VDAS® (MkII)
Versatile
Data Acquisition System
User Guide

TECQUIPMENT

Symbols Used in this Manual

NOTE		Important information
CAUTION		Failure to carry out this instruction could cause damage to the apparatus, other equipment, personal property, or the environment.
WARNING		**Failure to carry out this instruction could cause personal injury.**

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Versatile Data Acquisition System

User Guide

Introduction

Figure 1 The Versatile Data Acquisition System (VDAS®)

Manually recording data from experiments can be difficult, it takes time and can be repetitive. Some experiments require the user to take many readings from several instruments in a short time. Other experiments require the user to take regular readings over several hours or days. It is ofte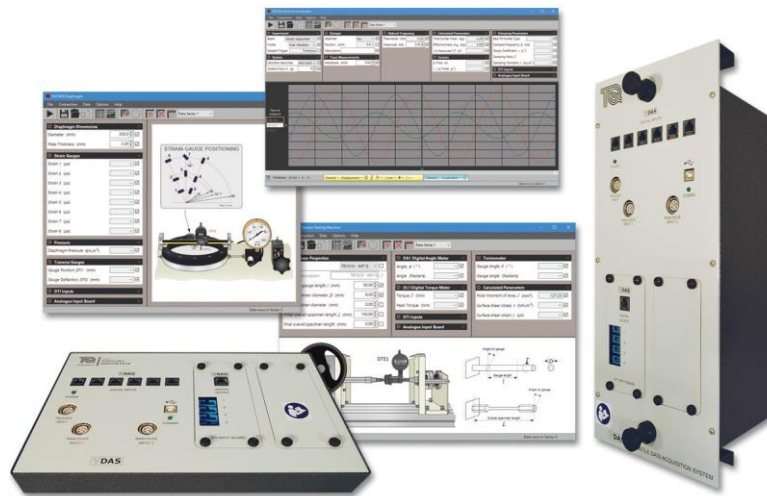n necessary to adjust controls and instruments while taking readings. Humans can also make mistakes when they read an instrument, write down the data or enter it into a computer. This can lead to errors in the data and may give faulty results.

The TecQuipment VDAS® (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 reduces the chance of human error. VDAS® 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 later or produce charts and tables.

VDAS® Software works with VDAS® (MkII) compatible hardware to display real-time traces and record analogue data as a user-friendly alternative to an oscilloscope on selected TecQuipment products.

NOTE

*A suitable computer will be required (not supplied) to use TecQuipment's VDAS®. For specification see: **'Technical Details'** on page 9*

VDAS® Software only works with VDAS® compatible TecQuipment products.

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VDAS® Hardware Overview

Hardware Interface Types

The VDAS® hardware interface is a computer interface module and connects the sensors and instruments of a TecQuipment VDAS® compatible product to a suitable PC running the VDAS® Software.

There are four basic types of hardware interface: VDAS-B, VDAS-F, VDAS-FC and Integrated-VDAS. Integrated-VDAS is built into selected TecQuipment products. VDAS-B, VDAS-F and VDAS-FC are electronically identical, but their cases are physically different.

VDAS® (MkII) introduces the ability to display real-time traces, similar to the functionality of an oscilloscope. This is only available for selected products in combination with a VDAS® (MkII) Hardware interface.

VDAS-B (MkII)

Figure 2 The VDAS-B (MkII) Hardware

This is the bench (or desk) mounted VDAS® hardware interface. It is functionally identical to the VDAS-F and VDAS-FC except that it is supplied with an external mains to DC power supply and housed in a compact metal 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.

VDAS-F (MkII)

Figure 3 The VDAS-F (MkII) Hardware

This is a frame-mounted hardware interface. It is functionally identical to the VDAS-B and VDAS-FC except that it includes an internal mains to DC power supply and is housed in a rugged metal box that fits onto the Instrument Rails and Frames on many TecQuipment products.

VDAS-FC (MkII)

This is a frame-mounted hardware interface, it is in an identical case to the VDAS-F. It is functionally identical to the VDAS-B and VDAS-F except that it has been designed to operate in an area where there is the possibility of water spillage. Therefore DC power is supplied through a waterproof connection from a suitable TecQuipment control unit.

Integrated-VDAS

Some TecQuipment products have the VDAS® hardware interface built-in. These products can be connected directly to a suitable PC, using a standard USB-A to USB-B cable.

Hardware Sections

The VDAS-B, VDAS-F and VDAS-FC hardware interfaces contain one fixed section and two modular board sections as standard.

