SpaceLogger®.W10 WindLogger

User Manual

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

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1 INTRODUCTION

SpaceLogger.W10 [WindLogger] is designed for real-time wind speed and direction data logging. It receives data via RS232 from Gill Instruments' WindSonic ultrasonic wind sensors and other compatible sensors, including the WindObserver II wind sensor.

When connected to the MetPak II weather station all environmental data output via RS232 from the multi-sensor instrument is recorded by the WindLogger. Data includes wind speed, wind direction, temperature, pressure, humidity and dew point.

Each data record is date and time-stamped when it is stored. A new file (.CSV) is generated for each day's worth of data.

Data is stored onto an SD card. SD 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 MMC mobile cards.

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 files may be read and manipulated in any standard spreadsheet program (e.g. MS Excel, OpenOffice.org calc).

The logger requires a 7 - 30 volt DC supply which can be provided by an AC/DC mains adaptor or suitable battery. Alternatively, where a WS-15A Display is used, power may be provided directly from the display unit.

For WindLogger advanced features and setup, please refer to section 6

Document revision summary

Issue	Date	Description
1	Nov 2007	Original document
2	2 Jan 2008	General revision
3	Aug 2009	New features added. Applies to units with serial numbers WL09-1220 and above
4	Feb 2012	Features updated. SETUP.TXT file format modified to include time & date set up. Logging interval set up method changed. Configuration now saved to memory. Applies to units with serial numbers WL11-6011 and above
5	Aug 2012	Correction for MetPak II output
6	Feb 2015	Terminal strip and plunger colours swopped (Fig 3 + Table 1)

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.

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2   QUICK START: EASY STEPS TO WIND DATA LOGGING

❶ . . . .   Connect RS232 inputs   see section 4.3

❷ . . . .   Select baud rate, logging interval or other advanced set up features, if   see section 6
required

❸ . . . .   Power on   see section 4.5

❹ . . . .   Set time and date   see section 5.1

❺ . . . .   Insert SD card   see section 5.2

❻ . . . .   Start recording data   see section 5.3

❼ . . . .   🕐 🕑 🕒 🕓 🕔 🕕 🕖 🕗 🕘 🕙 🕚 🕛

❽ . . . .   Stop recording data (press purge button)   see section 5.3

❾ . . . .   Remove card and transfer to PC to view and analyse data   see section 5.4

