



# **WinAQMS**

## **Mini Data**

## **Acquisition System**

**User Manual**

Version: 1.0

[www.ecotech.com](http://www.ecotech.com)



## **Manufacturers statement**

The WinAQMS Mini DAS package is a state of the art Data logging package that should give many years of trouble free service if installed, used and maintained correctly. By following the guidelines contained in this manual and with the implementation of a good quality-assurance program, the user can obtain accurate and reliable data. Please ensure that you read the safety and warranty detail as they contain important information for the user. If, after reading this manual you have any questions or you are still unsure or unclear on any part of WinAQMS Mini DAS then please do not hesitate to contact Ecotech.

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# 1 Introduction

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Thank you for purchasing WinAQMS Mini DAS (Mini Data Acquisition System). WinAQMS Mini DAS is the result of over 15 years of development,

- Beginning with the 9200 DASs,
- then the DOS based PEMS,
- the 9400 based AQMS software
- the fourth generation Windows/XP based version
- and now the Mini DAS.

We hope that you find this software both powerful and easy to use. Please ensure that you read the licence and warranty details as they contain important information for the user.



Figure 1 WinAQMS Mini DAS logger

## 1.1 Users and Passwords

### WINDOWS

WinAQMS Mini DAS comes preinstalled with a licensed version of Windows XP Home. Windows XP Home requires a password to be entered for a user to be able to login. There are 2 user accounts set up on a WinAQMS Mini DAS, the Administrator account and the WinAQMS Mini DAS account. The passwords for these accounts are case sensitive and are as follows.

Username: administrator

Password: ecotech

Username: winaqms

Password: ecotech

## WinAQMS Mini DAS SECURITY

WinAQMS Mini DAS can be used to restrict access of certain users by setting usernames and passwords (see “Security” in section 4.8). The default user access level is 70 (full access) and the username and password for WinAQMS Mini DAS is:

Username: WinAQMS Mini DAS

Password: ecotech

## 1.2 Software Protection Device

WinAQMS Mini DAS also comes with a software protection device (or “dongle”) which plugs into a USB port (or a parallel port on older loggers) on the DAS. The dongle must be plugged in to the USB (or parallel) port for the software to function correctly. If the user has a WinCollect dongle it can be used to run WinAQMS Mini DAS Client software.



Figure 2: WinAQMS Mini DAS USB dongle

## 1.3 About This Manual

This manual is intended to serve as a guide to the most used features of WinAQMS Mini DAS. We strongly recommend that you read this manual before using WinAQMS Mini DAS to gain an understanding of its capabilities and operation.

As we are always trying to improve our products we welcome any feedback that you might have with respect to this software. If you find any omissions or any errors in this manual or with the software please email us at

[WinAQMS Mini DAS.Feedback@ecotech.com.au](mailto:WinAQMS_Mini_DAS.Feedback@ecotech.com.au)

Throughout this manual there will be words printed in *italicized* text. These words refer to parts of the WinAQMS Mini DAS software, such as menu items and field names.

## 1.4 WinAQMS Mini DAS Architecture

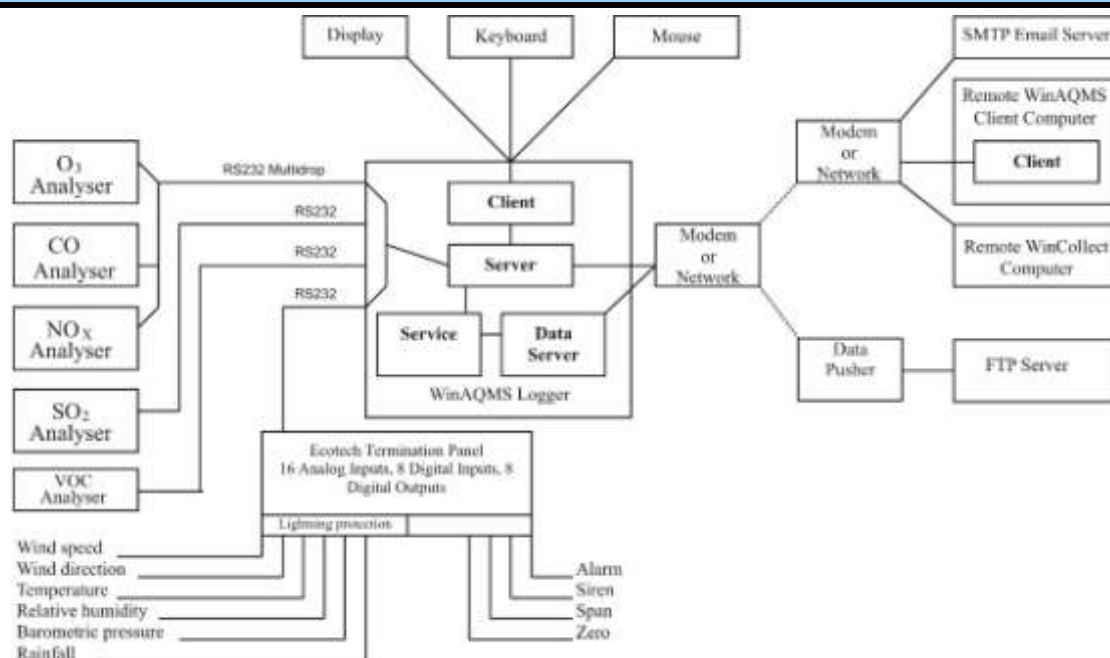


Figure 3 The WinAQMS Mini DAS architecture

WinAQMS Mini DAS has been designed as a client/server program. This means that WinAQMS Mini DAS has two parts: the client and the server. The server handles all the communication between the DAS and the analysers, recording of data and starting/stopping of calibrations. The client is concerned with giving the user access to settings and data. On its own the server has no user interface and there is no way you can interact with it using the mouse or keyboard. The client is the visual interface of WinAQMS and communicates with the server by requesting information or receiving information that it has asked for at a prior time. This arrangement means that the WinAQMS server must always be turned on before the WinAQMS client program can connect to it.

## 1.5 WinAQMS Mini DAS agent

The WinAQMS agent allows the user to activate or deactivate individual components of WinAQMS Mini DAS. The current status of each component is shown across the top, underneath each component heading. The agent works on a simple start/stop method where pushing the button underneath the status will either turn on (green arrow) or turn off (red square) that program.

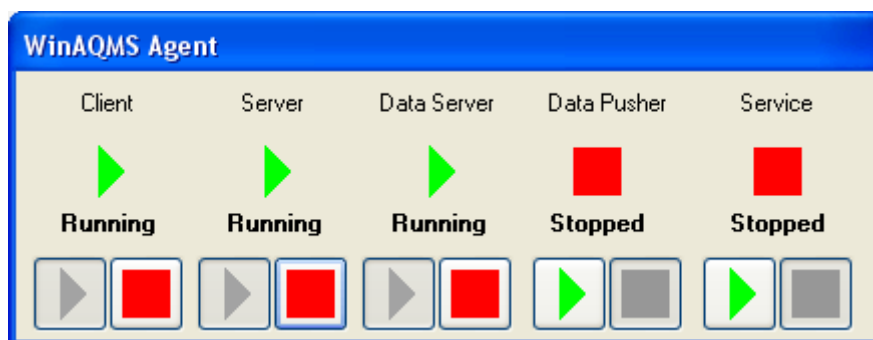


Figure 4 WinAQMS Mini DAS Agent interface

### Client

The Client is the user interface that is used to view data and alter the setup of the DAS components.

### Server

WinAQMS Server is the engine of the WinAQMS Mini DAS program, it requests, logs and stores data from the external instruments as well as sending data to the Client.

### Data Server

The Data Server is the part of the WinAQMS Mini DAS that listens for data requests from collection software and responds to the command with the appropriate data.

### Data Pusher

The Data Pusher is used to upload data to an FTP site without the need for a request. The Data Pusher requests data from the Data Server for a defined time period and automatically uploads the data file to the selected FTP site.

### Service

WinAQMS Mini DAS service is used to monitor the Server, Data Server, Client and Data Pusher to ensure they are all running. If there is a problem with one of these applications then the Service module will restart it.

## 2 Installation and Setup

### 2.1 Setting up users and permissions in Windows 2000/XP

Only user accounts that have been granted the required permissions can run WinAQMS Mini DAS. Users can be added from the local domain (the domain local to the WinAQMS Mini DAS) or from an external domain administered by a domain controller server. WinAQMS Mini DASs come with two users set up (the Administrator and WinAQMS Mini DAS users) on the DAS and WinAQMS Mini DAS installed and operational.

#### 2.1.1 Adding local users to the WinAQMS Mini DAS

Log in to the DAS as administrator or someone with administrator privileges. Go to the Control Panel and double click on *User Accounts* as shown in Figure 5. Within this new window select the *New Account* link and create a name for the account in the appropriate field. Once this is done select the administrator button and press the *Create Account* button.

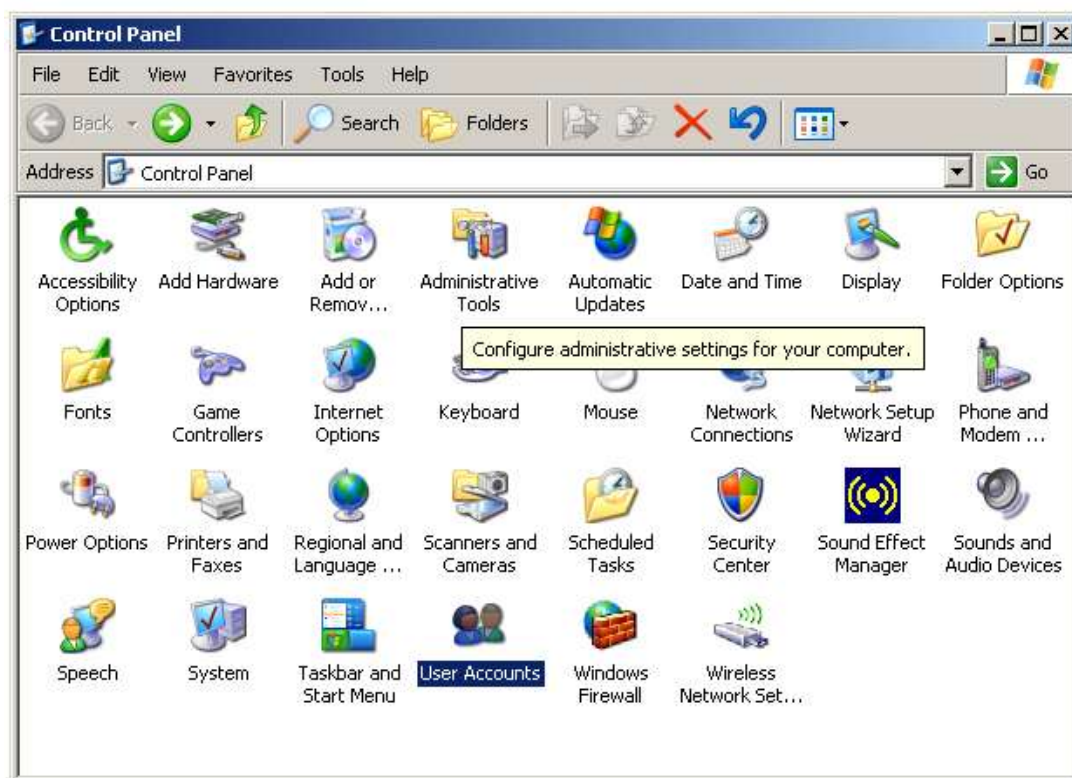


Figure 5 The Control panel

#### 2.1.2 Giving the WinAQMS Mini DAS user permission to log on as a service

1. In "Control Panel" open "Performance and Maintenance"
2. Click on "Administrative tools" and open "Local Security Policy"

3. In the "Local Policies" section double-click on "User Rights Assignment"
4. Find "Log on as a service" and double click on it.
5. Click on "Add User or Group", click on "Advanced", click on "Find Now"
6. Select the WinAQMS user from the group then click on "OK", click on "OK" and click on "OK" again.

## 2.2 Setting Windows XP to accept dialup connections

Windows XP can be set to automatically answer a dialup connection request through a modem, but a modem must be installed on the WinAQMS Mini DAS to allow this to occur. To accept incoming connections click on Start, Settings, Control Panel. This will open the control panel window. Double click on the Network and Dial-up Connections (Network Connections in Windows XP) and then on Make New Connection (New Connection Wizard in Windows XP). The Network Connection Wizard will start. Click on Next to proceed with making a new connection. In the Network Connection Type window choose Accept Incoming Connections (or Set up an advanced connection, hit next, then choose Accept Incoming Connections in Windows XP) as shown in Figure 6 below and click on Next.

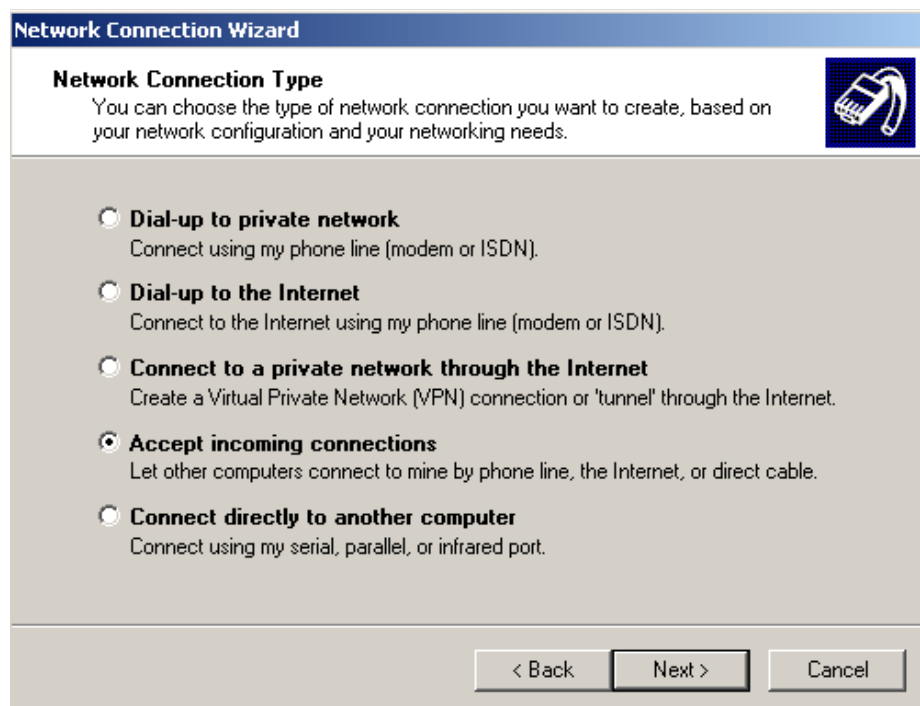
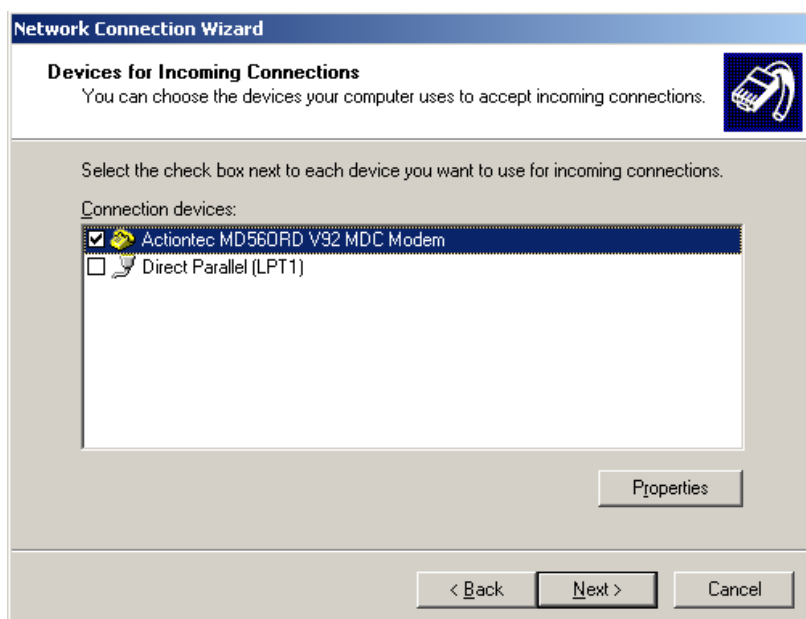


Figure 6 Adding a modem dialup support to Windows 2000.

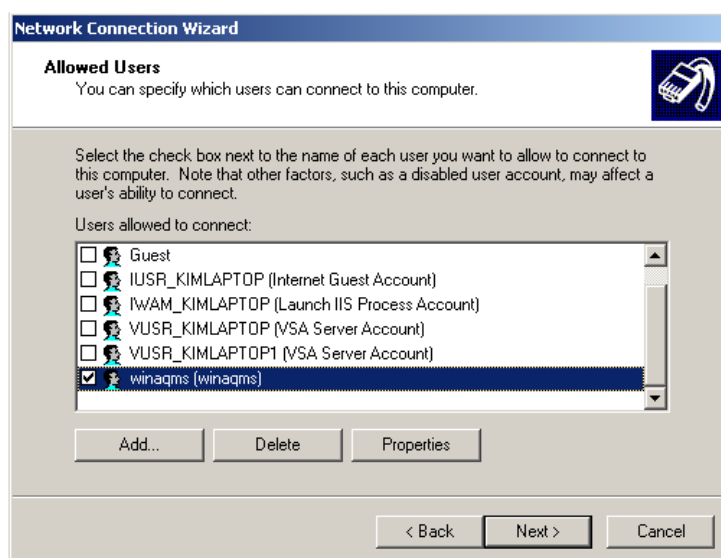
You will then see a window similar to Figure 7 below asking you to choose the device to accept the incoming connection. Choose the modem you have installed and click on Next.





**Figure 7 Selecting the incoming connection modem**

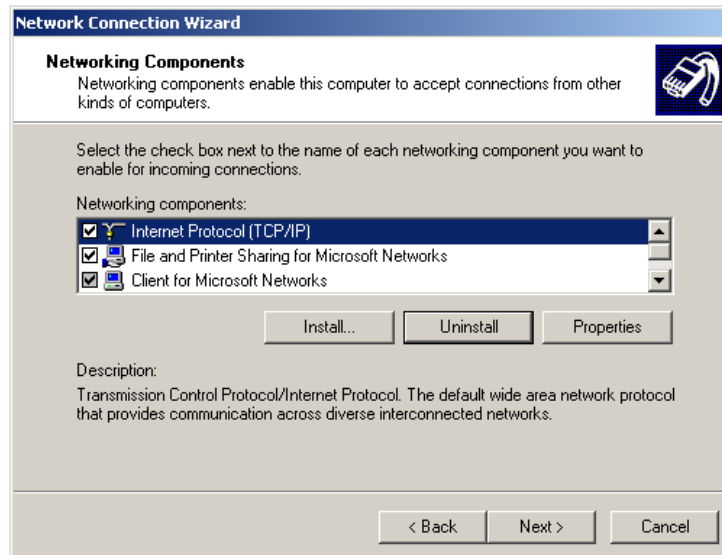
The next window will ask about Virtual Private Connections. Do not allow virtual private connections to the DAS and click on Next. Select the WinAQMS user account and any others you want to be allowed to log in using a dialup connection by placing a tick in their selection box as shown in Figure 8 below.



**Figure 8 Selecting the incoming connection users**

**Note:** Only the users on this list will be able to establish a dialup connection to this DAS. By default WinAQMS Mini DASs are set to allow dialup connections. These users must also be able to access the shared Database directory.

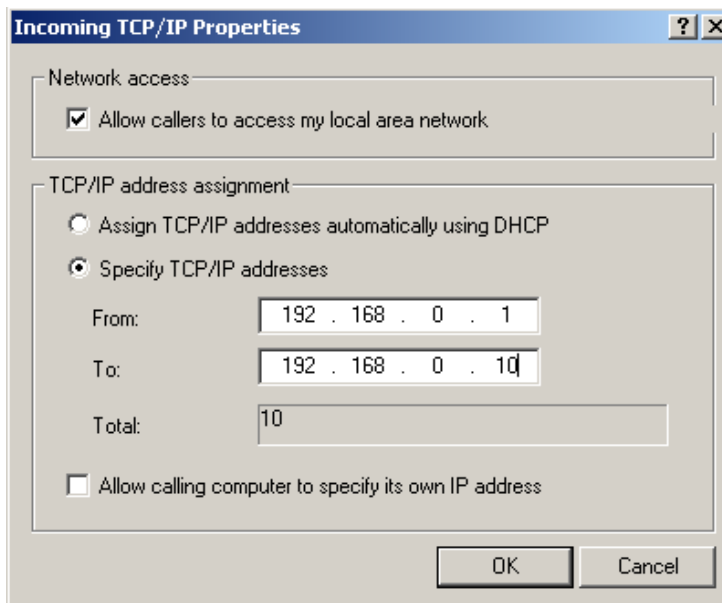
In the Networking Components list make sure that Internet Protocol (TCP/IP) is selected, then highlight it and click on properties (Figure 9).



**Figure 9 Setting the incoming connection properties**

In the TCP/IP properties window select the specific TCP/IP addresses and set the range from 192.168.0.1 to 192.168.0.10 as shown in Figure 10. Click OK and then Next.

All that remains is for the Incoming connections to be named and then the process is finished.



**Figure 10 Setting the incoming connection IP addresses.**

**Note:** The TCP/IP range 192.168.X.X (also 10.X.X.X) will not appear on the internet and can be safely used for local area networks. When dialing in to a WinAQMS Mini DAS it will always assign itself the IP address shown in the "From" field of Figure 10.

