



RST INSTRUMENTS LTD.

Multi Channel
Datalogger Mobile
Instruction Manual

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RST Multi Channel Datalogger

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Instruction Manual

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1 OVERVIEW

The RST Multi Channel Datalogger was intended to be low cost, simple to use, battery powered data logger, designed for reliable, unattended monitoring of a mix of vibrating wire sensors and thermistors. It is deployable in harsh environments and as compact as possible. The user-friendly software allows easy downloading of the data and maintenance in the field. The software is preinstalled on an Ultra-Rugged Field PC™ that can withstand the often demanding field conditions. Even users with very little experience with Geotechnical Instruments will be able to connect, download data and change settings with a matter of a few inputs. Moreover, the Multichannel host software is fully compatible with RST Single Channel Datalogger, the same software interface can be used to configure and download data from either Multichannel or Single Channel logger.

2 QUICK-START INSTRUCTIONS

The following is a brief outline with references to other parts of this manual to get you up and running quickly with the RST Multi Channel Datalogger:

2.1 MULTICHANNEL DATALOGGER SETUP

1. The software is preinstalled on Ultra-Rugged Field PC™.
2. Remove the cover of the datalogger by the four Phillips screws.
3. Insert the stripped ends of the cable for the VW Transducer or thermistor sensor through the cable gland and attach them to the terminal strip as shown below.

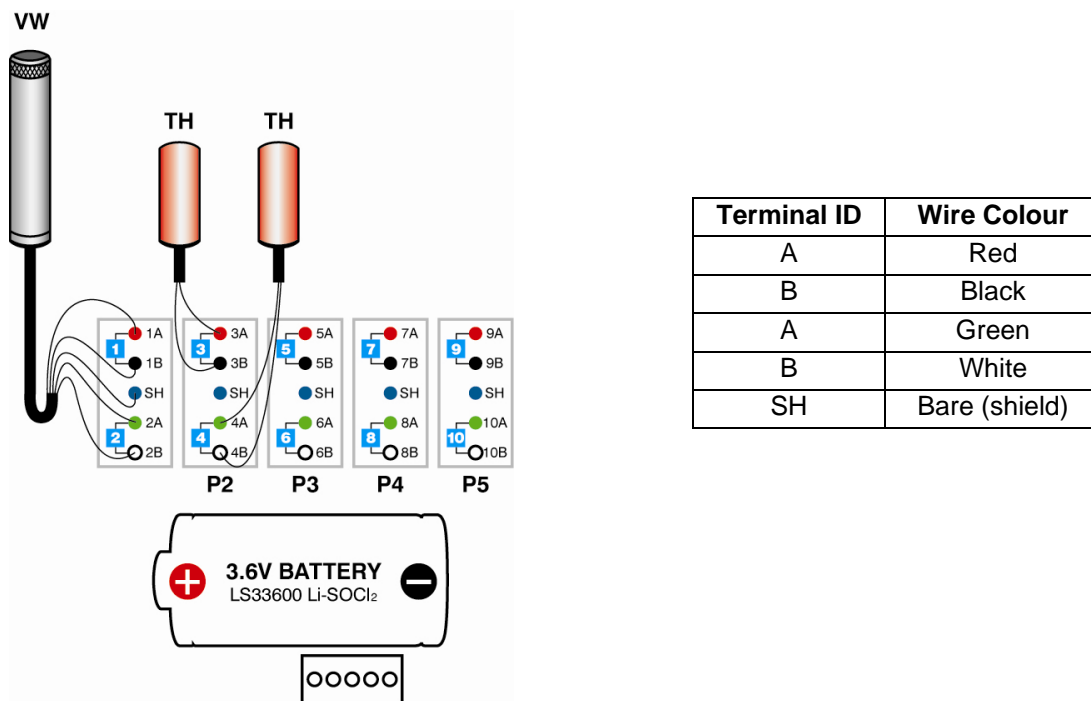


Figure 1: Sensor connections

4. Using the supplied USB cable, connect the datalogger to your Ultra-Rugged Field PC™.
5. Select *Multi* from pull down menu on *Status* screen.

2.2 SINGLE CHANNEL DATALOGGER SETUP

1. Remove the cover of the datalogger by the four Phillips screws.
2. Insert the stripped ends of the cable for the VW Transducer through the cable gland and attach them to the terminal strip. Where:

| Terminal ID | Wire Colour |
|-------------|---------------|
| C1 | Red |
| C2 | Black |
| T1 | Green |
| T2 | White |
| SH | Bare (shield) |

3. Insert two standard 'AA' Alkaline batteries into the holder.
4. Using the supplied COM cable, connect the datalogger to the Ultra-Rugged Field PC™ serial port.
5. Select *Single* from pull down menu on *Status* screen.

2.3 DATALOGGER CONFIGURATION

1. Launch the software. Once connected, the status screen should automatically appear displaying logger information. See Section 7.1 for connection troubleshooting.
2. Navigate to the *Sensors* tab and setup all attached sensors parameters. Once the desired parameters are set, press the *Apply* button to apply the changes and start logging.
3. If you wish to record the data in specific Engineering Units, enable the *Eng Units* and enter the appropriate parameters and press the *Apply* button to update the logger.
4. Go to Logging tab and check that logging parameters are correct and change them if necessary. If changes were made, Press the *Apply Settings* button to apply settings and start logging.
5. If desired, the sensor current reading can be monitored in real time by selecting the *Monitor* tab.
6. Under the *Status* tab, check to make sure the parameters are correct and that the logger is either *logging* or there is a *log pending*.
7. Exit the software and disconnect the USB cable.
8. The datalogger should now be taking readings. Return when desired to download the data. Make the habit of checking the battery voltage every time you connect.

2.4 DOWNLOADING DATA

1. Connect the USB cable to your computer and the datalogger and launch the software. If the connection is successful, the *Status* screen should display “Connected” status, and fill up the screen with other details of the datalogger..
2. Press the *Collect Data* button to download the data. A data file (*.csv) will automatically be created in the **My Documents\Multichannel** folder.
3. After downloading, the program will prompt you whether you would like to erase the existing data on the logger or keep appending to existing records. Alternatively, if you wish to erase the old data and continue logging with the same parameters, press the *Setup* tab and press *Apply*.
4. If you wish to keep the old data on the logger and continue logging, exit the program and disconnect the USB cable.
5. If you wish to change any logging parameters, do so under the *Logging* tab and press *Apply* to save the changes.
6. Disconnect the USB cable when finished.

3 READOUT UNIT

The Ultra-Rugged Field PC™ is well suited for use in the often demanding field conditions. All connections are conveniently located on the front of the case, after taking readings the cover should be always put back in place to protect connectors.