3   EXAMPLE APPLICATIONS

WindSonic Sensor

WindLogger

Manual transfer of SD card to PC card reader

Figure 1

MetPak II weather station

WS-15A Display Unit

WindLogger

Manual transfer of SD card to PC card reader

Figure 2

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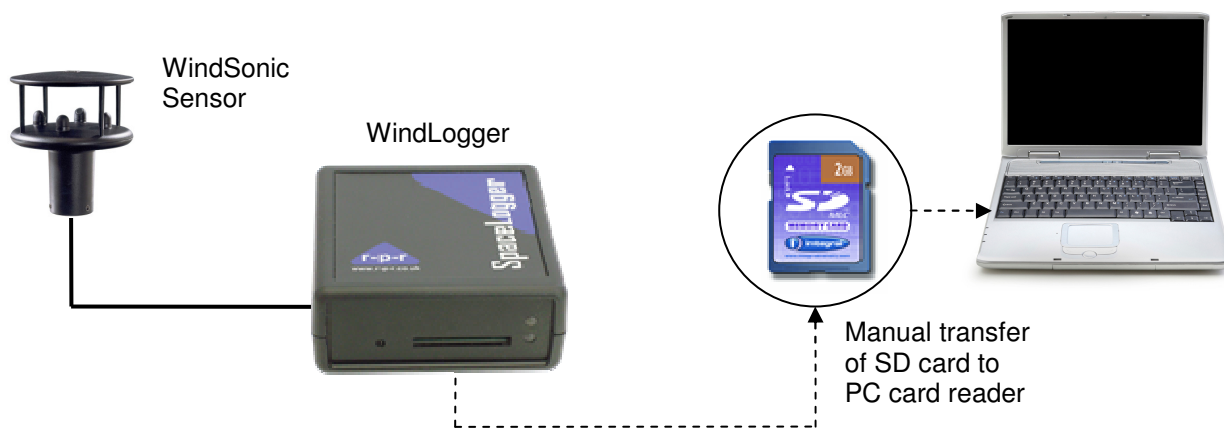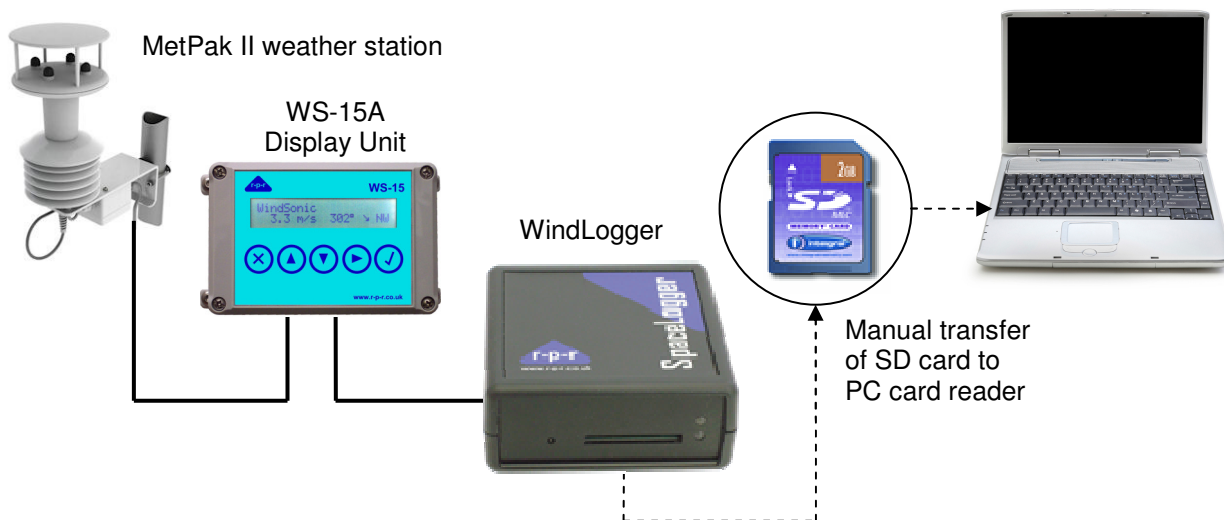
4   CONNECTING
4.1   Terminal Strip Arrangement
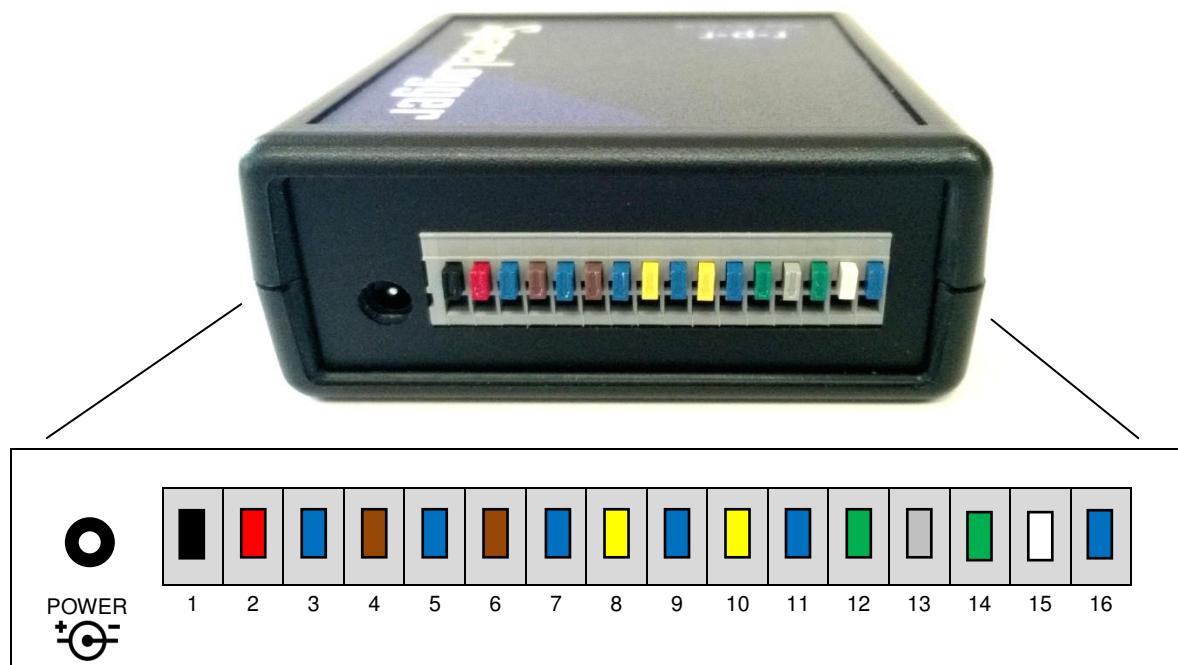
Figure 3

