Touch Screen IAQ Profile Monitor

Stand alone Indoor Air Quality (IAQ) monitoring unit

Operation Manual

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1. INTRODUCTION

The Touch Screen IAQ Profile Monitor is a stand-alone Indoor Air Quality (IAQ) monitoring unit, capable of continuously monitoring multiple IAQ parameters. Sensor readings are displayed continuously and in real time.

The Touch Screen IAQ Profile system has been designed to give a visual representation of indoor air quality in a building, as part of the buildings management standards in relation to conditions such as Sick Building Syndrome.

Sensor Options:

- Formaldehyde – Satellite unit only
- Glutaraldehyde – Satellite unit only
- Temperature
- Humidity
- Nitrogen Dioxide (NO2)
- Carbon Monoxide (CO)
- Carbon Dioxide (CO2)
- Sulphur Dioxide (SO2)
- Total Volatile Organic Compounds (TVOC's)
- Methane (CH4)
- Ammonia (NH3)
- Ozone (O3)
- Water (H20) single zone sensing cable
- Smoke Sensor
- Motion

* Other sensor options available

The IAQ Profile Monitor incorporates a variety of advanced gas sensor technologies to monitor the target gases including NDIR, PID and Electrochemical.

1.1   Initial Receipt of your Touch Screen IAQ Monitor

Your PPM Technology Touch Screen IAQ Monitor   has been packaged carefully and includes all the components necessary for full operation.   Immediately upon receipt, please examine the kit contents carefully to ensure that you have received the following items in good condition.

Kit Contents

The Touch Screen IAQ monitor kit contains:

- •   Touch Screen IAQ Monitor instrument with Desk Stand/Wall Mount
- •   DC Power Supply 12V
- •   Stylus
- •   Antenna (GSM, Wifi, ZigBee) *
- •   Operation Manual and User Guide

* The number of aerials received with your instrument will vary depending on the specification of your instrument.

Damage

Inspect all items carefully.   Any damage must be reported immediately to both the carrier and your dealer.
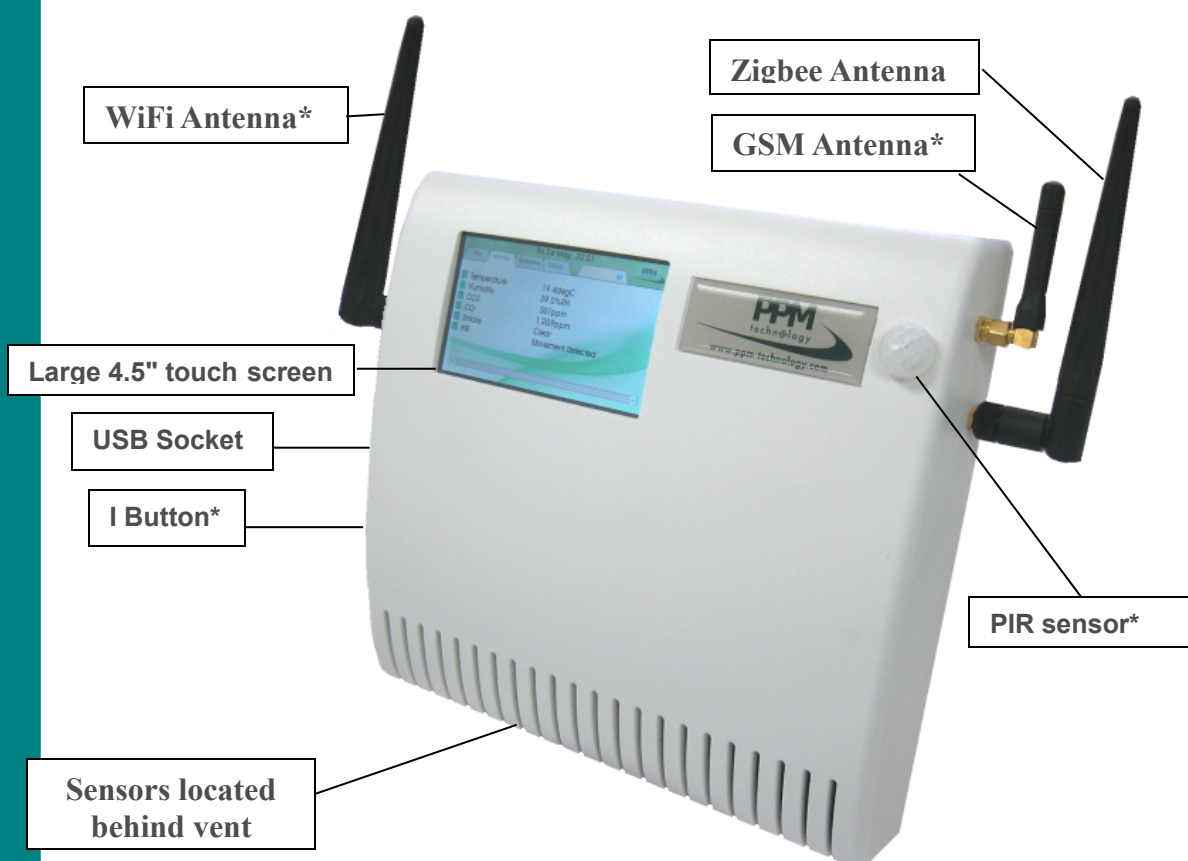
1.2   General Description

The Touch Screen IAQ profile monitor can be configured with WiFi and/or GSM modules. The WiFi module allows you to connect the IAQ monitor to your home/office network with the ability to download sensor data from the unit to another computer. If the IAQ monitor is not within reach of any WiFi network, then you can download the data to a USB flash drive using the built in USB socket located on the side of the instrument. The optional GSM module allows you to receive status updates and alarm alerts from the unit via text message to a mobile device. This early warning system allows you to keep right up to date with what the IAQ monitor is sampling, and also acts as an advance warning for staff working in the vicinity.

The user is able to navigate through the various sensors simply by touching the panel. The touch screen software allows simple control and navigation; the user can view the data graphically, as well as enable alarm functions and notifications for more effective and economical building management.

Summary:

- A compact Indoor Air Quality (IAQ) monitor for use as part of a buildings management standards.

- Built in 'touch screen', displaying current IAQ parameters in the building.

- Bench Top Stand or Wall mountable using standard VESA wall bracket.

- The unit includes a built in USB port for downloading data quickly and easily.

- Each unit is configurable with a number of sensors dependant on selected sensor types.

- May be used as a stand-alone monitor or as part of a wider IAQ monitoring network.

1.3   Instrument Features

WiFi Antenna*

Zigbee Antenna

GSM Antenna*

Large 4.5" touch screen

USB Socket

I Button*

PIR sensor*

Sensors located behind vent

* I Button, PIR sensor, WiFi and GSM are optional. Please specify configuration when ordering

- **Large 4.5" touch screen**
  Featuring a 4.5" touch screen which is able to display real time sensor data. Easy to use software designed to quickly navigate through various graphs and sensor parameters.

- **Built in WiFi and GSM module**
  The Touch Screen IAQ unit is configurable with both WiFi and GSM modules, with the ability to have notifications sent to a mobile device if required. (E.g. An text message sent to your mobile phone should an alarm be triggered on the IAQ monitor).

  A built in WiFi module allows you to add the IAQ monitor to your existing network. If correctly configured you can remotely view sensor data from anywhere in the world via the internet.

- **USB socket**

  A single USB 2 socket (480Mbit/s) at the side of the unit allows you to plug in removable USB drives to download data from the unit to take with you. This data can also be imported into the PPMonitor software suite.

  Future firmware releases for the unit can be installed onto the device using the USB socket. Please contact PPM Technology for more information on the latest firmware available for your device.

- **ZigBee**

  Can connect to IAQ Profile and Mini IAQ Monitors. These units will appear on the touch screen display and the sensors for these units will be available to look at. The ZigBee network can greatly increase the number of sensors available on the Touch Screen unit.

- **I Button**

  Located on the left hand side of the instrument, the I button allows multiple users to log into the instrument and also provides added security to the instrument. Can be used as a means of monitoring staff activity with users logging in and out of various areas of a building.

2. OPERATING GUIDE

2.1 Inserting a SIM card

*** If your instrument did not come with a GSM module, please skip to
2.2 Powering on the unit. ***

The Touch Screen IAQ monitor can be configured with a GSM module to enable the 'Alarm SMS' feature.