Figure 2: Ultra-Rugged Field PC™ Case

3.1 USING THE ULTRA-RUGGED FIELD PC™

Once the Ultra-Rugged Field PC™ is connected to the Datalogger, turn on the power to the Ultra-Rugged Field PC by pressing the power button (Figure 3).



Figure 3: Overview of the Ultra-Rugged Field PC™

| Front Image | | Back Image |
|-------------------------|-------------------------|--------------------------|
| 1. Elastomer overmold | 9. Speaker | 16. Battery Door Latch |
| 2. Magnesium case front | 10. Directional button | 17. Accessory attachment |
| 3. Display bezel | 11. Power button | 18. Hand strap |
| 4. Charge LED | 12. Context menu button | 19. Battery door |
| 5. Start menu button | 13. Enter button | |
| 6. Applications button | 14. Notification LED | |
| 7. Microphone | 15. Touchscreen display | |
| 8. Today screen button | | |

Top Image

- 20. Standard cap screws
- 21. Stylus

Bottom Image

- 22. Stylus slot
- 23. USB client (mini B)
- 24. 12V DC jack
- 25. 9-pin serial port
- 26. USB host (mini A)
- 27. Cable routing channel

Note

Depending on the version, the Ultra-Rugged Field PC™ may vary slightly from the model shown in Figure 3.

4 LOGGER MENU

Once the datalogger is connected to the Ultra-Rugged Field PC™, turn on the power to the Ultra-Rugged Field PC™ by pressing the power button (Figure 3).

Use the stylus to navigate through the operating environment. If you are unfamiliar with the *Windows Mobile* operating environment, please refer to the “*Getting Started Guide*” which is supplied on CD-ROM with the Ultra-Rugged Field PC™.

From the *Start* menu, choose: *Multichannel Logger* to launch the RST Multichannel Datalogger Software. The logger menu appears when the program is initially launched. The menu contains six tabs: *Status*, *Mon*, *Log*, *Sensors*, and *Exit*. Each tab option is explained in detail below. Until successful logger connection, all tabs are inaccessible except *Status*.

4.1 STATUS

The status tab contains three main components: *Logger*, *Sampling*, *Battery* and *Mode*.

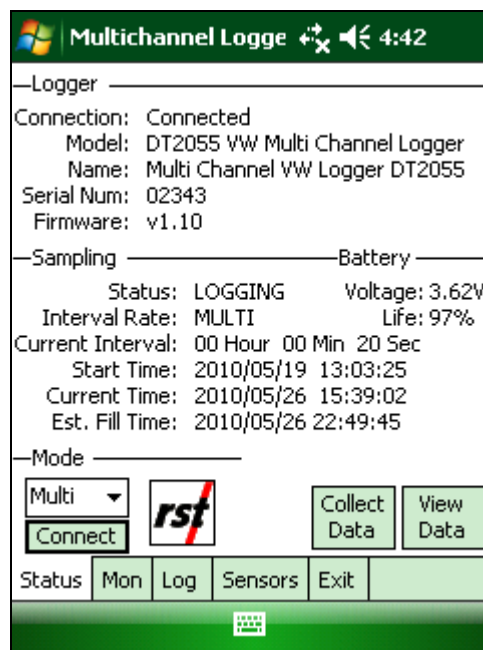


Figure 4: Status Tab

Logger

Provides information about the currently connected datalogger. This includes the model, name, serial number, and firmware version. Ensure that the serial number matches what is expected (in this example it is 02343). If it does not, ensure that a connection with the logger has been established.

Sampling

Provides information about the status of the logger. This includes whether or not it is logging, the log interval, and various time parameters.

Battery

Provides information on the battery voltage and the estimated battery life. To ensure uninterrupted operation, replace batteries when voltage drops below 2.0 Volts. DT2055 Multichannel logger uses special long life lithium battery, contact RST for replacement part.

Mode

The RST Multichannel Datalogger software connects to either the RST Multichannel Datalogger or RST Single Channel Datalogger. Select the device you wish to access and press *Connect* button.

Collect Data

If the datalogger has already been configured to collect data at a specified interval, the *Collect Data* button can be pressed. The program will download the data (a progress bar will be displayed) and automatically write it to a *.csv file in the **My Documents\Multichannel** directory. Please see section 5 for the *.csv file format.

Note

When pressing the *Collect Data* button, after the data download completes, the program will give a choice to keep or erase the data currently contained in the datalogger. If the datalogger memory is not erased, the next time the data is collected (and no parameters have been changed) it will download the current readings and all of the previous data to a *.csv file.

The current memory can also be erased by pressing the **Apply Settings** under the *Log* or *Sensors* menu. The program will prompt you to confirm the erasing of data from its memory.

RST Logo

Press the *RST Logo* button to display Multichannel Datalogger version and copyright information.

4.2 VIEW DATA

After the data is downloaded from datalogger memory, the contents of the data file can be viewed by pressing *View Data* button. The File Listing Screen is then presented. For each selected datafile, the status of the datalogger is shown at the bottom of the screen. This status is recorded in each datafile at the time of data download.

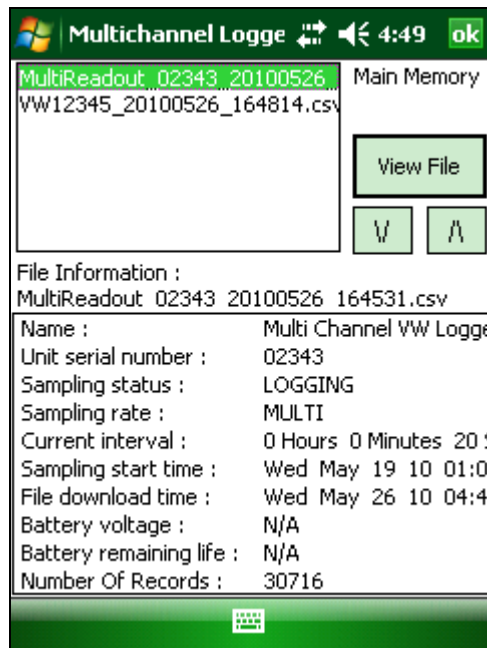


Figure 5: File Listing Screen

By selecting desired filename and pressing *View File*, the contents of the data file are displayed in the table. The status bar at the top of the screen shows the total number of recordings and the current line number. The sample screen is shown on Figure 6.

