

Hardware User's Manual

Stimuli Interface

Startle & Freezing



References:

LE118-4 (76-1074), LE118-8 (76-0283)

Publication:

PB-MF-MAN-024-REV-1.1

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.

PANLAB reserves the right to modify, in part or in total, the contents of this document without notice.

1. SYMBOLS TABLE

Recognising the symbols used in the manual will help to understand their meaning:

DESCRIPTION	SYMBOL
Warning about operations that must not be done because they can damage the equipment	
Warning about operations that must be done, otherwise the user can be exposed to a hazard.	
Protection terminal ground connection.	
Warning about a hot surface which temperature may exceed 65°C	
Warning about a metal surface that can supply electrical shock when it's touched.	
Decontamination of equipments prior to disposal at the end of their operative life	
Waste Electrical and Electronic Equipment Directive (WEEE)	

2. GOOD LABORATORY PRACTICE

Check all units periodically and after periods of storage to ensure they are still fit for purpose. Investigate all failures which may indicate a need for service or repair.

Good laboratory practice recommends that the unit be periodically serviced to ensure the unit is suitable for purpose. You must follow preventive maintenance instructions. In case equipment has to be serviced you can arrange this through your distributor. Prior to Inspection, Servicing, Repair or Return of Laboratory Equipment the unit must be cleaned and decontaminated.



Decontamination prior to equipment disposal

In use this product may have been in contact with bio hazardous materials and might therefore carry infectious material. Before disposal the unit and accessories should all be thoroughly decontaminated according to your local environmental safety laws.

3. UNPACKING AND EQUIPMENT INSTALLATION



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

- A. No special equipment is required for lifting but you should consult your local regulations for safe handling and lifting of the equipment.
- B. Inspect the instrument for any signs of damage caused during transit. If any damage is discovered, do not use the instrument and report the problem to your supplier.
- C. Ensure all transport locks are removed before use. The original packing has been especially designed to protect the instrument during transportation. It is therefore recommended to keep the original carton with its foam parts and accessories box for re-use in case of future shipments. Warranty claims are void if improper packing results in damage during transport.
- D. 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.
- E. Once the equipment is installed in the final place, the main power switch must be easily accessible.
- F. Only use power cords that have been supplied with the equipment. In case that you have to replace them, the spare ones must have the same specs that the original ones.



- G. 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.

PC Control

Some of these instruments are designed to be controlled from a PC. To preserve the integrity of the equipment it is essential that the attached PC itself conforms to basic safety and EMC standards and is set up in accordance with the manufacturers' instructions. If in doubt consult the information that came with your PC. In common with all computer operation the following safety precautions are advised.



- WARNING**
- To reduce the chance of eye strain, set up the PC display with the correct viewing position, free from glare and with appropriate brightness and contrast settings
 - To reduce the chance of physical strain, set up the PC display, keyboard and mouse with correct ergonomic positioning, according to your local safety guidelines.

4. 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 OR VOLTAGE SETTING CHANGE

In case of an over-voltage or other incident in the AC net making it impossible to turn on the equipment, or if the equipment voltage setting is incorrect, 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 the fuse-holder again, positioning it according to the voltage in the AC net.



115V POSITON



230V POSITION

Figure 5 Fuse holder position.

- 6 If the fuses blow again, unplug the equipment and contact technical service.



For electrical safety reasons, never open the equipment. The power supply has dangerous voltage levels.

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6. INTRODUCTION

The LE 118 Startle and Fear Interface is used as an interface between a computer and the LE 111 modules. The LE 118 performs the following functions:

- Amplifies the audio signal coming from the computer sound card.
- Buffers the control signals sent by the computer.
- Calibrates different computers to give the same audio level.
- Indicates which events are active (sound, white noise, light, shock and air stimulus) with different leds.

There are 2 models of LE 118 control units: the LE118-4 and LE118-8 featuring 4 or 8 ports labelled "Station Control" to simultaneously control up to 4 or 8 LE 111 modules.



Figure 6. LE 118 Startle & Fear Interface.

The LE 118 takes an audio signal that is generated by the program and comes from the computer sound card, and amplifies it to adjust to the cage audio level.

Additionally, the LE 118 takes the control signals coming from the computer and adapts them to work with LE 111 modules. The different events that the computer can control are the following:

- **Sound:** a tone of pure sound (having a unique frequency without harmonics).

- **White noise:** a sound that contains all the frequencies.
- **Light:** there is a lamp in the cage that can be used as light stimuli.
- **Shock:** the cage floor features a grid that can supply electrical shock to the animal.
- **Air:** the animal can be given air stimuli.

