

R60
USB to CAN interface
Manual (1.5 EN)

General information

R60 USB to CAN interface
Manual

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1. R60 USB to CAN interface

This manual describes the facilities and functions of the hardware and the installation of the necessary software (driver) of the R60 USB to CAN interface.

A detailed description of the d&b Remote network (CAN-Bus) is given in the technical information TI 312 which is provided with the CD-ROM or can be downloaded from our website at www.dbaudio.com. We recommend to regularly check the d&b website for the latest version of the documentation (R60 manual and TI 312).

1.1. Intended use

The R60 USB to CAN interface is designed to connect the d&b Remote network (CAN-Bus) to a PC via USB (**U**niversal **S**erial **B**us) and must only be used within a d&b sound reinforcement system.

The R60 provides two RJ 45 CAN connectors with a built in switchable terminator and comes with drivers for Windows® operating systems. Up to five R60 interfaces may be connected to a PC and simultaneously operated by the R1 software.

1.2. General safety instructions

WARNING! The R60 USB to CAN interface must not be used in applications where there is a potential risk of personal injury caused by malfunction or complete drop out of the unit.

Installation and start up must only be carried out by qualified technicians.

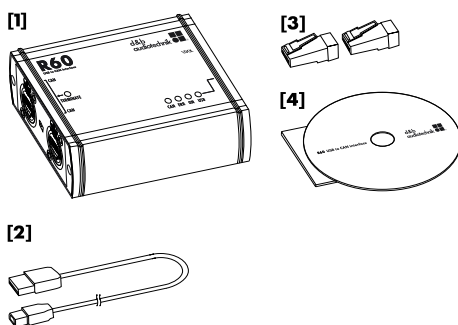
In case of a malfunction or doubts concerning the proper functioning of the device, please contact d&b audiotechnik for further information or advice.

As the device does not contain any components to be maintained or repaired by the user, the enclosure must not be opened. The device can only be repaired by d&b audiotechnik.

1.3. Scope of supply

Before installation and start up please verify the shipment for completeness and carry out a visual inspection of the packaging and the individual items listed below for obvious damage during shipment.

NOTICE: If there are any signs of obvious damage to the items, do not connect and operate the device.



Qty.	d&b Code	Description
1	Z6118	R60 USB to CAN interface [1]
1		Standard USB cable 0.5 m (1.6 ft) [2] (Connector type A to type B)
2	Z6116	RJ 45 M Terminator [3]
1		CD-ROM (containing the driver software, R60 manual and additional documentation – TI 312) [4]

1.4. Technical specification

Power supply

Supply voltage.....5 V, powered via USB Bus
 Current drawn.....< 100 mA
 Temperature range.....0 – 60 °C

Controls and indicators

Termination.....built in switchable terminator
Termination of CAN-Bus with internal resistor 120 Ω/ 1/4 W / ± 5%
with corresponding status LED
 Indicators (Status LEDs).....ON, USB, CAN, ERROR, TERMINATE

Connectors

USB.....1 x USB Type B connectors
 CAN.....2 x RJ 45 connectors, wired in parallel

Hardware

Controller.....8 Bit
 Flash Memory Size.....32 k
 SRAM Size.....128 kB
 EEPROM Size.....2 kB
 Additional features.....CAN galvanically isolated

CAN Specification

.....2.0 A/B
 CAN-Bus coupling.....High Speed, according to ISO 11898
 Max. CAN Baud Rate.....1 Mbit/s

USB Specification

USB Baud Interface.....USB 1.1
 USB Buffer Memory.....256 messages

PC Requirements

.....min. Pentium CPU, 32 MB RAM, 10 MB free disk space

Supported Operating Systems

.....Windows® 2000, XP
Mac OSX®

Housing/Dimensions

Housing.....Extruded aluminium
 Dimensions (Height x width x depth).....125x85x35 mm [5" x 3.5" x 1.4"]
 Weight.....200 g (0.45 lb)

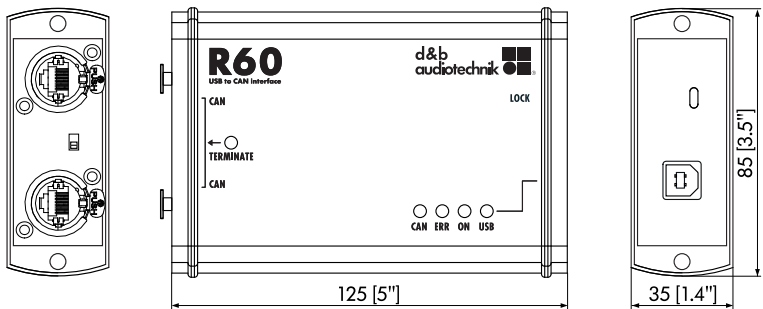


Fig. 1: Dimensions in mm [inch]

