Man 232

VWlog8 GPRS
User Manual

Man232 - VWlog8 GPRS - MN1114 - Rev1.1.1

What's this manual about?

This manual tells you about the VWlog8 GPRS system and how to set up an VWlog8 GPRS.

Who does this apply to?

Installers and field engineers who need to install, commission and maintain an VWlog8 GPRS system.

Welcome!

Thank you for choosing the VWlog8 GPRS system.

This manual has been written to help you utilise all of the functions of the VWlog8 GPRS. Please read this manual thoroughly before use to help avoid any problems and keep it handy when using the VWlog8 GPRS system.

VWlog8 GPRS

The VWlog8 GPRS is an eight channel Datalogger which reads most commercially available geotechnical and structural Vibrating Wire (VW) sensors and thermistor temperature sensors, communicating via GPRS.

The logger reading can be set to several different ranges allowing for differing VW Sensors.

Designed and built with the latest technology, VWlog8 GPRS utilises an onboard ring memory and fully wireless data retrieval via the mobile internet network, directly to the users own FTP site, minimising the risk of data loss.

VWlog8 GPRS is quick and easy to install in the field, requiring no site PC and no programming skill, enabling a basic user to easily set up the system.

Soil Instruments provide free software which helps you create the configuration file to update the VWlog8 GPRS settings via FTP. VWlog8 GPRS will automatically use the configuration file to update its settings when it performs its scheduled synchronisation.

The VWlog8 GPRS provides accurate, repeatable readings with low interference.

Contents

OVERVIEW & INTRODUCTION

Important information

The following symbols are used throughout the manual

IMPORTANT INFORMATION

QUESTION

WARNING

TIP

! Important: Failure to adhere to the warnings in this manual may result in network disruption and possible data loss.

Failure to observe the warning may result in injury, product malfunction, unexpected readings or damage to the product that may invalidate its warranty.

Tips give additional information that may be helpful when using VWlog8 GPRS.

PRODUCT CHANGES

Soil Instruments Limited has an on-going policy of design review and reserves the right to amend the design of their product and this instruction manual without notice.

WARRANTY

Refer to our terms and conditions of sale for warranty information. The batteries are a consumable item and are excluded from the warranty.

DISPOSAL

Products marked with the  symbol are subject to the following disposal rules in European countries:

- **This product is designated for separate collection at an appropriate collection point**
- **Do not dispose of as household waste**
- **For more information, contact Soil Instruments or the local authority in charge of waste management.**

System Description
Things You Need to Know About VWlog8

FEATURES

- Reads with a full sweep frequency range from 450Hz to 6000Hz by a user definable range
- Onboard data storage with ring memory; default 4GB
- Wireless data retrieval via the mobile internet network to users own FTP site
- Low power consumption
- Firmware updated over the mobile internet connection or locally using the SD card
- Gas Tubes and Earthing Connection Point provide full surge protection

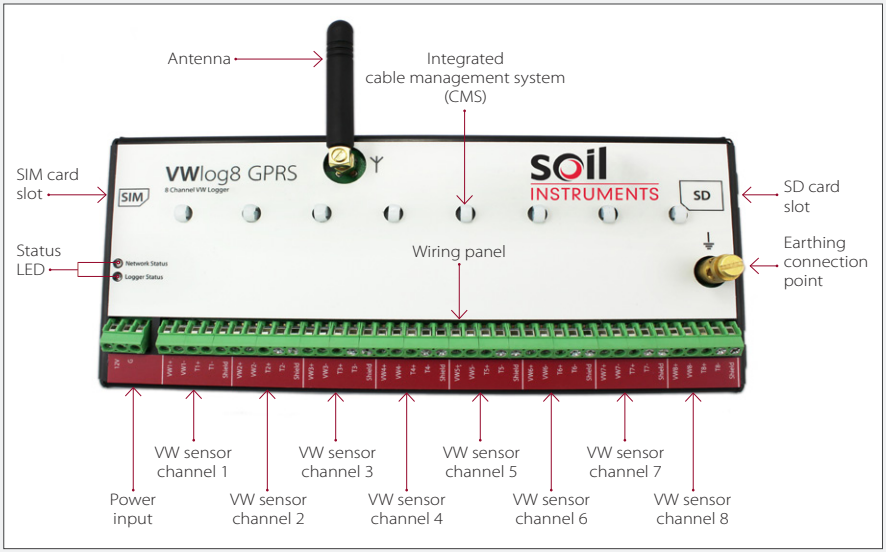
BENEFITS

- Readings are accurate, repeatable with low interference
- Optional 15V excitation ensures quality readings for sensors with long cables
- Quick and easy set up in the field; no site PC required
- Internet enabled; data uploaded directly to the users own FTP site
- Logger set up requires no programming skill and can be carried out via the FTP site wirelessly over a mobile data network (GPRS and GSM)
- Logger initiated communication; no requirement for a fixed IP address
- Onboard ring memory, capable of storing10,000 records inimises the risk of data loss.

System Components

VWLOG8 GPRS

VWlog8 GPRS is an eight channel Datalogger that will energise and read up to eight Vibrating Wire (VW) sensors, digitise the reading and then send it to the users FTP site via its inbuilt GPRS.



Follow the precautions outlined in this manual at all times to ensure the correct working order of your instrument.

It is essential that the equipment covered by this manual is handled, operated and maintained by competent and suitably qualified personnel.

To guide you in the competence required for installing each instrument in our product range, Soil Instruments provides a **recommended skill level** in all of our manuals and datasheets.

Quick Start Guide

VWlog8 GPRS is designed for quick and easy deployment in the field:

The VWlog8 GPRS will have been supplied to you with the latest firmware; however future firmware updates can be sent via FTP or installed directly onto the SD card.

Soil Instruments recommend an **intermediate** skill level for VWlog8 GPRS setup.

