

Report No.: SU2215/5064

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FINAL REPORT ON ELECTRICAL SAFETY OF

Brain Boxes Limited

RS232/44/USB Bluetooth Adapter, rated SELV

Specification: EN60950:2000

Result: Complied with the requirements of the clauses tested within, See main body of report for details.

Prepared by:

A handwritten signature in black ink, appearing to read 'D. Smith'.

D. Smith

Test Engineer

Authorised by:

A handwritten signature in black ink, appearing to read 'R. J. Mead'.

R. J. Mead

Director

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RF168 Is5

SECTION I - INTRODUCTION

Equipment tested: RS232/44/USB Bluetooth Adapter, rated SELV

	<u>Client details</u>	<u>Manufacturing details</u>
Addresses:	Brain Boxes Limited Unit 3C, Wavertree Boulevard South Wavertree Technology Park Liverpool L7 9PF	(See client details)
Specifications:	EN60950:2000	
Procedure:	SF006	
Date(s) of test / assessment:	04/12/2002 – 06/12/2002	
Classification:	Class III, IP2X, moveable, powered from external plug top adapter, pollution degree 2, maximum operating ambient of 25°C.	

General notes

- i Equipment submitted for test was an RS 232 Bluetooth adapter. The unit was powered from a plug top power supply and was designed to interface with a PC or similar via a RS 232 connector.
- ii Secondary circuits were considered as accessible and SELV and were separated by reinforced insulation from primary circuits, via supplied plug top adapter. Attention is drawn to the fact that the adapter was declared as being previously approved, see Section III, figure 1 and note iv below.
- iii Classification of some polymeric materials has been verified using data supplied by the client. In these cases no testing has been under this project.
- iv Where approval or product certification documentation has been used to verify suitability of these components then limited testing only has been conducted under this project. Responsibility for compliance, of such items, remains with the issuing authority.
- v The equipment was considered suitable for use with TN-C, TN-S, TN-C-S and TT power distribution systems.
- vi TRL Compliance Services Ltd is a DTI Notified Body under the Low Voltage Directive 73/23/EEC.
- vii This report may not be reproduced except as a whole without permission of TRL Compliance Services Ltd. Results contained herein relate only to the sample tested.

SECTION II – SUMMARY OF RESULTS

EN60950:2000

<u>Clause</u>	<u>Result</u>	<u>Remarks</u>
1 General		
1.5 Components	PASS	See remark 1
1.6 Power interface.....	PASS	
1.7 Marking and instructions.....	PASS	
2 <u>Fundamental design requirements</u>		
2.1 Protection against electric shock and energy hazards	PASS	See remark 2
2.2 SELV circuits	PASS	See remark 2
2.3 TNV circuits	N/A	
2.4 Limited current circuits.....	N/A	
2.5 Limited power sources.....	N/A	
2.6 Provisions for earthing and bonding	N/A	
2.7 Over current and earth fault protection in primary circuits.....	N/A	
2.8 Safety interlocks	N/A	
2.9 Electrical Insulation.....	N/A	See remark 2
2.10 Creepage distances, clearances and distances through insulation.....	N/A	
3 <u>Wiring connections and supply</u>		
3.1 General.....	N/A	
3.2 Connection to a.c. mains supplies.....	N/A	
3.3 Wiring terminals for connection of external conductors	N/A	
3.4 Disconnection from the a.c. mains supply	N/A	
3.5 Interconnection of equipment	N/A	
4 <u>Physical requirements</u>		
4.1 Stability	PASS	
4.2 Mechanical strength	PASS	
4.3 Design and construction	PASS	
4.4 Protection against hazardous moving parts	N/A	
4.5 Thermal requirements	PASS	
4.6 Openings in enclosures	PASS	
4.7 Resistance to fire.....	-	See remark 3

SECTION II – SUMMARY OF RESULTS

EN60950:2000

<u>Clause</u>		<u>Result</u>	<u>Remarks</u>
5	<u>Electrical requirements and abnormal conditions</u>		
5.1	Touch current and protective conductor current.....	PASS	
5.2	Electric strength.....	N/A	
5.3	Abnormal operating and fault conditions	PASS	
6.	<u>Connection to telecommunications network</u>		
6.1	Protection of telecommunication network service personnel, and users of other equipment connected to the network, from hazards in the equipment.....	N/A	
6.2	Protection of equipment users from overvoltages on telecommunication networks.....	N/A	
6.3	Protection of the telecommunication wiring system from overheating	N/A	

Remarks are contained in Section V of this report.

