

SpaceLogger®.T10 [TextLogger]

User Manual



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1 INTRODUCTION

SpaceLogger®.T10 (TextLogger) receives data from RS232 compatible data sources and is designed for simple data logging, supporting a range of ASCII text logging applications.

Data is stored onto an MMC mobile card. MMC mobile cards with up to 2 GByte capacity are compatible with SpaceLogger®. Higher capacity cards are not compatible. SpaceLogger will also accept other compatible data storage cards, such as full size MMC and some SD cards.

The MMC mobile card can be removed from the logger and inserted into a card reader connected to a PC. Stored data files are accessed in the same way as files on the computer's other disk drives. The text files may be read and manipulated in any standard Office applications (e.g. Notepad or MS Excel).

While the TextLogger is storing data on the MMC mobile card, it is also possible to output the received RS232 data from the TextLogger to another device. Refer to section 6.3 for details.


The logger requires a 7 - 30 volt DC supply which can be provided by an AC/DC mains adaptor or suitable battery.

Document revision summary

Issue	Date	Description
1	Oct 2007	Original document
2	Nov 2008	Operating conditions updated
3	Aug 2009	Baud rate selection detail added
4	Oct 2009	Data output option added. New SpaceLogger images
5	April 2010	Compatibility with alternative parity types and number of data bits added. Option to disable any modification of the data added. Option to translate all data to ASCII hex characters added.
6	March 2011	Product name change from SpaceLogger-RS to SpaceLogger. Reference new model number. No change to product.

Our products are in continuous development and therefore specifications may be subject to change and design improvements may be implemented without prior notice. Please visit our web site www.r-p-r.co.uk for the most up to date information on our products.

2 QUICK START: EASY STEPS TO DATA LOGGING

- | | | |
|---------|---|-----------------|
| ➊ | Connect RS232 inputs | see section 4.3 |
| ➋ | Select baud rate | see section 4.4 |
| ➌ | Power on | see section 4.6 |
| ➍ | Insert MMC mobile card | see section 5.1 |
| ➎ | Start recording data | see section 5.2 |
| |  | |
| ➏ | Stop recording data | see section 5.2 |
| ➐ | Remove card and transfer to PC to view and analyse data | see section 5.2 |

