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OM-93
OMEGA® Bluetooth® Wireless Temperature / Humidity Data Logger

M5543/0216

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User Guide

Contents

1. Document Overview

This guide is provided to distribute the following information:

- the main features of the OM-93 logger
- how to install the PC Application for the logger
- how to use the PC application for configuration, data extraction and data viewing
- how to install the iPhone® Application
- how to use the iPhone® application for configuration, data extraction and data viewing
- how to mount your OM-93 logger
- how to charge the battery within your OM-93 logger
- contact information should you have further technical questions

2. Product Overview

The OM-93 logger is a portable wireless logger from Omega. The OM-93 logger can be connected either via a USB cable to a Windows® PC application or using Bluetooth wireless technology to your iPhone®, iPad® or iPad mini®. Both Windows® PC and iPhone® applications offer a simple means of configuring the logger, data extraction and data viewing features.

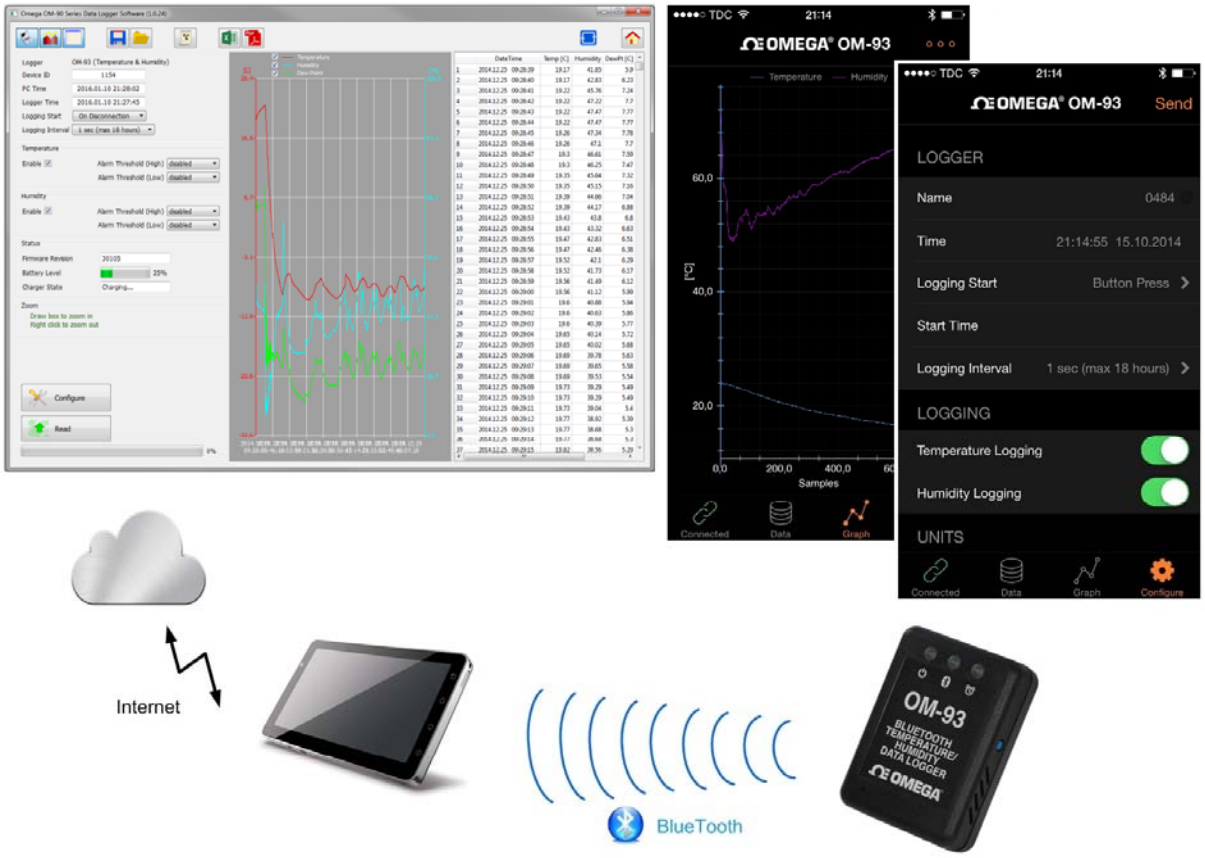

Figure 1: Introducing the Omega OM-93 Logger, PC and iPhone applications

The OM-93 logger can be used for a number of transportation applications including:

- sensitive/fragile items
- food
- animal/livestock
- plants
- chemicals
- medicines or organs

It can also be used in situations where it is simply not convenient to make a cable connection to a Windows® PC. Suppose for example you are storing some vaccines or chemicals in some environmental chamber and would like to ensure temperature and humidity conditions are kept within acceptable levels

over time. By mounting a OM-93 logger inside the chamber then one can periodically come near to the chamber, connect to the logger from an iPhone®, download the most recent data, email the recorded data and configure the logger to continue logging. This can happen wirelessly and without opening the chamber and affecting environmental conditions.

The OM-93 logger operates in an ultra low power mode even when logging temperature and humidity and can still be connected to wirelessly without any physical touching of the logger. The logger can operate in this fashion for 6 months from a fully charged battery. The rechargeable battery may be charged either by connection to USB on a computer or using a mains/USB power cable.

The OM-93 offers accurate and repeatable logging for temperature and relative humidity. Temperature is measured to an accuracy of ±0.3°C over the range +5°C to +60°C. Over the full range -20°C to +60°C the accuracy is ±2.0°C. Relative humidity is measured to an accuracy of ±2.0% over 20% to 80% humidity range and ±3.0% over 0% to 100%. Both temperature and relative humidity are logged at a user configurable logging rate which can be set in the PC application program or iPhone application.

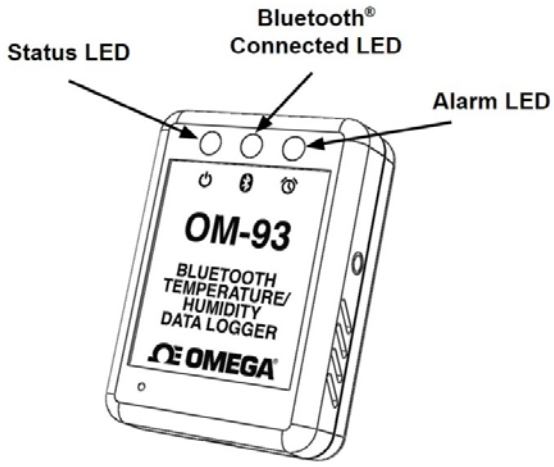

Figure 2: OM-93 Alarm Indicators

When you would like to guarantee that conditions are within particular environmental limits then one can also set operating ranges above or below which light indicators will be activated so that the user can become aware that the desired environmental conditions have been exceeded.

3. Technical Specifications

- Temperature range — -20°C to +60°C (-4° F to 140° F)
- Temperature accuracy (limited range) — ±0.3°C (+5°C to +60°C); ±0.5° F (41°F to 140°F)
- Temperature accuracy (-20°C to +60°C) — see accuracy curve in figure 3
- Temperature resolution — 0.04°C (0.08° F)

- Humidity range — 0% to 100%
- Relative humidity accuracy (limited range) — ±2.0% (20% to 80%)
- Relative humidity accuracy (0% to 100%) — see accuracy curve in figure 3
- Relative humidity resolution — 0.1%

- Temperature alarms (minimum & maximum)
- Relative humidity alarms (minimum & maximum)

- Battery — Rechargeable LiPo
- Battery life — 6 months (before needing recharging)

- Physical size — 50mm x 68mm x 20mm

- PC application available on Windows XP, Vista, Windows 7, Windows 8 and Mac

- Mobile application supported on iPhone®, iPad® and iPad mini® mobile digital devices using iOS7 and iOS8.

- Wireless connection range — 12 meters

- Logging space — 40,000 samples

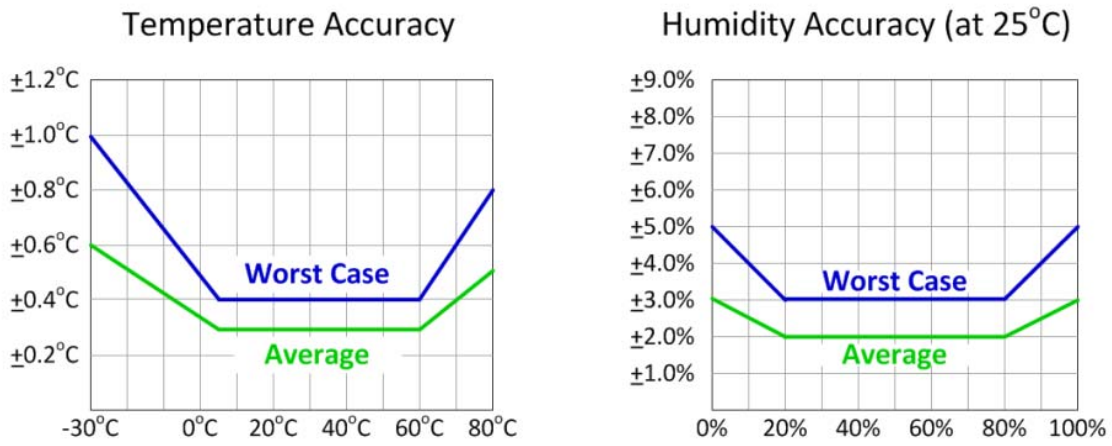

Figure 3: Temperature and Humidity Accuracy

4. Buttons and LED Indicators

The OM-93 logger includes one button located on the side of the logger. It is possible by configuration in the PC or iPhone® application to use this button as a way to start and stop logging. See sections 6.11 and 7.4 of this User Manual regarding configuring for button press start.

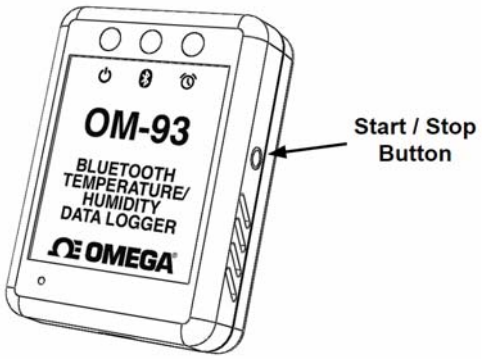

Figure 4: OM-93 Logger Start/Stop Button

The logger contains three LED indicators with the following functionality:

Status LED

- When the logger starts logging then this LED pulses **green** once for 1 second.
- When logging this LED pulses **green** for 7 milliseconds and off for 6 seconds.
- When the logger stops then this LED pulses **red** for 1 second then off forever.

Bluetooth Connected LED

- This LED is **blue** when the logger is connected to a mobile device.

Alarm LED

- When a temperature or humidity alarm is triggered this LED pulses **red** for 7 milliseconds and off for 6 seconds.
- When connected to USB cable this LED is **red** continuously when the logger is still charging and **green** when fully charged.

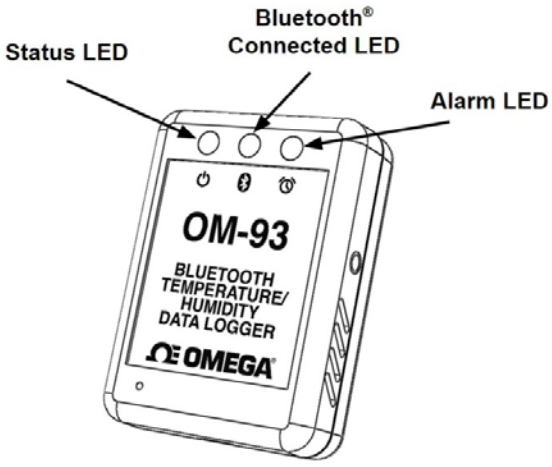

Figure 5: OM-93 LED indicators

5. Packaging List

Your Omega OM-93 logger comes standard with the following items.

- One OM-93 Logger unit

Figure 6: OM-93 Logger Unit

- One USB cable – type A to micro-USB type B

Figure 7: USB Cable

6. USB Operation

The OM-93 logger can be configured, data downloaded and further analysed by connection to a PC or Mac using a USB cable and the OM-90 Series Data Logger Software. The process for this is described in this section. The logger can similarly be configured by the iPhone® wireless device application as described in section 7.