Digital and Analogue Input Section
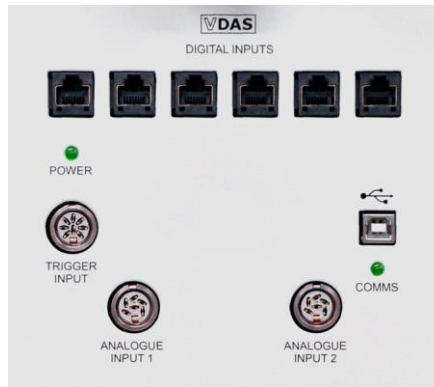
Figure 4 The Digital and Analogue Section

This connects any VDAS® compatible sensors and modules on the TecQuipment product to a suitable computer (not supplied). The digital outputs of any VDAS® compatible modules connect to any of the six sockets, marked 'DIGITAL INPUTS' (cables are supplied).

The analogue outputs from VDAS® compatible products connect to one or both of the ANALOGUE INPUTS, which accept industry-standard voltage and current ranges. The computer connects to the USB type B comms socket (cable supplied).

This section has two LEDs - 'POWER' indicates that its power input is good, 'COMMS' flashes to show that the interface-to-computer communications are good.

Modular Boards

DTI Input Board

Figure 5 The DTI Input Board

This board connects between the DIGITAL INPUTS of the main section and up to four VDAS® compatible digital transducers (or 'Dial Test Indicators') on the TecQuipment product.

Blank Plate

Figure 6 The Blank Plate

This plate may be removed for the user to fit the additional TecQuipment boards used on some products.

NOTE   *TecQuipment fit the DTI Input Board and Blank Plate as standard, but they may be interchanged, determined by the needs of the customer and the VDAS® compatible TecQuipment product (refer to '**Modular Board Installation**' on page 18).*
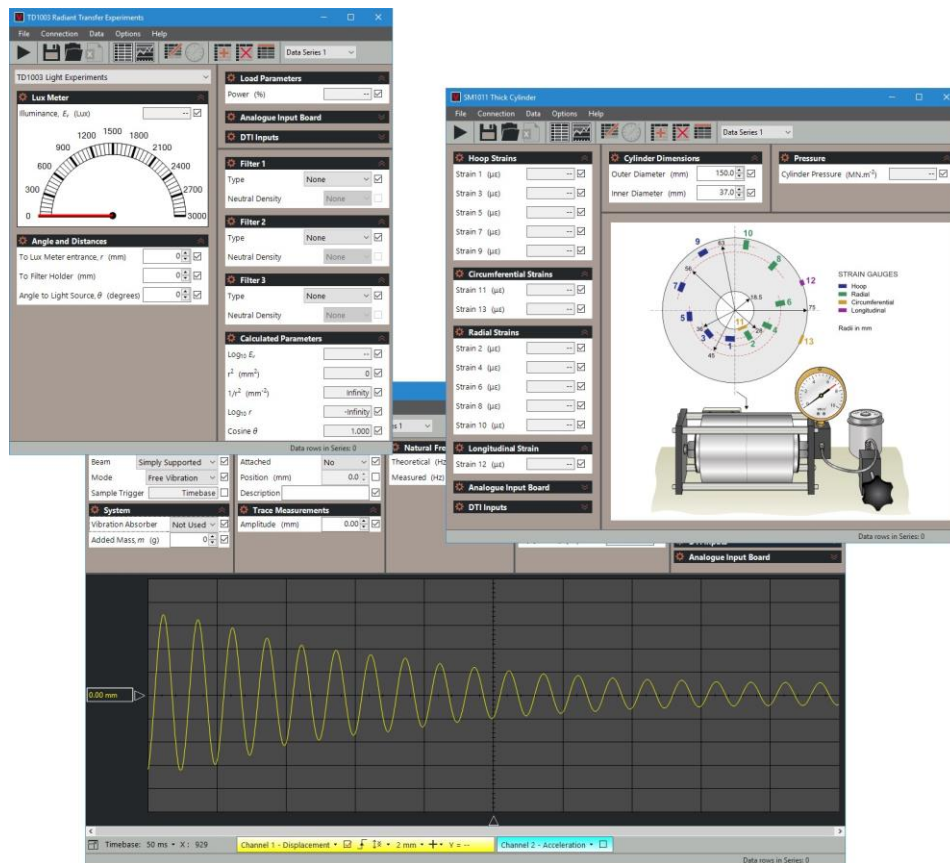
VDAS® Software Overview

Figure 7 Typical Screenshots of the VDAS® Software

TecQuipment's own specialist software engineers have created VDAS® Software for use with over 50 products. The VDAS® Software:

- Displays real-time data, numerically, as a dial meter or as an analogue trace.

- Logs data for printing and viewing later.

- Exports data for use with other software.

- Performs real-time calculations on the data to generate user-defined data.

- Uses the data to create and print charts and tables.

- Records data automatically or with some manual input.

