VDAS®

Versatile
Data Acquisition System

User Guide

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TecQuipment supply a Packing Contents List (PCL) with the equipment. Carefully check the contents of the package(s) against the list. If any items are missing or damaged, contact TecQuipment or the local agent.

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VDAS is a registered trademark of TecQuipment Ltd.

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VDAS®

Versatile
Data Acquisition System

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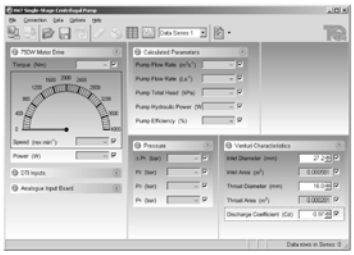
Aims

- Saves Time
- Removes errors
- Increases Accuracy
- Makes test and experiments easier
- User-friendly
- Produces professional results
- Can be customized



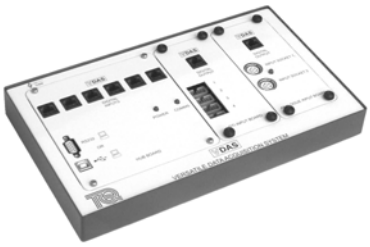


Figure 1 The Versatile Data Acquisition System (VDAS)

Manually recording data from tests and experiments can be difficult, it may take a long time and can be repetitive. Some tests need the user to take many readings from several instruments in a short time. Other tests need the user to take regular readings over several hours or days. Often, you need to adjust controls and instruments while you take readings. Humans can also make mistakes when they read an instrument, write down the data or enter it into a computer. All these actions can cause problems for the person that records the data and may give faulty results.

The TecQuipment VDAS®[1] Versatile Data Acquisition System is an excellent tool for use with many of TecQuipment's products. It removes the need to read, record and save data from experiments manually. It also removes some human error. It can record lots of data in a short time, or automatically take readings over several hours. It also saves the data in electronic form so the user may view it at a later date or produce charts and tables of data.

NOTE 

You will need a suitable computer (not supplied) to use the VDAS System

The VDAS system only works with VDAS Compatible TecQuipment Products.

1. *VDAS is a registered trademark of TecQuipment Ltd*

Description

The Versatile Data Acquisition System has two parts:

1 - The VDAS Software

2 - The VDAS Hardware (or 'Computer Interface Module')

The VDAS Hardware connects to the VDAS compatible sensors and instruments of the TecQuipment product and converts their output signals into a format suitable for the VDAS Software.

The VDAS Software

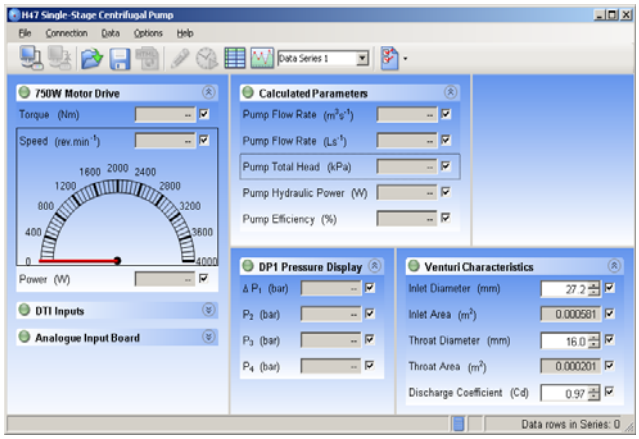


Figure 2 Typical Screenshot of the VDAS Software

TecQuipment's own specialist software engineers create VDAS Software for use with many of TecQuipment's products (ask the TecQuipment sales department or your local agent for details). The software does several jobs, it can:

- Display real-time data, either in digital form or as an analogue meter.
- Log data for printing and viewing later.
- Export data as HTML format for use by other software.
- Perform real-time calculations on the data to generate user-defined data.
- Use the data to create and print charts and Data Tables.
- Record data automatically or with some manual input.

The default 'Layout' of the software is slightly different for each product that you use it with. TecQuipment has created individual layouts that include all the displays you need for each product. For example, a TecQuipment Wind Tunnel needs different data displays to a TecQuipment Pump Test Set. However, the VDAS software is so flexible that it allows the user to create, save and re-use their own 'Custom Layout' if needed.

The VDAS Hardware (Computer Interface Module)

There are two basic types of Hardware - VDAS-B and VDAS-F. Both are electronically identical, and can be interchanged, but their cases are physically different, to make it easier for the user to fit them to their VDAS-compatible TecQuipment product.

Each type of VDAS Hardware is basically a metal box or 'Computer Interface Module' that contains three sections as standard:

1. The HUB BOARD that connects any VDAS compatible sensors and modules on the TecQuipment product to a suitable computer (not supplied). The VDAS compatible modules connect to any of six sockets, marked 'Digital Inputs' (cables are supplied). The computer connects to the USB type socket (cable supplied) or the RS232 Serial D-type socket.

   NOTE 

   TecQuipment recommends that you use the VDAS System with a modern computer with USB connection (refer to ***'Technical Details'*** *on page 7 for details).*

   The HUB BOARD has two lamps - 'POWER' indicates that its power input is good, 'COMMS' flashes to show that the HUB-to-computer communications are good.

2. The DTI INPUT BOARD that connects up to four VDAS compatible digital transducers (or 'Dial Test Indicators') on the TecQuipment product to the HUB BOARD.

3. The ANALOGUE INPUT BOARD that connects any suitable industry-standard sensors on the TecQuipment product to the HUB BOARD. This board allows connection of up to two 0 to 20 mA output sensors and up to two 0 to 10 V output sensors.

   NOTE 

   The DTI and ANALOGUE INPUT Boards are supplied as standard, but can be interchanged, determined by the needs of the customer and the VDAS compatible TecQuipment product (refer to ***'Board Changes'*** *on page 12).*

VDAS-B

This is the Bench (or Desk) mounted VDAS Hardware. It is identical to the VDAS-F except that it is supplied with an external mains to DC power supply and is supplied in a compact box for use on a desk or bench top. The VDAS-B is best used with TecQuipment products that have a bench mounted VDAS-compatible control unit.

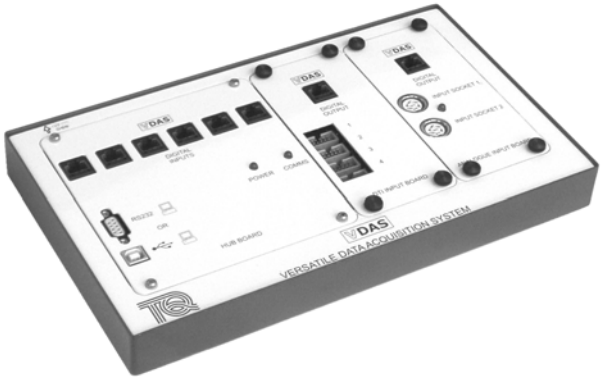


Figure 3 The VDAS-B Hardware

VDAS-F

This is the Frame-mounted Hardware. It is identical to the VDAS-B except that it includes an internal mains to DC power supply and is supplied in a rugged metal box that fits into the Instrument Rails and Frames on many TecQuipment products.

Figure 4 The VDAS-F Hardware

Technical Details

Technical Details

Item	Details
VDAS-B	
Dimensions	305 mm length x 180 mm width x 40 mm height
Nett Weight	2 kg
Power Supply Unit	Output: 12 V 5 A centre positive Input: 100 VAC to 240 VAC, 50 Hz to 60 Hz, 1.8 A maximum
Fuse	None Fitted
VDAS-F	
Dimensions	450 mm high x 190 mm wide 160 mm deep
Nett Weight	4.5 kg
Power Input	90 VAC to 250 VAC, 50 Hz to 60 Hz, 200 mA maximum
Fuse	F6.3 A 20 mm
Both Versions	
Operating Environment	Indoor (laboratory) Altitude up to 2000 m Overvoltage category 2 (as specified in EN61010-1). Pollution degree 2 (as specified in EN61010-1).
HUB BOARD Computer Outputs	1 off USB Type 1.1 or 2 socket and 1 off RS232 D Type 9 pin socket
HUB BOARD Digital Inputs	6 off RJ45 type sockets
DTI INPUT BOARD	4 off sockets for dial test indicators 1 off RJ45 digital output to HUB BOARD
ANALOGUE INPUT BOARD	1 off RJ45 digital output to HUB BOARD 2 off 6-pin DIN Sockets with: 0 to 10 V DC input 4 to 20 mA (0 to 20 mA) DC input 15 VDC 50 mA output for sensor supply
Computer (not supplied)	
Minimum Hardware	Intel® Pentium® 4 or equivalent processor operating at 2 GHz
	At least 512 MB of RAM
	SVGA Monitor that works with 16-bit 1024 x 768 colour resolution
	CD-Rom Drive
	USB type 1.1 or 2 socket or spare 9-Pin Serial Port (USB is best)
	2 GB of Hard Disc Space
	Standard Two-button Mouse (Three button mouse with scroll wheel is better)
Minimum Operating System	Microsoft® Windows XP, Vista, 7 and 8

Installation

VDAS-B Hardware Installation

1. Put the VDAS-B Hardware on a flat desk, bench or table top. It uses a space of 305 mm x 180 mm. The mains supply for its separate power supply must be nearby. For good signal transmission, the digital 'STP' cables supplied with the Hardware are short, so make sure that the VDAS-B Hardware is near to the Control Unit of the VDAS-compatible TecQuipment product that you need to take readings from.

2. Connect the low voltage lead from the separate power supply to the '12 V' socket on the side of the VDAS-B box.

3. Connect the RJ45 'STP' lead from the Control Unit of the VDAS-compatible TecQuipment product to ***any*** of the six 'Digital Inputs' sockets of the HUB BOARD.

4. Connect the mains supply input from the separate power supply to a spare IEC mains outlet on the TecQuipment product (if fitted) or to an electrical supply as described in **'Electrical Supply'** on page 10.

5. Figure 9 shows typical connections for the VDAS-B Hardware.

VDAS-F Hardware Installation

1. Hook the VDAS-F Hardware into the Frame or Instrument Rail of the VDAS-compatible TecQuipment product that you need to take data from. Think about the digital 'STP' cables supplied with the Hardware and position the VDAS-F Hardware in the Instrument Rail so that the cables will be neat and will not interfere with any moving parts of the TecQuipment product.

2. Connect the RJ45 'STP' leads from the VDAS-compatible Instrument Modules on the VDAS-compatible TecQuipment product to ***any*** of the six 'Digital Inputs' sockets of the HUB BOARD.

3. Connect the mains supply input at the back of the VDAS-F to a spare IEC mains outlet on the TecQuipment product (if fitted) or to an electrical supply as described in **'Electrical Supply'** on page 10.

4. Figure 10 shows typical connections for the VDAS-F Hardware.

Both VDAS-B and VDAS-F Installation

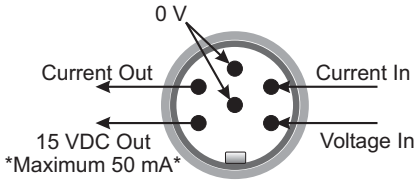
1. If you are to use the DTI INPUT BOARD, connect the short lead from its 'Digital Output' socket to one of the six 'Digital Inputs' sockets of the HUB BOARD. Connect the leads from any Dial Test Indicators or Digital Transducers on the TecQuipment product to each of the four digital inputs.

2. If you are to use the ANALOGUE INPUT BOARD, connect the short lead from its 'Digital Output' socket to one of the six 'Digital Inputs' sockets of the HUB BOARD. Connect the leads from any compatible analogue sensors or instruments on the TecQuipment product to the 0 to 10 V or 0 to 20 mA sockets (see Figure 5).

3. Connect the USB or an RS232 cable from the HUB BOARD to a suitable computer.

CAUTION 

Do not connect an RS232 and a USB cable at the same time. This will not damage the equipment, but it will cause communication problems with your computer operating system.