Number of records: 30716, 1

| # | Date Time | S 1 ("kPa") | S 2 ("de" |
|----|----------------|-------------|-----------|
| 1 | 2010/05/19 ... | 13.38 | 18.2 |
| 2 | 2010/05/19 ... | 13.38 | 18.2 |
| 3 | 2010/05/19 ... | 13.38 | 18.2 |
| 4 | 2010/05/19 ... | 13.38 | 18.2 |
| 5 | 2010/05/19 ... | 13.38 | 18.2 |
| 6 | 2010/05/19 ... | 13.38 | 18.1 |
| 7 | 2010/05/19 ... | 13.38 | 18.2 |
| 8 | 2010/05/19 ... | 13.38 | 18.1 |
| 9 | 2010/05/19 ... | 13.38 | 18.1 |
| 10 | 2010/05/19 ... | 13.38 | 18.1 |
| 11 | 2010/05/19 ... | 13.38 | 18.0 |
| 12 | 2010/05/19 ... | 13.38 | 18.0 |
| 13 | 2010/05/19 ... | 13.38 | 18.0 |
| 14 | 2010/05/19 ... | 13.38 | 18.0 |
| 15 | 2010/05/19 ... | 13.38 | 18.0 |
| 16 | 2010/05/19 ... | 13.38 | 18.1 |
| 17 | 2010/05/19 ... | 13.38 | 18.1 |

Figure 6: File View Screen

Note

Data View displays major datalogger settings and all saved data records. Use text file viewer or spreadsheet program (ex. MS Excel™) to see entire file.

4.3 MONITOR

Selecting the monitor tab sets the datalogger into monitor mode. The screen reports in B-units ($f^2 \times 10^{-3}$) or the thermistor temperature in degrees Celsius.

If successfully connected to the datalogger, the sensor reading or temperature reading is updated approximately once per two seconds. Dot indicator flashes each time a sensor data is updated. Clicking the check boxes changes the display to Engineering Units, or thermistor resistance. For Fahrenheit temperature units, check the appropriate box in *Sensors* tab. For Fahrenheit temperature units, check the appropriate box in *Sensors* tab.

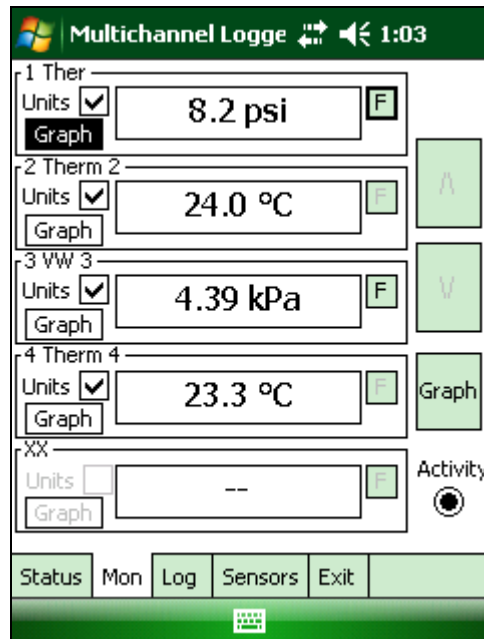


Figure 7: Monitor Tab

Note

Engineering Units are only available when sensor calibration data and conversion method is set in Sensors page. Please see section 4.5 for the instructions on entering calibration data.

Until communication is established with the datalogger, the program will display "----" in Sensor Reading fields.

When Sensor Reading is outside of the valid range, "RANGE_ERR" will be displayed.

4.4 GRAPH

The graph button invokes the datalogger graphical monitor for selected sensor. Recent monitor readings are displayed then in a Sensor Reading vs. Time graph. If successfully connected, the graphical monitor is updated approximately once every two seconds. Initially, the graphical screen needs few seconds to autocalculate axis ranges.

The real time sensor reading is displayed below the graph window. Manual “Scale” slider bar is provided for fine tuning of graph vertical scale.

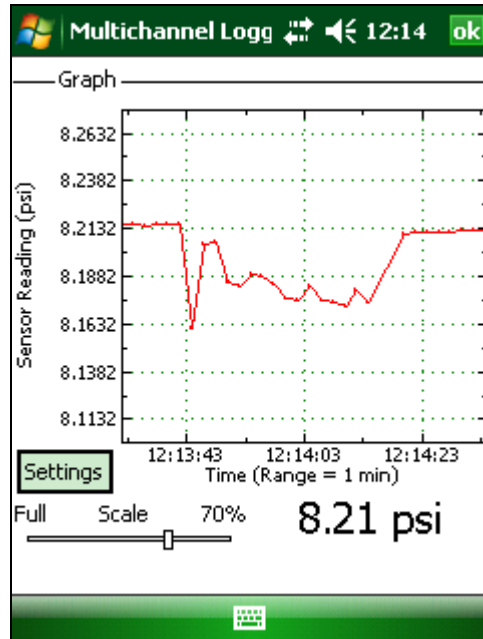


Figure 8: Graph Tab

Note

The Graph screen will be refreshed when engineering units are changed or relevant settings are changed.

Until communication is established with the datalogger, the program will display “----“ in sensor reading area.

When Sensor Reading is outside of the valid range, “RANGE_ERR” will be displayed.

The “Scale” slider is disabled when manual scale settings are used in Graphical Monitor Options.

The “Settings” button launches the Graphical Monitor Options dialog, which allows the user to manipulate the graph. Options include the ability to display Engineering Units, set minimum and maximum Sensor Reading ranges (y-axis), and set the time range of monitor data points displayed (x-axis, range between 1 minute and 2 hours).

To manually adjust the minimum and maximum Sensor Reading ranges (y-axis), the “Auto” checkboxes need to be cleared.

The Graphical Monitor Options screen is shown on Figure 9.

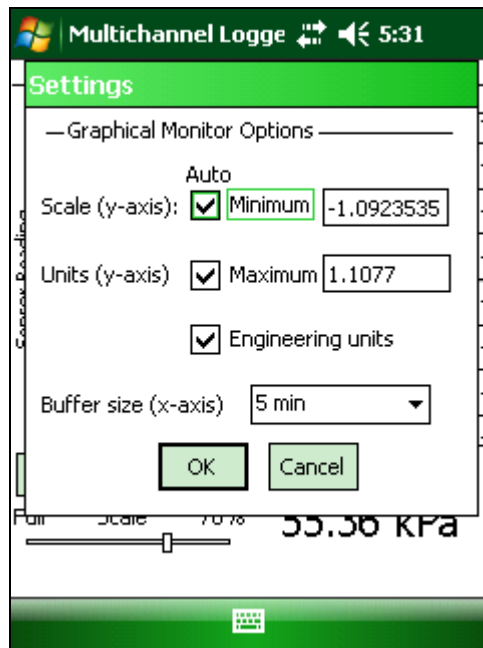


Figure 9: Graphical Monitor Options

4.5 LOGGING

The Logging tab contains three main components: *Interval*, *Logger Options* and *Clock Options*.

Figure 10: Setup Tab

Logger Label

Custom label can be entered if desired. Press the *Update Label* button to change logger label.