BEFORE YOU GO TO SITE:

- Ensure a SIM card with an adequate data plan is available, together with the APN, username and password.
  Soil Instruments recommend an '**M2M**' (machine to machine) SIM card.
- Create or edit a '**SIM setup file**' (sample provided on usb stick) using the Soil Instruments configuration software provided, or a text editor on your PC.
- Create or edit a '**VWlog8 GPRS configuration file**' (sample provided on usb stick) using the Soil Instruments configuration software provided.
- Copy both the '**SIM setup file**' and the '**VWlog8 GPRS configuration file**' onto the SD card supplied with the VWlog8 GPRS.
- Install the SIM card and the SD card into the VWlog8 GPRS, ensuring both cards are correctly orientated before insertion.
- Mount the VWlog8 GPRS, antenna and a 12V DC power supply (we recommend a 12V DC 7Ah battery as a minimum) into an enclosure suitable for your application.
- Use a non-metallic enclosure if you want to use the supplied stubby antenna or an external antenna with a lead if you are using a metallic enclosure.

It is not necessary to tighten the antenna with a spanner; tighten securely by hand only as over-tightening with a spanner could result in damage to the logger .

Please refer to '*Guide to the Configuration Files & Data File*' and '*Detailed Software Guide*' in this manual for more details.

The VWLog8 mains powered logger box includes a 12v 1.2Ah battery to provide a short term backup power source, incase of power outages.

Soil Instruments recommend a* 'basic' *skill level for VWlog8 GPRS field installation.

WHEN YOU ARE IN THE FIELD:

- Connect up to eight VW sensors (each can be with an optional built-in thermistor temperature sensor) to the wiring panel on the VWlog8 GPRS.
- Ensure the mobile internet signal of your data plan carrier is sufficiently strong. Soil Instruments recommend using a 'GSM/GPRS Radio Signal Analyser' which is available for purchase from Soil Instruments, order number 'DI-SIG-TEST'.
- With the power supply turned off, connect the 12-20V DC power supply to the VWlog8 GPRS power input terminals.
- Turn on the 12-20V DC power supply to power the VWlog8 GPRS.

Please refer to '*Detailed VWlog8 GPRS User Guide*' in this manual for more details.

Ensure correct polarity when connecting the power supply to the VWlog8 GPRS.

Ensure soler panel is connected and wired up correctly when using the Solar VWlog8 GPRS version.

Soil Instruments recommend an* 'intermediate' *skill level for editing and updating the configuration files.

FROM THE OFFICE:

- Log on to the FTP site you specified in the VWlog8 GPRS configuration file.
- Make any adjustments of the VWlog8 GPRS configuration file, as necessary, by editing it with Soil Instruments configuration software or a text editor and re-uploading via the FTP.
- Download the data from the FTP site.

You can update the VWlog8 GPRS firmware remotely via FTP.
The firmware will be supplied by Soil Instruments as a "**hex**" extension.
The typical filename is "**VWLVx.xx.hex**".

Soil Instruments recommend an* 'intermediate' *skill level for updating firmware via FTP.

TO PERFORM A REMOTE FIRMWARE UPDATE:

- Rename the latest firmware file such as "**VWLVx.xx.hex**" to "**imagexxxx.hex**", where; **xxxx** is the VWlog8 GPRS ID (four character serial number found on the silver label).
- Upload "**imagexxxx.hex**" to the folder on the FTP site as specified in the "**xxxxVWL.cfg**".
- When the VWlog8 GPRS connects to the FTP site, VWlog8 GPRS will copy "**imagexxxx.hex**" to the SD card as "**image.hex**".
- VWlog8 GPRS will then perform a software reset and update its firmware to the new firmware version.
- VWlog8 GPRS will delete "**image.hex**" from the SD card.
- VWlog8 GPRS will replace the content of "**imagexxxx.hex**" on the FTP with "**done**".

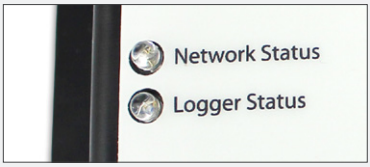
Please refer to '*Appendix A*' in this manual for more details.

DETAILED VWLOG8 GPRS USER GUIDE

Status LED

NETWORK STATUS LED

The Network Status LED is directly driven by the GPRS module as follows:



NETWORK STATUS LED	STATUS OF THE GPRS WIRELESS MODULE
OFF	OFF
Permanently ON	ON but not registered on the network
Slow flash, LED ON for 200ms, OFF for 2s)	ON and registered on the network and/or communication in progress
Very quick flash (ON for 100ms, OFF for 200ms)	ON but 'Bad Software' – software downloaded is either corrupted or non-compatible

If the network status LED is flashing quickly, therefore indicating '**bad software**', either try to load both the configurations files (SIM setup and logger configuration) again or contact Soil Instruments.

LOGGER STATUS LED

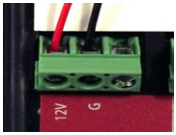
The Logger Status LED is multifunctional. The table below shows this LED in different states.

LOGGER STATE	LOGGER STATUS LED	DESCRIPTION	NOTE
Firmware update	Flashing with high frequency (100ms and more)	The firmware update is running normally. The new "**hex**" file is now being read from the SD card	This operation will take no more than 20 seconds
Standard mode	Flashes with every reading	The frequency depends on the reading settings in the Config file	
	Toggles every 3 seconds	Standby low power mode. The logger is waiting for any of the following events: • **Next reading** • **Next FTP communication**	
	Solid	No SD card has been installed in the device.	

Connecting the Power Supply and VW Sensors

CONNECTING THE POWER SUPPLY

Connect the wires to the power terminals as shown in the table below.



POWER CONNECTIONS	POWER TERMINAL
12-20V DC	12V
Ground	G

Ensure the power supply is OFF and correct polarity of the connections when connecting the wires.