3 EXAMPLE APPLICATION

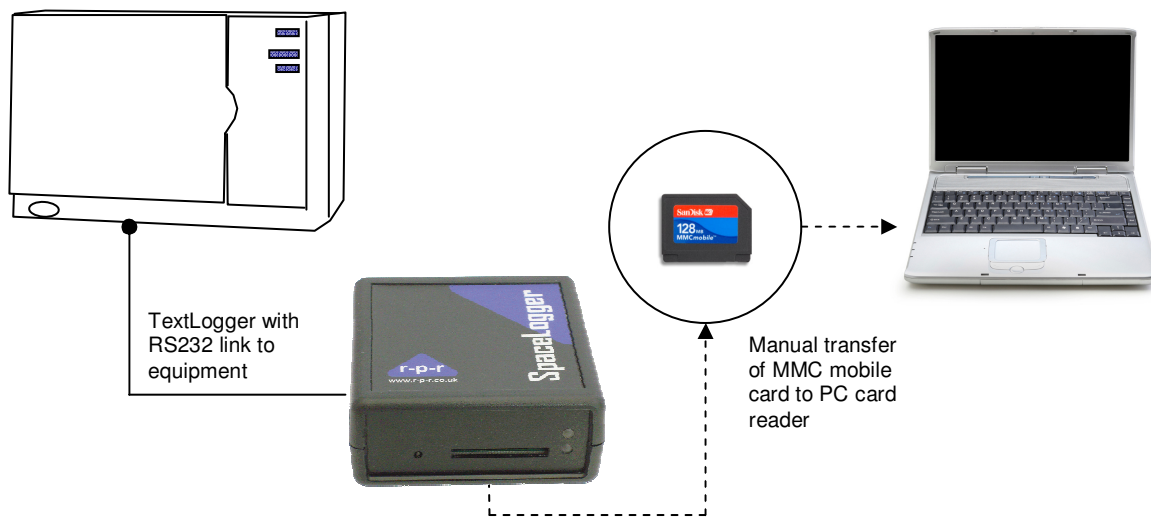


Figure 1

4 CONNECTING

4.1 Terminal Strip Arrangement

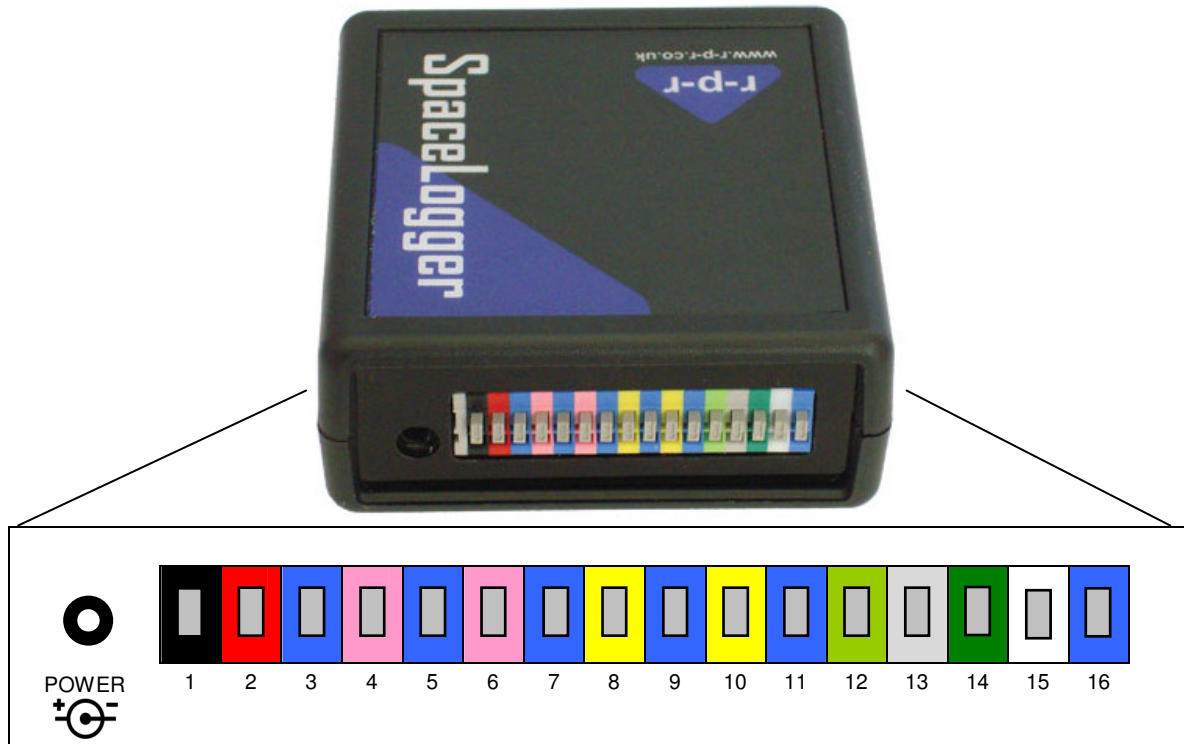


Figure 2

4.2 Generic Terminal Allocations

SpaceLogger Terminal	Signal description		Use
1	Power GND		Power
2	Supply +V (+7 to 30V dc)		
3	Analogue GND 1		Reserved for future options
4	Analogue input 1		
5	Analogue GND 2		
6	Analogue input 2		
7	Digital I/O GND 1		
8	Digital I/O input 1		
9	2400 baud rate selection	Digital I/O GND 2	Baud rate
10	2400 baud rate selection	Digital I/O input 2	
11	GND		RS232 signal output (in Debug mode)
12	RS232 Tx 2		Reserved for future options
13	RS232 Rx 2		
14	RS232 output 1		RS232 signal output (in Debug mode)
15	RS232 input 1		RS232 signal input from data source
16	RS232 GND 1		

Table 1

4.3 RS232 Interface

RS232 connection to the data source should be made as per Table 1. This table should be read in conjunction with Figure 2. Wires should be prepared as per section 4.5.