6.1. Installation of the PC Application (Windows)

Installation of the OM-90 Series Data Logger Software is very simple. The OM-93 needs no special drivers since it is a USB HID device and such devices can make use of the standard drivers that come with Windows. The software is located on the included CD or can be downloaded from the Omega website.

The PC application is a single application that can support all OM-90 series loggers including the OM-91, OM-92 and the OM-93.

6.2. Front Page

When the OM-90 Series Data Logger Software is started the welcome screen appears and gives a brief introduction to the OM-90 Series loggers and what they can be used for.

- Click on the Configuration Wizard Button to start configuration of the logger.
- Click on the View Logged Button if you want to view data graphically.
- Click on the View Spreadsheet Button if you want to view logger data as a table.

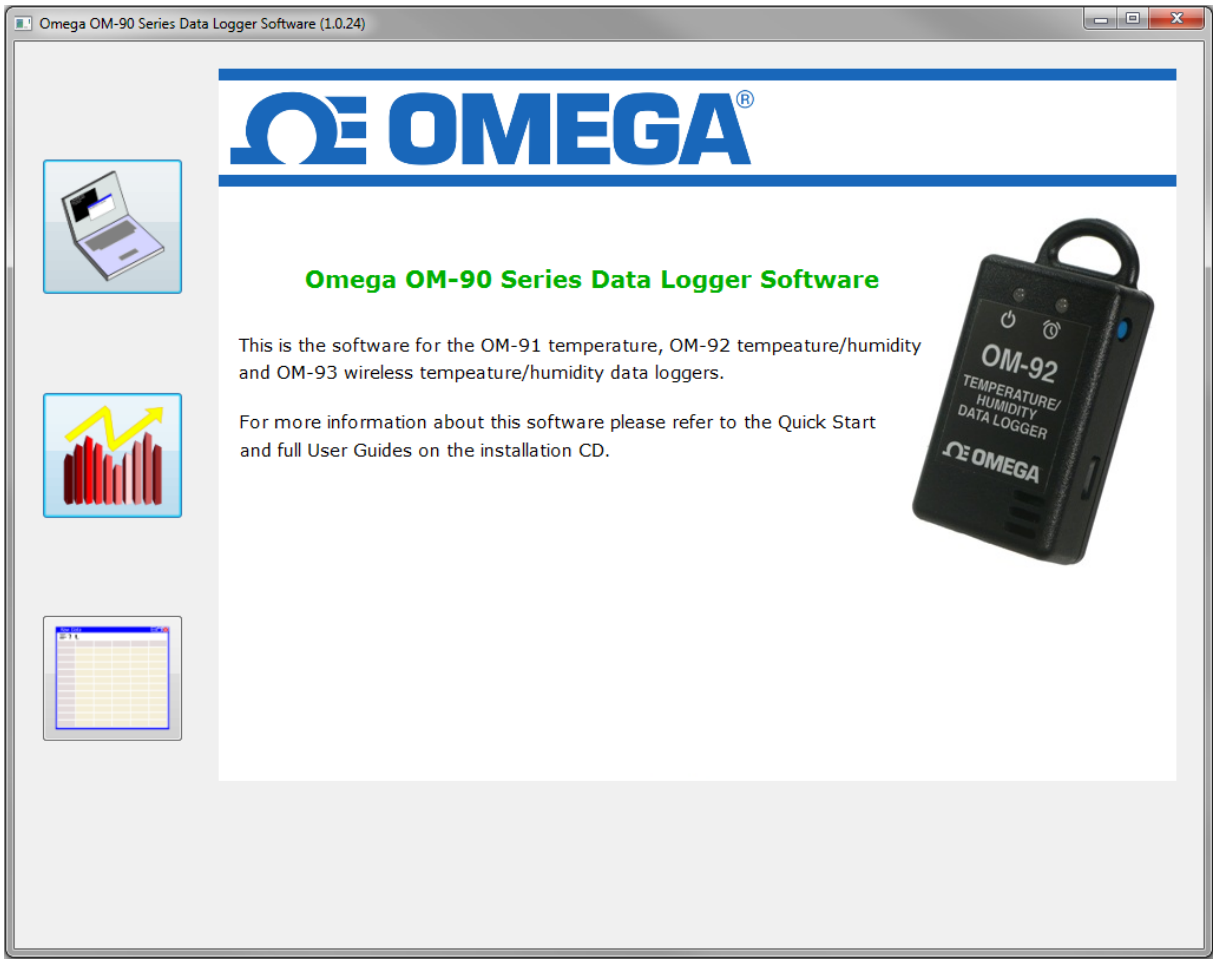

Figure 8: OM-90 Series Data Logger Software

6.3. Main Page

The main page of the application GUI consists of a configuration pane, a graphical pane and a spreadsheet pane. It is possible to have any of these enabled or disabled by the buttons located top left in the window. The panes will automatically start in an enabled or disabled view depending on the viewing mode select from the front page.

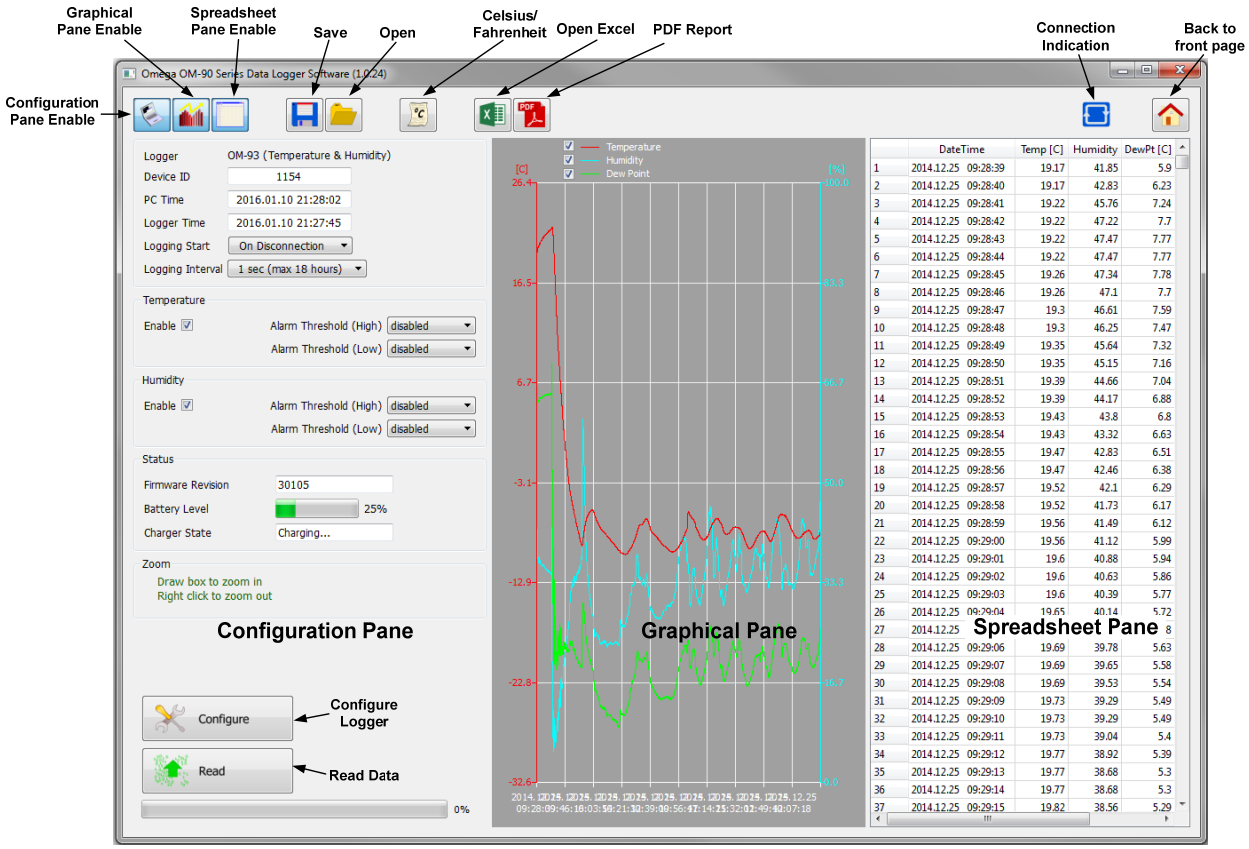

Figure 9: PC Application Main Page

Buttons are also included for saving/loading configuration and logged data to and from file.

There is also a button for selection between Celsius or Fahrenheit temperature scales.

A connection indication on the right hand side becomes blue when your application is connected to a OM-93 logger and is greyed-out otherwise.

Icons are provided for opening in Excel and for generating PDF reports.

Finally a home icon provides a link back to the front page.

6.4. Configuration of a OM-93 Logger (Start on Disconnection)

Configuration of the OM-93 logger starts by specifying the device name. Up to 16 characters is allowed in the name.

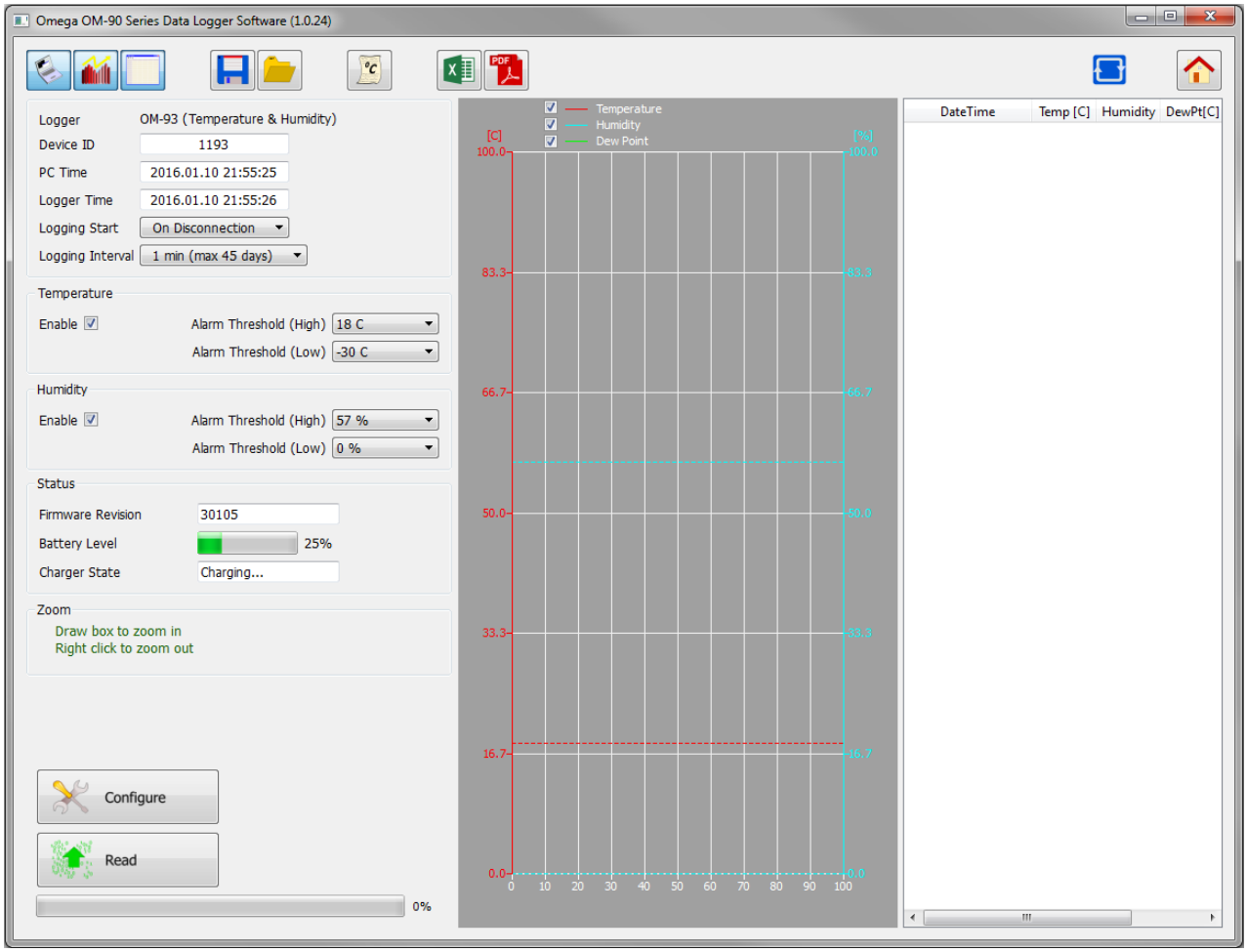

Figure 10: Configuration Step (Start on Disconnection)

Next select the logger start to On Disconnection. There are other options (At Specified Time, Button Press and Real Time Logging) which will be discussed in later sections of this manual.