This unit also works as an interface between the LE111 Load Cell Coupler and the PC. The LE 118 can activate up to 4 or 8 LE111 units. Thus the same audio signal (frequency and amplitude) and control signals can be transmitted to different cages.

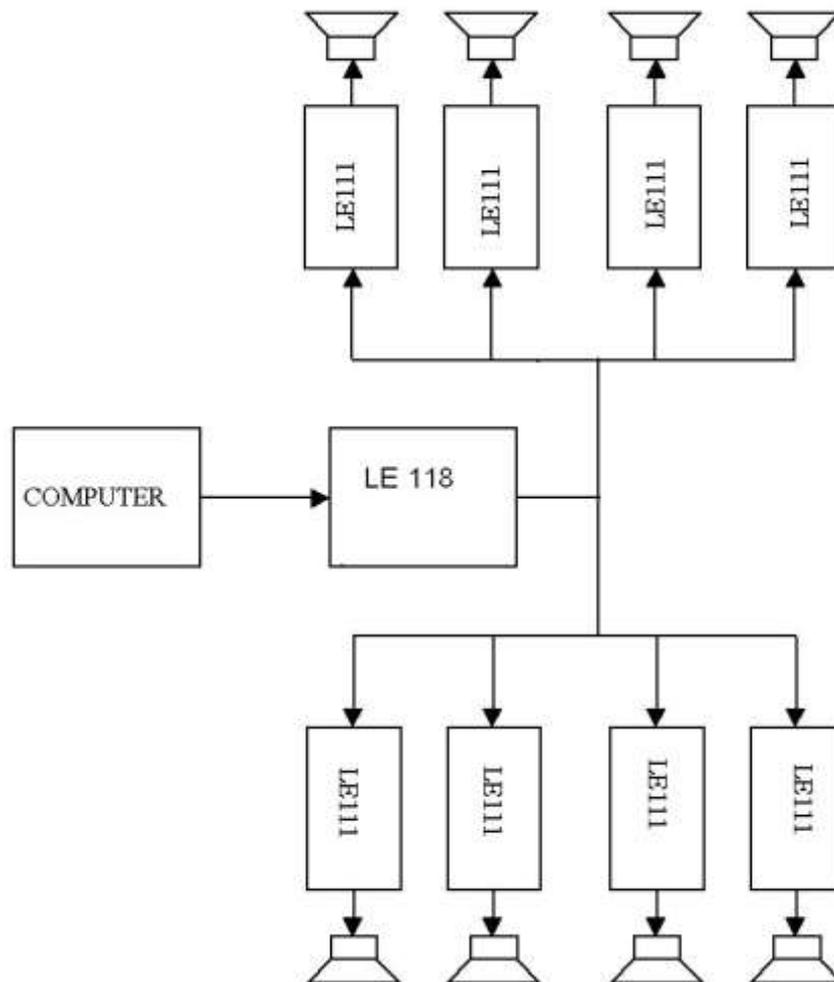


Figure 7. Blocks Diagram of the system with the LE118-8.