CONNECTING THE EARTH WIRE

The VWlog8 GPRS must be earthed to ensure protection against voltage surge. A conductive connection using a 2.5mm^2 gauge wire should be linked between the earth connection point on the VWlog8 GPRS and the enclosure, the enclosure must also earthed.

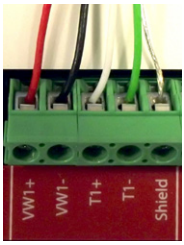
EARTH CONNECTION	TERMINAL
VWlog8 GPRS earth connection point	Enclosure earth point

Failure to earth the VWlog8 GPRS as instructed will invalidate any warranty as the VWlog8 GPRS will not be protected against any voltage surge.

Ensure the solar panel has been wired in correctly and polarity has been checked, before switching on power to the VWlog8 GPRS.

Connecting Sensors With Built-In Temperature Sensor

For sensors with built-in temperature sensors, connect the wires to the sensor terminals as shown in the table below.

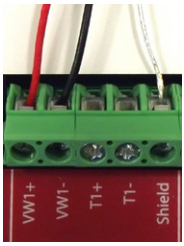


SENSOR CONNECTIONS	SENSOR TERMINAL
VW Sensor +	VW1+
VW Sensor -	VW1-
VW Thermistor +	T+
VW Thermistor -	T-
Shield	Shield

The VWlog8 GPRS is only compatible with the 3K ohm thermistor temperature sensors. It will not work with RTD-based temperature sensors used by some manufacturers.

Connecting Sensors Without A Temperature Sensor

For sensors without built-in temperature sensors, connect the wires to the sensor terminals as shown in the table below.



SENSOR CONNECTIONS	SENSOR TERMINAL
VW Sensor +	VW1+
VW Sensor -	VW1-
Not used	T+
Not used	T-
Shield	Shield

Only a qualified person trained in the use of VWlog8 GPRS and the VW sensors may connect the sensors.

Setup of the VWlog8 GPRS Locally

OVERVIEW

The VWlog8 GPRS can be used locally, using the SD Card and card reader connected to a site PC or laptop. You will need the following software:

- **Soil Instruments configuration software provided, or a text editor on your PC.**

Soil Instruments recommends using the software provided for editing SIM and GPRS configuration files. If using a text editor, Soil Instruments recommends '**NotePad++**' because it will display the lines in a more organised fashion. Sample sim setup and configuration files are provided on the usb stick

Never remove the SD card when the unit is powered up.

- **Power off the VWlog8 GPRS.**
- **Remove the SD Card from the VWlog8 GPRS and place in the card reader of the local PC, ensuring correct orientation.**

SIM SETUP FILE

The SIM setup file is a text file that holds information for the GPRS data connection. The filename is "**xxxxSIM.cfg**", where; '**xxxx**' is the VWlog8 GPRS ID (four character serial number found on the silver label).

- **Edit the SIM setup file if needed and save to the SD card.**

LOCAL UPDATE OF CONFIGURATION FILES

The Configuration file defines how the sensors are read and sets the channel and FTP parameters. The filename is "**xxxxVWL.cfg**", where; '**xxxx**' is the VWlog8 GPRS ID (four character serial number found on the silver label).

You can update the logger with your new SIM and Configuration files locally by following the steps below;

STEP	ACTION
1	Edit the VWlog8 GPRS SIM setup file "**xxxxSIM.cfg**" and the configuration file "**xxxxVWL.cfg**" as required
2	Save the new "**xxxxSIM.cfg**" and "**xxxxVWL.cfg**" to the SD Card, ensuring to delete the old "**xxxxSIM.cfg**" and "**xxxxVWL.cfg**" files respectively
3	Insert the SD card into the VWlog8 GPRS, ensuring correct orientation
4	Power on the VWlog8 GPRS with the SD card inserted to apply the new settings
5	After VWlog8 GPRS configuration update, the VWlog8 GPRS will read and upload data as per the settings in the new "**xxxxVWL.cfg"**

Please refer to '***Guide to the Configuration Files & Data File***' and '***Detailed Software Guide***' for more details.

Setup of the VWlog8 GPRS over the FTP Site

OVERVIEW

The VWlog8 GPRS is designed for easy deployment in the field. It has no user interface such as keyboard and display. As a result, the site installation only requires a basic skill level that involves connecting sensors, checking the signal level and connecting the power supply.

Once the site installation is completed, the operation and fine tuning of the VWlog8 GPRS are done remotely and wirelessly via the FTP site.

The aim is to ensure time spent and skill level required (the two most costly items in the field) are minimised.

You will need the following software:

- **FTP client software to connect your PC to the FTP site and to transfer files between your PC and the FTP site.**
- **Soil Instruments Configuration Software.**
- **A text editor to view the log and data files and to edit the configuration files.** Soil Instruments recommends '**NotePad++**' because it will display the lines in the files in a more organised fashion. (Some of the FTP sites strip Line Feed from the cfg files, causing problems with text editors such as Notepad).

Soil Instruments recommends using the software provided for editing **SIM** and **GPRS configuration files.**

The SIM setup file can only be modified locally while the SD card in the VWlog8 GPRS is physically accessible. It cannot be modified via the FTP site.

VWLOG8 GPRS CONFIGURATION FILE

You can modify how the sensors are read and how the data is uploaded by following the steps below;

STEP	ACTION
1	Edit the VWlog8 GPRS configuration file "**xxxxVWL.cfg**" as required.
2	Upload the new configuration file "**xxxxVWL.cfg**" to the folder on the FTP site.
3	The next time the VWlog8 GPRS connects to the FTP site, it will copy "**xxxxVWL.cfg**" to its SD card and update the VWlog8 GPRS configuration accordingly.
4	After a successful configuration update, the VWlog8 GPRS will: • Delete the content of "**xxxxVWL.cfg**" and write "**done**" in the file.
5	After VWlog8 GPRS configuration update, the VWlog8 GPRS will read and upload data as per the settings in the new "**xxxxVWL.cfg"**, after the next FTP session.