Interval

This section is used to set the logging interval. *Fixed interval* and *Multi interval* options are available. The fixed logging interval can be invoked by choosing the “Fixed” radio button, and set within the main setup tab. Arrow buttons allow the user to scroll up or down preset values.

To setup the logger with multiple intervals, select the *Multi (Advanced)* radio button. Clicking the *Advanced* button launches the Multi Interval Table dialog, where up to 12 custom, multiple intervals can be applied.

| Multi Interval Table | | | | | |
|----------------------|------|-----|-----|-----------|---------------------|
| | Hour | Min | Sec | Iteration | Fill Time (d h:m:s) |
| 1: | 1 | 0 | 5 | 3000 | 125 04:10:00 |
| 2: | 0 | 0 | 20 | 2000 | 0 11:06:40 |
| 3: | 0 | 1 | 40 | 1500 | 1 17:40:00 |
| 4: | 0 | 1 | 0 | 1000 | 0 16:40:00 |
| 5: | 0 | 2 | 0 | 500 | 0 16:40:00 |
| 6: | 1 | 0 | 0 | 0 | 1000 00:00:00 |
| 7: | 0 | 0 | 0 | 0 | |
| 8: | 0 | 0 | 0 | 0 | |
| 9: | 0 | 0 | 0 | 0 | |
| Totals: | | | | 8000 | 1128 18:16:40 |

Save Cancel Update

Figure 11: Multi Interval Table

The hour, minute, second and number of iterations per interval must be specified.

Note

Each interval **MUST** have an iteration except the last iteration which must be set to zero. This tells the program that the logger will continue at the last iteration rate.

The memory capacity depends on logger hardware. Multichannel logger data recording capability ranges from up to 303,030 records with 2 sensors connected and 106,470 records in 10 sensor configuration. Single Channel Loggers can hold up to a maximum of 32,000 iterations for all intervals. The dialog features an Interval Fill Time field, which allows the user to see the exact time, relative to the start time of the interval, the interval iterations will finish. To update both the *Interval Fill Time* and *Total Iterations field*, click the "Update" button. To save changes, click the "Save" button.

Logger Options

Start Time: A check box can be selected to enable a custom start time. The hour and minute can be entered in 24-hour format.

Note

If a custom start time is entered and this time has already past, the logger will not start until 24 hours has passed. For example: If the current time is 13:01 and the start time is set to 13:00, the datalogger will not start logging data until 13:00 *the next day*.

If a custom start time is applied, i.e. for some time in the future, the *Status* will read *Log Pending* until that interval is reached.

Wrap on Mem Full (Overwrite Data): When the datalogger memory becomes full, it will overwrite itself.

Stop on Mem Full: Datalogger stops collecting data when it reaches its memory storage limit.

Clock Options

Allows the user to set the date and time of the datalogger. Checking the *Auto Sync Time* checkbox will update datalogger internal clock each time *Apply Settings* button is pressed.

Apply Settings Button

After any changes have been made on the datalogger *Log* screen, pressing the *Apply Settings* button saves these changes and uploads them to the datalogger's memory.

4.6 SENSORS

The Multichannel Host Software *Sensors* tab will display one of two types of sensor configuration screens, depending on sensor type. The following buttons are common to all sensor configuration screens:

Add Sensor

This button will activate sensor add menu.

To add vibrating wire sensor, select *Add VW Sensor*. The screen will change to VW mode.

To add thermistor sensor, select *Add Temp Sensor*. The screen will show controls for setting up thermal sensor.

Delete

Deletes currently displayed sensor configuration.

File

This button will activate sensor configuration file menu.

Select *Save to File* for later retrieval.

Select *Load from File* to load previously saved sensor settings.

Verify

Once sensor configuration is saved and sensors connected, click on *Verify* to detect and verify current setup. Each connection is tested and results displayed.

The following parameters are shown:

- Sensor label
- Pre-configured (Expected) sensor type
- Detected sensor type
- Measured sensor resistance in Ohms

When detected sensor parameters appear correct, background color turns green, otherwise background color turns red to indicate error.

The sample screen is shown on Figure 12.

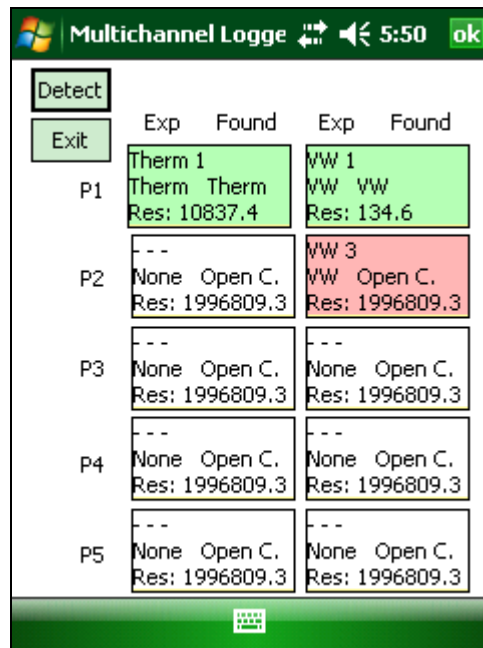


Figure 12: Verify Sensor Connections

Apply

As a reminder, whenever **ANY** changes are made under the Sensors tab, the *Apply* button must be pressed in order to update the logger with the current sensor settings.

4.6.1 VW SENSOR CONFIGURATION SCREEN

Often the user may wish to report the readings directly in engineering units, rather than B-units ($f^2 \times 10^{-3}$). Data required for the conversion to engineering units is always found on the calibration sheets for the transducer.

Each transducer is shipped from the factory with a calibration sheet. If you have not received a calibration sheet, or the sheet has been lost, please contact RST Instruments and a copy will be faxed or e-mailed to you.

Figure 13: VW Sensors Tab

VW Sensor Type

A drop down menu allows the user to select from a list of preset sweep frequency settings. The software also allows a custom, user defined sweep frequency for use with non-standard vibrating wire sensors. To select this option, choose the “Custom (Advanced)” option from the drop down menu, click the “Advanced” button, fill in the required fields and click *Sweep* to determine the remaining parameters.