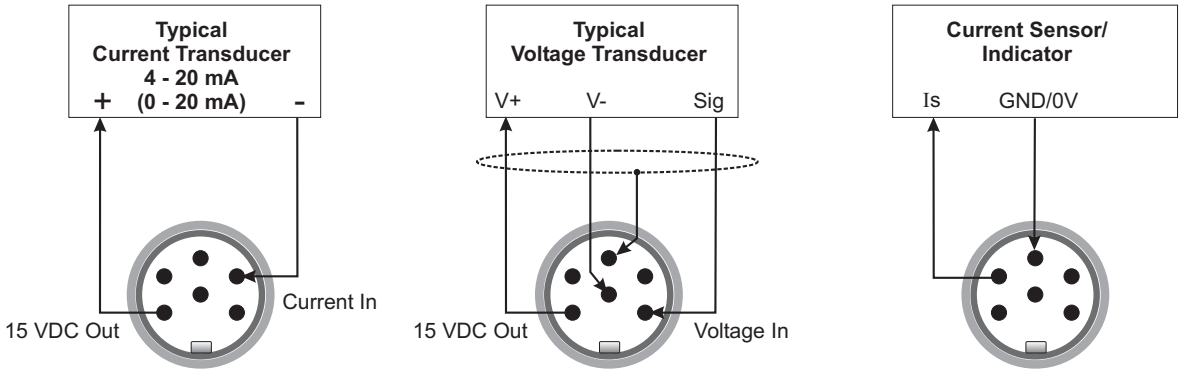


Figure 5 Sensor Connections for the Analogue Input Board

Electrical Supply

VDAS-B

Use the cable supplied with the equipment to connect it to an electrical supply. Use this colour code to identify the individual conductors of the cable:

GREEN AND YELLOW:	**EARTH E OR** ⏚
BROWN:	**LIVE**
BLUE:	**NEUTRAL**

WARNING 

Connect the apparatus to the supply through a plug and socket. The apparatus must be connected to earth.

VDAS-F

TecQuipment supply the VDAS-F with an IEC type extension cable (socket to plug). Use this cable to connect the VDAS-F to the IEC outlets of the TecQuipment main product you use it with.

WARNING 

The mains supply connector at the back of the VDAS-F is its mains disconnect device. Make sure it is always easily accessible.

Board Changes

Some VDAS - compatible TecQuipment products are supplied with unique boards that fit in place of the DTI Input Board or the Analogue Input Board.

To change the boards:

NOTE *This procedure shows the VDAS-B. The procedure for the VDAS-F is similar.*

1. Disconnect the electrical supply to the VDAS Hardware.
2. Unscrew the fixings for the board that you need to change (see Figure 6).
3. Carefully lift the board up (see Figure 7).

Figure 6 Unscrew the Fixings (VDAS-B Hardware shown, VDAS-F is similar)

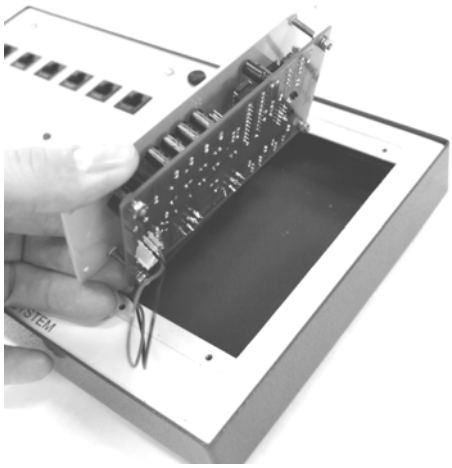


Figure 7 Carefully Lift the Board

4. Carefully remove the small plug from the board and take the board away (see Figure 8). Store it in a safe place for future use.

5. Fit the small plug into the socket on the back of the new board and fit the new board into place.

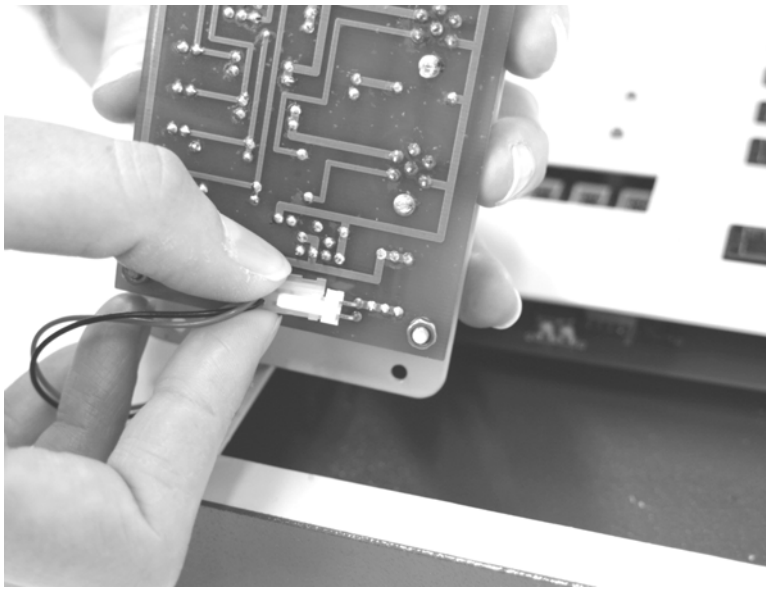


Figure 8 Unplug the Old Board and Take It Away for Safe Storage

Typical System Connection Diagrams

VDAS-B

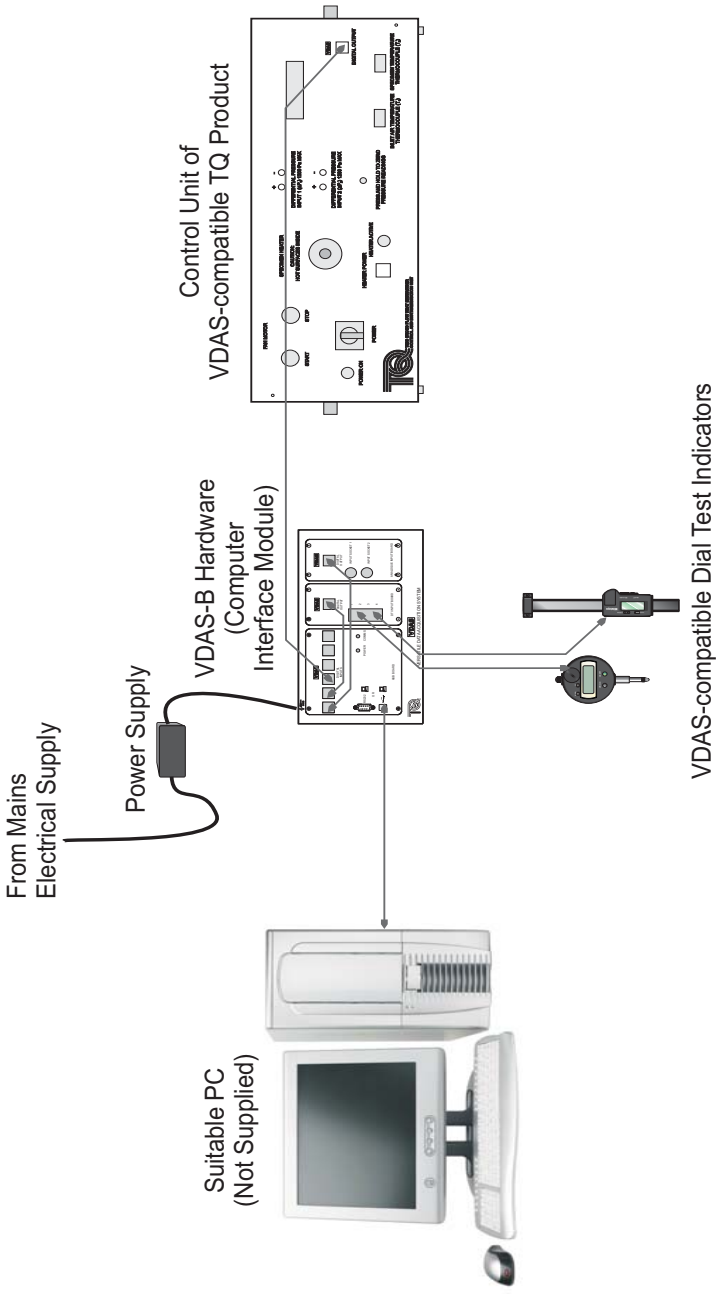


Figure 9 Typical System Connections for the VDAS-B

VDAS-F

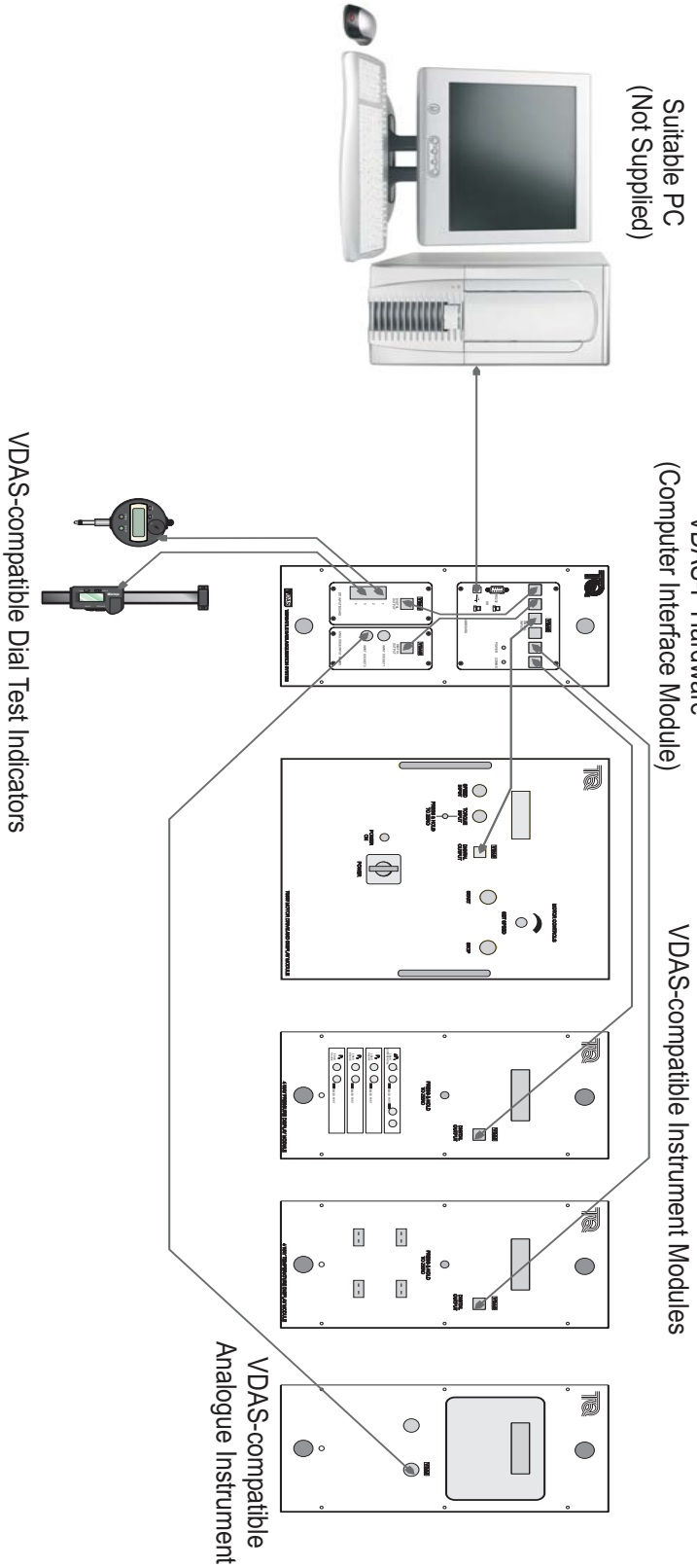


Figure 10 Typical System Connections for the VDAS-F

Typical Dial Test Indicator (DTI) Connection Sockets

The Dial Test Indicators (DTIs) have a small flexible plug that covers their connection sockets. Use your fingers to carefully remove the plug. Insert the end of the ‘SPC’ cable (where supplied) into the DTI connection sockets. Keep the flexible plug safe to refit it when you store the equipment.