7. EQUIPMENT DESCRIPTION

7.1. FRONT PANEL

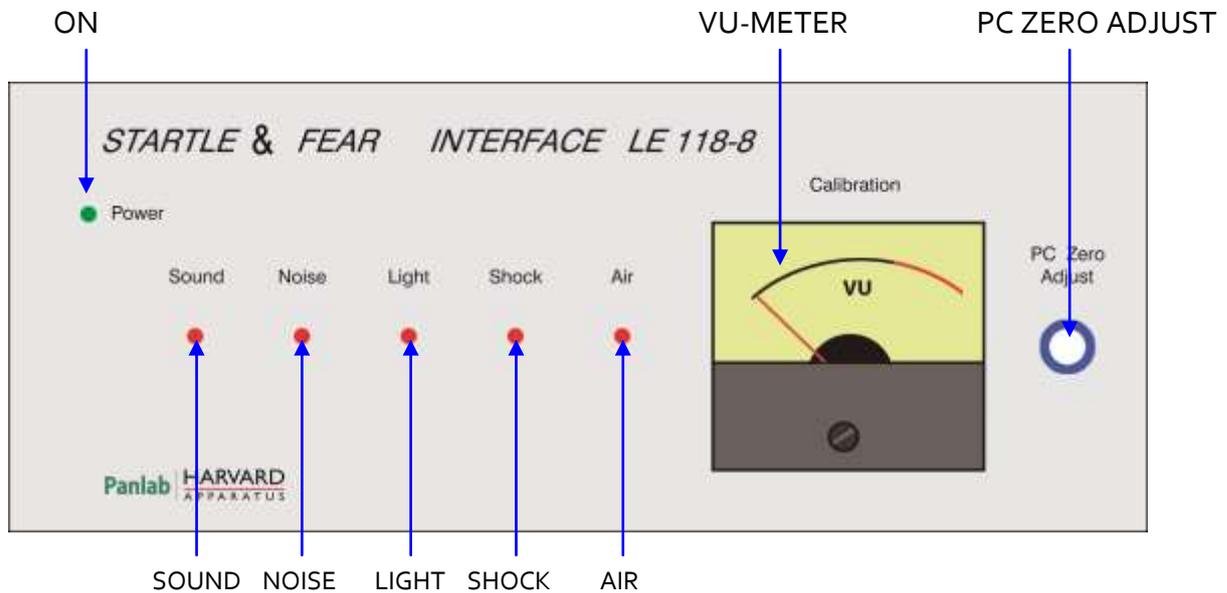


Figure 8. LE 118 Front Panel.

- **ON:** Led that indicates when the equipment is turned on.

The following leds show events controlled by the computer. These leds are on when the computer activates the event and remain off when no event is activated.

- **SOUND:** sound is active.
- **NOISE:** white noise is active.
- **LIGHT:** light is active.
- **SHOCK:** shock is active.
- **AIR:** air stimulus is active.

Audio level display and adjustment:

- **VU-METER:** displays the audio signal level. The needle begins to move for sounds louder than 100dB.
- **PC ZERO ADJUST:** Potentiometer used to adjust the computer's audio signal gain in the program's calibration mode. It is used to make the input sound signal to the LE 118 equal regardless of the computer used.

7.2. REAR PANEL

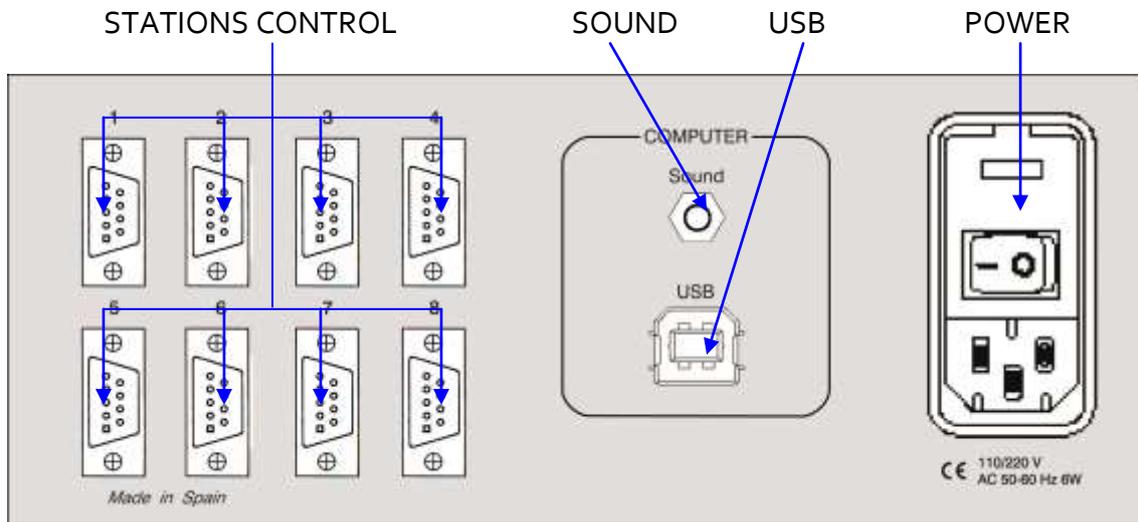


Figure 9. LE 118-8 Rear Panel.

- **Station Control:** The LE 118-4 has 4 Delta 9 female ports that can control up to 4 LE 111 Modules. The LE 118-8 has 8 Delta 9 female ports that can control up to 8 LE 111 Modules.
- **Sound:** Stereo jack connector to connect the LE 118 with a computer's sound card output.
- **USB:** USB connector to connect the LE 118 to a free USB port on the Computer.
- **Power:** Power inlet, main switch and fuse holder.

The necessary connections are described in the following table.

	FROM	TO	CABLE
1	PC USB port	LE 118 USB	USB cable
2	PC Sound card output	LE 118 Sound	3.5mm stereo jack cable
3*	LE 118 Stations Control n	LE 111 Control n	DELTA 9 cable
4*	LE 111 Load Cell Platform	Cage Load Cell	DIN 5 cable
5*	LE 111 Shocker	LE100-26 GND	Mono jack to Black Banana
5*	LE 111 Shocker	LE100-26 External Time	Mono jack to Green Banana
6*	LE 111 Chamber	Cage Speaker Box	4 pins cable
7*	Cage Light	Cage Speaker Box	Mono Jack 6.35mm
8*	LE 100-26 Shock	Cage Grid	DIN6 to DELTA 9 cable
9*	LE 111 Air	Valve	3.5mm mono jack
10**	Pressured air system	Valve	Pipe
11**	Valve	Cage	Pipe

* n is the number of cage. All of these connections are necessary for each cage.