4.4 Baud Rate Selection

The default baud rate is 9600 bits per second. If an input baud rate of 2400 is required, terminals 9 (blue) and 10 (yellow) should be linked as per Figure 3 below.

Terminal linking for 2400 baud rate

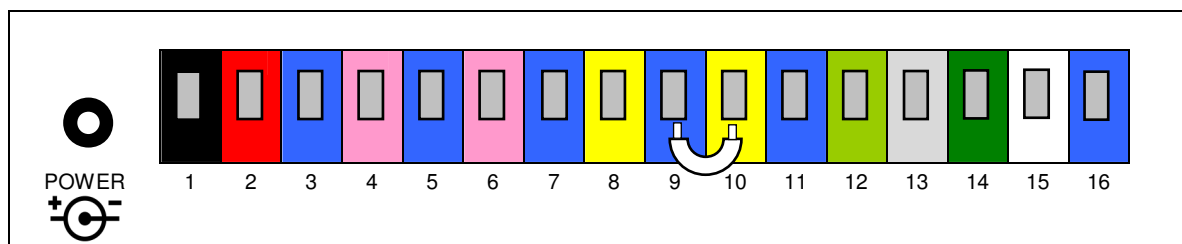


Figure 3

To configure the TextLogger for other baud rates (selectable from 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200, 300 and 110 bits per second) use file SETUP.TXT as described in section 6.1.

Limitations: Please note that although the TextLogger can be set to communicate at higher baud rates than the default 9600, the internal buffer size and the speed at which it is able to write to the memory card limits the total throughput. Possible data loss can occur with continuous data at high baud rates.

4.5 Cable Preparation

The logger uses screwless terminals and to ease connection, wires should be prepared as per Figure 4. It is important that the stripped ends be accurately 9 to 10mm long to ensure good connections in the terminals.

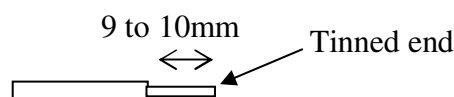


Figure 4

Either solid or stranded cable is acceptable, in the range 0.32 to 0.65 mm diameter (AWG 28 to 22) with gauge 24 being ideal.

Using a small flat headed screw-driver fully depress the grey plunger for the required terminal and insert the wire as far as it will go, into the hole below the plunger. Release the grey plunger and

the wire is held captive by the connector. A gentle tug on the wire will confirm that it is held firmly.

If the wire in question is multi-strand, ensure that all strands are inserted in the terminal hole.

Please note that interconnection of all components should be completed prior to applying power.

4.6 Power Supply

When the logger is powered using a 7 to 30 V DC supply the central pin on the power socket should be to GND.

Alternatively, power may be supplied via terminals 1 (black) and 2 (red) on the screwless terminal connector strip, as per Table 1. Note that if power is supplied via the supply socket then terminal 2 (red) is automatically disconnected.



Warning: All GNDs are common and so damage to the logger may result if they are connected to different voltages.