The default 'Layout' of the software is tailored specifically for each product that it is used with. TecQuipment has created individual layouts that include the fields required for each product. For example, a TecQuipment Wind Tunnel needs different data fields to a TecQuipment Pump Test Set. The flexible VDAS® software also allows the user to create, save and reuse their own 'Custom Layout' as required.

NOTE 👆 VDAS® Software works with older VDAS® Hardware, but many newer products require the VDAS® (MkII) Hardware to make the analogue traces work correctly.

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Technical Details

Item	Details
VDAS-B	
Dimensions	305 mm length × 180 mm width × 40 mm height
Nett weight	2 kg
Power input	12 VDC 1.5 A
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 × 190 mm wide × 160 mm deep
Nett weight	4.5 kg
Power input	90 VAC to 250 VAC, 50 Hz to 60 Hz, 350 mA to 250 mA
Fuse	F5 A 20 mm
VDAS-FC	
Dimensions	450 mm high × 190 mm wide × 160 mm deep
Nett weight	4.5 kg
Power input	Direct connection to Control Unit 12V DC
VDAS-B, VDAS-F and VDAS-FC	
Digital Inputs	6 × RJ45 type sockets Extra Low Voltage
DTI Input board	4 × sockets for dial test indicators 1 × RJ45 digital output Extra Low Voltage
Analogue inputs	1 × 8-pin DIN Socket for trigger input <5 V 5 VDC and 12 VDC 50 mA outputs for sensor supply 2 × 6-pin DIN Sockets with: 0 to 10 V input 4 to 20 mA (0 to 20 mA) input 15 VDC 50 mA output for sensor supply Frequency up to 25 kHz with 12 bit resolution (0 to 10 V inputs) Bandwidth/Filter cut-off 3 kHz (nominal) (0 to 10 V inputs)
All Versions (including Integrated-VDAS)	
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).
USB output	1 × USB 2.0 type B socket Extra Low Voltage

Item	Details
Computer (not supplied)	
Minimum hardware	Intel® i5 or equivalent processor. Multi-core processors give better performance.
	1280 x 768 screen resolution
	USB 2.0 or 3.0 port
	500 MB of Hard Disc Space
Only required if using a CD-ROM for software installation	CD-ROM drive
Minimum operating system	Microsoft® Windows 7 or later

Electrical Supply

VDAS-B

This interface includes a 12 VDC power supply and a flexible IEC type mains cable.

Figure 8 Typical 12 V DC Power Supply

VDAS-F

This interface includes 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 it is to be used with. Where the main product does not have these outlets, TecQuipment may supply an alternative cable for direct connection to the supply.

VDAS-B and VDAS-F

For both VDAS-B and VDAS-F interface units, 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 VDAS-B apparatus to the supply through a plug and socket. The plug and socket will form the mains disconnect devices. Make sure they are easily accessible.

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

The mains cables of both units must have a connection to earth.

VDAS-FC

This interface receives DC power from a suitable TecQuipment Control Unit.

Integrated-VDAS

Please see the User Guide for the Integrated-VDAS apparatus for information about the electrical supply for that apparatus.

Installation

VDAS Hardware Interface Installation

VDAS-B Hardware Installation

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

2. Put the VDAS-B Hardware on a flat desk, bench or table top. It requires 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 readings are to be taken from.

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

4. Connect the mains supply input from the separate power supply to an electrical supply as described in **'Electrical Supply'** on page 11.
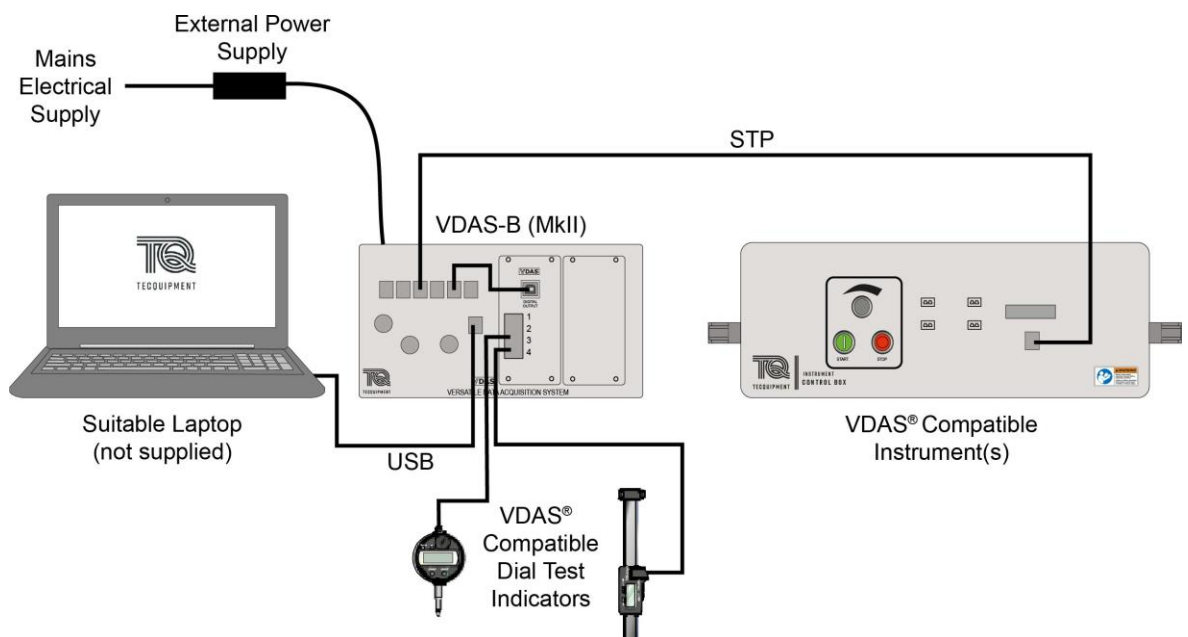