Go to the Control Panel and double click on Users Accounts as shown in Figure 5. Click on the Advanced tab, click Advanced in the Advanced User Management. In

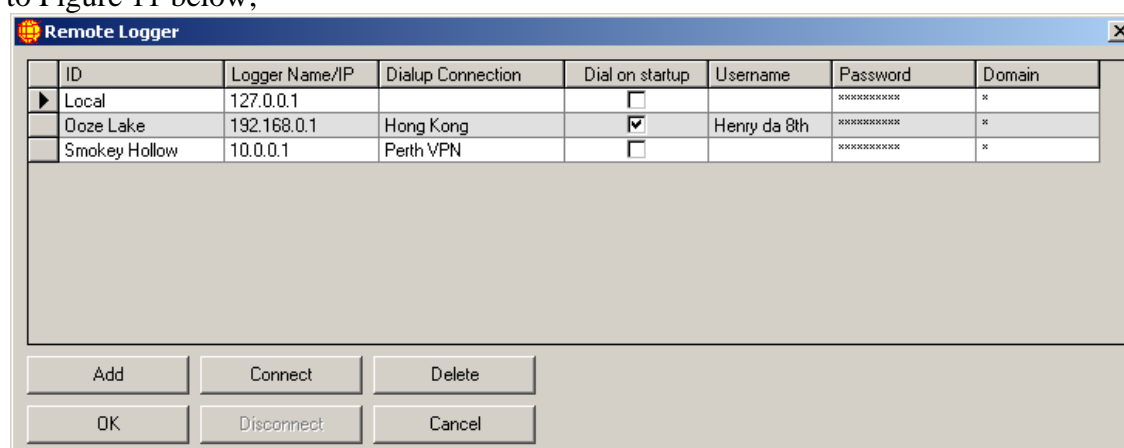
the Local Users and Groups window click on Users and go up to Action and select New User. Set the User Name to be WinAQMS Mini DAS (or another account name that you want to use to run WinAQMS Mini DAS), type in a password and remember it. Remove the tick in the User Must Change Password at Next Logon and add a tick to the Password Never Expires option. Click on Create and then close the box. Open the Control Panel again and double click on Users Accounts shown in Figure 5. Click on the Users tab, select the WinAQMS Mini DAS user and then click on properties. Select the Group Membership properties and give the WinAQMS Mini DAS account Standard User access. Click on the Apply button and close the Users and Passwords box.

## 2.3 Connecting a Remote Client to a WinAQMS Mini DAS

A remote WinAQMS Mini DAS client is able to connect to different WinAQMS Mini DAS servers (a compatible server/client version is required). In this way a single computer with the WinAQMS Mini DAS Client software installed can oversee the operation of multiple mini DAS. If WinAQMS Mini DAS is started using the start menu or a standard shortcut it will attempt to connect to a running WinAQMS Mini DAS Server process on the local computer. If you want to connect to a DAS using a dialup connection or if you want to connect to different WinAQMS Mini DAS you need to enter a special command line when starting WinAQMS Mini DAS so that it gives you a choice of DAS to choose from. To do this click on Start, then Run. Delete any text in the box and replace it with the following line (including quotes).

“C:\Program Files\WinAQMS\Client\WinAQMSClient.exe” /ask

Then click on OK. This will tell the WinAQMS Mini DAS Client software to start in a mode where it waits for a connection request from the user before it tries to connect to a remote server. WinAQMS Mini DAS will start up and display a window similar to Figure 11 below;



**Figure 11 Connecting to a Remote WinAQMS Mini DAS**

Figure 11 shows that the WinAQMS Mini DAS client can be set to connect to multiple WinAQMS Mini DASs.

- The ID field is used by WinAQMS Mini DAS to uniquely identify loggers.
- Logger Name/IP is the logger's network name or IP address.

- Dial-up Connection is a dropdown list which allows the user to specify which dial-up connection to use to make a connection to the DAS.
- Dial on start-up allows the user to tell WinAQMS Mini DAS whether it should try to establish the dial-up connection automatically. If the Connect button is used then the WinAQMS Mini DAS client will attempt to connect to the currently selected server using the specified Dial-up connection even if the Dial on start-up checkbox is not set.

In Figure 11 there is Local, Ooze Lake and Smokey Hollow servers listed. The Local DAS uses the loop back address (127.0.0.1) and will be located on the same computer as the client software. The Ooze Lake logger has an IP address of 192.168.0.1 and the WinAQMS Mini DAS client software will establish the Hong Kong dialup connection (using the entered Username, Password and Domain) before attempting to connect to the logger when the Connect button is pressed. The Smokey Hollow logger with IP address of 10.0.0.1 will use the Perth VPN dialup connection when connect is pressed.

The Dial on Startup checkbox is used by WinAQMS Mini DAS to determine if a dialup connection should be established if it is started and the /ask command line option is not used. If the Smokey Hollow logger was the last logger connected and WinAQMS Mini DAS was started without the /ask command line option then the WinAQMS Mini DAS client would try to connect to the Smokey Hollow logger at IP address 10.0.0.1 using its currently active dialup/LAN connections. If the Ooze Lake logger was the last logger connected to and WinAQMS Mini DAS was started without the /ask command line option then the WinAQMS Mini DAS client would try to connect to the Ooze Lake logger at IP address 192.168.0.1 by first establishing the Hong Kong dialup connection.

### 3 General Information

The Main screen of WinAQMS Mini DAS contains a plain background with 5 menus on the top toolbar as seen in Figure 12. The file menu and Help menu are accessories for use of WinAQMS Mini DAS and are briefly described here; the File, View and Manual menus are most comprehensively used within WinAQMS Mini DAS and will be individually discussed in the following three sections.

#### USING WINAQMS MINI DAS

Several parts of the WinAQMS Mini DAS interface do not change in appearance. This section details these parts and how they work.

Like most Windows based software, WinAQMS Mini DAS has a menu system that allows you to activate the desired part of the program from a set of options. Use the mouse to access a menu bar item by left clicking on the required menu heading, then on the required menu bar item. Menu bar items can also be accessed by using the keyboard.

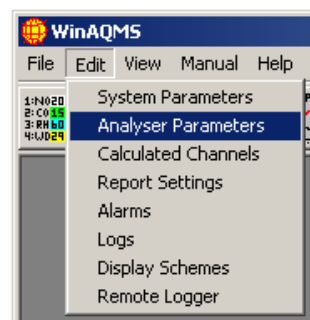


Figure 12 Menu shortcuts

When the ALT key is hit you will notice that the shortcut key for each menu item is underscored. As you navigate further into the menu structure the shortcut key for each menu item is also underscored, as shown in Figure 12. For example, instead of using the mouse to open the Edit menu you can hit the ALT key and then press the E key. Hit the A key and the Analyser Parameters window will load in the same way as if you had used the mouse.

There is a set of Buttons just under the menu bar. These allow quick access to commonly used parts of WinAQMS Mini DAS (Figure 13).



Figure 13 Menu Buttons

For example, if you click on the Analyser Parameters button the Analyser Parameters window will load just as if you had used the menu bar or the keyboard shortcuts.

To close a window click on the small button with the cross in the top right hand corner of the window or on the OK or Cancel buttons that appear on the window. Clicking the OK button on any window in WinAQMS Mini DAS it will save any changes that you have made and close the window. Clicking Cancel will discard any changes then close the window. Clicking the close button in the top right hand corner of a window will give the same result as clicking the cancel button. Not all windows in WinAQMS Mini DAS have OK and Cancel buttons but all windows have the close button in the top right hand corner.



Figure 14 Minimise and Maximise buttons

Many windows also have minimise and maximise buttons as shown in Figure 14. The Minimise button



Figure 15: Minimised form

will reduce the window to become like Figure 15. To restore the window to its original size, hit the Restore Up/Down button (the left button in Figure 15) and the window will return to its original size. The Maximise buttons in Figures 25 and 26 will increase the size of the window to fill the whole WinAQMS Mini DAS screen except for the toolbar and the menu buttons.

Figure 16 shows a maximised

Instantaneous Graph window. It occupies the entire WinAQMS Mini DAS screen except for the top menu bar and buttons and the status bar at the bottom. Only one window can be maximised at a time and is displayed in front of the other windows. This means

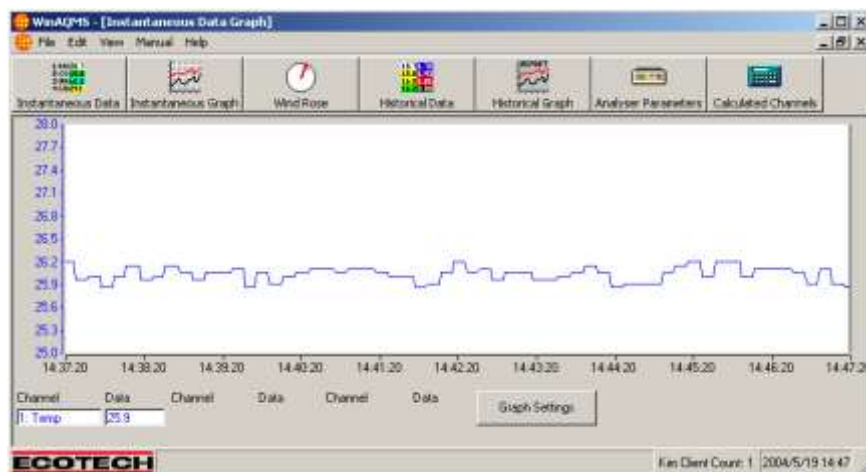


Figure 16 Maximised form

that when a window is maximised it is the only visible window. In Figure 16 clicking on the Graph Settings button will open the Graph Settings window and reduce the Instantaneous Graph window to the size it was before it was maximised.

The Instantaneous Graph, Historical Graph, Historical Data and Wind Speed and Direction windows all resize their visual aspect to match their size. For example, resizing the wind speed and direction window will cause the compass to resize itself to match the size of the window.

WinAQMS Mini DAS has a comprehensive online help menu which can be accessed by hitting the F1 button on the keyboard when the relevant screen is being displayed. For example if you want to know more about the system parameters options then open that window up and hit the F1 key. A help screen will appear which has information about the system parameters.

The three main menus used in WinAQMS Mini DAS are the Edit, View and Manual menus which will now be outlined in greater detail.

## FILE MENU

The file menu contains menu objects that are concerned with the settings of the overall program. These include changing the grey background to a customised picture, saving or loading the configuration of WinAQMS Mini DAS or exiting the program.

## HELP MENU

The Help menu contains three help menu items *Contents*, *Index* and *Introduction to WinAQMS Mini DAS* all access the online help file (Figure 17). *Contents* can be used to get help on topics; *Index* can search the help file for specific words and *Introduction to WinAQMS Mini DAS* goes through an online version of the example in this manual.



Figure 17 Help index.

The *Help, About WinAQMS Mini DAS* window shows important legal information concerning the licence agreement and warranty of WinAQMS Mini DAS and also shows the version number of WinAQMS Mini DAS that is running (Figure 18).



Figure 18 About WinAQMS Mini DAS.

*Registered Users* shows information about who WinAQMS Mini DAS is registered to, the date of production, how many users are allowed to use the software at the same time and the Ecotech Identification number for the software (Figure 19).

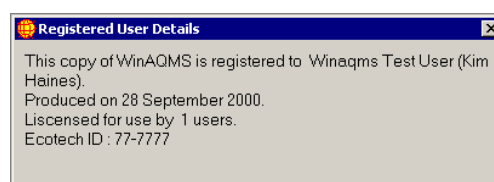
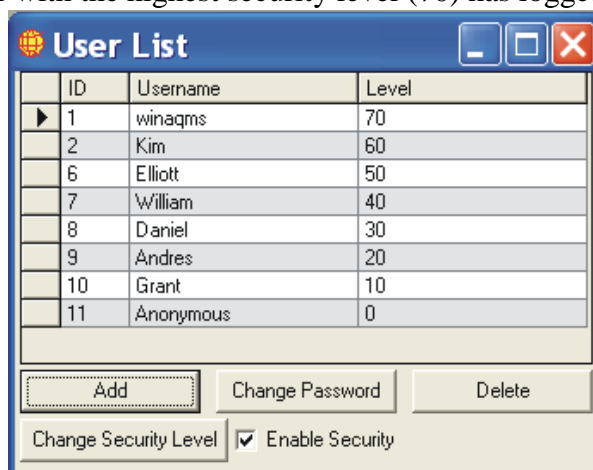


Figure 19 Registered User Details

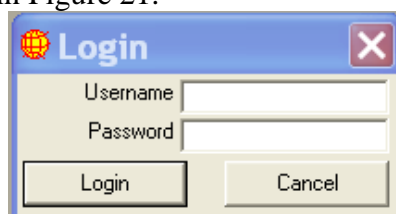
## Security

WinAQMS Mini DAS can be set to require a username and password to be entered before access to the system is enabled. Users in WinAQMS Mini DAS have a username, password and a security level. Usernames and Passwords can be up to 32 characters in length and are case-sensitive. Figure 20 below shows the User List options when a user with the highest security level (70) has logged into the system.



**Figure 20 User List Window**

The Enable Security checkbox will enable or disable security. Once enabled WinAQMS Mini DAS will require users to enter a username and password into the login box as shown below in Figure 21.



**Figure 21 Login Window**

Each user is able to change their own password (except for those with a security level of 0). To change a password, double click on the user in the list or select the users record and press the Change Password button. You will be prompted to enter the old password, the new password and to confirm the new password. To change a users security level highlight the user in the list and click the Change Security Level button. If a user level less than 0, or greater than 70, is entered then the user security level will not be changed.

A level 70 user can add new users, delete existing users, change the user levels and change the password of other users without needing to know their passwords.



The table below shows the user levels in WinAQMS Mini DAS and what operations the level is permitted to perform. This lowest level is 0 and each higher level is permitted to do everything the previous level could in addition to what is listed in the table.

User Level	Security level description
0	No access to menu structure or buttons except the Security and Remote Logger menu. Can view windows that open on startup but not move them or change settings.
10	Can access any item in the View menu and move the windows around. No settings can be changed.
20	Can open View menu windows and change the setting of the windows.
30	Can access the Edit menu items for viewing but cannot change any settings.
40	Can Add/Edit logs, set precision values and set a channel out of service. Can also access and use all Manual menu items.
50	Can change settings in the Edit menu, but not add or remove channels/analysers.
60	Can add or remove channels/analysers.
70	Can add/remove other users and their passwords. Can also enable/disable security.

The default user access level is 70 and the username and password for WinAQMS Mini DAS is:

Username: WinAQMS Mini DAS

Password: ecotech



## 4 Edit Menu

The Edit menu allows the user to enter the specifications for running the program. These specifications include the parameters for the DAS and analysers, calculated channels for transformation of data, alarm generation and more.

### 4.1 System Parameters

The *System Parameters* window contains the basic DAS information and some of the system-wide settings. Basic DAS information includes:

- *ID*, a text field for identifying the system.
- *Company Name*, a text field for recording the name of the company using the system.
- *Contact Person*, a text field for recording the name of the person to contact regarding the system.
- *Site Name*, a text field for recording the name of the system site.
- *Notification Number*, a text field for recording the telephone number to call if faults occur.

Figure 22 System Parameters

#### System wide settings include:

- *Language*: The language listbox offers you the choice of what language you want WinAQMS Mini DAS's text to be displayed in (English, Chinese, Spanish). If there is only one language displayed (Australian English) then that is the only language available to you. If a different language from the current language is chosen and the OK button is pressed then WinAQMS Mini DAS's menu structure and buttons will be changed **immediately** to the new language with the exception of windows which are already open. If a window is open prior to a language change then it should be closed and then reopened to allow it to properly update its text and buttons.
- *SMTP Server*, the server name or IP address WinAQMS Mini DAS will use to send emails if there is an alarm condition.

- *Data File Prefix.* The data that WinAQMS Mini DAS records is stored in ASCII text files in C:\Data\<year>\<month>\ and are named with the data file prefix then with a numeric <year><month><day>.waq. A new data file is made at the start of each day so any change made to the Data File Prefix field will take affect at the start of the next day of logging.
- *Secure Telnet Connection,* Specifies whether a secure (encrypted) telnet connection will be established between the WinAQMS Mini DAS client and server.
- *Certificate Name,* Within this field place the Certificate Name to allow the secure connection to proceed. The Certificate name is taken from the digital certificate which can be obtained by contacting Ecotech.

**Note:** To use the secure connection component of WinAQMS Mini DAS the user must first contact Ecotech and arrange its setup and receive a digital certificate. Securing connections should only be used when necessary.

## 4.2 Analyser Parameters

The *Analyser Parameters* window contains all the settings for each analyser as well as for any analogue or digital channels that are provided by those analysers. Any communication settings, calibration settings and digital input or output settings can be altered in the *Analysers Parameters* window.

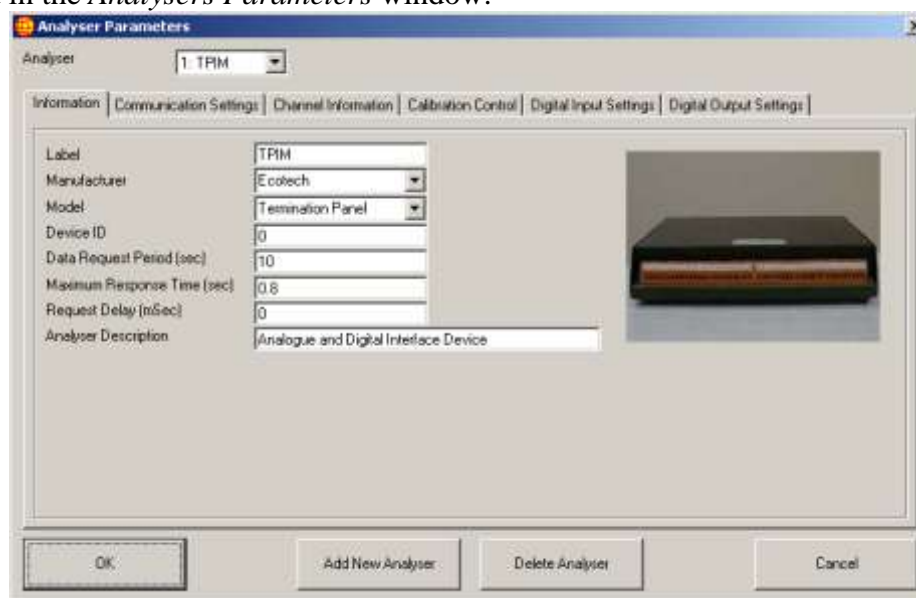


Figure 23 Analyser Parameters

The *Analyser* list box at the top of the window contains a list of all the analysers currently in the WinAQMS Mini DAS system. Changing between different analysers in the system using this list box will alter the information in the tabs to match the chosen analyser. The options available in the tabs and the number of tabs will change, depending on the analyser. E.g. for an Ecotech Termination Panel the *Digital Input Settings* and *Digital Output Settings* tabs will appear, but a R&P Teom 1400a analyser has no digital inputs or outputs so the corresponding tabs will not appear.

Clicking on the *Add New Analyser* button will add a new analyser to the system, which will default to an Ecotech Termination Panel (TP) with no channels configured and default communication settings. The *Delete Analyser* button will delete the currently selected analyser from the system including any channel configurations it has. The *OK* and *Cancel* buttons function as described earlier, except that clicking the *OK* button will also restart the server to reflect any changes.

---

#### 4.2.1 Information

---

When opened, the *Analyser Parameters* window will display the *Information* tab for the first analyser in the system. Figure 24 shows a typical opening screen for an Ecotech Termination Panel. Entries can be made in the following fields:

- The *Label* text box allows you to enter a label that will help you to identify the analyser.
- The *Manufacturer* list box shows the names of manufacturers of analysers which WinAQMS Mini DAS supports.
- The *Model* list box shows the analyser models corresponding to the *Manufacturer* list box that WinAQMS Mini DAS supports. The image to the right changes to match the selected model.
- The *Device ID* is used by WinAQMS Mini DAS when communicating with the analyser. It also identifies an individual analyser when several analysers are multi-dropped (that is, communicating on the same serial port).
- *Data Request Period (sec)* is the time in seconds between requests for data made by WinAQMS Mini DAS to the analyser.
- *Maximum Response Time (sec)* is the time in seconds that WinAQMS Mini DAS will wait for the analyser to respond. If this time passes with no response, WinAQMS Mini DAS will set its data value for the reading to NULL. If Maximum Response Time is set too low then the analyser will not have sufficient time to respond in time so WinAQMS Mini DAS will report NULL's even if the analyser is functioning normally.
- *Request Delay (mSec)* is the time in milliseconds that WinAQMS Mini DAS will wait before issuing the data request to the serial port. This parameter is useful when several analysers are being multidropped and analysers have a delay in transmitting and receiving information.
- *Analyser Description* is a brief description of the function of the analyser model selected.

For Opsis analysers there is no *Device ID* but there are *Station #* and *Data Update Timeout* fields. The *Station #* field should be set according to what is set on the Opsis analyser. As the Opsis often will not update its data value the *Data Update Timeout* is used as the length of time (in MM:SS format) to keep using the last valid data value before setting the current data to a null value.

For Thermo Environmental analysers the *Device ID* field becomes a dropdown list for the common Thermo Environmental analyser types of 42C (ID 170), 43C (ID 171), 48C (ID 176) and 49C (ID 177) as well as an Other list item for Thermo Environmental analysers that use ID's other than the ones listed.

Below are the suggested Device ID and Max Response Time settings for various analysers.

**Table 1 : Suggested Device ID's and Maximum Response Times for analysers.**

<b>Manufacturer</b>	<b>Model</b>	<b>Device ID</b>	<b>Maximum Response Time (seconds)</b>	<b>Request Delay (milliseconds)</b>
API	AMX Series	1	1	0
Dani	TNMH 462	None Required	1	0
Ecotech	98XX series Serinus series	10, 11, 20 , 30, 41, 42, 50 depending on analyser	1	0
	M9003, GasCal 1000, Termination Panel	0 unless multidropping	1	0
Environnement SA	AC31M, AF21M, CO11M, O341M	None Required	1	0
Gill	WindObserverII, WindSonic	0 corresponds to an ID of A	1	0
ICP DAS	I-7024	1	1	200
LN Industries	Sonimix 3080	0	1	0
Met One	E-BAM BAM 1020	None required	1	0
Monitor Labs	9841, 9842	41, 42	3	0
	98XX	10, 11, 20 , 30, 50 depending on analyser	2	0
Opsis	AR600, AR650, LD500	None Required	3	0
Rupprecht and Patashnick	Teom 1400a	4	1	0
Synspec	GCx55	0	1	0
Teledyne	M700	None required	1	0
Thermo Environmental	42C, 43C, 48C, 49C and others	170, 171, 176, 177 or other	1	250
Vaisala	PTB220, WS425	1 if required	1	0
Verewa	F-701	None Required	1	0

---

## 4.2.2 Communication Settings

---

The *Communication Settings* tab shows the settings WinAQMS Mini DAS is using to communicate with the selected analyser.

- *Connection Type* list box shows whether the connection to the analyser is Serial RS232 or U.S.B. (Universal Serial Bus).
- *Serial Port* list box shows all serial ports which WinAQMS Mini DAS finds on the system
- *Baud Rate* shows a list of communication speeds ranging from 110 to 256000 baud
- *Data Bits* can be from 4 to 8
- *Parity* can be even, mark, none, odd or space
- *Stop Bits* can be 1, 1.5 or 2. Most analysers have 8 data bits, no parity and 1 stop bit.

Whenever possible an analyser should be set up with the maximum possible baud rate to ensure the fastest possible communication between the DAS and the analyser. WinAQMS Mini DAS can communicate with Ecotech EC98XX/Serinus series analysers via a U.S.B. type A or type B cable. If a U.S.B. connection is selected a dropdown list of U.S.B. analysers connected to the DAS will be displayed.