Before we can turn the instrument on for the first time we need to install a working SIM card into the GSM module (Please make sure that there is sufficient credit available on the card if you are not using a contract SIM).
To do this you will need to open up the instrument by unscrewing the four screws located at each corner of the unit:
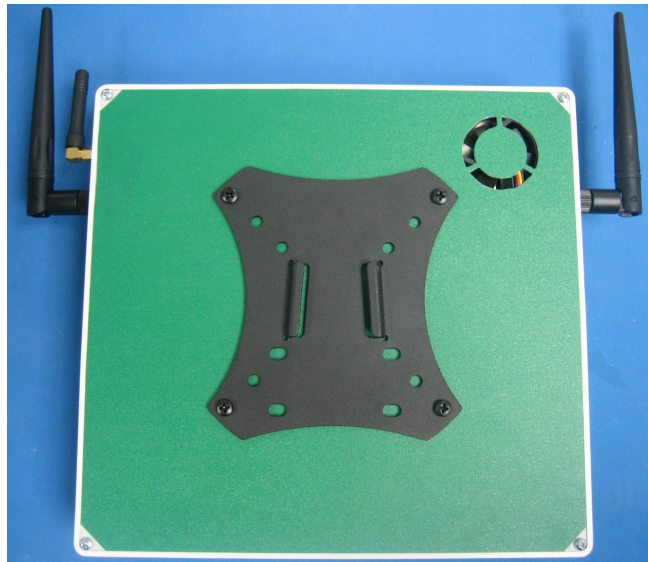
Carefully pull away the backplate from the white outer case and rotate to the right hand side of the instrument so as to avoid disconnecting the fan.
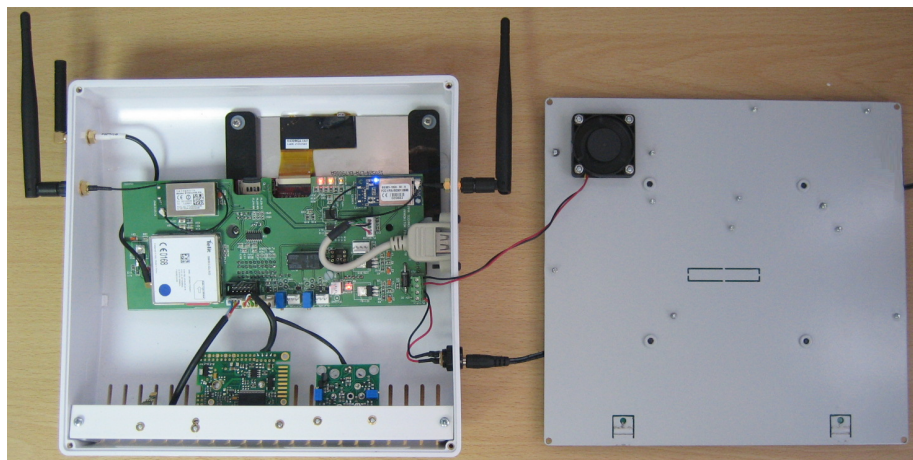
You can now see the square GSM module located on the far left of the main board. Line up the SIM card with the GSM module (contact pins facing down) as shown in the diagram on the GSM module. Then push the SIM card into the module. You should hear it click into place. The SIM card should only protrude 2mm outside of the module if done correctly.

Now re-assemble the instrument making sure not to sever the fan connection when placing the backplate on the unit.

2.2 Powering on the unit

When using the Touch Screen IAQ Monitor for the first time, simply plug the included 12V DC supply into the socket located on the left hand side of the instrument and switch on at the socket. The unit will take some time to boot up, so please be patient. You should be greeted with the loading screen shown below:


The firmware version of your unit is displayed in the top left corner.

Once the instrument has booted up (This can take up to 60 seconds) you should be greeted with the main page bellow:
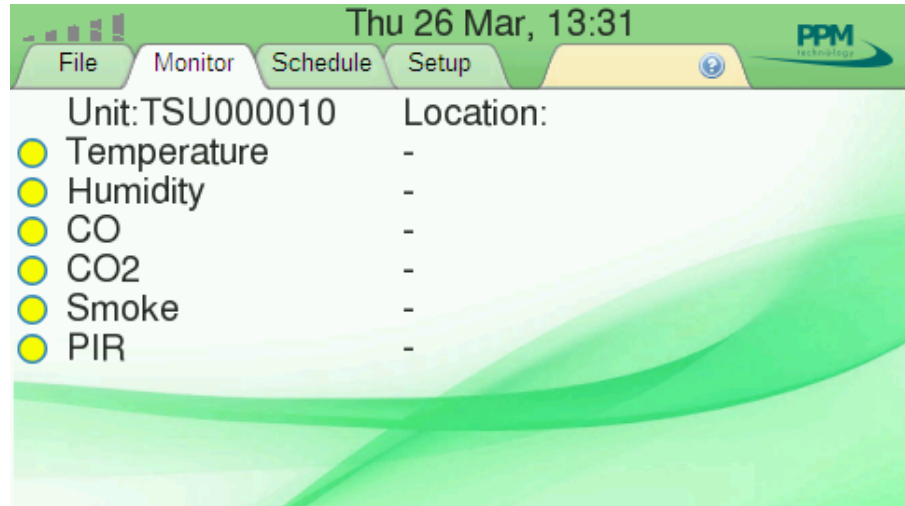

When you first turn on the instrument there will be no readings available for any of the sensors or satellite units. During this warm-up period the sensors for the units have a yellow circle. A typical sensor or satellite unit connected to the Touch Screen unit can have a warm-up period of up to five minutes. As the readings from the sensors arrive, the unit name is populated, the yellow circle turns green and the first reading from the sensor will appear on the screen next to the sensor type.
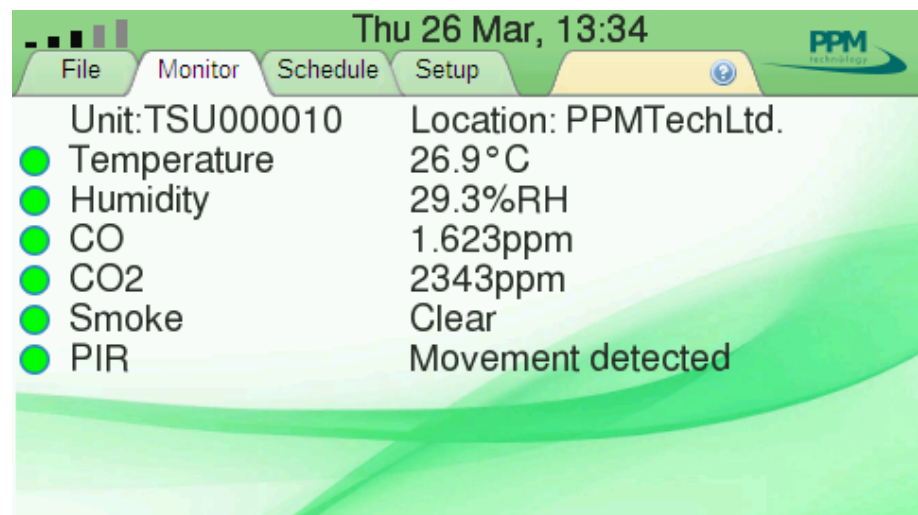
2.3 Navigating the menus

You can navigate between the various parameter sensors of the touch screen device by using the included stylus and clicking on the green box corresponding to each sensor. A separate page is generated for each parameter sensor clicked on. A graphical representation of the sensor readings over a period of time can be seen on screen.
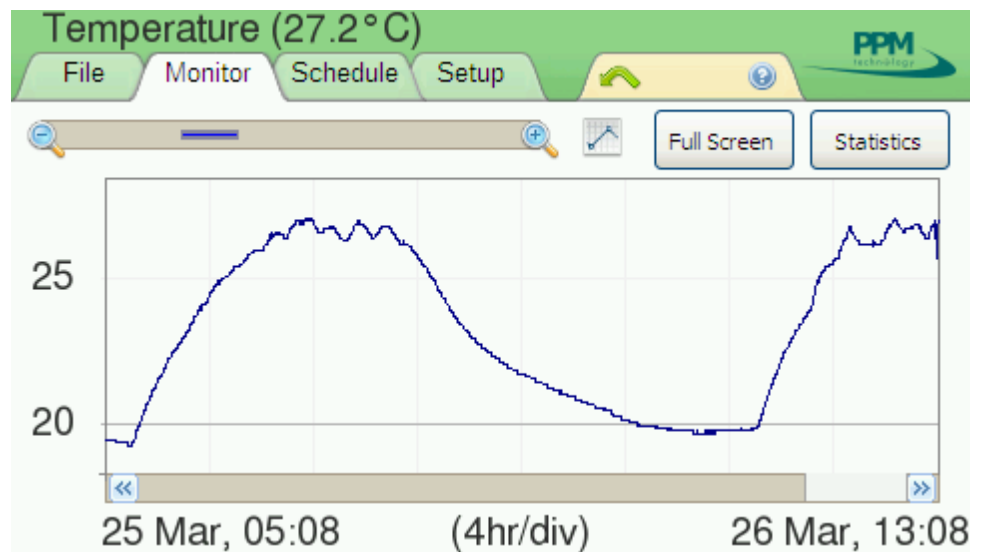
You can increase or decrease how much data is shown on the graph by clicking on the - or the + spyglass symbols respectively. This is great for viewing graphical data from a day or two ago.
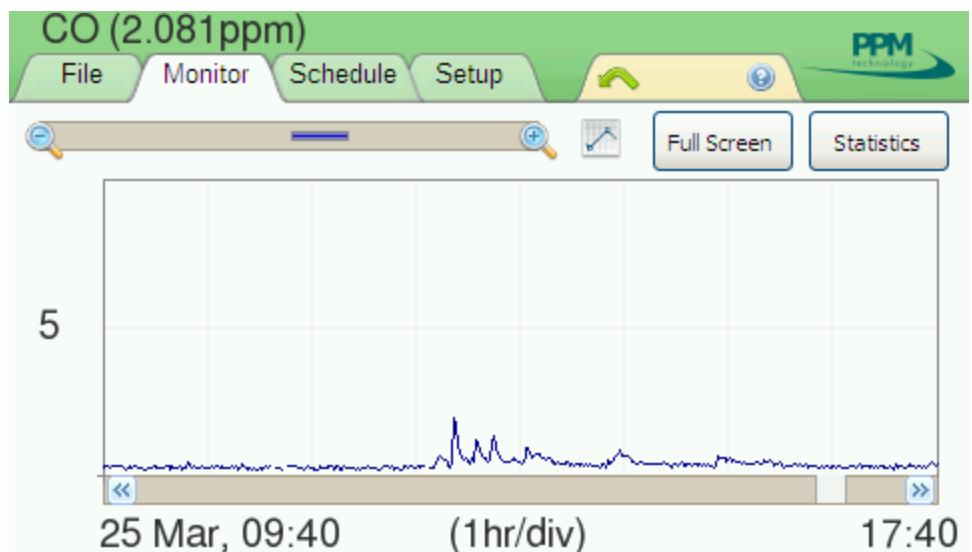

You can scroll through the time axis using the grey coloured bar at the bottom of the page.