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	Reserved for future Options
8	Digital I/O input 1	
9	Digital I/O GND 2	
10	Digital I/O input 2	
11	GND	RS232 signal output ground (see section 6.5)
12	RS232 Tx 2	Reserved for future Options
13	RS232 Rx 2	
14	RS232 output 1	RS232 signal output (see section 6.5)
15	RS232 input 1	RS232 signal input from wind sensor / weather station
16	RS232 GND 1	

Table 1

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4.3   RS232 Interface

RS232 connection to the wind sensor (or WS-15A display unit) should be made as per Table 1. This table should be read in conjunction with Figure 3. Wires should be prepared as per section 4.4.

WindSonic Sensor
For Gill Instruments' **WindSonic sensors**, the following table describes the connections required:

WindLogger terminal		WindSonic connection	
15	RS232 input 1	Pin 5	TXD
16	RS232 GND 1	Pin 1	Signal GND

Table 2

Note that the WindLogger will only receive RS232 input, so when a WindSonic Sensor 2 or 3 is used, it should be configured for RS232 output. When RS422/485 output is required from the sensor (for example, where a longer cable run is necessary or when using a WindObserver II sensor), a WS-15A display or a suitable RS485 to RS232 converter at the WindLogger end must be used.

To be compatible with the WindLogger, the WindSonic sensor output must be set to one of:
* ASCII Polar Continuous (default WindSonic setting)
* ASCII UV Continuous
* ASCII Tunnel Continuous

MetPak II Weather Station
For Gill Instruments' **MetPak II / MetPak IIR weather stations**, the following table describes the connections required:

WindLogger terminal		MetPak II connection [J5 Hub Box]	
15	RS232 input 1	3	TX
16	RS232 GND 1	2	Signal GND

Table 3

To be compatible with the WindLogger, the MetPak output must be set to:
* ASCII Continuous (default MetPak setting)

WS-15A Display
For Richard Paul Russell Ltd's **WS-15A wind display unit**, the following table describes the connections required. The WindLogger is powered by the display unit in this situation.

WindLogger terminal		WS-15A terminal	
	Not connected	24	Screen
1	Power GND	25	Power GND
2	Supply +V	26	+V Supply Output
15	RS232 input 1	28	RS232 Tx Output

Table 4

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The connections should be made with the power to the display unit switched off. For more details on wiring the WS-15A display please refer to the WS-15A User Manual.

4.4   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.
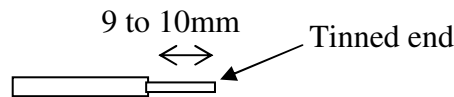
9 to 10mm   Tinned end

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 colour plunger for the required terminal and insert the wire as far as it will go, into the hole below the plunger. Release the terminal 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.

4.5   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.**

4.6   MetPak Output and Modified WindSonic Output

When connecting to a MetPak, the default baud rate for communication is 19200. To configure the WindLogger to suit, refer to section 6.1.

If the WindSonic baud rate setting has been changed from the default (9600 baud), refer to section 6.1.

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5   LOGGING

Red LED: Flash on Power on & Data writing to card

Green LED: Ready to Record Data

Card Slot for SD card insertion

Time & Date Set, Stop Recording & Buffer Purge Button

Figure 5

5.1   Setting the Time and Date

To set the time and date for correct stamping of the data records, a file named SETUP.TXT must be created on the memory card. This file is read by the WindLogger when the card is inserted into the logger and the clock synchronised to the given time when the button to the left of the card slot is pressed.