Figure 9 Typical System Connections for the VDAS-B

VDAS-F Hardware Installation

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

2. Hook the VDAS-F Hardware into the Frame or Instrument Rail of the VDAS® compatible TecQuipment product. 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.

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 11.
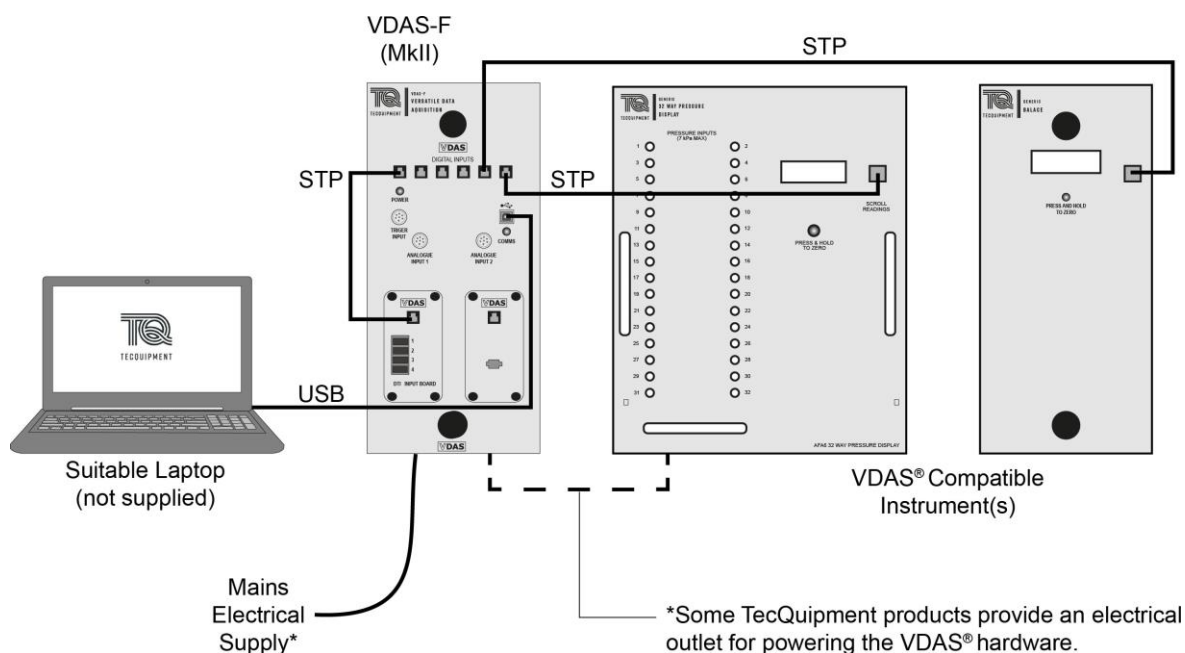

Figure 10 Typical System Connections for the VDAS-F

VDAS-FC Hardware Installation

1. Figure 11 shows typical connections for the VDAS-FC Hardware.

2. Hook the VDAS-FC hardware onto the Frame or Instrument Rail of the VDAS® compatible TecQuipment product. Think about the digital 'STP' cables supplied with the hardware and position the VDAS-FC Hardware in the Instrument Rail so that the cables will be neat and will not interfere with any moving parts of the TecQuipment product.

