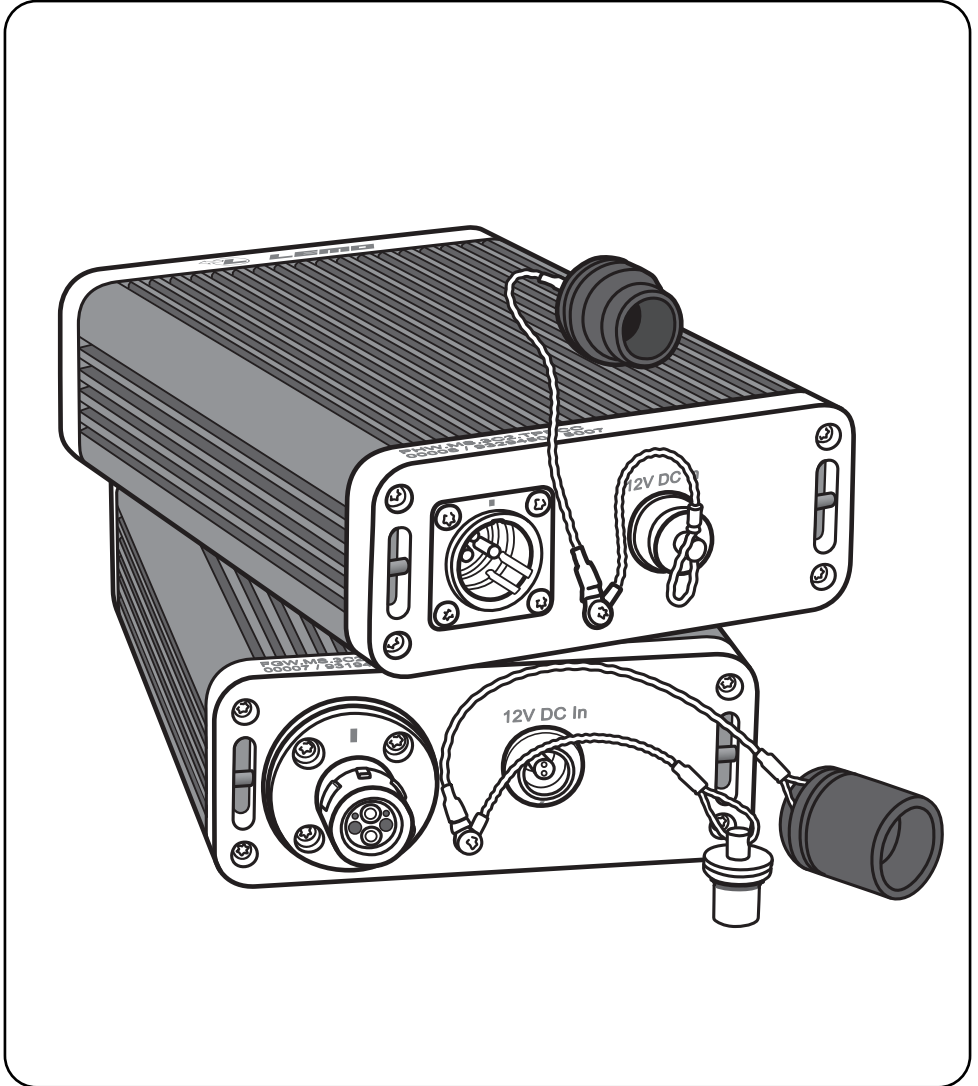
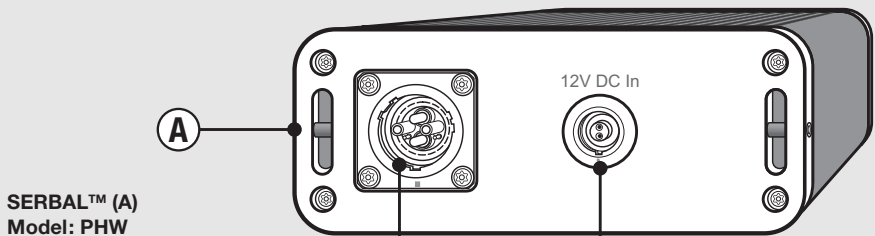