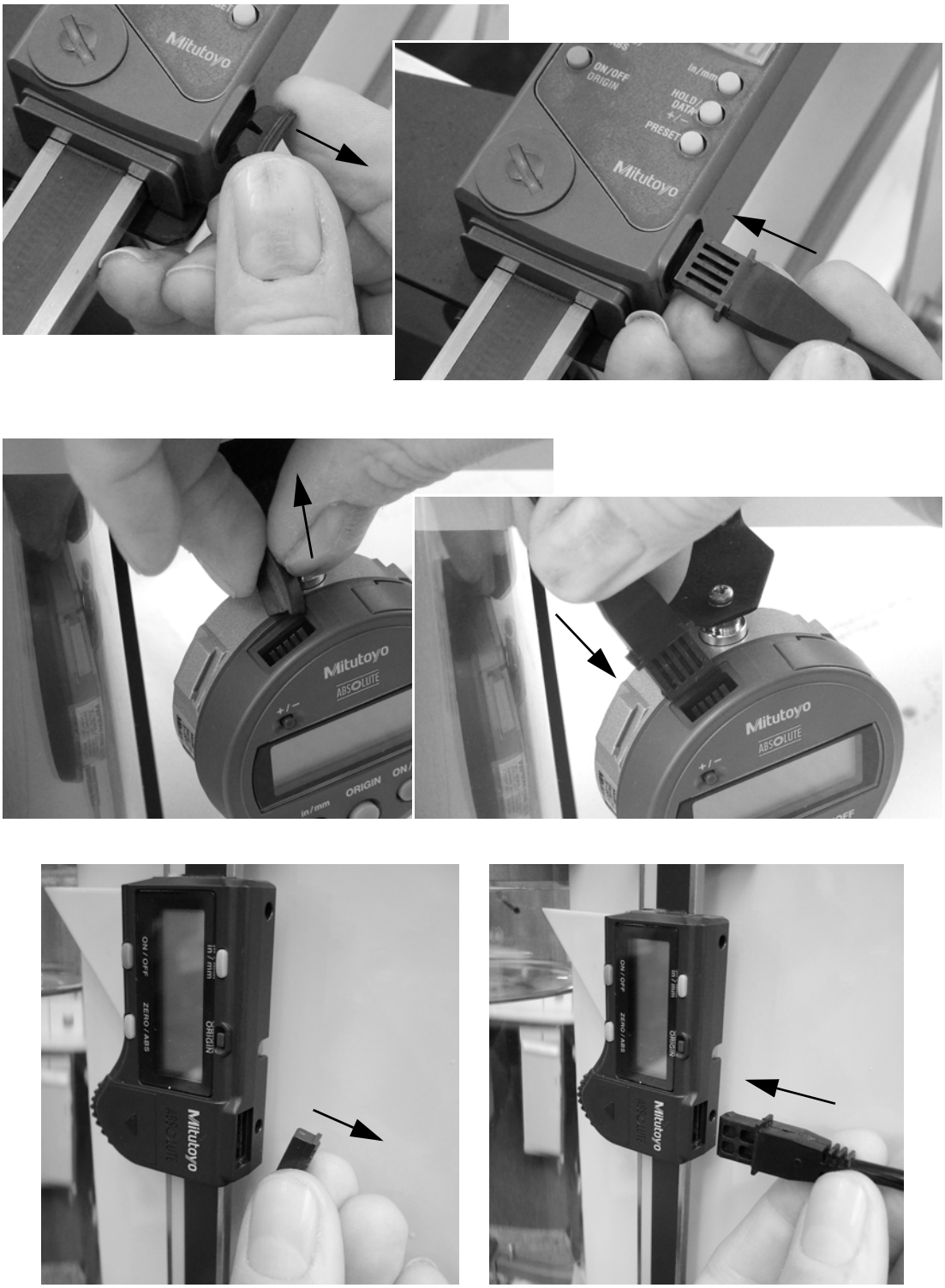


Figure 11 Typical DTI Connection Sockets

VDAS Software Installation

The software is supplied on a CD-ROM. To install the software you must have a computer (PC) with the specifications shown in **'Technical Details'** on page 7.

To install the software:

1. Switch on the computer and wait for it to finish loading its operating system.
2. Insert the VDAS Software CD-ROM into the CD-ROM drive of the PC.
3. Wait a few moments. The software should automatically start the installation process. If it does not, click the 'My Computer' icon of your Windows® software and click on the icon for your CD drive. The software may now start the installation process, if it does not, double-click on the file called 'Setup.exe' on the CD-ROM. The software will now start the installation process.

NOTE

The software will only install if you have administrative access. If you do not, then an error will appear and you must contact your computer system administrator before you install the software.

If you have problems with the installation, it may help to turn off your virus checker software before you start the installation. Turn it back on when you have finished the installation.

4. When the installation starts, the software will check to see whether the Microsoft .NET Framework 4.0 is already installed on your PC. If it is, then the installation will continue as in Step 6. If the .NET Framework has not been previously installed, then installation will continue as in Step 5.

NOTE

Windows 8 includes the .NET Framework already installed, so you do not need to re-install it.

5. If the Microsoft .NET Framework has not previously been installed on the PC, then the Dialogue Box will appear as shown in Figure 12. The .NET Framework must be installed in order to run the TecQuipment software. The .NET Framework may take several minutes to install and will guide you through its installation.

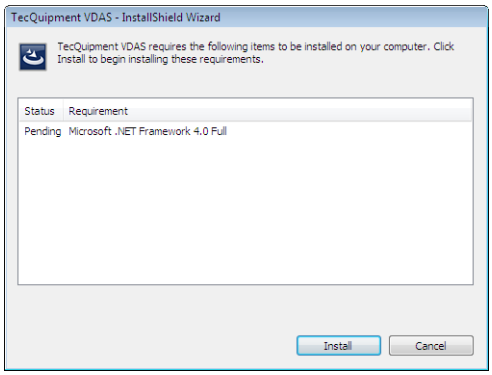


Figure 12 Microsoft .NET Framework Setup

6. When the .NET Framework has installed, (or if you already have it installed) the first screen of the TecQuipment software will appear as in Figure 13. Click on the 'Next' button and obey the instructions of the next screens.

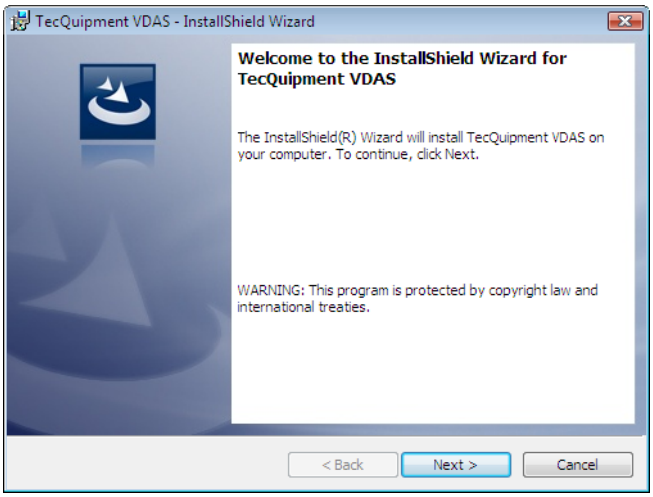


Figure 13 First VDAS Installation Screen

7. The Software will now complete its installation onto your PC. It will create a new 'VDAS - Versatile Data Acquisition System' Icon on your desktop and a new program group on your **Start-Programs** menu.

8. The first time that you use VDAS, the software will show a 'Select TecQuipment Application' Screen (see Figure 14). Use this screen to select the TecQuipment VDAS-compatible product that are to use with the VDAS software. The software will then set itself to automatically load the correct settings and Layout for your product.

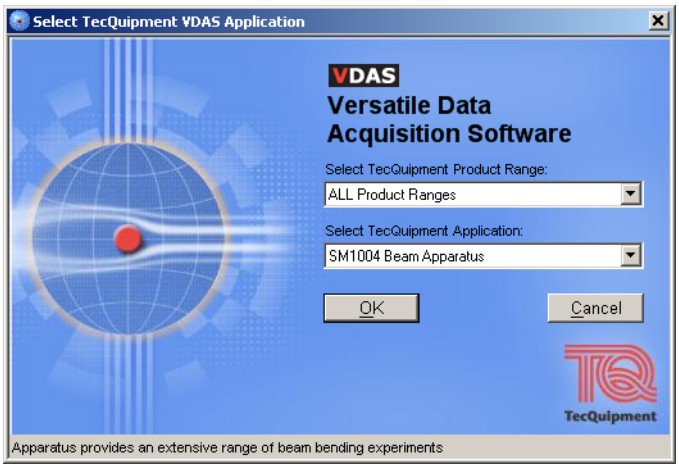


Figure 14 The 'Select TecQuipment Application' Screen

Installation Problems

If you have problems when you install the software, TecQuipment recommends that you retry the installation, but first you must manually install the Microsoft .NET framework version 4.0 or 4.5. You can download the .NET framework and service packs from the Microsoft website (www.microsoft.com), or from 'Windows Update' at (http://update.microsoft.com). Remember that you do not need to install .NET Framework on Windows 8.

To Use the VDAS Equipment

WARNING 

Use this equipment as described in these instructions.

If you do not use the equipment as described in these instructions, its protective parts may not work correctly.

To Start the VDAS Software

1. Switch on the computer and the VDAS Hardware.
2. On the computer, double-click on the VDAS - Versatile Data Acquisition System Icon on your desktop (see Figure 15) or click on **Start - Programs* - TecQuipment VDAS - TecQuipment Versatile Data Acquisition System.** (*Windows Vista says **All Programs**).
3. A 'Splash Screen' will appear as in Figure 16.
4. After a few seconds, the VDAS Window will appear (see Figure 17).

NOTE 

If the PC is a low specification machine, the VDAS Window may take a while to appear, please be patient.

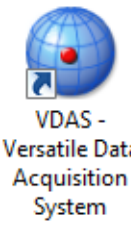


Figure 15 Desktop Icon

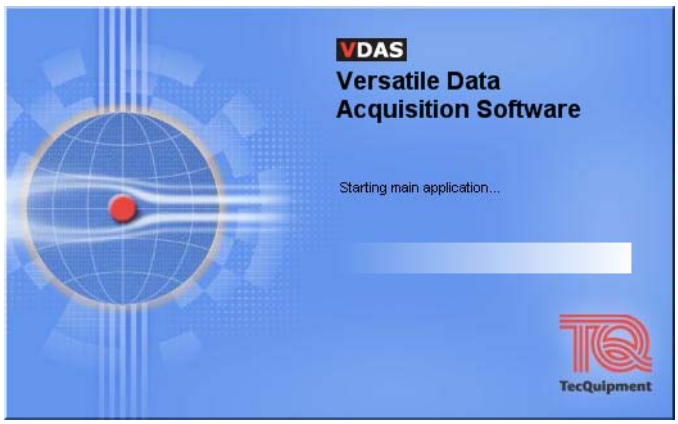


Figure 16 The VDAS 'Splash Screen'.