Accessories

Z6122/Z6123 Bopla mounting clamps.....wall mounting
top hat rail mounting (TS 35)

2. R60 Hardware

The hardware of the R60 USB to CAN interface is housed in a rugged aluminium enclosure including connectors, controls and indicators.

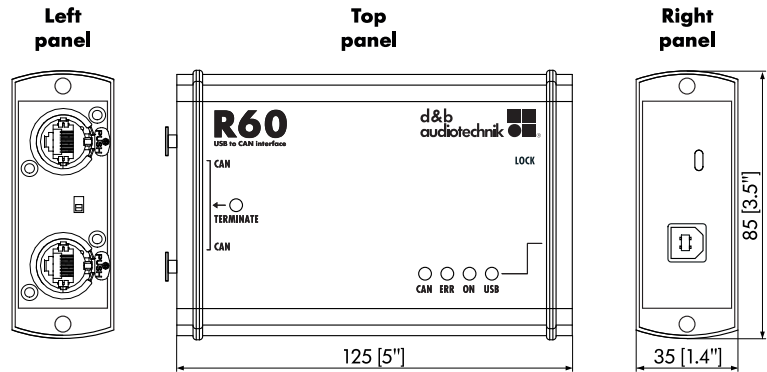


Fig. 2: Top and side views

2.1. Power supply

The device is powered by the USB port and is therefore not dependent on any external power supply.

It is recommended to power the device by the PC (USB Host) or by a self powered USB Hub.

NOTICE: With bus powered USB Hubs the voltage supply might not be sufficient to power up the R60 interface.

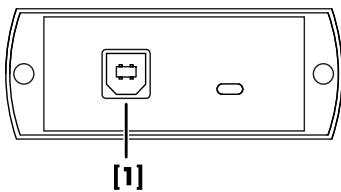
2.2. Connectors

2.2.1. USB port [1]

The USB connector type B is located on the right hand side panel of the device.

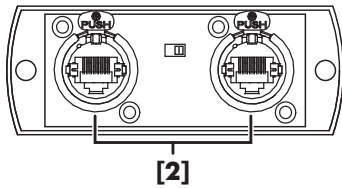
The USB-Port is used to interface the R60 with a PC. It provides a data transmission rate of up to 12 Mbit/s. To interface the device with a PC the supplied standard USB cable should be used.

NOTICE: To match EMC requirements the length of the USB cable is limited to a maximum of 3 m (10 ft).



Pin	Signal	Remark
1	V_{Bus}	
2	D	
3	D +	
4	GND	
Shell	Enclosure	Shield

Tab. 1: USB port pin assignment



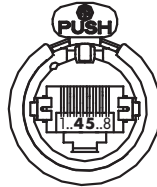
2.2.2. CAN-Bus connectors [2]

The RJ 45 connector type B (white colored coding ring) is located on the left hand side panel of the device.

Note: Crossover Detection and Auto Correction are supported.

Two RJ 45 connectors are located on the left side panel of the device. Both connectors are wired in parallel to allow different wiring setups of the CAN-Bus (see section 2.3.2. CAN-Bus termination on page 9).

RJ 45 [2]



Pin	Signal	Remark
1	-	
2	-	
3	-	
4	CAN_H	CAN high bus line (active high)
5	CAN_L	CAN low bus line (active low)
6		
7		
8		
Shell	GND	CAN ground

Table 2: RJ 45 (CAN-Bus) pin assignment

NOTICE! To connect the devices to the d&b Remote network (CAN-Bus) shielded cables and shielded RJ45 connectors must be used. The cable shielding must be connected to both sides of the RJ45 connector as the "CAN Ground" is routed via the cable shielding.

The signals on the CAN connection terminals CAN_H and CAN_L must match the signals on the CAN terminals of the connected devices.