Clicking on the square chart icon (left of the 'Full Screen' button) will display the last 2 hours of sensor data.

Full screen mode will enable you to maximise the size of the graph by simply tapping on the 'Full Screen' icon. You can return to the previous view by tapping anywhere on screen

Clicking on the **Statistics** button will bring up the following pop up showing further details of the sensor in question including the maximum and minimum readings:
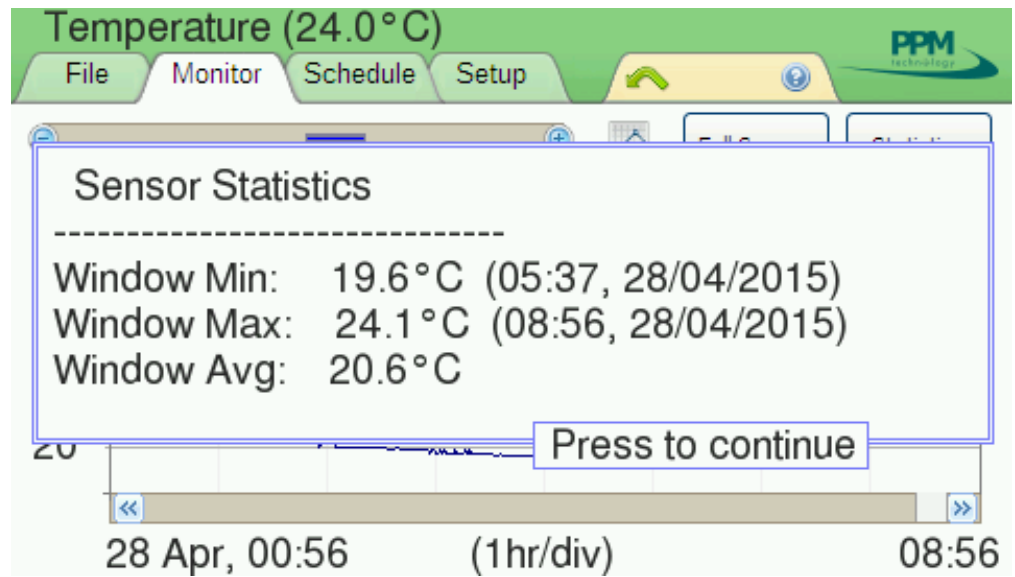
To return to the main homepage, click on the **Press to Continue** button to close the pop up and the tap the green arrow in the fifth tab of the menu.

2.4 Satellite Units

If you have any additional IAQ Monitor units transmitting to the Touch Screen Unit (See section **2.8 Setup>ZigBee** for adding satellite units), you can view the sensor data generated by the instrument by clicking on the bottom right arrow, which will then take you to a separate page with the unit name and a list of sensors available on the instrument.

To navigate back to the sensor list on the Touch Screen Unit itself, simply click on the left arrow located on the bottom left of the screen.

2.5 Setting Alarms

You can view and set alarm conditions for individual sensors by taping the green circle to the left of the sensor name.
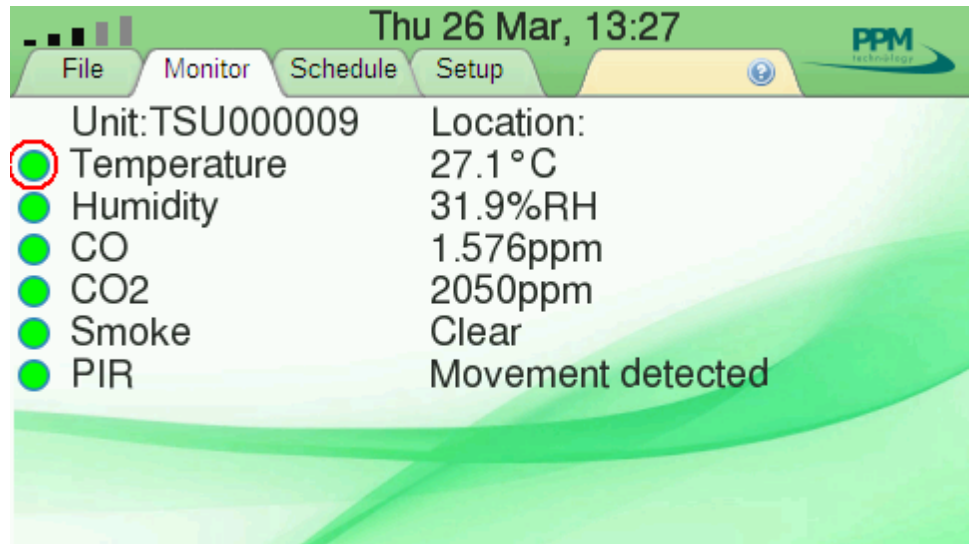

Each sensor can have up to two alarm conditions defined, namely Temperature <= and Temperature >= setting an alarm for greater than or lesser than the value respectively. An alarm threshold value can be defined by clicking in either of the two available white boxes. The alarm can be triggered if the current value is greater than or lesser than the alarm threshold depending on which box you select. Either of the two alarms can also be enabled or disabled using the on/off toggle switches.
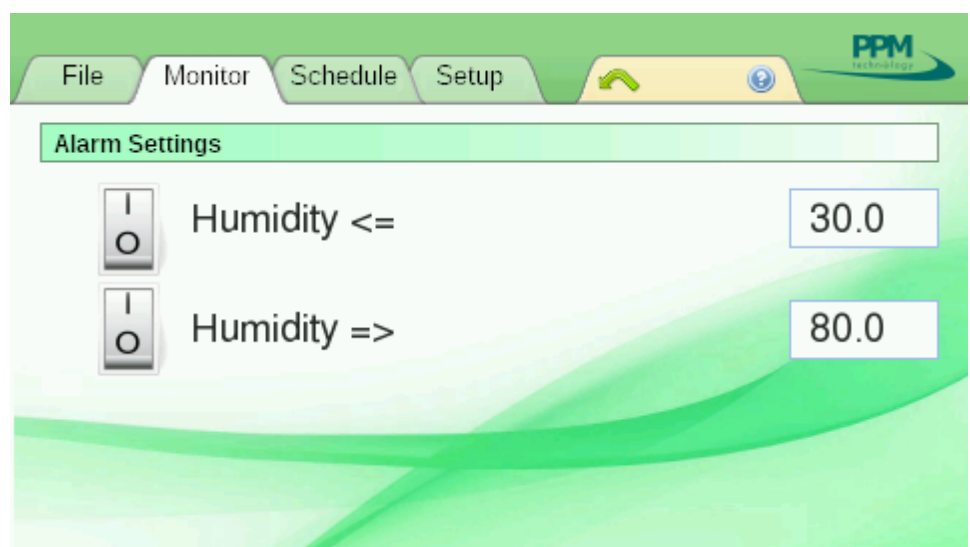
2.6 Setting a Schedule

The touch screen IAQ Monitor is capable of running schedules which the user can specify.

Clicking on the 'Schedule' tab from the home screen will bring up the following page:
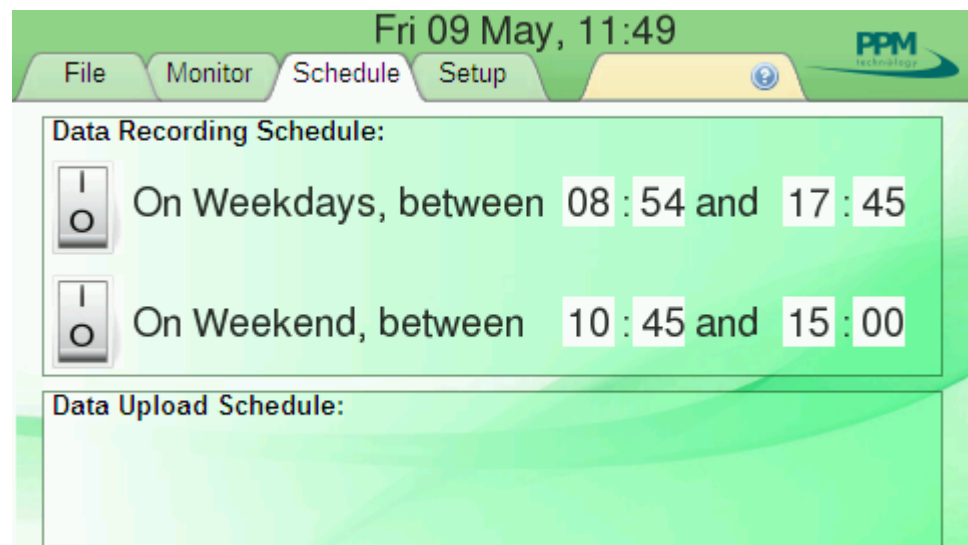

Here you have the ability to turn on a schedule for a weekday or weekend session. Simply click on the toggle switch to activate/deactivate the schedule.