5 LOGGING

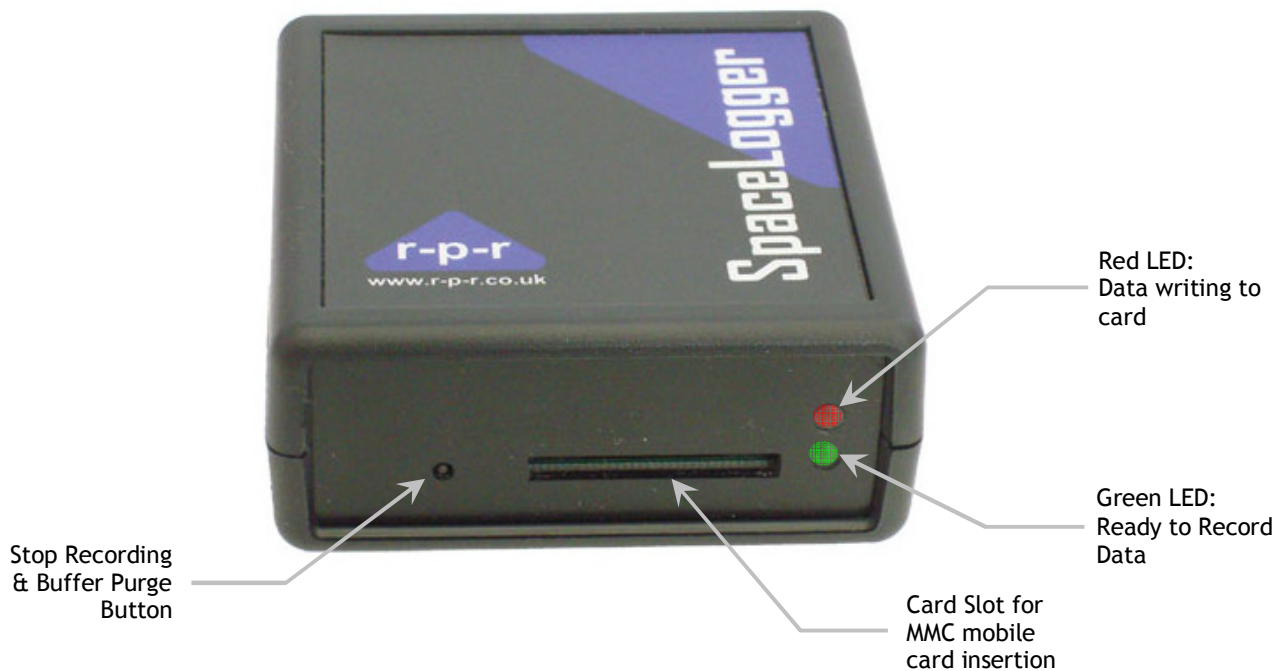


Figure 5

5.1 MMC mobile Card

When the MMC mobile card is inserted correctly into the SpaceLogger (with power supplied), the unit should 'Beep' once and the red LED blink as the card initialises. At this stage, the SpaceLogger's internal buffer is cleared and is ready to start receiving new data from the connected equipment.

The green LED will then switch on indicating that the unit is 'Ready to Record Data'. The green LED will remain on while the unit is in this state.

The MMC mobile card is designed to fit easily into the card slot one way only. Do not bend the card or force it into the slot.

5.2 Data Transfer

Received data is stored temporarily in a buffer (1024 bytes). Data is transferred from the buffer to the MMC mobile card in 512 byte packages. If no data has been received from the data source for a set time period (approximately 4 seconds) then any remaining data in the buffer is written to the MMC mobile card. The red LED blinks each time data is written to the card.

The MMC mobile card should not be removed while data is being written to it. To stop recording data, the small button to the left of the card slot on the front of the SpaceLogger should be depressed. There will be an audio signal to indicate that the button has been pressed. This action will also purge any data in the buffer to the MMC mobile card so the card is ready to be removed from the SpaceLogger. The green LED will automatically switch off to indicate that the unit is no longer enabled to record further data.

To recommence data logging the power must be cycled or a card re-inserted in order to re-initialise the card. The green LED will again indicate the unit as 'Ready to Record Data'.

To avoid losing data or corrupting the card, never remove the card or disconnect the power supply when the red LED is flashing or blinking.

5.3 Data Storage

The TextLogger creates a folder **DATA** on the MMC mobile card. Data is written to a file in the folder entitled **LOGFILE1.TXT**. All subsequent data logging will be to this same file with the new data appended to the file, rather than overwriting the existing data.

