

Hardware User's Manual

Semi-Automated 8-arm radial maze with video-tracking



References:

LE767(76-0229), LE769(76-0230)

Publication:

PB-MF-MAN-050-REV1.0

Limitation of Liability

PANLAB does not accept responsibility, under any circumstances, for any harm or damage caused directly or indirectly by the incorrect interpretation of what is expressed in the pages of this manual.

Some symbols may have more than one interpretation by professionals unaccustomed to their usage.

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1. EQUIPMENT INSTALLATION



WARNING: Failure to follow the instructions in this section may cause equipment faults or injury to the user.


- A. Place the equipment on a flat surface and leave at least 10 cm of free space between the rear panel of the device and the wall. Never place the equipment in zones with vibration or direct sunlight.



- B. Make sure that the AC voltage in the electrical network is the same as the voltage selected in the equipment. **Never connect the equipment to a power outlet with voltage outside these limits.**



WARNING

For electrical safety reasons you only can connect equipment to power outlets provided with earth connections .

This equipment can be used in installations with category II over-voltage according to the General Safety Rules.

The manufacturer accepts no responsibility for improper use of the equipment or the consequences of use other than that for which it has been designed.

2. MAINTENANCE



WARNING: Failure to follow the instructions in this section may cause equipment fault.

- **PRESS KEYS SOFTLY** – Lightly pressing the keys is sufficient to activate them.
- Equipments do not require being disinfected, but cleaned for removing urine, faeces and odour. To do so, we recommend using a wet cloth or paper with soap (which has no strong odour). **NEVER USE ABRASIVE PRODUCTS OR DISSOLVENTS.**
- **NEVER** pour water or liquids on the equipment.
- Once you have finished using the equipment turn it off with the main switch. Clean and check the equipment so that it is in optimal condition for its next use.
- The user is only authorised to replace fuses with the specified type when necessary.

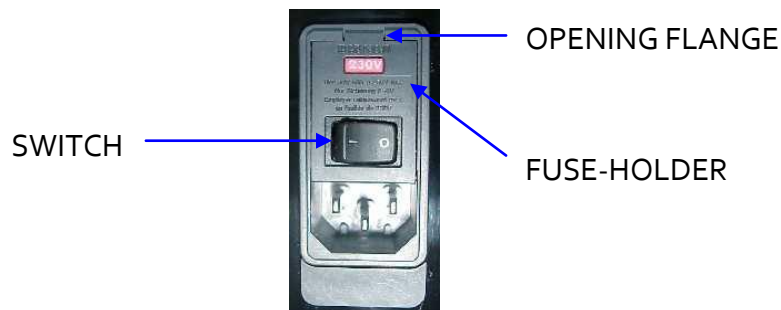


Figure 1. Power inlet, main switch and fuse holder.

FUSE REPLACEMENT

In case of an over-voltage or other incident in the AC net making it impossible to turn on the equipment, check fuses according to the following procedure.

- 1 Remove power cord from the power inlet

- 2 Open fuse-holder by pulling the flange with a regular screwdriver



Figure 2. Open fuse-holder door.

- 3 Extract fuse holder using the screwdriver.

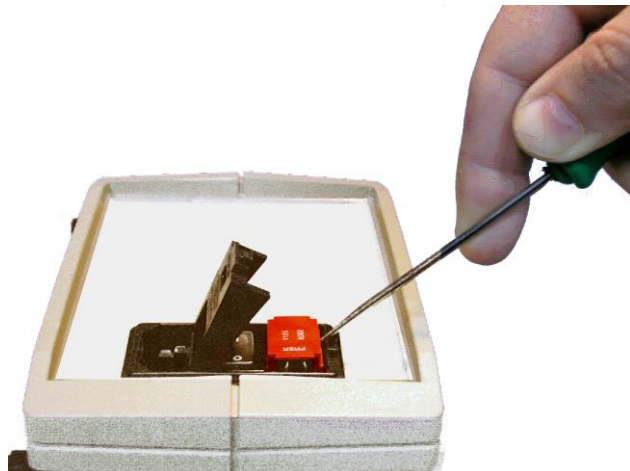


Figure 3. Extract fuse-holder.