The start and end time can be set by clicking on the numbered icons. This will bring up a separate interface for you to type the time you would like the schedule to start and finish on. Once entered, simply click on 'Go' and you will be sent back to the 'Schedule' screen.
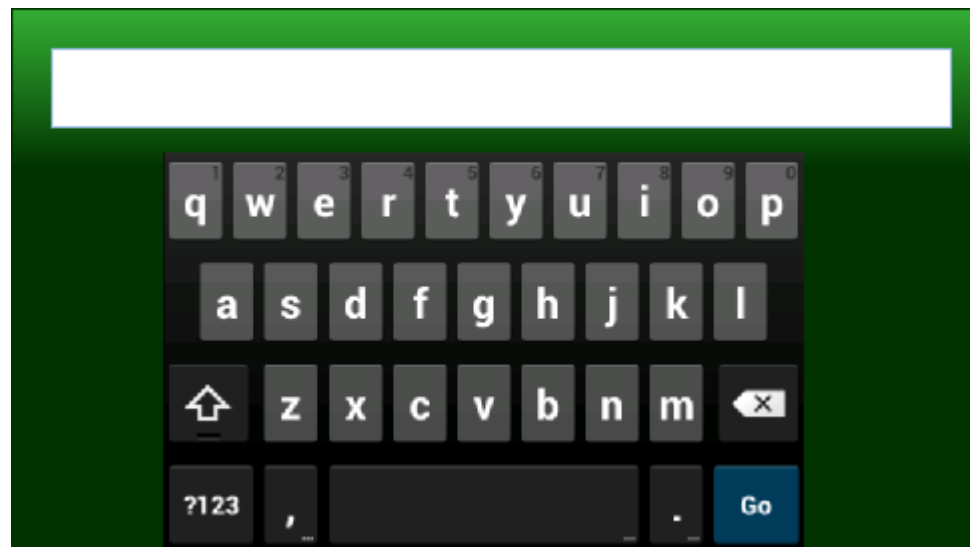
2.7 Exporting Data

The Touch Screen IAQ Monitor is capable of downloading sensor data taken over a period of time to a USB pen drive or hard drive. The data can be in the form of a CSV file for viewing in a spreadsheet package or in a format for use with the PPMonitor suite
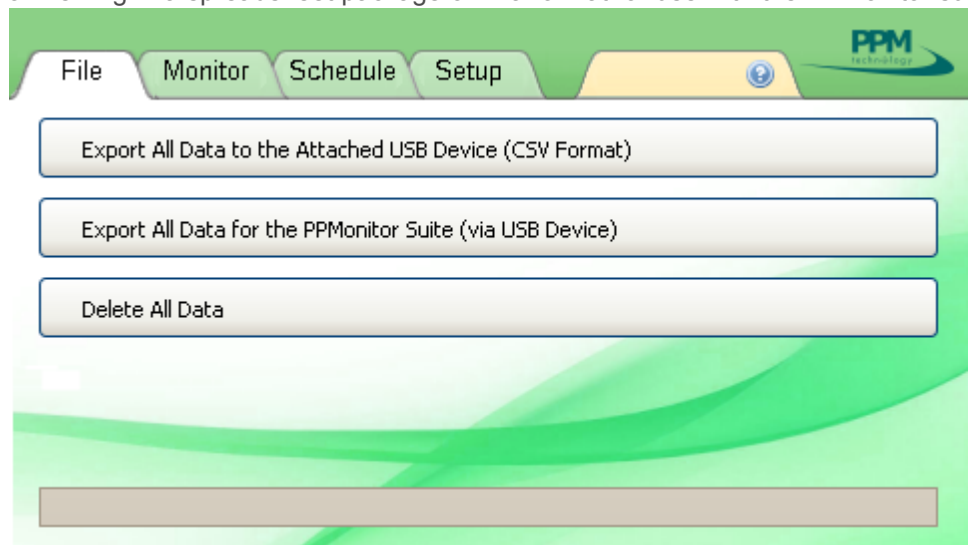
(PC software for use with individual IAQ monitors)

Select the required option by tapping the corresponding button and following the on-screen instructions. The CSV format file can be imported to a spreadsheet package such as Microsoft Excel and manipulated into graphs and so forth. If you choose to have the data downloaded in a format for use with the PPMonitor suite, simply unplug the USB device from the Touch Screen unit and plug into a computer running the latest version of PPMonitor. Once plugged in you can import the data from the USB device into the PPMonitor SQL database. Simply click on **'File'** and then **'Import TSU Data'**.
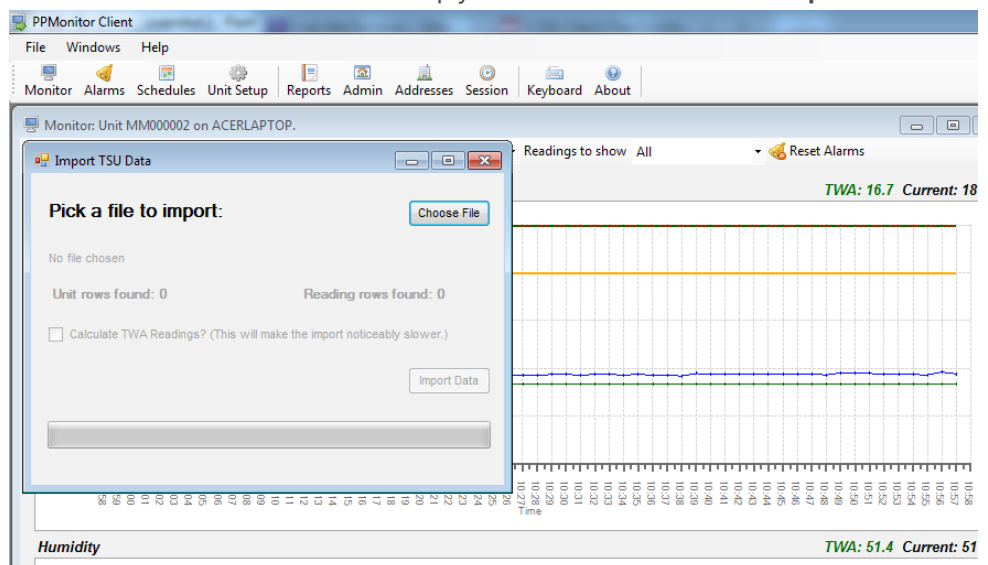
You should then be greeted with a pop up asking you to select the file to import:

2.8 Setup

In the setup menu you will find a window displaying the Serial Number and location of
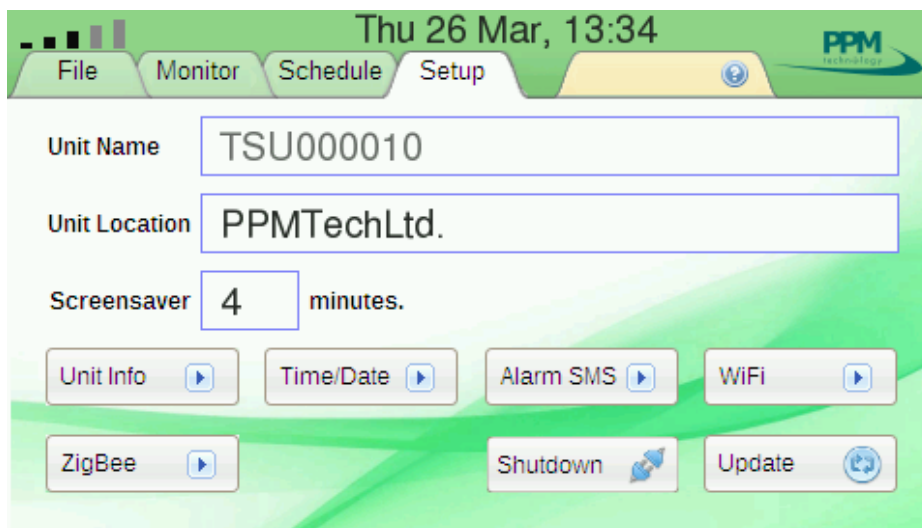
your Touch Screen Unit as well as other configurable settings such as time/date, SMS settings, WiFi, ZigBee and Software Update.

Unit Info

Clicking on the unit info button will bring up a pop up window displaying the specifications for the unit in question.

Here you will find details of the device ID, IMEI number (if GSM module is fitted) as well as device ID's for any satellite units you may have connected up to Touch Screen Instrument.
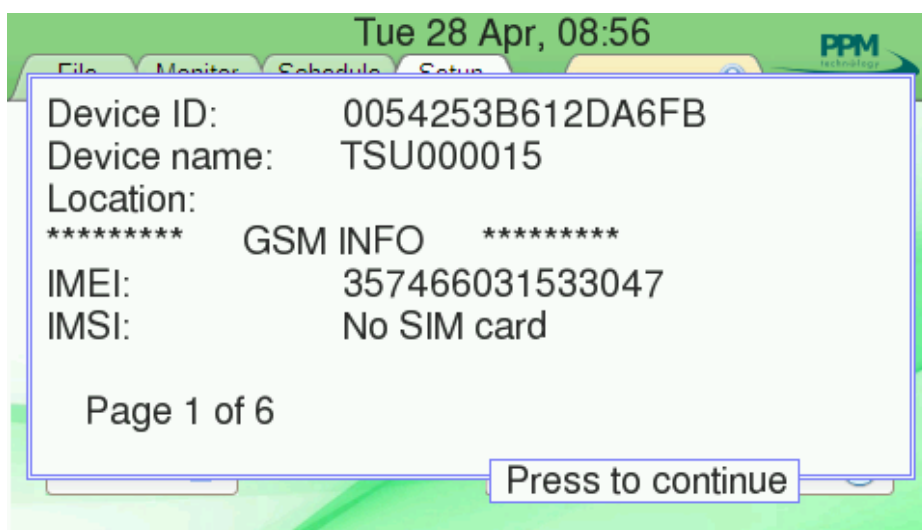
Time/Date

The 'Time/Date' button allows the user to change the current time and date of the instrument. Clicking on the button will bring up a separate window as shown below:

Please note that the hours value uses a 24 hour clock so that, for instance, '2pm' is denoted by '14'. You can also set your Timezone by clicking on the up and down arrow keys next to the text box. You can return to the setup window by pressing the OK
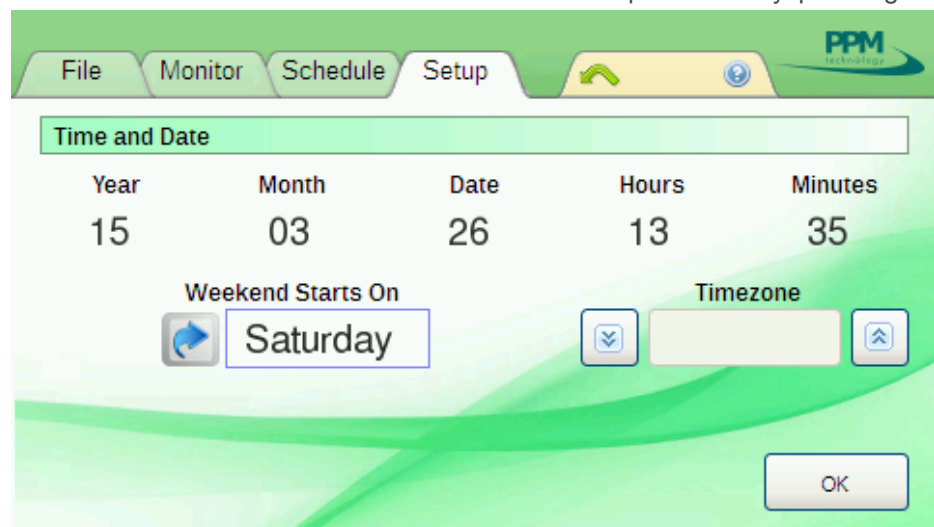
button.

Alarm SMS

The 'Alarm SMS' button allows the user to specify which telephone number is to receive the alarm messages sent by the device if any of the sensors record a dangerously high reading or otherwise. On the left hand side of the text box you will see a toggle switch, which will allow you to turn the text based alarm system ON and OFF.

To add a contact number, simply click on the text field using the stylus. This will bring up the on screen keyboard which you can use to enter the mobile phone number. Once complete, simply click on GO to save the changes.

WiFi

The WiFi module on the Touch Screen instrument will allow you to connect to your home or office network. This will allow you to log into the instrument to view sensor data remotely. Further details on logging into your instrument can be found in section **2.9 – Connecting to a Touch Screen Hotspot.**

ZigBee

Clicking on the ZigBee button will give you access to the following menu:
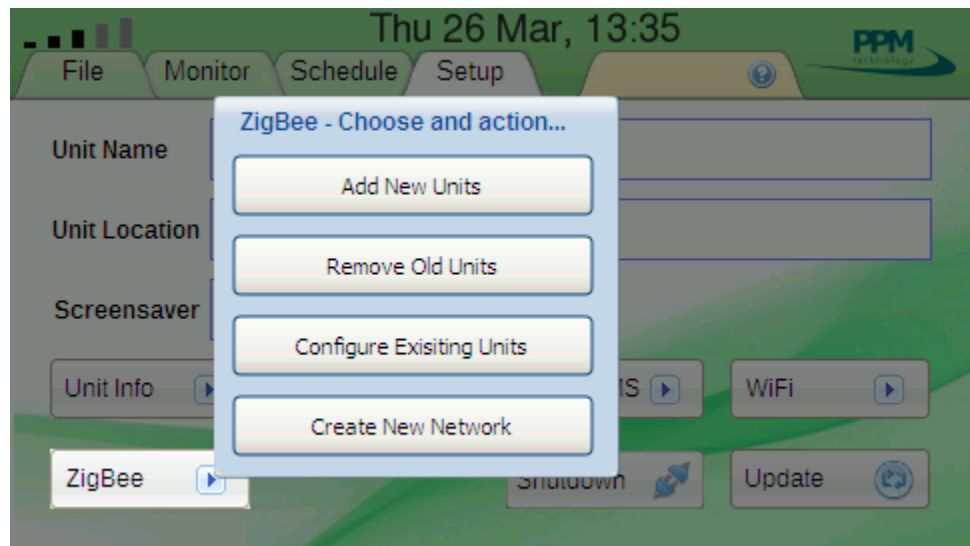
Additional wireless IAQ monitors can help expand your area of coverage and are fully compatible with the Touch Screen IAQ Monitor. You can add up to 10 IAQ monitors to the Touch Screen unit. These include both our Mini and Large IAQ monitors.

To add a new instrument to the Touch Screen Monitor, simply power on the new monitor (making sure it is within range of the Touch Screen Monitor). Then click on **'Add New Units'.** The software will now scan for any new instruments that may been in the area (this can take a few minutes). Once found, you have the option to add the new unit to the network. The new monitor will then begin transmitting to the Touch Screen Monitor and you will be able to navigate to the data from the **Monitor** tab of the menu and clicking on the arrow highlighted below:
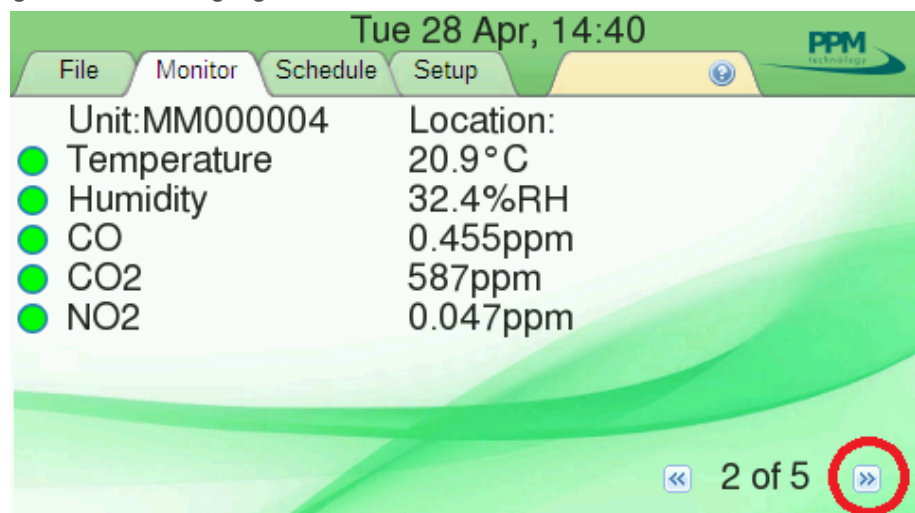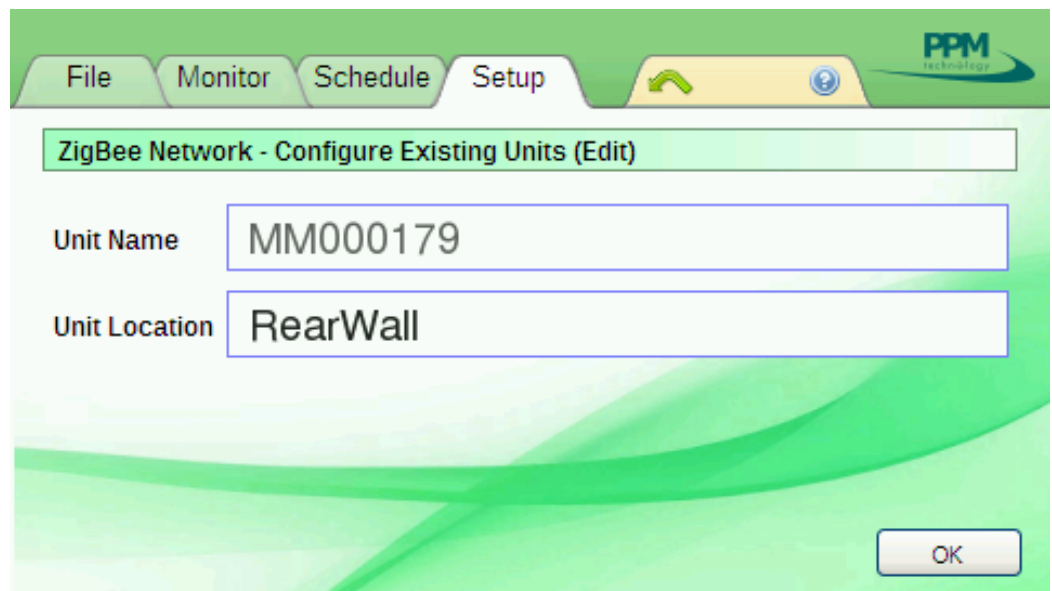
To remove any unwanted instruments from the network, click on the **'Remove Old Units'.** You will then be able to select which instrument you want to remove from the network. Repeat this procedure for each additional unit you wish to remove.

It may take a few minutes for the data to be removed from the system once selected.

If you wish to configure any existing instruments on the network, click on the **'Configure Existing Units'** button and you will then be greeted with the following pop up:

The unit name corresponds to the Device serial number which in this case is MM000179. The 'MM' denotes a small IAQ profile monitor. Should you have a larger monitor on the network, this would be shown as 'ZWU'.

Clicking on the **Unit location** text field will allow you name the location of your monitor. This makes it easier to see where each individual monitor is currently sampling.

Clicking on **OK** will save the changes.

Shutdown

Clicking on the Shutdown button will safely turn OFF your Touch Screen instrument. Once the screen has turned OFF, you may now unplug the power adapter from the instrument.

Update

The 'Update' button allows the user to upgrade the system software using a USB pen drive plugged into the Touch Screen IAQ monitor.