To ensure logged data can be easily read with Microsoft notepad, when any end of line is detected by the processor, it is stored as a <CR><LF> combination.

Where, <CR> is the ASCII carriage return character with a value of 13
<LF> is the ASCII line feed character with a value of 10

Also, un-printable characters with an ASCII value less than 10 are converted to a space character <SP>.

Please note: it is possible to disable this modification of the data before storage; please refer to section 6.4 for details.

Should the MMC mobile card be removed from the SpaceLogger or reach its data capacity while a data source is still connected, the buffer will fill over time. When the buffer is full and unable to write to the MMC mobile card, the SpaceLogger will emit an audio warning signal, indicating that data has been lost. Note that it is not possible to recover data in the buffer in this situation because the buffer will be cleared when a new card is inserted into the SpaceLogger.

6 ADVANCED FEATURES

A number of the TextLogger default settings are customisable using a SETUP.TXT file written to the MMC mobile card. The following parameters may be modified using defined commands:

- Baud rate
- Parity and number of data bits
- RS232 data output
- Storage format of data

Refer to the sections below for command details and section 6.6 for how to create the SETUP.TXT file.

6.1 To Select an Alternative Baud Rate

If an alternative input baud rate to 9600 or 2400 is required, the following SETUP.TXT command is required:

BAUD=b

Where b is the baud rate.

Valid baud rates are 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200, 300 and 110 bits per second.

6.2 To Select an Alternative Parity or Number of Data Bits

If the input data stream has even or odd parity, the following SETUP.TXT command is required:

PARITY=p,x

Where, p is the parity type.

And, x is the number of data bits

Valid parity settings are **N** (none), **O** (odd) and **E** (even)

Valid numbers of data bits are **7** and **8**

For example, to set up for 8 bits and even parity, use command line PARITY=E,8

NB: The setting of N (none) for parity and 7 data bits is not a valid command; the SpaceLogger will use the default settings of 8 and none.

6.3 To Output RS232 Data from the TextLogger

RS232 data may be output in two forms from the TextLogger. There is the option to output data exactly as it is received by the TextLogger from the attached equipment, or the option to output the data in the format it is written to the log file on the memory card.

The wiring connections for RS232 output are as described in Section 4.2 – to terminal 11 (blue) GND and terminal 14 (green) RS232 Output 1.

The baud rate of the output data stream is as per the data received, i.e. default 9600 baud or as selected per sections 4.4 or 6.1.

Data will always be output at 8 bits and no parity, regardless of settings for the input data stream.

RS232 data output from the TextLogger is enabled by using the following SETUP.TXT command line:

DEBUG=2

or

DEBUG=4

If DEBUG=2, the data received on the RS232 input (Rx) is output on the RS232 output (Tx)

If DEBUG=4, the data as written to the log file on the memory card is output on the RS232 output (Tx)

The TextLogger will now output data (in the selected format) to the RS232 Output 1 terminal.

Please note that some system initialisation information is output from the logger on powering on and when the MMC mobile card is inserted.

To discontinue data output, either delete the file SETUP.TXT from the card (or remove the command DEBUG=2 or DEBUG=4 from the file) and cycle the power to the logger before reinserting the card, or replace the command with DEBUG=0.

Please refer to section 6.6 if more than one debug mode is required.

6.4 To Disable Any Modification of the Data

By default the TextLogger will modify data as described in Section 5.3 before it is stored or output.

To disable this feature – i.e. to allow unprintable characters and to not correct <LF> <CR> combinations, the following SETUP.TXT command is required:

DEBUG=32

The TextLogger will now store and output (if selected) all data exactly as output by the attached equipment without exception.

Please refer to section 6.6 if more than one debug mode is required.

6.5 To Translate all Input Characters to Their ASCII Hex Value

Should it be required to record all input data characters as their relevant ASCII Hex value for debugging purposes, the following SETUP.TXT command is required:

DEBUG=64

The TextLogger will now translate all input data to its corresponding ASCII hex value and store the data in this format. Each hex value will be followed by a space.