The VDAS Window

NOTE

Your VDAS Window will be set to the last layout you used with VDAS or to the layout you set in the installation (for example H47 Pump). If you need to change the layout to suit your product, See ***Select VDAS Application*** *on page 48.*

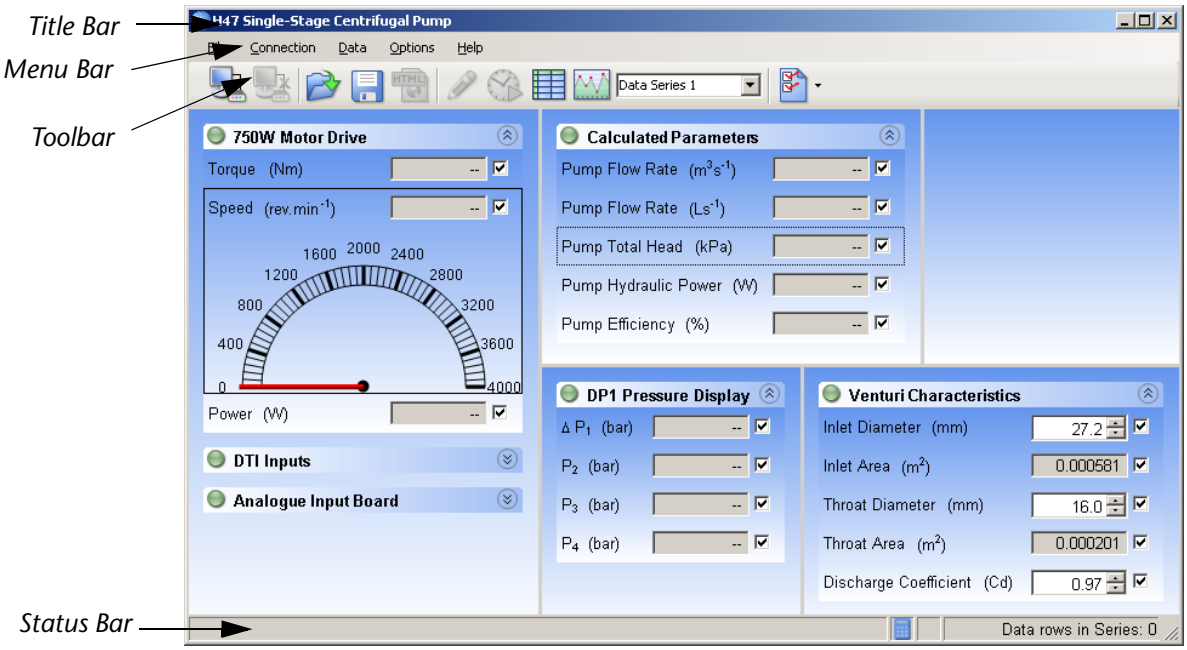


Figure 17 A Typical VDAS Window (H47 Form Layout Shown)

The Title Bar

The Title Bar displays the name of the software and has the three standard buttons to the right hand side (Minimize, Maximise/Restore and Close).

You may click and drag on the edge or corner of the VDAS Window and adjust it to the size that you prefer.

The Menu Bar

This includes the Menu Names and their Commands, shown in Tables 1 and 2. You may also use the 'Alt' key together with other keys on your keyboard as a short cut to the command.

The Toolbar

This includes several buttons that give you quick access to the menu commands (see Tables 1 and 2).

NOTE

When a button has lost its colour ('greyed out') or is not visible, this is not a fault. It means that this button is not needed yet.

Status Bar

The Status Bar shows useful information about the system and tasks that you are doing (see Figure 18).

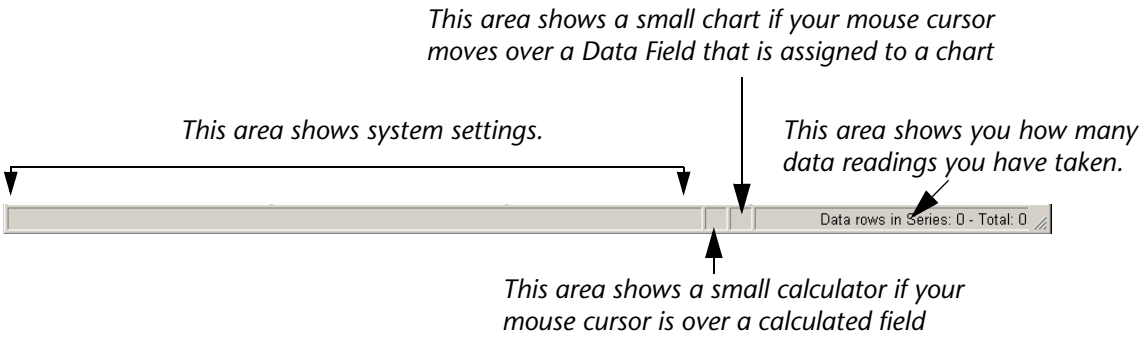


Figure 18 The Status Bar

VDAS Menus and Toolbar Buttons

Menu Names	Commands	Toolbar Button	Keyboard Shortcut	Details
File	**New**		**Ctrl + N**	Abandons all current data and starts a new window
	Open		**Ctrl + O**	Use this to open the data from an earlier experiment.
	Save		**Ctrl + S**	Use this to save the data.
	Save As		**Alt + F + A**	Use this to save the data with a new name.
	Layout - Revert to default		**Alt + F + L + R**	Restores the default form layout of Data Groups and Data Fields
	Layout - Open custom layout		**Alt + F + L + O**	Use this to load your customized form layout of Data Groups and Data Fields
	Layout - Save custom layout		**Alt + F + L + S**	Use this to save your customized form layout of Data Groups and Data Fields
	Layout - Assign Default Font		**Alt + F + L + A**	Use this to assign a default font to all captions (not units) of the data groups and data fields in your customized layout. This only applies to the customized layout you have made (not any other layouts).
	Export data to HTML		**Alt + F + E**	Saves the recorded data to a HTML format file, so that you can use suitable software to process it if you need.
	Exit		**Alt + F + X**	Closes the VDAS Window - The same as pressing the close button on the Title Bar.
Connection	**Connect to Device**		**Alt + C + C**	Tests and connects the link to the VDAS Hardware Module.
	Disconnect from Device		**Alt + C + D**	Disconnects the link to the VDAS Hardware Module.

Table 1 The Menu Names, Their Commands and the Toolbar Buttons.

Menu Names	Commands	Toolbar Button	Keyboard Shortcut	Details
Data	**View Data Tables**		**Alt + D + V**	Opens a Data Table window that displays your recorded data in a table.
	Display Chart		**Alt + D + C**	Opens a new window to display a chart
	Record Data values		**Function Button F4**	Records all the data in the Data Fields that you can see on the VDAS Window.
	Start Timed Data Acquisition		**Alt + D + S**	Opens the Timed Data Capture box.
	Delete Last Recorded Data row		**Alt + D + D**	Remove only the last recorded row of data.
	Maintain Data Series - New Data Series		**Alt + D + M + N**	Starts a new data series
	Maintain Data Series - Delete Data Series		**Alt + D + M + D**	Deletes the data series that you are using
	Maintain Data Series - Change Data Series Name		**Alt + D + M + C**	Allows you to change the name of your data series
Options	**Display Options**		**Alt + O + D**	Use to alter the appearance of the VDAS Window.
	Communications Options		**Alt + O + C**	Use to select the serial 'COM' port to use for communications and test this link.
	Select VDAS Application		**Alt + O + S**	Opens the 'Select TecQuipment Application' Screen.
Help	**Help**		**Alt + H + H or Function Button F1**	Opens a concise help window.
	About TecQuipment Software		**Alt + H + A**	Opens a small window that shows details about the version of software that you are using

Table 2 The Menu Names, Their Commands and the Toolbar Buttons.

Data Groups and Fields

The VDAS Window shows the default Data Groups and Data Fields. A 'Data Group' is a group of displays or 'Data Fields' (see Figure 19).

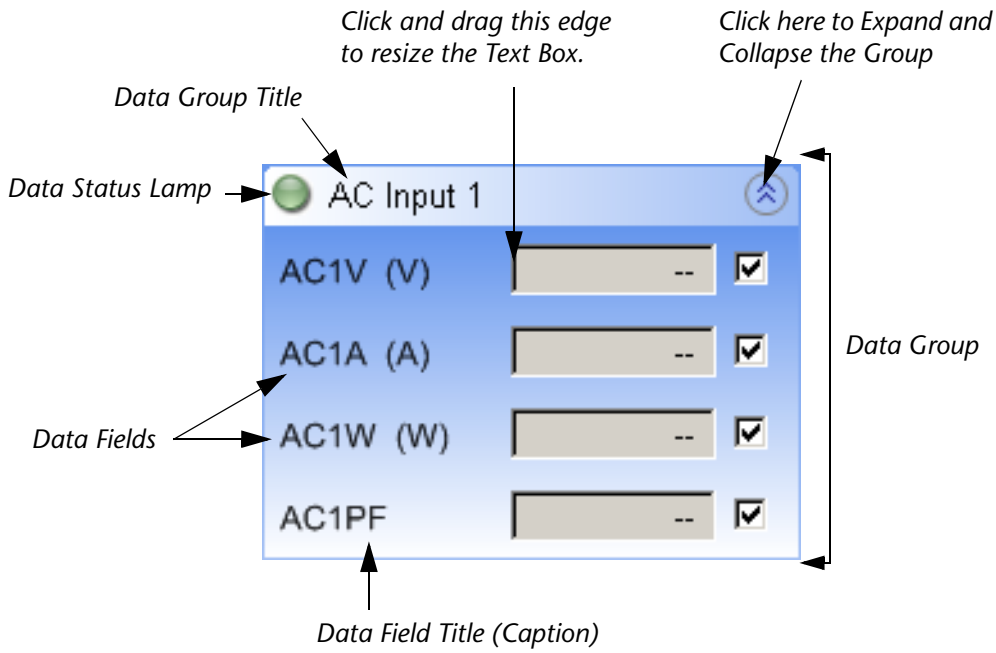


Figure 19 A Data Group and its Fields

Parts of the Data Group

The Data Group includes a Title, this is set by TecQuipment or will be 'User-defined' if you add a new Data group. Next to the title is a coloured 'Data Status Lamp', that is normally green (or flashing green) to show that data in at least one data field is changing.

You may click on the button to expand and collapse the Data Group. You may also use your mouse to resize the text boxes in each Data Field (in case of large numbers).

Customizing Data Groups and Fields

The default VDAS Form Layout for your TecQuipment product (for example: AF100 Wind Tunnel) shows the most commonly used Data Groups and Fields for your TecQuipment Product.

You may customize or add new Data Groups and Fields to the VDAS Form Layout. You may then save your new 'customized form layout' so that you may re-load it the next time you use the software.

This feature is useful, as the software may be customized to suit a particular experiment.

To Add a New User Defined Data Group

Right-click in the blank space underneath any of the existing Data Groups. A small menu will appear which says '**Add Group**'; select this option. A Data Group entitled '**User Defined**' will appear.

To Customize a Data Group

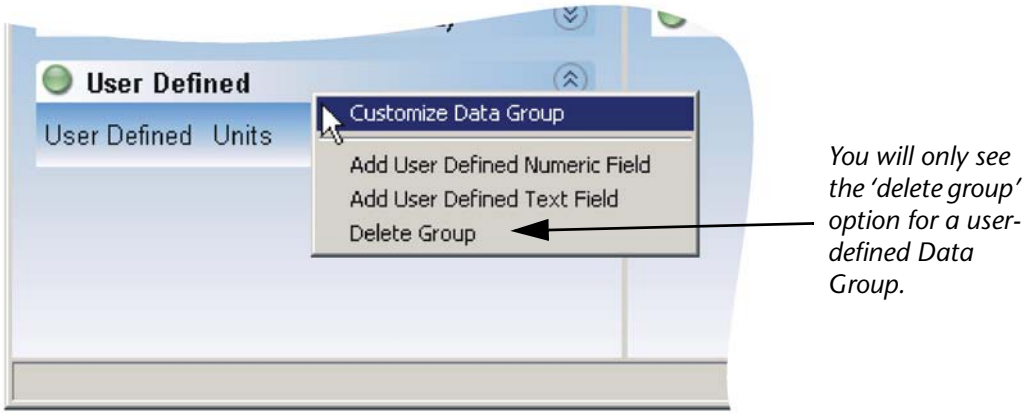


Figure 20 Right Click Over the Top of a Data Group

Right-click at the top of the group. A menu with three or four options will appear (see Figure 20). Select '**Customize Data Group**'. A 'Customize Properties' dialogue box will appear. It allows you to change the caption (name) of the Data Group and whether it is expanded by default.