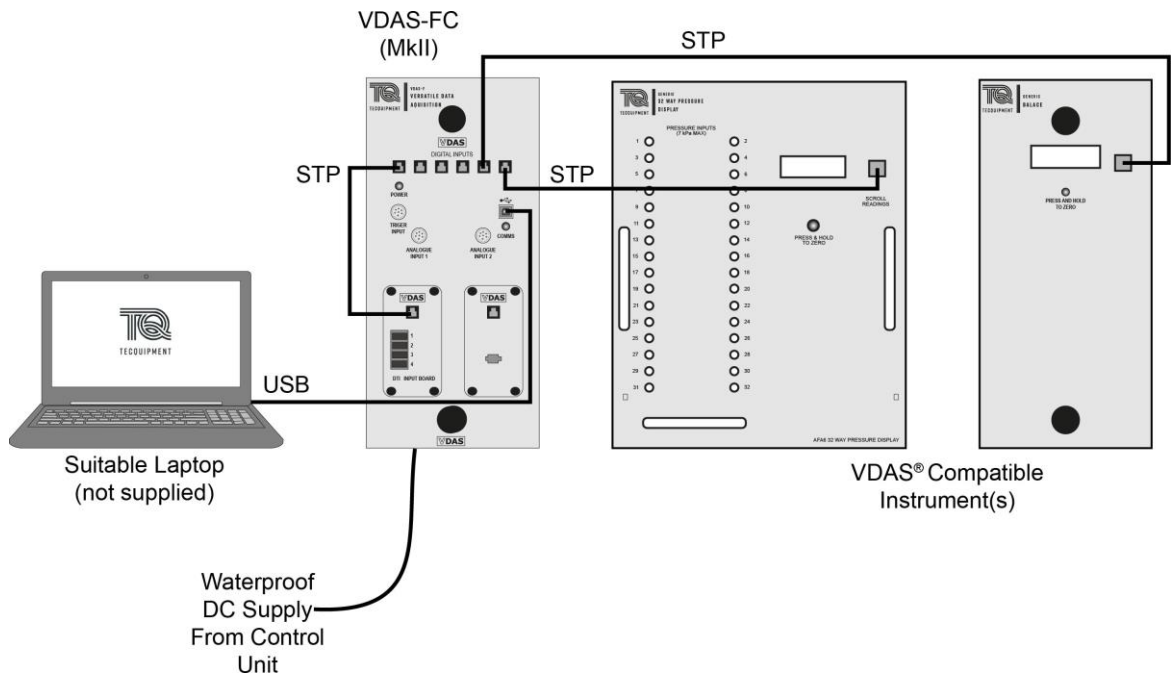3. Connect the waterproof DC connection from the TecQuipment Control Unit to the VDAS-FC.

Figure 11 Typical System Connections for the VDAS-FC

VDAS-B, VDAS-F and VDAS-FC Installation

1. Use the 'STP' (Shielded Twisted Pair) leads supplied to connect the VDAS® compatible product to *any* of the 'Digital Inputs' of the interface.

2. If using the DTI Input Board (see **'DTI Connection'** on page 19), connect the short lead from its 'Digital Output' socket to one of the six 'Digital Input' sockets of the interface. Connect the SPC leads supplied with Dial Test Indicators or Digital Transducers to connect them to the DTI Input Board digital inputs.

3. Use the analogue cables supplied with selected TecQuipment products to connect them to the Analogue Inputs.

4. Connect the USB cable (supplied) from the interface to a suitable computer.

Integrated-VDAS Installation

1. Figure 12 shows typical connections for Integrated-VDAS®.

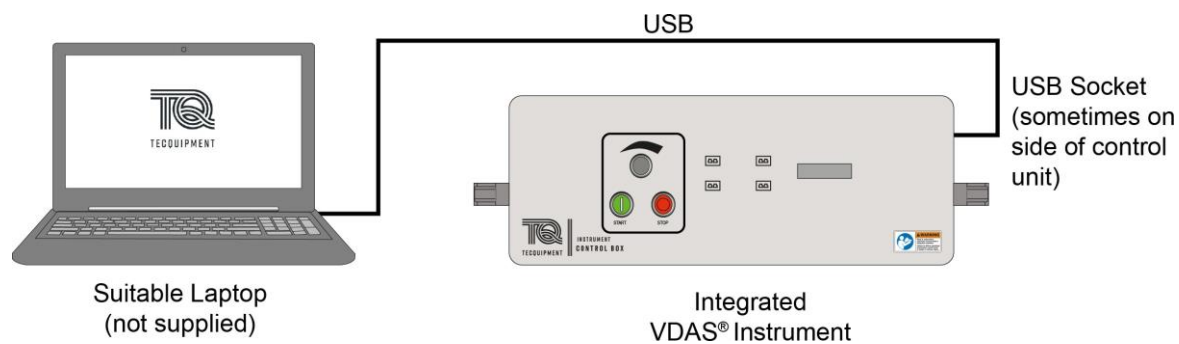2. Connect the USB cable (supplied) from the VDAS® socket on the apparatus to a suitable computer.