You can download the latest release from our website at the following address:

<div align="center">

www.ppm-technology.com/downloads

</div>

Please read section **3.2** for a step by step guide on updating the software if your touch screen instrument.

2.9   Connecting to a Touch Screen Hotspot

By connecting to the ad-hoc Wi-Fi network hosted by a TSU you will be able to access the data being recorded by the TSU and some of the settings via your browser. Please note that the ad-hoc Wi-Fi network is only available on units fitted with the Wi-Fi option; the connection speed and signal range is limited compared to other Wi-Fi networks; the number of simultaneous connections to the network is limited and that you will not be able to access any other internet sites or services through the ad-hoc Wi-Fi network.
You will need a computer with a working Wi-Fi network device and a recent web browser.
Using the network connection tools for your operating system, locate the TSU ad-hoc network (you may need to "refresh" or "rescan" at this point). It will be named to match the serial number of the TSU:

The ad-hoc Wi-Fi network is not secured by any passwords so you ought to be able to simply select and connect to the network – wait whilst your computer negotiates new network settings with the TSU. This can take a while, depending on the signal strength and any activity being carried out by the TSU such as saving data or sending alarm messages.
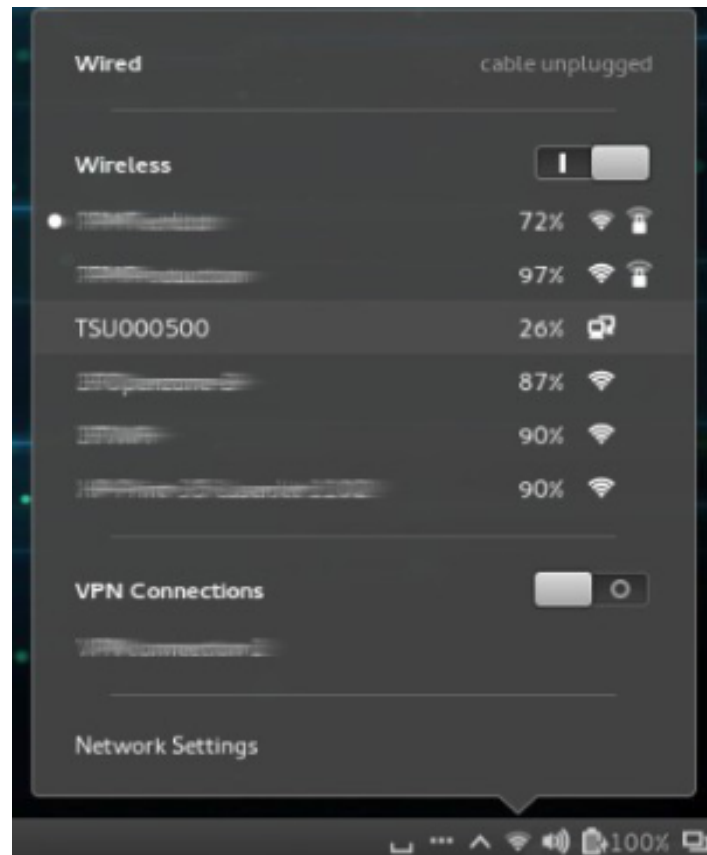
Once your computer is connected the network open your web browser and enter the following in the address bar: "**http://192.168.111.111**". This connect your browser to the website hosted by the TSU. You may be prompted for a *username* and *password* at this point:
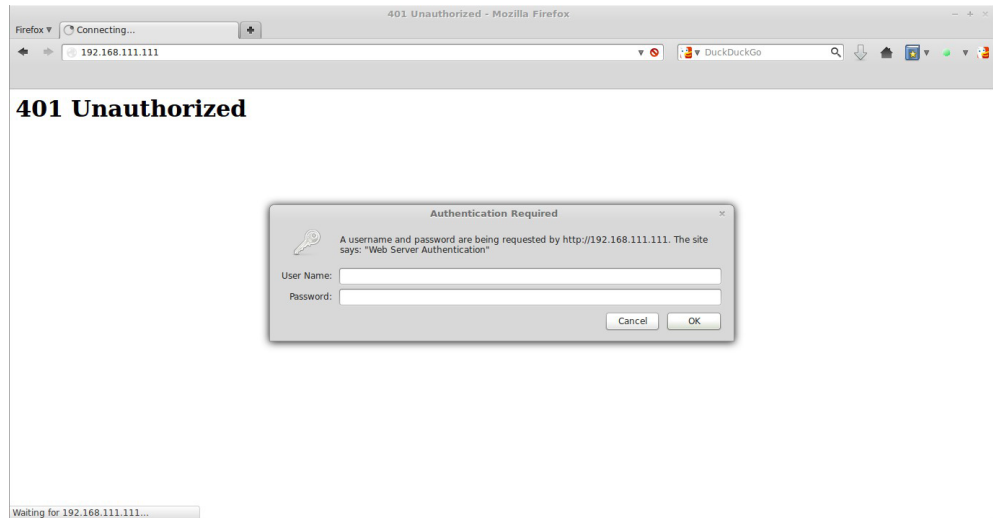
Consult the documentation that came with the TSU for the exact details required by the TSU, but the default username is "**admin**" and the default password is "**password**". Click on OK to continue to the site:
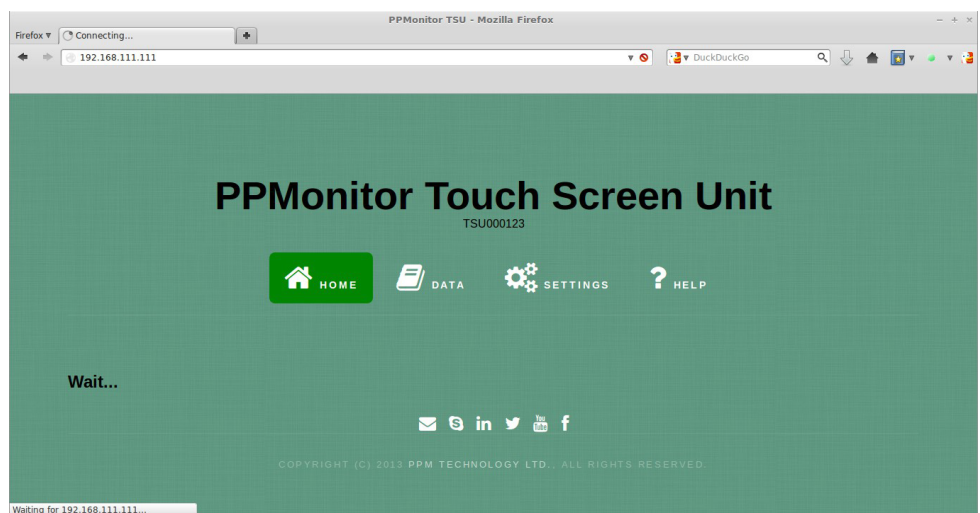
2.10 Using the Touch Screen Unit website

The website on the Touch Screen Unit allows the user to view, create and manage '.csv' and PPMonitor files. It also allows the user to change system settings and view a help-file for the PPMonitor Touch Screen Unit.


The **Data Tab** can be used to generate files that contain the readings stored on the Touch Screen Unit. Two types of files can be generated, namely .csv' files and PPMonitor files. '.csv' files allow the user to import the data to a spreadsheet to create bespoke reports and graphs. The PPMonitor files can be used to import data from a Touch Screen Unit into the PPMonitor Software Suite.

Generate the respective file types by following the blue link marked **here**. It takes time to collect all the relevant data especially if there is a lot of data stored on the Touch Screen Unit. The reports created contain all the data collected by the Touch Screen Unit from when it was first turned on.

Once the file is generated the user is given the choice to return to the data generation window, download or delete the data. Previously generated reports are also shown in the data generation window and can be viewed, generated or deleted using the relevant action icon.

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The **Settings** section of the website contains the System Status and allows the user to stop or restart the system.
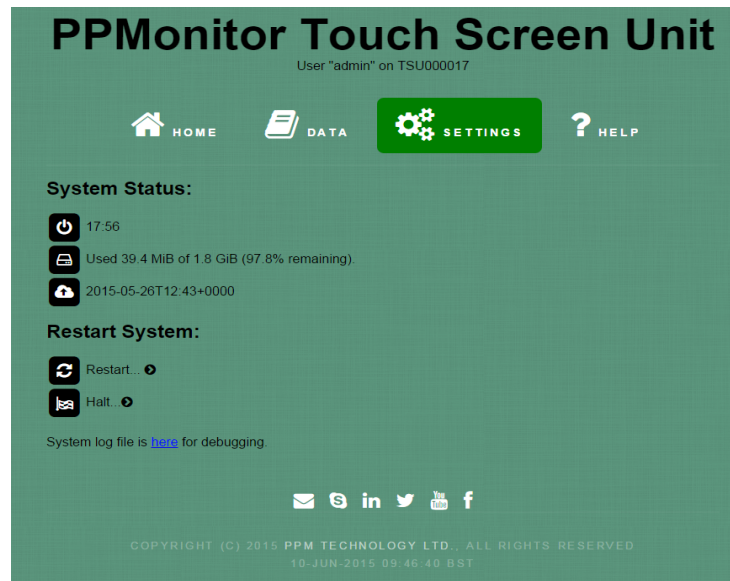
The System Status gives information on when the instrument was turned on, how much of the SD card is being used to store data and when the last data upload was made from the Touch Screen Unit.

The Help section includes instructions of how to use the website and instructions of how to connect the touch screen unit to an existing wireless network.

2.11 Connecting the Touch Screen Unit to existing networks

The Touch Screen Unit can also be configured to connect to existing wireless network. To connect to the network you will need the wireless network name, the wireless network password and a means of assigning an IP to the Touch Screen Unit like a DHCP server.