**pneumatic circuit connections.

9. CALIBRATION

The calibration function allows adjustment of input audio signal level from the computer sound card. This way, the same results will be obtained regardless of the computer used.

The LE 118 must be calibrated the first time it is connected to the computer sound card. Every time the computer is changed it must be calibrated again.

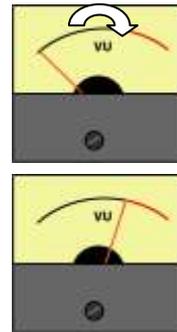
The steps to calibrate are as follows:

- 1) Connect the USB and the audio cable to LE118-8 (see Figure 10).
- 2) Read the software **PacWin** user's manual in order to generate a calibration tone of 4 kHz at 120dB.

- 3) While the calibration tone is on the led  will be on.

- 4) The needle of the **VU-meter** will move.

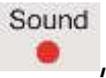
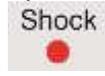
- 5) Adjust the  potentiometer so that the **VU-meter** indicates 100% (or 0dB). The needle will be between the red and black sections.



NOTE: The **VU-meter** has a scale of 120dB (100%). It is mainly used during calibration. During normal program operation it measures sound between 100dB and 120dB.

10. PREPARING THE EXPERIMENT

- 1) Connect the computer to the LE 118 and connect the LE 118 to all the LE 116 systems (see Figure 10).
- 2) Calibrate the audio level (only the first time it is used).
- 3) Set the protocol sequence in the **PacWin** program. Every time an event is

activated its corresponding led on the LE 118 will be turned on ( ,  ,  ,  , ), and stimuli will be activated in the cage.

11. ADJUSTING SOUND WITH SEVERAL CAGES

Although the LE 118 sends the same sound signal to each LE 111 cage, there will probably be slight sound differences from cage to cage. To solve this problem, a fine sound adjustment can be made cage by cage. To do so, there is a potentiometer on

the rear panel of the LE 111 labelled  for this purpose.

To adjust the audio level proceed as follows:

- Place the dB meter inside the cage. The dB meter must be able to measure in impulse mode and it must have a fast response.
- In the program, create a protocol that gives a pulse of 80dB with a duration of at least 500ms.

- Adjust the  potentiometer on the rear panel of the LE 111 so that the dB meter measures 80dB. This potentiometer allows a maximum attenuation of 10dB.

12. TROUBLESHOOTING

This table features instructions to solve the most frequent problems.

PROBLEM	SOLUTION
The equipment does not start up.	<ul style="list-style-type: none"> • Ensure that the voltage of mains is the same as that selected in the fuse holder. • Check the condition of the fuses.
Air stimulus does not work.	<ul style="list-style-type: none"> • Check connections (see Figure 10). • Check that the AIR led lights up on the front panel of LE118. If not, it can be a problem in the drivers or the USB cable connection. • Check that the source of compressed air supplies air to the electro valve.
The animal does not receive electrical shock.	<ul style="list-style-type: none"> • Check connections (see Figure 10). • Check that SHOCK led lights on the front panel of LE118, if not can be a problem in the drivers or the USB cable connection. • Check that SHOCK/ CALIBRATION switch in the Shocker is in the SHOCK position. • Check that the INTENSITY knob in the Shocker is set to a value higher than 0mA. • Check that the grid is clean (urine and excrements can conduct current).
Light stimulus does not turn on.	<ul style="list-style-type: none"> • Check connections (see Figure 10). • Check that the LIGHT led lights up on the front panel of the LE118. If not, it can be a problem in the drivers or the USB cable connection. • Check that the bulb is not burned out.

PROBLEM	SOLUTION
White noise does not sound.	<ul style="list-style-type: none"> • Check connections (see Figure 10). • Check that the NOISE led lights up on the front panel of the LE118. If not, it can be a problem in the drivers or the USB cable connection. • Check in the program that the duration and selected Sound level are enough so that the white noise is audible.
The tone does not sound.	<ul style="list-style-type: none"> • Check connections (see Figure 10). • Check that the SOUND led lights up on the front panel of the LE118. If not, it can be a problem in the drivers or the USB cable connection. • Check in the program that the duration and selected Sound level are enough so that the tone is audible.
The VU meter needle does not move.	<ul style="list-style-type: none"> • Below 100dB the needle will not move. • Check connections (see Figure 10). • Check with the help of PC speakers that the sound card of the PC runs.
The computer does not detect the animal's movements.	<ul style="list-style-type: none"> • Ensure that the grid and tray are correctly positioned. • Remove the tray and check in the four tray supports of the platform, when pressing on them, they are not blocked and move. • Increase the gain with the GAIN knob on the front panel of the LE111.