2.3. Controls and indicators

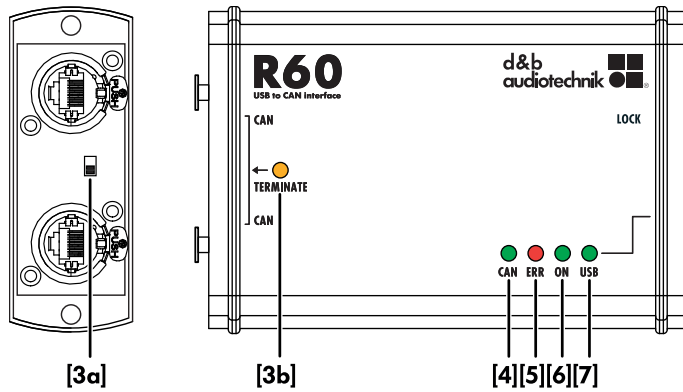


Fig. 3: Controls and indicators

2.3.1. Termination switch [3a] and indicator [3b]

In general the CAN-Bus has to be terminated on both ends of a CAN-Bus segment. Please refer to the technical information TI 312 d&b Remote network for more detailed information.

The R60 interface has a built in switchable terminator which can be activated when only one of its CAN connectors is used (refer to the wiring examples given in the following section 2.3.2).

To terminate the interface:

- Set the termination switch [3a] to TERMINATE.
- The corresponding status LED [3b] illuminates.
In this case both RJ 45 connectors are terminated as shown in the graphic opposite.

Note: The two RJ 45 M terminators supplied with the R60 interface must not be used to terminate the interface if the termination switch is set to TERMINATE. They are used to terminate the end of a CAN-Bus segment at its last device (refer to the following section 2.3.2).

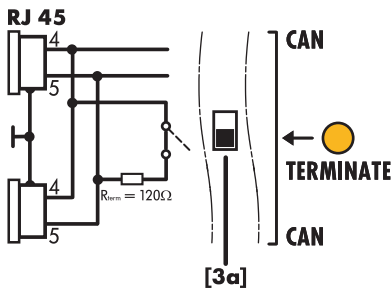


Fig. 4: Termination switch and corresponding indicator LED

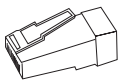


Fig. 5: Z6118 RJ 45 M Terminator

2.3.2. CAN-Bus termination

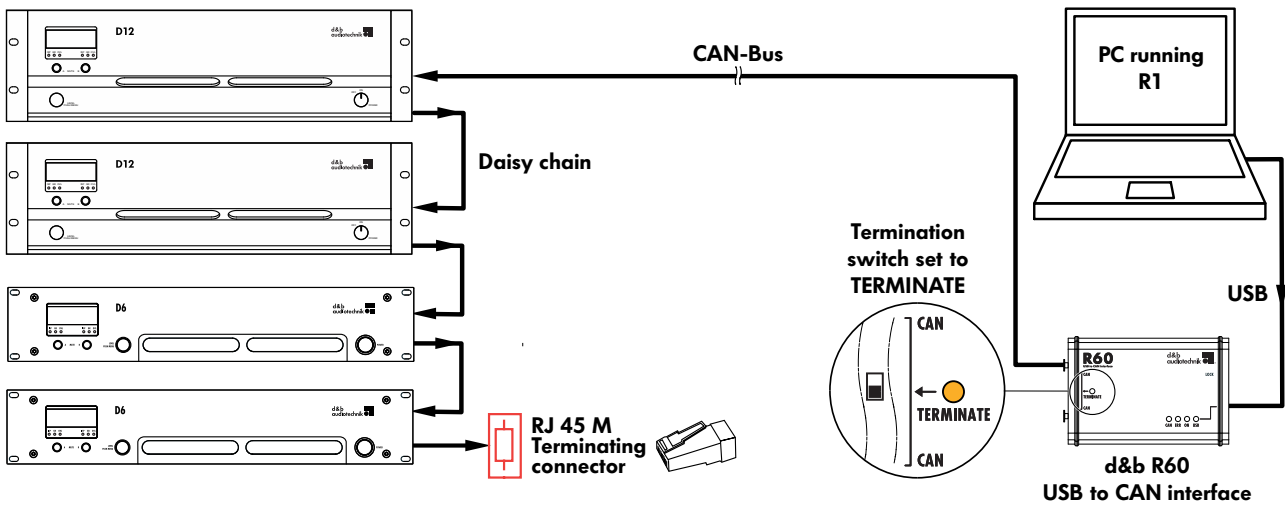


Fig. 6: d&b Remote network (CAN-Bus), wiring example 1 with terminated R60 interface at the "beginning" of the CAN-Bus segment.

