SpaceLogger®.T10
[TextLogger]

User Manual

For the latest information and support please go to our website www.spacelogger.com

Tel +44 (0) 1590 679755 Fax +44 (0) 1590 688577 e-mail sales@r-p-r.co.uk web www.r-p-r.co.uk

017SL007/7 22/10/12

Tel +44 (0) 1590 679755 Fax +44 (0) 1590 688577 e-mail sales@r-p-r.co.uk web www.r-p-r.co.uk

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 SD card. SD or MMC cards with up to 2 GByte capacity are compatible with SpaceLogger®. Higher capacity cards are not compatible.

The SD 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 SpaceLogger.T10 is storing data on the SD card, it is also possible to output the received RS232 data from the SpaceLogger.T10 to another device. Refer to section 5.6 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.
7	Oct 2012	Features updated. SETUP.TXT file commands modified. Configuration now saved to memory. Applies to units with serial numbers TL12-7468 and above

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

❶ ..... Connect RS232 inputs — see section 4
❷ ..... Set up logging preferences with SETUP.TXT file — see section 5
❸ ..... Power on — see section 4.6
❹ ..... Insert SD card — see section 6.1
❺ ..... Start recording data — see section 6.2
..... ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱
❻ ..... Stop recording data — see section 6.2
❼ ..... Remove card and transfer to PC to view and analyse data — see section 6.2

3 EXAMPLE APPLICATION

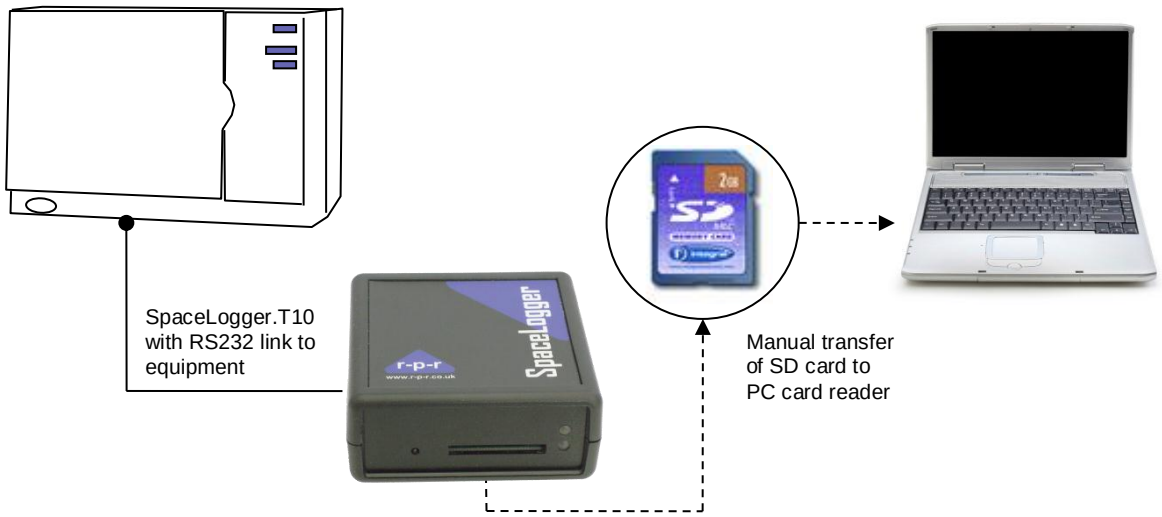

Figure 1

Tel +44 (0) 1590 679755 Fax +44 (0) 1590 688577 e-mail sales@r-p-r.co.uk web www.r-p-r.co.uk