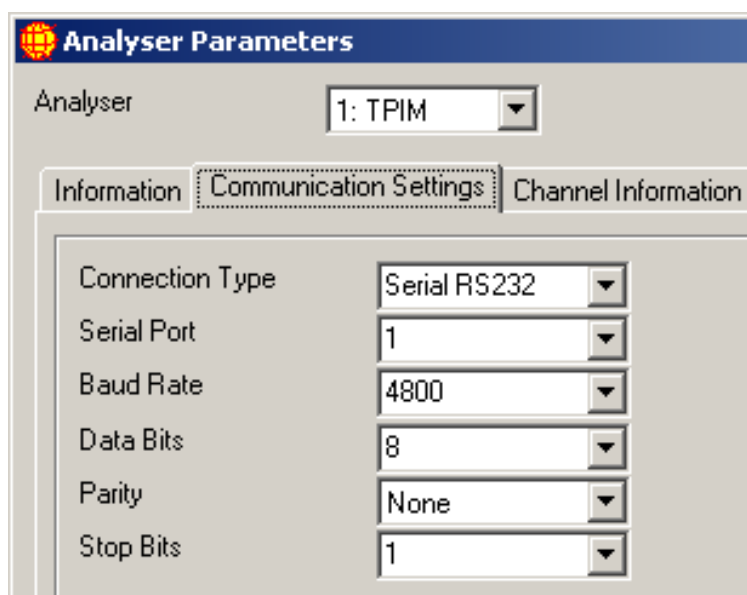


Figure 24 Communication Settings in Analyser Parameters

**Table 2 Suggested Communication Settings for analysers.**

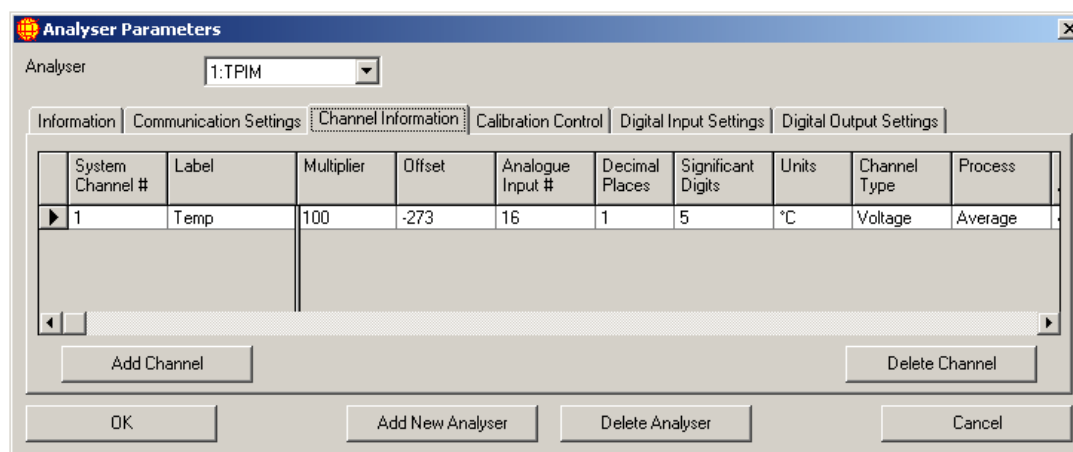
<b>Manufacturer</b>	<b>Model</b>	<b>Baud Rate</b>	<b>Data Bits</b>	<b>Parity</b>	<b>Stop Bits</b>
API (Teledyne)	AMX Series	9600	8	None	1
Dani	TNMH 462	9600	8	None	1
Ecotech	EC 98XX, Serinus and Aurora series	38400	8	None	1
	Termination Panel, GasCal 1000 (Gas Calibrator)	4800	8	None	1
Environnement SA	AC31M, AF21M, CO11M, O341M	9600	8	None	1
Gill	WindObserverII (Wind)	9600	8	None	1
ICP DAS	I-7024	9600	8	None	1
Met One	E-BAM	9600	8	None	1
	BAM 1020	9600	8	None	1
Monitor Labs	ML 98XX Series	9600	8	None	1
Opsis	AR600, AR650, LD500	9600	8	None	1
Rupprecht and Pertashnick	Teom 1400a	9600	8	None	1
Teledyne	M700	9600	8	None	1
Thermo Environmental	42C, 43C, 48C, 49C and others	9600	8	None	1
Vaisala	PTB220, WS425	9600	8	None	1
Verewa	F-701	1200	8	None	1

Wherever possible WinAQMS Mini DAS handles the special communication requirements of analysers in software. For example the TEOM 1400a Particulate Monitor normally requires a special cable but this is handled in software with special communication settings so that a standard serial cable can be used.

**Note:** The Monitor Labs 98XX Series of analysers have a default baud rate setting of 2400 baud. If you set WinAQMS Mini DAS to communicate with a Monitor Labs 98XX analyser at 9600 baud then you must ensure that the Multidrop baud in the Interface menu of the analyser is set to 9600 baud.



### 4.2.3 Channel Information



**Figure 25 Channel Information in Analyser Parameters**

The *Channel Information* tab allows configuration of the input data channels for the analyser. To add a channel to the system click on the *Add Channel* button. To remove a channel, highlight it by clicking on the grey block at the left end of the channel row and click on the *Delete Channel* button. Multiple channels can be highlighted and deleted at the one time. The fields present in the *Channel Information* tab includes those listed below:

- *System Channel #*: the unique number that WinAQMS Mini DAS uses to identify the channel. This number can be changed but must be unique.
- *Label*: allows you to enter a label to easily identify the channels in other parts of WinAQMS Mini DAS.
- *Analogue Input #*: the physical channel number on the analyser. For a Teom analyser the *Analogue Input #* field is replaced by a *PRC#* field, which allows you to specify certain register numbers in the Teom analyser.
- *Analogue Output #*: Choose from four channels where voltage output signals will be sent from (ICP DAS only).
- *Multiplier* and *Offset*: Every time a reading is taken the value is multiplied by the value in *Multiplier* and has *Offset* added to it (in that order).
- *Units*: is an editable list which shows the units of the channel data. If you do not find the appropriate unit in the dropdown list then you can edit the *Units* box and enter the unit you require. Superscript and subscript characters can be entered using the Windows Character Map utility which can be found in Start, Programs, Accessories, System Tools, Character Map.
- *Decimal Places*: When the data is displayed the number digits to the right of the decimal place will match the number in the *Decimal Places* column.
- *High Alarm* and *Low Alarm*: show the values at which WinAQMS Mini DAS will label the status of the data as being in high or low Alarm. Setting both high and low alarm values to 0 will disable the alarms for that channel. Data must first qualify as 'Good' (that is, the percentage of readings that were valid exceeds the value in the *System Parameters* window) before it can be marked as in high or low alarm.

- *Alarm Number*: refers to the alarm that is triggered when the channel enters a high or low alarm condition. One alarm number can be used for many channels.
- *Valid Data High* and *Valid Data Low*: show the values at which WinAQMS Mini DAS will label the status of the data as being bad. Setting both values to 0 will disable the valid data limits. Data that is labelled as bad will not be included with other valid readings in a data average labelled as 'Good'.
- *Channel Type*: Each channel has a Channel Type, which can change depending on the type of analyser. For example the Ecotech EC/ML 9841 nitrous oxide analysers respond with data for NO, NO<sub>x</sub> and NO<sub>2</sub> when a data request is made but the channel can only store one of the three values passed to it. Specifying one of NO, NO<sub>x</sub> or NO<sub>2</sub> tells WinAQMS Mini DAS which part of the data returned that you want. The Voltage type is the default value and is used if there is no need to signal to the analyser that WinAQMS Mini DAS wants data specific to a particular channel type, register etc.

**Table 3 Channel types and the analysers that use them.**

<b>Channel Type</b>	<b>Manufacturer</b>	<b>Model</b>
Voltage	Default	Default
Frequency	Ecotech	Termination Panel
Counter	Ecotech	Termination Panel
NO	Ecotech, Monitor Labs, API, Environnement SA	9841, AC31M, AMX Series
NO <sub>2</sub>	Ecotech, Monitor Labs, API, Environnement SA	9841, AC31M, AMX Series
NO <sub>x</sub>	Ecotech, Monitor Labs, API, Environnement SA	9841, 9842, AC31M, AMX Series
Concentration	Opsis	AR600, AR650, LD500
Deviation	Opsis	AR600, AR650, LD500
Light Level	Opsis	AR600, AR650, LD500
Logger	Opsis	AR600, AR650, LD500
CH <sub>4</sub>	Dani	TNMH 462
NMHC	Dani	TNMH 462
THC	Dani	TNMH 462
H <sub>2</sub> S	API	AMX Series
TRS	API	AMX Series
O <sub>3</sub>	API, Environnement SA	AMX Series, O341M
CO	API, Environnement SA	AMX Series, CO11M
NH <sub>3</sub>	API, Ecotech, Monitor Labs	AMX Series, 9842
SO <sub>2</sub>	API, Environnement SA	AMX Series, AF21M
N <sub>x</sub>	Ecotech, Monitor Labs	9842
WS	Gill, Vaisala	WindObserverII, WindSonic, WS425
WD	Gill, Vaisala	WindObserverII, WindSonic, WS425

- *Process*: The *Process* field determines what mathematical property of the data received over the average period will be stored. Options include: Average (default), Max (maximum value), Min (minimum value), Total (the sum of all the readings received on that channel) and Std Dev (standard deviation).
- *Description*: is a fifty-character text field. This field is used to more fully describe a channel if the Label is insufficient
- *Percentage Ok*: the percentage of data that must be valid before WinAQMS Mini DAS will mark a report as being OK. If a value of 60 is entered here then if there is a problem with over 40% of the data readings the report will have a bad status.
- *Log Report 1, 2, 3, 4*: determines whether the channel data will be recorded in the database for the selected report. If not ticked, the channel will still request data but there will be Null data recorded in the database. If all four of the Log Report options are not ticked for a channel then that channel will have no entry at all in the database.
- *Out of Service*: If a channel is marked as being Out of Service then the channel's data will still appear in the database but its' status will indicate that the channel is out of service.
- *Serial Port Output*: specifies whether data for the channel will be included in the string of data averages which is sent to the serial port specified by *Report Settings*.
- *Alternate File Output*: specifies whether data for the channel will be included in the data averages stored in alternative data files.

Different Analyser types will have different fields available in the Channel Information tab. The differences are listed below.

- Ecotech EC/ML 98XX, 9841, 9842, API, Dani, Environment SA and Teco analysers do not show the *Analogue Input #* field.
- The *Digital Input Settings* and *Digital Output Settings* tabs will only appear for the Ecotech Termination Panel (TP) and Ecotech EC/ML analysers.
- Opsis analysers have a *Gas#* and a *Path #* field instead of an *Analogue Input #* field.

### 4.2.4 Calibration Control

The *Calibration Control* tab shows the signals that the digital output channels and calibrators are set to when the channels of the selected analyser enter the span, zero and stabilisation periods of their calibration sequence. Each row (point) of the grid matches a part of a sequence occurring within the analyser. Measurements are only taken during the Span and Zero cycles, the stabilisation point is a recovery cycle.

**Analyser Parameters**

Analysers: 2-9830

Information | Communication Settings | Channel Information | **Calibration Control** | Digital Input Settings | Digital Output Settings

Sequence: 2 Date/Time: 2005/05/24 01:00 Add Sequence  
 Label: Sequence 2 Period: 1 Day Delete Sequence

Sequence Settings | Precision Values

Point #	Label	Point Type	Duration (min)	Average Duration (min)	2-9830	6:C6
1	span	Span 1	20	2	Span	Hi
2	Zero	Zero	20	2	Zero	Hi
3	stabilise	Stabilisation	20	2	Measure	Lo

Add Point Delete Point

OK Add New Analyser Delete Analyser Cancel

**Figure 26 Calibration Control in Analyser Parameters**

- Point:** This is one part of a sequence of events that are performed during a calibration
- Label:** This is the name you give a specific point so that it is instantly recognisable and unique
- Point type:** The drop down field contains the name of the process that the point will perform (span, zero, stabilise)
- Duration:** This is the length of time that each point will perform there function (minutes)
- Average duration (min):** This is the length of time that the measurement will take place and is displayed as a average over that time i.e. if set to 2 as in Figure 26 then readings will be taken over minutes 18 to 20 and the average measurement over this time will be recorded.

### Extra fields

#### Digital Outputs

**(DO):** These fields are used when sending digital signals to the instrument. The digital signals can be set to either high, low or empty and should match up to the requirements of the instrument (see section 6.3 Communicate with Analyser). Click repeatedly on the cells to change their values.

**Instruments:** Instruments that are being used for calibrations can appear in this section (9830, 9841 etc) these fields should have the function being performed to them at this specific point.

#### 4.2.5 Digital Input and Output settings

The *Digital Input Settings* (Figure 27) and *Digital Output Settings* (Figure 28) Tabs show the digital input and output points and their settings for the currently selected analyser. The High Value and Low Value fields show the value that is recorded into the database for the digital input and output channels when they are high or low; all other fields have the same function as described in *Channel Information*. The *Add Digital Input/Output* buttons and the *Delete Digital Input/Output* buttons also function identically to the *Add Channel* and *Delete Channel* buttons in *Channel Information*.

System Channel #	Label	Analogue Input #	High Alarm	Low Alarm	Alarm Number	High Value	Low Value	Decimal Places	Description
7	CO	1	0	0	0	1	0	0	Carbon Dioxide

Figure 27 Digital Input Settings in Analyser Parameters

The *Default Output* field in *Digital Output Settings* is the value that the digital output is set to when WinAQMS Mini DAS is started.

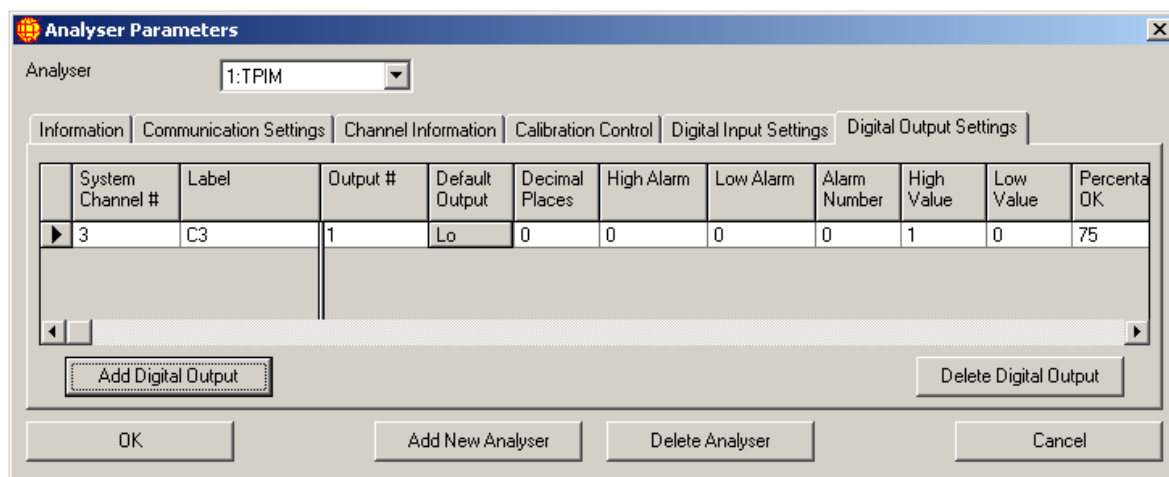


Figure 28 Digital Output Settings in Analyser Parameters

## 4.3 Calculated Channels

### 4.3.1 Calculated Channels

The *Calculated Channels* tab on the *Calculated Channels* window allows you to create new channels that perform scalar calculations on the data in existing channels.

All the fields in the *Calculated Channels* tab have the same function as in the *Channel Information* tab of the *Analyser Parameters* window, except for the *Calculation* field. This field

is where you enter the calculation you want the channel to perform. The calculation refers to system channels with the text CX, where X is the system channel number. In Figure 29, for example, a calculated channel determines the temperature in Kelvin using the calculation <C1 + 273>, where channel 1 contains the temperature data in degrees Celsius. The Process field works on the data after the calculation has finished.

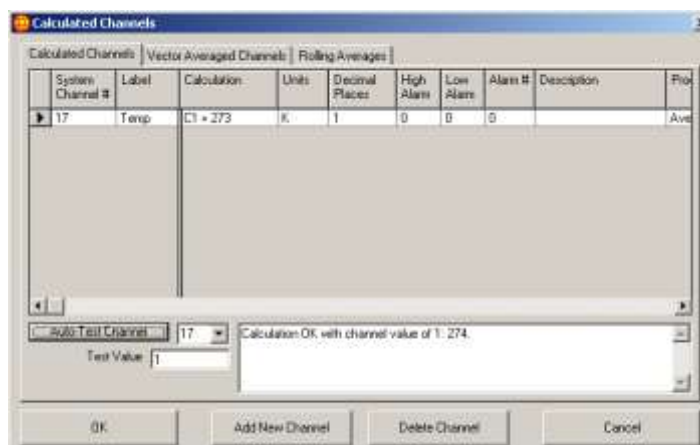


Figure 29 Calculated Channels

**Note:** If a source channel is using a maximum, minimum, standard deviation or total process the calculated channel will use the instantaneous data values for those channels not the maximum, minimum, standard deviation or total for the average period.

Below the table of calculated channels is a dropdown list box and a button. The dropdown list will show all the calculated channels and clicking on the *Auto-Test Channel* button will run the calculation for the channel in the dropdown list box with the channel value entered in the *Test Value* box. Each occurrence of a channel, CX,

will be replaced with the number in *Test Value*. The results of the calculations are reported in the text box at the right. If there was an error produced when a calculation was performed then the result text box will include a line similar to <Problem found with calculation for channel value of X>.

The following operators and functions can be used:

Arithmetic operators: +, -, \*, /, and brackets ().

Logical operators: =, < (less than), > (greater than), <> (not equal), >= (greater than or equal), <= (less than or equal), NOT, AND and OR which all evaluate to -1 if true or 0 if false.

Trigonometric operators: SIN, COS, TAN and ATN which have radian operands and results.

Mathematical operators: SQR (square root), EXP (natural exponent), LOG (natural log) and ^ (power). The constant for NULL can be included in a calculation. WinAQMS Mini DAS evaluates NULL to a numerical value (-1.79769313486231E+308) that it recognises as a NULL data reading.

Example: if you want a channel to have a result of 10 if channel 22 is under 800 units or over 900 units and a value of 5 if channel 22 is between 800 and 900 units, then you would use a calculation like the following.

$-10 * ((C22 < 800) \text{ OR } (C22 > 900)) - 5 * ((C22 \geq 800) \text{ AND } (C22 \leq 900))$

### 4.3.2 Vector Averaged Channels

The second tab on the *Calculated Channels* window allows you to find the vector average or the sigma theta of vector data which is often used for wind data. Since each channel, however, can only record scalar (non-vector) data, to calculate a vector average two channels must be set up, one to find the magnitude and the other the direction of the vector average.

System Channel #	Label	Magnitude Source Channel	Direction Source Channel	Magnitude Channel	Direction Channel	Sigma Theta Channel	Multiplier	Offs
100	WS Average	13	14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	0
101	WD Average	13	14	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	0
102	Sigma Theta	13	14	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	0

Figure 30 Vector Averaged Channels in Calculated Channels

Figure 30 shows an example of this. The wind speed and direction channels are numbers 13 and 14 respectively. Having *Magnitude Channel* ticked means that channel 100 will store the magnitude of the vector average. Channel 101, meanwhile, with *Direction Channel* ticked, will record the direction of the vector average and channel 102 with *Sigma Theta Channel* ticked will record the standard deviation of wind direction for channel 14.

### 4.3.3 Rolling Averages

Rolling average channels can be made by specifying an existing channel as the *Source Channel* and an existing report as the *Source Report*. The *Rolling Count* indicates how many times the channel will roll the specified report. For example, if report 1 was averaged every 5 minutes and report 2 was averaged every hour and an 8 hour rolling average of 1 hour data was required then the *Source Report* value would be set to 2 (report 2), the *Rolling Count* would be set to 8 (8 hours).



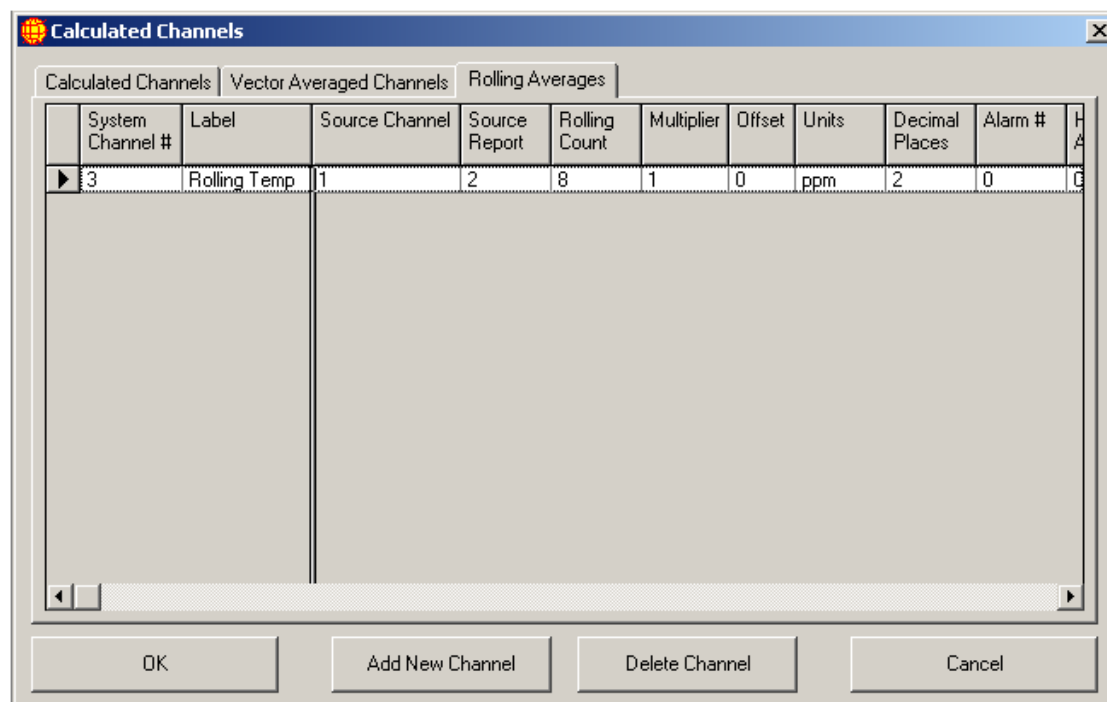


Figure 31 Rolling Average Channels in Calculated Channels

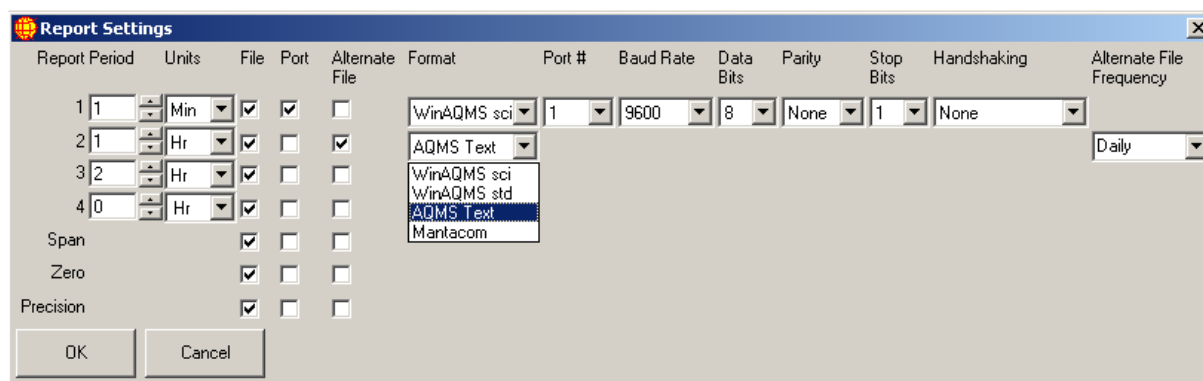
#### 4.4 Report Settings

The *Report Settings* menu allows you to change the reporting period of any of the four reports which WinAQMS Mini DAS supports as well as setting whether reports are written out to a serial port or to an alternative data file.