- 4 Replace fuses if necessary. Insert fuses in the fuse-holder in the correct position.



CORRECT



INCORRECT

Figure 4. Fuses position.

- 5 Insert again fuse-holder, both possible positions are correct because power supply is universal.
- 6 If the fuses blow again unplug the equipment and contact technical service.



WARNING

For electrical safety, never open the equipment. The power supply has dangerous voltages.

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4. INTRODUCTION

Mazes are commonly used in neuroscience. An eight-arm radial maze makes it possible to study an animal spatial memory.

The animal's position in an LE 767 – LE 769 eight-arm radial maze is detected by a video camera located over the maze that uses the **Smart** software for position detection.



Figure 5. Eight-arm radial maze.

Whether the Radial maze protocol needs the use of the doors, a manual doors operation can be made remotely by the user by using the switches available on the control unit.

This means that the SMART video tracking software would not provide an automated control of the doors: the user observe the position of the animal through the image of the camera shown in SMART and control manually the door on the control unit depending on this information.

There are two models of 8-arm radial mazes:

CODE	ANIMAL	POSITION DETECTION
LE 767	Rat	Video Camera + Smart software
LE 769	Mouse	Video Camera + Smart software

Each arm in the radial maze has a door activated either manually by means of a switch on the front panel of the control unit door will always be opened.

5. EQUIPMENT DESCRIPTION

5.1. Control Unit Front Panel

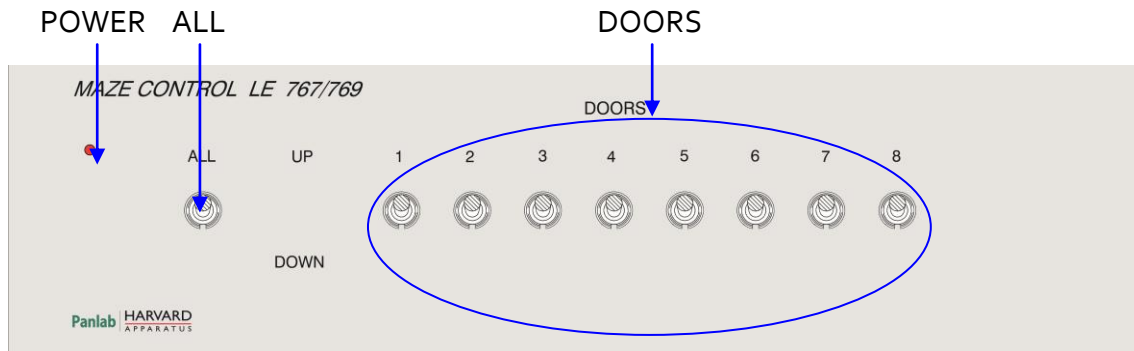


Figure 6. Front panel.

- **DOOR:** There are 8 switches, one for each arm of the radial maze.
 - UP: The door opens when the switch is in the up position.
 - DOWN: The door closes when the switch is in the down position.
- **ALL:** This switch controls all 8 doors at the same time.
- **POWER:** Red coloured LED that comes on while the control unit is on.

