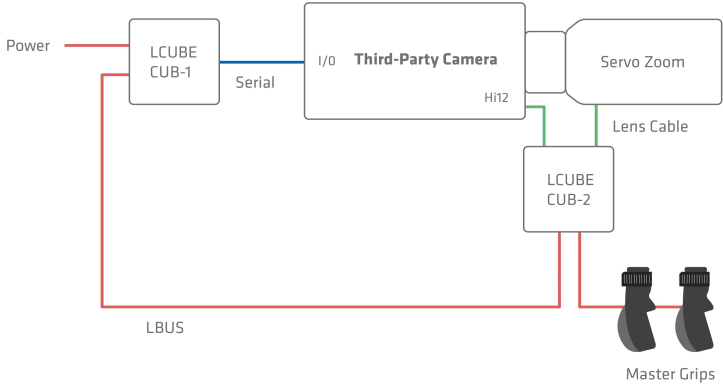
The LCUBE CUB-2 is a miniature signal converter that integrates the 12 pin Hirose ENG protocol into the LBUS ecosystem. It provides two options for iris control: Auto-iris from the camera or manual iris from a Master Grip.

### Main features

- Adapts servo-zoom lenses (Hirose 12 pin) to LBUS (Lemo 4 pin).
- Enables Master Grips to directly control focus, iris and zoom of a servo-zoom lens.
- Provides a switch to select between iris control from camera (auto-iris via camera Hirose 12 pin interface) or Master Grips (via LBUS).

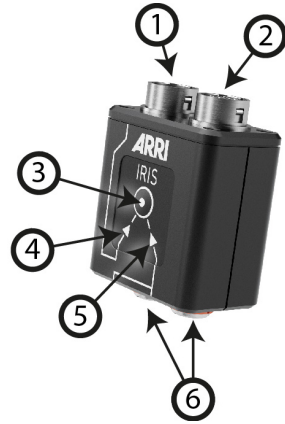
# 5.1 Sample setup

## 3rd party camera with ENG lens and Master Grips



## 6 Layout

- 1 ENG IN - camera
- 2 ENG OUT - lens
- 3 Setup button
- 4 Indicator: Iris control via camera
- 5 Indicator: Iris control via LBUS
- 6 LBUS connectors



### 6.1 Status

The LED of the SETUP button indicates the current status.

Solid green	Device is ready, no warnings
Green/red flashing	No LBUS master device connected
Solid red	Power supply is below 11V
Red flashing	No LBUS data is available
Blue flashing	Device is executing the boot-loader

## 6.2 Setup button

### IRIS source

The source of iris control can be either set to camera or LBUS. The currently active iris source is indicated by two arrows underneath the SETUP button (see "Layout", page 14, (4) and (5)).

Press the SETUP button momentarily to indicate the current iris source. Press the SETUP button momentarily again to change the assignment. Toggle through until you reach the desired setting.

## 7 Operation

- Connect the ENG input of CUB-2 to the camera Hirose 12 pin lens interface (optional).
- Connect the ENG output of CUB-2 with the ENG lens cable.
- Connect the control devices (e.g. Master Grips) via LBUS with the CUB-2.
- Power the LBUS.
- Select the source of the iris on the CUB-2

**NOTE:** The setup does not require the CUB-2 to be connected to the camera Hirose 12 pin lens interface.



## 8 Software update

The LCUBE CUB-2 can be updated from external devices through its LBUS interface.

The following devices provide update functionalities for LCUBE CUB-2:

- ARRI Wireless Compact Unit WCU-4
- ARRI Active Motor Controller AMC-1
- ARRI Universal Motor Controller UMC-4
- cmotion compact hand unit
- cmotion cworld

Please refer to the respective user manuals for further information.

### **⚠ WARNING!**

Before starting the update, make sure that there are no devices connected to the LCUBE CUB-2, except LBUS devices necessary for the update itself.

### **⚠ WARNING!**

Do not switch off power and do not remove the storage media during the update, as this may damage the LCUBE CUB-2.

## 9 Appendix

### 9.1 Part numbers

#### Part numbers

<b>KK.0013217</b> (equals K0.0012983)	<b>LCUBE CUB-2 Basic Set</b>
contains	
K2.0010681	LCUBE CUB-2
K2.0013194	Cable LCUBE CUB-2 to camera Hi12 1.6ft
K2.0009620	LCUBE Bracket Quick release bracket with 3/8" screw for LCUBE converters

#### **NOTICE**

The LCUBE CUB-2 Basic Set does not include an LBUS cable. LBUS cables are available in various lengths and need to be ordered separately.