- *Period* can be altered with the up and down arrows used to increase or decrease the report period value.
- *Units* this field indicates the units of time associated with the period filled in above. The time unit can be minutes, hours or days.
- *File*: this check box determines whether the averages for all channels are written out to the data files.
- The *Port* check box indicates whether the report is to be sent to a serial port. A report is output to the listed serial port immediately after the report is written to the data file.

**Note:** If the port option is not checked then all of the fields *Port#*, *Format*, *Baud Rate*, *Data Bits*, *Parity*, *Stop Bits* and *Handshaking* will be hidden. All of the previously listed fields except for *Format* are settings for the serial port and should be set as appropriate to communicate with the receiving system.

- The *Alternate File* check box indicates whether a secondary data file will be produced in the specified format. The *Format* field indicates the type of text (or other) formatting that the serial output report will take (for more detail see APPENDIX D).

**Figure 32 Report Settings**

The *Alternate File Frequency* field has 2 options, Daily and Report.

### Daily

This will make a data file for each day in the C:\data directory with a name in the format

<PPP><RRR><YYYYMMDD>.txt

where

PPP - is the data file prefix (1 to 3 character length)

RRR - is the report number (3 character 0 filled)

001 = report 1

002 = report 2

003 = report 3

004 = report 4

128 – 143 = span report 1-16

144 = zero report

160 -175 = precision report 1-16

YYYYMMDD - date of the data readings

### Report

This will make a new data file every time report data is ready in the C:\data directory with a name in the format

<PPP><RRR><YYYYMMDDHHNNSS>.txt

where

PPP - is the data file prefix (1 to 3 character length)

RRR - is the report number (3 character 0 filled)

001 = report 1

002 = report 2

003 = report 3

004 = report 4

128 – 143 = span report 1-16

144 = zero report

160 -175 = precision report 1-16

YYYYMMDDHHNNSS – date and time of the data reading

### 4.4.1 Alarms

The *Alarms* window sets any digital outputs, emails and WinCollect alarms that get sent when a channel in WinAQMS Mini DAS triggers an alarm. A channel triggers an alarm by either going above the High Alarm Value or below the Low Alarm Value. Report alarms are triggered by the values of reports. Instantaneous alarms are triggered by the instantaneous data values received from analysers.

Both windows are presented in the same format being made up of at least 7 fields and is shown in Figure 33.

Alarm #	Digital Output #				Send Email	Reoccurring Emails	Min Time Between Emails	Email Details	Wincollect Alarm	
	7	8	9	10					Send Alarm	Alarm Details
1	Hi	Lo			<input type="checkbox"/>	<input type="checkbox"/>	00:00:00	View/Set	<input type="checkbox"/>	View/Set

Figure 33 Alarms

- *Alarm #* : This field is used to identify the alarm.
- *Digital Outputs #* : The four Digital Output fields specify which digital output gets set to either Hi, Lo or not changed (blank).
- *Send Email* sets whether WinAQMS Mini DAS sends an email when the alarm is triggered.
- *Reoccurring Emails* sets whether WinAQMS Mini DAS will continue to send new emails if a channel stays in the alarm state.

**Note:** If a channel enters its alarm state and the *Send Email* field is set a single email will be sent. If a channel stays in the alarm state at the time of the next report (or the next instantaneous data reading) a new email will not be sent unless the *Reoccurring Emails* field is set.

- *Min Time Between Emails* is the minimum time in hours, minutes and seconds between an email being sent for that alarm.

**Note:** If a channel enters an alarm state and the *Send Email* and *Reoccurring Email* fields are set then a new email will be sent only if the time in *Min Time Between Emails* has passed since the time the last email was sent.

- The *Email Details View/Set* button will open up a window as shown below in Figure 34.

Figure 34 Alarm Email Details

- The *To* field is the email address that the alarm email should be sent to. *From* is where the email will say it is from.
  - *Subject* is the subject of the email message.
  - *Attached* is the path and name of any files that are to be attached to the alarm email message. (This should be a comma delimited list of valid paths and filenames on the logger.)
  - The large open text box is for the text of the email message.
- *Send Alarm*: When an alarm condition is met and the *Send Email* option is set, WinAQMS Mini DAS will send an email using the SMTP server that has been set in the *SMTP Server* field in *System Parameters* (Section 4.1). The email will automatically include an additional short text message describing what alarm has been triggered and when it happened in addition to the text in the box (which will follow the message).
- The *Alarm Details View/Set* button will open up a window similar to the one shown below.

Figure 35 Wincollect Alarm

- The *Dialup Connection* dropdown list is a list of all the dialup connections on the DAS. If the DAS is not connected to the

Wincollect workstation through a network then a dialup connection needs to be used.

- The *Username* and *Password* fields are for the username and password required by the dialup connection.

- 

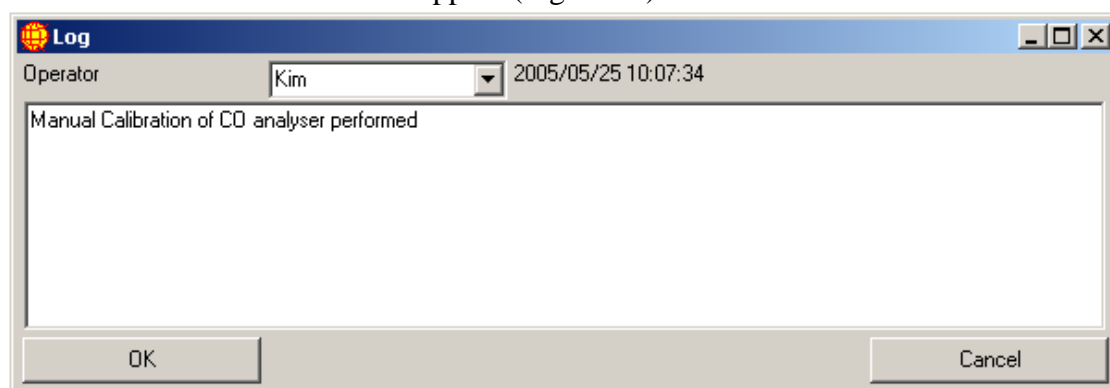
**Note:** If there is no *Dialup Connection* selected from the dropdown list the *Username* and *Password* fields will be hidden.

- The *Wincollect IP address* field is the Wincollect workstations' TCP/IP address on the network. (LAN or dialup connection)
- The *Domain* field is used if the Wincollect Workstation is part of a domain but otherwise can be left blank.

## 4.5 Logs

WinAQMS Mini DAS has a Log feature which allows users to Log in all activity that has been performed on or with the WinAQMS Mini DAS program to keep track of work and changes performed.

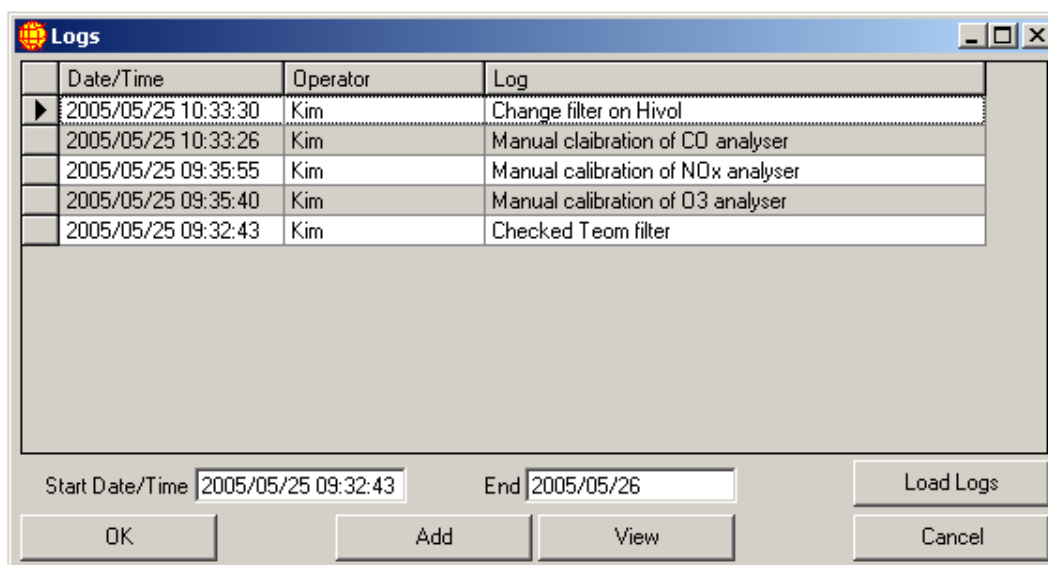
1. Under the *Edit* menu select the *Log* menu item
2. On the main Log screen click the Add new log entry, a new window will appear (Figure 36).



**Figure 36 Log entry window**

3. Within this new window choose the operator name if not already present then enter a new name
4. In the blank white space type in the task being performed the press ok, if you wish not to save/enter the log then press cancel.

The main Log screen contains a summary of Log entries. By default the Log screen will record the last 10 log entries; more can be accessed by changing the Start Date/time.



**Figure 37 Logs main screen**

**Start date time:** Time from which logs are to be collected from. Default is start of the 10 latest logs, this can be altered to include more older logs by changing the start date time.

**End date time:** Date up to which logs will be included. Default is the following day to ensure most recent logs are included.

**Ok :** Confirm log entries, must be pressed for any entries to be confirmed and saved.

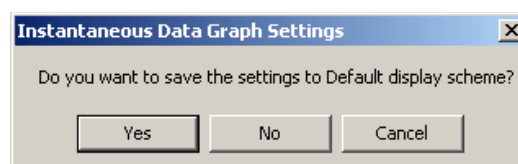
**Load Log:** Loads all logs from within the time specified in the start and end date/time.

**Cancel:** Leave the window without saving changes

## 4.6 Display Schemes

Display schemes in WinAQMS Mini DAS save settings for the *Instantaneous Data*, *Instantaneous Graph*, *Instantaneous Wind Speed and Direction*, *Historical Data* and *Historical Graph* windows. A display scheme will remember your settings for each of these windows. For example, the Default scheme will remember which channels you have selected in the *Instantaneous Data* and *Instantaneous Wind Speed and Direction* windows, the colours you have selected for the channels plotted in the *Instantaneous* and *Historical Graphs* and all other settings you have chosen.

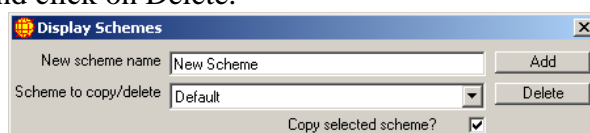
When you make a change to any of the settings for these windows and close the window a dialog box will appear as shown in Figure 38. If you want to save the changes made to the window then choose *Yes*. If you do not want to save the changes to the window then choose *No*. If you do not want to save the changes to the window and want the window to remain open so you can make more changes then choose *Cancel*.



**Figure 38 Saving settings to a Display Scheme**

When a window that uses a display scheme is closed or the WinAQMS Mini DAS program exited, WinAQMS Mini DAS will remember the settings and display scheme of the windows and will restore them exactly the same way they were before.

To add a display scheme enter the name of the new scheme into the text box to the right of “New scheme name” as shown in Figure 39. If you want to copy the settings from the display scheme shown in the dropdown box, then put a tick in the Copy selected scheme checkbox and click Add. To delete an existing scheme, select it from the dropdown list and click on Delete.

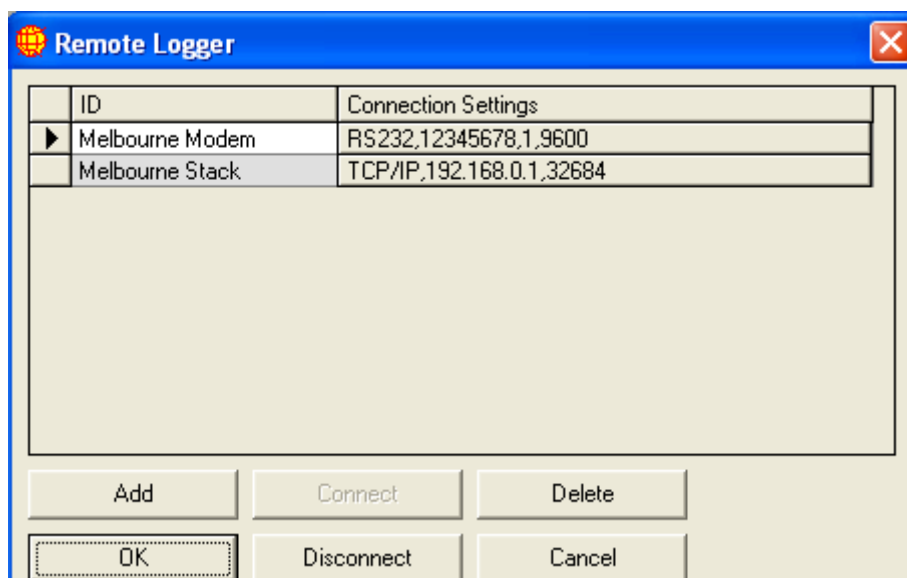


**Figure 39 Adding a new Display Scheme**

## 4.7 Remote Logger

The Remote Logger window shows a list of the remote data DAS connections. Connections can be added by clicking on the Add button. Connections can be deleted by highlighting the connection(s) and clicking on the delete button. A deletion confirmation box will appear when deletions are made. A connection to a remote DAS can be established by highlighting the required connection and clicking the connect button. Once a connection is established the Connect button will become inactive and a new connection cannot be made unless the current connection is dropped.

The Connection Settings column shows the basic information about the connection. It shows the connection type (TCP/IP or RS232) and basic settings related to the connection. For TCP/IP connections it shows the IP address and port number. For RS232 connections it shows the phone number, RS232 port number and baud rate. Clicking on the Connection Settings button will open a second window which will show the full details of the connection as shown in Figure 41 and Figure 42.



**Figure 40 Remote Logger Window**

RS232 connection has the following fields

- Phone #:** The phone number that will be dialed by WinAQMS Mini DAS. If this field is empty then no phone number will be dialed.
- Modem Init String:** This string command will be sent to the RS232 port prior to the Phone # being dialed.
- RS232 Port:** The port that will be used to make the connection.
- Baud Rate:** The speed at which the RS232 port will be set to operate at. 110-256000 (9600 default).
- Parity:** Space, Odd, None (default), Mark or Even
- Data Bits:** 4 to 8 (default).
- Stop Bits:** 1 (default), 1.5 or 2
- Handshaking:** None (default), XOn/XOff, RTS/CTS or XOn/XOff+RTS/CTS



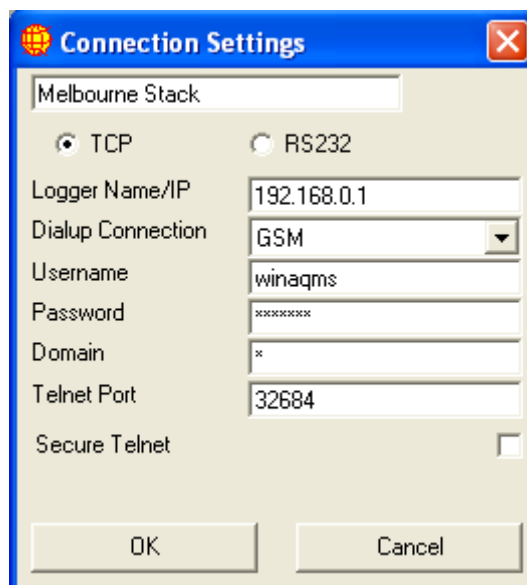
**Figure 41 RS232 Connection Settings**

TCP/IP connection has the following fields

- Logger Name/IP:** The IP address or name of the DAS (192.168.0.1 default).
- Dialup Connection:** This is a dropdown list of the dialup connections that are set up on the DAS. The default is not to use a connection.
- Username and Password:** The username and password required to authenticate onto the remote DAS.
- Domain:** The name of the Microsoft Windows domain that a DAS is connected to. If there is no domain then leave this value as a \*.
- Telnet Port:** The port that the client will use to connect to the DAS (32684 default).
- Secure Telnet:** This checkbox allows you use a secure telnet connection between the WinAQMS Mini DAS Client



and Server. This option requires digital certificates that have been issued by Ecotech Pty. Ltd.



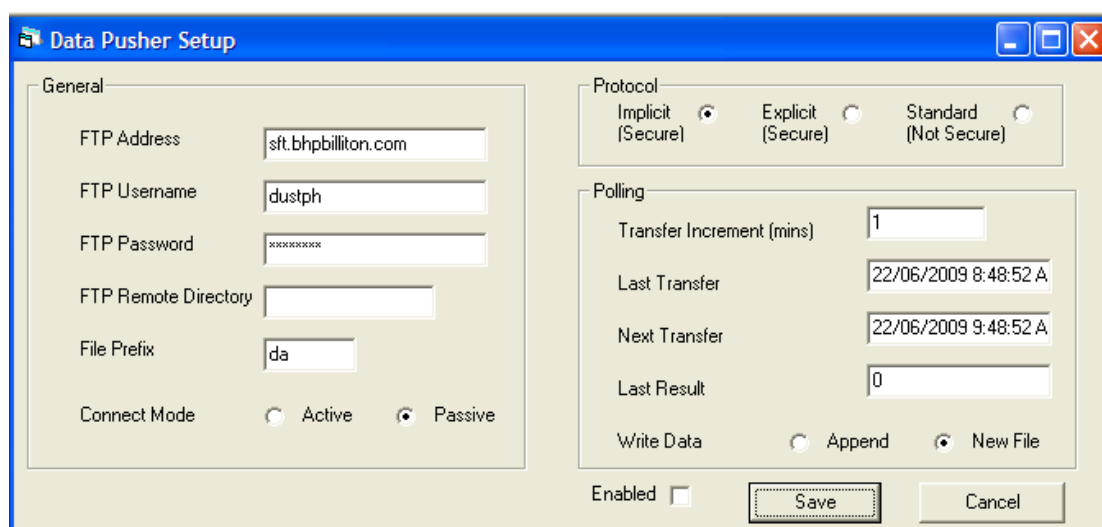
**Figure 42 TCP/IP Connection Settings**

## 4.8 Security

The Security menu item is used to login, change passwords, add users and change security levels (see the section “Security” on page 14).

## 4.9 Data Pusher

The Data Pusher is used to upload data to an FTP site without the need for a request. The Data Pusher requests data from the Data Server for a defined time period and automatically uploads the data file to the selected FTP site.



**Figure 43 Data Pusher screen**

## General

<b>FTP Address:</b>	URL or IP address of FTP server
<b>FTP Username:</b>	Username needed to logon to FTP server
<b>FTP Password:</b>	Password needed to logon to FTP server
<b>FTP Remote Directory:</b>	If data is to be located in subdirectories on FTP server eg. Data
<b>File Prefix:</b>	Attaches character to the start of the filename to differentiate data from different stations
<b>Connect mode:</b>	Choose between “Active” and “Passive”.  Active work by WinAQMS Mini DAS initialising a connection to the FTP Server, the server then connects to WinAQMS Mini DAS.  Passive works by WinAQMS Mini DAS initialising a connection to the FTP Server which informs WinAQMS Mini DAS of which port to connect to, WinAQMS Mini DAS will then connect to the FTP Server on the specified port.

## Protocol

<b>Implicit (Secure):</b>	The FTP server defines a specific port for the client (990) to be used for secure connections.
<b>Explicit (Secure):</b>	Uses the default ftp port (port 21)
<b>Standard (Not Secure):</b>	Standard port 21 with no security

## Polling

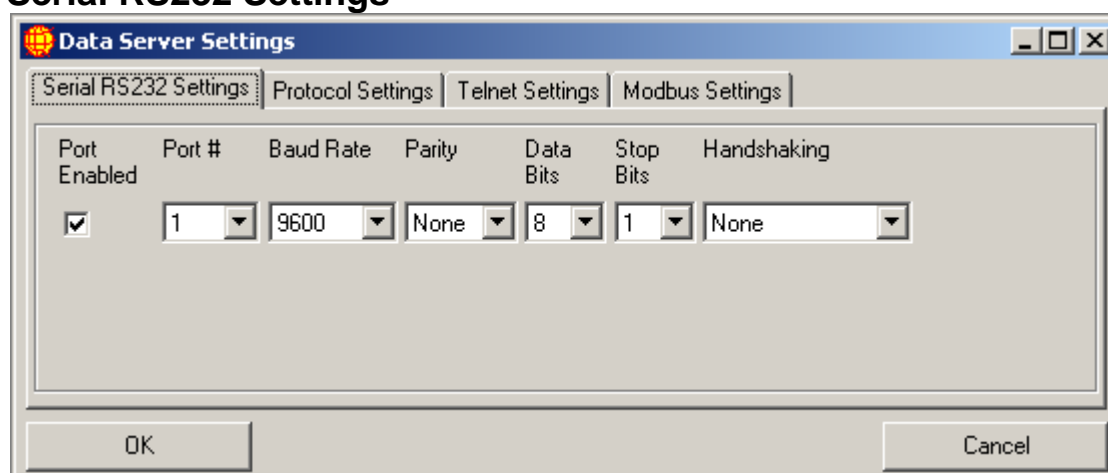
<b>Transfer Increment (mins):</b>	Number of mins between data transfers
<b>Last Transfer:</b>	The date of last transfer (this does not need to be set in initial setup)
<b>Next Transfer:</b>	The date of the next transfer (this can be set in initial setup or can be left)
<b>Last Result:</b>	A number indicating the status of the last result. i.e. 0 for success
<b>Write data:</b>	Choose either “Append” or “New File”.  Append will create a single file for each day and all uploads from that day will be stored in this file.  New File will create a new file for every upload (including the time in the filename) as defined by the transfer increment value above.
<b>Enabled:</b>	This enables/ disables the service to start the Data Pusher.