To Add a New Data Field

Right-click on the Data Group panel. A menu with three or four options will appear (see Figure 20).

Select '**Add User Defined Numeric Field**' to add a field that works with numbers (just like most other fields).

Select '**Add User Defined Text Field**' to add a field that allows you to enter a short piece of text to record with your results. This is useful to help you record the names or types of different specimens that you test with your equipment.

You may add as many of these fields as you need.

To Customize a Data Field

Right-click on the field. A menu with several options will appear, select '**Customize field**'. A Dialogue Box will appear to allow you to customize the properties of the Data Field (see Figure 21).

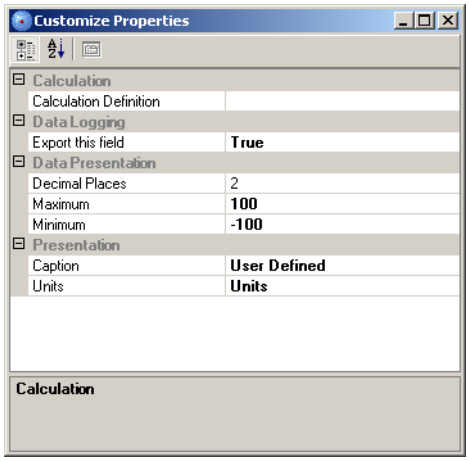


Figure 21 Customize Properties Dialogue Box

The properties that you can change in this Dialogue Box are:

- Calculation

1. Click on the calculation definition text box to make the new Data Field into a calculated field, it will become highlighted and a browse button (...) will appear to the right. To choose the type of calculation, click on the browse button. An Equation Designer dialogue box will appear to customize your calculated field (see Figure 22).

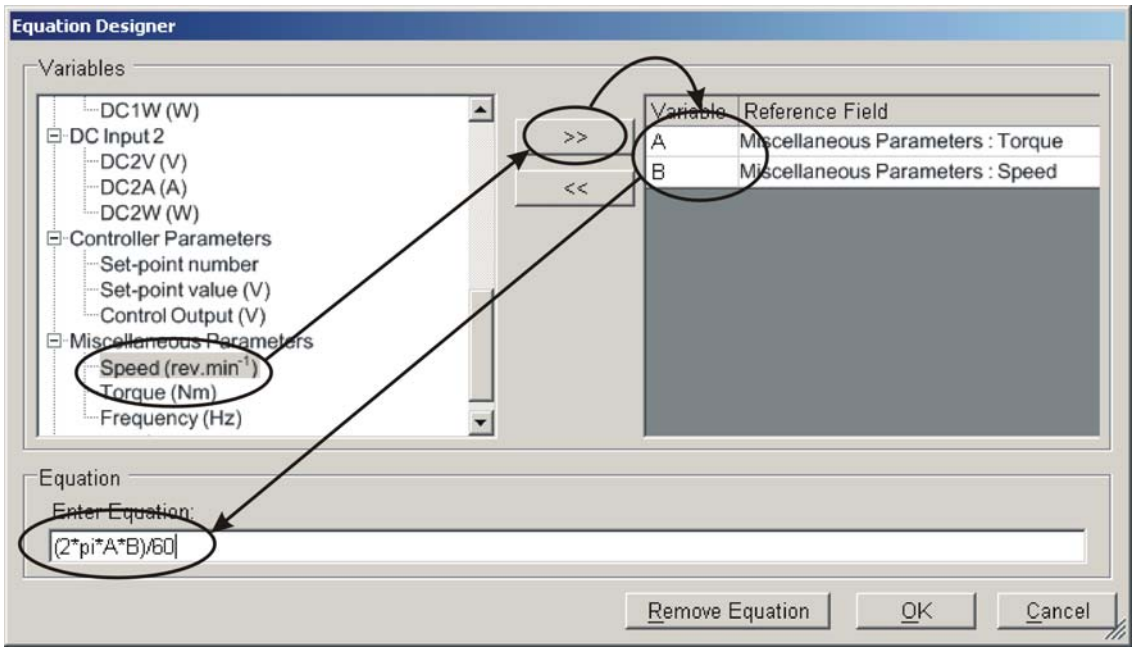


Figure 22 Example of Creating an Equation

2. Select a ‘Variable’ from the list of existing Data Fields shown in the left-hand panel.

3. Double-click on the variable name or click on the '>>' button to add the field to the list in the right-hand panel. A letter (for example A, B or C) will be given to your variable. You will use these ‘Variable Letters’ to build the equation.

4. Type the Variable Letter into the Equation Designer text box along with any of the mathematical operators, constants or functions shown in Table 3.

NOTE  *Enter the constants and functions in lower case. Enter the variables in upper case.*

5. Click 'OK' to close this window. Your equation will now appear in the Calculation text box of the ‘Customize Properties’ Dialogue Box. Click the 'X' button in the top-right of the Dialogue Box to close the form and accept all changes. The user defined field will now appear as a calculated field on the VDAS Window and will be updated as the fields on which it is based are changed.

Operators	**+**	**-**	*****	**/**	**%** [Modulus Operator]	**^** [To the power of]	**(**	**)**
Constants	e	pi						
Functions	sqrt	ln	log	logn	exp	sin	cos	tan
	sinh	cosh	tanh	asin	acos	atan	abs	

Table 3 Mathematical Operators, Constants and Functions Used in the Equation Text Box

- Data Logging

When ‘Export this field’ is set to 'True', this data will be included in your Data Table and when you export data to a HTML file. If it is set to 'False' then this data will not be included in your Data Table or exported.

- Data Presentation

Use ‘Decimal places’, ‘Maximum’ and ‘Minimum’ to set the range of the Data Field values. This only affects the user added spin boxes, and the range of the Analogue Meter and Time Plots.

- Presentation

Use ‘Caption’ and ‘Units’ to select the Data Field Title and units. You may enter HTML (Hyper Text Markup Language) into these text boxes to format the text shown (see Table 4).

HTML Code	How it will look on your results
Nm⁻²	Nm^{-2}
A_k	A_k
S	Σ
mm	**mm**
Newtons	*Newtons*
<u>Important</u>	Important
<s>Not used</s>	~~Not used~~
<big>BIG</big>	BIG
small	small

Table 4 HTML Codes and The Results

Analogue Meters

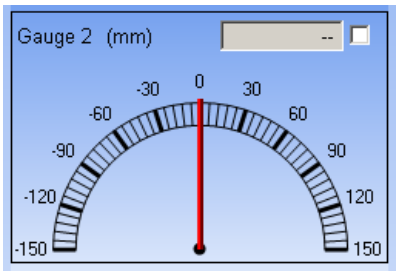


Figure 23 The Analogue Meter Read-out

You may change the look of your Data Fields so that you can display an analogue meter read-out as well as the digital read-out. To do this, right-click on any Data Field and select ‘Show Analogue Meter’. An Analogue Meter will appear below the normal numerical read-out (see Figure 23). This feature does not affect your results.

Large Displays

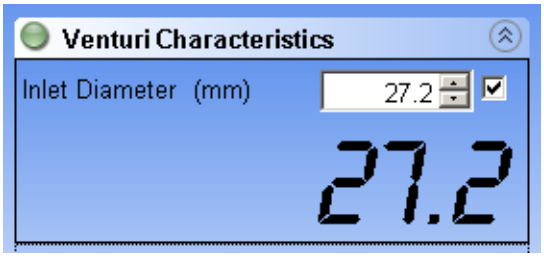


Figure 24 A Large Display

You may change the look of your Data Fields so that you can display a large digital display. The large display can be used with the Time Plot, and Analogue Meter as well as the normal smaller digital read-out. To activate the large display, right-click on any Data Field and select 'Show Large Display'. A large digital display will appear below the normal numerical read-out (see Figure 24). This feature does not affect your results.

To remove the Large Display, right-click over the Data Field and select 'Hide large display'.

Zero Offset

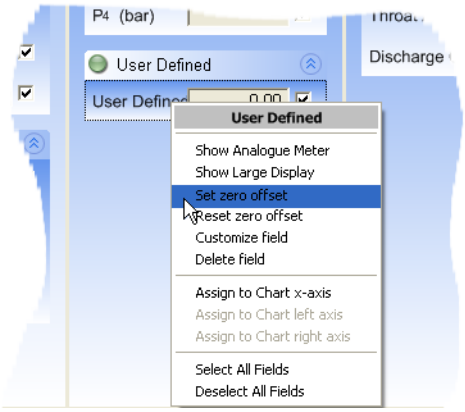


Figure 25 Set Zero Offset

For some pre-defined data fields (with calculations) and any of the user-defined Data Fields that have calculations, you may 'offset' the value of the active data to zero. This is useful for data that has a 'bias' or constant error that you do not need to see or that may confuse your readings. To set the zero offset, right-click over your Data Field and select 'Set zero offset'. To remove the zero offset, right-click over your Data Field and select 'Reset zero offset'.

NOTE

- *You can only set a zero offset when the VDAS software is receiving data.*
- *Only use the zero offset when your data is stable.*

Time Plot

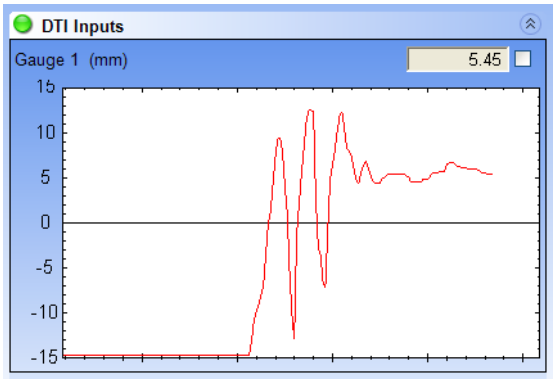


Figure 26 Time Plot

You can display a real-time plot against time of the active data in your Data Field. This helps to visualize the changes in your data. To show the time plot, right-click over your Data Field and select 'Show Time Plot'. To remove the Time Plot, right-click over your Data Field and select 'Hide Time Plot'.

The vertical scale of the Time Plot is set to the Maximum and Minimum values in the 'Data Presentation' area of the 'Customize Properties' Dialogue Box (see Figure 21). To re-adjust the vertical scale of the Time Plot, right-click over the time plot and select 'Customize field'. Change the Maximum and Minimum values to match your needs.

You may resize the Time Plot. To do this, use your mouse cursor to resize the pane of your Form Layout.

The Time Plot feature does not affect your results.

Live Data Grid and Bar Chart

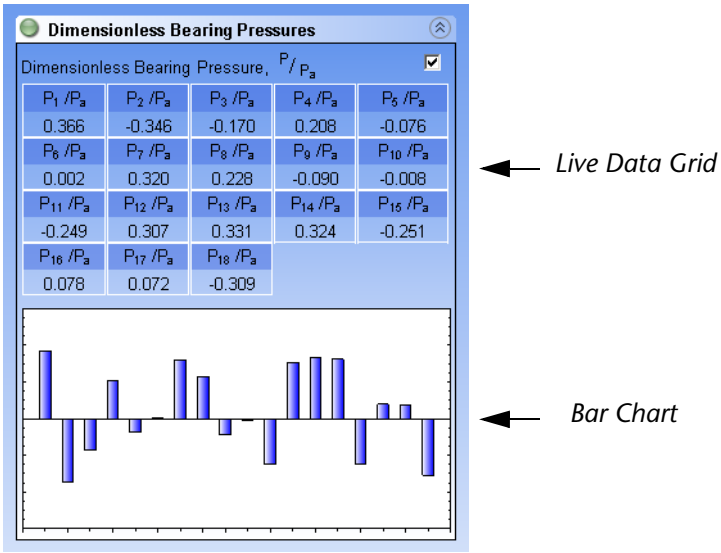


Figure 27 Live Data Grid and Bar Chart

If your TecQuipment product includes multiple readings from one instrument, the VDAS layout may be set by default to show the readings in a Live Data Grid (see Figure 27). Just as in other Data Fields, you can select to the data from the Live Data Grid in the Data Tables and export the using the check box at its top right corner.