# SERBAL™ HD/SDI-TO-FIBRE CONVERTER

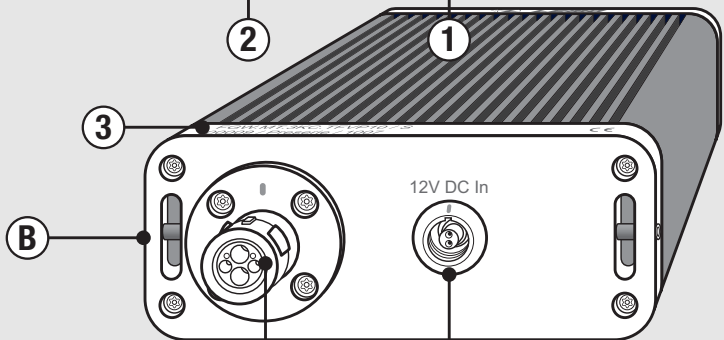
Instructions for use



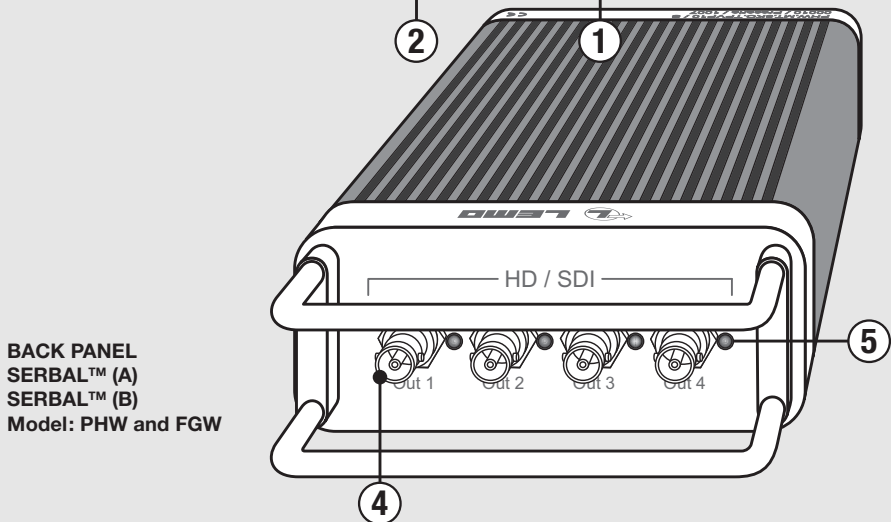
SERBAL™  
HD/SDI-TO-FIBRE  
CONVERTER



SERBAL™ (A)  
Model: PHW



SERBAL™ (B)  
Model: FGW



BACK PANEL  
SERBAL™ (A)  
SERBAL™ (B)  
Model: PHW and FGW

# 4 channel coaxial to fibre media converter

The SERBAL™ provides a compact conversion unit which allows transmission of HD/SDi video from up to 4 cameras to be transmitted over a single standard LEMO 3K.93C SMPTE cable.

## How does it work?

The SERBAL™ utilises Wavelength Division Multiplexing (WDM). Each fibre carries two optical signals at different wave lengths. By converting the electrical signals into fibre optic signals clearer error free transmission can be obtained over greater distances.

## 3 different systems to suit your requirements

The system is available in three versions:

- 4 x HD/SDI signals from the cameras to the OB van
- 2 x HD/SDI signals from the cameras to the OB van, 2 signals for monitor feedback
- 3 x HD/SDI signals from the cameras to the OB van, 1 signal for monitor feedback

### ◀ Getting to know the SERBAL™

- ① Power socket
- ② HDTV connector (ARIB, SMPTE, EBU compatible)
- ③ Part number and model
- ④ BNC connector
- ⑤ LED indicators

Before operating the system please read the User Manual.