SECTION III – DESCRIPTION OF EQUIPMENT

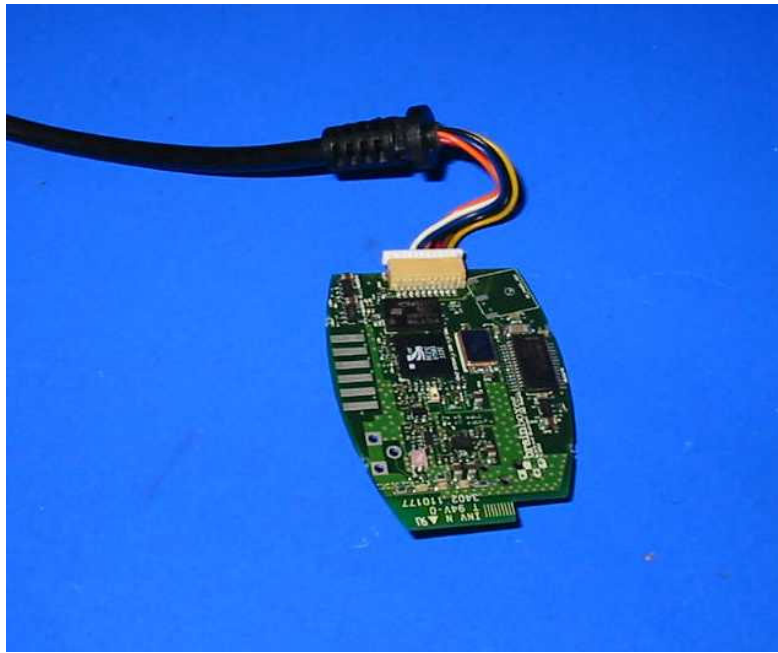
Figure 1 – External view of equipment



1. RS232 Bluetooth adapter. Having the approximate overall dimensions of 80 mm x 40 mm x 20 mm and weighs approximately 70g.
2. Outer case, (top and bottom), polycarbonate, material manufacturer declared V-0.
3. PSU (not shown), FWGB, type FW238/05, rated 100-240V, 200mA, output 5V, 800mA. Approval based on VDE report 129580, to EN 60950. (UK plug pin assessment conducted by BABT).

SECTION III – DESCRIPTION OF EQUIPMENT

Figure 2 – Internal view of equipment



1. PCB, BL-510rev6, Invotec, type multilayer, rated UL 94 V-0, UL file Number E72693.

SECTION IV – TABLES AND RESULTS

Power Interface

The following measurements were taken after the heating test.

Input voltage (Vac)	Input current (mAac)
220	3.59
230	3.62
240	3.66
DC Input voltage	Input current (mAdc)
5V	3.66

Heating test

The equipment was operated at 10% above and below the upper and lower limits of its voltage range, respectively, i.e. at 254Vac and 90Vac. Once thermal equilibrium had been achieved, the temperature rises were noted in the table below. The ambient temperature was recorded as 18°C.

Temperature rise table		Temperature Rise (K)	
Location	Position	90Vac	254Vac
External PSU	Outer case	2	14
RS 232 Adapter	Outer case	1	1
	Internal ambient	1	1
	Maxim chip	1	1
	ST chip	1	1

Touch current

The equipment was operated at 10% above the upper limit of its voltage range, i.e. at 254vac. Touch currents were measured as follows

Measurement	Current mA
Live line to accessible metal	0.002
Neutral line to accessible metal	0.002
Live line to accessible metal (neutral broken)	0.002
Neutral line to accessible metal (live broken)	0.002

SECTION IV – TABLES AND RESULTS

Abnormal Operation and fault conditions

The following fault conditions were simulated:

Fault	Result
Short circuit RS 232 Connector	No significant temperature rises compared with normal operation. No hazard. PASS
Short circuit main connector to GND	No significant temperature rises compared with normal operation. No hazard. PASS
Short circuit capacitor C43	No significant temperature rises compared with normal operation. No hazard. PASS
Short circuit capacitor C14	No significant temperature rises compared with normal operation. No hazard. PASS
Short circuit capacitor C46	No significant temperature rises compared with normal operation. No hazard. PASS
Short circuit capacitor C48	No significant temperature rises compared with normal operation. No hazard. PASS
Short circuit capacitor C45	No significant temperature rises compared with normal operation. No hazard. PASS
Short circuit capacitor C44	No significant temperature rises compared with normal operation. No hazard. PASS
Short circuit capacitor C42	No significant temperature rises compared with normal operation. No hazard. PASS
Short circuit capacitor C8	No significant temperature rises compared with normal operation. No hazard. PASS

SECTION V - REMARKS

See results page for the clause references to which the following remarks relate:

- (1) Where approval or product certification documentation has been used to verify suitability of these components then limited testing only has been conducted under this project. Tests in application have been conducted to confirm suitability for use in this end application. Responsibility for compliance remains with the issuing authority.
- (2) Equipment only to be supplied from designated charger and / or PC having SELV outputs, having a maximum of 5Vdc, 800mA. Isolation of secondary voltages from hazardous voltages to be contained within peripheral equipment (PSU and PC).
- (3) Classification of some polymeric materials has been verified using data supplied by the client. In these cases no testing has been under this project.

APPENDIX A – SCOPE AND MARKING DETAILS

Equipment included within the scope of this report:

RS232/44/USB Bluetooth Adapter, rated SELV. Attention is drawn to note ii) and iv) on page 2 of this report.

Rating plate and marking details:

BRAIN BOXES

BL-510