

# LCUBE CUB-1

## LBUS to Serial Converter

USER MANUAL

**Date: 1st February 2017**



## Imprint

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## Scope

This User Manual applies to the following product:

K0.0010104	LCUBE CUB-1 with Software Update Packet SUP 2.0.1
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## Revision history

Version	ID	Order #	Release	Date
01	10001784	K5.0010634	F06066	20.5.2016

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02

10001784

K5.0010634

W01194

01.02.2017

## Disclaimer

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

The ARRI LBUS to Serial Converter LCUBE CUB-1 is/are only available to commercial customers. By utilization, the customer agrees that the LCUBE CUB-1 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-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 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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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.

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# 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-1 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 interface CUB-1
- 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



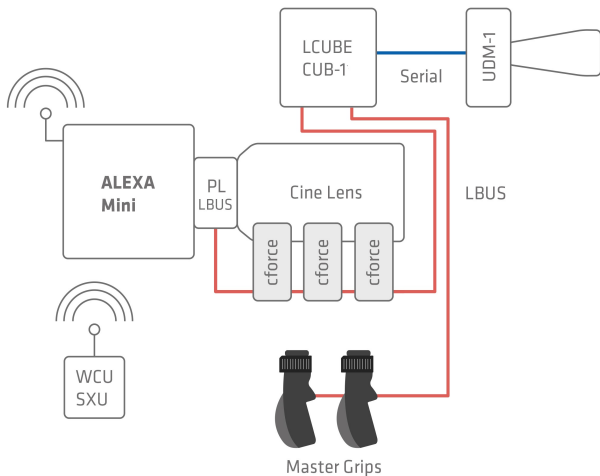
The LCUBE CUB-1 is a miniature signal converter that converts LBUS protocols to serial protocols and vice versa. It is multi-purpose protocol converter that will prove useful for many different functions and many different camera setups.

### Main features

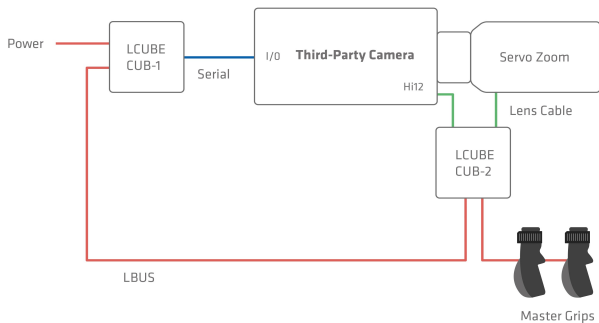
- Converts serial protocol (RS232, RS485, RS422) to LBUS and vice versa
- Super small and lightweight (~60g/2.11oz incl. LCUBE Bracket)
- Daisy-chainable via LBUS

## 5.1 Sample setups

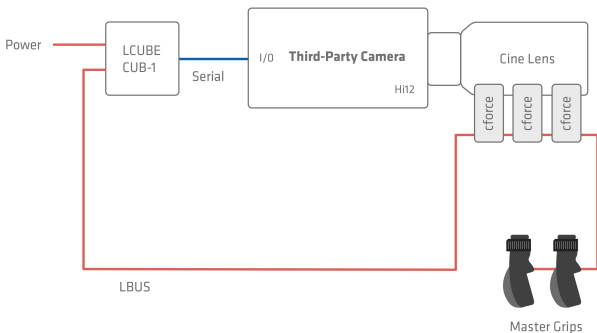
### ALEXA Mini with UDM and Master Grips



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

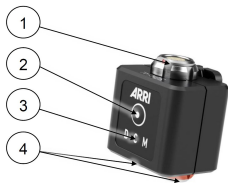


### 3rd party camera with cine lens and Master Grips



## 6 Layout

- 1 Serial connector
- 2 Setup button
- 3 Distance, Camera, Motor indicator
- 4 LBUS connectors



### 6.1 LCUBE status

The LED of the SETUP button indicates the current adaptor status.

LED	Status
Solid green	Device is ready, no warnings
Green/red flashing	No serial communication
Solid red	Adaptor power supply is below 11V
Red flashing	No LBUS data is available
Blue flashing	Device is executing the bootloader

## 6.2 Setup button

### Adaptor assignment

Most accessories are automatically recognized by special coded cables or the serial data. The assignment is automatically made by the LCUBE.

Press the SETUP button momentarily to indicate the current assignment. The **D**(istance), **C**(amera) or **M**(otor) indicator underneath the SETUP button will light up for three seconds. If there is no serial connection established, DCM indicators are flashing for three seconds.