### Warning

**To prevent fire or shock hazard, do not immerse the unit in water.**

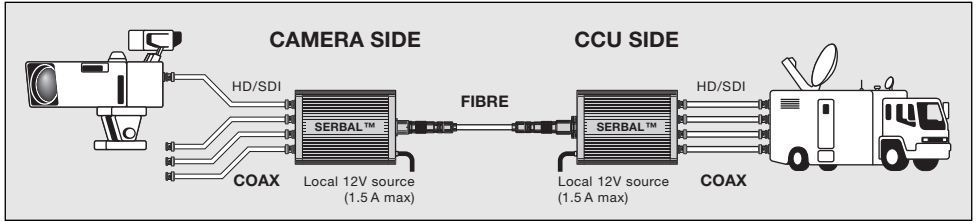
**To avoid electrical shock, do not remove covers or panels.**

**To prevent overheating risk, ventilate the units correctly.**

**Only use the power supply included.**

**Refer servicing to qualified personnel only.**

# Operating Instructions



The SERBALS works as a system pair. Place the first SERBAL™ at the camera side (identified as part number PHW) and the second SERBAL™ at the CCU / OB van side (identified as part number FGW)

## HDTV connectors.

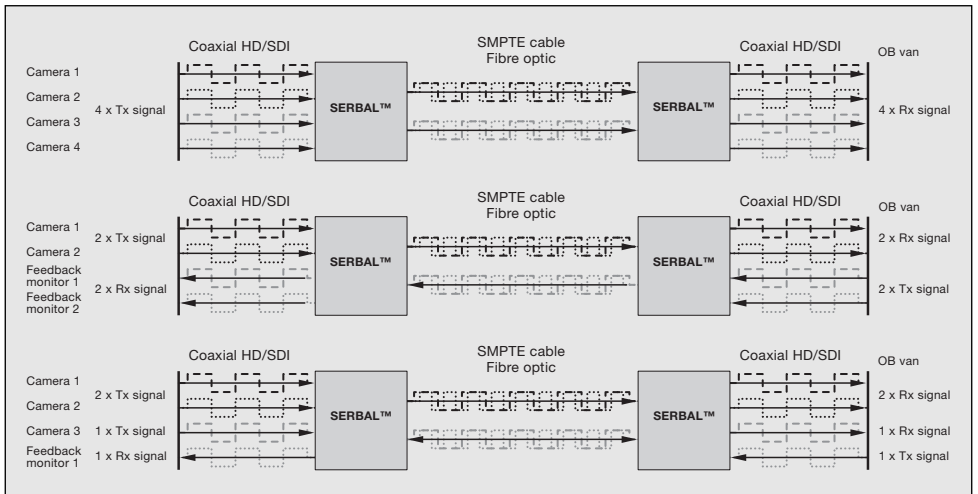
Connect the HDTV connector (LEMO 3K.93C Series) to the appropriate HDTV compatible socket or plug. Note: as with HDTV systems ensure that the HDTV (SMPTE) cable is laid in the appropriate direction - socket at the OB van / CCU end and plug at camera end.

## BNC connectors.

Connect up to 4 cable leads with BNC connectors from the SERBAL™ to the camera or feedback monitor. The connection done on the OB van/ CCU side is similar.

## SERBAL Power Supply.

Connect the unit to a suitable power source by using the AC/DC adaptor (12 Volts) supplied.