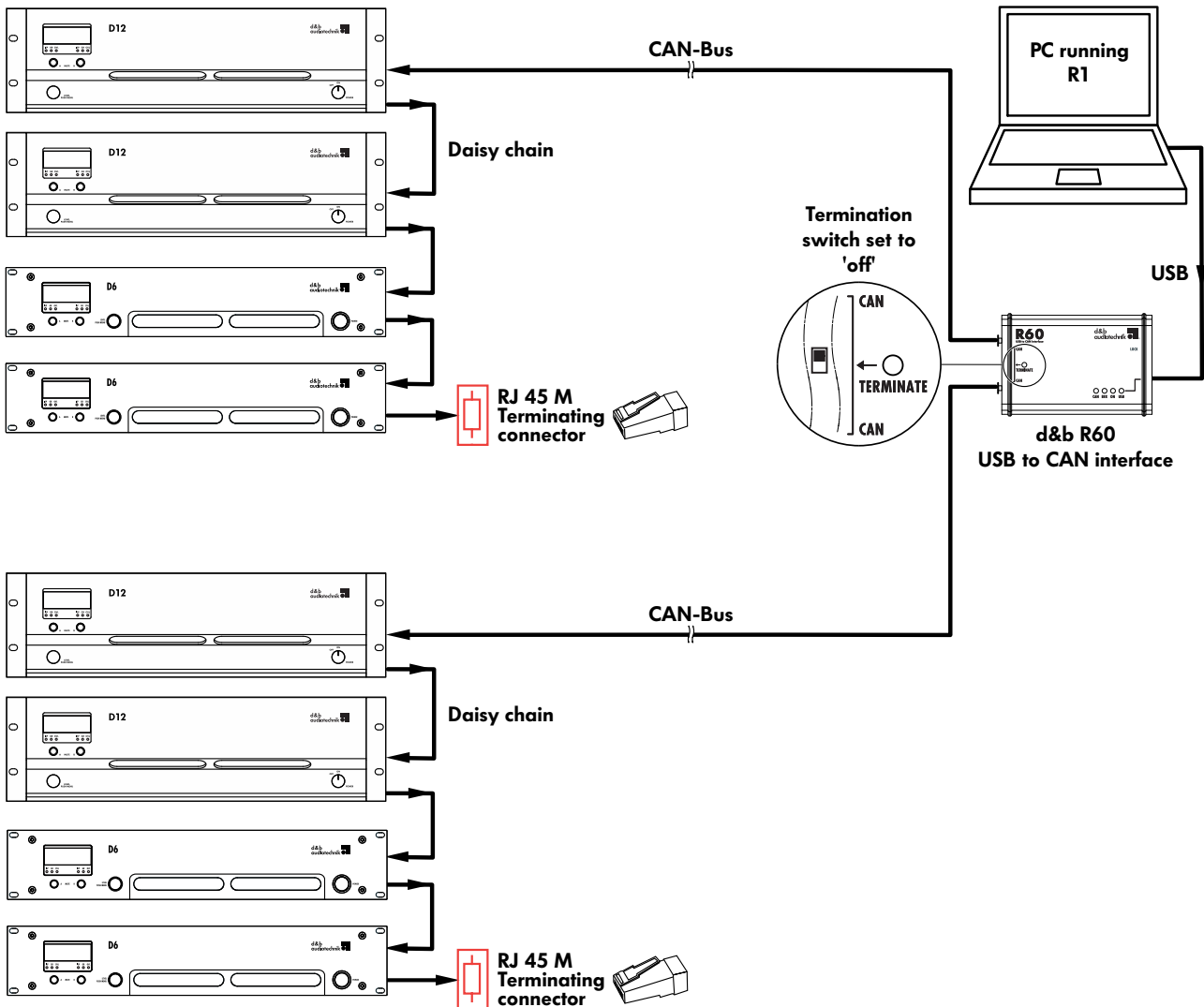
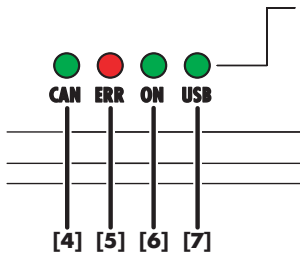


Fig. 7: d&b Remote network (CAN-Bus), wiring example 2 with non terminated R60 interface within the CAN-Bus segment.