Steps to set the time and date:

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 following three lines:

> **WAIT**
> **TIME=hh:mm:ss**
> **DATE=DD/MM/YYYY**

> Where hh:mm:ss is the time in, say, a couple of minutes and DD/MM/YYYY is today's date.

3.   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 Vista and higher versions of Windows, please refer to section 6.7.

4. Remove card from card reader and, with the power on, insert the card into the WindLogger. Both the red and green LEDs will come on.

5. At the time saved in the SETUP.TXT file, press the button to the left of the card slot. The WindLogger will 'Beep' once and both LED's switch off. Release the button. The red LED may flicker on and off after this and once the card has completed its initialisation the green LED will come back on and remain on.

6. After updating the time and date, the WindLogger renames the file SETUP.TXT to SETUPOLD.TXT to avoid unintentionally repeating the commands next time the unit is switched on or the card re-inserted.

The WindLogger has an internal battery to maintain the time and date when the power to the unit is switched off. When it is necessary to reset the time and date, please repeat the steps outlined above.

If no time and date is set up on the WindLogger, the unit will emit a warning 'Beep' four times a minute as a reminder.

Should you wish to switch off the time-stamping function of the WindLogger – please refer to section 6.4.

5.2   SD Card

Once the time and date have been set on the WindLogger; when the SD card is next inserted correctly into the WindLogger (with power on), the unit should 'Beep' once and the red LED blink as the card initialises. At this stage, the WindLogger's internal buffer is cleared and is ready to start receiving new data from the connected wind sensor.

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.

After initialisation, the green LED will 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.

5.3   Data Transfer

Received data is stored temporarily in a buffer (1024 bytes). The WindLogger inserts the time and date at the start of each data record. 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 11 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 WindLogger 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 WindLogger. The green LED will automatically switch off to indicate that the unit is no longer enabled to record further data. The card may then be safely removed.

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.

5.4   Data Storage

WindLogger creates a folder DATA on the SD card root folder. Data files are written to this folder. A new file is generated each day. The file name takes the default format 20YYMMDD.CSV where YYMMDD is that day's date.

As default, data is stored in comma separated variable format files (.CSV) which may be opened in MS Excel and other spreadsheet programs. These files are also readable in notepad or a similar text editor.

To change the file name format, including the file extension, refer to section 6.3.

NB: If the logging interval is set to once per second or a higher frequency, the resulting file size for a complete 24 hr period will contain too many records to open, without manipulation, in Excel due to Excel's limitations on number of rows in a worksheet.   Should this be required, an Excel spreadsheet with suitable macro is available to download for free from our website, called WindLog. This will separate the day's data file into the necessary number of worksheets and generate charts of wind speed against time. The Excel file is then available for editing.

When the WindLogger is used with WindSonic sensors, data is stored in the following format:

> DD/MM/YY,hh:mm:ss,Q,ddd,SSS.SS,U,AA, CC

Where:

> DD/MM/YY is the date
> hh:mm:ss is the time
> Q is the WindSonic sensor identifier
> ddd is the is the wind direction from the sensor
> SSS.SS is the wind speed
> U is the wind speed units M = m/s, N = knots, P = mph, K = km per hour, F = ft per min
> AA is the sensor status 00 = OK, 01 = axis failed, 02 = axis 2 failed, 04 = axis 1 and 2 failed, 08 = NVM error, 09 = ROM error
> CC is the checksum EXCLUSIVE-OR of the bytes between (and not including) the time and the space character before CC as a two character hexadecimal value

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When logging from a **WindSonic sensor**, each data reading comprises up to 41 bytes. The following table gives the approximate capacity of various sized memory cards, depending on the logging interval selected, assuming a WindSonic sensor is connected.