5.2. CONTROL UNIT REAR PANEL

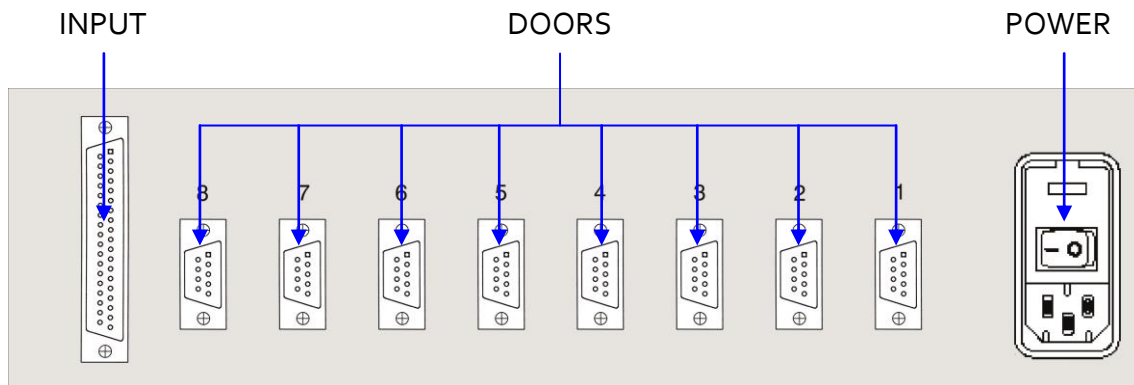


Figure 7. Rear Panel.

- **DOORS:** There is a DB9 female connector for each arm. It is used to control the door.
- **POWER:** Power inlet, main switch and fuse holder.
- **INPUT:** INPUT connector not used in this configuration.

5.3. MAZE



Figure 8. Eight-arm radial maze.

The radial maze has 8 arms and a central area. Each arm has a manually operated door. The animal's position is detected by a video camera and the **Smart** software. There is a cylindrical container for food at the end of each arm.

6. EQUIPMENT CONNECTION

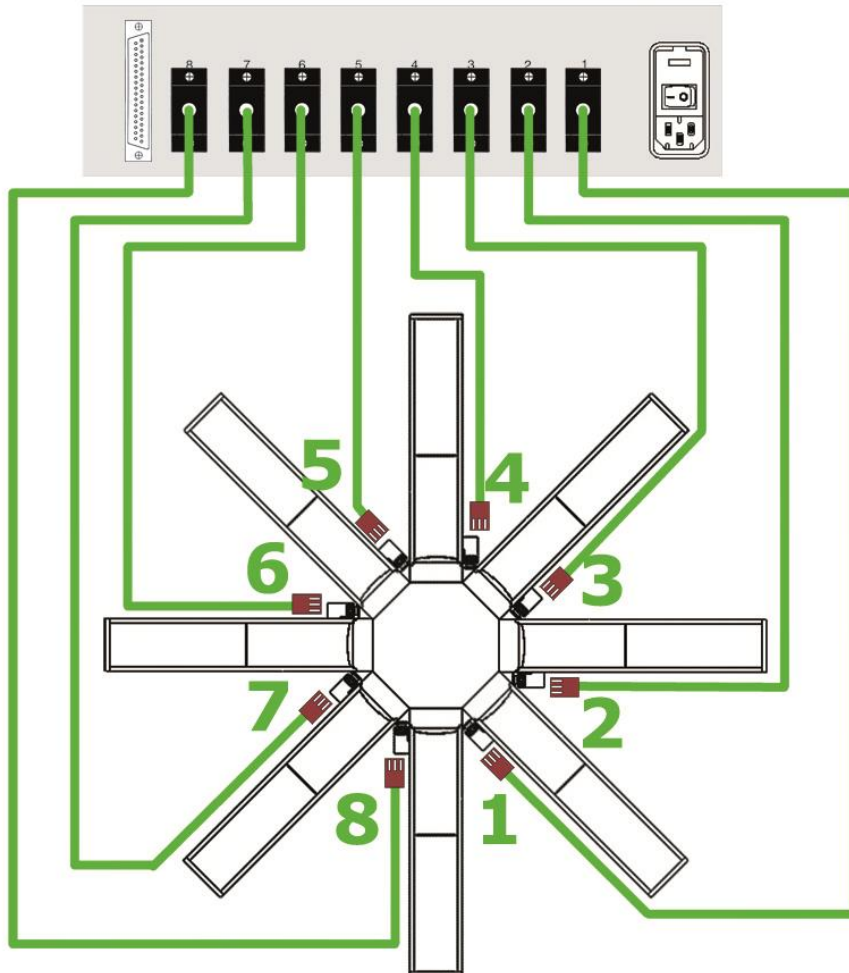


Figure 9. Equipment connection.