**Note:** WinCollect can import from the files that WinAQMS Mini DAS pushes to. This eliminates the need for a static IP or a DNS service

## 4.10 Data Server Settings

The data server settings window is used to specify the settings of the WinAQMS Mini DAS Data Server. Programs such as Ecotech's WinCollect, communicate with the WinAQMS Mini DAS Data server to retrieve data. This window contains four tabs labelled Serial RS232 Settings, Protocol Settings, Telnet Settings and Modbus Settings.

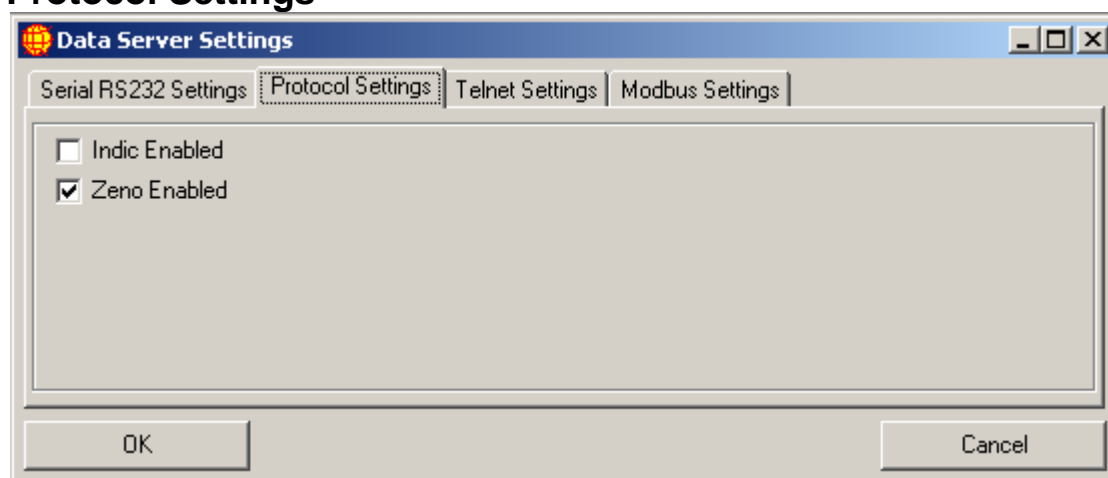
### Serial RS232 Settings



**Figure 44 Serial RS232 tab**

This tab allows the user to enable a serial port that the WinAQMS Mini DAS Data Server can communicate through; it also allows the user to specify the parameters of this communication.

### Protocol Settings



**Figure 45 Protocol settings tab**

This Tab allows the user to choose if they want to enable Indic or Zeno logger emulation for the request of data from the Data server.

## Telnet Settings

**Data Server Settings**

Serial RS232 Settings | Protocol Settings | **Telnet Settings** | Modbus Settings

Telnet Port: 32683

Alternate Port: 32682

OK Cancel

**Figure 46 Telnet Settings**

The Telnet Settings tab sets the Port number which the data server will listen to for an incoming connection. The First Telnet port is set to the default of 32683 where it listens for valid data requests. The alternative port is set to a port number that the data server will also listen to for valid data requests.

## Modbus Settings

**Data Server Settings**

Serial RS232 Settings | Protocol Settings | Telnet Settings | **Modbus Settings**

☒ Modbus Enabled Modbus Slave Address: 1

Modbus Channel	Multiplier	Offset	Source Channel	Source Report
1000	1	0	1:Temp	RPT1
▶ 1001	1	0	2:CO	RPT1
1002	1	0	3:Pressure	RPT1

Add Channel Delete Channel

OK Cancel

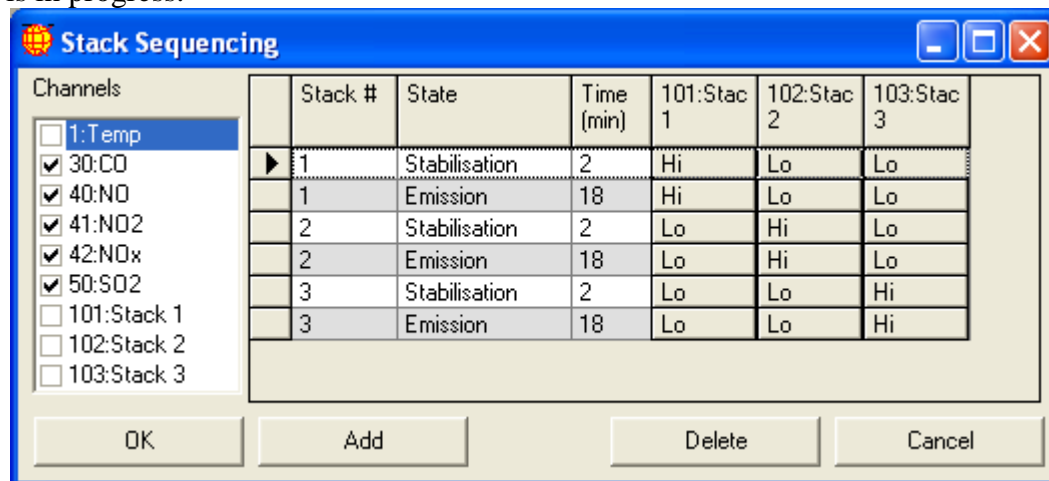
**Figure 47 Modbus Settings**

The Modbus settings tab allows the Modbus protocol to be enabled. The Modbus protocol is an alternative protocol for the request and transfer of data. WinAQMS Mini DAS acts as a slave to the requesting program and must have a unique slave number to respond to appropriate requests for data. Modbus channels are different to those in WinAQMS Mini DAS and within this window the Modbus channels can be linked to their equivalent WinAQMS Mini DAS channels. Channels can be created and deleted by using the two buttons near the bottom of the tab, the information sent from WinAQMS Mini DAS can be transformed using the multiplier and offset fields, and the data sent is specified to a certain report period.

**Note:** Leaving Multiplier as 1 and Offset as 0 will not perform any transformation to data.

## 4.11 Stack sequencing

Stack sequencing allows WinAQMS Mini DAS to set digital outputs in a repeating cycle. The cycle is made up of a series of points which will run through sequentially and repeat continuously. The stack sequencing will be suspended when a calibration is in progress.



**Figure 48 Stack sequencing window**

**Channels:** the channels that are selected here will be marked with a calibration state for the points which have a Stabilisation state.

**State:** dropdown list which allows the stack point to be set to Stabilisation or Emission. In Stabilisation state channels will be marked with a calibration status. In Emission state channels will not be marked with a calibration status.

**Time (min):** duration that the stack point will last before moving on to the next point.

**Digital Outputs:** each digital output in the system will be shown to the right of the Time column. Each output in each point can be set with a value (Hi, Lo or no change) which will be activated when the system is running the point.

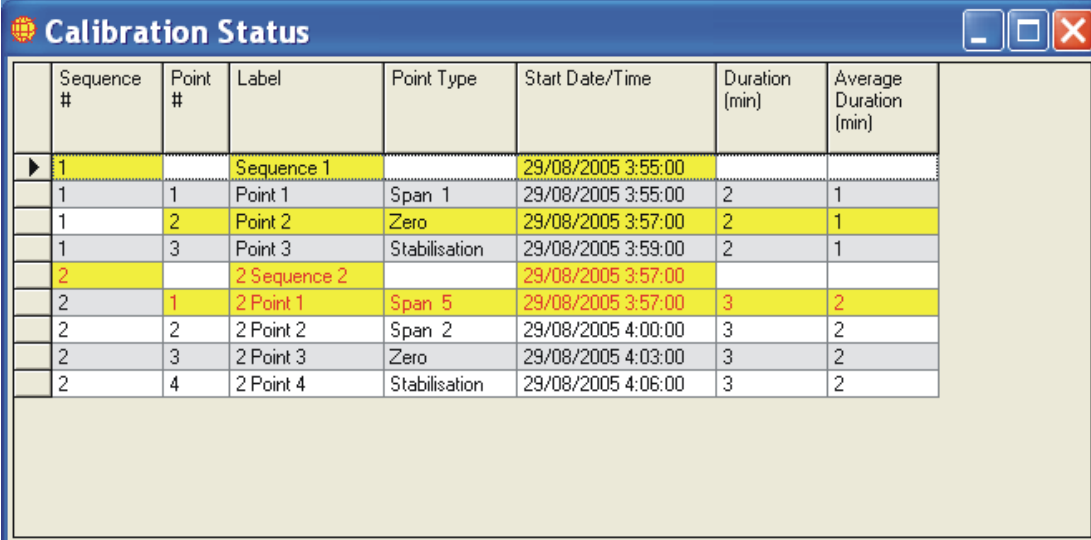


## 5 View Menu

The View menu allows users to access information and data from the instruments. This data can be in real time Instantaneous data, or Historical data. This data can be accessed either in the form of data readings, or in a graphical format such as a line graph.

### 5.1 Calibration Status

The Calibration Status window shows the current calibration state of the WinAQMS Mini DAS. All sequences and points are listed on a separate row in the Calibration Status table which also shows the Label, Point Type, Starting Date/Time, Duration (min) and Average Duration (min). When a sequence and point is active they will be displayed with a yellow background. The text colour will be black if an automatic sequence/point is running and red if a manual sequence/point is running. Any points in an active sequence that are not currently running will not show up with a yellow background. When a point is running the Average Duration (min) column will show as being active only when the Span or Zero report for the point is being calculated.



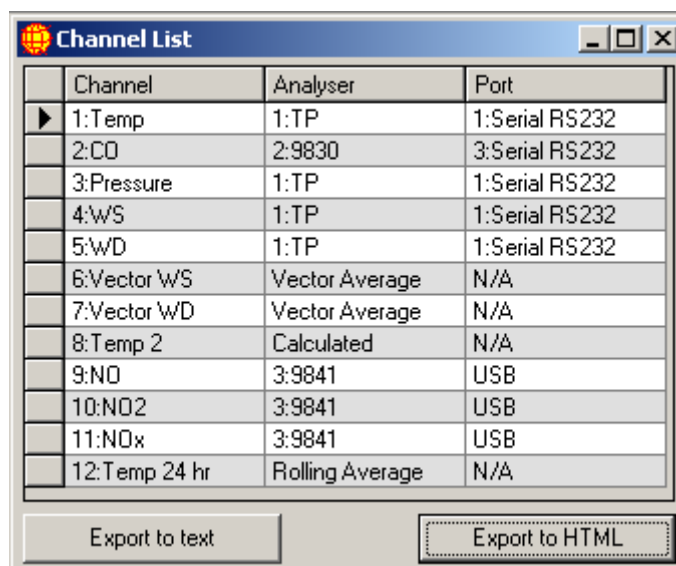
The screenshot shows a window titled "Calibration Status" with a table containing the following data:

Sequence #	Point #	Label	Point Type	Start Date/Time	Duration (min)	Average Duration (min)
1		Sequence 1		29/08/2005 3:55:00		
1	1	Point 1	Span 1	29/08/2005 3:55:00	2	1
1	2	Point 2	Zero	29/08/2005 3:57:00	2	1
1	3	Point 3	Stabilisation	29/08/2005 3:59:00	2	1
2		2 Sequence 2		29/08/2005 3:57:00		
2	1	2 Point 1	Span 5	29/08/2005 3:57:00	3	2
2	2	2 Point 2	Span 2	29/08/2005 4:00:00	3	2
2	3	2 Point 3	Zero	29/08/2005 4:03:00	3	2
2	4	2 Point 4	Stabilisation	29/08/2005 4:06:00	3	2

Figure 49. Calibration status window

### 5.2 Channel List

The Channel list window provides a streamlined view of the channels and the instruments associated with them. The first column lists the channel number and name, in column two the analyser from which data is being acquired for that channel is listed and the third column has the communication port that WinAQMS Mini DAS is receiving the data through. As shown below in Figure 50 multiple channels can be serviced by the same instrument running through the same communications port. The list can be ordered by channel, analyser or port number by clicking on the heading of the respective column. This list can be exported to a comma delimited text file by pressing the "Export to text" button or to a H.T.M.L. formatted file by pressing the "Export to HTML" button.



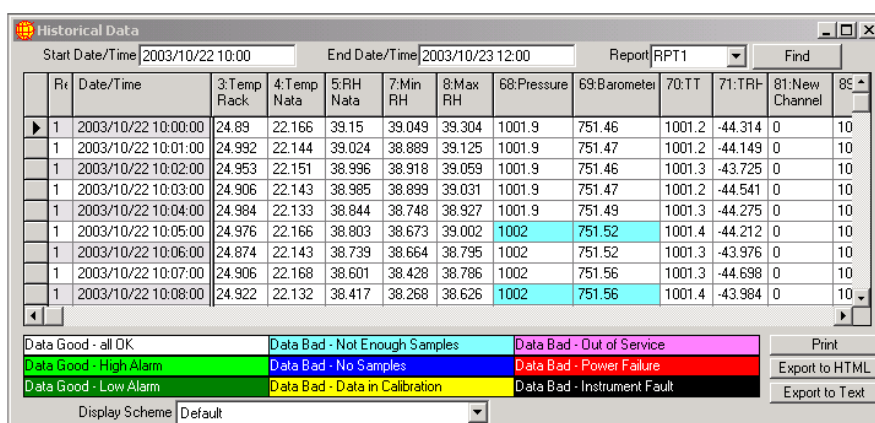
Channel	Analyser	Port
1:Temp	1:TP	1:Serial RS232
2:CO	2:9830	3:Serial RS232
3:Pressure	1:TP	1:Serial RS232
4:WS	1:TP	1:Serial RS232
5:WD	1:TP	1:Serial RS232
6:Vector WS	Vector Average	N/A
7:Vector WD	Vector Average	N/A
8:Temp 2	Calculated	N/A
9:NO	3:9841	USB
10:NO2	3:9841	USB
11:NOx	3:9841	USB
12:Temp 24 hr	Rolling Average	N/A

Export to text      Export to HTML

Figure 50 Channel list screen

### 5.3 Historical Data

The Historical Data window displays data from the database as a table.



R#	Date/Time	3:Temp Rack	4:Temp Nala	5:RH Nala	7:Min RH	8:Max RH	68:Pressure	69:Barometer	70:TT	71:TRH	81:New Channel	85
1	2003/10/22 10:00:00	24.89	22.166	39.15	39.049	39.304	1001.9	751.46	1001.2	-44.314	0	10
1	2003/10/22 10:01:00	24.992	22.144	39.024	38.889	39.125	1001.9	751.47	1001.2	-44.149	0	10
1	2003/10/22 10:02:00	24.953	22.151	38.996	38.918	39.059	1001.9	751.46	1001.3	-43.725	0	10
1	2003/10/22 10:03:00	24.906	22.143	38.985	38.899	39.031	1001.9	751.47	1001.2	-44.541	0	10
1	2003/10/22 10:04:00	24.984	22.133	38.844	38.748	38.927	1001.9	751.49	1001.3	-44.275	0	10
1	2003/10/22 10:05:00	24.976	22.166	38.803	38.673	39.002	1002	751.52	1001.4	-44.212	0	10
1	2003/10/22 10:06:00	24.874	22.143	38.739	38.664	38.795	1002	751.52	1001.3	-43.976	0	10
1	2003/10/22 10:07:00	24.906	22.168	38.601	38.428	38.786	1002	751.56	1001.3	-44.698	0	10
1	2003/10/22 10:08:00	24.922	22.132	38.417	38.268	38.626	1002	751.56	1001.4	-43.984	0	10

Data Good - all OK      Data Bad - Not Enough Samples      Data Bad - Out of Service      Print

Data Good - High Alarm      Data Bad - No Samples      Data Bad - Power Failure      Export to HTML

Data Good - Low Alarm      Data Bad - Data in Calibration      Data Bad - Instrument Fault      Export to Text

Display Scheme: Default

Figure 51 Historical Data

- It has a *Start Date/Time* field that indicates the time of the first data value you want to look at. The *Start Date/Time* has a default value of the current date with no time specified. If no time is specified it is taken as being 12:00 midnight or 00:00 in 24 hour time for the date entered.
- The *End Date/Time* field shows the date and time of the last data reading you want to look at. The *End Date/Time* has a default value of the day after the current day at 12:00 midnight or 00:00 in 24 hour time. It is not recommended that you view more than 1 week's data as the time required to retrieve this data may become excessive over slower communications links.
- The *Report Name* field indicates the report you are looking at and can be one of RPT1 (Report 1), RPT2, RPT3, RPT4, Span, Zero, Precision or All. RPT1 to RPT4 show the data for the four reports which WinAQMS Mini DAS supports. Span, Zero and Precision show the report data from when the channels went into calibration. The Span and Precision reports show all 16 Span or Precision reports.



The All option shows the data for all reports in the database for the selected time period.

- The *Find* button will use the values in the Start Date/Time, End Date/Time and Report Name fields to load the data into the grid in the centre of the window.

At the bottom of the window are nine boxes. These show the possible data status and the colour that the data will be shown in if it has that particular status. The status colours can be changed by clicking on the coloured box and then selecting the colour for the status from the colour selection window. Any data that has the status will then show up in the grid in the appropriate colour.

## 5.4 Historical Graph

The *Historical Graph* is used to display report data from the database as a graph. It allows up to six plots of channel data to be drawn, with options for each plot as for the *Instantaneous Graph*. The *Historical Graph* window shows the graph, channel number and channel value boxes, and a Start and End Date/Time boxes. When the *Load Data* button is pressed all data with a time stamp equal to or greater than the *Start Date/Time* box and less than or equal to the *End Date/Time* box will be loaded from the database.

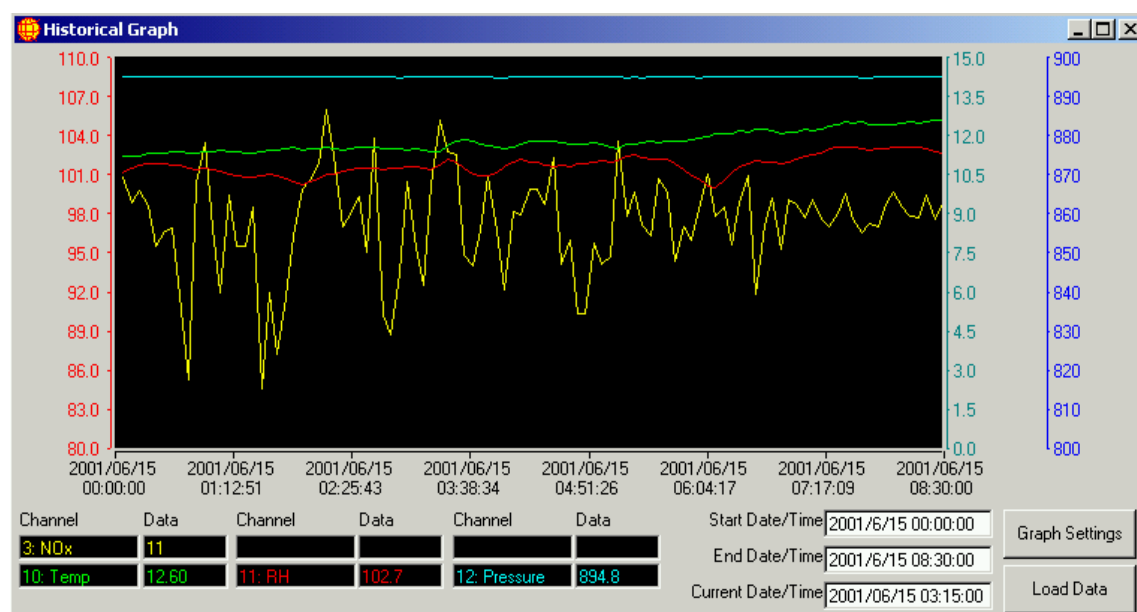


Figure 52 Historical Graph

To view the graph data at a particular point, click on the graph and a vertical black or white line will appear on the Graph. The data boxes at the bottom of the window will display the data value for each plot from that time. The *Current Date/Time* box shows the date and time of the data point under the black/white line. The left and right arrow keys move the line to an earlier or later data point.

## Historical Graph Settings

Access this through the *Graph Settings* button on the Historical Graph window. Each of the six plots of channel data can be configured individually to suit the needs of the channel it is plotting.



Figure 53 Historical Graph Settings with Plot Settings

- The *Plot Drawn* option will set whether a plot is drawn. If this option is not selected the data will still be present but the plot will not be drawn.
- *Channel* determines which channel the graph will be plotting.
- *Normal Data Colour* is the colour that the plot will use when the data for the channel is equal to or below the high alarm value and equal to or above the low alarm value. To change the *Normal Data Colour* click on the box with the plot colour and a colour selection window will appear which will give you the option of selecting one of several predetermined colours or making your own colour.
- The *High Alarm Colour* and *Low Alarm Colour* can be changed in the same way as the *Normal Data Colour*.

The *Show Axis Settings/Show Plot Settings* button allows you to toggle between the settings for the plots and the settings for the axes.



Figure 54 Historical Graph Settings with Axis Settings

- *Axis Colour* is the colour of the axis for the plot.
- To remove the axis for a specific channel remove the tick from the *Axis Shown* box.
- *AutoScale* will scale the axis based on the data that has been plotted since the plot was started. Autoscaling will give the axis a maximum value just above that of the largest value received and a minimum of just below that of the smallest value received.
- If you do not want the plot to use the autoscaled axis then remove the tick in the *AutoScale* box, which will then enable the *Max. and Min. Axis Value* boxes. Entering values in these two boxes will set the maximum and minimum values for the axis and scale the plot using those values.

Available in both Plot Settings and Axis Settings modes are:

- *Graph Background Colour*, which sets the colour that will appear as the background colour for the graph. It can be changed like the other colour selections.

- *Display Scheme*, which will load the settings of a particular scheme.
- *Report*, which shows which report will be displayed on the graph.

## 5.5 Instantaneous Data

The *Instantaneous Data* window shows up to ten channels with their most recent data and the units of the channel. Clicking on a dropdown box allows you change the channel for which the data is displayed. The window is updated at the speed of the fastest channel in the system. If the *Instantaneous Data* menu option or button is selected when there is already an *Instantaneous Data* window visible then a second window will be displayed. Each of the Data boxes is shown in a colour indicating its status. An extra field at the bottom is *Display Scheme*, which will load the settings of a particular scheme.