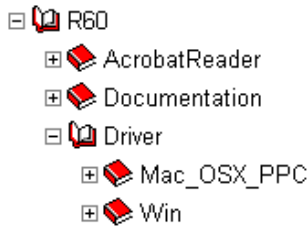
2.3.3. Indicators (Status LEDs)

The R60 interface is equipped with four LEDs for visual status control of the device. The corresponding function of each LED is described in the table below:



LED (Col. [Pos.])	Status:	Description
CAN (Green [4])	Off:	No CAN data transfer
	Flashing:	CAN data transfer
	Flashing with ERR:	CAN error
ERR (Red [5])	Off:	No error
	Flashing with CAN:	CAN error
	Flashing with USB:	USB error
ON (Green [6])	Off:	No USB connected
	On:	Device ready for operation
USB (Green [7])	Off:	No USB data transfer
	Flashing:	USB data transfer
	Flashing with ERR:	USB error

3. R60 Software



3.1. R60 CD-ROM

The CD-ROM provided with the R60 USB to CAN interface contains the following software and documentation:

- R60 drivers for Windows® and Mac OS X®.
- R60 USB to CAN interface manual.
- R60 USB driver installation:
Windows® installation guides
and Mac OS X® installation guide
- Technical information TI 312 d&b Remote network (CAN-Bus).

Additionally, the AcrobatReader® in its current version is provided to allow the documents to be displayed and printed.

Note: We recommend you to regularly check the d&b website www.dbaudio.com for the latest version of the R60 drivers and documentation (R60 manual, TI 312).

3.2. R60 USB driver installation

The R60 USB to CAN interface requires special drivers for use with a computer. For use with Mac OS X (PowerPC), the respective driver has to be used. In this case, the d&b Remote network software runs on an appropriate Windows emulation. For Mac OS X (Intel) the Windows driver can be used to run d&b Remote software in a virtualization.

Note: The installation procedure is described in a separate installation guide for the respective operating system. The installation guides are provided with the CD-ROM in English language and are also included in the respective R60 driver package which can be downloaded from the d&b website at www.dbaudio.com.

4. R60 accessories

4.1. Mounting clamps

The additional Z6122/6123 Bopla mounting clamps allow the R60 interface to be mounted to:

- Walls or inside racks.
- Top hat rails (TS 35 – 35 mm/1.4") inside an equipment cabinet.

Notes on Z6122:

If the Z6122 Mounting clamp is intended to be used in a rack for mobile applications it is recommended to use two clamps on the outer edges of the interface to prevent it from rattling as shown in the graphic below.

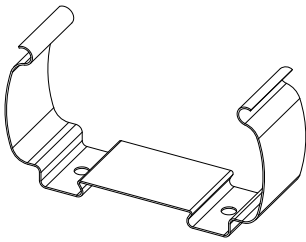


Fig. 8: Z6122 Bopla Mounting clamp

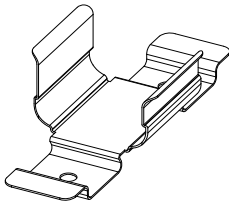
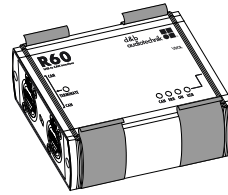
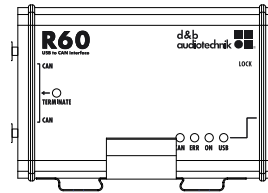