4 CONNECTING

4.1 Terminal Strip Arrangement

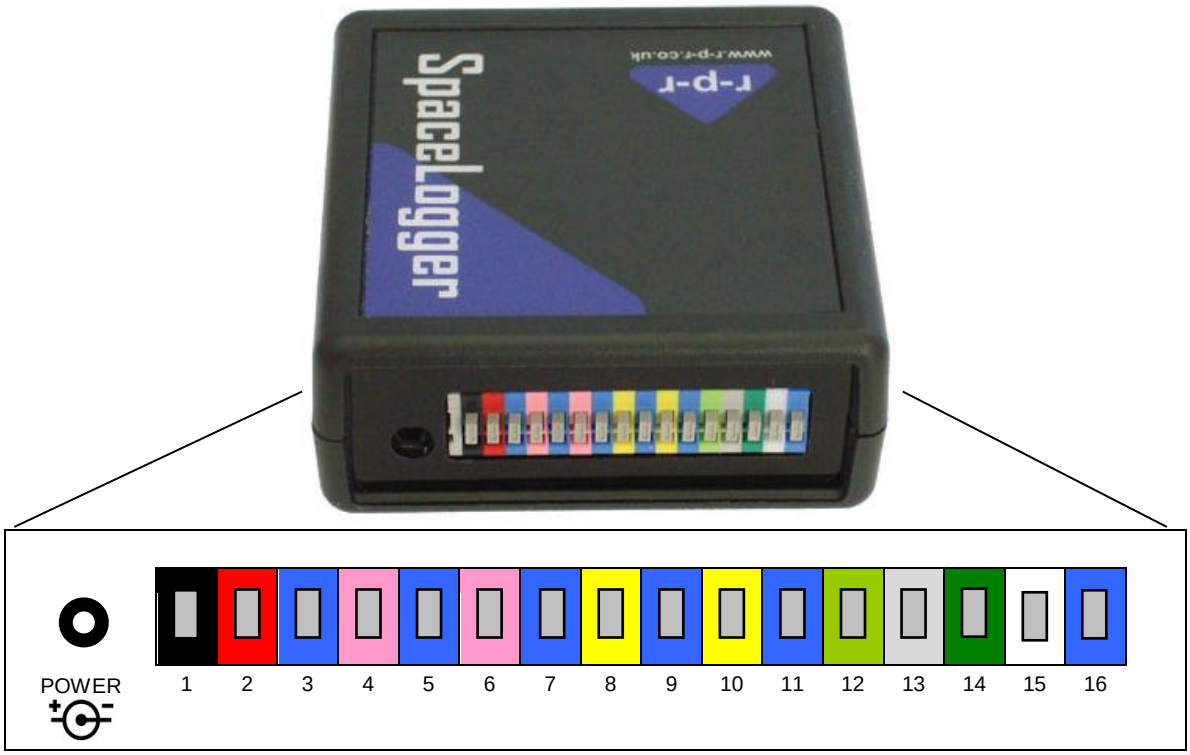

Figure 2

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 2400 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) could be linked as per Figure 3 below.

Terminal linking for 2400 baud rate

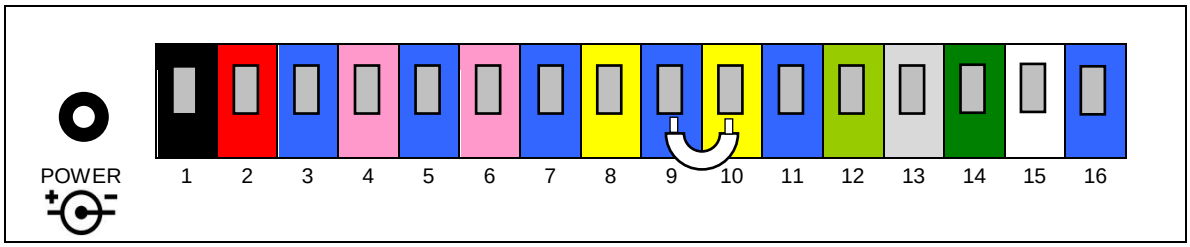

Figure 3

Alternatively, to configure the SpaceLogger.T10 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 5.1.

Limitations: Please note that although the SpaceLogger.T10 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.

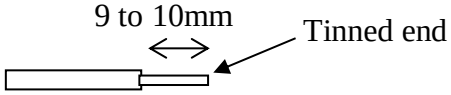

Figure 4

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 SETUP FEATURES

The SpaceLogger.T10 settings are customisable using a configuration file named SETUP.TXT written to the SD card.