Memory Card Size	WindSonic Logging Interval (Readings per time interval)					
	4 per sec	**2 per sec**	**1 per sec**	**1 per 2 sec**	**1 per 5 sec**	**1 per 10 sec**
1 GB	75 days	151 days	303 days	606 days	>4 years	>8 years
2 GB	151 days	303 days	606 days	>3 years	>8 years	>16 years

Table 5

When logging from a **MetPak weather station**, each data reading comprises at least 75 bytes. The following table gives the approximate capacity of various sized memory cards, depending on the logging interval selected, assuming a MetPak is connected.

Memory Card Size	MetPak II Logging Interval (Readings per time interval)		
	1 per sec	**1 per 2 sec**	**1 per 10 sec**
1 GB	>600 days	>3 years	4.5 years
2 GB	>300 days	>600 days	9 years

Table 6

6   ADVANCED FEATURES

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

- Baud rate
- Logging interval
- File name format
- Time-stamping
- RS232 data output

Refer to the sections below for command details and section 6.7 for how to create the SETUP.TXT file.

6.1   To Select an Alternative Baud Rate

The default baud rate is 9600 bits per second. If an alternative baud rate is required the following SETUP.TXT command line 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.

6.2   Logging Interval

By default, the WindLogger will record every sample output by the wind sensor.

For the WindSonic sensor, the default output rate is 1 sample per second. Please refer to the WindSonic user manual for information on changing the rate between the available 0.25, 0.5, 1, 2 and 4 times per second.

If an alternative logging interval is required, the WindLogger may be set to record by using the following SETUP.TXT command line:

> **RATE=r**
>
> Where r is the time in seconds between sampling, as an integer.
> Note:
> - r = 0 to 60
> - r should be set to a value greater than the sensor output interval or 0
> - If r = 0, every sample received by the WindLogger will be recorded

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6.3   To Customise File Names

The default file name for each day's data is 20YYMMDD.CSV where YYMMDD is that day's date.

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

FILE=ff.nnn

Where:
ff is a pair of ASCII characters that set the start of the file name. Default characters are 20.

And,
nnn are the ASCII character that set the file extension. Default characters are CSV.

Note:
- Lower case characters are converted to upper case characters so will not be differentiated.
- Question marks (?) may be used to denote a space.

The stored file name will now take the format:

ffYYMMDD.nnn

6.4   To Disable the Time-Stamp

The date and time-stamping of data by the WindLogger may be switched off by using the following SETUP.TXT command line:

TIMESTAMP=t

Where t = Y or N

- If **TIMESTAMP=Y**, on detection of the start of the sample the date & time stamp will be inserted into the stored data
- If **TIMESTAMP=N**, data will not be date & time stamped

6.5   To Output RS232 Data from the WindLogger

RS232 data may be output in two forms from the WindLogger. There is the option to output data exactly as it is received by the WindLogger from the attached sensor, 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 Section 6.1.

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

OUTPUT=o

- If o = **I**, the data received on the RS232 input (Rx) is output on the RS232 output (Tx)
- If o = **L**, the data as written to the log file on the memory card is output on the RS232 output (Tx)
- If o = **N**, no data will be output

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

Please note that the SpaceLogger model, software version and time and date are also output from the logger on powering on.

6.6 Resetting the WindLogger 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
RATE=0
FILE=20.CSV
TIMESTAMP=Y
OUTPUT=N

6.7 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.

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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, the file SETUP.TXT could contain any of the following lines:

> **WAIT**
> **TIME=hh:mm:ss**
> **DATE=DD/MM/YYYY**
> **BAUD=b**
> **RATE=r**
> **FILE=ff.nnn**
> **TIMESTAMP=t**
> **OUTPUT=o**

5. Comments may be added to the SETUP.TXT file using **//**. The WindLogger 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 6.7.

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

8. The command lines will now be effective. The configuration is saved to the WindLogger 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**.

6.8   Notes on saving 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 Vista (and higher versions of Windows) it is beneficial to have File Extensions visible when viewing documents in Explorer.