NOTE *You cannot create a Live Data Grid, TecQuipment sets it by default in some layouts.*

When you have a Live Data Grid, you also have the option to show the live data as a Bar Chart. To do this, right-click anywhere over the Live Data Grid and select 'Show Bar Chart'. To hide the Bar Chart, right-click over the Bar Chart or the Live Data Grid and select 'Hide Bar Chart'.

The 'Customize Properties' Dialogue Box (see Figure 21) of the Live Data Grid allows you to adjust the range of the vertical axis of the Bar Chart.

Customizing Fonts and Text on the Layout

VDAS version 1.0.33 onwards includes extra font and text editing options - especially useful for translating the layout into different languages.

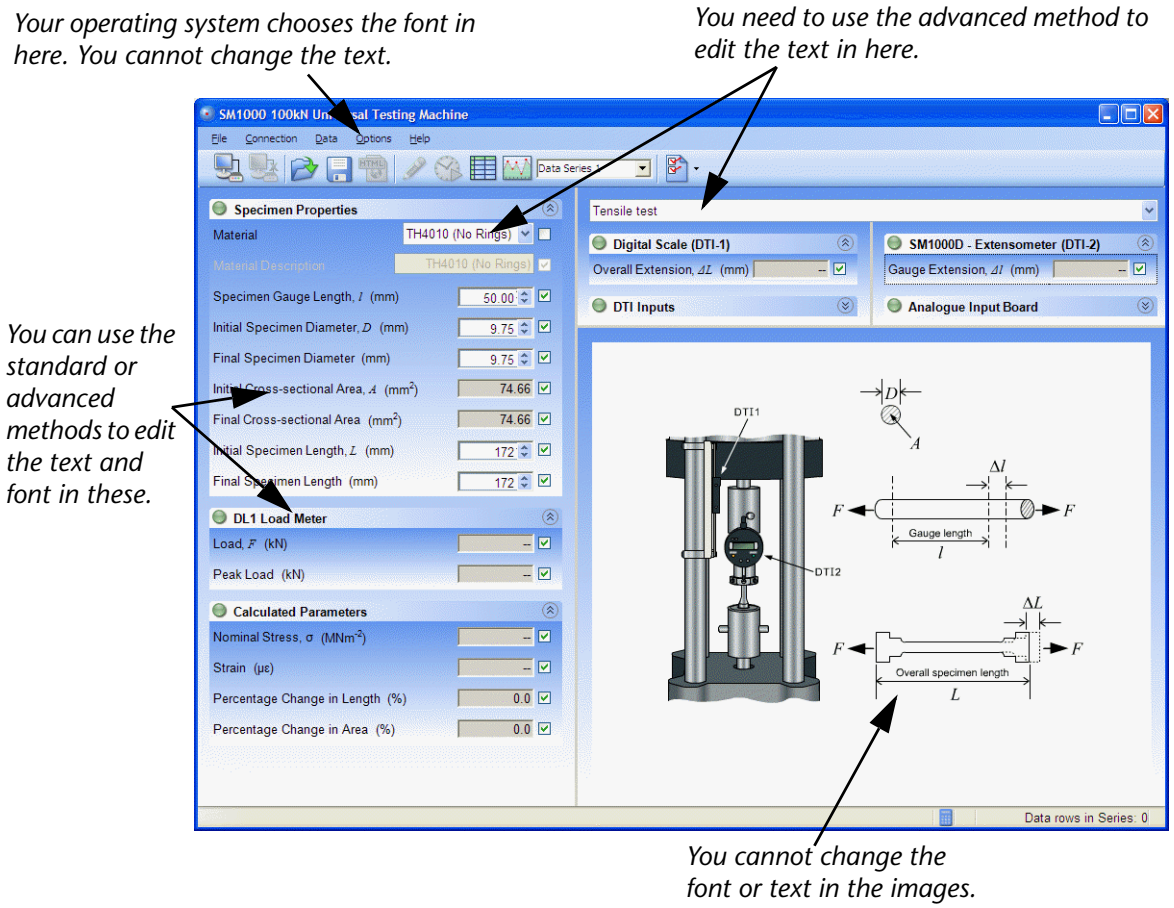


Figure 28 What You Can and Cannot Change in Your Layout

Standard Method

1. Use the new **File-Layout-Assign Default Font** option in VDAS version 1.0.33 onwards. This allows you to choose a default font to use in ***all the captions and any text fields*** of the Data Groups and Data Fields.

2. Save your layout as a custom layout (see **'To Save and Restore Your Customized Form Layout'** on page 35).

3. See **'Customizing Data Groups and Fields'** on page 27 to customize the Data Groups and Data Fields of your custom layout.

NOTE 

*The default font option only changes the fonts of the Data Group and Data Field captions and any text fields in them. It does **not** change:*

- *The data field units*
- *The VDAS menu names*
- *The VDAS menu commands*
- *The text in any images*

The Data Field units stay as Arial, unless you alter them using the method shown in **'Customizing Data Groups and Fields'** *on page 27). Your operating system chooses the font of the VDAS menu names and commands. The text in the images is fixed.*

You can only change the default font of your custom layout. The font reverts to Arial if you open a fresh TecQuipment layout.

Advanced Method (with XML)

If you are confident editing XML, you can directly edit the XML file for your custom layout. This allows you to change the text of the captions and units in all Data Groups and Data Fields, just as in the standard method. However, it also allows you to change the text used in the drop-down boxes on some layouts, that you cannot change using the standard method (see Figure 28).

To use the advanced method:

1. Save your layout as a custom layout (see **'To Save and Restore Your Customized Form Layout'** on page 35).

2. Remember where you save your layout. VDAS defaults to your 'My Documents' folder (for Windows XP) or 'Documents' folder (Vista and later) and the file extension is *.layout. This is an XML format file. Figure 29 shows a small sample of an XML file. This file contains the text used in your custom layout, so you can change it.

3. Now use a simple text editor (or XML editing software) to find the words you need to change, edit the text in the file and re-save it.

```
<?xml version="1.0" encoding="utf-8"?>

<SM1000FormMemento xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <ExpSelectionOptions>

    <string>Tensile test</string>

    <string>Brinell hardness test</string>

    <string>Deflection of a coil spring</string>
```

Figure 29 A Small Sample of an XML Format File

To Save and Restore Your Customized Form Layout

When you have added or changed Data Groups and Data Fields so that the VDAS Window layout ('form layout') is exactly as you need it, you may save your new customized form layout.

To Save Your Form Layout

NOTE 

The VDAS Software to Hardware communications are disabled whenever you use the save function.

1. Select **File - Layout - Save Custom layout**
2. A dialogue box will appear as in Figure 30.
3. Use the dialogue box to save your form layout (with the file extension *.layout) file.

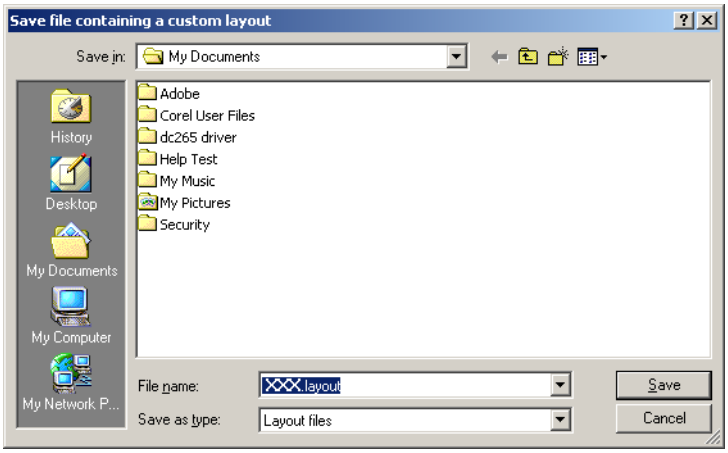


Figure 30 Save Custom Layout Dialogue Box

To Restore Your Form Layout

1. Start the software as in **'To Start the VDAS Software'** on page 21.
2. Select **File - Layout - Open Custom layout**.
3. A Dialogue Box will appear as in Figure 31.
4. Use the Dialogue Box to load your form layout.

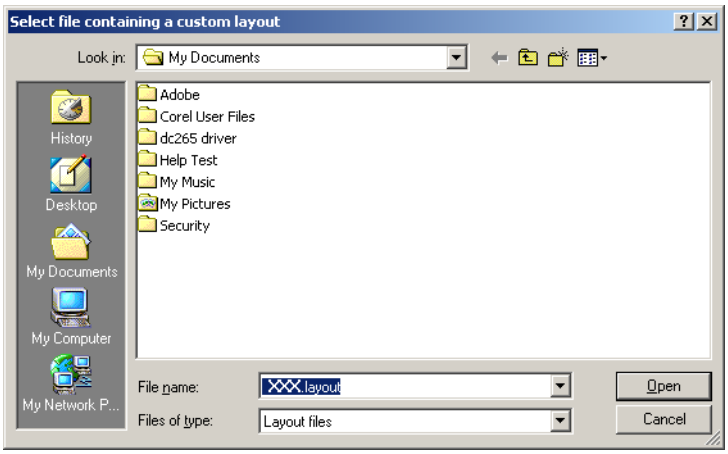


Figure 31 Load Custom Form Layout Dialogue Box

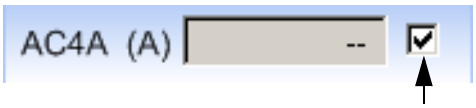
To Record and Display Data (Data Tables)

1. Start the VDAS Software as described in **'To Start the VDAS Software'** on page 21.
2. Make sure that the VDAS Hardware is connected correctly.
3. Click on the '**Initiate communications with device**' button. If communications are good, you will see the '**Terminate communications with device**' button more clearly. If this does not happen, refer to **'Communications Options'** on page 47.
4. Switch on the power to your test circuit.
5. The VDAS Software will display the readings.
6. Use your mouse to tick the check boxes in the Data Fields that you need to record.

NOTE

The Data Table will only display the data from Data Fields that have their check box ticked (see Figure 32).

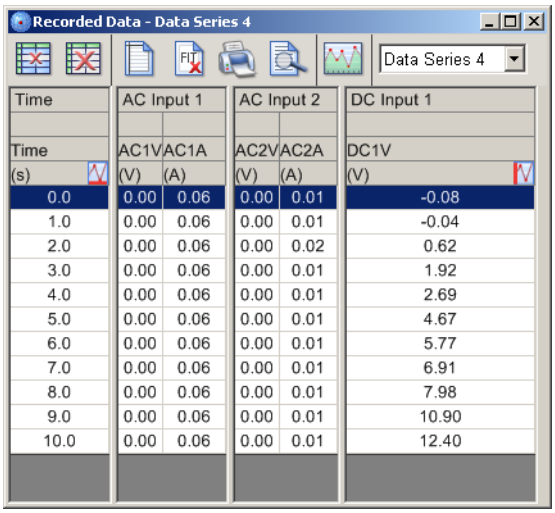
To save time, you can right-click your mouse over any of the fields and 'Deselect All Fields' or 'Select All Fields' to remove or add ticks to the check boxes on your form layout.