The following parameters may be modified using defined commands:

Refer to the sections below for command details and section 5.9 for how to create the SETUP.TXT file.

Please refer to Appendix A1 for full list of commands and the valid inputs for their values and the default settings.

5.1 Baud Rate

The default baud rate is 9600 bits per second. A baud rate of 2400 may be set by connecting terminal 10 to Ground, as described in section 4.4. If an alternative input baud rate is required, command BAUD may be used.

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.

Limitations: Please note that although the SpaceLogger.T10 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.

5.2 Parity and Number of Data Bits

The default parity and number of data bits setting for the RS232 input is 8 bits and no parity. 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.

The configuration of the RS232 output will always be 8 bits no parity, regardless of the input set up.

5.3 Format of the Stored Data

By default, the SpaceLogger.T10 will record all data as received, without modification.

The format of the logged data may be controlled with the SETUP.TXT command **LOG**. In brief:

LOG=R
Or **LOG=H**
Or **LOG=CRLF 0-8 SUB1 SUB2 ESC**

These parameters that may be set for the **LOG** command are described below.

Only one **LOG** command line should be included in the SETUP.TXT file. If more than one LOG command is listed, only the last line will be applied.

When more than one **LOG** parameter is specified, the order in which the SpaceLogger applies the modification determined by the parameter, to the received data, is as follows:

R, H, ESC, SUB1, SUB2, 0-8, CRLF

5.3.1 To Disable Any Modification of the Data

If command line **LOG=R** is used, all data is logged as received i.e. in Raw form – this is the default setting.

If LOG=R is specified, no character substitutions are possible.

If no parameter is specified after command LOG=, this is treated as LOG=R.

5.3.2 To Translate all Input Characters to Their ASCII Hex Value

If command line **LOG=H** is used, the SpaceLogger will translate all input data characters to their corresponding ASCII hex value and store the data in this format. Each hex value will be followed by a space.

If LOG=H is specified, no character substitutions are possible.

5.3.3 To Enable Character Substitutions

5.3.3.1 End of Line Substitutions

To ensure logged data can be easily read with Microsoft notepad, when any end of line is detected by the processor, it is possible to get the SpaceLogger.T10 to store this 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

To enable this substitution of <CR><LF> combination, the following SETUP.TXT command line may be used:

LOG=CRLF

5.3.3.2 Un-printable Character Substitutions

To aid readability of data, it is possible to configure the SpaceLogger.T10 to convert any un-printable characters with an ASCII value of between 0 and 8 to a space character <SP>.

To enable this substitution of ASCII characters 0-8 with <SP>, the following SETUP.TXT command line may be used:

LOG=0-8

5.3.3.3 Specified Character Substitutions

It is possible to substitute up to 2 specified characters in the received data stream with pre-defined substitutions.

To enable this substitution of defined characters, the following SETUP.TXT command line may be used:

LOG=SUB1 SUB2

To set the characters that are to be substituted, the following SETUP.TXT command lines are also required:

SUB_VAL1=x,y
SUB_VAL2=x,y

Where, **x** is the ASCII value (0-255) of the character in the received data and
y is the ASCII value (0-255) of the substitute character.

For example, to configure the SpaceLogger.T10 to replace all received characters { (ASCII value 123) with [(ASCII value 91) you would require command lines:

LOG=SUB1
SUB_VAL1=123,91

5.3.3.4 Removal of ESC Printer Commands

If the received data includes ESC printer commands, these may be removed from the stored data by using the following SETUP.TXT command line:

LOG=ESC

This parameter removes the ESC character (ASCII value 27) plus the following characters up to and including the next <SP> space character from the stored data.

5.4 Logic Inversion of the Received Signal

The SpaceLogger.T10 is RS232 and TTL/CMOS* logic compatible.