Select the logging interval (this is the time between samples).

For temperature logging then one needs to enable or disable the logging. In the case the temperature logging is enabled then one can also set alarm thresholds for which the alarm indication will signify that temperature limits have been exceeded.

Similarly for humidity one needs to enable or disable the logging and configure the alarm limits.

Finally to save the configuration setup to the OM-93 logger, press the Configure Button.

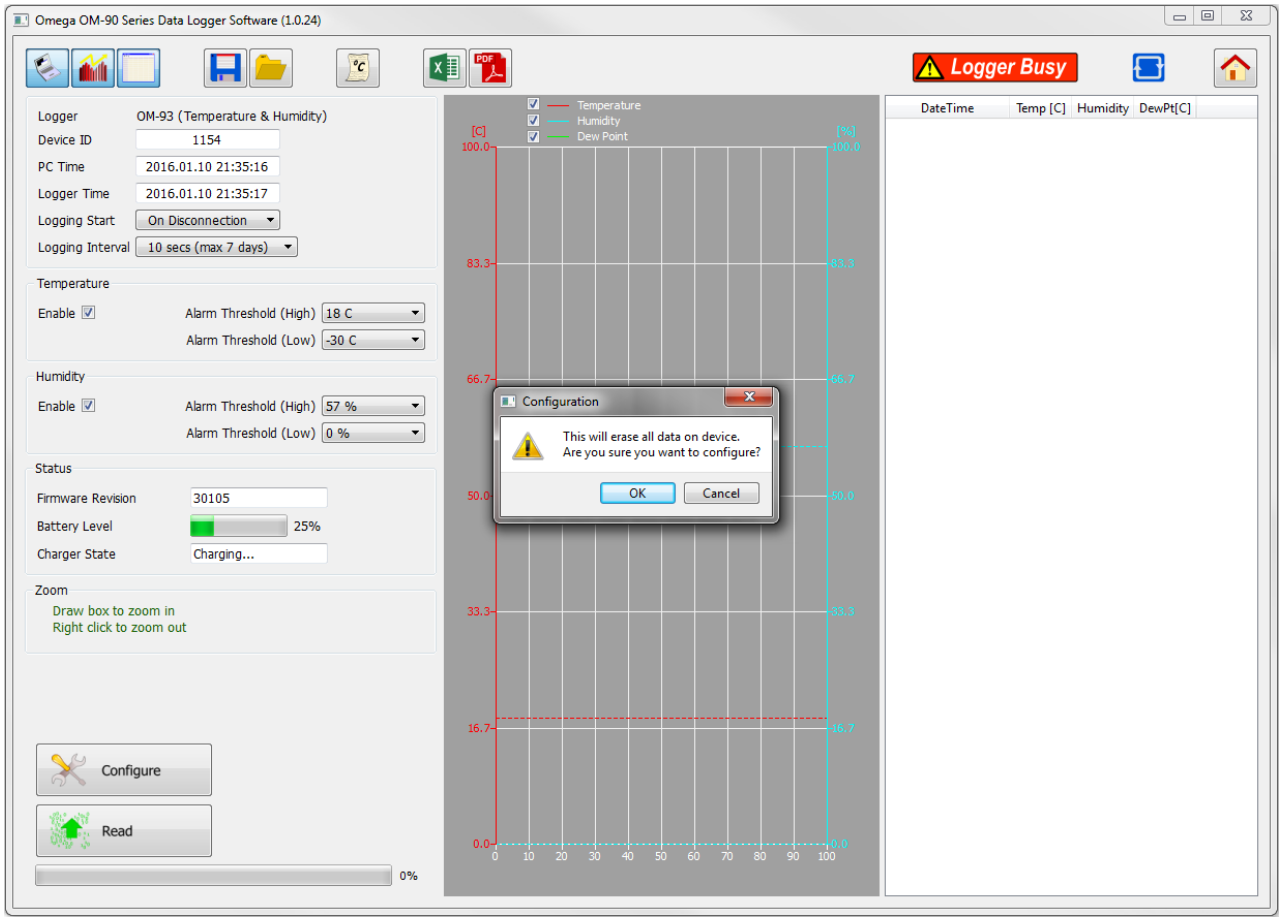

Figure 11: Write Configuration to the Logger

Once configured the PC application will show the logger time will be synchronized to the PC time. The logger firmware revision will also appear in the application.

Once you disconnect the logger from the PC, logging will start automatically and at the configured logging interval. A green status LED will flash every 6 seconds to indicate that the unit is logging. The red alarm LED will flash also in the case that the temperature or humidity goes outside of the allowed limits and triggers the alarms.

If the logger becomes full then all LEDs will stop flashing.

6.5. Saving a Configuration File

Configurations can be saved to file so that you can use the configuration next time or if you have multiple devices with the same configuration.

Saving a configuration file is just a matter of selecting the save icon and filling out the file name. If the logger contains no logged data then it will only save the configuration settings. Configuration and logged data is stored in Comma Separated Value (CSV) format.

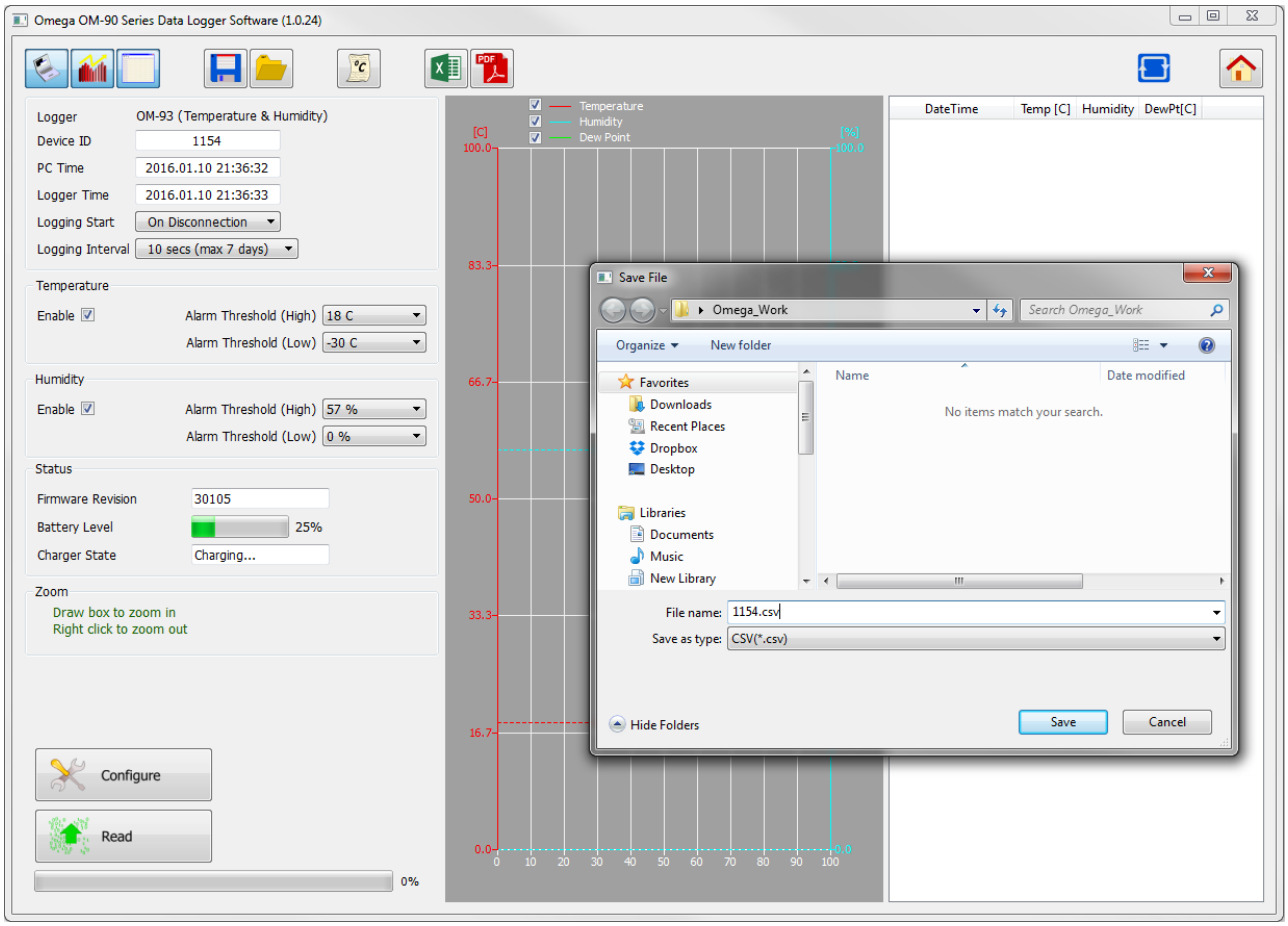

Figure 12: Saving a Configuration to File

6.6. Loading a Configuration from File

Loading a configuration file from disk is just a matter of selecting the open icon and selecting the configuration file name. This upload presents a simple way to configure multiple loggers with the same configuration. This ensures a common configuration and saves time/effort when configuring multiple devices.

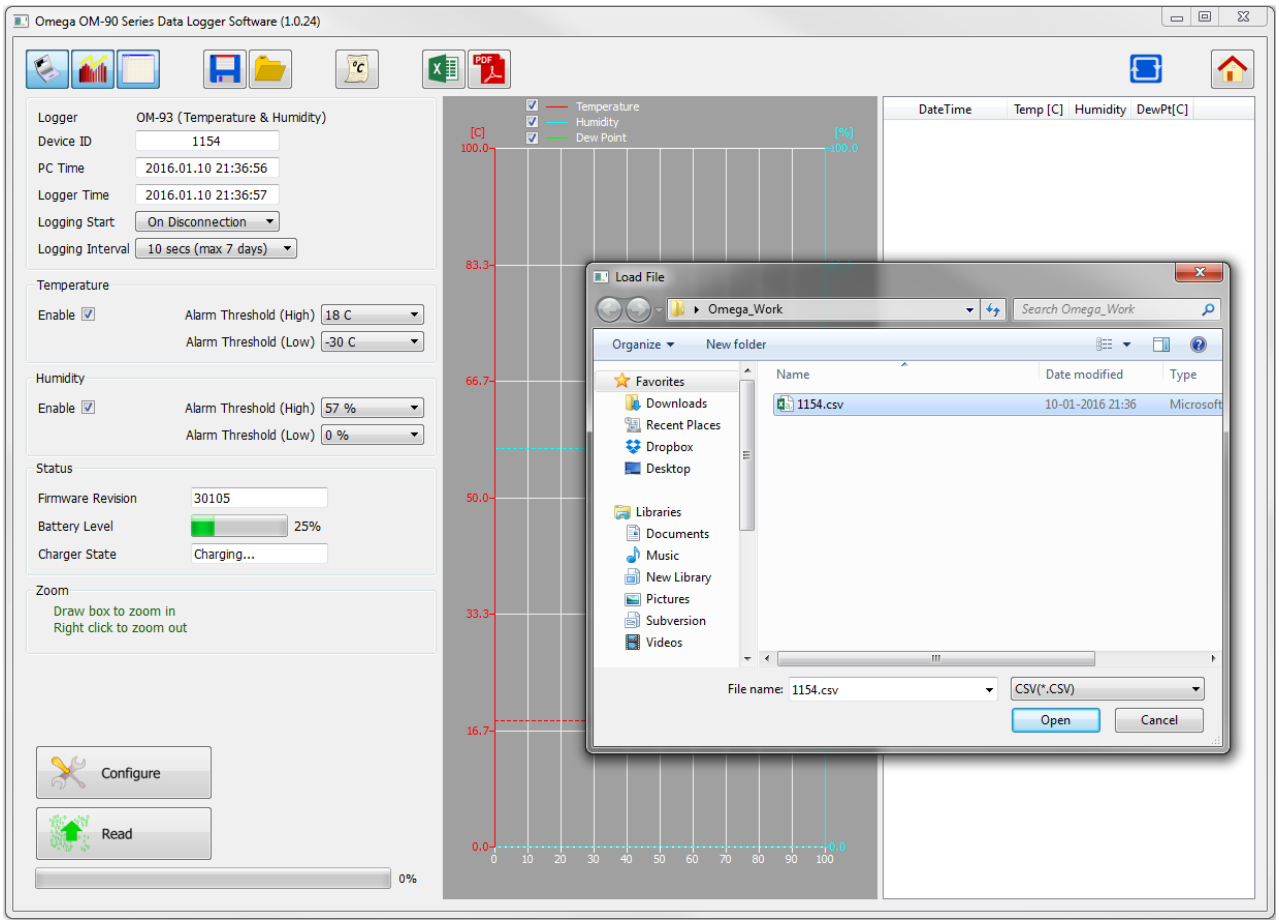

Figure 13: Loading a Configuration from File

Remember to press the configuration button if you want the configuration data held in the GUI to be written to your OM-93 logger.