Figure 12 Typical System Connections for Integrated-VDAS

Analogue and Trigger Inputs Installation

The TecQuipment products which use the Analogue or Trigger Inputs will be supplied with suitable DIN cables to connect to the equipment. These inputs are wired to the standard as shown in Figure 13.
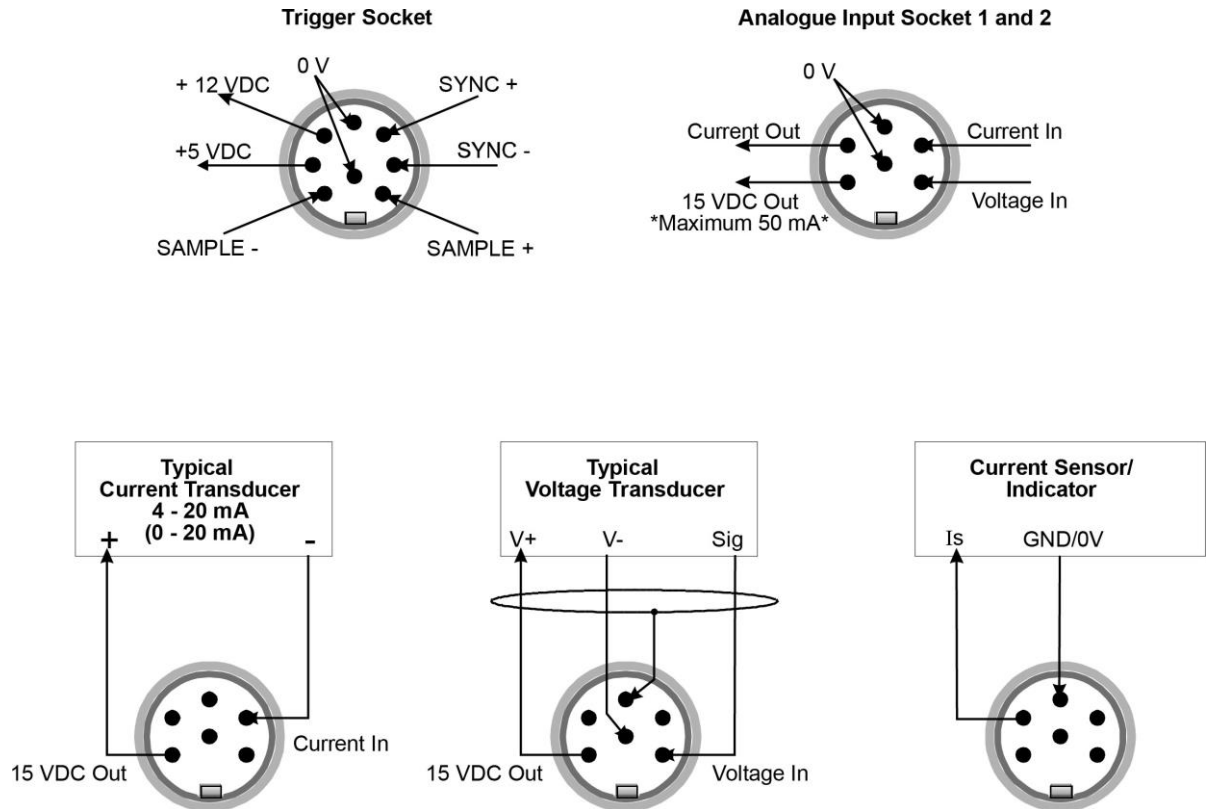

Figure 13 Sensor Connections for the Analogue and Trigger Inputs

NOTE   *Only the Analogue Voltage Inputs link to the VDAS® (MkII) Trace Window, because they accept the faster moving signals. The Analogue Current Inputs accept only very slow moving signals and link to the standard Data Fields.*

Modular Board Installation

TecQuipment supply some products with alternative Modular Boards that fit in place of the blank plate.

To fit the boards:

NOTE 👆 *This procedure shows the VDAS-F. The procedure for the VDAS-B and VDAS-FC are similar.*

1. Disconnect the electrical supply to the VDAS® Hardware.

2. Unscrew the fixings for the blank plate (see Figure 14).

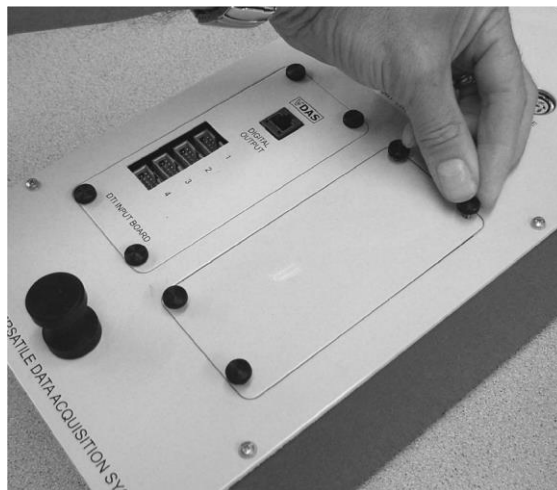3. Carefully lift the blank plate (see Figure 15).