13. TECHNICAL SPECIFICATIONS

<p>POWER SUPPLY</p> <p>Input voltage: Frequency: Fuse: Maximum power: Conducted noise:</p>	<p>115 /230 VAC 50 /60 Hz 2 fuses 5x20mm 100mA 250V Fast 6 W EN55022 /CISPR22/CISPR16 class B</p>
<p>ENVIRONMENTAL CONDITIONS</p> <p>Operating temperature: Operating relative humidity: Storage temperature:</p>	<p>10°C to +40°C 0% to 85% RH, non-condensing 0°C to +50°C, non-condensing</p>
<p>OUTPUT AMPLIFIER</p> <p>Number output channels: Output configuration: Maximum output current: Output impedance: Range: Slew rate: Linearity error: Output protection:</p>	<p>8 single-ended +- 2 mA by channel 0.1 ohm typical +10V to -10V 15V/us < 1% yes</p>
<p>ANALOGIC INPUT</p> <p>Type: Range:</p>	<p>Differential +5 to -5V</p>
<p>CONTROL CONNECTOR (9 pins)</p> <p><u>Pin</u> 5 9 2 3 4 7, 8 1 6</p>	<p><u>Function</u> Output sound signal Output sound GND TTL output light TTL output shock TTL output air GND digital Load cell input + Load cell input -</p>
<p>COMPUTER CONNECTOR</p> <p>Type:</p>	<p>USB type B</p>
<p>DIMENSIONS</p> <p>Width x Height x Depth: Weight:</p>	<p>232 mm x 124 mm x 297 mm 3.67 kg</p>

**DECLARACIÓN DE CONFORMIDAD
DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITÉ**

Nombre del fabricante: **Panlab s.l.u.**
 Manufacturer's name: www.panlab.com
 Nom du fabricant: info@panlab.com

Dirección del fabricante: **Energía, 112**
 Manufacturer's address: **08940 Cornellà de Llobregat**
 Adresse du fabricant: **Barcelona SPAIN**

Declaro bajo su responsabilidad que el producto: **Startle and Fear Interface**
 Declares under his responsibility that the product:
 Déclare sous sa responsabilité que le produit:

Marca / Brand / Marque: **PANLAB**

Modelo / Model / Modèle: **LE 118-8, LE118-4**

Cumple los requisitos esenciales establecidos por la Unión Europea en las directivas siguientes:
 Fulfils the essential requirements established by The European Union in the following directives:
 Remplit les exigences essentielles établies pour l'Union Européenne selon les directives suivantes:

- 2006/95/EC** Directiva de baja tensión / Low Voltage / Basse tension
- 2004/108/EC** Directiva EMC / EMC Directive / Directive CEM
- 2012/19/EU** La Directiva de Residuos de Aparatos Eléctricos y Electrónicos (WEEE) / The Waste Electrical and Electronic Equipment Directive (WEEE) / Les déchets d'équipements électriques et électroniques (WEEE)
- 2011/65/EU** Restricción de ciertas Sustancias Peligrosas en aparatos eléctricos y electrónicos (ROHS) / Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (ROHS) / Restriction de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques (ROHS)
- 2006/42/EC** Directiva mecánica / Machinery directive / Directive mécanique

Para su evaluación se han aplicado las normas armonizadas siguientes:
 For its evaluation, the following harmonized standards were applied:
 Pour son évaluation, nous avons appliqué les normes harmonisées suivantes:

- Seguridad / Safety / Sécurité: **EN61010-1:2011**
- EMC: **EN61326-1:2012 Class B**
- FCC: **FCC47CFR 15B Class B**
- Safety of machinery: **EN ISO 12100:2010**

En consecuencia, este producto puede incorporar el marcado CE y FCC:
 Consequently, this product can incorporate the CE marking and FCC:
 En conséquence, ce produit peut incorporer le marquage CE et FCC:



En representación del fabricante:
 Manufacturer's representative:
 En représentation du fabricant: **Carme Canalís**
General Manager
Panlab s.l.u., a division of Harvard BioScience

Cornellà de Llobregat, Spain
 25/06/2014

(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 aplicará 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 y 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 collettivi 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.