6.7. Retrieving Logged Data

Data can be retrieved from the logger by connecting to the logger and then pressing the read button at the bottom left of the GUI.

Both the device configuration and logged data will immediately become uploaded and viewable in the configuration, graphical and spreadsheet views.

Zooming in and out of the graphs can be achieved by the following controls:

- To Zoom In - Drag the left mouse button
- To Zoom Out - Click the right mouse button
- When zoomed in you can move around using the key-board arrows or the mouse scroll wheel

To write data and configuration to file, press the save icon. Data and configuration is then stored in Comma Separated Value (CSV) format which can be edited by third party software such as Microsoft Excel or read back into the OM-90 Series Data Logger Software at a later point.

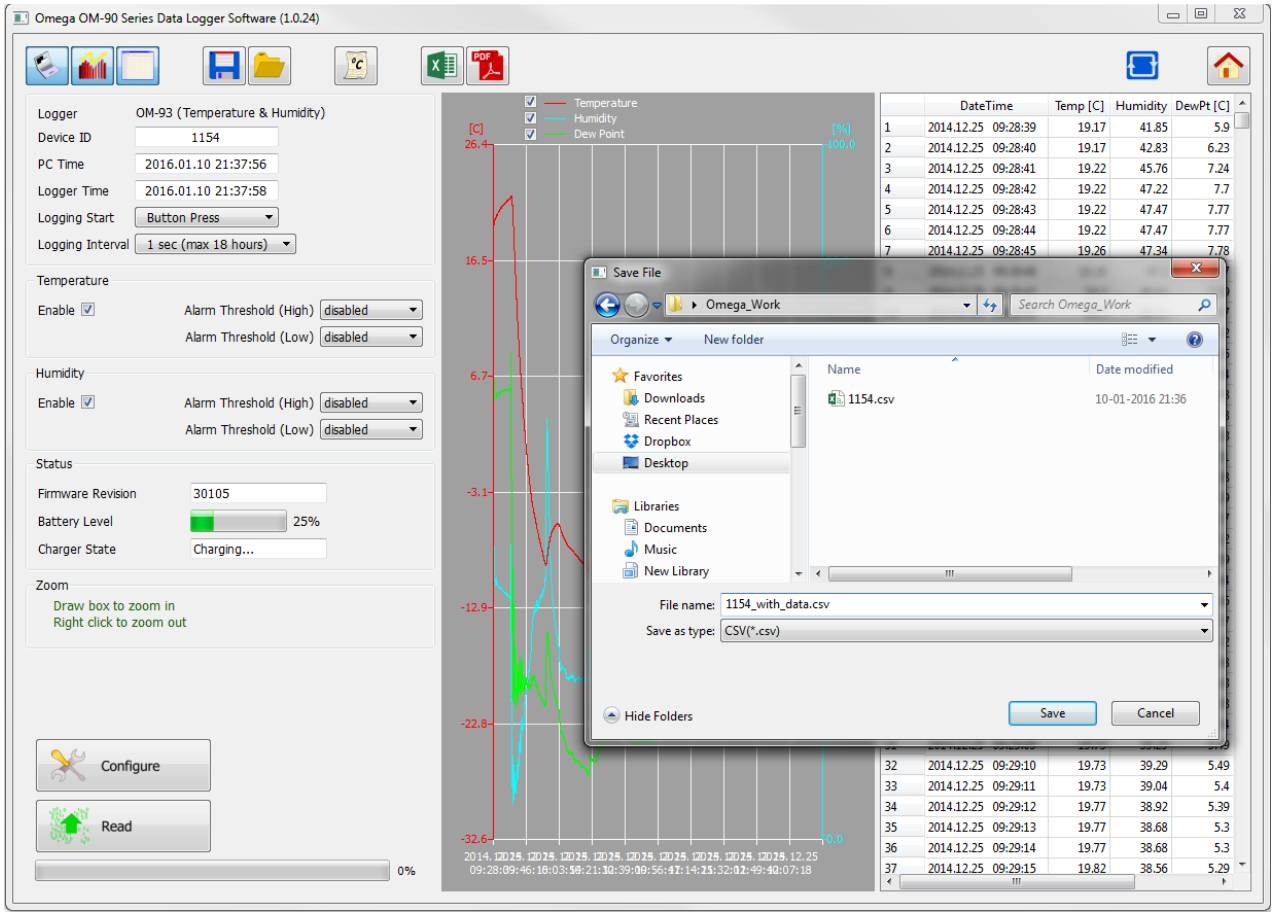

Figure 14: Saving Logged Data to File

6.8. Viewing Logged Data from File

It is a simple matter to read back data from file (CSV format) into the GUI and view previous logs graphically or using the spreadsheet views. Simply press the open icon and then select the file which you would like to view.

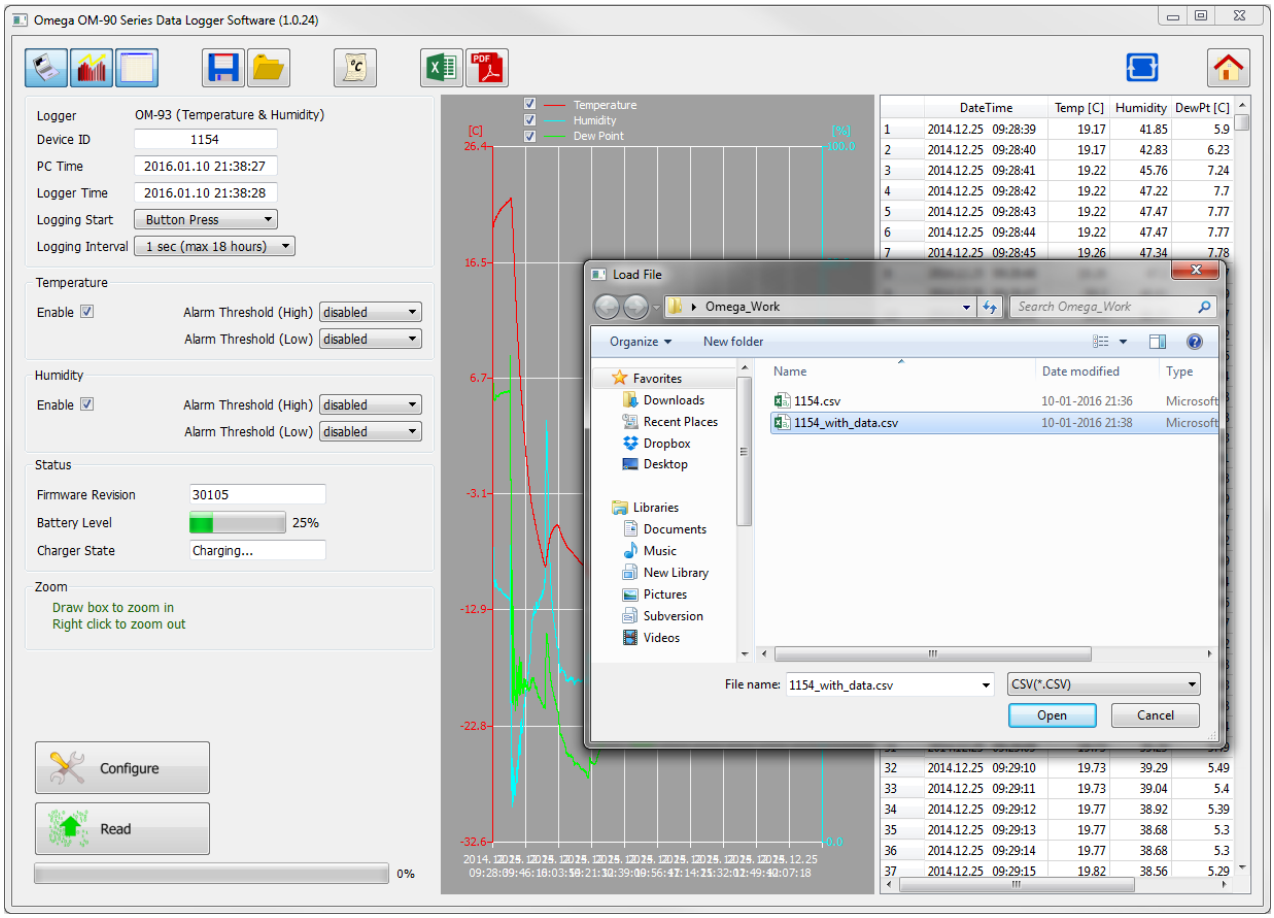

Figure 15: Retrieving Logged Data from File

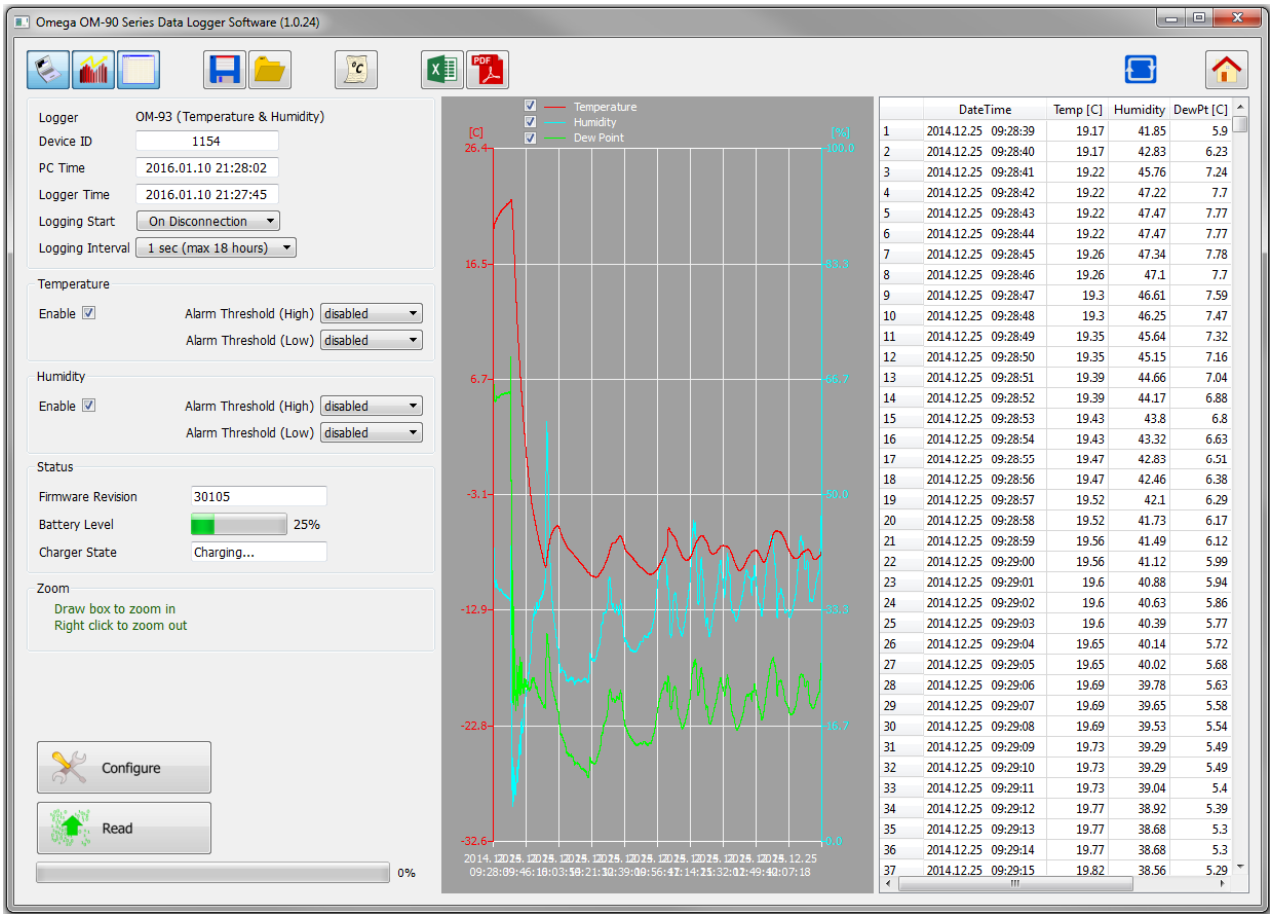

Figure 16: Retrieving Logged Data from File (complete)

6.9. Configuration of a OM-93 Logger (Start at Specified Time)

You can configure a device so that it starts at a specific time. Configure as per section 6.4 but select At Specified Time. Fill in the exact month, day, hour, minute and seconds when you want the logging to start.