The necessary cables and connections are listed in the following table:

	FROM	TO	CABLE
1	LE 767 Door 1	Arm 1	Cable DB9 to LUCAS 3
2	LE 767 Door 2	Arm 2	Cable DB9 to LUCAS 3
3	LE 767 Door 3	Arm 3	Cable DB9 to LUCAS 3
4	LE 767 Door 4	Arm 4	Cable DB9 to LUCAS 3
5	LE 767 Door 5	Arm 5	Cable DB9 to LUCAS 3
6	LE 767 Door 6	Arm 6	Cable DB9 to LUCAS 3
7	LE 767 Door 7	Arm 7	Cable DB9 to LUCAS 3
8	LE 767 Door 8	Arm 8	Cable DB9 to LUCAS 3

7. MOUNTING THE RADIAL MAZE

1. Insert the structure arm into the circular base using the corresponding orifices.



Figure 10. Inserting the arm in the circular base.

2. Screw the Allen screws into the base to fix the structure arms.



Figure 11. Screwing the Allen screws.

3. Secure the screws with a hexagonal key.

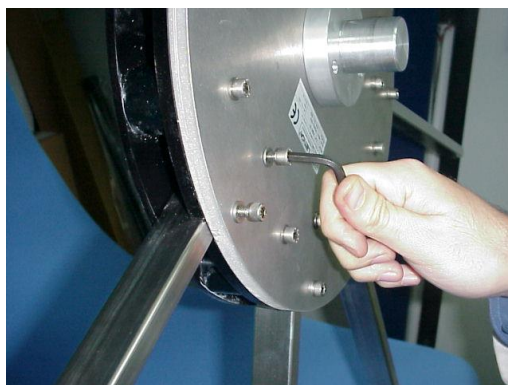


Figure 12. Securing the screws.

4. Fit the platform with the 8 structure arms to the tripod.

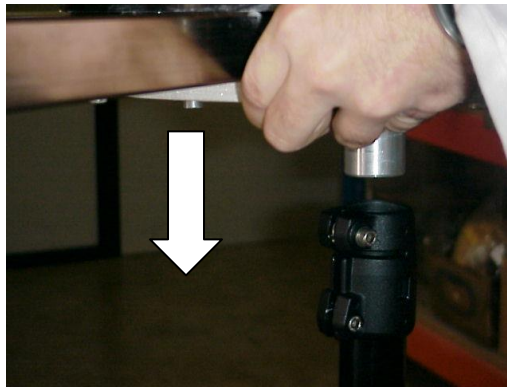


Figure 13. Placing the platform on the tripod.

5. Secure the platform to the tripod with a hexagonal key.

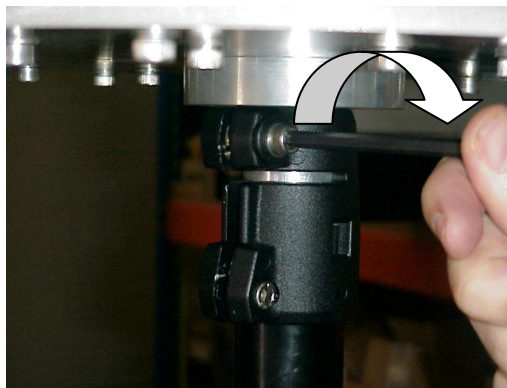


Figure 14. Securing the platform to the support.

6. Place the maze arm in the structure arm and push it until it reaches the central area.

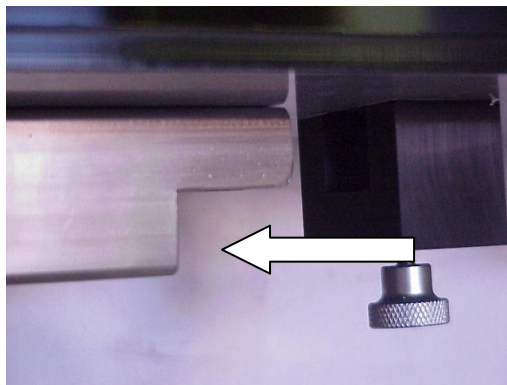


Figure 15. Placing the maze arm.