**Mechanical accessories**

K2.0009620 LCUBE bracket (included)



K2.0006176 CLM-5/cforce mini clamp console  
19/15 mm (not included)



**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

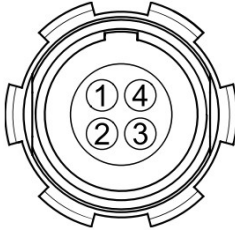
**⚠ DANGER!****Risk of fire!**

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.

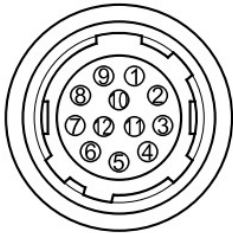
## 9.2 Pinouts

### LBUS connector



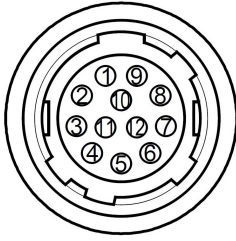
1	GND	Ground
2	CAN-L	CAN bus
3	V-BAT	Power supply in-/output
4	CAN-H	CAN bus

### 12 Pin LENS connector



1, 2	n.c.	
3	GND	Ground
4, 5	n.c.	
6	+12V	Regulated 12V/1A lens supply
7, 8, 9, 10	n.c.	
11	CAM Rx	Serial connec- tion
12	CAM Tx	Serial connec- tion

## 12 Pin CAM connector



1, 2	n.c.	
3	GND	Ground
4, 5	n.c.	
6	DC-IN	12-34 VDC IN
7, 8, 9, 10	n.c.	
11	CAM Rx	Serial connection
12	CAM Tx	Serial connection

## 9.3 Compatibility

### 9.3.1 Cameras and lenses

The CUB-2 supports most cameras and lenses with Hirose 12 pin connector.

### 9.3.2 Hand units

The following hand units can be connected directly to the LCUBE CUB-2 for servo motor control or REC start/stop functionality. In such a case, use the Cable LCUBE CUB-2 to camera Hi12 (K2.0013194) to connect the camera 12 pin Hirose lens interface to the CUB-2 ENG input (for camera REC start/stop functionality) and connect the hand unit to a CUB-2 LBUS connector (see page 14).

	<b>REC Start/Stop</b>	<b>Servo control</b>
Master Grips	Yes	Yes
cmotion pan-bar zoom		Yes

NOTE: The recording status of the camera is not indicated on the Master Grip screen when using the LCUBE CUB-2 directly connected to the camera 12 pin Hirose lens interface.

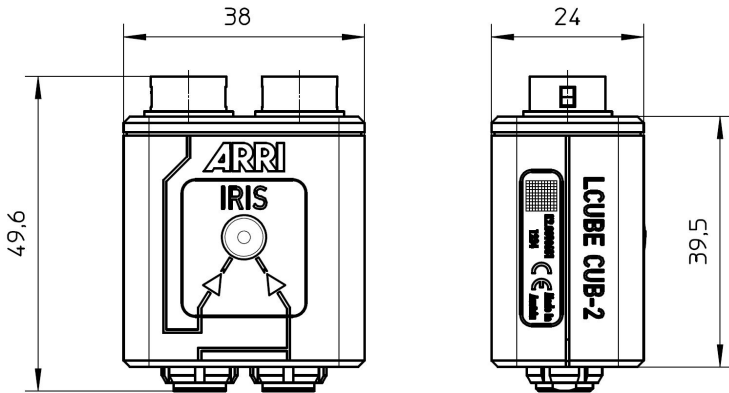


## 9.4 Specifications

Temperature range:	-20 to +50° C (-4 to +122° F)
Supply voltage:	12 - 34 VDC
Current consumption:	50mA @ 24 V

### 9.4.1 Dimensions and weight

#### Dimensions



#### Weight

CUB-2:	60g/2.12oz
LCUBE Bracket:	13g/0.46oz

## 9.5 Service contacts

### **Munich, Germany**

ARRI & Richter Cine 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)

## 9.6 International declarations

### EC Declaration of Conformity

The product 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 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 55103-1:2009; EN 55103-2:2009



### 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.

## **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.