To assist with input of TTL/CMOS data, the SpaceLogger.T10 may be configured to invert the logic of the received signal. By default the input is RS232 logic compatible.

To set the SpaceLogger.T10 to invert the logic of the received signal command **RX_INV** is used.

RX_INV = Y Logic inverted on received signal

RX_INV = N Signal not inverted

The default setting is RX_INV=N.

*V_{IL} Input threshold low: 0.6V min 1.2V Typ. V_{IH} Input threshold high: 1.5V Typ, 2.4V max

5.5 File Name Customisation

The SpaceLogger.T10 creates a folder **DATA** on the SD card root folder. Data files are written to this folder.

The default file name for all data is LOGFILE1.TXT.

This may be customised to the format ffffffff.nnn by using the following SETUP.TXT command line:

FILE=ffffffff.nnn

Where:

ffffffff is a set of up to 8 ASCII characters that set the file name. Default characters are LOGFILE1.

And,

nnn are the ASCII characters that set the file extension. Default characters are TXT.

Note:

- Lower case characters are converted to upper case characters so will not be differentiated.

5.6 To Output RS232 Data from the SpaceLogger.T10

RS232 data may be output in two forms from the SpaceLogger.T10. There is the option to output data exactly as it is received by the SpaceLogger 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 SpaceLogger.T10 is enabled by using the command **OUTPUT.**

OUTPUT = I The data input on the RS232 input (Rx) is output on the RS232 output (Tx)

OUTPUT = L The data as written to the log file on the memory card is output on the RS232 output (Tx)

OUTPUT = N No data will be output

The SpaceLogger.T10 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 SD card is inserted.

5.7 To Output a File containing the current SpaceLogger.T10 Settings

To obtain information about how the SpaceLogger.T10 is currently configured, each time the memory card is initialised (either on power on or when the card is inserted), a file named SETTINGS.TXT may be output to the memory card.

This SETTINGS.TXT file contains a list of all the logger settings.

To control the output of this file, the command **SETTINGS** is used.

SETTINGS=Y The settings are written to file SETTINGS.TXT, overwriting the contents of the file if it already exists.

SETTINGS=N File SETTINGS.TXT is not generated.

File SETTINGS.TXT is saved to the memory card in the root directory.

5.8 Resetting the SpaceLogger.T10 to Default Settings

To intentionally return to the default settings, create a new SETUP.TXT file containing the command line:

RESET

RESET loads the following default settings:

BAUD=9600
PARITY=N,8
LOG=R
RX_INV=N
FILE=LOGFILE1.TXT
OUTPUT=N
SETTINGS=N

5.9 SETUP.TXT file

The SETUP.TXT file is created as follows:

1. Insert SD 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, to set up all available parameters, the file SETUP.TXT should contain the following lines:

   BAUD=
   PARITY=
   LOG=
   SUB_VAL1=
   SUB_VAL2=
   RX_INV=
   FILE=
   OUTPUT=
   SETTINGS=

5. Comments may be added to the SETUP.TXT file using //. The SpaceLogger will not read any text following // until the end of the line.

6. Save this text file as **SETUP.TXT** on the SD 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 5.10.

7. Remove card from card reader and insert the card into the SpaceLogger.

8. The command lines will now be effective. The configuration is saved to the SpaceLogger.T10 and the file SETUP.TXT is automatically renamed to SETUPOLD.TXT on the memory card. Settings are stored in eeprom and are preserved when power is switched off.

9. To intentionally return to the default settings, a new SETUP.TXT file must be created containing the command **RESET**

5.10 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.