Fig. 9: Z6123 Bopla Mounting clamp upright

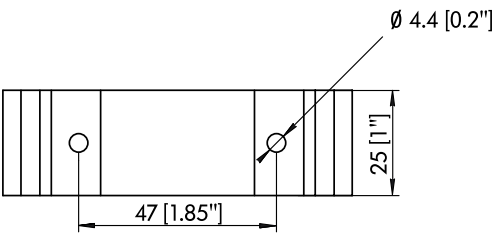
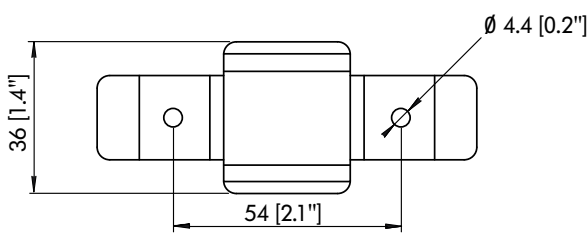
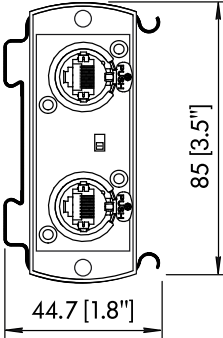
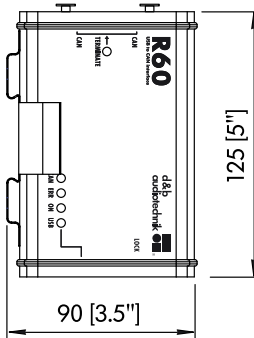
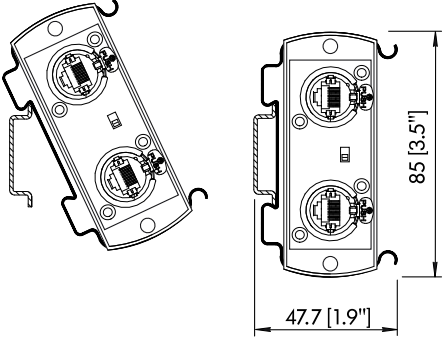
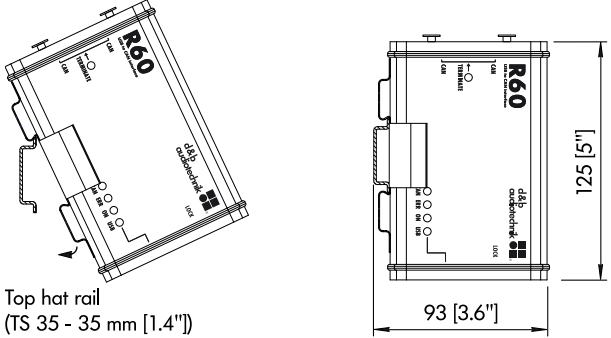


Notes on Z6123:

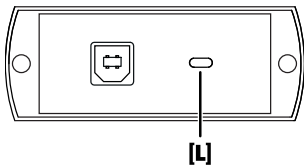
The two clamp halves have different lengths. For this reason, we recommend you to align the clamp or the R60 in such a way that the short clamp half is located on the top panel of the device as shown in the graphic below.



4.1.1. Dimension drawings

<p>Z6122 Bopla mounting clamp</p>  <p>Ø 4.4 [0.2"]</p> <p>25 [1"]</p> <p>47 [1.85"]</p> <p>Fig. 10: Dimensions in mm [inch]</p>	<p>Z6123 Bopla mounting clamp upright</p>  <p>Ø 4.4 [0.2"]</p> <p>36 [1.4"]</p> <p>54 [2.1"]</p> <p>Fig. 11: Dimensions in mm [inch]</p>
 <p>85 [3.5"]</p> <p>44.7 [1.8"]</p> <p>Fig. 12: Wall mounting with dimensions in mm [inch]</p>	 <p>125 [5"]</p> <p>90 [3.5"]</p> <p>Fig. 13: Wall mounting with dimensions in mm [inch]</p>
 <p>85 [3.5"]</p> <p>47.7 [1.9"]</p> <p>Fig. 14: Top hat rail mounting with dimensions in mm [inch]</p>	 <p>125 [5"]</p> <p>93 [3.6"]</p> <p>Top hat rail (TS 35 - 35 mm [1.4"])</p> <p>Fig. 15: Top hat rail mounting with dimensions in mm [inch]</p>

4.2. Anti-theft protection – LOCK



A slot (LOCK - [L]) is located on the right hand side panel of the device and allows for the attachment of a Kensington lock device.

5. Manufacturer's declarations

5.1. EU declaration of conformity (CE symbol)



This declaration applies to the R60 USB to CAN Interface manufactured by d&b audiotechnik GmbH:

R60, USB to CAN Interface, Z6118.000

All products of this type starting from variant Z6118.000 are included, provided they correspond to the original technical version and have not been subject to any later design or electromechanical modifications.

We herewith declare that said product is in conformity with the provisions of the following EC directives including all applicable amendments:

2004/108/EC Electromagnetic Compatibility

2006/95/EC Low Voltage

IEC 60950 (DIN EN 60950): 2001

A detailed declaration is available on request and can be ordered from d&b or downloaded from the d&b website at www.dbaudio.com.

5.2. Disposal (WEEE symbol)



This symbol indicates that electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime.

When out of use the device must be disposed of in accordance with the national environmental regulations.