Please refer to '***Guide to the Configuration Files & Data File***' and '***Detailed Software Guide***' in this manual for more details.

GUIDE TO CONFIGURATION FILE & DATA FILE

Configuration Files

SIM SETUP FILE

The "**SIM setup file**" is a text file that holds information for the GPRS data connection (a sample file is provided on the usb stick).

The filename is "**xxxxSIM.cfg**", where; '**xxxx**' is the VWlog8 GPRS ID (four character serial number found on the silver label).

More details on the content and format of "**xxxxSIM.cfg**" are shown in the table below.

Details for SIM setup should be obtained from SIM card provider

On power up, the VWlog8 GPRS will read the information in "**xxxxSIM.cfg**" and use the information to connect to the Internet.

The SIM setup file can only be modified if you edit the copy on the SD card, or copy a new "**xxxxSIM.cfg**" from your PC to the SD card. It cannot be changed remotely (such as over an FTP connection).

If the SIM setup file is corrupted or contains syntax errors, default values will be used. If this happens, the VWlog8 GPRS will not be able to connect to the mobile internet connection.

SIM setup file table;

AVAILABLE PROPERTIES FOR THIS SECTION	VALID VALUE	DEFAULT VALUE	DESCRIPTION
APNname	Text, up to 31 characters	internet	Internet Access Point Name (APN)
Username	Text, up to 15 characters	(empty)	Internet User Name
Password	Text, up to 15 characters	(empty)	Internet Password
GPRS_Access_Timeout	1 to 255	30	GPRS registration timeout in seconds
Internet_Access_Timeout	1 to 255	30	timeout during start GPRS bearer in seconds
DNS1	IP string	(empty)	Address of primary DNS server "" – DNS has not been defined
DNS2	IP string	(empty)	Address of secondary DNS server "" – DNS has not been defined

VWLOG8 GPRS CONFIGURATION FILE

The '**VWlog8 GPRS Configuration File**' is a text file that holds information on how the VW sensors are read, as well as how and where the data will be uploaded (a sample file is provided on the usb stick).

The filename is "**xxxxVWL.cfg**", where; **xxxx** is the VWlog8 GPRS ID (four character serial number found on the silver label).

On power up, the VWlog8 GPRS reads the information in "**xxxxVWL.cfg**" and uses the information to read the sensors and save the data to its memory.

The '**VWlog8 GPRS Configuration File**' can be modified if you edit the copy on the SD card or copy a new "**xxxxVWL.cfg**" from your PC to the SD card. It can also be modified remotely (over a wireless link to a FTP site).

If the VWlog8 GPRS configuration file is corrupted, or contains syntax errors, default values will be used. If this happens, you may experience unexpected readings, reading intervals, upload intervals and/or no FTP connection.

More details on the content and format of "**xxxxVWL.cfg**" are shown in the table on the following pages.

Logger config file table;

SECTION	AVAILABLE PROPERTIES FOR THIS SECTION	VALID VALUE	RECOMMENDED VALUE
[Channel0] (battery voltage & PCB temperature)	Enabled	"yes" or "no"	yes
	Reading_Interval (mins)	5 to 60	60
[Channel1] [Channel2] [Channel3] [Channel4] [Channel5] [Channel6] [Channel7] [Channel8]	Enabled	"yes" or "no"	yes
	Reading_Interval (mins)	5 to 60	60
	Hz_min	450-6000	1400
	Hz_max	450-6000	3500
	Excitation_Voltage (V)	5 or 15	5
[FTP] (FTP server access properties)	Address	Text, up to 31 characters	"00.000.0.00"
	Username	Text, up to 15 characters	"..."
	Password	Text, up to 15 characters	"..."
	Port	0 to 65535	21
	Data_Folder	Text, up to 126 characters	""
	Reg_Timeout (mins)	1 to 255	10
	Upload_Interval (mins) *	5 to 65535	720
	Max_Upload_Size	1 to 128	2
	Max_Connection_Time	1 to 120	5

If the FTP Upload Interval * is set to less than 60 minutes, battery life will be significantly reduced.

	DESCRIPTION
	"yes" – the reading has been enabled"no" - the reading has been disabled
	Time (in minutes) between the readings
	"yes" – the reading has been enabled"no" - the reading has been disabled
	Time (in minutes) between the readings
	Swept freq min in Hz
	Swept freq max in Hz
	Exciting voltage in V
	FTP address (IP address of the FTP)
	FTP User name
	FTP Password
	FTP port
	FTP sub-folder for data, Enter "" for ftp root folder or a folder name (for example "/datafiles"). This subfolder must already be created on the FTP site
	FTP registration timeout in seconds
	Period in minutes between procedures of the data upload on the FTP
	Maximum data file size. FTP connection will be closed if the Max Upload Size is exceeded, continuing on the next upload interval (no data will be lost)
	Maximum data file transferring time, in minutes. FTP connection will be closed if data file transferring time is exceeded

Format of the Configuration Files

PROPERTIES

The basic element contained in a CFG file is the property. Every property has a name and a value, delimited by an equals sign (=). The name appears to the left of the equals sign.

name=value

The text value must be quoted by using double quotes:

name="value"

The property names are not case sensitive but must not contain any spaces between characters.

If a property is skipped or is not included in the configuration file, the default values of this property will be assumed.

SECTIONS

Properties have been grouped into sections. The section name appears on a line by itself, in square brackets (**[and]**). All properties after the section declaration are associated with that section. There is no explicit "**end of section**" delimiter; sections end at the next section declaration, or the end of the file. Sections may not be nested.

[section]

The section names are not case sensitive but must not contain any spaces between characters. If the same section appears more than once in the same file, or if the same property name appears more than once in the same section, then the last occurrence prevails.

If there is an unrecognised section name, the entire section (with all its properties) will be skipped. Within a known section, all unrecognised properties will be skipped.

