MOBAL
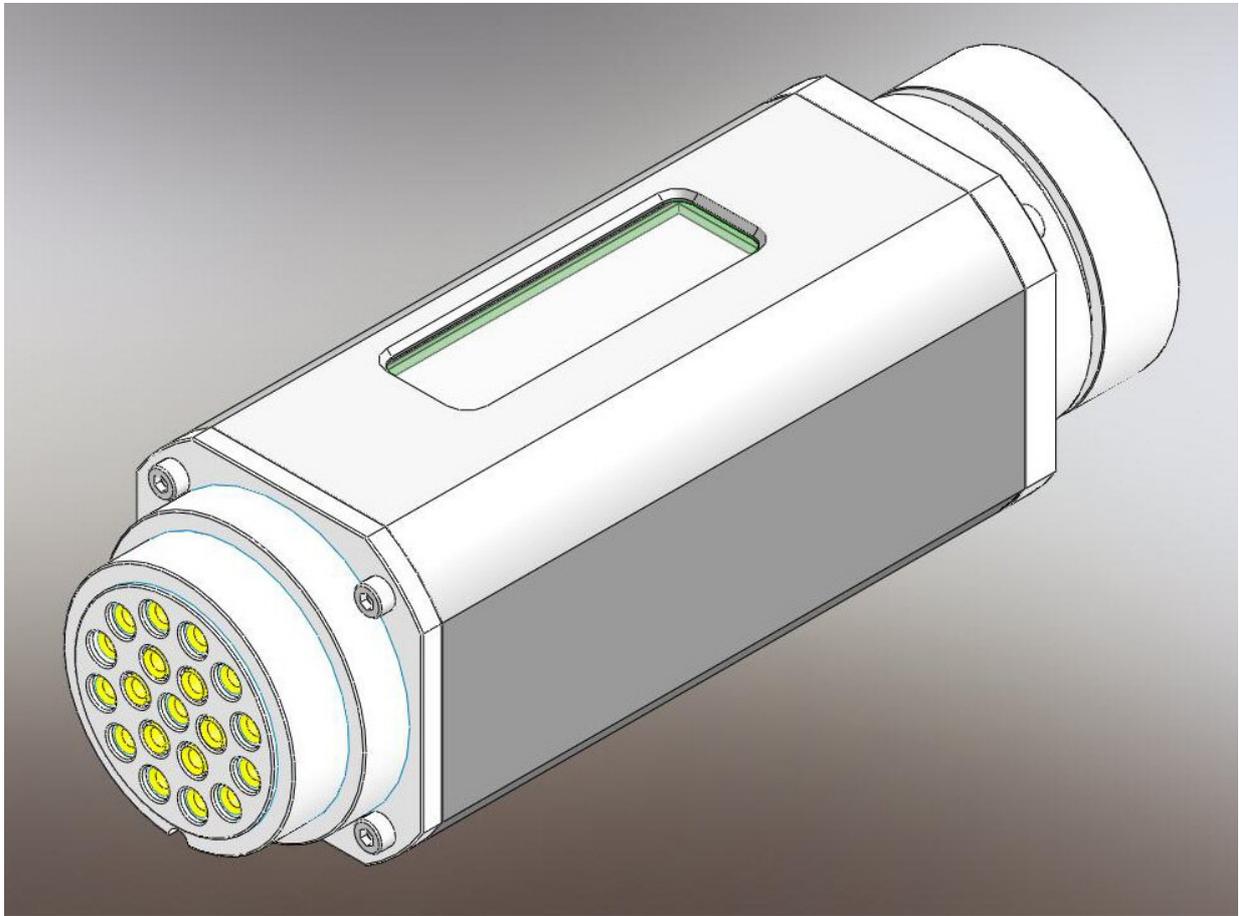### Make Or Break And Load
User Manual

Introduction

MOBAL is a fully automatic compact portable 19-Pin cable diagnostic tool, designed specifically for the entertainment industry. MOBAL performs two tests; Continuity and Load. There are no words used in MOBAL, just symbols and numbers.

Conformity

MOBAL conforms to the following British and European Standards:

EN 61000-6-3   Light Industrial Emissions
EN 61000-4-2   Heavy Industrial Immunity
EN 60945   Marine

$\mathsf{C}\,\mathsf{E}$

Further information can be obtained from technical@gds.uk.com

Cable Test

MOBAL will test for 3 types of fault during the cable test.

1. Open circuits or missing/unconnected pins.
2. Short circuits between 2 or more pins.
3. Reversed pins.

To perform the cable test, attach the cable to be tested to both ends of MOBAL. If the cable is wired correctly, MOBAL will display one of the following images: -
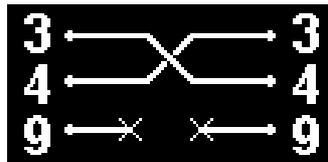

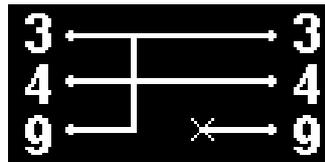CABLE OK

CABLE OK (Bussed Earths)**

If there is a fault in the cable, MOBAL will display the faults one by one using graphical representation.