## Specifications

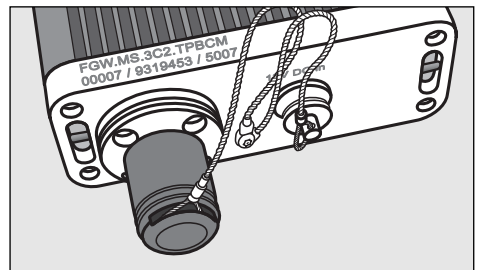
Input/outputs	Connectors
I/O ports	BNC connector (75 Ohms)
	LEMO connector 3K.93C Series, (HDTV)
Signal Standards	SMPTE 292M, SMPTE 259M, SMPTE 297M SMPTE 305M, SMPTE 310M, DVB-ASI
DC in	LEMO 0K Series, 2pin in-line transformer
General	Values
Dimensions	172W x 125L x 50H mm
Mass (approx.)	2Kg
Power requirements In North America, Japan and areas of South America	100 to 120 Vac, 50/60Hz
Power requirements In Europe, Africa, Australia, Scandinavia, China	220 to 240 Vac, 50/60 Hz
Operating voltage	12 Vdc / 1.5A max
Operating temperature	- 30 °C to + 70 °C
Humidity	up to +95%
Index protection	IP50
Signals	Values
Transm. wavelength	1310nm /1550nm
Optical launch power	- 6 dB @ 1310 nm
	- 4.5 dB @ 1550 nm
Optical receive sensitivity	- 30 dB @ 1310 nm
	- 30 dB @ 1550 nm
Equalisation (camera side)	up to 300 m @ 270 Mb/s
	up to 100 m @ 1.485 Gb/s
Return loss	> 15 dB @ 1.485 Gb/s
Supplied accessories	Quantity
AC/DC power supply	1 with UK, USA, Europe adaptors
User's guide	1
Conformance	Standard
EMI/RFI	89/336/EEC
Electrical	EN 61000-6-1 EN 61000-6-2

## Recommended variants of SMPTE-311M Cable

Manufacturer	Part Number (camera cable)
Furukawa	2SM-9.2-37.5
Furukawa	TV-OM-AMS
Furukawa	TV-OM-HAMS
Fujikura	B-97J501
Draka	CT2987300
Belden	7804C
Mohawk	M96040
Mohawk	M95421

## Part Number

The SERBAL™ system always works as a pair. These are identified as PHW (camera side) and FGW (CCU side) in the operating instructions.



The part number of your purchased product is located on the top of the unit (see above).

	SERBAL™ Part number	Broadcast setup
Camera side	PHW.MS.3C4.TPBCC	4 Tx signals (return video)
	PHW.MS.3C2.TPBCC	2 Tx signals + 2 Rx signals
	PHW.MS.3C3.TPBCC	3 Tx signals + 1 Rx signal
CCU side	FGW.MS.3C4.TPBCM	4 Rx signals (video feed)
	FGW.MS.3C2.TPBCM	2 Rx signals + 2 Tx signals
	FGW.MS.3C3.TPBCM	3 Rx signals + 1 Tx signal

## Troubleshooting

### Why doesn't it work the way I want?

This section lists some problems you might encounter during the use of the SERBAL™. Some problems require that you call your local support, but other problems can easily be solved.

### The device doesn't operate.

Are the LED's lit (see diagram page 2)? If not, check that the power supply is correctly plugged in. If one of the LED's is not functioning, check that the associated cable is correctly plugged in.

LED status	Description
Off	No Power
Red	Power. No Signal
Green	Power and Signal present

### The device gets warm.

This is normal; the units get warm during normal operation. The shell heat exchanger should be kept free of obstructing materials and not covered, in order to dissipate the heat.

## Certifications and warranty

### CE marking

CE marking means that the appliance or equipment bearing it complies with the protection requirements of one or several European safety directives.

### RoHS statement

LEMO products are in compliance with the RoHS directives (2002/95/EC) of the European Parliament. This directive specifies the restrictions of the use of hazardous substances in electrical and electronic equipment marketed in Europe.

LEMO guarantees that its connectors and media converters are free of mercury, cadmium, lead, hexavalent chromium and polybromide biphenyl (PBB) or polybromide diphenyl ether (PBDE).

## CAUTION Class 1 Laser Product

The SERBAL™ is classified as a CLASS 1 LASER PRODUCT. Do not stare into the beam or view it directly with optical instruments.

### Recommendations

Do not paint your product. Always treat your product with care and keep the fibre optic connectors capped when not in use.

## Cleaning Instructions

It is essential that the optical interface (ferrule end faces) of the 3K.93C fibre optic contacts are clean and free from any kind of debris to ensure the correct performance and operation of the contact. It is recommended that the inspection and cleaning instructions provided by LEMO are used on the 3K.93C connector to ensure the connector performs to the specified ratings.