Remember to write the setup to the logger by pressing the Configure Button.

When you have disconnected the logger and the time reaches the desired start time for the logging then the logger will begin to log. This is a perfect way to have multiple loggers start logging at exactly the same time.

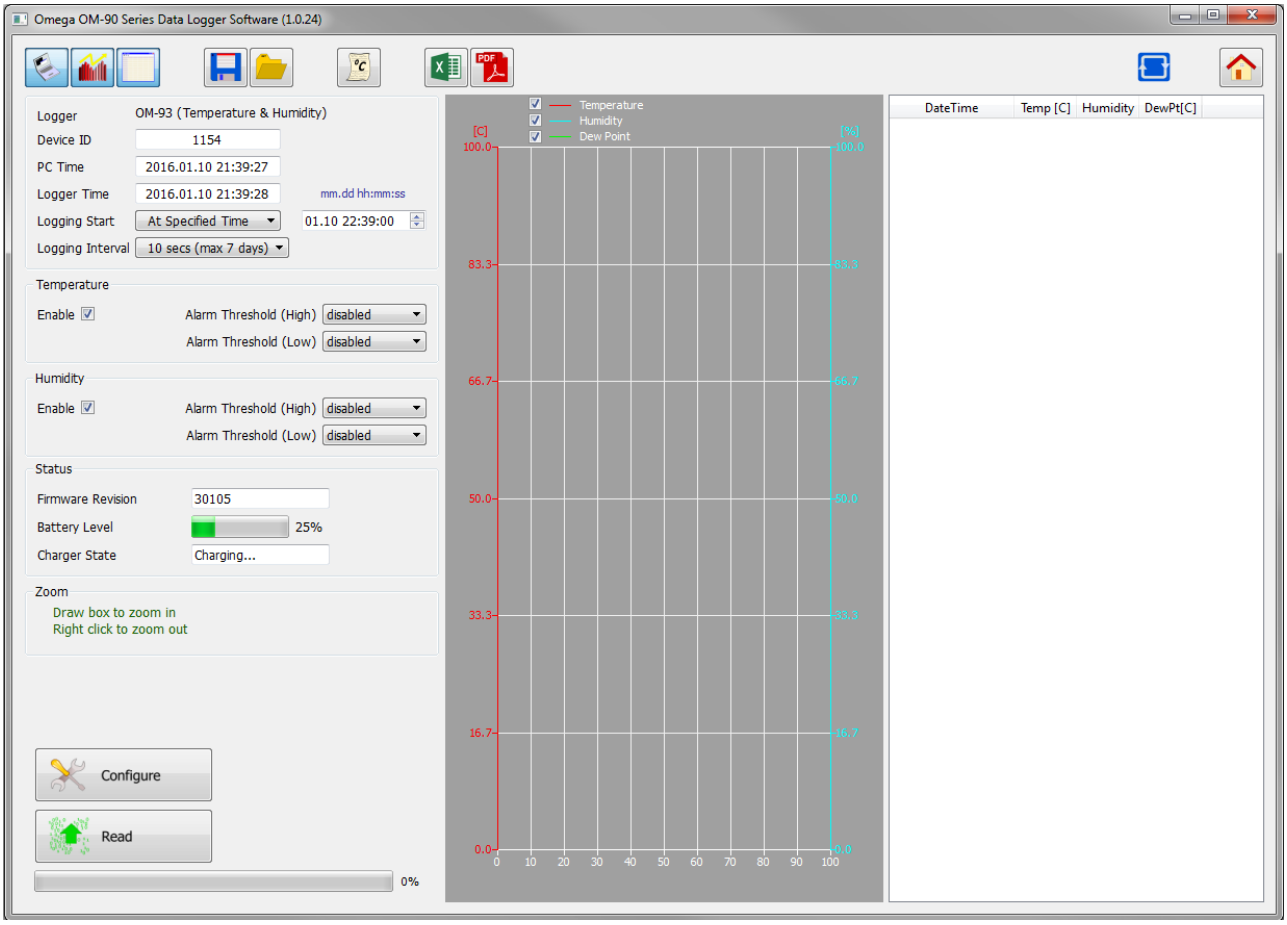

Figure 17: Configuration Step (Start at Specified Time)

6.10. Configuration of a OM-93 Logger (Start using Button Press)

You can also configure the device so that it starts logging on a button press. Configure as per section 6.5 but select Button Press.

Remember to write the setup to the logger by pressing the Configure Button.

When you have disconnected the logger you can start logging by a simple button press. You will then see it is logging because the green light starts flashing every 6 seconds. You can also stop it using a button press – and all lights will stop flashing.

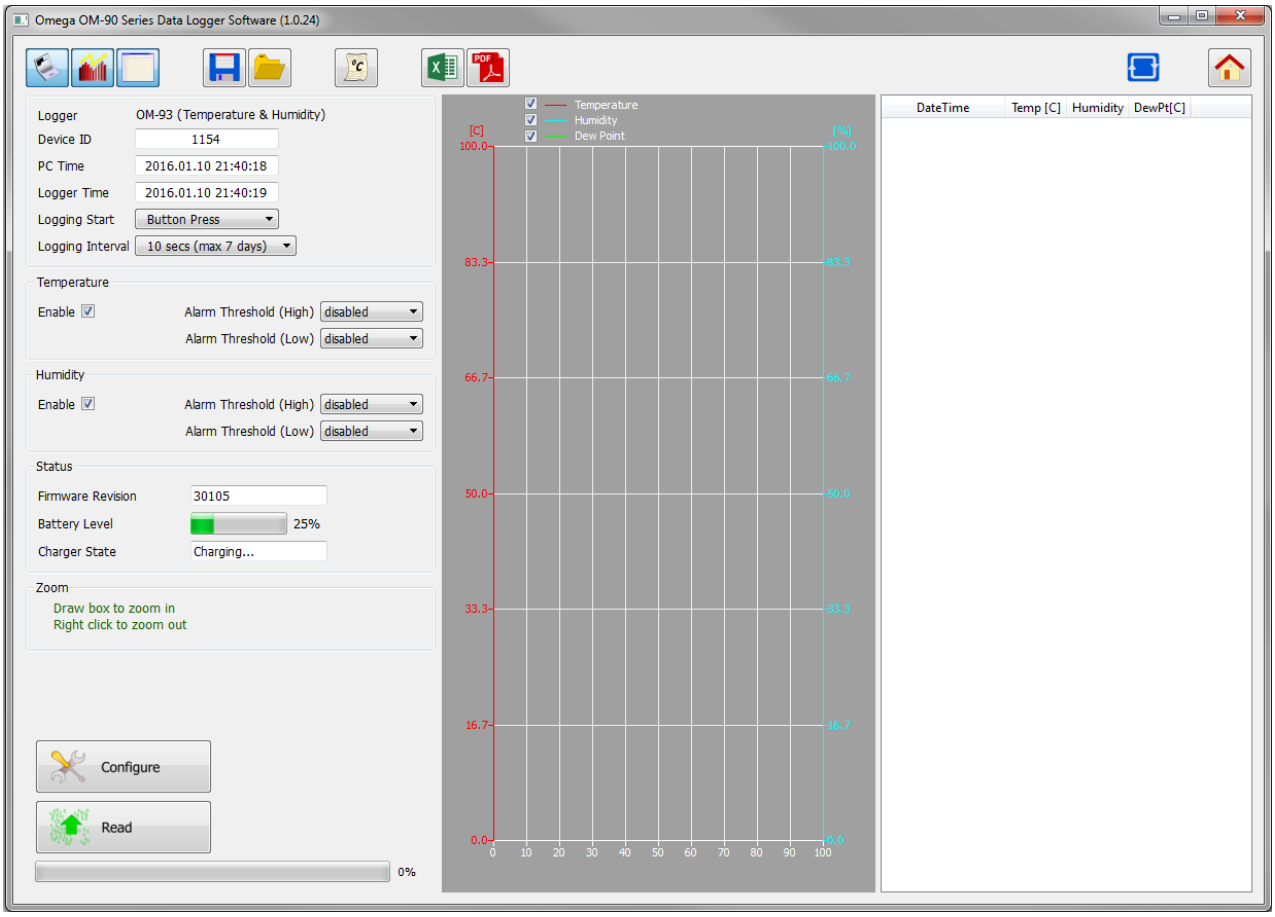

Figure 18: Configuration Step (Start using Button Press)

6.11. Configuration of a OM-93 Logger (Real Time Logging)

You may also use your OM-93 Logger in Real Time Logging mode. Select the start logging to Real Time Logging with the appropriate logging interval. Next press start. You will then see the PC application take samples from the logger directly and display them on the table and graphs. This is a way to monitor temperature and humidity conditions directly from your PC instead of using the remote logging.

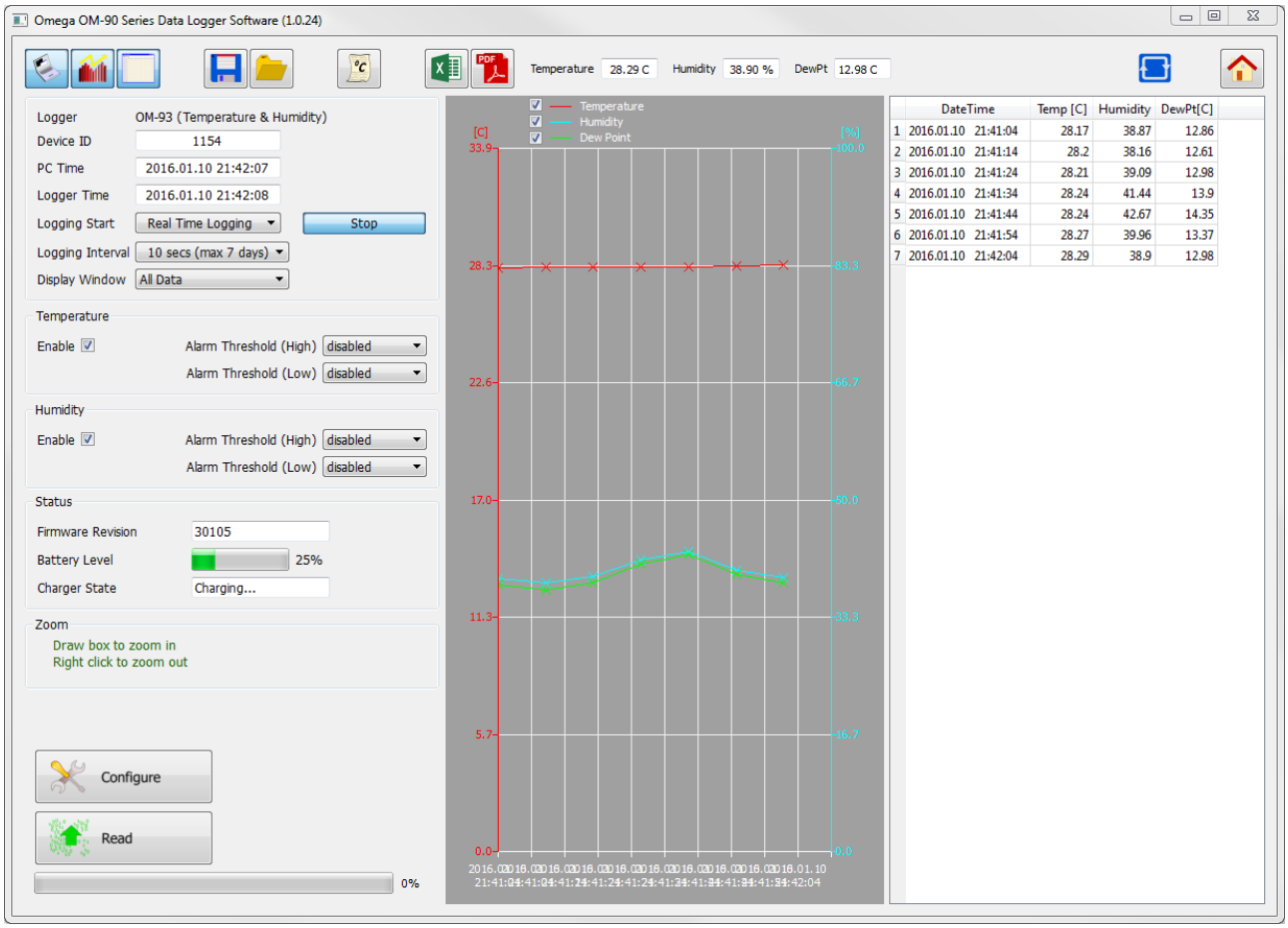

Figure 19: Configuration Step (Real Time Logging)

6.12. Opening Excel

When the GUI has data, it is possible to press the Excel button  to show the data in Microsoft® Excel. During this process the user needs to select if your version of Excel is expecting and "." or "," to represent the number decimal point.