Firstly Navigate to the Setup window and click the **WiFi** button.
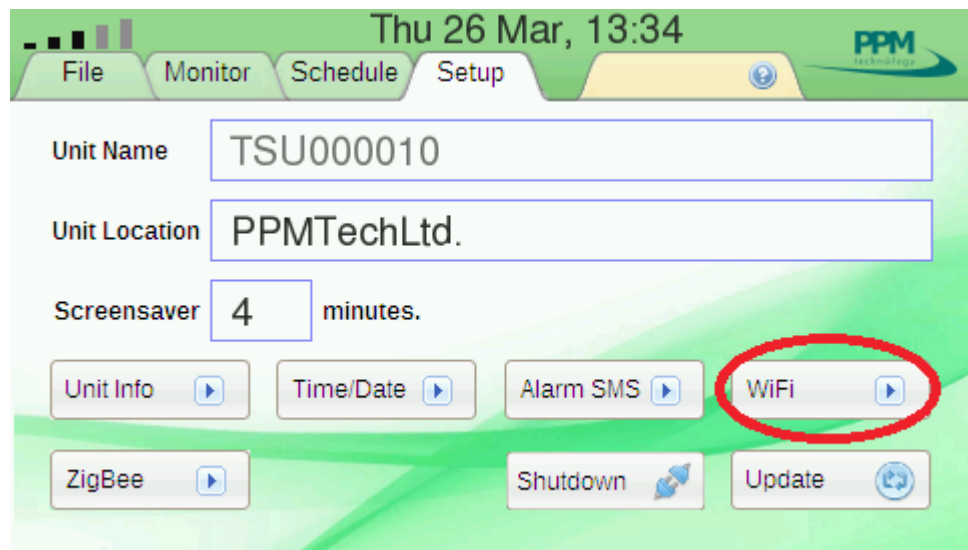
When shipped out from PPM Technology the touch screen unit is setup as default to host an ad-hoc Wi-Fi network.
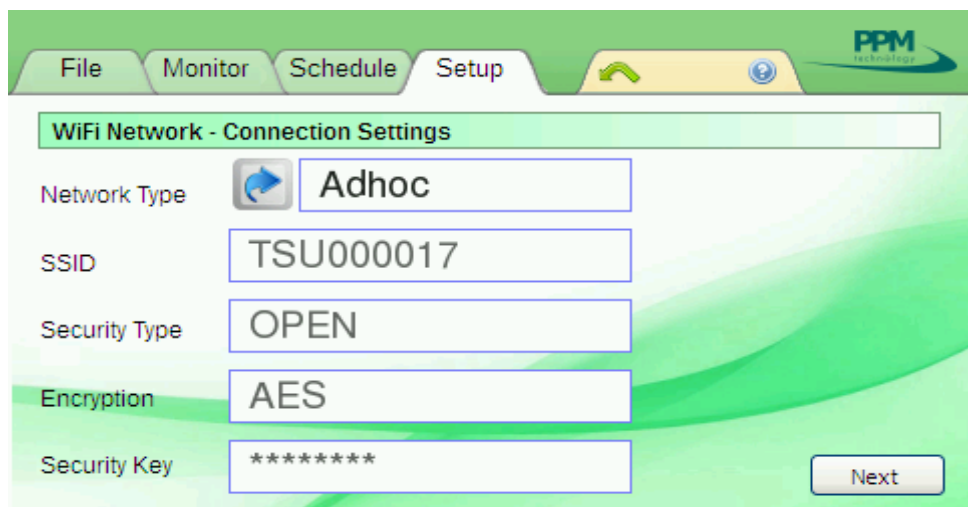
To connect to an existing network you will need to change the network type from Adhoc to Infra. After this you can put in the network name into the SSID entry.
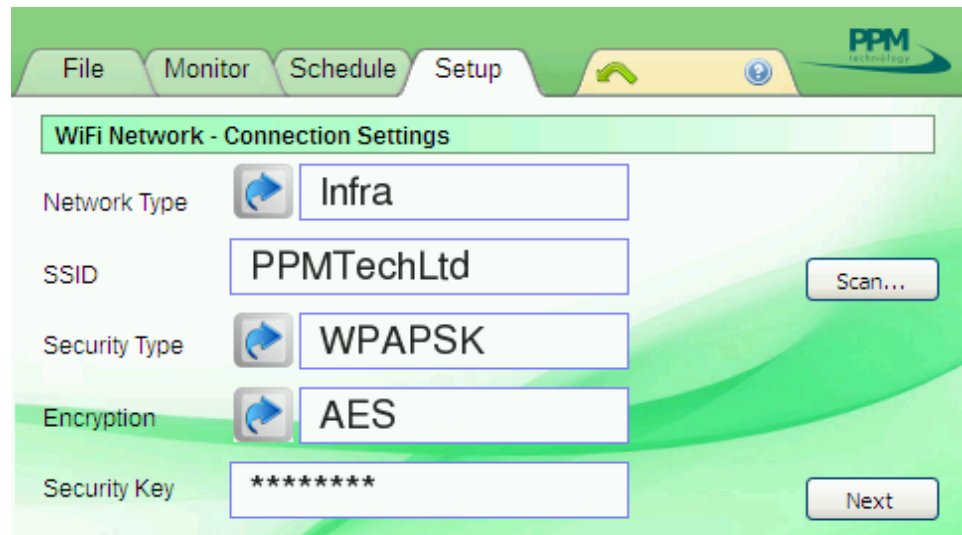
When changing the SSID name a keyboard will appear on the screen. From there you can change the name to your own network name. The network name in this example is PPMTechLtd.
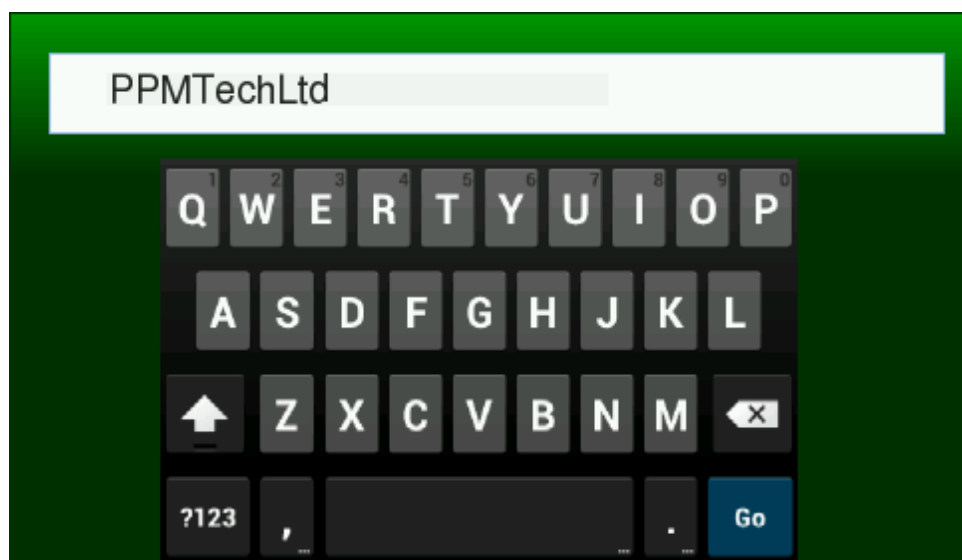
A similar window will also appear when changing the security key (network password). Once a network key and security key is configured and you have the correct security key and encryption type you can connect to this network by pressing Next. If you do not know your wireless network SSID, Security Type, Encryption or Security Key contact your Network Administrator for details. These details have nothing to do with PPMTechnology and as such we can't provide these for you.

After pressing Next for an Infra network type a new window for WiFi Network – Address Settings. These contain the details for your DHCP server. Again if you are unsure contact your Network Administrative team.
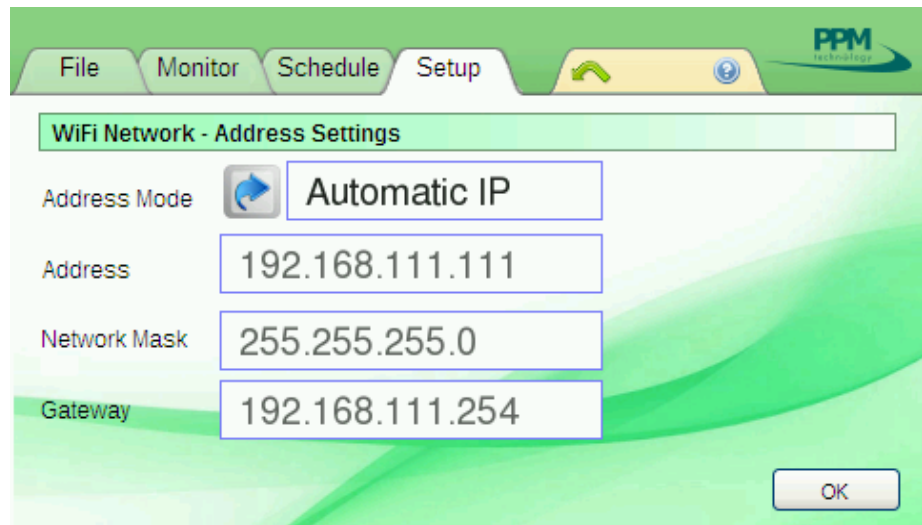
You may need to wait a few minutes for your servers to assign the IP. If your network details are correct you can find out your new IP in the Setup>Unit Info section. Your network details including IP address are on page two of your Unit Info screen.
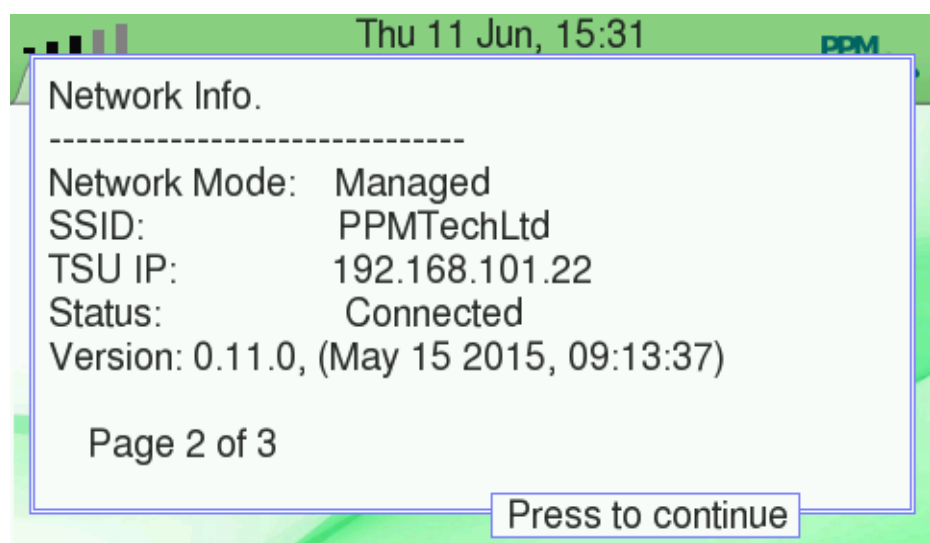
The IP number is no longer 192.168.111.111 but rather 192.168.101.22 (your IP will probably differ). You will now need this address to continue to communicate with the unit.