## Technical support

We understand you may have questions regarding your new product. Should you require any assistance, our technical support and customer service is available to you. Whenever calling your LEMO support, you will need to refer to the part numbers located on the top the SERBAL™ unit.

**Europe email:** mc\_europe@lemo.com

**Europe telephone:**  
0044 (0) 1903 222411

**USA email:**  
mc\_usa@lemo.com

**USA telephone:**  
(+1 707) 578 88 11

**Asia/Pacific email:** mc\_asia@lemo.com

**Japan telephone:**  
+81-3-5446-5510

**China telephone:**  
(86 21) 5899 7721

## Warranty - 5 years

LEMO warrants this product to be free from defects in design, material and workmanship under normal use for the period of five (5) years from purchase date.

If during the warranty period, this product should fail under normal operation, LEMO will, at its option, replace or repair the defective part.

This warranty does not include failure caused by improper installation, operation, accident, improper connection to peripherals, software or hardware modifications outside of LEMO's control.

*Design and specifications are subject to change without notice.*

## **LEMO** HEADQUARTERS

### **SWITZERLAND**

#### **LEMO SA**

Chemin des Champs-Courbes 28  
P.O. Box 194 - CH-1024 Ecublens  
Tel. (+41 21) 695 16 00 - Fax (+41 21) 695 16 02  
e-mail: info@lemo.com

## **LEMO** SUBSIDIARIES

### **AUSTRIA**

**LEMO Elektronik  
GesmbH**  
Tel: (+43 1) 914 23 20 0

### **CANADA**

**LEMO CANADA Inc**  
Tel: (+1 905) 477 77 22

### **CHINA**

**LEMO Trading  
(Shanghai) Co., Ltd.**  
Tel: (+86 21) 5899 7721

### **DENMARK**

**LEMO Denmark A/S**  
Tel: (+45) 45 20 44 00

### **FRANCE**

**LEMO France Sàrl**  
Tel: (+33 1) 60 94 60 94

### **GERMANY**

**LEMO Elektronik GmbH**  
Tel: (+49 89) 42 77 03

### **HONG KONG**

**LEMO Hong Kong Ltd.**  
Tel: (+852) 21 74 04 68

### **HUNGARY**

**REDEL Elektronika Kft**  
Tel: (+36 1) 421 47 10

### **ITALY**

**LEMO Italia srl**  
Tel: (+39 02) 66 71 10 46

### **JAPAN**

**LEMO Japan Ltd**  
Tel: (+81 3) 54 46 55 10

### **NETHERLANDS / BELGIUM**

**LEMO Connectors  
Nederland B.V.**  
Tel: (+31) 251 25 78 20

### **NORWAY / ICELAND**

**LEMO Norway A/S**  
Tel: (+47) 22 91 70 40

### **SINGAPORE**

**LEMO Asia Pte Ltd**  
Tel: (+65) 6476 0672

### **SPAIN / PORTUGAL IBERLEMO S.A.**

Tel: (+34 93) 860 44 20

### **SWEDEN / FINLAND**

**LEMO Nordic AB**  
Tel: (+46 8) 635 60 60

### **SWITZERLAND**

**LEMO Verkauf AG**  
Tel: (+41 41) 790 49 40

### **UNITED KINGDOM**

**LEMO UK Ltd**  
Tel: (+44 1903) 23 45 43

### **USA**

**LEMO USA Inc**  
Tel: (+1 707) 578 88 11

© DOC:MS.W300.000 - Printed in Switzerland, November 2012

## **LEMO** DISTRIBUTORS

AUSTRALIA, BRAZIL, CZECH REPUBLIC, GREECE,  
INDIA, ISRAEL, NEW ZEALAND, PAKISTAN,  
POLAND, RUSSIA, SOUTH AFRICA,  
SOUTH KOREA, TAIWAN, TURKEY, UKRAINE

[www.lemo.com](http://www.lemo.com)