If a section is skipped, or is not included in the Logger Configuration File, the default values of all the properties in the section will be assumed.

LINE TERMINATORS, SPACES & COMMENTS

Lines are terminated by a **CR+LF** (carriage return + line feed). Semicolons (**;**) at the beginning of the line indicate a comment.

; comment text

Comments, empty lines and spaces at the beginning of a line will be ignored.

CONTENTS OF THE SIM SETUP FILE 'XXXXSIM.CFG'

The name of the SIM setup file is "**xxxxSIM.cfg**", where; **xxxx** is the VWlog8 GPRS ID (four character serial number found on the silver label).

An example of the SIM setup file is shown below:

```
; VWlog_V1
; SN: 0001
; GPRS (SIM) Config file
; 20 January 2013
; Author: Soil Instruments

[Base]
;GPRS connecting data
APNname="internet"
Username="Soil Instruments1"
Password="password1"
GPRS_Access_Timeout=60
Internet_Access_Timeout=70
DNS1=""
DNS2=""
```

CONTENTS OF LOGGER CONFIGURATION FILE 'XXXXVWL.CFG'

The name of the configuration file is "**xxxxVWL.cfg**", where; **xxxx** is the VWlog8 GPRS ID (four character serial number found on the silver label).

An example of the VWlog8 GPRS configuration file is given below showing channels one and eight;

```
; VWlog_V1
; SN: 0001
; Logger Config file
; 20 January 2013
; Author: Soil Instruments
[Channel0]
; The battery voltage and PCB temperature
Enabled=yes
Reading_Interval=1800
```

```
[Channel1]
; The external channel #1
Enabled=yes
Reading_Interval=900
Hz_min=450
Hz_max=1125
Excitation_Voltage=5

[Channel8]
;The external channel #8
Enabled=yes
Reading_Interval=900
Hz_min=1400
Hz_max=3500
Excitation_Voltage=5

; FTP access
Address="66.220.9.50"
Username="myname"
Password="mypw"
Port=21
Data_Folder="/files/VWlog8 GPRS/"
Reg_Timeout=50
Upload_Interval=120
//data file max size, in MegaBytes
Max_Upload_Size=2
//max data file transferring time, in minutes
Max_Connection_Time=5
```

If the signal strength is below 20 the VWlog8 GPRS can communicate intermittently, below 16 and no communication is likely.

Soil Instruments recommend using a '**GSM/GPRS Radio Signal Analyser**' which is available for purchase from Soil Instruments; order number '**DI-SIG-TEST**'.

Data Files

OVERVIEW

Each time the VWlog8 GPRS is connected to the FTP site, it will perform the following tasks;

1. Generate a new data file with the name; "**yyyymd_xxxx_nnnn.dat**", where;
   - '**yyyy**' is the year, '**m**' is the month and '**d**' is the day.
   - '**xxxx**' is the VWlog8 GPRS ID (four character serial number found on the silver label).
   - '**nnnn**' is a 4-digit file number.

   When '**nnnn**' reaches '**512**', the next data file name will return to "**yyyymd_xxxx_0000.dat**". A new date/time will not cause an overwrite of the previous "**.dat**" file.
2. Update the log file on the device.

Do not remove or delete the files 'xxxxTRK.ini' or 'xxxxVWL.new' (where 'xxxx' is the four character serial number) stored on the SD card under any circumstances.

DATA FILE FORMAT ON SD CARD (RAW DATA)

The Data File is saved as "**.csv**" format using a ring configuration; newest data is saved over oldest (when capacity is full), the size of the ring is hardcoded in the firmware and set at 10,000 records.

The data file on the SD card is a CSV file named "**xxxxnnnn.csv**" where; '**xxxx**' is the logger id and '**nnnn**' is the file number.

The logger will begin to overwrite files when it reaches 511 (512 files).

The data stored in the "**.csv**" file is as follows;

"Date Time",RecordNumber,"Identifier",Battery,Temperature,Reserved, Reserved,Freq1,Freq2,Freq3,Freq4,Freq5,Freq6,Freq7,Freq8,Temp1, Temp2,Temp3, Temp4,Temp5,Temp6,Temp7,Temp8

COLUMN	DESCRIPTION	BYTES	TYPE	NOTES
1	ISO Date/time	6	u8 x 6	Data set time stamp [Year, month, day, hour, min, sec]
2	Record number	1	u8	0-255 (max 256 records/file)
3	Identifier (logger ID)	2	u16	0 – FFFF
4	Battery	4	f32	Battery Voltage
5	Temperature	4	f32	Logger temperature °C
6	Reserved	1	u8	For future use
7	Reserved	1	u8	For future use
8 – 15	Freq(1-8)	4	f32	Sensor Frequency (Hz)
16 – 23	Temp(1-8)	4	f32	Sensor Temperature (°C)

Total bytes per record = 83

FTP UPLOAD

Each time the logger connects to the FTP site it will perform the following;

Generate and upload the file(s) with the name;

'**yyyymd_xxxx_nnnn.dat**', where;

- '**yyyy**' is the year, '**m**' is the month and '**d**' is the day.
- '**xxxx**' is the logger ID and '**nnnn**' is the file number.

The "**.csv**" file on the logger is changed to '**.snt**' to indicate a successfully uploaded file.

LOG FILE

The log file will register various parameters, keeping 10KB rolling records. The Log file is named; "**VWL.LOG**".

Example of a log file;

2014-05-23 08:36:31: Log: GPRS Initialisation OK
2014-05-23 08:36:40: Log: GPRS Signal Level OK

Items logged are:

Power ON
Low Power VX1
Low Power VX2
GPRS SIM Not Present
GPRS Initialisation
GPRS Signal Level
GPRS Resister Success
FTP Success
Unspecified Modem Error

The unspecified modem error may indicate that there are no '**config**' or '**hex**' files to be downloaded from the FTP server.