Figure 14: Custom Vibrating Wire Settings

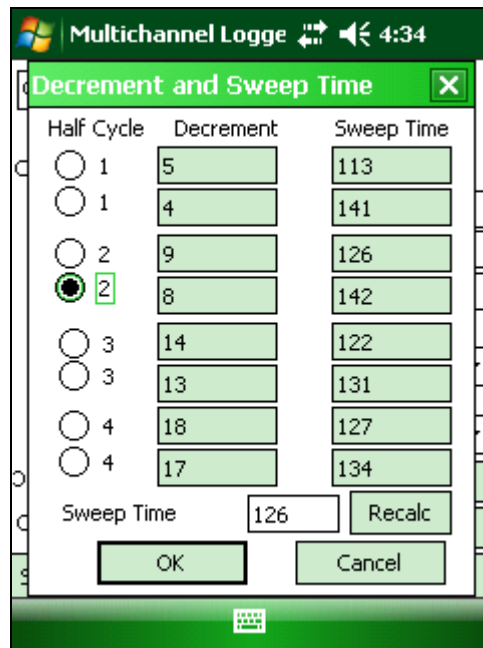


Figure 15: Decrement and Sweep Time options

Enter the desired Sweep Time and click *Recalc*. The program will calculate Decrement and Sweep Time and give option to choose optimal parameters

Conversion Method

The user is given an option to apply either a *Linear* or *Polynomial* Conversion. If *Linear conversion* is selected, input the provided Calibration Factor and Zero Reading into the appropriate boxes.

If *polynomial conversion* is selected, input the provided coefficients (A, B & C) into the appropriate boxes.

Temperature Correction

When the Temp Corr box is checked, the software will apply a temperature correction to the data. This requires the user to enter in the temperature correction factor and an initial temperature which is found on the calibration sheet for that particular instrument. Then select thermistor sensor used to read temperature.

If the calibration sheet is missing, please contact RST Instruments and a copy of the calibration sheet can be faxed or e-mailed to you.

Units Conversion

Units Type: Choose pressure or distance using the drop-down menu.

Input Units: These are the units of the calibration constants you inputted into either the linear conversion or polynomial conversion methods. In general, the calibration constants reported on the calibration sheets are either in kPa/B unit or psi/B unit. In the case of strain gauges, this could be mm/B unit.

Output Units: Select the appropriate output units from the drop-down list. The conversion will be done automatically resulting in desired units displayed in Monitor tab and recorded in downloaded file data.

Output Offset: This is a user defined offset value. Under certain circumstances, the user may wish to enter in the elevation of the pressure transducer. In this way the reported pressure will be correlated to a reference elevation (i.e. above sea level).

4.6.2 THERMAL SENSOR CONFIGURATION SCREEN

Thermal Sensor Type

A drop down menu allows the user to select the type of thermistor used in the vibrating wire instrument.

To display Fahrenheit units, check the *Fahrenheit temperature units* checkbox. This global setting applies to all thermistor sensors.

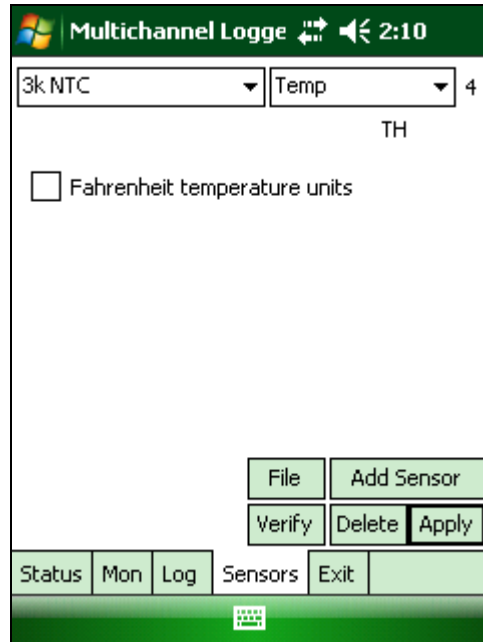


Figure 16: Temperature Sensors Tab

4.7 EXIT

Pressing the *Exit* tab will close the Multichannel Logger program.

5 DOWNLOADING DATA TO A DESKTOP PC

The software used to transfer data will depend on the version of Microsoft Windows installed on a desktop PC.

For Windows XP versions, ActiveSync™ is required. Windows Vista and Windows 7 have a build-in Mobile Device Center. It is highly recommended to download and install the newest updates from Microsoft website.

5.1 INSTALLING MICROSOFT ACTIVESYNC™ ON WINDOWS XP

In order to communicate between the Ultra-Rugged Field PC and a desktop PC or laptop, Microsoft's ActiveSync™ software is required and is included with the Multichannel Datalogger System. Communication between the two devices is achieved through an USB connection.

Note

Microsoft's ActiveSync™ software can be freely downloaded from Microsoft's website.

Important

Don't connect the USB cable before installing ActiveSync™ software. Doing so will result in installation of generic Windows USB drivers which will not work with Ultra-Rugged Field PC.

To install Microsoft ActiveSync™:

1. Insert the Ultra-Rugged Field PC Companion CD into the CD-ROM drive. On most systems, Windows will automatically launch the setup program. Minimum system requirements are outlined in the jacket of the CD-ROM. Once the CD is up and running, a graphical window will open. Press the *play* icon on this window.
2. Click the link marked *Start Here*.
3. Click *Install ActiveSync*. Note: When prompted to download the file, select *Run this program from its current location*. Installing Microsoft Outlook is **not** necessary, for the Multichannel Datalogger System to function. If you wish to use the Ultra-Rugged Field PC for e-mail, install Outlook.
4. Follow the on-screen instructions until you reach the screen shown below, and then continue with Step 5.

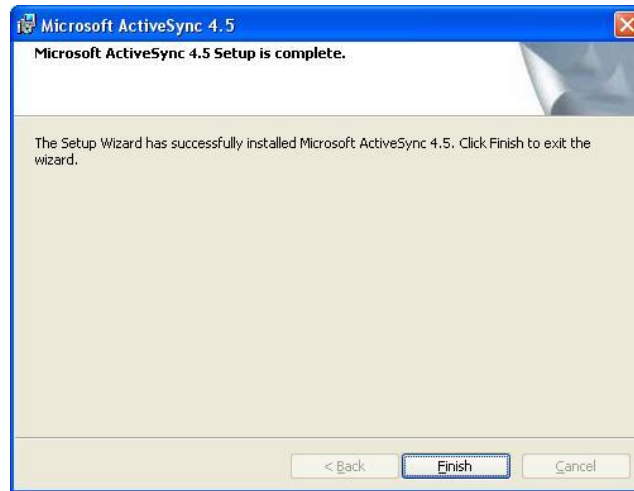


Figure 17: ActiveSync Connection Screen

5. Click Finish button.
6. Insert the AC Adapter plug into an electrical outlet. Connect the AC connector barrel connection on the base of the Ultra-Rugged Field PC (item 24, Figure 3).
7. If you have not already done so, connect the mini USB connector to the connector on the base of the rugged case and the USB connector to the USB port on either the front or back of your personal computer.

Note

ActiveSync will automatically detect the Ultra-Rugged Field PC connection.