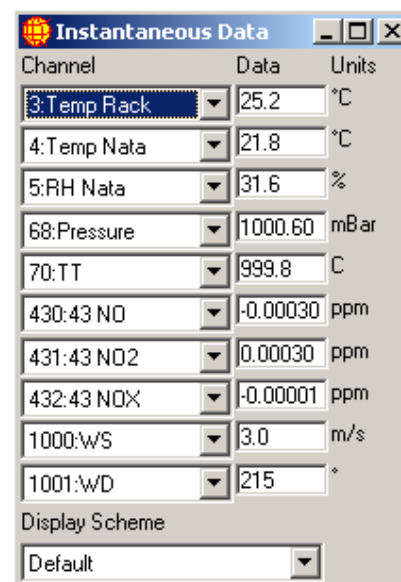


Figure 55 Instantaneous Data

## 5.6 Instantaneous Graph

The *Instantaneous Graph* gives a visual plot of data as WinAQMS Mini DAS receives it. The graph can show up to six plots simultaneously, each using different axes, plot colours and axis colours. For each channel plotted, the vertical scale can be shown as an axis in any colour. The axes can be set to have a fixed range or to auto-scale to match the data that is being plotted. Each plot can be enabled or disabled and can be shown in a unique colour. To change the settings for the *Instantaneous Graph* select the *Graph Settings* button, which will load the *Graph Settings* window.

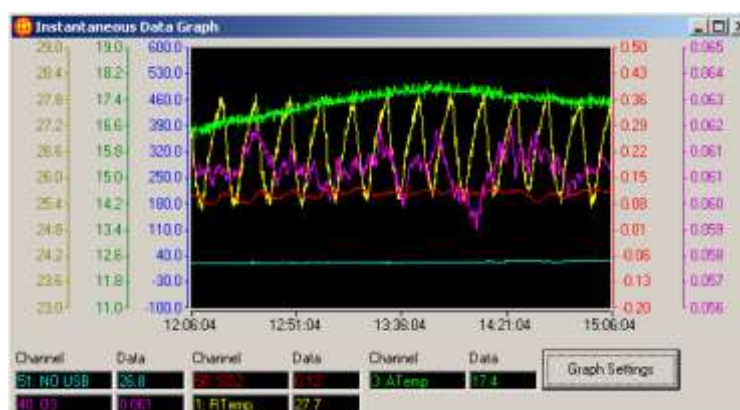


Figure 56 Instantaneous Graph

Graph data from a particular time can be viewed in the same way as for the *Historical Graph*, (with the black/white line). As time passes, the line and plots will move towards the left edge of the screen as new data values arrive. When the line goes off the left edge of the screen the data values displayed at the bottom of the screen will return to being the most recently logged values.

## Instantaneous Graph Settings

Access this through the *Graph Settings* button on the Instantaneous Data Graph window. Settings for the *Instantaneous Graph* are the same as for the *Historical Graph* except that the *Report* list box is replaced with a *Graph Time Frame* and a *Graph Redraw Period* (Refer to Section 2.10.1, Historical Graph Settings for explanation of the other options.)

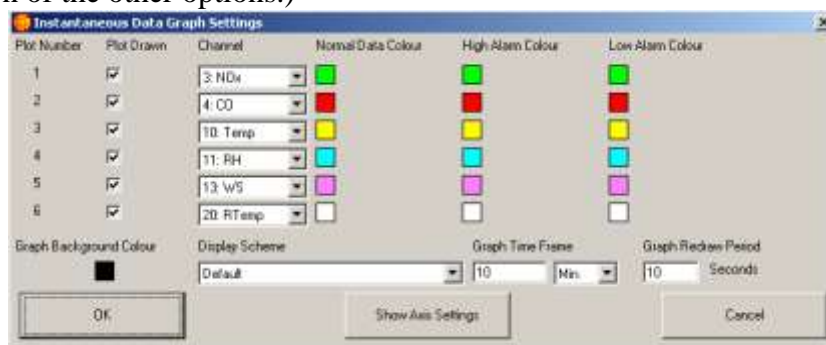


Figure 57 Instantaneous Graph Settings with Plot Settings

- *Graph Time Frame*, sets the length of time that the graph will retain data for. If the *Graph Time Frame* is set to 10 minutes then all displayed plots will show data for the last ten minutes.
- *Graph Redraw Period*, sets the interval at which the graph redraws. The data from the analysers will continue to be stored by the graph but will not be displayed until the graph redraw period is up. Clicking on the graph or using the keyboard to display the white line will also cause the graph to redraw itself.



Figure 58 Instantaneous Graph Settings with Axis Settings

## 5.7 Instantaneous Wind Speed/Direction

The *Wind Speed and Direction* window displays the wind speed and direction data in graphical form. The data points can be positioned either towards or away from the wind source and will be positioned according to the magnitude of data. If the data value goes over the high alarm value or under the low alarm value for the channel the data points can be set to change colour when this occurs. Data is displayed as a dot, cross, plain line or one with an arrow head. These data points, along with the rest of the graph, can be customised within the settings menu (see below).

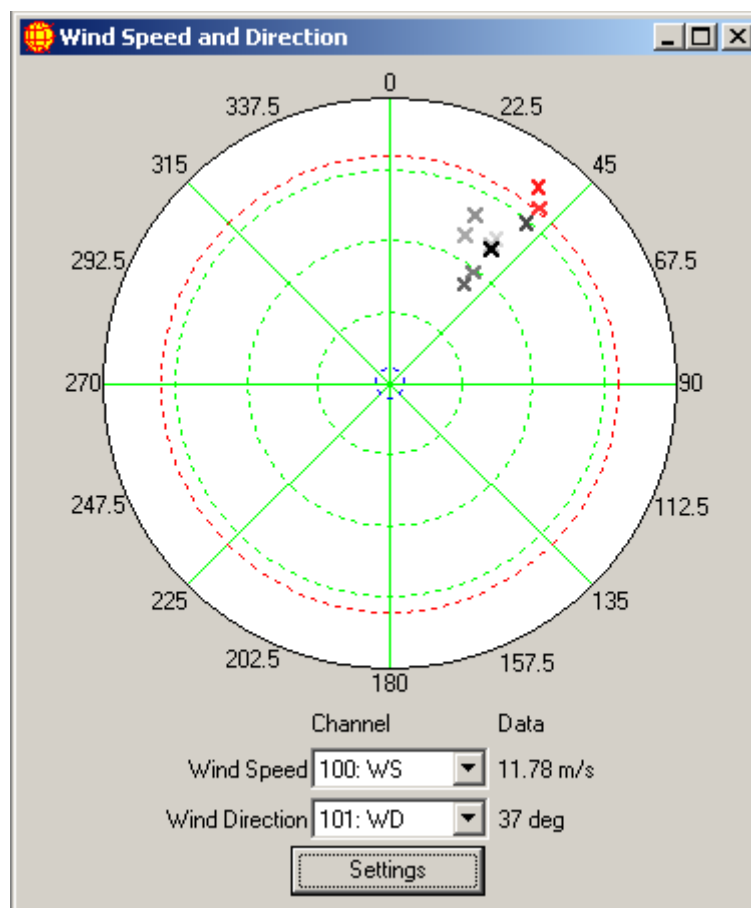


Figure 59 Wind Speed and Direction

**Wind Speed and Direction Settings**

Display Type: 4: Cross towards source

Line Width: 1

Data Count: 10

Text Type: 0: Digits

Data History Fade: ☒

Show High Alarm Level: ☒

Change High Alarm Data Colour: ☒

Show Low Alarm Level: ☒

Change Low Alarm Data Colour: ☒

Show Magnitude Markers: ☒

Show Sector Markers: ☒

Magnitude Marker Interval: 5

Display Scheme: Default

Max WS: 20

Data Colour: [Black]

Text Colour: [Black]

Background Colour: [White]

High Alarm Level Colour: [Red]

High Alarm Data Colour: [Red]

Low Alarm Level Colour: [Blue]

Low Alarm Data Colour: [Blue]

Magnitude Marker Colour: [Green]

Sector Marker Colour: [Green]

Sector Marker Interval: 60

OK Cancel

Figure 60 Wind speed and direction Settings

## Wind speed and direction settings

<b>Display Type:</b>	The readings can be shown as a dot, cross, line with an arrow head or a line. The data can be shown as towards the source of the reading or away from the source of the reading. Example: Instead of an arrow pointing into the wind it can be set to point in the direction of the wind.
<b>Line Width:</b>	The line, dot or cross can be made larger using the Line Width parameter.
<b>Max WS:</b>	The maximum wind speed parameter is the radius of the wind rose.
<b>Data Count:</b>	Shows how many readings will be shown on the wind rose.
<b>Data Colour:</b>	This field allows the colour of the data point to be chosen.
<b>Text Type:</b>	The type of labels shown on the edge of the wind rose.
<b>Text Colour:</b>	This field allows the colour of the text (shown on the edge of the wind rose) to be selected.
<b>Data History Fade:</b>	This will fade data as it gets older. Each time new data is shown the older data will change more in colour to that of the Background Colour.
<b>Background Colour:</b>	This field allows the colour of the background of the wind rose to be selected.
<b>Show High Alarm Level:</b>	If the Wind Speed channel has a high alarm value set then a dashed circle will be shown on the wind rose at this level.
<b>High Alarm Level Colour:</b>	This field allows the colour of the high alarm dashed line to be selected.
<b>Change High Alarm Data Colour:</b>	If set this will change the colour of any data readings which are above the high alarm level.
<b>High Alarm Data Colour:</b>	This field allows the colour of the high alarm data readings to be selected.
<b>Show Low Alarm Level:</b>	If the Wind Speed channel has a low alarm value set then a dashed circle will be shown on the wind rose at this level.
<b>Low Alarm Level Colour:</b>	This field allows the colour of the low alarm dashed line to be selected.
<b>Change Low Alarm Data Colour:</b>	If set this will change the colour of any data readings which are below the low alarm level.
<b>Low Alarm Data Colour:</b>	This field allows the colour of the low alarm data readings to be selected.
<b>Show Magnitude Markers:</b>	This will enable markers to indicate the numeric value of the data reading
<b>Magnitude Marker</b>	

<b>Colour:</b>	This field allows the colour of the magnitude markers to be selected.
<b>Show Sector Markers:</b>	This will split the wind rose into sectors like a pie graph.
<b>Sector Marker Colour:</b>	This field allows the colour of the sector markers to be selected.
<b>Magnitude Marker Interval:</b>	This is the spacing between successive magnitude markers.
<b>Sector Marker Interval:</b>	This is the spacing of the sector markers (in degrees).
<b>Display Scheme:</b>	This field will load the settings of a particular scheme the user has defined previously

## 5.8 Sizeable Font Data Value

The sizeable font data value displays a single channels data value with user specified font settings.

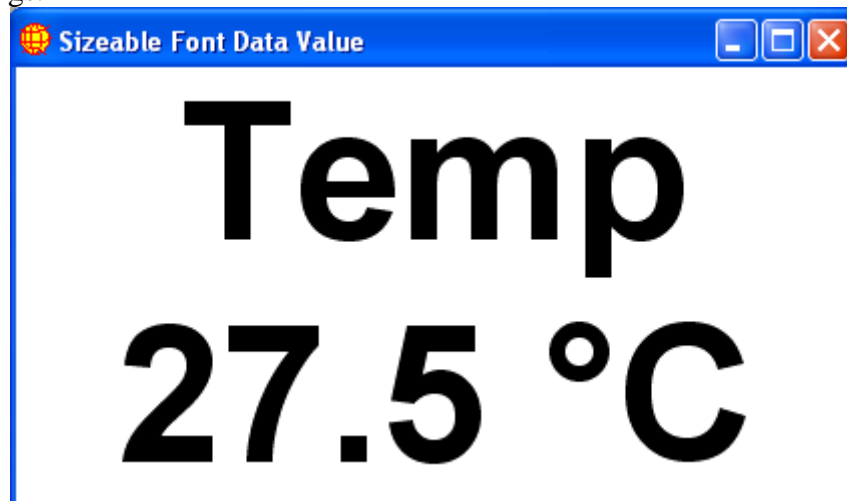


Figure 61 Sizeable Font Data Value Window

Double clicking on the window will open the settings window.

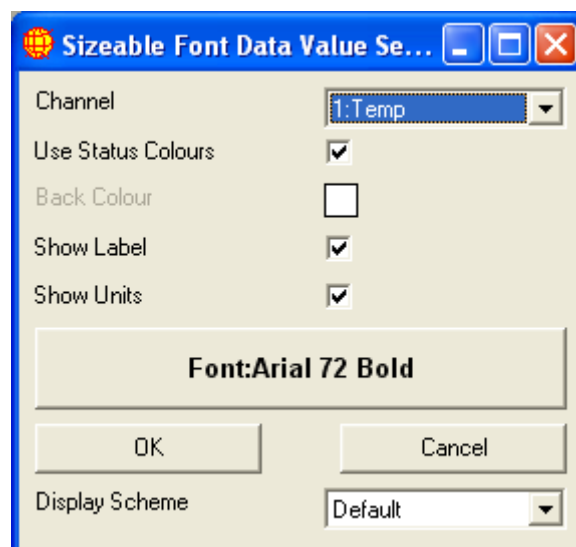


Figure 62 Font size Settings Window

The settings window has the following settings:

- Channel:** allows you to specify which channel to display.
- Use Status Colours:** allows you to specify if the colours used by the window will match those specified in Historical Data.
- Back Colour:** allows you to specify a background colour to use if you do not want to use the system status colour scheme.
- Show Label:** allows you to control if the channel label is shown in the window.
- Show Units:** allows you to control if the channel units are shown in the window.
- Font button:** allows selection of font settings such as style and size.
- Display Scheme:** is the display scheme used by this window.



## 6 Manual Menu

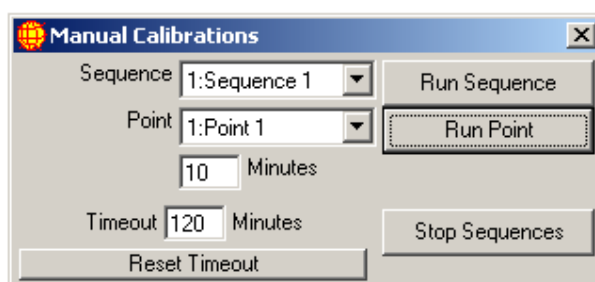
The Manual menu is designed to allow the user to manually perform Calibrations, communicate with software and alter other software aspects.

### 6.1 Start Calibration

The *Start Calibration* option on the *Manual* menu will manually start the calibration for the selected channel. When the *Start Calibration* menu item is chosen you will be asked if you want to disable scheduled calibrations. This will disable the automatic calibrations for all channels. If you want the scheduled automatic calibrations to be disabled then select the Yes button. If you do not want scheduled calibrations to be disabled while you are running manual calibrations then select No.

If you choose to disable scheduled calibrations then any automatic calibration that had already started will be aborted and any calibration that is set to start while this window is open will not do so. The reason this option is given is to stop automatic calibrations, which may change digital outputs, from interfering with the running of manual calibrations.

This option is used to stop automatic calibration, which may change digital outputs, instrument states and calibration settings, causing conflicts with the manual calibration.



**Figure 63 Start Manual Calibrations**

Once a selection is made a window like that shown in Figure 63 will open. The sequence/point will begin calibrating using the same digital inputs and outputs and the same span, zero and precision times as was set for the automatic calibration. If the channel was already in the middle of a calibration then it will drop out of the current calibration, complete the requested manual calibration and then set its next calibration time to occur as if the manual calibration did not occur. This means a manual calibration will not mess up the timing of scheduled calibrations in the future. The Sequence and Points options allow the user to choose which sequence or which point from the sequence they wish to run manually (these sequences and points were created in section 4.2.4 Calibration control). The duration is automatically updated to the normal time taken for that point but can be altered when an individual point is manually calibrated. Press the *Run Sequence* or *Run Point* button to run the selected sequence or specific point. The *Stop* button will stop any manual calibration in progress for that sequence.

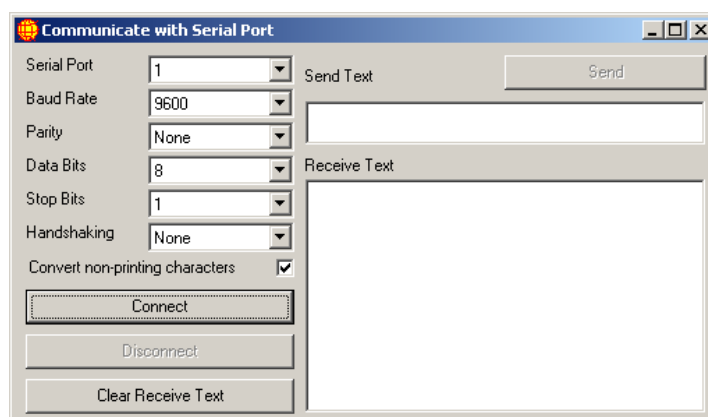
The timeout value (defaults to 120 minutes) decrements every minute. When the timeout value reaches 0 the *Manual Calibration* window will close. When the

window closes all manual calibrations will end and all automatic calibrations will be enabled once again. To reset or update the timeout type a new numeric value within the timeout box and click on the *Reset Timeout* button. The timer will now count down from this new number.

**Note:** If the start time for an automatic calibration passes while calibrations have been disabled the calibration time will move on to its next scheduled start time.

## 6.2 Communicate with Serial Port

The *Communicate with Serial Port* option on the *Manual* menu allows you to communicate directly with the desired communications port using the settings shown on the window. It allows you to select the communications port you want to communicate with, the baud rate, the parity, data bits, stop bits and handshaking you want to use.



**Figure 64 Communicate with Serial Port**

- Once all the communication settings have been entered click on the *Connect* button. The logger will suspend logging on the selected communication port and attempt to open it with the given settings. If the connection request succeeds then a message will appear in the status bar of WinAQMS Mini DAS saying 'Talking directly to serial port'.
- To send data to the port, type the message into the *Send Text* box and then hit the *Send* button. The message will be sent to the port you are connected to. Any response from the port will be shown in the *Receive Text* box.
- If the *Receive Text* box is becoming too cluttered with text then clicking the *Clear Receive Text* button will remove all text from the *Receive* box.
- Once you have finished communicating with the port click on the *Disconnect* button and WinAQMS Mini DAS will release the port and display the message 'Communication port released'. If WinAQMS Mini DAS was using the port previously to log data then it will resume doing so.

If there is a check in the *Convert non-printing characters* checkbox then ASCII characters can be sent to the serial port (or printed when they are received) by enclosing the ASCII character code in square brackets. For example to send a data request to a R&P Teom instrument with a PRC# of 8 you need to send the string

<STX>4AREG K0 8<ETX>

There is no key on the keyboard to send an STX character (ASCII code 2) or an ETX character (ASCII code 3) but when the Convert non-printing characters option is set you could send the string

[2]4AREG K0 8[3]

If the Convert non-printing characters checkbox is set then WinAQMS Mini DAS knows to replace the [2] with an STX and the [3] with an ETX.

Any non-printing characters in the responses from the analysers will also be converted to their ASCII codes and put into square brackets when shown in the Receive Text box.

### 6.3 Communicate with Analyser

WinAQMS Mini DAS can communicate with analysers which have ANSI terminal modes. To communicate with an analyser, choose the *Communicate with Analyser* option on the *Manual* menu and select the analyser from the dropdown box. The dropdown box contains information which will uniquely identify the analyser such as analyser number, label, manufacturer, model, ID and the communication port the analyser uses. Once a selection has been made click on the *Connect* button and the terminal screen for the analyser will come up in the black screen on the window. When you have finished using the analyser in terminal mode click on the *Disconnect* button and WinAQMS Mini DAS will release the communications port so that normal logging can be resumed.

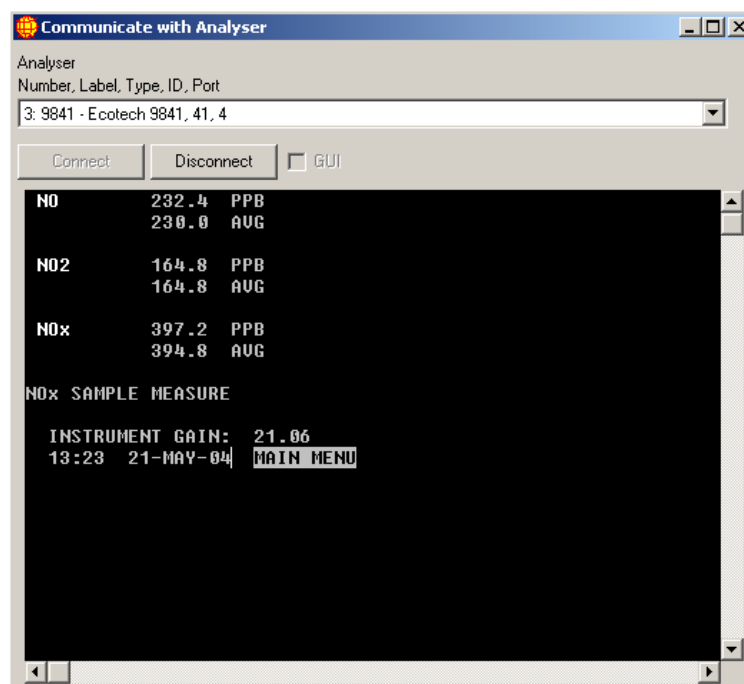


Figure 65 Communicate with Analyser

**Note:** When using a communication port to communicate with an analyser in terminal mode WinAQMS Mini DAS will suspend **all** logging on that port. There is no timeout on this operation.

The Ecotech and Monitor Labs 98XX series analysers, Serinus series, Ecotech Aurora Nephelometers and Ecotech Gascal-1100 have terminal modes. WinAQMS Mini DAS can display a Graphical User Interface (G.U.I.) for the settings of an Ecotech

GasCal-1100 calibrator. To use the G.U.I. interface an Ecotech GasCal-1100 must be selected from the list and the *GUI* checkbox must be selected. A set of four tabs containing settings will be shown after the *Connect* button is pressed as shown in Figures 65 66 67 and 68. These settings cover points, gases, alarms and factory settings.

**Note:** To use the G.U.I. interface for the Ecotech GasCal-1100 the calibrator must be running firmware version 2.0.6 or later. Factory Settings should only be changed by qualified personnel as they will affect the calibration of the GasCal.