Please refer to section 6.6 if more than one debug mode is required.

6.6 SETUP.TXT file

The SETUP.TXT file is created as follows:

1. Insert MMC mobile card into card reader attached to USB port of PC (or use integrated card reader if the PC has one).
2. Open notepad or similar text editor and type the required command line or lines. Refer to sections above for explanation of commands.
3. Commands may be typed in upper or lower case but they will be converted to upper case before execution.
4. If it is necessary to modify more than one of the default settings, the SETUP.TXT file may contain a list of commands. For example, if both an alternative baud rate and data output are required, the file SETUP.TXT should contain the two lines:

BAUD=b
DEBUG=2

5. Should more than one debug mode be required this may be achieved by summing the relevant DEBUG values. For example to switch to store unmodified data and to enable data output as received on the RS232 input, set DEBUG=34.
6. Comments may be added to the SETUP.TXT file using //. The TextLogger will not read any text following // until the end of the line.
7. Save this text file as **SETUP.TXT** on the MMC mobile card in the root folder. (Note: if folder DATA already exists on the card, ensure the file SETUP.TXT is not in this folder but at the top level in the root directory.) If using Windows and Vista, please also refer to section 6.7.
8. Remove card from card reader and insert the card into the TextLogger.

9. The command lines will now be effective. For the configuration to remain active, the file SETUP.TXT must remain on the MMC mobile card in the root directory.
10. To intentionally return to the default settings, delete the file SETUP.TXT from the memory card (or remove the necessary command line from the file) and cycle the power to the logger before reinserting the card.

6.7 Notes on saving file SETUP.TXT

File SETUP.TXT must have its name and file extension in capitals, e.g. not SETUP.txt.

To ensure saving correctly from Notepad or similar text editor, select 'Save As...'. When the Save As box appears, select 'All Files' from the pull down list next to 'Save as type:' and type SETUP.TXT in the File name box.

With Windows and Vista it is beneficial to have File Extensions visible when viewing documents in Explorer.

7 SPACELOGGER.T10 TEXTLOGGER SPECIFICATION

Physical	Dimensions	Width: 67 mm Depth: 67 mm Height: 28 mm (excluding optional rubber feet)
	Weight	75g
	Enclosure material	GP ABS (UL94-HB) plastic and acrylic
I/O Capability	Transmission standard	RS232 compatible, 8 bits and no parity (default). Input data may be 8 bits and none, even or odd parity or 7 bits and even or odd parity. Output data format always as default.
	Transmission speed	9600 Baud (default) or selectable from 115200, 57600, 38400, 19200, 4800, 2400, 1200, 300 or 110 Baud
	Wire acceptance	0.32 to 0.65 mm diameter (AWG 28 to 22)
Data Storage	Data Storage Card	Removable MMC mobile
	Data Capacity	2 GByte (max)
	File System	FAT16 or FAT32 with 8.3 file names Sector size 512 Bytes
	Data logging interval	Continuous
Audible / Visual Indicators	LED Indicators	Green: Ready to record data Red: Writing data to MMC mobile card
	Audio Bleeper	Two tone signal on correct card insertion. Single tone when data purge button depressed.
Power	Power requirement	7 to 30 Vdc
	Current at 12Vdc	10 mA typical
	Supply input protection	Polarity reversal protected and internal fuse – 500 mA slo-blo® (Littelfuse type 0454500 or equivalent)
	Connection	1.3 mm centre pin DC connector, or Screwless terminals (0.32 to 0.64 mm, AWG 28 to 22 diameter conductors)
Environmental	Operating Temperature Range	-25 °C to +70 °C
	Storage Temperature Range	-40 °C to +70 °C
	Enclosure protection	IP203
Guarantee	Period	1 year (refer to Appendix)

APPENDICES

A1 Guarantee

System components are warranted for a period of twelve (12) months from the original date of purchase, against defective materials and workmanship. In the event that warranty service is required, please contact Richard Paul Russell Ltd.