8. Continue to follow the ActiveSync instructions to establish a partnership. Eventually you will come to a screen like the one below:

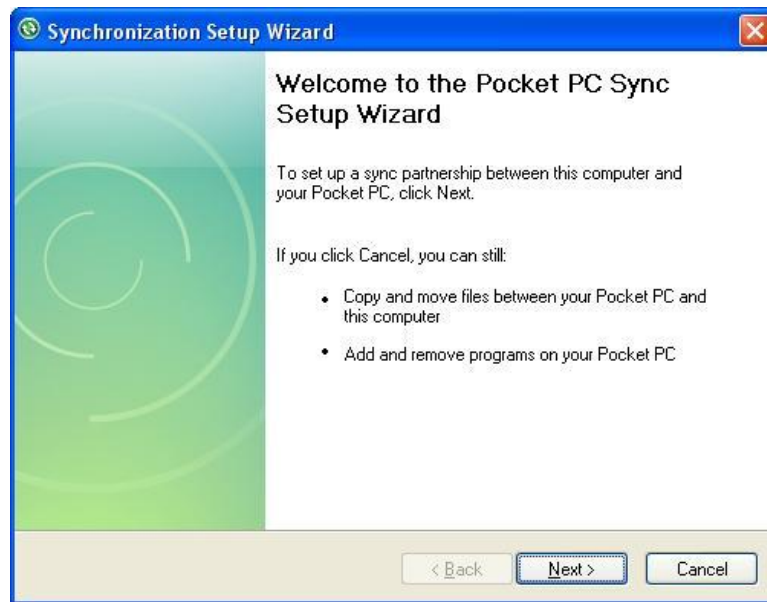


Figure 18: Setting Up a Partnership

In order to synchronize the data in real-time between the Ultra-Rugged Field PC and the desktop PC, you must set up a *sync partnership*. If you do not wish to synchronize data and simply use Windows Explorer to copy files to and from the Ultra-Rugged Field PC, click Cancel to leave the connection as *Guest Partnership* and skip the remaining instructions.

1. To set up a *sync partnership*, press *Next*.
2. Uncheck the option for synchronizing with Microsoft Exchange Server, press *Next*.
3. Decide what type of information you would like synchronized with the desktop computer. If you are only using the Ultra-Rugged Field PC for the purposes of transferring Multichannel Datalogger information, uncheck all the options and place a check mark next to the *Files Folder* (see below).

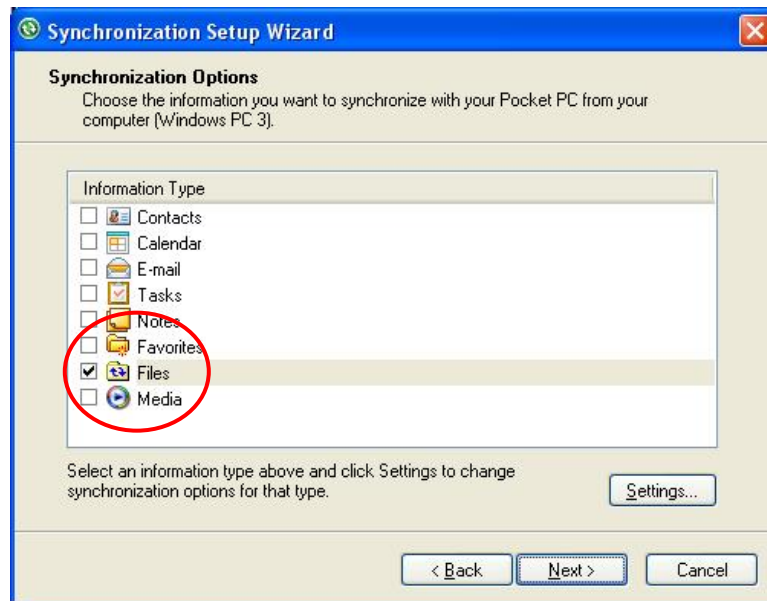


Figure 19: Synchronization Settings

The software will notify you that it will create a folder on the desktop which links directly to the Ultra-Rugged Field PC (*press OK*). Click *Next*, and then *Next* on following dialog, then *Finish* the installation. Once the partnership is established, the PC will recognize and

automatically synchronize to the Ultra-Rugged Field PC each time it is connected with the USB cable.