Communicate with Analyser

Analysers  
Number, Label, Type, ID, Port  
B: GasCal - Ecotech GasCal 1000, 0, 3

Connect Disconnect ☒ GUI Save Settings Load Settings

Points Gases Alarms Factory Settings

Point	Gas Number	Flow	Concentration	O3 Concentration	Units	Input Mask								Output Mask															
						1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8								
1	1	3000	0	0	ppm	1	0	1	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	1	3000	0.4	0	ppm	0	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
3	1	3000	0.1	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4	0	4	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	0	5	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	0	6	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
7	0	7	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8	0	8	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
9	0	9	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10	0	10	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
11	0	11	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12	0	12	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
13	0	13	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
14	0	14	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
15	0	15	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
16	0	16	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
17	0	17	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
18	0	18	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
19	0	19	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
20	0	20	0	0	ppm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Figure 66 Ecotech GasCal 1000 point settings

Points Gases Alarms Factory Settings

Zero Correction Factor Air 0.998

Gas	Label	Concentration	Units	Gas Correction Factor	Port
1	NO	99.14	ppm	Nitrogen-N2	1.000
2	CO	9956	ppm	Nitrogen-N2	1.000
3	SO2	94.98	ppm	Nitrogen-N2	1.000
4	GAS4	0	ppm	Nitrogen-N2	1.000
5	GAS5	0	ppm	Nitrogen-N2	1.000
6	GAS6	0	ppm	Nitrogen-N2	1.000
7	GAS7	0	ppm	Nitrogen-N2	1.000
8	GAS8	0	ppm	Nitrogen-N2	1.000
9	GAS9	0	ppm	Nitrogen-N2	1.000
10	GAS1XX	100	ppm	Nitrogen-N2	1.000

Figure 67 Ecotech GasCal 1000 gas settings

Points Gases Alarms Factory Settings									
	Alarm	Output Mask							
		1	2	3	4	5	6	7	8
►	Low Flow	X	X	X	X	X	X	X	X
	Over Range	X	X	X	X	X	X	X	X
	Under Range	X	X	X	X	X	X	X	X

Figure 68 Ecotech GasCal 1000 Alarm settings

Points Gases Alarms Factory Settings				
Mass Flow Controller/Generator Coefficients				
	Item	Coefficient 1	Coefficient 2	Coefficient 3
►	Zero Air MFC	-5.676	1989.978	2.16
	Ozone MFC	-0.44	18.918	0.142
	Span Gas 1 MFC	0.062	20.352	-0.038
	Span Gas 2 MFC	0	0	0
	Ozone Generator	-13.775	10.642	1.661
O3 Maximum Voltage		3.8		
O3 Minimum Voltage		1.2		
Purge Time (sec)		0		
2nd MFC Flag		0 ▼		

Figure 69 Ecotech GasCal 1000 factory settings

## 6.4 Digital Outputs

*Digital Outputs* is an aid which can be used to help check calibration sequences as well as the functionality of digital outputs. When this option is selected a window similar to Figure 74 will be displayed.

If you choose to disable scheduled calibrations then any automatic calibration that had already started will be aborted and any calibration that is set to start while this window is open will not do so. The reason this option is given is to stop automatic calibrations, which may change digital outputs, from interfering with the manual changing of digital outputs.

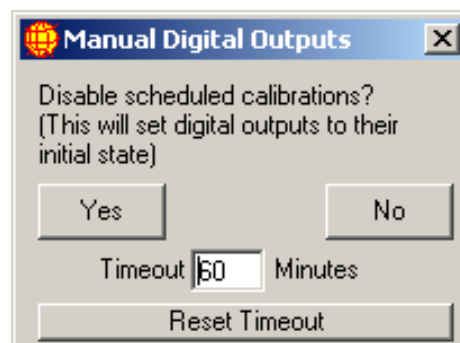


Figure 70 Disabling scheduled calibrations

After a choice is made, to enable or disable scheduled calibrations is made a window similar to the one in Figure 75 is shown. It lists all digital output channels and their current digital state. To change an outputs state click on the *State* button to the right of the Channel and it will toggle between Hi and Lo.

The timeout value (defaults to 120 minutes) decrements every minute. When the timeout value reaches 0 the *Manual Digital Outputs* window will close. When the window closes all automatic calibrations will be enabled once again. To reset or update the timeout, change the numeric value in the timeout box and click on the Reset Timeout button.

**Note:** If the start time for an automatic calibration passes while calibrations have been disabled the calibration time will move on to its next scheduled start time.

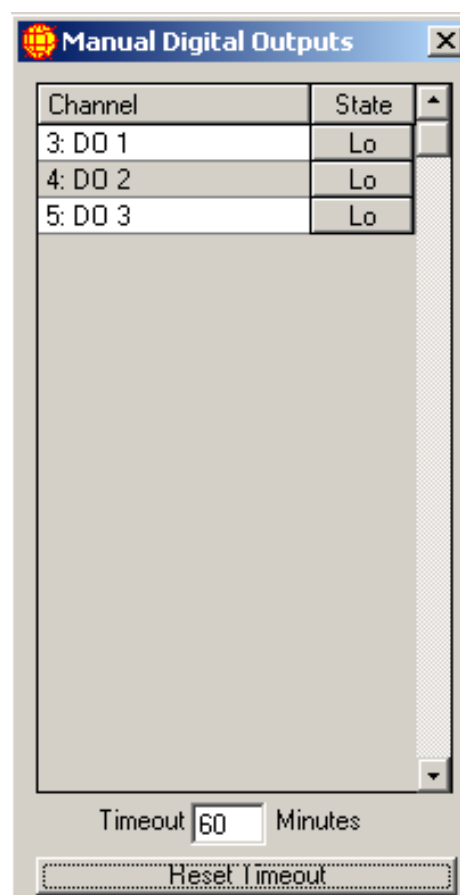


Figure 71 Manually setting digital outputs

## 6.5 Channel State

Channel state allows the Out of Service status to be set for each channel. The channel can be set to be out of service for a specified duration of time or indefinitely.

**Current State:** Is the current state of the channel (Normal or Out of Service)

**Set New State:** This checkbox tells WinAQMS Mini DAS to update the channel with a new state (specified in the New State field) when the OK button is pressed.

**New State:** This list shows the new state (Normal or Out of Service) to which a channel will be changed.

**Duration and Unit:** These two fields show the time that a channel will be set to be out of service.

**Timeout Date/Time:** This field shows when a channel with a Current State of Out of Service will return to Normal state. It also will set the timeout time for a channel

**All Out of Service:** This button will set the Set New State checkbox to checked and the New State listbox to Out of Service for all channels. The All Normal button will set the Set New State checkbox to checked and the New State listbox to Normal for all channels.

In this diagram channel 30 (CO) has been set to the Out of Service state until 2007/3/9 17:06:23, channel 50 (SO<sub>2</sub>) has been set to the Out of Service state indefinitely and all other channels are running normally.

Channel	Current State	Set New State	New State	Duration	Unit	Timeout Date/Time	No Timeout
1:Temp	Normal	<input type="checkbox"/>	Out of Service	3	Hr		<input type="checkbox"/>
30:CO	Out of Service	<input type="checkbox"/>	Normal	0	Min	2007/03/09 17:06:23	<input type="checkbox"/>
40:NO	Normal	<input type="checkbox"/>	Out of Service	3	Hr		<input type="checkbox"/>
41:NO2	Normal	<input type="checkbox"/>	Out of Service	3	Hr		<input type="checkbox"/>
42:NOx	Normal	<input type="checkbox"/>	Out of Service	3	Hr		<input type="checkbox"/>
50:SO2	Out of Service	<input type="checkbox"/>	Normal	0	Min		<input checked="" type="checkbox"/>
101:Stack 1	Normal	<input type="checkbox"/>	Out of Service	3	Hr		<input type="checkbox"/>
102:Stack 2	Normal	<input type="checkbox"/>	Out of Service	3	Hr		<input type="checkbox"/>
103:Stack 3	Normal	<input type="checkbox"/>	Out of Service	3	Hr		<input type="checkbox"/>

Buttons: OK, All Out of Service, All Normal, Cancel

Figure 72 Channel State

## 6.6 Restart Server

When the *Restart Server* option is selected all logging is suspended and all settings will be loaded from the database. Once the settings have finished loading, WinAQMS Mini DAS will begin logging with those settings. During this restart a small number of data readings may not occur. This process takes about 10 seconds.

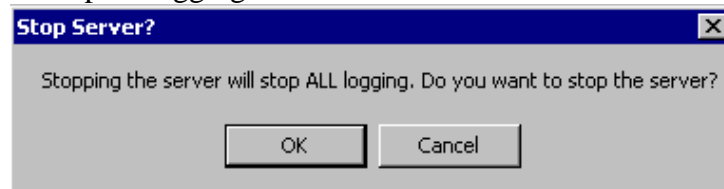
## 6.7 Suspend/Resume Logging

This option, available from the *Manual* menu, will stop all logging being done by WinAQMS Mini DAS until the option is again selected. Once *Suspend Logging* has been chosen its text will become *Resume Logging*. Communication ports will not be

released by the activation of this option and will remain open but unused by WinAQMS Mini DAS.

## 6.8 Stop Server

This option will bring up a confirmation window as shown below in Figure 73. Selecting *OK* will terminate WinAQMS Mini DAS including the server part of the program and will stop all logging.



**Figure 73 Stop Server confirmation box**



## Appendix A – Configuring WinAQMS Mini DAS Example

In the example in this manual you will be shown how to configure WinAQMS Mini DAS using the basic database which is included on the WinAQMS Mini DAS CD and then to add analysers and channels to build up a more complex system. It is recommended that you read section 3-6 of this manual to become familiar with the layout and capabilities of WinAQMS Mini DAS before going through this example.

Start WinAQMS Mini DAS by going to the Start menu and clicking on the Start button, select Programs (All Programs for Microsoft Windows XP), move to the WinAQMS Mini DAS Client icon and select WinAQMS Mini DAS Client. WinAQMS Mini DAS will load and display the screen shown below, then goes to the main WinAQMS Mini DAS screen.



Figure 74 WinAQMS Mini DAS Loading

The basic database that comes with WinAQMS Mini DAS has two channels. They are a temperature channel and a Carbon Monoxide channel. The temperature sensor is a basic device connected to an Ecotech Termination Panel (TP). The Carbon Monoxide channel data is supplied by a Ecotech EC9830 analyser.

On the menu bar select Edit and then Analyser Parameters. The two analysers should have settings matching those in Table 4.

Table 4: Initial Analyser Settings

	Ecotech TP	Ecotech EC9830
<b>INFORMATION</b>		
Label	TP	9830
Manufacturer	Ecotech	Ecotech
Model	Termination Panel	98XX
Device ID	0	30
Data Request Period	10	10
Max Response Time	1	1
Request Delay	0	0
<b>COMMUNICATION SETTINGS</b>		
Connection Type	Serial RS232	Serial RS232
Serial Port	2	3
Baud Rate	4800	9600
Data Bits	8	8
Parity	None	None
Stop Bits	1	1

The two channels in the system should have the channel information settings matching those in table 5 below.

**Table 5 Initial database channel settings**

	TP Temperature Channel	9830 CO Channel
System Channel #	1	2
Label	Temp	CO
Analogue Input #	16	N/A
Multiplier	100	1
Offset	-273	0
Units	°C	ppm
Decimal Places	1	2
High Alarm	40	4
Low Alarm	0	0
Alarm Number	1	2
Valid Data High	0	0
Valid Data Low	0	0
Channel Type	Voltage	Voltage
Process	Average	Average
Description	Ambient Temperature	Carbon Monoxide
Log Report 1	Set (ticked)	Set (ticked)
Log Report 2	Set (ticked)	Set (ticked)
Log Report 3	Set (ticked)	Set (ticked)
Log Report 4	Set (ticked)	Set (ticked)
Out of Service	Unset (not ticked)	Unset (not ticked)
Serial Port Output	Set (ticked)	Set (ticked)
Alternate File Output	Set (ticked)	Set (ticked)

Select the Calibration control tab and an almost empty table will appear. While there is nothing in there yet, this option allows you to set which digital channels go high(H)/low(L)/no change when the analogue channels on the analyser go into calibration.

We will now add a barometric pressure, wind speed and wind direction channel to the channels on the TP. Switch to analyser number 1 on the Analyser Parameters dropdown list and choose the information tab. Click on the Add Channel button three times. Three new channels will be added to the list and they will have default values entered into most of their columns. Make sure the settings match those of table 6 below

**Table 6 Settings for the pressure, wind speed and wind direction channels**

	TP Pressure	TP WS	TP WD
System Channel #	3	4	5
Label	Pressure	WS	WD
Analogue Input #	2	13	3
Multiplier	60	1	72
Offset	800	0	0
Units	Mbar	m/s	deg
Decimal Places	0	1	0
High Alarm	1030	20	370
Low Alarm	980	0	-10
Alarm Number	2	3	4
Valid Data High	0	0	0
Valid Data Low	0	0	0
Channel Type	Voltage	Frequency	Voltage
Process	Average	Average	Average
Description	Barometric Pressure	Wind Speed	Wind Direction
Log Report 1	Set (ticked)	Set (ticked)	Set (ticked)
Log Report 2	Set (ticked)	Set (ticked)	Set (ticked)
Log Report 3	Set (ticked)	Set (ticked)	Set (ticked)
Log Report 4	Set (ticked)	Set (ticked)	Set (ticked)
Out of Service	Unset (not ticked)	Unset (not ticked)	Unset (not ticked)
Serial Port Output	Set (ticked)	Set (ticked)	Set (ticked)
Alternate File Output	Set (ticked)	Set (ticked)	Set (ticked)

Now press the OK button on the Analyser Parameters window. This will save the settings to the database. You may notice that the Restart Server button is not enabled at this time. This allows WinAQMS Mini DAS to have sufficient time to write the settings to the database before you restart the server again with the updated settings.

The wind speed and direction sensor that is being used is an analogue output MetOne-034 sensor.

We have now added three channels to the TP which record barometric pressure and wind speed and direction. To vector average the wind speed and direction channels two calculated channels are needed. On the menu bar select Edit and then select Calculated Channels. The calculated channels window will load and show an empty table. Click on the Vector Averaged Channels tab and then add two new channels. Enter the channel settings as shown in table 7 below.

**Table 7 Settings for the vector averaged wind speed and wind direction channels**

	Vector WS	Vector WD
System Channel #	6	7
Label	WS Ave	WD Ave
Magnitude Source Channel	4	4
Direction Source Channel	5	5
Magnitude Channel	Set (ticked)	Unset (not ticked)
Direction Channel	Unset (not ticked)	Set (ticked)
Sigma Theta Channel	Unset (not ticked)	Unset (not ticked)
Multiplier	1	1
Offset	0	0
Units	m/s	deg
Decimal Places	1	0
High Alarm	20	370
Low Alarm	-1	-10
Alarm Number	6	7
Valid Data High	0	0
Valid Data Low	0	0
Description	Vector averaged WS	Vector averaged WD
Log Report 1	Set (ticked)	Set (ticked)
Log Report 2	Set (ticked)	Set (ticked)
Log Report 3	Set (ticked)	Set (ticked)
Log Report 4	Set (ticked)	Set (ticked)
Out of Service	Unset (not ticked)	Unset (not ticked)
Serial Port Output	Set (ticked)	Set (ticked)
Alternate File Output	Set (ticked)	Set (ticked)

Click on the OK button at the bottom left corner of the window to save the changes you have just made and to restart the WinAQMS Mini DAS Server process with the changes. The vector averaged wind speed and direction channels are now set up and will begin logging.

Now we will add a Ecotech 9841 oxides of Nitrogen analyser and a 9850 Sulfur Dioxide analyser. These two analysers will be multi-dropped together with the Ecotech 9830 carbon monoxide analyser that is already set up on the system.

Open the Analyser Parameters window and click on the Add New Analyser button. This will add a new analyser to WinAQMS Mini DAS which will be an Ecotech

Termination Panel by default and have all of its parameters set to default values. Change the Model of the analyser to be 9841. The picture in the top right hand corner should change to show an Ecotech analyser. Enter settings for the analyser as shown in table 8.

**Table 8 Settings for the Ecotech 9841 Nitrous Oxide analyser.**

	Ecotech EC9841
<b>INFORMATION</b>	
Label	9841
Manufacturer	Ecotech
Model	9841
Device ID	41
Data Request Period	10
Max Response Time	1
Request Delay	0
<b>COMMUNICATION SETTINGS</b>	
Connection Type	Serial RS232
Serial Port	3
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1

**Note:** Remember to set the baud rate on the Ecotech EC9800 analyser to 9600 and the Main Gas ID to 041 to match the settings in WinAQMS Mini DAS.

Add 3 channels with settings shown in table 9 to the new analyser and then hit OK.

**Table 9 Settings for the NO, NO<sub>x</sub>, and NO<sub>2</sub> channels.**

	9841 NO Channel	9841 NO <sub>x</sub> Channel	9841 NO <sub>2</sub> Channel
System Channel #	8	9	10
Label	NO	NO <sub>x</sub>	NO <sub>2</sub>
Multiplier	1	1	1
Offset	0	0	0
Units	ppm	ppm	ppm
Decimal Places	4	4	4
High Alarm	0.1	0.4	0.1
Low Alarm	0	0	0
Alarm Number	8	9	10
Valid Data High	0	0	0
Valid Data Low	0	0	0
Channel Type	NO	NO <sub>x</sub>	NO <sub>2</sub>
Process	Average	Average	Average
Description	Nitrogen Monoxide	Nitrous Oxide	Nitrogen Dioxide
Log Report 1	Set (ticked)	Set (ticked)	Set (ticked)
Log Report 2	Set (ticked)	Set (ticked)	Set (ticked)
Log Report 3	Set (ticked)	Set (ticked)	Set (ticked)
Log Report 4	Set (ticked)	Set (ticked)	Set (ticked)
Out of Service	Unset (not ticked)	Unset (not ticked)	Unset (not ticked)
Serial Port Output	Set (ticked)	Set (ticked)	Set (ticked)
Alternate File Output	Set (ticked)	Set (ticked)	Set (ticked)

Add another new analyser to be the 9850 and changes its settings to match table 10 and a new channel to the analyser to match table 11.

**Table 10 Settings for the Monitor Labs 9850 Sulfur Dioxide analyser.**

	Ecotech EC 9850
<b>INFORMATION</b>	
Label	9850
Manufacturer	Ecotech
Model	98XX
Device ID	50
Data Request Period	10
Max Response Time	1
Request Delay	0
<b>COMMUNICATION SETTINGS</b>	
Connection Type	Serial RS232
Serial Port	3
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1

**Table 11 Settings for the Sulfur Dioxide channel**

	9850 SO <sub>2</sub> Channel
System Channel #	11
Label	SO <sub>2</sub>
Multiplier	1
Offset	0
Units	ppm
Decimal Places	3
High Alarm	0.1
Low Alarm	0
Alarm Number	11
Valid Data High	0
Valid Data Low	0
Process	Average
Description	Sulfur Dioxide
Log Report 1	Set (ticked)
Log Report 2	Set (ticked)
Log Report 3	Set (ticked)
Log Report 4	Set (ticked)
Out of Service	Unset (not ticked)
Serial Port Output	Set (ticked)
Alternate File Output	Set (ticked)

We have eleven channels on the system, each of which will log the appropriate analyser on the appropriate communications port. Now we will add two digital output channels that can be used to switch solenoids when the SO<sub>2</sub> analyser goes into calibration.

Again open the Analyser Parameters window and go to the Digital Output Settings tab for analyser 1. Add two digital output channels to the analyser and make their settings like table 12.

**Table 12 Settings for the two digital output channels.**

	TP Pressure	TP WS
System Channel #	12	13
Label	Dig Out 1	Dig Out 2
Output #	0	1
Default Output	Lo	Lo
High Value	1	1
Low Value	0	0
High Alarm	0	0
Low Alarm	0	0
Description	Digital Output 1	Digital Output 2
Log Report 1	Set (ticked)	Set (ticked)
Log Report 2	Set (ticked)	Set (ticked)
Log Report 3	Set (ticked)	Set (ticked)
Log Report 4	Set (ticked)	Set (ticked)
Out of Service	Unset (not ticked)	Unset (not ticked)
Serial Port Output	Set (ticked)	Set (ticked)
Alternate File Output	Set (ticked)	Set (ticked)

Now we have to put in the settings for the digital outputs for the SO<sub>2</sub> analyser. Change the Analyser to be 4 and save any settings to the current analyser. Select the Calibration Control tab.

Add a new sequence to the list by clicking on the Add Sequence button. A new sequence will be added to the list and default values will be set. Set the sequence label to be "SO<sub>2</sub> Cal". Click on the Add Point button 3 times to add 3 points to the sequence and set the settings as shown in table Table 13 below.

**Table 13 Settings for the three new sequences**

	Point 1	Point 2	Point 3
Point	1	2	3
Label	SO <sub>2</sub> Span	Zero	Stabilise
Point type	Span	Zero	Stabilise
Duration	20	20	20
Ave duration	2	2	2
<b>SEQUENCE SETTINGS</b>			
12: C12	Hi	Lo	Lo
13:C13	Lo	Hi	Lo
2:9850	Span	Zero	Measure
<b>PRECISION</b>			
11:SO <sub>2</sub>	50	0	0

Select channel 11 from the channel list and click on the precision Values tab. Enter the precision value for the SO<sub>2</sub> channel for point 1.



Click on Restart Server when the button is enabled and display the instantaneous data window. When the time reaches the time you entered for the calibration to begin the digital output channels should change from a value of 0 to the sequence that was entered into the Calibration Settings for the SO<sub>2</sub> channel and the Ecotech 9850 analyser should change its calibration state.

This concludes the example of setting up channels on WinAQMS Mini DAS.

## **APPENDIX B – Compatible Modems**

The following Modems are compatible with the WinAQMS Mini DAS system:

Siemens M1 GSM.

Siemens M20 GSM.

Siemens TC35i Dual Band GSM.

Falcom A2D1 GSM

Falcom A2D3 GSM with SMS.

Netcomm Mymodem 56 external landline

ETM 9500i Dual Band GSM with SMS

## APPENDIX C – How to set up the Analysers:

### Ecotech EC9800 Series Analysers

Features:

- The WinAQMS Mini DAS supports both A and B series EC9800 analysers as well as all versions of software.
- The Ecotech EC9800 series analysers all have multidrop RS232 communications ports on the rear. In fact there are two in parallel.
- Each analyser can have an individual address (Main Gas I.D.).
- All EC9800 analysers can be connected in a daisy chain configuration to one RS232 port on the WinAQMS Mini DAS. i.e. If you have four 9800 analysers, you only need to use one RS232 port on the rear of the logger.

### Ecotech EC9800 Setup

Before connecting to the analysers you must first set the address of each analyser. The preferred addressing convention is to use the analyser type as the address. e.g. for 9841A use 041, for 9850 use 050 for 9830 use 030 ...etc.