6 LOGGING

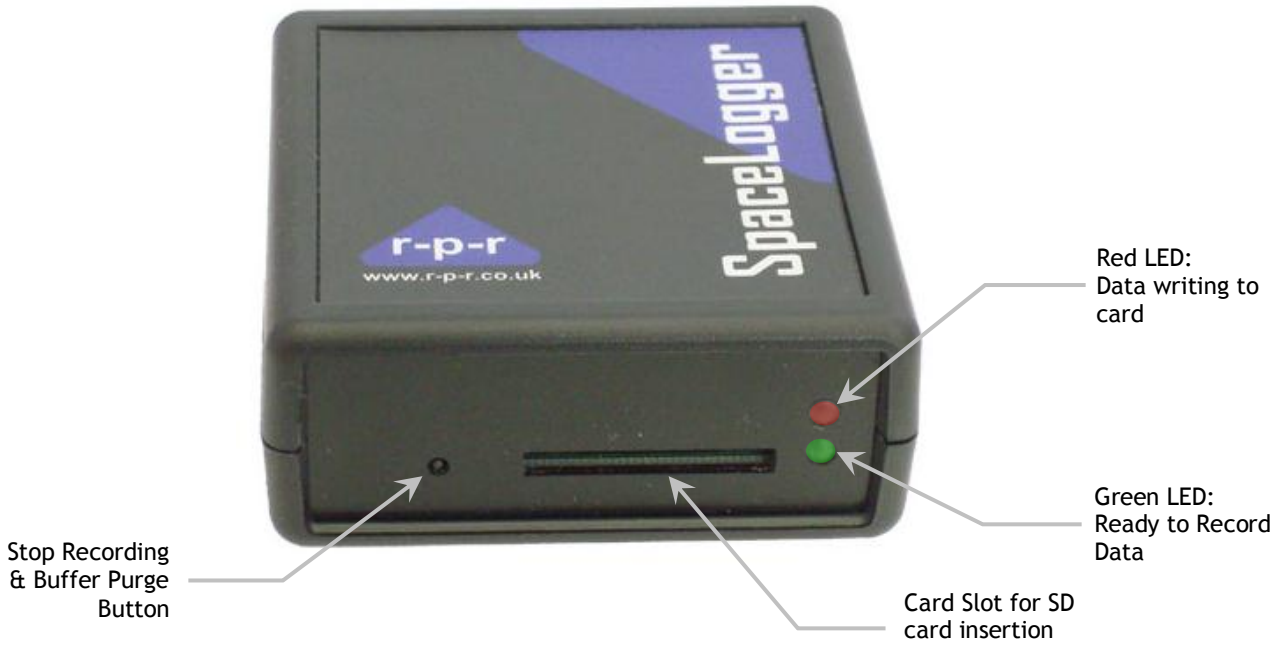

Figure 5

6.1 SD Card

When the SD 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 length of time the memory card takes to initialise will depend on the formatting of the card and the amount of data already stored on it.

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

SpaceLogger is compatible with SD cards up to 2GB capacity but not SDHC cards. MMC and MMC mobile cards up to 2GB capacity are also compatible.

6.2 Data Transfer

Received data is stored temporarily in a buffer (1024 bytes). Data is transferred from the buffer to the SD 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 SD card. The red LED blinks each time data is written to the card.

The SD 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 SD 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.

When the memory card becomes full the SpaceLogger will stop logging data; it will not overwrite files already saved.

6.3 Data Storage

The SpaceLogger creates a folder **DATA** on the SD card root folder. Data is written to a file in the folder with default filename **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 change the file name, including file extension, refer to section 5.5.

By default the SpaceLogger.T10 records the data without modification. To change the format of the stored data please refer to section 5.3.

Should the SD 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 SD 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.

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
Input / Output Capability	Transmission standard	RS232 and TTL/CMOS* logic compatible. *V_{IL} Input threshold low: 0.6V min 1.2V Typ. V_{IH} Input threshold high: 1.5V Typ, 2.4V max 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. Logic inversion on received data is selectable.
	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 SD, MMC or MMC mobile card
	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 SD 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 re-settable fuse – 140 mA
	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 ºC to +70 ºC
	Storage Temperature Range	-40 ºC to +70 ºC
	Enclosure protection	IP203
Guarantee	Period	1 year (refer to Appendix)