DETAILED SOFTWARE GUIDE
VWlog8 GPRS Configuration Software

PROPERTIES

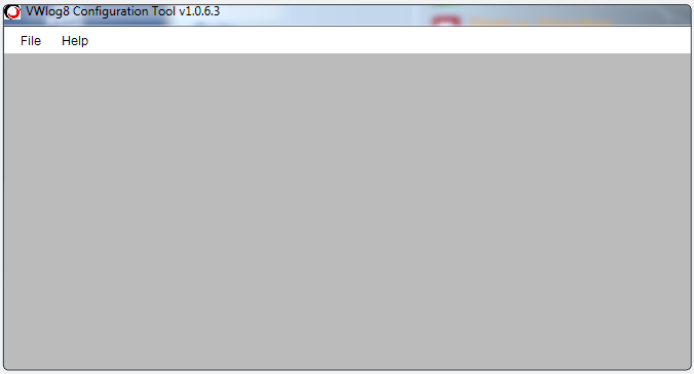
The VWlog8 GPRS is despatched with a blank SD card. Sample files of the VWlog Configuration file and SIM configuration file are provided on the usb stick.

The filenames are:

- VWlog Configuration File: "**xxxxVWL.cfg**"
- SIM Configuration File: "**xxxxSIM.cfg**"

where; '**xxxx**' is the VWlog8 GPRS ID (four character serial number found on the silver label).

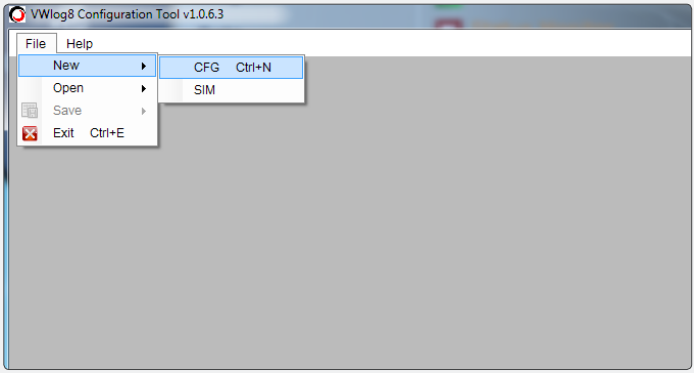
When you start the software, you will see the main VWlog Config form. The software version is displayed at the top of the form after the software name as shown in the screen shot below (VWlog Config v1.0.4.0).



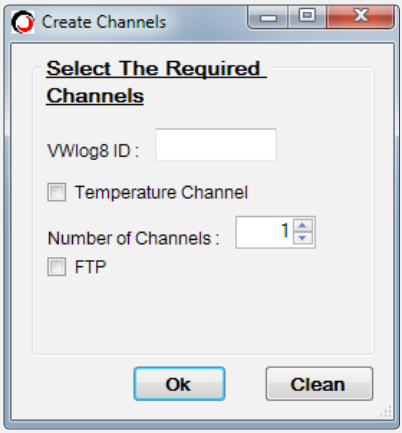
CREATING A NEW CONFIG FILE

File → New →CFG

Selecting '**CFG**' will let you create a new config file while selecting '**SIM**' will create a new SIM file. This section explains how to create a config file, using the provided software.



'**Create Sections**' allows you to choose the required sections.
To create a new configuration file, enter the four digit serial number of the logger into the '**VWlog8 ID**' textbox. This will create the name of the configuration file.

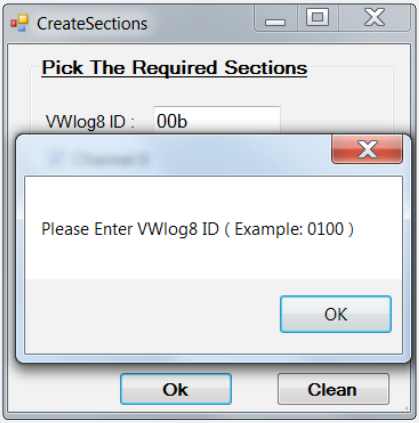


'**Channel 0**' and '**FTP**', checkboxes create the corresponding sections.
'**NTP**' and '**TIME**' are reserved for future use.

(Please refer to the table in '***Contents of Logger Configuration File***' earlier in this manual for detailed explanation);

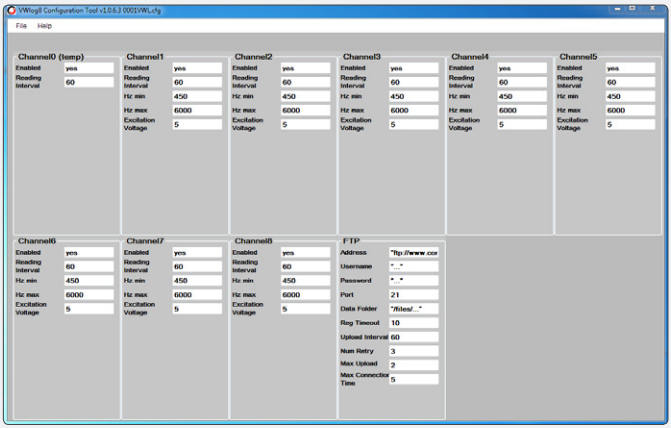
'**Number of Channels**' lets you choose how many channels you want to see displayed on screen.

If the information entered in the '**VWlog8 ID**' textbox is incorrect (for example letters instead of numbers) a box will appear asking you to input the correct information before allowing you to proceed.



If you accidentally type in too many numbers in the '**Number of Channels**' checkbox, it will automatically correct the number defaulting to 8.

When you click '**Ok**', these values are used to create sections in the main form '**VWlog Config**', the file name is displayed on the top of the form as shown in the following;



Please refer back to '***Contents of Logger Configuration File ("xxxxVWL.cfg")***' in the previous chapter for full details and config file examples.