In example 1 the cable has pins 3 and 4 reversed and pin 9 open.

Example 2 shows a cable with a short circuit between pins 3, 4 and 9 on the male connector, but pin 9 open between the male and female ends.

Example 1

Example 2

If MOBAL tests a cable with more than 3 faults, the display will scroll to show the remaining faults. MOBAL only displays the first 8 faults on a cable. If more than 8 faults exist, these should be rectified and the cable retested.

**Bussed Earths

This symbol is shown when MOBAL detects pins 13 to 18 are connected together at both ends of the cable.

When testing bussed earth cables, it is important to remember MOBAL (or any other form of electrical test) can't detect missing earth conductors between the male and female connectors. Whilst MOBAL will only display the cable OK symbol if it can see all 6 pins connected to all 6 pins, your cable could have only one earth conductor connected between the male and female connector. Because of this, you should always conduct a visual check of the cable as well.

Load Test

MOBAL performs the load test by measuring the resistance between the Live and Neutral pins of the 19 pin connector. If there is a lamp on the end of the cable, MOBAL will display a symbol of a resistor and the measured resistance below it. Depending on the cable length and the type of load, this resistance will vary.

To perform the load test, attach the 6 channel lighting bar wired to the correct standard (see below) to MOBAL. MOBAL will automatically enter load test mode.

In this example MOBAL has detected the following:

Circuit 1:	Resistance of 100 Ohms
Circuit 2:	Short Circuit or <10 Ohms
Circuit 3:	Short Circuit or <10 Ohms
Circuit 4:	Open Circuit
Circuit 5:	Resistance of 47 Ohms
Circuit 6:	Open Circuit

A blown lamp will display as an open circuit. A good lamp will display as a short circuit (like channel 2) or a low resistance. The actual value will depend on cable length, lamp wattage and voltage.

Moving Lights

MOBAL is able to detect some types of moving light fixtures and other load types. Typical loads MOBAL is able to measure will have magnetic ballasts or transformers. MOBAL will also detect any resistive loads below 5k Ohms. MOBAL is unable to detect any fixture using electronic ballasts or switching power supplies. MOBAL will not detect a fixture with its power switch in the OFF position.

Connection to Live Cables

Whilst GDS have taken every precaution to protect MOBAL from accidental connection to a live cable or dimmer, MOBAL should NOT be connected to the mains.

Standard Pin Allocations

PIN	Channel	PIN	Channel
1	CHANNEL 1 – LIVE	10	CHANNEL 5 – NEUTRAL
2	CHANNEL 1 – NEUTRAL	11	CHANNEL 6 – LIVE
3	CHANNEL 2 – LIVE	12	CHANNEL 6 – NEUTRAL
4	CHANNEL 2 – NEUTRAL	13	CHANNEL 1 – EARTH
5	CHANNEL 3 – LIVE	14	CHANNEL 2 – EARTH
6	CHANNEL 3 – NEUTRAL	15	CHANNEL 3 – EARTH
7	CHANNEL 4 - LIVE	16	CHANNEL 4 – EARTH
8	CHANNEL 4 - NEUTRAL	17	CHANNEL 5 – EARTH
9	CHANNEL 5 - LIVE	18	CHANNEL 6 – EARTH
		19	NOT USED

Charging

MOBAL's internal Li-ion battery will provide 20 hours of continuous testing and a standby time of 100 days.

When MOBAL's battery is flat you can charge it by simply plugging in the supplied charger. MOBAL will display an animation of a battery symbol to show its charging. When MOBAL is fully charged it will display a full battery symbol. This will be displayed for 1 hour before the display blanks. This is done to prolong the lifetime of the screen. The firmware version is also displayed on this screen.

MOBAL Charging   MOBAL Charged

MOBAL will continue to work normally until the battery level becomes too low to perform testing. When this happens the unit turns off. At this point MOBAL will not operate until it has received a charge. The charge time is approximately 3-4 hours. MOBAL can be left permanently connected to the charger for testing without damaging the battery.

Troubleshooting

If you are experiencing problems with your MOBAL or you can't find the answer in this user manual, please contact your local distributor.

Accessories

MOBAL accessories are available from your local distributor. Please contact them directly for more information.
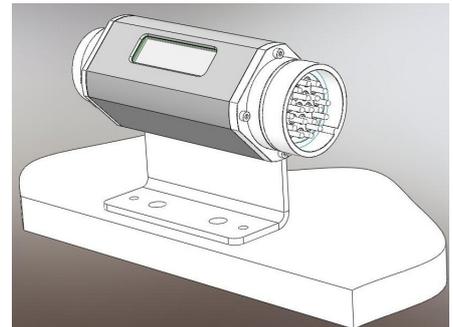
Optional Bench Mount Adaptor

Warranty

MOBAL is guaranteed for a period of one (1) year from date of purchase. For terms and conditions of this warranty please contact your local distributor.

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