3. TROUBLESHOOTING

3.1 Diagnosing the problem

Alarms are not being triggered when values pass the threshold.
This may occasionally happen, and there is no obvious cause for it. Restarting the client is usually enough to resolve this problem.

The monitoring screen is not updating.
If the units have been detected but the graphs are not being updated, this problem is usually resolved by restarting the instrument.

Satellite units are not being detected by the software.
The system is sent out pre-configured so that detection of additional satellite units is automatic. If units are not being detected, try the following solutions:

1. Make sure the wireless units are turned on.
2. Make sure the wireless units are within range of each other* and the Touch Screen IAQ Monitor recording the data.
3. If the units are not being detected after 10 minutes, please click on the 'ZigBee' configuration button found in the setup menu.

If the troubleshooting section has not resolved any of your problems, please contact PPM Technology or your distributor.
Contact details can be found here:

technical@ppm-technology.com

3.2 Updating the Software

The Touch Screen IAQ Monitor will have the latest release software pre-installed when you receive your unit. New updates will be made available from time to time, each offering new features and improvements. To find out if your instrument has a new update available, please contact PPM Technology on the following address:

technical@ppm-technology.com

To update the software, you will need a USB pen drive with up to 4GB of available storage. You will also need to download the update file from the PPM Technology web site found on our 'Downloads' page:

http://www.ppm-technology.com/downloads.htm

Please format the pen drive prior to transferring the downloaded update file. This will make sure the device will work with the Touch Screen Unit and will ensure there are no other installation files located on the USB device.

Next, navigate to the 'Setup' menu located on the 4th tab of the main home homepage.
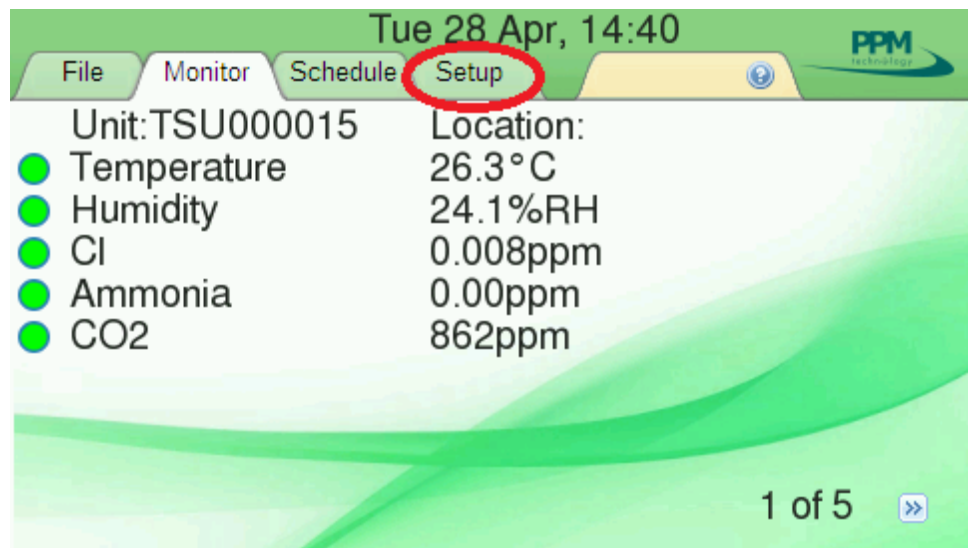
In the new page, click on the icon labelled as 'Update' located in the bottom right hand corner and follow the installation guide. The unit will restart and you should now have the latest software installed.
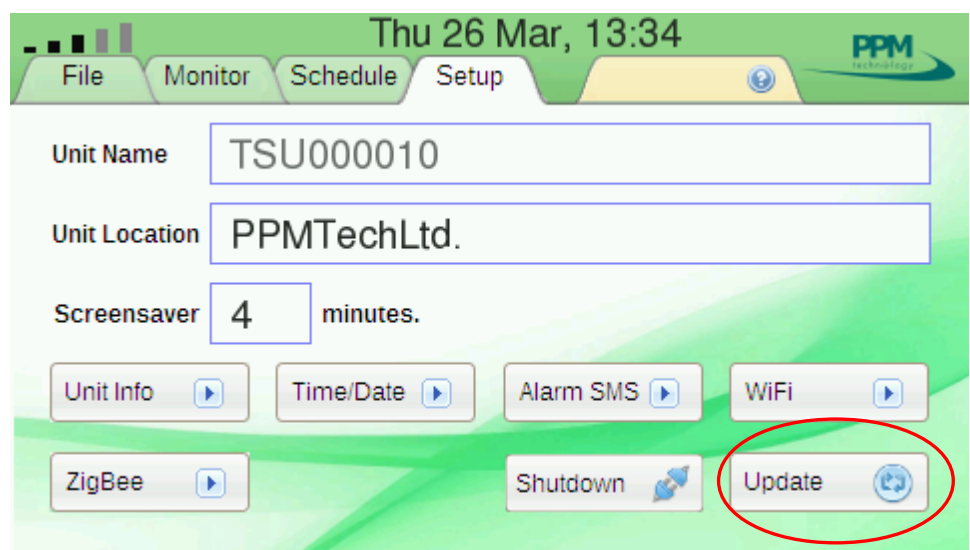
4. MAINTAINANCE

4.1 Storage

The Touch Screen IAQ Monitor is designed to work in a variety of indoor environments. If however you wish to store the unit for a long period of time, then please remove the power source and make sure that there is nothing resting on the screen when stored as this can damage the touch screen.
Please also make sure the unit is stored in a vertical position, as depending on your sensor setup, some sensors can dry out if left in a horizontal position for very long periods of time.

4.2 Sensor lifespan

The operating life of a typical sensor can vary enormously depending on the environment and how the instrument is used. Not all sensors will have the same operating life, so depending on your configuration the sensors will need to be replaced over time when the instrument is in for service.
Very dry environments can also effect the operating life of a sensor as many of the sensors rely on NDIR, PID technologies.

4.3 Calibration of sensors

We do not advise the sensors contained within the Touch Screen IAQ Monitor be calibrated outside of PPM Technology. The sensors are very delicate and can be damaged if calibrated or powered up incorrectly. We advise that you send the instrument in to us here at PPM Technology to have the unit service and checked with our equipment.

5. ACCESSORIES

5.1 Satellite units

A variety of additional IAQ monitors can be added to your Touch Screen IAQ unit to greater increase your coverage area. These include our current range of Mini and Large IAQ Monitors available from our website:

<div align="center">

www.ppm-technology.com

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5.2 USB Module

USB modules pre loaded with our latest software release can be purchased from us here at PPM Technology, making it easy to update the software of your Touch Screen IAQ Monitor.
Simply contact sales on the following address to request a USB Module:

sales@ppm-technology.com

5.3 Additional antennae

If you are struggling to pickup a signal (GSM, Zigbee or Wifi) with your current setup, then we also provide a number of larger antennae, which can greater increase your coverage area.
Simply contact sales on the following address to request a additional antennae:

sales@ppm-technology.com

6. WARRANTY

The Touch Screen IAQ Profile Monitor is warranted to be free of defects in material and workmanship under proper and normal use and service for a period of 1 year from the date of purchase. This warranty is limited to repair or replacement (at our option) of any part that proves defective in material or workmanship under normal use and service, provided the product is returned to PPM Technology Limited, shipment charges prepaid.

Damage due to defacement, misuse, tampering, lack of prescribed maintenance or use in violation of the instructions furnished by PPM Technology Limited is not covered.

This warranty is in lieu of all other warranties, express or implied, including but not limited to merchantability or fitness for a particular purpose. In no event shall we be liable for any incidental or consequential damages of any nature.

PPM Technology Limited reserves the right to make changes at any time to this document and to the design, construction, appearance and specifications of its products without notice.

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Please contact us at the following address should you have any queries regarding your unit:

repairs@ppm-technology.com