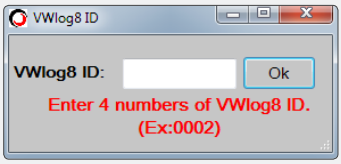
Using the '**Save**' options, you can save the VWlog8 GPRS configuration file either on your computer or on the FTP server.

(Please refer to detailed '**Save**' guide in the following section).

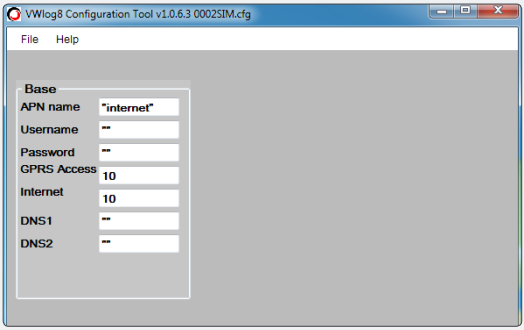
CREATING A NEW SIM FILE

File → New → SIM

The SIM menu item opens a prompt screen to create the SIM section. To create a new "**SIM configuration file**", enter the four digit serial number of your VWlog8 GPRS into '**The VWlog8 ID**' textbox.



The '**Ok**' button uses the number and creates the new SIM section.



Please refer back to '*SIM Setup File ("xxxxSIM.cfg")*' in the previous chapter for full details and config file examples.

File →Save

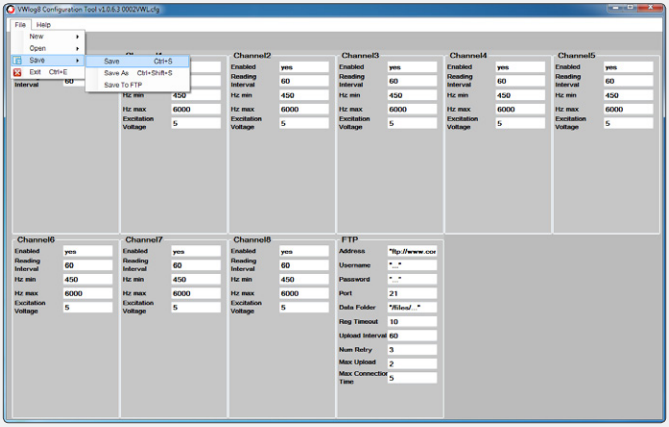
Using the '**Save**' option, you can save the VWlog8 GPRS configuration file on your computer.

Before data is saved, the software checks if the values are correct. If it finds an error, it changes the textbox colour and shows an error message. It will not save the file until the errors are fixed.

The '**Save**' option saves screen data in one of three ways:

1. If it is a new file, it opens a dialogue box to save data in a new configuration file.
2. If a configuration file is opened from a folder, it will save over the same file.
3. If a configuration file is opened from an FTP site, it opens a dialogue box ('**Save As**') to save the configuration file on to the computer.

'**Save As**' allows you to create a folder in your chosen path and save the form data inside that file.



You must be connected to the internet to configure, upload and download compatible files over an FTP site.

'**Save To FTP**' allows you to save config/setup files on the FTP server:

'**Address:**' The FTP address

'**Data Folder:**' The FTP sub-folder

'**File Name:**' The logger configuration file name ('**xxxxVWL**')

'**Username**' and '**Password**': The FTP username and password to log in.

A config file must have already been stored onto the FTP site. The "Save to FTP" overwrites the original file.

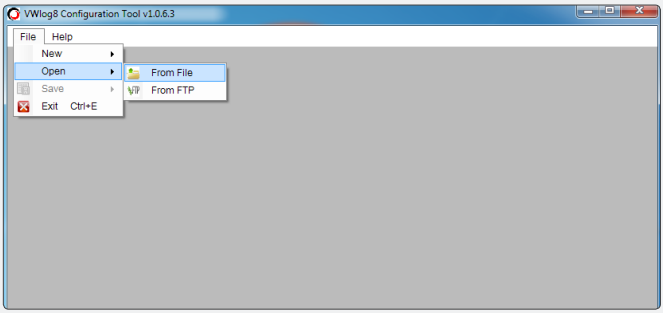
If all the textboxes are completed, click '**Ok**' to connect to the FTP and close the FTP Data form. Configuration file sections will be created on the main form and you will see the address displayed on the top of the main menu.

'**Clean**' clears all the textboxes in the FTP Data form.

'**Quick Save FTP**' lets you save the file in the FTP, using the FTP section data previously saved.

File → Open

When you click on '**Open**' there are two options; one opens the file on your computer ('**From File**'), the other opens the file in the FTP server ('**From FTP**'):



'**From File**' displays a dialogue box from which you can select a configuration or SIM file, however, the SIM file cannot be opened via FTP. After you have chosen the file, previous sections are removed from screen and new file sections are created on the main form. If the section numbers are greater than 12, a scroll bar appears on the right of the form.

'**From FTP**' opens the FTP Data Form to retrieve the FTP information in order to read the file from FTP server:

When the VWlog8 GPRS connects to the FTP, it will copy "**xxxxVWL.cfg**" to the FTP for processing. When the contents of the file "**xxxxVWL.cfg**" displays "**done**" you know that the config file has been successful.

'**Username**' and '**Password**': The username and password of the FTP to log in.

If all the textboxes are completed, click '**Ok**' to connect to the FTP and close the FTP Data form. The logger configuration file sections are then created in the software.

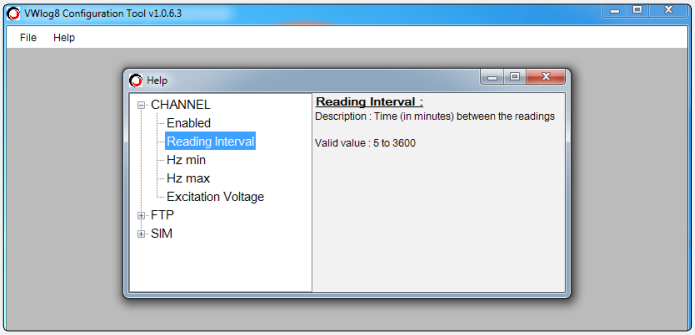
'**Clean**' clears all the textboxes in the FTP Data form.