7. Secure the maze arm to the structure arm with the screw.

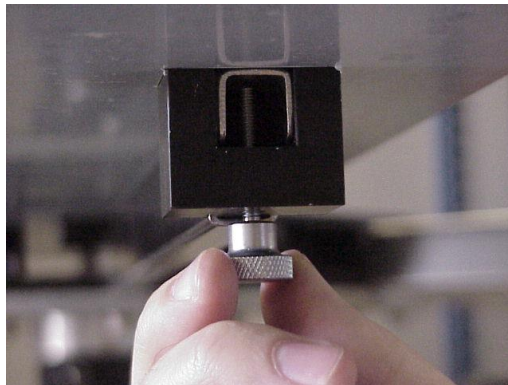


Figure 16. Securing the maze arm.

8. Affix the motor mechanism lid.

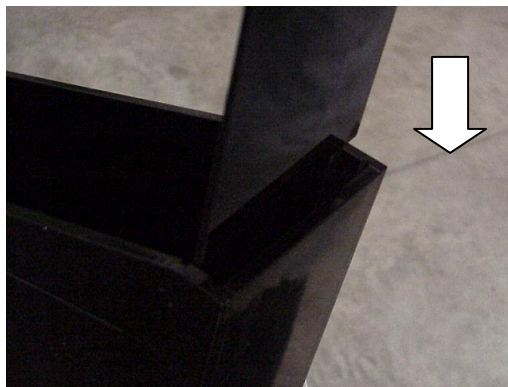


Figure 17. Introducing the motor mechanism lid

8. SPECIFICATIONS

POWER SUPPLY Input voltage: Frequency: Fuse: Maximum Power: Conducted Noise:	Universal input 90 Vac to 264 Vac 50 /60 Hz 2 fuses 5mm*20mm 2A 250V 18 W EN55022 /CISPR22/CISPR16 class B					
ENVIRONMENTAL CONDITIONS Operating Temperature: Operating Relative Humidity: Storage Temperature:	10° C to +45°C 0% to 85% RH, non-condensing 0°C to +50°C, non-condensing					
DOOR Time open-closed: Regulation open: Regulation closed:	0.6s (mouse) , 0.75s (rat) Potentiometer P2 Potentiometer P1					
CONNECTOR DOOR (DB9 female) <u>Pin</u> 1 5 6	<u>Function</u> Door + 5V DC GND					
DIMENSIONS(CONTROL UNIT) Width x Height x Depth: Weight:	340mm x 110mm x 340mm 5.44 kg					
DIMENSIONS (CAGE) ¹ :						
MODEL	ANIMAL	ARM DIMENSIONS [Width x Height x Depth]	BASE [Diameter x Height]	DOOR [Height]	WALLS [Height]	TRIPOD [Height]
LE767	Rat	144X345X715	Ø 1249X114.5	90	From 294 to 41	850
LE769	Mice	357X201X102	Ø 616X116	50	From 150 to 26	850

¹ Dimensions are expressed in millimetres

(GB) Note on environmental protection:



After the implementation of the European Directive 2002/96/EU in the national legal system, the following applies:

Electrical and electronic devices may not be disposed of with domestic waste. Consumers are obliged by law to return electrical and electronic devices at the end of their service lives to the public collecting points set up for this purpose or point of sale. Details to this are defined by the national law of the respective country. This symbol on the product, the instruction manual or the package indicates that a product is subject to these regulations. By recycling, reusing the materials or other forms of utilising old devices, you are making an important contribution to protecting our environment.