This capability assumes that Microsoft® Excel is installed on your PC. If not, then the option will not work. This option is not available on the Mac® version of the GUI.

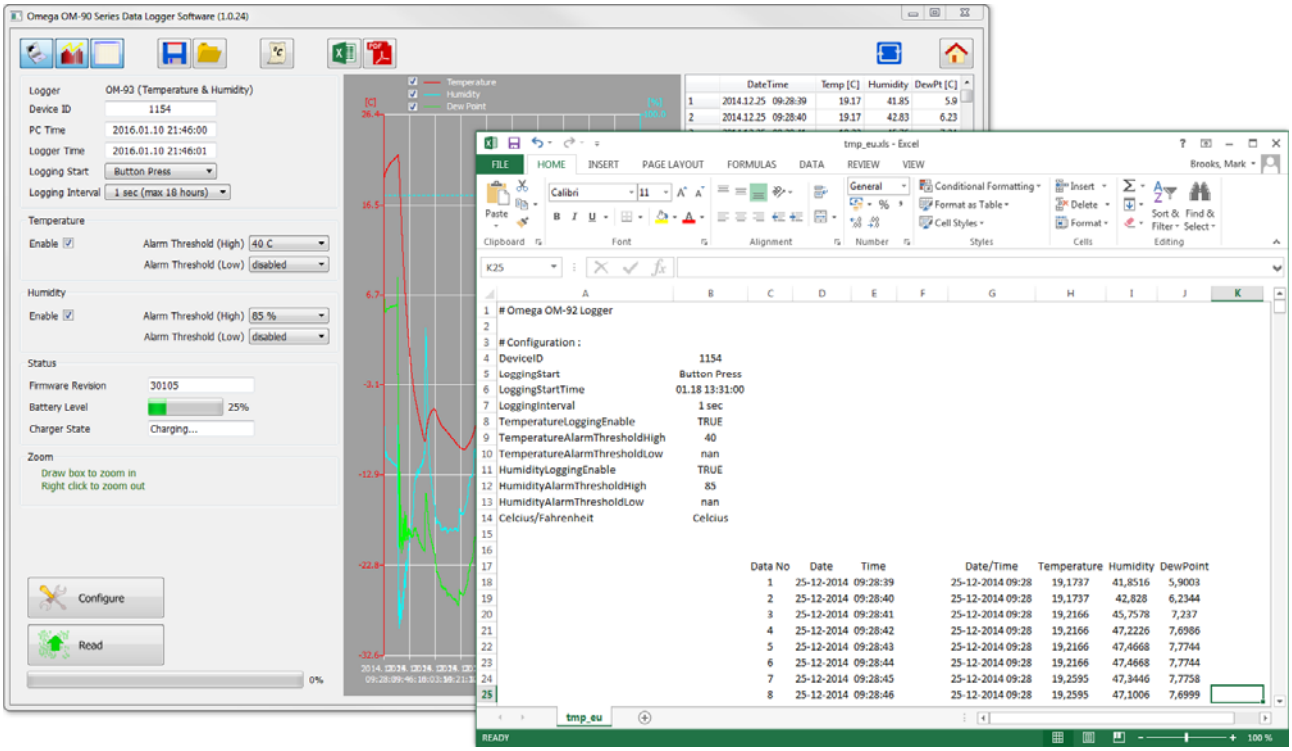

Figure 21: Opening Excel from the GUI

6.13. Writing PDF reports

When the GUI has data, a simple one-page PDF report can be written to summarize the data in the logger by way of statistics and as a graph. The PDF can be written either in US Letter page size of A4 page size. The user can enter one's own notes at the footer of the PDF. PDFs are written to file and can be opened by any standard PDF reader.

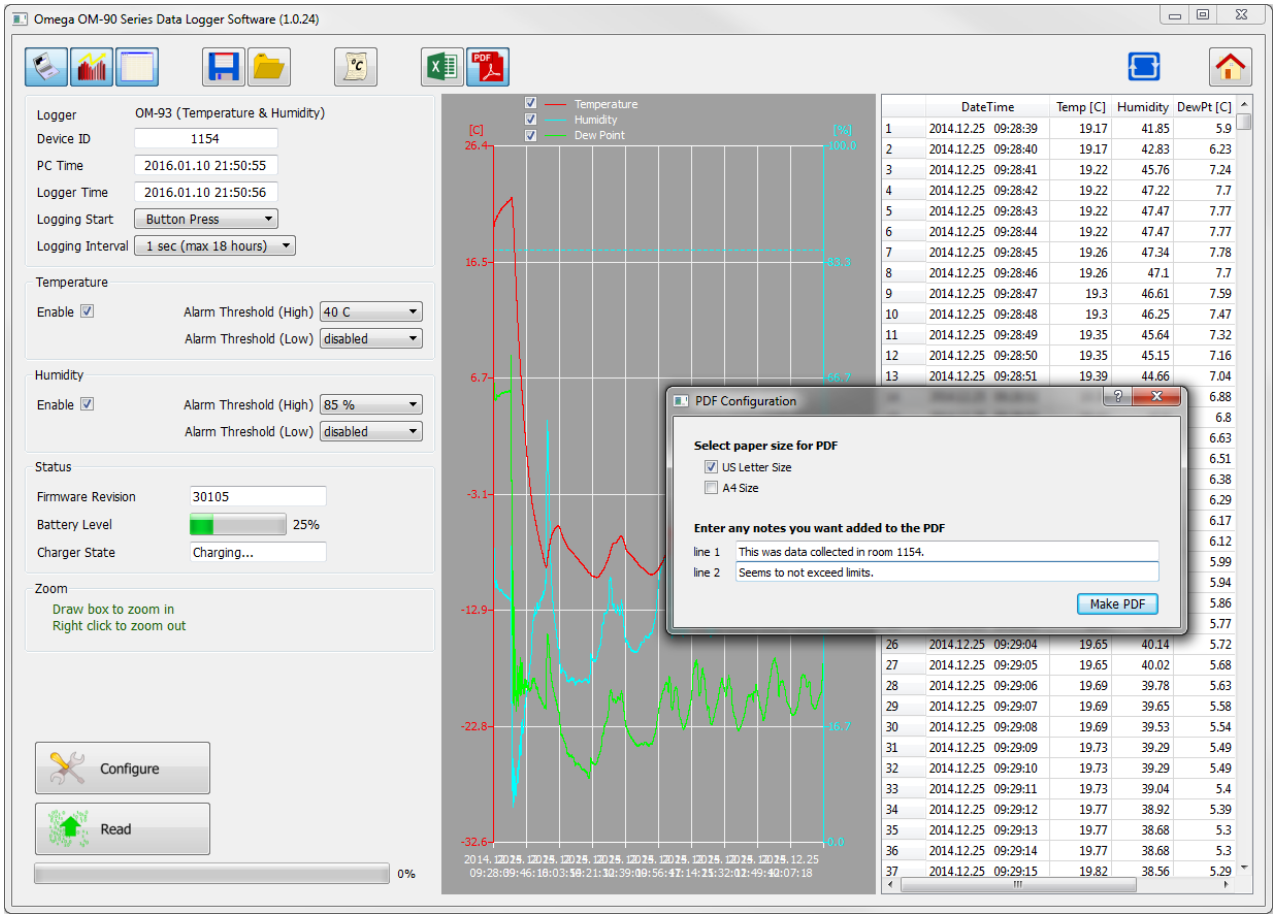

Figure 22: Writing a PDF report from the GUI

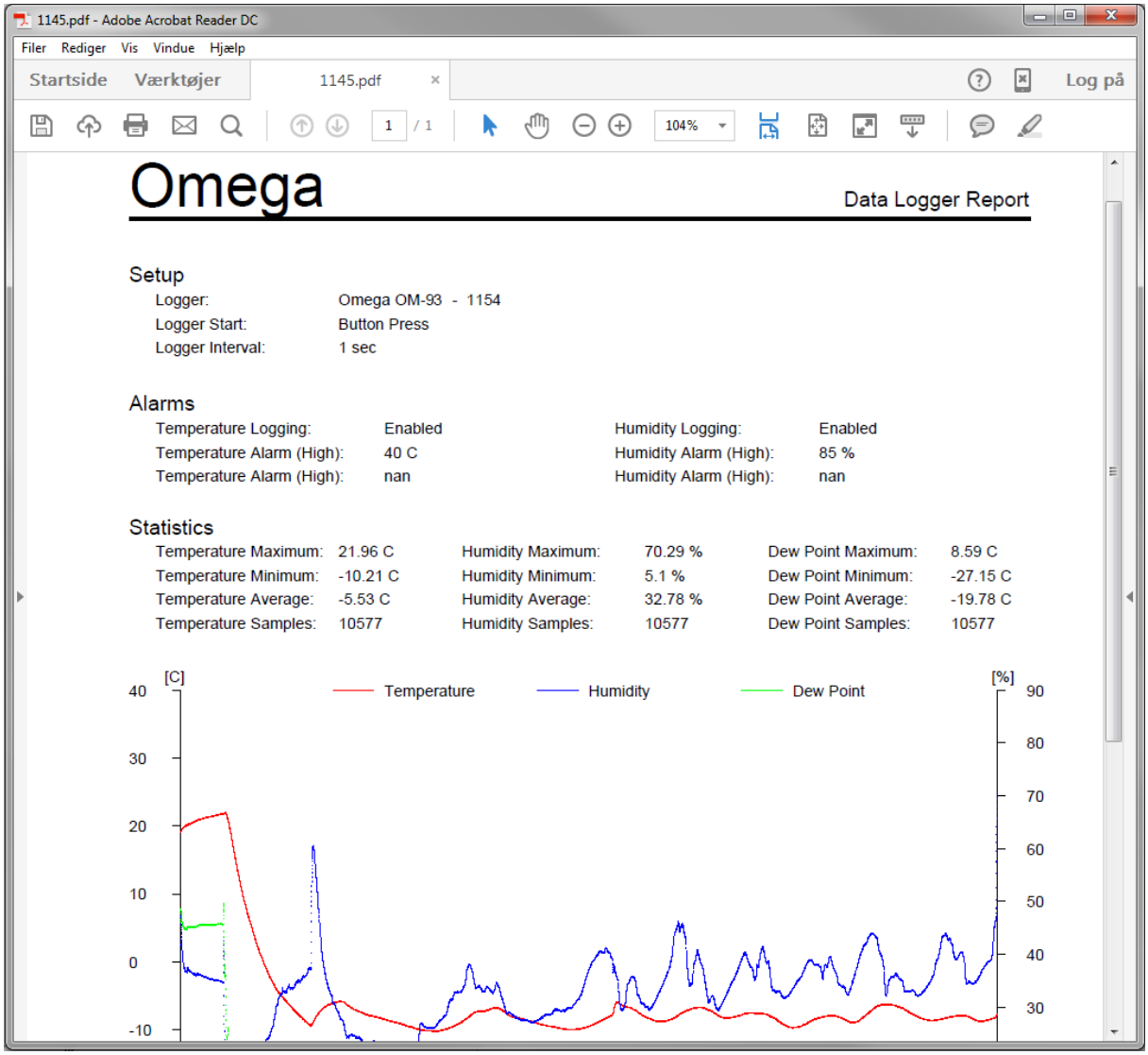

Figure 23: A typical PDF report

7. iPhone® Operation

The OM-93 logger can be configured; data can be downloaded and further analyzed through wireless connection from an iPhone®, iPad® or iPad mini® using the OM-93 iPhone® application. This process is described in this section. The logger can similarly be configured by a Windows PC as described in section 6.