APPENDICES

A1 SETUP.TXT Commands

Command	Description	Valid command inputs	Default value
BAUD	Sets baud rate for RS232 data input and output	115200 57600 38400 19200 9600 4800 2400 1200 300 110	9600
PARITY	Sets the parity and data bits for RS232 input	N O E 7 8	N,8
LOG	Controls format of stored data. Includes: • conversion of received data to Hex • modification of unprintable characters (those of value 0-8) to <SP> characters • any end of line conversion to <LF><CR> • up to two specified character substitutions • removal of ESC printer commands	R H CRLF 0-8 SUB1 SUB2 ESC	R
SUB_VAL1	Defines character substitution required when parameter SUB1 set via LOG command	0 to 255, 0 to 255 [two integer values]	0,0
SUB_VAL2	Defines character substitution required when parameter SUB2 set via LOG command	0 to 255, 0 to 255 [two integer values]	0,0
RX_INV	Controls logic inversion of the received data	Y N	N
FILE	Modifies file name and extension format	ffffffff.nnn	LOGFILE1.TXT
OUTPUT	Controls RS232 output of data to RS232 Output 1	I L N	N
SETTINGS	Defines if the logger's settings / configuration is output to a SETTINGS.TXT file. [Settings will not be output if no value is specified]	Y N	N
RESET	Returns logger to default settings	N/A	N/A

A2 ASCII – American Standard Code for Information Interchange

Value	Hex	Character	Value	Hex	Character	Value	Hex	Character	Value	Hex	Character
0	00H	NUL	16	10H	DLE	32	20H	SP	48	30H	0
1	01H	SOH	17	11H	DC1	33	21H	!	49	31H	1
2	02H	STX	18	12H	DC2	34	22H	"	50	32H	2
3	03H	ETX	19	13H	DC3	35	23H	#	51	33H	3
4	04H	EOT	20	14H	DC4	36	24H	$	52	34H	4
5	05H	ENQ	21	15H	NAK	37	25H	%	53	35H	5
6	06H	ACK	22	16H	SYN	38	26H	&	54	36H	6
7	07H	BEL	23	17H	ETB	39	27H	'	55	37H	7
8	08H	BS	24	18H	CAN	40	28H	(	56	38H	8
9	09H	HT	25	19H	EM	41	29H	)	57	39H	9
10	0AH	LF	26	1AH	SUB	42	2AH	*	58	3AH	:
11	0BH	VT	27	1BH	ESC	43	2BH	+	59	3BH	;
12	0CH	FF	28	1CH	FS	44	2CH	,	60	3CH	<
13	0DH	CR	29	1DH	GS	45	2DH	-	61	3DH	=
14	0EH	SO	30	1EH	RS	46	2EH	.	62	3EH	>
15	0FH	SI	31	1FH	US	47	2FH	/	63	3FH	?

Value	Hex	Character	Value	Hex	Character	Value	Hex	Character	Value	Hex	Character
64	40H	@	80	50H	P	96	60H	`	112	70H	p
65	41H	A	81	51H	Q	97	61H	a	113	71H	q
66	42H	B	82	52H	R	98	62H	b	114	72H	r
67	43H	C	83	53H	S	99	63H	c	115	73H	s
68	44H	D	84	54H	T	100	64H	d	116	74H	t
69	45H	E	85	55H	U	101	65H	e	117	75H	u
70	46H	F	86	56H	V	102	66H	f	118	76H	v
71	47H	G	87	57H	W	103	67H	g	119	77H	w
72	48H	H	88	58H	X	104	68H	h	120	78H	x
73	49H	I	89	59H	Y	105	69H	i	121	79H	y
74	4AH	J	90	5AH	Z	106	6AH	j	122	7AH	z
75	4BH	K	91	5BH	[	107	6BH	k	123	7BH	{
76	4CH	L	92	5CH	\	108	6CH	l	124	7CH	|
77	4DH	M	93	5DH	]	109	6DH	m	125	7DH	}
78	4EH	N	94	5EH	^	110	6EH	n	126	7EH	~
79	4FH	O	95	5FH	_	111	6FH	o	127	7FH	DEL

A3 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.

A4 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

CE

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.

A5 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.

A6 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.