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



## 7 Operation

The CUB-1 can operate in three different modes:

### 7.1 Distance

The distance mode converts serial distance readings and streams it to all LBUS devices.

Connect a UDM-1 or similar device like the Cine Tape Measure to the CUB-1. If a serial data stream is detected, the indication letter **D** is illuminated.

### 7.2 Camera

The camera mode is for controlling 3rd party camera. Rec start/stop and user buttons.

See "Compatibility", page 24 for further information about 3rd party cameras.

### 7.3 Motor

The motor mode allows the control of the motors via RS232. For information about the protocol contact the ARRI service team. [service@arri.com](mailto:service@arri.com)

## 8 Software update

The LCUBE CUB-1 can be updated from external devices through its LBUS interface.

The following devices provide update functionalities for LCUBE CUB-1:

- 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-1, 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-1.

## 9 Appendix

### 9.1 Part numbers

#### Part numbers

<b>K0.0010104</b> (equals K0.0010104)	<b>LCUBE CUB-1 Basic Set</b>
contains	
K2.0008630	LCUBE CUB-1
K2.0009620	LCUBE Bracket Quick release bracket with 3/8" screw for LCUBE converters

#### ***NOTICE***

The LCUBE CUB-1 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!

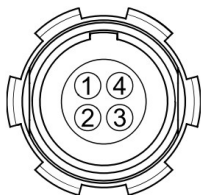
Always use original ARRI/cmotion LBUS cables to external power sources (D-Tap, XLR)! ARRI/cmotion LBUS cables to external power sources provide a protection circuit to prevent back currents to power supplies/batteries.

**Serial cables**

K2.0012631	Cable CUB-1 to F5/F55 cameras 0,8m/2.6ft
K2.0012632	Cable CUB-1 to RED cameras 0,4m/1.3ft
K2.0012633	Cable CUB-1 to LANC 0,4m/1.3ft
K2.65144.0	Cable UDM to UMC/CUB-1 1,5m/5ft
K2.0003624	Cable UMC-RS232
K2.65063.0	Kabel UMC zu Cine Tape Measure

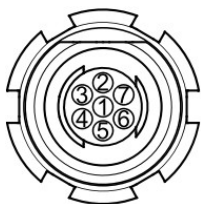
## 9.2 Pinouts

### LBUS connector



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

### Serial connector



1	GND	Ground
2	V-IN	Battery supply in-/output
3	TxD	RS232
	Tx-	RS422
	RXTX-N	RS485
4	RxD	RS232
	RX+	RS422
	RXTX-P	RS485
5	TX+	RS422
6	RX-	RS422
7	CABLE-ID	Analog input

## 9.3 Compatibility

### 9.3.1 Distance measuring devices

ARRI UDM-1 Universal distance measure
Cinematography Electronics CTM CINE TAPE MEASURE

### 9.3.2 Cameras

Camera	Distance Measure	REC Start/Stop	User Buttons
<b>ARRI</b>			
ALEXA Mini	YES		
AMIRA			
<b>3rd party</b>			
Sony F5/F55		YES	
Red Epic/ Dragon		YES	YES

## 9.4 Specifications

Temperature range: -20 to +50° C (-4 to +122° F)

Supply voltage: 12 - 34 V

Current consumption: 20mA @ 24 V



## 9.4.1 Interface standards

The LCUBE CUB-1 provides following standardised serial interfaces:

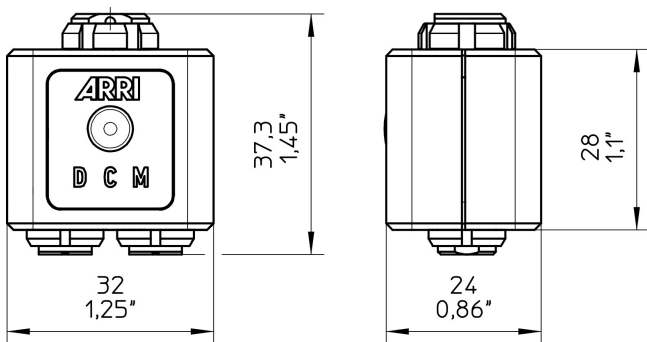
RS232

RS422

RS485

## 9.4.2 Dimensions and weight

### Dimensions



### Weight

CUB-1: 47g/1.66oz

LCUBE Bracket: 13g/0.46oz

## 9.5 Service contacts

### **Munich, Germany**

Arnold & 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 LCUBE CUB-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 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; EN 50581:2012

### 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.