7.1. Installation of the iPhone® Application

The OM-93 iPhone® Application is a free app found on Apple's App Store. Search for Omega OM-93 Application. Find it and download the application.

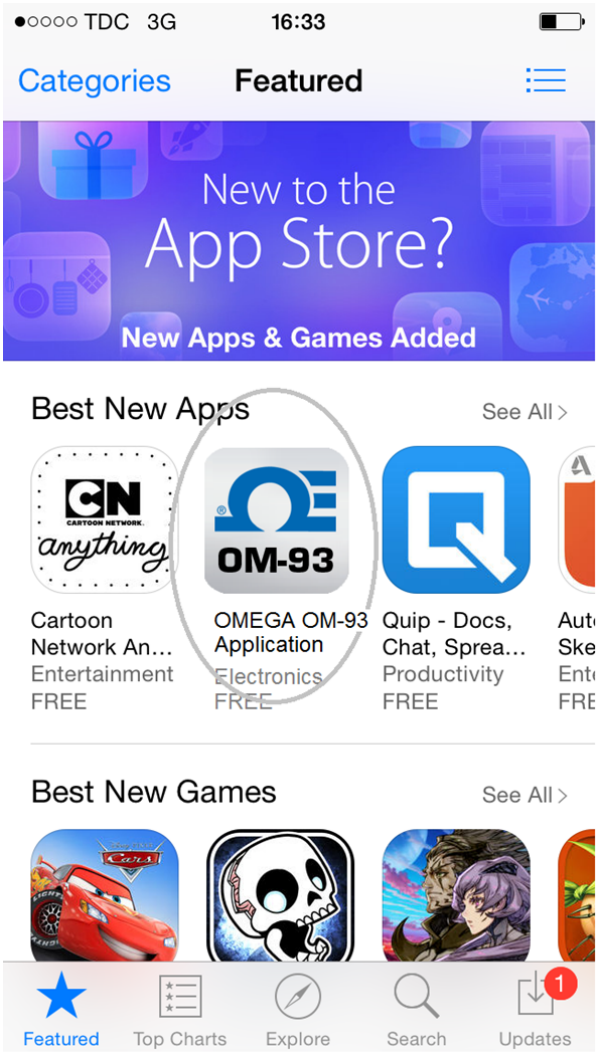

Figure 20: OM-93 iPhone App on Apple's App Store

7.2. Searching for OM-93 loggers

The OM-93 iPhone application requires that the Bluetooth® is enabled for the mobile device. If the application is started and this is not the case then it will first ask to enable this. Once theOM-93 application is started then there is an option of scanning for all OM-93 loggers.

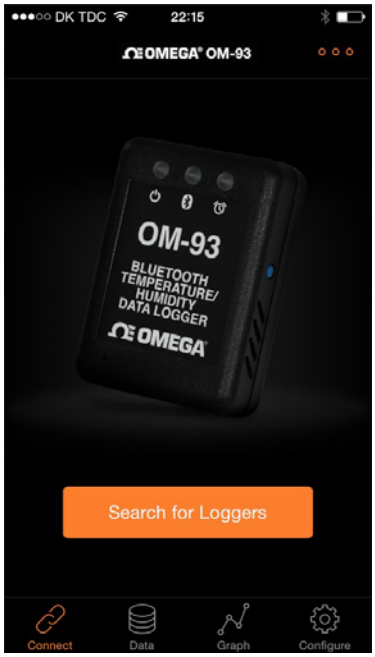

Figure 21: OM-93 iPhone App – Searching

7.3. Connecting to your logger

After searching the application will provide a list of all OM-93 devices that can be connected from your mobile device. See figure 22. Select one of the devices within range.

The first time the iPhone application discovers a OM-93 logger, it will mark it as "**-undiscovered-**". Upon connecting and thereafter it will use the logger name found when the application recovers it from the logger.

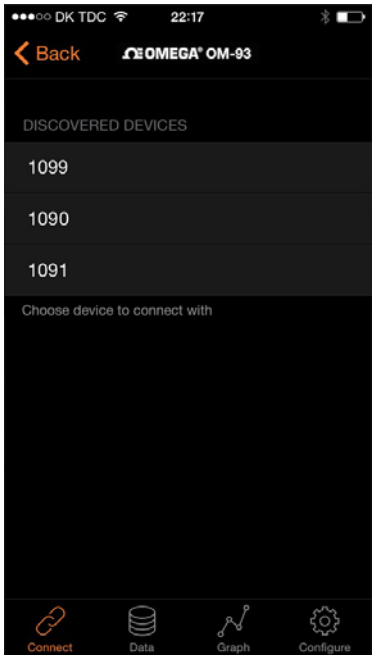

Figure 22: OM-93 iPhone App – Connecting to a device

Upon successful connection the logger's Bluetooth® Connected LED turns blue. On the application the connected icon turns green. Also the application starts showing in real time the temperature and humidity from the logger.

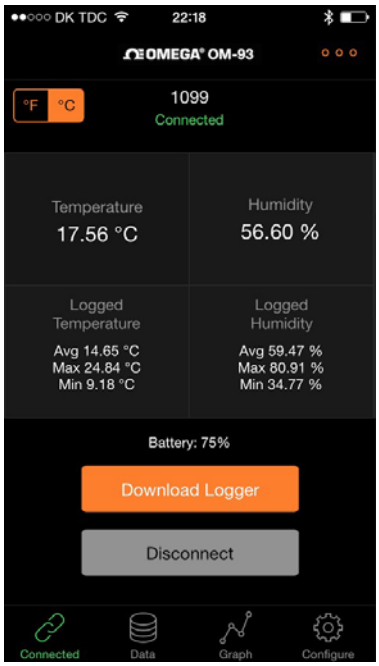

Figure 23: OM-93 iPhone App – Logger Connected

7.4. Configuring the logger

To configure a logger one needs to go to the Configure screen.

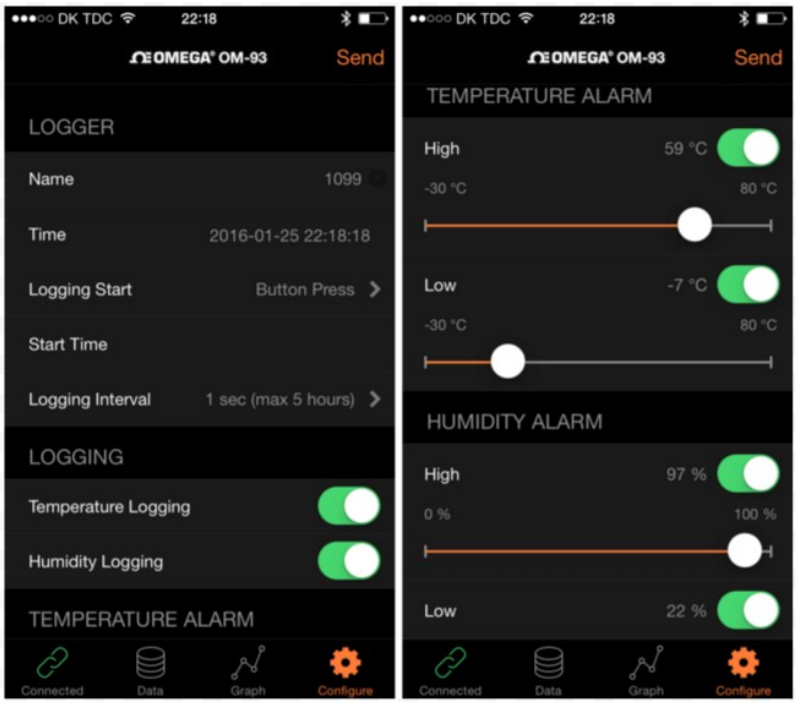

Figure 24: OM-93 iPhone App – Configuration Screen

Next fill out all desired settings including:

- the name of the logger
- the logging start mode
  - on disconnection
  - by button press
  - at specified start time
- the logging interval
- enabling/disabling of temperature logging
- enabling/disabling of humidity logging
- temperature units (Fahrenheit or Celsius)
- temperature alarms levels (upper and lower)
- humidity alarms levels (upper and lower)

Once all configuration is as required then press send to download all settings to the logger.

7.5. Downloading data

After connecting to a logger that has collected data then to download the data, select Download Logger from the Connected screen.

The application then moves to the Data screen and all data appears as a list of all sample points collected.

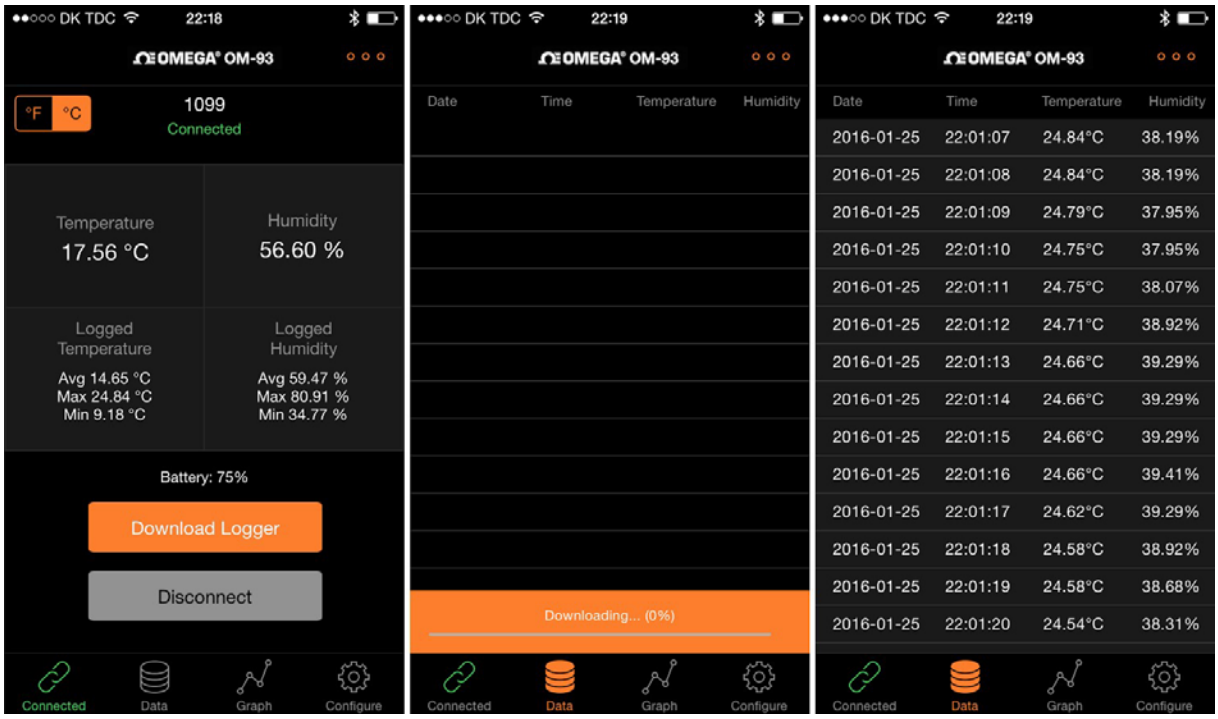

Figure 26: OM-93 iPhone App – Downloading Data

7.6. Viewing data graphed

Once data is read into the application it is possible to view the data graphically from the Graph screen. Zooming is controlled by finger movement (Apple's usual pinch out to zoom in and pinch in to zoom out).