Tick the check boxes to view the data in the Data Table

Figure 32 Data Field Check Boxes

7. To record a set of data values, click on the '**Record data values**' button (or press your keyboard function button F4).
8. If you press the 'Record data values' button by mistake, then you may select '**Delete Last Recorded Data Row**' from the '**Data**' menu to delete the last set of data values.
9. To display your recorded data, click on the '**View recorded data**' button. Your recorded data will appear in a 'Data Table', similar to Figure 33. The Data Table includes toolbar buttons to help you remove a line (or all) of your data and set up your data for printing. The '**Shrink to fit**' button makes sure that your Data Table is shrunk to fit on your printed page. You may need to use the 'Landscape' function on your page setup for best results.



Time	AC Input 1		AC Input 2		DC Input 1
Time	AC1V	AC1A	AC2V	AC2A	DC1V
(s)	(V)	(A)	(V)	(A)	(V)
0.0	0.00	0.06	0.00	0.01	-0.08
1.0	0.00	0.06	0.00	0.01	-0.04
2.0	0.00	0.06	0.00	0.02	0.62
3.0	0.00	0.06	0.00	0.01	1.92
4.0	0.00	0.06	0.00	0.01	2.69
5.0	0.00	0.06	0.00	0.01	4.67
6.0	0.00	0.06	0.00	0.01	5.77
7.0	0.00	0.06	0.00	0.01	6.91
8.0	0.00	0.06	0.00	0.01	7.98
9.0	0.00	0.06	0.00	0.01	10.90
10.0	0.00	0.06	0.00	0.01	12.40

Figure 33 Data Table

To Select, Rename, Delete and Add a Data Series

Each Data Table shows a 'series' of data. This a collection of data that you have recorded for the experiment. For some experiments, you may need to give your data series a name or date to help you keep it separate from other results. You may also need to start a new series of data or delete one of your older series.

Figure 34 The Data Series Drop-down Box

On the Toolbar of the VDAS Window is the Data Series Drop-down Box.

Use this box to select the data series or your re-named data series. You may use the 'maintain data series' option in the 'data' menu to delete, add or change the name of your data series.

NOTE

- *A new Data Series is automatically created each time that you connect, or do Timed Data Capture, unless your current Data Table contains no data.*
- *You may right-click on any data column to open a short cut menu that allows you to 'assign the selected field to an axis on the chart' or 'show the maximum and minimum values of the field'.*

Data Table Toolbar Buttons

Along the top of the Data Table is a selection of Toolbar Buttons:

Toolbar Buttons	Command	Details
	Delete Selected Row	Deletes the row that you have selected in the Data Table
	Delete Current Data Series	Deletes <u>all</u> the data (the series) in your Data Table
	Page Setup	Allows you to set up your paper in your printer.
	Toggle 'Shrink to fit'	Adjust your print out so that all the data in the Data Table will fit onto your printed page
	Print	Prints your Data Table
	Print Preview	Allows you to see how your Data Table will look before you print it.
	Display Chart	Opens the Chart Window

Table 5 Toolbar Buttons on the Data Table

To Use Timed Data Capture

1. Make sure that the VDAS Hardware Module is connected correctly and communicates with the VDAS Software (see **'To Start the VDAS Software'** on page 21).

2. Click on the 'Start Timed Data Acquisition' Toolbar button. A 'Timed Data Capture' box will appear (see Figure 35).

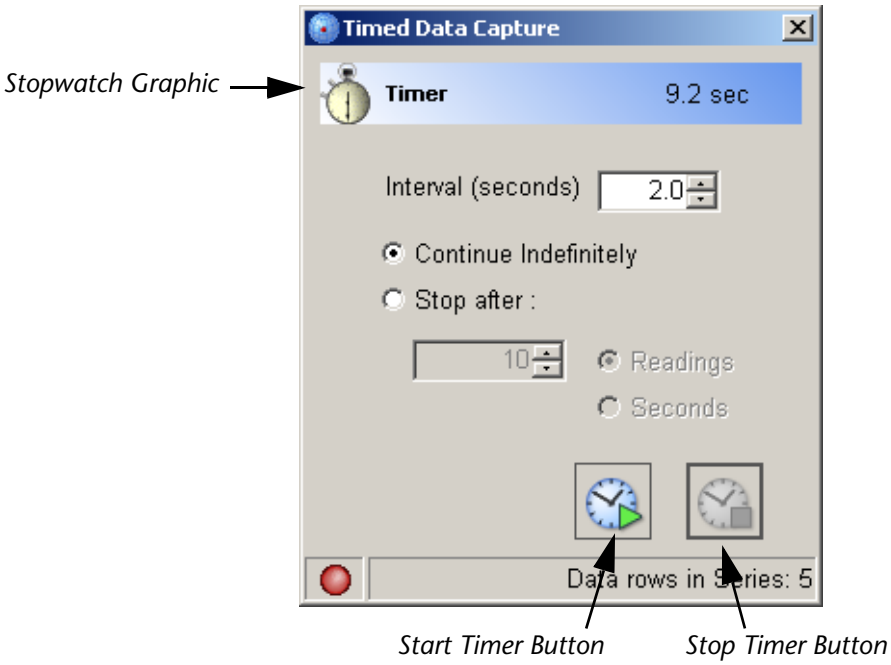


Figure 35 The Timed Data Capture Box

3. Use the Timed Data Capture box to select the time interval between each set of results and the total amount of readings (or time) that you need the results to be taken over. Alternatively, you can set the timer to continue indefinitely taking readings.

4. Make sure your VDAS Hardware Module is ready and click on the 'Start Timer' button in the Timed Data Capture box. The hand will move in the small stopwatch graphic and the elapsed time will be shown. The timer will stop after the time or amount of readings you have selected. You may also use the 'Stop Timer' button to stop the timer manually.

NOTE 

A low specification computer may reduce or increase the interval by +/- 0.1 seconds.

The Timed Data capture will start a new series (Data Table) each time it is used.

To Save and Export the Data

When you have recorded all the data, it can be exported to an HTML file for use in a suitable spreadsheet package, or saved to a data file, combined with the form layout, so that you may open it again at a later date.

NOTE 

The VDAS Software to Hardware communications are disabled whenever you use the save function.

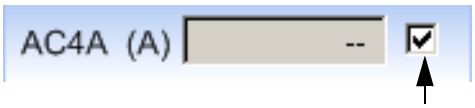
HTML Export

NOTE 

- *Before you export the data to HTML, make sure that the small check boxes at the side of each Data Field are ticked or its data will not be exported (see Figure 36).*
- *To save time, you can right-click your mouse over any of the fields and deselect or select all of the check boxes on your form layout.*

To export the data to HTML, press the '**Export recorded data to HTML file**' button. A 'Save As' Dialogue Box will appear and you may save the data to a HTML file. This data can be imported into a suitable spreadsheet or word processor software package.

To clear all data after it has been exported, select '**New**' from the '**File**' menu.



You must make sure that this check box is ticked or the HTML data will not be exported

Figure 36 Click on the Check Box at the Side of the Data Field to Export its Data to HTML.

Data Save

To save the data, select '**Save**' from the '**File**' menu and save your data file (it will have the extension *.dat). Your saved data file is a combined file that includes all your data and the Form Layout. You may then use the software to open the data file at a later date. You do not need to tick the check boxes, all your data is automatically saved.

CAUTION 

Only the VDAS software can open the data file. Do not try to open the data file with any other program, your computer may report an error.

Charts

You may produce a chart from your Data Tables. Charts can be made of:

- Input levels and calculated fields against time, or
- Input levels and calculated fields against each other.

NOTE 

*To produce a chart of an input or calculated field against **time**, your data must be collected against time (by means of the timed data capture).*

You cannot plot charts of one Data Series against another.

Chart Window Toolbar Buttons

A selection of Toolbar buttons is available on the Toolbar of the chart window:

Toolbar Buttons	Command	Details
	Page Setup	Allows you to set up your paper in your printer.
	Print	Prints your chart.
	Print Preview	Allows you to see how your chart will look before you print it.
	Modify Curves	Re-opens the Chart Curves Dialogue Box so that you may modify the way your curve is displayed.
	Best Fit Line	Opens a 'Data Fitting' Dialogue Box with option buttons to allow you to fit a line to the data points on your chart.
	Fit Chart to Show all Data	Re-sizes the chart to fit all the available data.
	View Recorded Data	Opens the Data Table (series) that the Chart is created from.

Table 6 Chart Window Toolbar Buttons

To Create a Chart

1. Use the drop down box to select the Data Table (for example 'Data Series 1') that you need to produce the chart from (see Figure 37).

2. Click on the 'Display Chart' Toolbar button. A 'Chart Curves' Dialogue Box will appear (see Figure 38).

3. Click on the 'Assign Field' button. A new smaller 'Select x-axis Field' Dialogue Box will appear (see Figure 38). Use this box to choose the data that will make the x-axis (horizontal axis) of your chart, then click on the 'OK' button. Note that you can only have one x-axis on your chart.

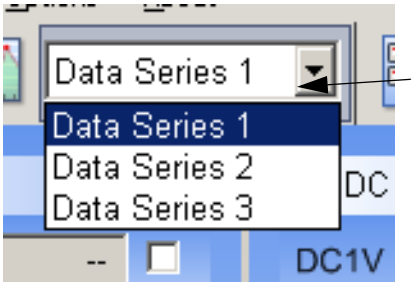


Figure 37 Use the Data Series Box to select your Data Table

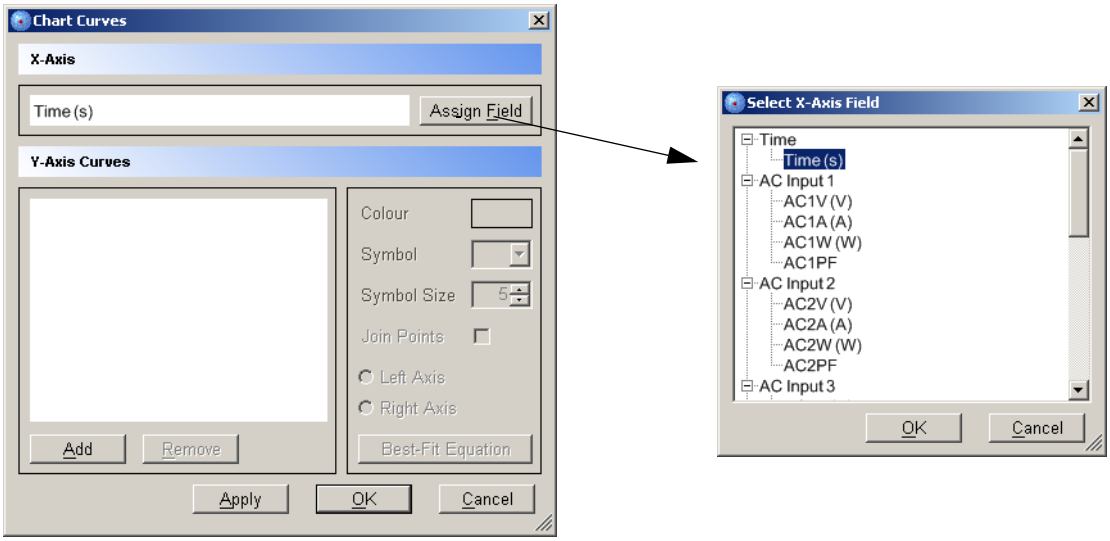


Figure 38 Chart Curves and the Select X-Axis Field Dialogue Boxes

4. On the 'Chart Curves' Dialogue Box, click on the 'Add' button to select the Data Field that you need to plot as the y-axis (vertical axis) of your chart.