This warranty is only valid if, when warranty service is required, a full description of the fault is provided and presented with the original invoice, and the serial number(s) on the component has not been defaced.

Richard Paul Russell Ltd's liability is limited to items of its own manufacture, and it does not accept liability for any loss resulting from the operation or interpretation of the results from this equipment.

This warranty covers none of the following:

- Periodic check ups, maintenance and repair or replacement of parts due to normal wear and tear.
- Cost relating to transport, removal, or installation of the component.
- Misuse, including failure to use the component for its normal purpose or incorrect installation.
- Damage caused by Lightning, Water, Fire, Acts of God, War, Public Disturbances, incorrect supply voltage or any other cause beyond the control of Richard Paul Russell Ltd.
- Units which have been repaired or units altered by a party other than Richard Paul Russell Ltd's employees or agents without prior written consent from Richard Paul Russell Ltd.

In no event shall Richard Paul Russell Ltd be liable under any circumstances for any direct, indirect or consequential damages, any financial loss or any lost data contained in any product (including any returned product), regardless of the cause of loss. Richard Paul Russell Ltd products are not warranted to operate without failure. Richard Paul Russell Ltd's products must not be used in life support systems or other application where failure could threaten injury or life.

The Customers statutory rights are not affected by this warranty. Unless there is national legislation to the contrary, the rights under this warranty are the customer's sole rights and Richard Paul Russell Ltd shall not be liable for indirect or consequential loss or damage to any other related equipment or material.

A2 Electromagnetic Conformity

**EC DECLARATION OF CONFORMITY
ACCORDING TO COUNCIL DIRECTIVE
2004/108/EC**

We, Richard Paul Russell Limited of
New Harbour Building
Bath Road
Lymington
Hampshire SO41 3SE
United Kingdom

Declare under our sole responsibility that the product:

SpaceLogger-RS

Manufactured by: Richard Paul Russell Limited

to which this declaration relates, is in conformity with the protection requirements of Council Directive 2004/108/EC on the approximation of the laws relating to electromagnetic compatibility.

This Declaration of Conformity is based upon compliance of the product with the following harmonised standards:

Emissions EN 61326:2006

Immunity EN 61326:2006

Signed by: *R.P.Russell*

Richard Paul Russell – Director

Date of Issue: 3 August 2009

Place of Issue Richard Paul Russell Limited
New Harbour Building, Bath Road
Lymington SO41 3SE, UK

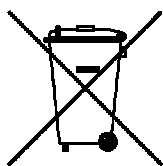




SpaceLogger-RS has been tested for compliance with FCC standards FCC/CFR 47: Part 15:2004. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The user is cautioned that changes or modifications not approved by the responsible party could void the user's authority to operate the equipment, in line with the FCC guidelines.

A3 WEEE (Waste, Electrical and Electronic Equipment) Statement



The WEEE directive places an obligation on all EU-based manufacturers and importers to take-back electronic products at the end of their useful life. Richard Paul Russell Ltd accepts its responsibility to finance the cost of treatment and recovery of redundant WEEE in accordance with the specific WEEE recycling requirements.



This symbol on the product or on its packaging indicates that the product must NOT be disposed of with normal household waste. Instead, it is the end user's responsibility to dispose of their waste equipment by arranging to return it to a designated collection point for the recycling of WEEE. By separating and recycling waste equipment at the time of disposal, natural resources will be conserved and it will be ensured that the equipment is recycled in a manner that protects human health and the environment. For more information about where you can send your waste equipment for recycling, please contact your local council office or visit our website www.r-p-r.co.uk.

A4 RoHS Statement (The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2006)



SpaceLogger-RS has been designed to comply with EU Directive 2002/95/EC on RoHS regulations that came into force on 1 July 2006. The unit is assembled from compliant components.

RoHS is often referred to as the lead-free directive, but it restricts the use of the following six substances:

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent chromium (Cr6+)
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ether (PBDE)

PBB and PBDE are flame retardants used in some plastics.