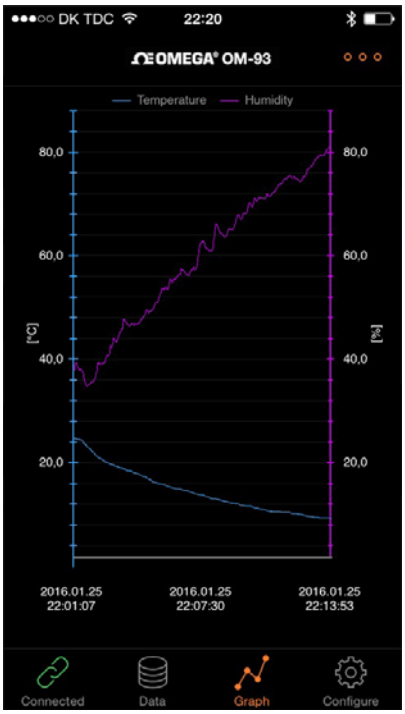

Figure 27: OM-93 iPhone App – Graphing Data

7.7. Saving data to the iPhone

Data can be saved to the iPhone from the Data screen. Select the option to the top of the application and then select Save to File. You will then be prompted for the file name.

This saves data to the phone in case there is no Wifi or Cellular connection.

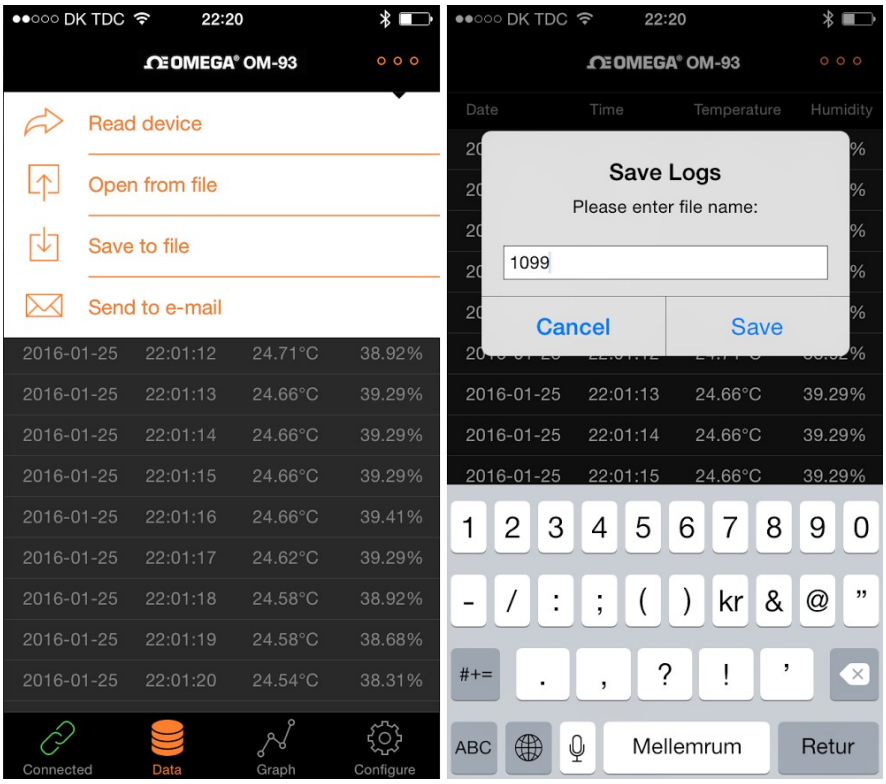

Figure 28: OM-93 iPhone App – Saving Data to the iPhone

7.8. Opening data from the iPhone

You can read data back from the iPhone to the application. Select the option to the top of the application and then select Open from File.

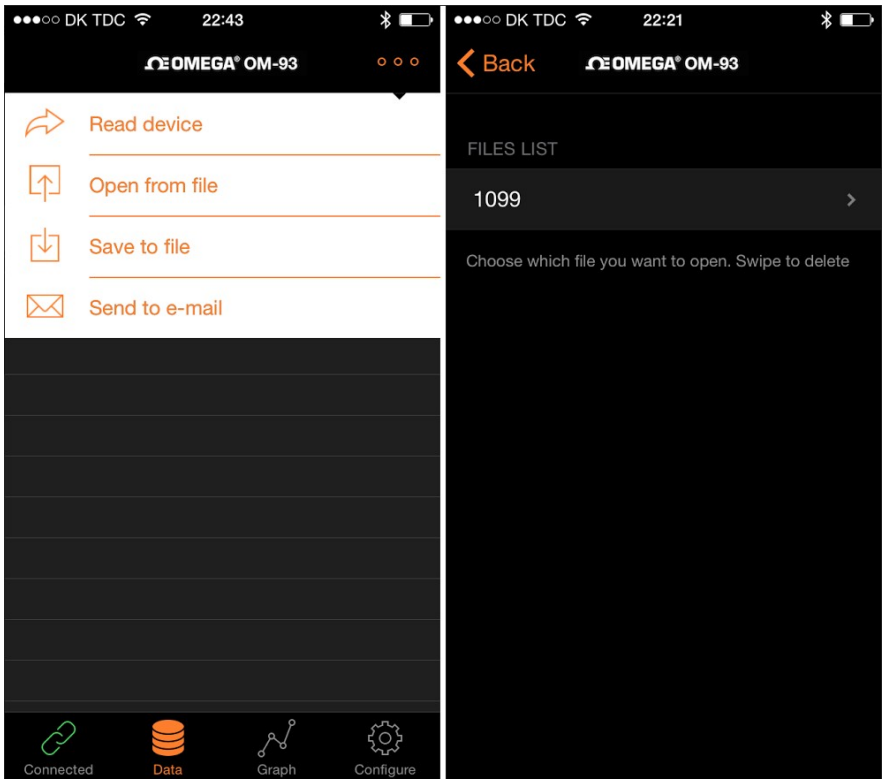

Figure 29: OM-93 iPhone App – Retrieving Data from the iPhone

To delete from the file list swipe left on the desired file.

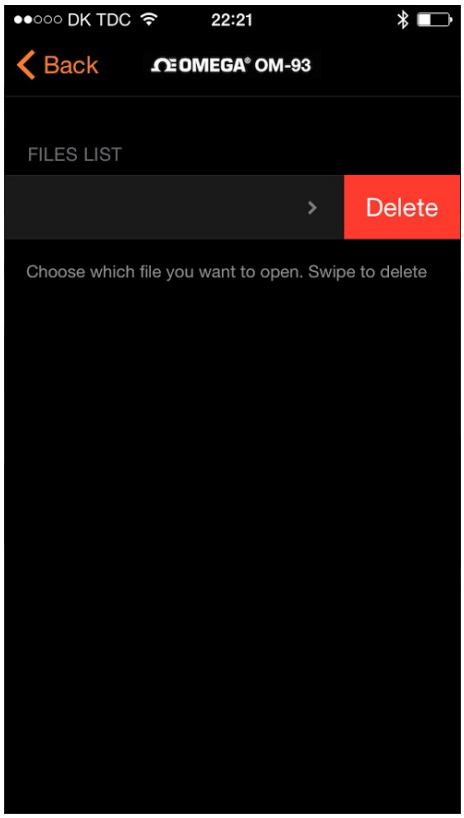

Figure 30: OM-93 iPhone App – Deleting a stored file

7.9. Emailing data files

You can email data contained within the iPhone® application. Select the option to the top of the application and then select Send to e-mail.

Please note that in order for the application to use the emailing function your iPhone® or iPad® will need to be setup with at least one email account.

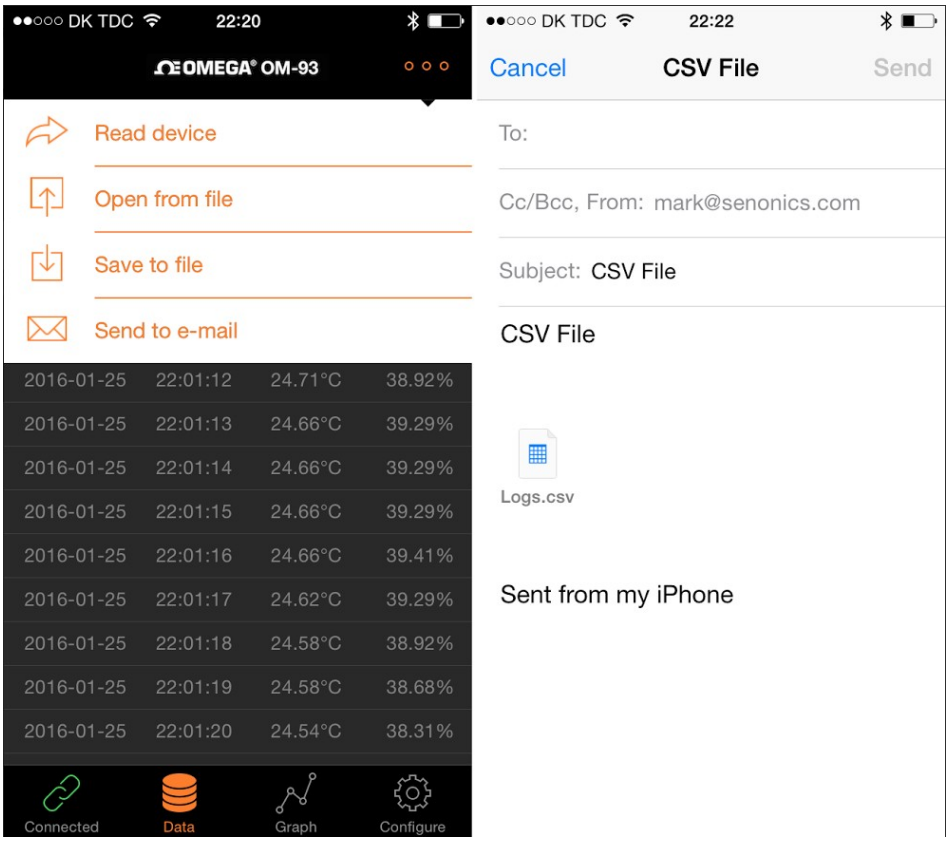

Figure 31: OM-93 iPhone App – Emailing Data

7.10. Disconnecting from the logger

To disconnect from the logger either select Disconnect on the Connected screen or just close the application. The Blue LED will turn off indicating the logger disconnected state. Having the application sent to the background is also sufficient to close connection to the logger.

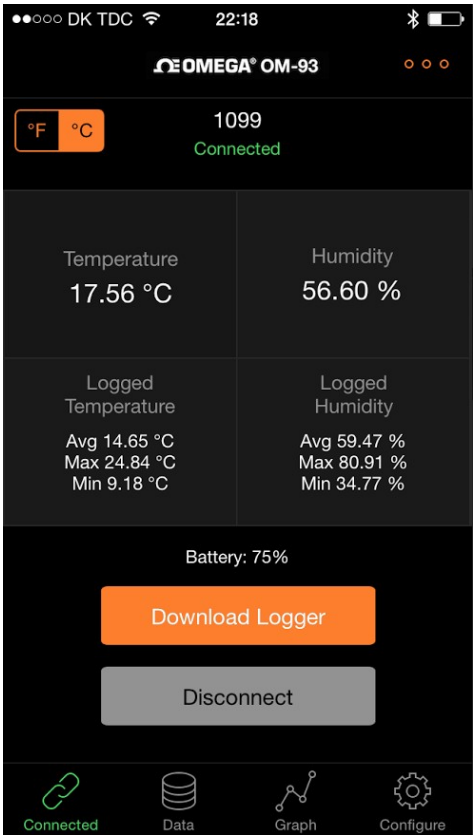

Figure 32: OM-93 iPhone App – Disconnection

8. USB and iPhone® App Connection / Disconnection Behaviour

As a rule the OM-93 logger will stop logging when it is either connected to via USB or if it is connected to from the iPhone® application. Upon disconnection of either the USB or iPhone® connection the OM-93 logger will resume logging if it was previously logging at the time of the connection.

9. Mounting Guidelines

There is no particular limitation with regard to transporting your Omega OM-93 logger. The logger may be fastened to a transportation container or loosely packed.

It is recommended however to keep some air space around the ventilation slots on the logger or else the logger may take longer to track humidity and temperature changes.

10. Battery Charging

Your Omega OM-93 logger includes a Lithium Polymer (LiPo) rechargeable battery. The Battery automatically charges by connection to any USB source such as a PC or Mac.

It is also possible to charge using a USB mains charger.

Figure 24: USB Mains Charger

When running the logger while connected to USB power the logger will be charging the rechargeable battery. A consequence of this is that the logger will itself dissipate some heat and therefore affect temperature readings. For highest logger accuracy always run without USB power connected.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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