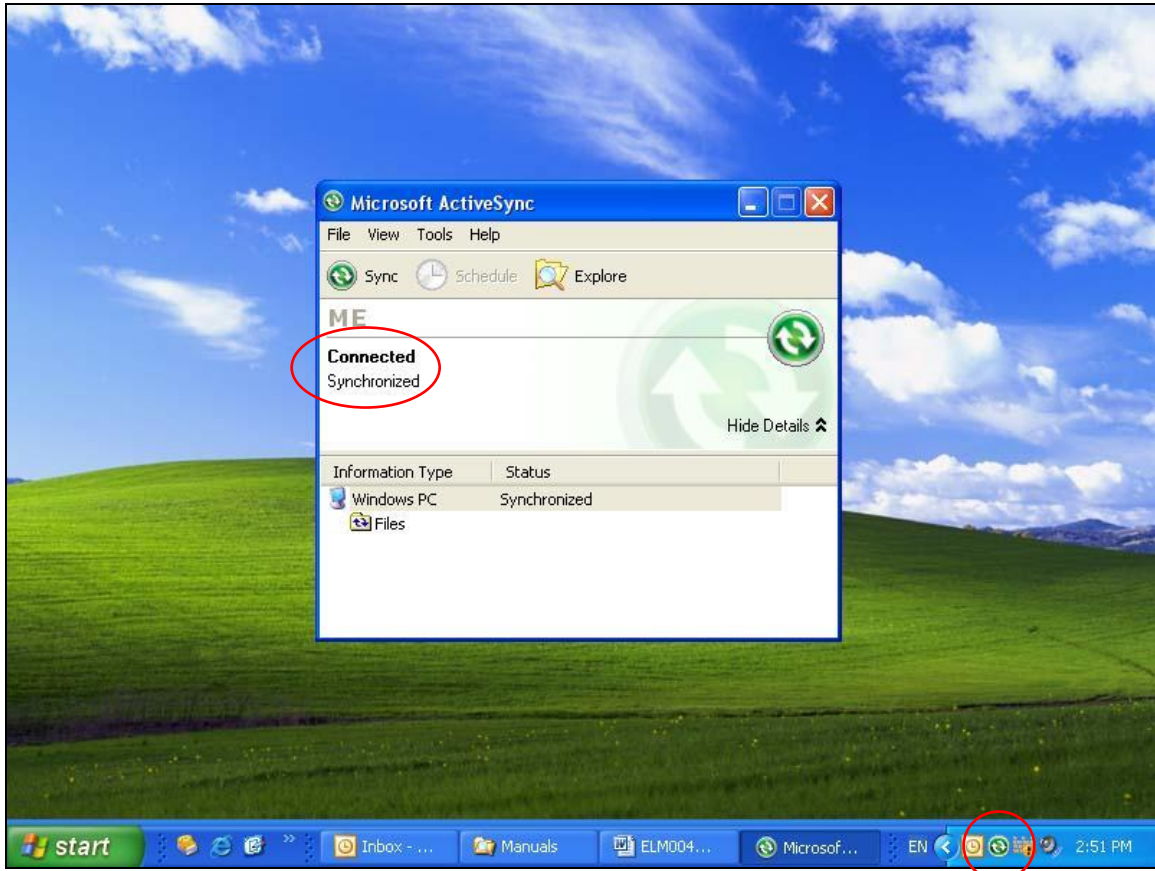


Figure 20: ActiveSync Screen

Important

It is extremely important that the user realizes that the synchronized folder created on the desktop is an **active** link to the Ultra-Rugged Field PC. Any changes you make in that folder will be reflected on the Ultra-Rugged Field PC. For example, if you delete a file in the folder, the same file will be deleted on the Ultra-Rugged Field PC. If the Ultra-Rugged Field PC happens to be disconnected at the time, as soon as it is re-connected it will automatically see the missing file in the folder and the file will be deleted during the connection. It is therefore important to exercise good data management. Once the data is synchronized to the PC, move the data files to a safe location (i.e. a network server or hard drive).

For further instructions regarding synchronizing data between a PC and the Ultra-Rugged Field PC, please refer to the supplied documentation and software which comes with the Ultra-Rugged Field PC (CD-ROM).

5.2 SETTING UP MOBILE DEVICE CENTER ON WINDOWS VISTA AND WINDOWS 7

Before connecting to Ultra-Rugged Field PC, it should be verified that desktop PC or laptop contains current version of Microsoft Mobile Device Center™. Communication between the two devices is achieved through an USB connection.

Note

Microsoft's Mobile Device Center™ software can be freely downloaded from Microsoft's website. Choose 32 bit or 64 bit version depending on Windows Vista™ or Windows 7™ operating system.

After Mobile Device Center™ is installed, connect the Ultra-Rugged Field PC to desktop or laptop computer using USB cable provided with the Multichannel Datalogger System. Windows Vista™ should detect new connection and display following dialog box.



Figure 21: Mobile device Center Screen

In order to synchronize the data in real-time between the Ultra-Rugged Field PC and the desktop PC, you must click on *Set up your device*. If you do not wish to synchronize data and simply use Windows Explorer to copy files to and from the Ultra-Rugged Field PC, click *Connect without setting up your device*. Data files can be copied from Ultra-Rugged Field PC using File Management, as shown on Figure 23.

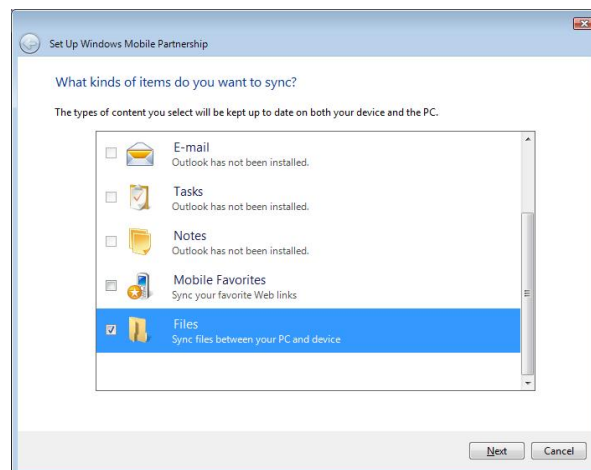


Figure 22: Synchronization Settings on Windows Vista™ or Windows 7™

If synchronizing files, decide what type of information you would like synchronized with the desktop computer. If you are only using the Ultra-Rugged Field PC for the purposes of transferring Multichannel Datalogger information, uncheck all the options and place a check mark next to the *Files* (see above).



Figure 23: Accessing Files on Windows Vista™ or Windows 7™

Important

It is extremely important that the user realizes that the synchronized folder created on the desktop is an **active** link to the Ultra-Rugged Field PC. Any changes you make in that folder will be reflected on the Ultra-Rugged Field PC. For example, if you delete a file in the folder, the same file will be deleted on the Ultra-Rugged Field PC. If the Ultra-Rugged Field PC happens to be disconnected at the time, as soon as it is re-connected it will automatically see the missing file in the folder and the file will be deleted during the connection. It is therefore important to exercise good data management. Once the data is synchronized to the PC, move the inclinometer files to a safe location (i.e. a network server or hard drive).

For further instructions regarding synchronizing data between a PC and the Ultra-Rugged Field PC, please refer to the supplied documentation and software which comes with the Ultra-Rugged Field PC (CD-ROM).

6 DATA FILES (*.CSV)

Whenever the *Collect Data* button is pressed under the *Status* tab, the software will collect all the current data stored in the memory of the datalogger. A progress bar will be displayed showing the status of this collection.

The software will automatically write the data to a *.csv file created in the **My Documents\Multichannel** directory.

The *.csv file has the following format:

serialnumber_yymmdd_hhmmss.csv

This file can then be opened directly with Microsoft Excel™ or other spreadsheet programs. A new file will be created each time the data is collected. It is the user's responsibility to copy data into a single spreadsheet if desired.

The following is how the data appears in Excel:

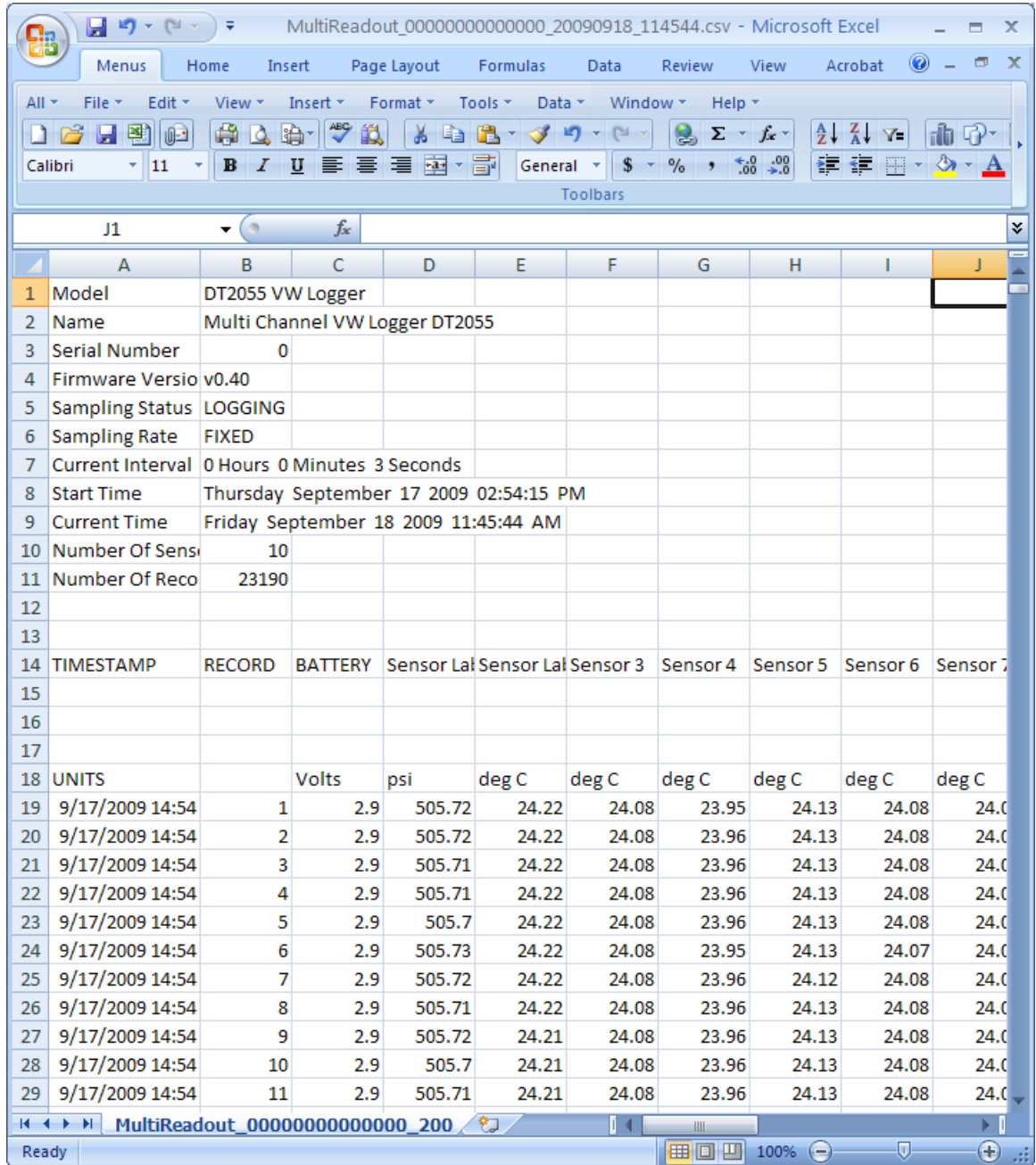


Figure 24: Sample Data File

Note

When sensor reading is outside of the valid range, the “99999” value will be recorded as the Eng Units and B Units data.

7 CHANGING THE BATTERIES

Very Important

Upon replacement of the batteries, it is important to connect to the datalogger and re-apply the datalogger logging settings. This re-initializes the datalogger and ensures that the time settings are correct. Failure to do this could result in improper time stamps after the batteries are replaced.

7.1 MULTICHANNEL LOGGER

The DT2055 Multichannel Datalogger uses special 3.6V LS33600 lithium battery. Contact RST for a replacement battery. The following steps outline the procedure to change the battery:

1. Connect to the datalogger via the USB cable and download the data.
2. Disconnect from the Ultra-Rugged Field PC™ and remove the top cover (4 Phillips screws).
3. Remove the battery from the carrier and replace with fresh one.
4. Replace the lid.
5. Connect to the Ultra-Rugged Field PC™ again and navigate to the *Log* screen. Verify that the settings are correct and press the *Apply Settings* button. You must press Apply to reset the datalogger regardless if the setup parameters are changed or not. Please see the above note.

7.2 SINGLE CHANNEL LOGGER

The single channel VW Datalogger uses standard 'AA' alkaline batteries which are readily available. The following steps outline the procedure to change the batteries:

1. Connect to the datalogger via the COM or USB cable and download the data.
2. Disconnect from the computer and remove the top cover (4 Phillips screws).
3. Remove the batteries from the carrier and replace with fresh ones. If the unit is being used in a cold environment, RST also offers Lithium-Ion AA cells.
4. Replace the lid.
5. Connect to the PC again and navigate to the *Logging* screen. Verify that the settings are correct and press the *Apply Settings* button. You must press Apply Settings to reset the datalogger regardless if any parameters are changed or not.

8 TROUBLESHOOTING

8.1 CONNECTION PROBLEMS

Upon launching, Multichannel Logger, software will try to connect to DT2055 Data logger using current communication settings. Once connected, the *Status* screen should display logger information.

The connection status is displayed on status tab. If the connection fails (status screen shows no status data), take note of the message displayed, then find the corresponding description in the Table 1: Status Messages.

1. Port not open: The communication port is being used by some other application.
Solution: Close other windows applications that might be using serial port assigned to Multichannel Logger. Ensure that Multi is selected when connecting DT2055 logger.
2. Connecting to the logger message continuously displayed.
Solution: Verify that the serial communication cable is connected and connections are tight.
3. State Errors, Reading Errors, Memory Read Errors: Verify battery voltage displayed on Status screen. Replace battery if voltage falls below 2V. Check cable for damage. Replace USB communication cable if in doubt.

8.2 SOFTWARE STABILITY

The Multichannel Logger real time readout relies on continuous data transmission over serial communication port. This transmission may be occasionally interrupted by other computer activity resulting with program freezing or displaying erroneous data. If this happens, Multichannel Logger needs to be closed down and restarted. Check battery voltage regularly, low battery voltage (below 2V) might cause data transmission errors. Always close software when changing loggers or reconnecting communication cable.

8.3 STATUS CONNECTION MESSAGES

The following table lists the status bar messages with descriptions.

| # | Status Message | Description |
|----|--------------------------------------|--|
| 1 | Communication port open | Communication port is open |
| 2 | Unable to open communication port | Some other application is using this port |
| 3 | Connecting to the logger | Multichannel Logger is trying to connect to the logger |
| 4 | Connection not established | Multichannel Logger was unable to connect to the logger |
| 5 | Connection established to the logger | Multichannel Logger was able to connect to the logger |
| 6 | Reading logger settings | All logger settings are copied to the Multichannel Logger for display |
| 7 | Error during settings read | Error occurred during settings read |
| 8 | Idle | Idle time between status or data reads |
| 9 | New logger detected | Logger exchanged with another logger, Multichannel Logger reset |
| 10 | Logger settings successfully read | All logger settings were successfully transferred to Multichannel Logger |
| 11 | Error reading logger settings | Error occurred during reading logger settings |
| 12 | Connection Error | Connection attempts timed out |
| 13 | Reading logger memory | Logger memory contents is being copied to the Multichannel Logger |
| 14 | Writing logger settings | All displayed settings are being transferred to the logger |
| 15 | Error during settings write | Error during settings write |

Table 1: Status Messages

9 CONTACT US

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