File → Exit

'**Exit**' closes the main form.

Help

If you click on '**Help**', it will open a new form which explains the section contents and shows example values on screen:



About

'**About**' displays information about the software.

MAINTENANCE GUIDE
Maintaining the VWlog8 GPRS System

The VWlog8 GPRS is manufactured with multilayer circuit boards containing surface mounted components. For this reason there are no parts which require routine maintenance other than the replacement of the external battery, the recalibration of the VWlog8 GPRS and insertion of a SIM card.

BATTERY MAINTENANCE

Battery maintenance is required when the VWlog8 GPRS is solely powered by a 12V lead acid battery.

When replacing the batteries, make sure to run all the start-up tests to ensure that the VWlog8 GPRS is still communicating, Soil Instruments recommend increasing the upload frequency to around every 5 minutes and checking the FTP for successful communication.
This will ensure the VWlog8 GPRS is working with the new battery.

The VWlog8 GPRS battery status is logged at regular intervals, enabling you to monitor and replace in a timely manner and so avoid subsequent data loss.

Ensure the power source is connected in the correct polarity.

Battery life is dependent on the following factors:

- Upload frequency
- Battery type
- Sensor reading frequency
- Ambient temperature

Soil Instruments advise using a 12V 7Ah battery as a minimum for the Battery and Solar power applications.

SIM CARD REPLACEMENT	A SIM card will need to be inserted each time the VWlog8 GPRS is installed; no SIM card is supplied with the VWlog8 GPRS so you will need to supply your own SIM card and replace it yourself if necessary. Soil Instruments support may advise you if the SIM card is the cause of any problems you may be experiencing with the VWlog8 GPRS, but it will be your responsibility to supply a new SIM card. A data plan of 10Mb would be more than sufficient for standard read and upload rate. However, the exact data plan required will depend on how many sensors you want the VWlog8 GPRS to read and how often.
SD CARD REPLACEMENT	The VWlog8 GPRS is provided with a 4GB SD card as standard. In the unlikely event of the SD card requiring replacement, Soil Instruments recommend using a recognised brand with a similar amount of data storage, 4GB being the maximum size supported.

APPENDICES

Appendix A – Firmware Update

LOCAL FIRMWARE UPDATE

You can update the VWlog8 GPRS firmware locally. The firmware will be supplied by Soil Instruments as a binary file with a "**hex**" extension. The typical filename is "**VWLVx.xx.hex**".

To perform a local firmware update;

STEP	ACTION
1	Power down the VWlog8 GPRS
2	Remove the SD card from the VWlog8 GPRS.
3	Rename the latest firmware file such as "**VWLVx.xx.hex**" to "**image.hex**".
4	Copy "**image.hex**" to the root folder of the SD card.
5	Re-install the SD card.
6	Power up the VWlog8 GPRS
7	VWlog8 GPRS will update its firmware to the new firmware.
8	VWlog8 GPRS will delete "**image.hex**" from the SD card.

REMOTE OVER-THE-AIR FIRMWARE UPDATE

You can update the VWlog8 GPRS firmware remotely and over-the-air. The firmware will be supplied by Soil Instruments as a binary file with a "**hex**" extension. The typical filename is "**VWLVx.xx.hex**".

To perform a remote firmware update;

STEP	ACTION
1	Rename the latest firmware file, e.g. "**VWLVx.xx.hex**" to "**imagexxxx.hex**", where; '**xxxx**' is the VWlog8 GPRS ID (four character serial number found on the silver label).
2	Upload "**imagexxxx.hex**" to the folder on the FTP site as specified in the "**xxxxVWL.cfg**".
3	When the VWlog8 GPRS connects to the FTP site, VWlog8 GPRS will copy "**imagexxxx.hex**" to the SD card as "**image.hex**".
4	VWlog8 GPRS will then perform a software reset and update its firmware to the new firmware.
5	VWlog8 GPRS will replace the content of "**imagexxxx.hex**" on the FTP with "**done**".

If the VWlog8 GPRS has a poor mobile signal, it may have problems uploading the firmware due to the size of the firmware file. Soil Instruments recommend a local firmware update in this case. Please refer to '***Detailed Software Guide***' in this manual.

Appendix B – Frequently Asked Questions

Why does the Power light not light up when I apply power?

This may be caused by a flat battery or a bad connection to the battery. Use a multimeter to check the battery power. If the battery has full voltage and the light still does not light up, then please contact Soil Instruments support.

Why is the Network Status light permanently on?

This means the VWlog8 GPRS is having trouble connecting to the GPRS Network. This can happen occasionally if the local network provider is having problems. The VWlog8 GPRS will automatically try a different network, or continue retrying the same network if it is the only one available. If the problem persists please contact your wireless data plan provider for further assistance.

Do I need a static IP (internet provider) address to operate the VWlog8 GPRS?

No, the VWlog8 GPRS connects to the FTP directory using a SIM card (supplied by you). All communications with the web portal are initialised by the VWlog8 GPRS; as a result no static IP is required.

What size of data plan will I need with my SIM card?

The size of data plan you need will depend on how many sensors you are reading and how often you read them and upload the data. However, Soil Instruments has found that a 10MB data plan is more than sufficient for logging eight sensors plus battery voltage every 15 minutes and uploading data every hour (although logging and uploading at this rate will reduce the battery life).

What sweep frequency range should I use to read my VW sensors?

In most cases, the default sweep frequency range (1400-3500 Hz) works well. Soil Instruments recommend you consult the manufacturers manual for the recommended sweep range for the particular instrument. Several user setable ranges can be created.

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