There are two ways to set the address:

- In the 9800 main menu select "Instrument Menu". Then, in the field for "MAIN GAS ID" enter the address. This method is the easiest.
- For analysers with older versions of software and do not have the Main Gas ID in their menu, you will have to use the following procedure.
  1. Set the 9800 analyser's Multidrop Baud Rate in the Interface Menu. Also make sure that it is in COMMAND mode not TERMINAL mode. The default setting is usually 38400 baud for Ecotech 9800's and 2400 for Monitor Labs 9800's.
  2. Connect the RS232 cable from the analyser to the WinAQMS Mini DAS. Only connect one analyser at a time.
  3. From the WinAQMS Mini DAS Manual menu select Communicate with RS232. Set the port number as well as the baud rate and connect to the port.
  4. By typing DCONC,???<enter> will cause the analyser to respond as long as its main gas ID is not 000. If there is no response then check your communications setup and RS232 cable.
  5. Send the command PInnn<enter> where nnn is the 3 digit address for the analyser. E.g. for 9850 use PI050<enter>.
  6. You can test the analysers operation by typing DCONC,nnn<enter> (eg DCONC,050). The analyser should respond with the instantaneous concentration and a status word.

## TEOM Continuous Particulate Monitor

The 1400A and 1400AB TEOMs can be directly connected to the WinAQMS Mini DAS via RS232. The TEOM also has the added feature of monitoring all its internal parameters. For example you can record the filter loading of the TEOM and hence remotely determine if the filter needs to be changed.

### TEOM Setup

For RS232 communication between the TEOM and the WinAQMS Mini DAS the TEOM has to be in "**AK Protocol**" mode. If it is in AK Protocol mode the top line of the TEOM display should read "**AU**" next to the filter loading.

If not, on the TEOM front panel press the RS232 button. If the Mode is not AK Protocol then press the down arrow until the cursor is pointing to AK Protocol then press Enter.

The TEOM has a station number or address. The factory default address used by TEOM is 4 (ASCII 52). There is no need to change this. However, if you need to change the address, proceed as follows:

1. Press Step Screen until the COM 2-Way Settings screen is displayed.
2. If RS-Para 1 is not equal to the ASCII code of the selected station number then set the cursor against RS-Para 1 and press Edit.
3. Key in the selected ASCII number (ASCII 52 for address 4) and press Enter.
4. Press Main to exit setup.

The program register codes are listed in Appendix A in the TEOM 1400a manual.

## DANI TNMH Hydrocarbons Analyser

The AQMS software supports RS232 communications with the DANI TNMH 451 & 452 Hydrocarbon analysers.

- The only parameters available from the DANI are MET (CH<sub>4</sub> or Methane), NMHC (Non Methane Hydrocarbons) and THC (Total Hydrocarbons).
- All readings are in ppm.
- The default baud rate is 9600 baud.
- There is no address or physical input number.
- If there is a flame fail condition or other alarm condition, there will be data but it will be marked as having an instrument fault status.
- When the DANI switches from MR to LINE measure and back again (every 3 minutes), AQMS will not read data for a short time (approx 30 seconds) to allow for the reading to stabilise.
- When the DANI switches from MR to LINE measure a back again (every 3 minutes), WinAQMS Mini DAS will not be able to read a new data value for a short time but instead will use the last data value before the DANI switched to the LINE measure.
- When configuring WinAQMS Mini DAS you should set the "*% Samples for valid report*" to no more than "70%" in the *System Parameters*.

## APPENDIX D – USB Protocol parameter list

Table 14 USB Protocol Parameter list

#	Description	Notes
0	Internal Valve 1	0=Closed, 1=Open
1	Internal Valve 2	0=Closed, 1=Open
2	Internal Valve 3	0=Closed, 1=Open
3	External Measure Valve	0=Closed, 1=Open
4	External Zero Valve	0=Closed, 1=Open
5	External Span Valve	0=Closed, 1=Open
6	Aux Valve 1	0=Closed, 1=Open
7	Aux Valve 2	0=Closed, 1=Open
8	Aux Valve 3	0=Closed, 1=Open
9	Valve Sequencing	0=Off, 1=On
10	LCD Contrast POT	0=Lightest, 99=Darkest
11	PRE POT 1	Measure coarse pot for all analysers except 9841A which is chassis fan speed.
12	PRE POT 2	Measure Fine: 981X, 9820, 9830, 9841, 9842 Bench Fan Speed: 9841A Reference_zero : 9850
13	PRE POT 3	Input for all except 9850 which is measure gain.
14	PRE POT 4	981X, 984X: Test Measure 9820, 9830: test_reference 9850: reference gain
15	PRE POT 5	981X: Lamp Adjust 9820,9830,9850:test measure 984X: high voltage adjust
16	PRE POT 6	9850: high voltage adjust
17	PRE POT 7	9850: lamp adjust
18	VREG POT 1	Flow control zero
19	VREG POT 2	
20	VREG POT 3	
21	VREG POT 4	
22	VREG POT 5	Fan speed control
23	VREG POT 6	Pump speed fine
24	VREG POT 7	Pump speed coarse
25	Analogue input 0	
26	Analogue input 1	
27	Analogue input 2	
28	Analogue input 3	
29	Analogue input 4	
30	Analogue input 5	
31	Analogue input 6	
32	Analogue input 7	
33	Analogue input 8	
34	Analogue input 9	
35	Analogue input 10	
36	Analogue input 11	
37	Analogue input 12	

38	Analogue input 13	
39	Analogue input 14	
40	Analogue input 15	
41	50 PIN IO bits 0-7	BIT 7: Span Out of Range BIT 6: Span On BIT 5: Copper Fail BIT 4: Zero On BIT 3: Lamp Fail BIT 2: Out Of Service BIT 1: Flow Fail BIT 0: Span Cycle
42	50 PIN IO bits 8-15	BIT 7: Pump On BIT 6: Range 1 BIT 5: Startup BIT 4: Heater Fail BIT 3: Range 0 BIT 2: IZS On BIT 1: Spare 1 BIT 0: ZeroCycle
43	50 PIN IO bits 16-23	BIT 7: Power On BIT 6: Sys Fail BIT 5: High Voltage Fail BIT 4: Power Supply Fail BIT 3: Electric Test BIT 2: Optical Test BIT 1: Range 2 BIT 0: PPM / Metric
44	50 PIN IO bits 24-31	Really User ID
45	50 PIN IO bits 32-39	BIT 7: P4 BIT 6: P3 BIT 5: P2 BIT 4: P1 BIT 3: Spare Driver 1 BIT 2: BIT 1: BIT 0: Reference Fail
46	50 PIN IO bits 40-47	BIT 7: BIT 6: BIT 5: BIT 4: BIT 3: BIT 2: BIT 1: P6 BIT 0: P5
47	50 PIN IO bits 48-55	BIT 7: Status 2 LED BIT 6: Status 1 LED BIT 5: Sys Fail LED BIT 4: HeartBeat LED BIT 3: BIT 2:

		BIT 1: BIT 0:
48	50 PIN IO bits 56-63	BIT 7: BIT 6: BIT 5: BIT 4: BIT 3: BIT 2: BIT 1: BIT 0: Status 3 LED
49	PGA Gain	0-7
50	Primary Gas Concentration	
51	Secondary Gas Concentration	
52	Calculated Gas Concentration	
53	Primary Gas Average	
54	Secondary Gas Average	
55	Calculated Gas Average	
56	Instrument Gain	
57	Main Gas ID	
58	Aux Gas ID	
59	Decimal Places	
60	Noise	
61	Gas 1 Offset	
62	Gas 3 Offset	
63	Flow Temperature	
64	Lamp Current	
65	Digital Supply	
66	Concentration Voltage	
67	High Voltage	
68	Ozonator	0=Off, 1=On
69	Control Loop	
70	Diagnostic Mode	
71	Gas Flow	
72	Gas Pressure	
73	Ambient Pressure	
74	Analog Supply	
75	Cell Temperature	
76	Converter Temperature	
77	Chassis Temperature	
78	Manifold Temperature	
79	Cooler Temperature	
80	Mirror Temperature	
81	Lamp Temperature	
82	O3 Lamp Temperature	
83	Instrument Status	
84	Reference Voltage	
85	Calibration State	0 = MEASURE 1 = CYCLE 2 = ZERO

		3 = SPAN
86	Primary Raw Concentration	(before 984X background and gain)
87	Secondary Raw Concentration	(before 984X background and gain)
88	984X Background Concentration	(before gain)
89	Calibration Pressure	
90	Converter Efficiency	
91	Multidrop Baud Rate	
92	Analog Range Gas 1	
93	Analog Range Gas 2	
94	Analog Range Gas 3	
95	Output Type Gas 1	0=Voltage 1=Current
96	Output Type Gas 2	0=Voltage 1=Current
97	Output Type Gas 3	0=Voltage 1=Current
98	Voltage Offset /Current Range Gas1	0=0% or 0-20mA 1=5% or 2-20mA 2=10% or 4-20mA
99	Voltage Offset /Current Range Gas2	0=0% or 0-20mA 1=5% or 2-20mA 2=10% or 4-20mA
100	Voltage Offset /Current Range Gas3	0=0% or 0-20mA 1=5% or 2-20mA 2=10% or 4-20mA
101	Full Scale Gas 1	
102	Full Scale Gas 2	
103	Full Scale Gas 3	
104	Zero Adjust Gas 1	
105	Zero Adjust Gas 2	
106	Zero Adjust Gas 3	
107	Negative 10V Supply	
108	50 Pin IO ANIN1	20mV resolution analog input (0-5V)
109	50 Pin IO ANIN2	20mV resolution analog input (0-5V)
110	Instrument State	
111	CO Linearisation Factor A	
112	CO Linearisation Factor B	
113	CO Linearisation Factor C	
114	CO Linearisation Factor D	
115	CO Linearisation Factor E	
116	Instrument Units	0= PPM 1=PPB 2=PPT 3=mG/M <sup>3</sup> 4=μG/M <sup>3</sup> 5=nG/M <sup>3</sup>
117	Background Measure Time	In seconds
118	Sample Fill Time	In seconds
119	Sample Measure Time	In seconds



120	Aux Measure Time	In seconds
121	Aux Sample Fill Time	In seconds
122	Background Fill Time	In seconds
123	Zero Fill Time	In seconds
124	Zero Measure Time	In seconds
125	Span Fill Time	In seconds
126	Span Measure Time	In seconds
127	Span Purge Time	In seconds
128	Background Pause Time	In seconds
129	Background Interleave Factor	In seconds
130	Calibration Pressure 2	
131	AUX Instrument Gain	
132	Background voltage	
133	AUX Background Voltage	

## Appendix E – Ecotech Termination Panel Connections

Table 15 Termination Panel connections

9400TP Termination Panel. Rev.C					
Markings	Description	Lightning Protection	Input Number	Baud rate	
1 ↓	Ground	Yes			
2 CH1	Channel 1	Yes	1	4800	
3 CH2	Channel 2	Yes	2	4800	
4 ↓	Ground	Yes			
5 CH3	Channel 3	Yes	3	4800	
6 CH4	Channel 4	Yes	4	4800	
7 ↓	Ground	Yes			
8 CH5	Channel 5	Yes	5	4800	
9 CH6	Channel 6	Yes	6	4800	
10 ↓	Ground	Yes			
11 CH7	Channel 7	Yes	7	4800	
12 CH8	Channel 8	Yes	8	4800	
13 ↓B	Ground	Yes			
14 CH9	Channel 9	Yes	9	4800	
15 CH10	Channel 10	Yes	10	4800	
16 ↓	Ground	Yes			
17 CH11	Channel 11	Yes	11	4800	
18 CH12	Channel 12	Yes	12	4800	
19 ↓	Ground	Yes			
20 CH13	Channel 13 (Frequency 1)	Yes	13	4800	
21 CH14	Channel 14 (Frequency 2)	Yes	14	4800	
22 ↓	Ground	Yes			
23 CH15	Channel 15 (Frequency 3)	Yes	15	4800	
24 CH16	Channel 16 (Frequency 4) & Temperature	Yes	16	4800	
25	EARTH				
26 +12V	+ 12 volt supply	Yes			
27 0V	0 volt	Yes			
28 +5V	+ 5 volt reference	Yes			
29 0V	Common	Yes			
30 F5	Frequency input (Frequency 5) or –12V supply	Opto	17	4800	
31 COM	Common /0V	Yes			
32 OP0	Output 0	Opto	0	4800	
33 OP1	Output 1	Opto	1	4800	
34 OP2	Output 2	Opto	2	4800	
35 OP3	Output 3	Opto	3	4800	
36 OP4	Output 4	No	4	4800	
37 OP5	Output 5	No	5	4800	
38 OP6	Output 6	No	6	4800	
39 OP7	Output 7	No	7	4800	
40 COM	Common / 0V	Yes			
41 IP0	Input 0	Opto	0	4800	
42 IP1	Input 1	Opto	1	4800	
43 IP2	Input 2	Opto	2	4800	
44 IP3	Input 3	Opto	3	4800	
45 IP4	Input 4	No	4	4800	
46 IP5	Input 5	No	5	4800	
47 IP6	Input 6	No	6	4800	
48 IP7	Input 7	No	7	4800	

## Appendix F – Setting up Drivers and Modems

### Using Hyperterminal

Start->Programs->Accessories->Communications->Hyperterminal

Name the session "Direct to Com X" where x is the number of the serial port you are connecting to.

Connect using COM X where is the serial port the modem is connected to. ->OK

Bits per second = 19200 or 9600 depending on defaults

Data bits = 8

Parity = None

Stop Bits = 1

Flow Control = Hardware or None depending on defaults

->OK

You can now enter the AT commands required to set up the modem correctly.

The modem and sim card must be set up to be in **NON-TRANSPARENT** (ie error corrected) mode. Telstra #1800636785 for sim card services (1300131816 wireless and data services). If you receive a telstra message saying that the **equipment you are calling is not compatible** then the modem and sim card are not set to the same transparency settings. **The sim card must be set up to not expect a pin code to be entered.**

### AT commands to set up the modem

AT&F	Reset the modem to factory (default) settings
ATS0=0	Windows will do the answering for you. (It looks for two RING strings to come from the modem and will then issue an ATA command to the modem)
AT+IPR=9600	Set the port baud rate to 9600 ( <b>note:</b> if you change this setting you will have to set the baud rate in hyperterminal to match)
AT+IFC=2,2	Set the handshaking to RTS/CTS (Hardware Handshaking). Use 0,0 for no flow control and 1,1 for Xon/Xoff.
AT+CBST=7,0,1	Set the protocol to V32, 9600 Baud, Non-Transparent mode
AT+DS=0	Turns off V42bis data compression
AT+CSQ	Test the GSM reception strength
AT+Y0	Loads configuration 0 at modem startup
AT+CLIP=0	<b>(FALCOM A2D3 ONLY)</b> Call Line Identification Presentation Set this to 0 or the modem will not work with windows.
AT+CRC=0	<b>(FALCOM A2D3 ONLY)</b> Cellular Result Code command Set this to 0 or the modem will not work with windows.
&CNF GSM,,ATZ;+CSCS="PCCP437"	<b>(FALCOM A2D3 ONLY)</b> Loads configuration profile and correct SMS character codes at startup (Firmware bug workaround)
&CNF MODE,V,	<b>(FALCOM A2D3 ONLY)</b> Set the mode to Voice Mode
AT&V	Display the current configuration (Falcom A2D3 also use &REQ CNF)
AT&W0	<b>(SIEMENS ONLY)</b> Save current configuration in position 0 (0 or 1)
AT&W	<b>(FALCOM ONLY)</b> Save the current configuration

Other commands that aren't normally required:

AT+CBST=7,0,0	set the protocol to V32, 9600 Baud, Transparent mode ( <i>Not Recommended as this is not error corrected</i> )
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Required sequence is

- 1: Reset the modem to the default settings.
- 2: Enter desired settings
- 3: Save the settings (AT&W)
- 4: Reset the modem by taking out the power and putting it back in.
- 5: Display the current configuration to ensure changes have been saved.

6: Test the GSM reception strength. In general any value for the first number above 10 is good reception and any value other than 99 is good for the second value.

7: Reboot the logger.

If you are having trouble getting the modem to recognise the dial tone then use the initialisation string

x3

which will tell the modem to not wait for a valid dial tone before dialling.

## Setting up the Siemens M20 modem driver in Windows 2000/XP

Open the Control Panel ->Phone and Modem Options

go to the modems tab -> Add - Don't detect the modem. Select it from the list -> Next

Choose the Siemens M20 GSM -> Next

Select COM X (where X is the serial port the modem is connected to) -> Finish

## Setting up the Falcom A2D modem driver in Windows 2000

Open the Control Panel->Phone and Modem Options

go to the modems tab -> Add - Don't detect the modem. Select it from the list -> Next

Choose the Standard 9600 bps modem -> Next

Select COM X (where X is the serial port the modem is connected to) -> Finish

## Set up Windows 2000 to Accept Incoming Connections

Open the Control Panel->Network and Dialup Connections->Make new connection->Next->Accept Incoming Connections->Next->Chose - Standard 9600 bps Modem ->Next

Do not allow virtual private connections

Select the administrator and the WinAQMS Mini DAS user to be given access to dialup remotely->Next

Highlight Internet Protocol (TCP/IP)->Properties

Allow callers to access my Local Area Network

Specify IP addresses from 192.168.0.1 to 192.168.0.10->OK->Next->Finish.

## Set up Windows XP to Accept Incoming Connections

Open the Control Panel->Network Connections->Create a new connection->Next->Accept Incoming Connections->Next->Chose - Standard 9600 bps Modem ->Next

Do not allow virtual private connections

Select the administrator and the WinAQMS Mini DAS user to be given access to dialup remotely->Next

Highlight Internet Protocol (TCP/IP)->Properties

Allow callers to access my Local Area Network

Specify IP addresses from 192.168.0.1 to 192.168.0.10->OK->Next->Finish.

**Note:** Incoming connections in windows will not re-establish its connection with a modem that has been switched off unless the logger is rebooted or the modem was disassociated with incoming connections before it was turned off. IE if the modem loses power and the logger does not then the logger will no longer listen for incoming connections to the modem.

## Appendix G – Serial output report formats

The current list of serial output report formats is as follows.

**AQMS text** is the same format as that used by the older Ecotech 9400DAS.

<PP><sp><RRRR><sp><yy-mm-dd hh:mm:ss><sp><####0.####><ST><####0.####><ST>...<CR><LF>

PP - 2 letter space filled data file prefix

sp - the space character (A.S.C.I.I. 32)

RRRR – report type. One of RPT1, RPT2, RPT3, RPT4, SPAN, ZERO or PREC.

yy-mm-dd hh:mm:ss – Year, month, day, hour (24 hour), minute, second.

####0.#### - 10 digit numerical value (space filled on the left hand side). If the value uses more than 10 digits then the format changes to a scientific format of the form M.MME+XX where M.MM is the mantissa of the number and XX is the exponent. For example, the number 123.456 in scientific format will be changed to 1.23E+02 and the number 0.023456 will be changed to 2.35E-02.

ST – is a status character for the data reading where

\* is out of service

p is analyser power failure

f is instrument fault

L data good, low alarm

> data good, high alarm

a space is good data

< data bad, not enough data

= data bad, no data

Null data is assigned a value of -9999

CR – carriage return character (A.S.C.I.I. 13)

LF – linefeed character (A.S.C.I.I. 10)

### WinAQMS Mini DAS sci.

<PPP>,<RRR>,<YYYY/MM/DD

HH:NN:SS>,<CH#>,<M.MMMME+XX>,<status>,<CH#>,<M.MMMME+XX>,<status>,...<CR><LF>

PPP - is the data file prefix (1 to 3 character length)

, - comma character (A.S.C.I.I. 44)

RRR - is the report number (1 to 3 character length) where:

1 = report 1

2 = report 2

3 = report 3

4 = report 4

128 = span report

144 = zero report

160 = precision report

YYYY/MM/DD HH:NN:SS - is the date and time

CH# - the channel number

M.MMMME+XX - channel data in scientific format

status - data status (see section 8 Appendix D for more information on the WinAQMS Mini DAS status)

CR – carriage return character (A.S.C.I.I. 13)

LF – linefeed character (A.S.C.I.I. 10)

**WinAQMS Mini DAS std.**

<PPP>,<RRR>,<YYYY/MM/DD HH:NN:SS>,<CH#>,<0.####>,<status>,<CH#>,<0.####>,<status>,...<CR><LF>

PPP - is the data file prefix (1 to 3 character length)

, - comma character (A.S.C.I.I. 44)

RRR - is the report number (1 to 3 character length) where:

1 = report 1

2 = report 2

3 = report 3

4 = report 4

128 = span report

144 = zero report

160 = precision report

YYYY/MM/DD HH:NN:SS - is the date and time

CH# - the channel number

0.#### - channel data in standard numerical format with the number of decimal places specified in WinAQMS Mini DAS.

status - data status (see section 8 Appendix D for more information on the WinAQMS Mini DAS status)

CR – carriage return character (A.S.C.I.I. 13)

LF – linefeed character (A.S.C.I.I. 10)

**Mantacom**

The Mantacom format is a 3<sup>rd</sup> party format used by specific customers. The entire message is 85 characters long including the carriage return (CR) and linefeed (LF) characters and is space filled if required.

<HH:MM:SS><sp><0.####><sp><0.####><sp>...<sp><CR><LF>

HH:MM:SS – time of the data reading

sp – space character (A.S.C.I.I. 32)

0.#### - channel data is standard numerical format with the number of decimal places specified in WinAQMS Mini DAS

CR – carriage return character (A.S.C.I.I. 13)

LF – linefeed character (A.S.C.I.I. 10)

## Appendix H – WinAQMS Mini DAS status information

WinAQMS Mini DAS stores status information for data readings as a byte. X's indicate that the bit of the byte can be either a 0 or a 1.

**Table 16 Bite table**

BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0		
GOOD /BAD	CALIBRATION	FAULT	N/A	N/A					
0 = BAD	0 = NOT IN CAL	0 = NO FAULT							
1 = GOOD	1 = IN CAL	1 = FAULT						Status Description	ASCII Code
1	0	0	X	X	0	0	0	DATA GOOD ALL OK	128
1	0	0	X	X	0	0	1	SUFFICIENT DATA	129
1	0	0	X	X	0	1	0	GOOD HIGH ALARM	130
1	0	0	X	X	0	1	1	GOOD LOW ALARM	131
0	0	0	X	X	0	0	0	NO DATA	0
0	0	0	X	X	0	0	1	NOT ENOUGH DATA	1
X	1	0	X	X	0	0	0	CALIBRATION ALL OK	64
X	1	0	X	X	0	0	1	CALIBRATION SUFF. DATA	65
X	X	1	X	X	0	0	1	INSTRUMENT FAULT	33
X	X	1	X	X	0	1	0	POWER FAILURE	34
X	X	1	X	X	1	0	0	OUT OF SERVICE	36