NOTE

- *You can assign the Data Field to the left or the right axis, each axis may have a different scale.*
- *You can add several Data Fields to the y-axis. Use the 'Colour', 'Symbol' and 'Symbol Size' options to adjust how you need each curve to look.*
- *Select 'Join Points' for each curve to show your data points joined up.*
- *The vertical axis has no unique units label because it may be used for several different series on one chart, such as speed and temperature. The key for each series is shown at the top of the chart.*

5. When you have done, click on the 'Apply' button, then the 'OK' button. Your chart window will appear, similar to Figure 39.
6. Use your mouse and right-click anywhere on the chart to open a short-cut menu that allows you to:
   - Copy the chart to your computer 'clipboard'
   - Save the chart as a graphic image file (*.png, *.gif, *.jpg, *.tif, *.bmp)
   - Setup the page for printing
   - Print the chart with your printer
   - Show Point Values - the value of your data point is shown by the tooltip when your mouse cursor is nearby
   - Give your chart a title
   - Show x and y axis gridlines
   - Include the x and y axis zero - set the chart to show the origin (zero) values of the x and y axis

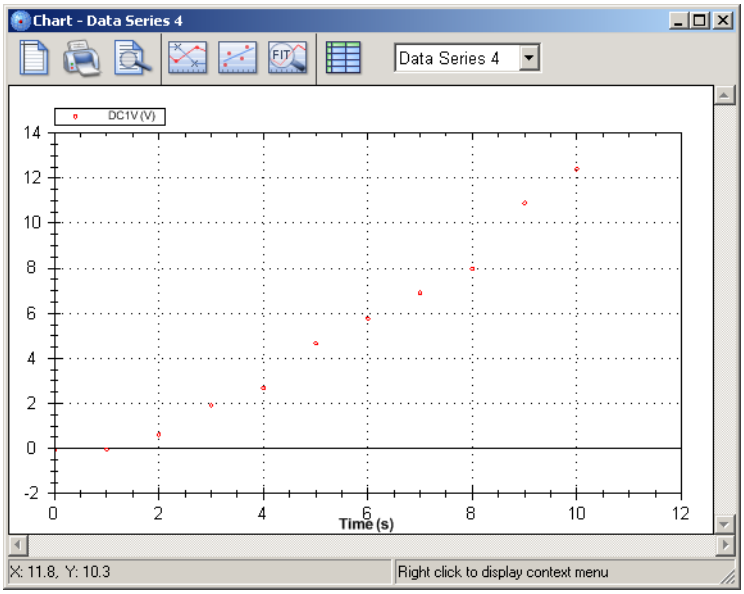


Figure 39 Example of a Chart Window

Zoom or Straight Line Drawing Buttons

Figure 40 The Zoom or Draw Option Buttons on a Chart

Two option buttons on the Toolbar of your chart allow you to use your mouse to zoom in and out of the chart or draw a freehand line on your chart. See '**To Zoom (magnify) in and out of your Chart**' or '**To Draw a freehand line on your Chart**'. The zoom option is the default setting.

To Zoom (magnify) in and out of your Chart

Make sure the Zoom or Draw option button is set to 'zoom'. See '**Zoom or Straight Line Drawing Buttons**'.

If you have a mouse with a scroll wheel, you may use the scroll wheel to zoom in and out of your chart.

To select and enlarge an area of your chart, use your mouse to left-click and drag an area over the chart. To return to the normal chart view, use the 'Fit Chart to show all Data' button.

If you have a three button mouse you may click and hold the third button so that your cursor becomes a dynamic pan tool. If your mouse is only a two button mouse, you may hold the shift key of your keyboard and your left mouse button.

If your mouse is only a two button mouse, but has a scroll wheel, the wheel may be configured as a third button (see your mouse driver software). You may then use the scroll wheel for the dynamic pan.

To Draw a freehand line on your Chart

Make sure the Zoom or Draw option button is set to 'draw'. See '**Zoom or Straight Line Drawing Buttons**'.

Use your mouse and left-click where you need your line to start. Keep your finger on the left button of the mouse and drag your mouse pointer to where you need your line to stop. Release the mouse button, the line will change from black to blue. Your line's equation will appear near the top of the chart.

NOTES:

- The software uses the x axis and the left y axis scales to calculate the line's equation.
- You can only draw one line at a time. Drawing a new line deletes the first line.
- You can use your mouse to move the ends of the line. The equation will update automatically.
- Your line will delete if you shut the chart or change the data assigned to the x axis.

To Add a Best Fit Line and Equation to your Chart

1. On the Chart Window, click on the ‘Best Fit Line’ Toolbar button. A new ‘Data Fitting’ Dialogue Box will appear, similar to Figure 41.

2. Use the Data Fitting Dialogue Box to select the type of line you need to fit around your data and press the ‘Calculate’ button. A small ‘Best Fit Line Properties’ window will appear that shows the equation of the line, and a Best Fit Line will appear on your chart.

3. Click on the ‘Modify Curves’ Toolbar button to open the ‘Chart Curves’ Dialogue Box. You may now modify the colour of your ‘Best Fit Line’ or view its equation.

4. Use the ‘Print Preview’ and ‘Print’ buttons to print your curve to a suitable printer.

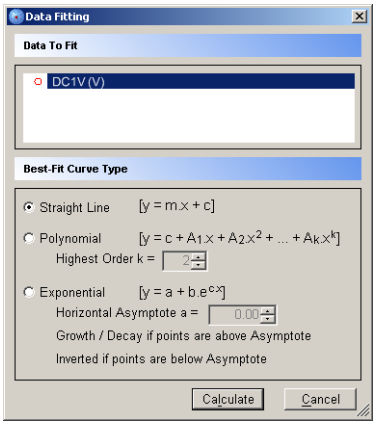


Figure 41 Data Fitting Dialogue Box

Definitions of the Best-Fit Curve Equations

Straight Line - Gives a straight line of the standard ‘y = mx + c’ format.

Polynomial - Gives a curve based on the sum of several terms that contain different powers of the same variable.

Exponential - Gives a curve based on an exponential value of the data.

Asymptote - A line that continually approaches a given curve but does not meet it at a finite distance.

Options

Communications Options

Use the '**Options**' menu to select the communications options. The Communications Options dialogue box (see Figure 42) selects which serial COM port of your computer you need to use.

NOTE 

TecQuipment recommends that you use the VDAS System with a modern computer with USB connection (refer to ***'Technical Details'*** *on page 7* *for details).*

USB Connection

If you connect by USB, all communications are fully automatic and you do not need to adjust anything, but TecQuipment recommend that you select the 'Only connect via USB' box. This helps to stop any errors that your computer and operating system may generate if it tries to connect to or test a serial comm port that is not used.

NOTE 

USB Connection does not work with Windows® NT Operating Systems

Serial Port Connection

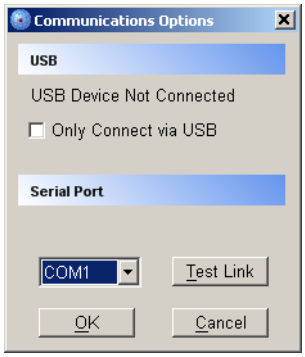


Figure 42 Communications Options Dialogue Box

Only serial ports which actually exist on the PC will be displayed in the options box (the software recognises up to a maximum of 4 ports). If you click the '**Test Link**' button the software will try to communicate with the VDAS Hardware. The VDAS Hardware must be switched on or this test will not succeed.

If the test fails:

- Check that the cable is connect correctly and is not damaged
- Check your computer communications settings (see **'Technical Details'** on page 7)
- Try a different COM port.

Display Options

The appearance of the VDAS Window may be changed by use of the Display Options dialogue box (see Figure 43). Use the '**Options**' menu to open this box.

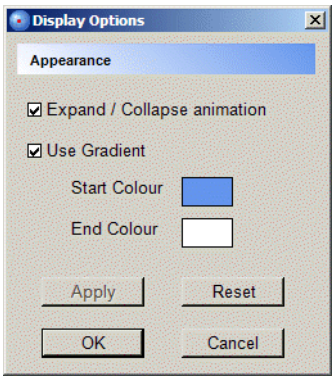


Figure 43 Display Options Dialogue Box

You may use the Display Options Box to turn on or off the display appearance features. You may also click on the 'Start Colour' and 'End Colour' boxes to change the background gradient colours of the panels.

NOTE

If your computer is of low specification, it will run faster if you turn off the 'Expand/Collapse animation' and the 'Use Gradient' features.

Take care with your choice of colours, the colours may not work well with your computer's settings.

Select VDAS Application

The VDAS software works with many VDAS-compatible TecQuipment products. If you have more than one VDAS-compatible TecQuipment Product, you may use the **Options - Select VDAS Application** menu to open the 'Select TecQuipment VDAS Application screen (see Figure 44). Use this screen to select the default Layout for the other VDAS-compatible products.

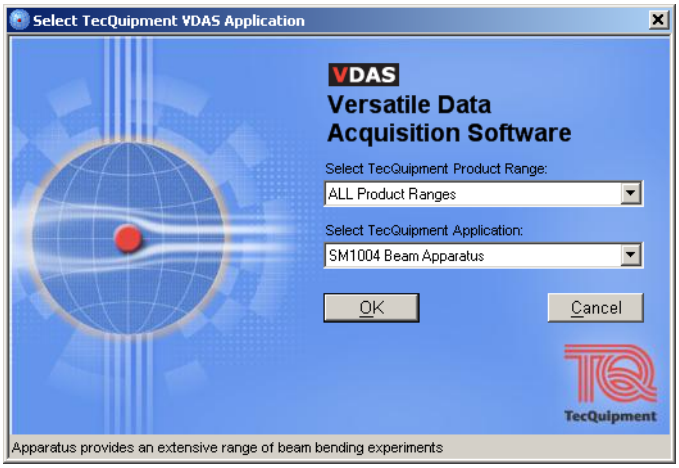


Figure 44 The 'Select TecQuipment VDAS Application' Screen.

Maintenance, Spares and Customer Service

Maintenance

General

Regularly check all parts of the VDAS Hardware for damage, renew if necessary.

When not in use, store the VDAS Hardware in a dry dust free area, preferably covered with a plastic sheet.

If the apparatus becomes dirty, wipe the surfaces with a damp, clean cloth. Do not use abrasive cleaners.

Regularly check all fixings and fastenings for tightness, adjust where necessary.

NOTE  *Renew or replace faulty or damaged parts with an equivalent item of the same type or rating.*

Electrical

WARNING  ***Only a qualified person may carry out electrical maintenance.***

Obey these procedures:

- Assume the apparatus is energised until it is known to be isolated from the electrical supply.
- Use insulated tools where there are possible electrical hazards.
- Confirm that the apparatus earth circuit is complete.
- Identify the cause of a blown fuse before renewing.

To renew a broken fuse

- Isolate the apparatus from the electrical supply.
- Renew the fuse.
- Reconnect the apparatus to the electrical supply and switch on.
- If the apparatus fails again, contact TecQuipment Ltd or your agent for advice.

NOTE  *Renew faulty or damaged parts or detachable cables with an equivalent item of the same type or rating.*

Fuse Location

Only the VDAS-F has a renewable fuse, it is located at the IEC socket at the rear of the box. Use a small flat-bladed screwdriver to open the fuse carrier.

Spare Parts

Check the Packing Contents List to see what spare parts we send with the apparatus.

If you need technical help or spares, please contact your local TecQuipment Agent, or contact TecQuipment direct.

When you ask for spares, please tell us:

- Your Name
- The full name and address of your college, company or institution
- Your email address
- The TecQuipment product name and product reference
- The TecQuipment part number (if you know it)
- The serial number
- The year it was bought (if you know it)

Please give us as much detail as possible about the parts you need and check the details carefully before you contact us.

If the product is out of warranty, TecQuipment will let you know the price of the spare parts.

Customer Care

We hope you like our products and manuals. If you have any questions, please contact our Customer Care department:

Telephone: +44 115 9722611

Fax: +44 115 973 1520

email: **customer.care@tecquipment.com**

For information about all TecQuipment Products and Services, visit:

www.tecquipment.com