7   SPACELOGGER.W10 WINDLOGGER SPECIFICATION

<table>
<tr>
<td rowspan="3">Physical</td>
<td align="right">Dimensions</td>
<td>Width: 67 mm
Depth: 67 mm
Height: 28 mm (excluding optional rubber feet)</td>
</tr>
<tr>
<td align="right">Weight</td>
<td>75g</td>
</tr>
<tr>
<td align="right">Enclosure material</td>
<td>GP ABS (UL94-HB) plastic and acrylic</td>
</tr>
<tr>
<td rowspan="5">Input / Output Capability</td>
<td align="right">Sensor type</td>
<td>Gill Instruments' WindSonic, WindObserver II and WindMaster ultrasonic wind speed and direction sensors
MetPak II weather station
Other sensors with data output starting <STX> and ending <LF></td>
</tr>
<tr>
<td align="right">Transmission standard</td>
<td>RS232 compatible, 8 bits and no parity</td>
</tr>
<tr>
<td align="right">Sensor output format</td>
<td>Continuous mode: ASCII UV (or UVW), Polar or Tunnel from all sensors</td>
</tr>
<tr>
<td align="right">Transmission speed</td>
<td>9600 Baud (default) or selectable from 115200, 57600, 38400, 19200, 4800, 2400, 1200, 300 or 110 Baud</td>
</tr>
<tr>
<td align="right">Wire acceptance</td>
<td>0.32 to 0.65 mm diameter (AWG 28 to 22)</td>
</tr>
<tr>
<td rowspan="4">Data Storage</td>
<td align="right">Data Storage Card</td>
<td>Removable SD, MMC or MMC mobile card</td>
</tr>
<tr>
<td align="right">Data Capacity</td>
<td>2 GByte (max)</td>
</tr>
<tr>
<td align="right">File System</td>
<td>FAT16 or FAT32 with 8.3 file names
Sector size 512 Bytes</td>
</tr>
<tr>
<td align="right">Data logging interval</td>
<td>Default as per WindSonic setting (1, 2 or 4 readings per sec or one reading every 2 or 4 seconds) or select from 1 reading per 1 to 60 seconds</td>
</tr>
<tr>
<td rowspan="2">Audible / Visual Indicators</td>
<td align="right">LED Indicators</td>
<td>Green: Ready to record data
Red: Writing data to MMC mobile card</td>
</tr>
<tr>
<td align="right">Audio Bleeper</td>
<td>Two tone signal on correct card insertion.
Single tone when data purge button depressed.
Four bleeps per minute when time & date not set.</td>
</tr>
<tr>
<td rowspan="2">Real Time Clock</td>
<td align="right">Accuracy</td>
<td>±40 ppm at 25 ºC</td>
</tr>
<tr>
<td align="right">Backup battery</td>
<td>CR2032</td>
</tr>
<tr>
<td rowspan="4">Power</td>
<td align="right">Power requirement</td>
<td>7 to 30 Vdc</td>
</tr>
<tr>
<td align="right">Current at 12Vdc</td>
<td>10 mA typical</td>
</tr>
<tr>
<td align="right">Supply input protection</td>
<td>Polarity reversal protected and internal resettable fuse – 140 mA</td>
</tr>
<tr>
<td align="right">Connection</td>
<td>1.3 mm centre pin DC connector, or
Screwless terminals (0.32 to 0.64 mm, AWG 28 to 22 diameter conductors)</td>
</tr>
<tr>
<td rowspan="3">Environmental</td>
<td align="right">Operating Temperature Range</td>
<td>-25 ºC to +70 ºC</td>
</tr>
<tr>
<td align="right">Storage Temperature Range</td>
<td>-40 ºC to +70 ºC</td>
</tr>
<tr>
<td align="right">Enclosure protection</td>
<td>IP203</td>
</tr>
<tr>
<td>Guarantee</td>
<td align="right">Period</td>
<td>1 year (refer to Appendix)</td>
</tr>
</table>

8   APPENDICES

A1   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

A2   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.

A3   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.

A4   WEEE (Waste, Electrical and Electronic Equipment) Statement
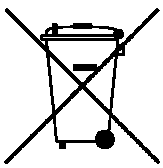
The WEEE directive places an obligation on all EU-based manufacturers and importers to take-back electronic products at the end of their useful life. Richard Paul Russell Ltd accepts its responsibility to finance the cost of treatment and recovery of redundant WEEE in accordance with the specific WEEE recycling requirements.

This symbol on the product or on its packaging indicates that, within the EU, 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.

A5   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.