Figure 14 Unscrew the Fixings (VDAS-F Hardware shown, VDAS-FC and VDAS-B are similar)
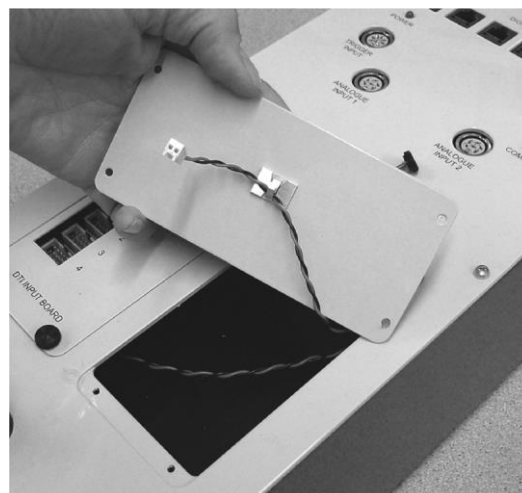

Figure 15 Carefully Lift the Blank Plate

4. Under the blank plate, is the low voltage power supply plug ready for the new board.

5. Carefully remove the blank plate and store it safely.

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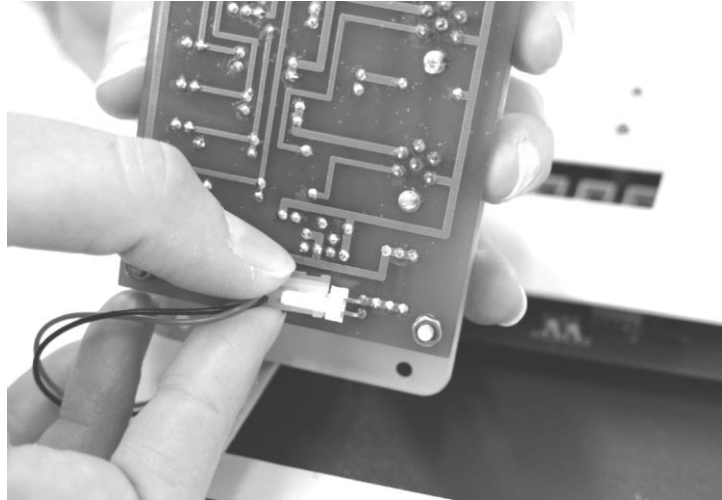

Figure 16 Fit the Plug Into the Socket of the New Board

DTI Connection

The Dial Test Indicators (DTIs) have a small flexible dust cover, which protects their connection sockets. Use fingers to carefully remove the cover. Insert the end of the 'SPC' cable (where supplied) into the DTI connection sockets. Keep the flexible cover safe to refit it when storing the equipment.
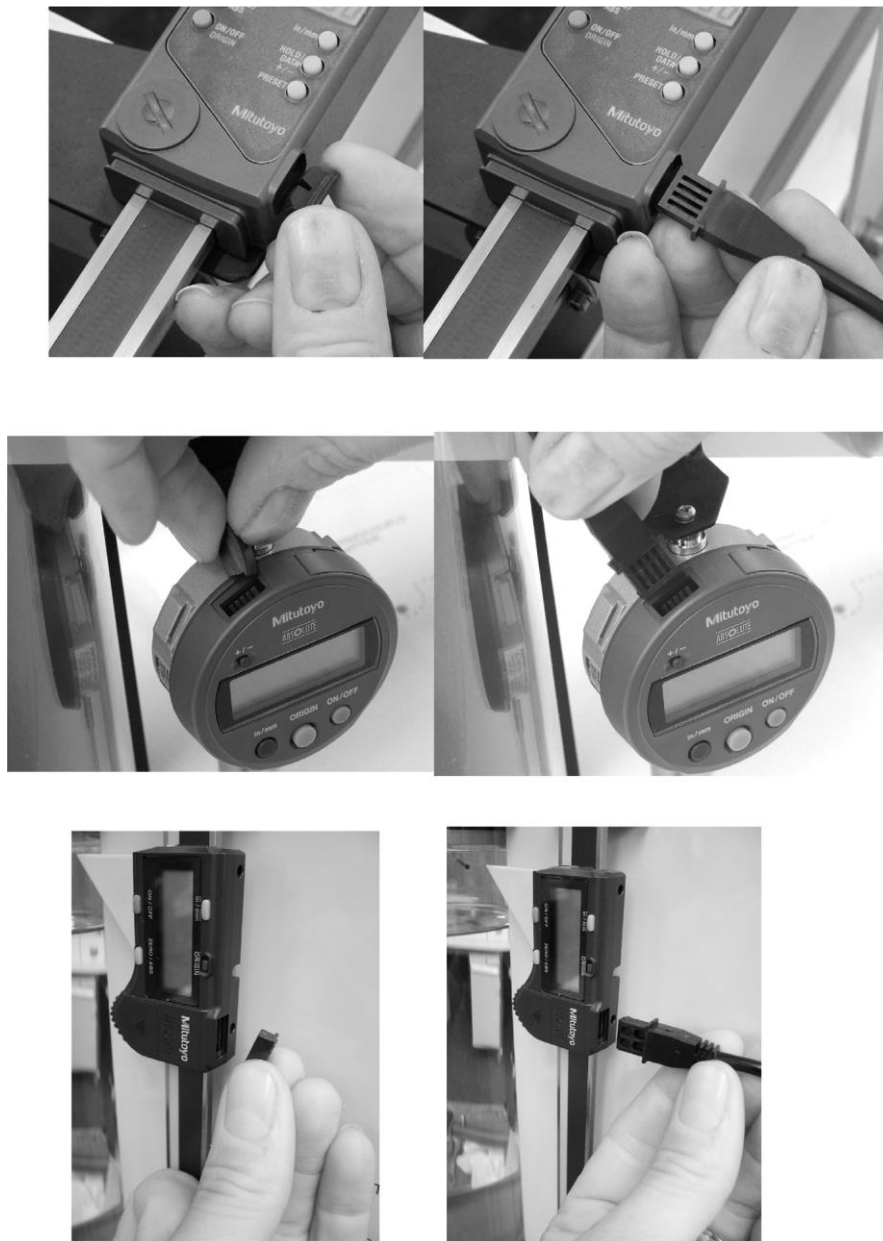
Figure 17 Typical DTI Connection Sockets