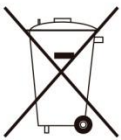
(E) Nota sobre la protección medioambiental:



Después de la puesta en marcha de la directiva Europea 2002/96/EU en el sistema legislativo nacional, Se aplicara lo siguiente:

Los aparatos eléctricos y electrónicos, así como pilas y baterías, no se deben tirar a la basura doméstica. El usuario está legalmente obligado a llevar los aparatos eléctricos y electrónicos, así como pilas y baterías, al final de su vida útil a los puntos de recogida municipales o devolverlos al lugar donde los adquirió. Los detalles quedaran definidos por la ley de cada país. El símbolo en el producto, en las instrucciones de uso o en el embalaje hace referencia a ello. Gracias al reciclaje, a la reutilización de materiales i a otras formas de reciclaje de aparatos usados, usted contribuirá de forma importante a la protección de nuestro medio ambiente.

(F) Remarques concernant la protection de l'environnement :



Conformément à la directive européenne 2002/96/CE, et afin d'atteindre un certain nombre d'objectifs en matière de protection de l'environnement, les règles suivantes doivent être appliquées.

Elles concernent les déchets d'équipement électriques et électroniques. Le pictogramme "picto" présent sur le produit, son manuel d'utilisation ou son emballage indique que le produit est soumis à cette réglementation. Le consommateur doit retourner le produit usager aux points de collecte prévus à cet effet. Il peut aussi le remettre à un revendeur. En permettant enfin le recyclage des produits, le consommateur contribuera à la protection de notre environnement. C'est un acte écologique.

(D) Hinweis zum Umweltschutz:



Ab dem Zeitpunkt der Umsetzung der europäischen Richtlinie 2002/96/EU in nationales Recht gilt folgendes:

Elektrische und elektronische Geräte dürfen nicht mit dem Hausmüll entsorgt werden. Der Verbraucher ist gesetzlich verpflichtet, elektrische und elektronische Geräte am Ende ihrer Lebensdauer an den dafür eingerichteten, öffentlichen Sammelstellen oder an die Verkaufsstelle zurückzugeben. Einzelheiten dazu regelt das jeweilige Landesrecht. Das Symbol auf dem Produkt, der Gebrauchsanleitung oder der Verpackung weist auf diese Bestimmungen hin. Mit der Wiederverwertung, der stofflichen Verwertung oder anderer Formen der Verwertung von Altgeräten leisten Sie einen wichtigen Beitrag zum Schutz unserer Umwelt.

(I) Informazioni per protezione ambientale:



Dopo l'implementazione della Direttiva Europea 2002/96/EU nel sistema legale nazionale, ci sono le seguenti applicazioni:

I dispositivi elettrici ed elettronici non devono essere considerati rifiuti domestici. I consumatori sono obbligati dalla legge a restituire i dispositivi elettrici ed elettronici alla fine della loro vita utile ai punti di raccolta collerici preposti per questo scopo o nei punti vendita. Dettagli di quanto riportato sono definiti dalle leggi nazionali di ogni stato. Questo simbolo sul prodotto, sul manuale d'istruzioni o sull'imballo indicano che questo prodotto è soggetto a queste regole. Dal riciclo e re-utilizzo del material o altre forme di utilizzo di dispositivi obsoleti, voi renderete un importante contributo alla protezione dell'ambiente.

(P) Nota em Protecção Ambiental:



Após a implementação da directiva comunitária 2002/96/EU no sistema legal nacional, o seguinte aplica-se:

Todos os aparelhos eléctricos e electrónicos não podem ser despejados juntamente com o lixo doméstico. Consumidores estão obrigados por lei a colocar os aparelhos eléctricos e electrónicos sem uso em locais públicos específicos para este efeito ou no ponto de venda. Os detalhes para este processo são definidos por lei pelos respectivos países. Este símbolo no produto, o manual de instruções ou a embalagem indicam que o produto está sujeito a estes regulamentos. Reciclando, reutilizando os materiais dos seus velhos aparelhos, esta a fazer uma enorme contribuição para a protecção do ambiente.