VDAS® Software Installation

The latest software is available from the TecQuipment website www.tecquipment.com. Alternatively CD-ROMs can be provided on request. To install the software it is necessary to have a computer (PC) with the specifications shown in **'Technical Details'** on page 9.

NOTE

The software will only install if logged in as an administrator. If not, then an error will appear and the computer system administrator must be contacted to install the software.

If there are problems with the installation, it may help to turn off the virus checker software before starting. Turn it back on when the installation has finished.

To install the software:

1. Download the VDAS® installer from the TecQuipment website (www.tecquipment.com/downloads) or insert the VDAS® CD-ROM.

2. Run the downloaded installer or double-click on the file called 'Setup.exe' on the CD-ROM. The software will now start the installation process.

3. The first screen of the TecQuipment software will appear as in Figure 18. Read the license terms and conditions, then select the option to agree. Click on the 'Install' button.

4. The installer will check whether Microsoft .NET Framework 4.6 is already installed on the PC.

   - If the correct .NET Framework **is not** present, then installation will continue as in Step 5.

   - If the correct .NET Framework **is** present then the installation will continue as in Step 6.

NOTE

Windows 10 includes the .NET Framework already installed, so it does not need to be re-installed.

VDAS® Software will not work unless the PC has the correct .NET Framework software.

5. The Dialogue Boxes will appear as shown in Figure 19. The .NET Framework may take several minutes to install.

6. The software will now complete its installation onto the PC. It will create a new 'TecQuipment VDAS', Icon on the desktop and a new program group on the **Start-Programs** menu.

   If the .NET Framework was installed, then the final screen asks for the computer to be restarted as in Figure 20 so that the .NET Framework software works correctly.

   If the computer already had .NET Framework, then the final screen allows the VDAS® Software to be launched as in Figure 21.

NOTE

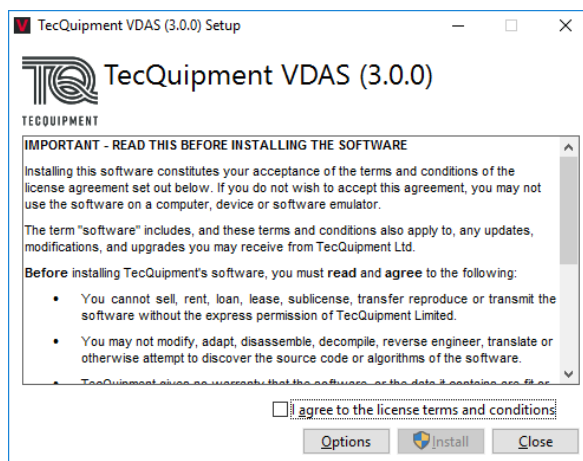*TecQuipment recommends that any relevant Microsoft operating system updates are installed.*

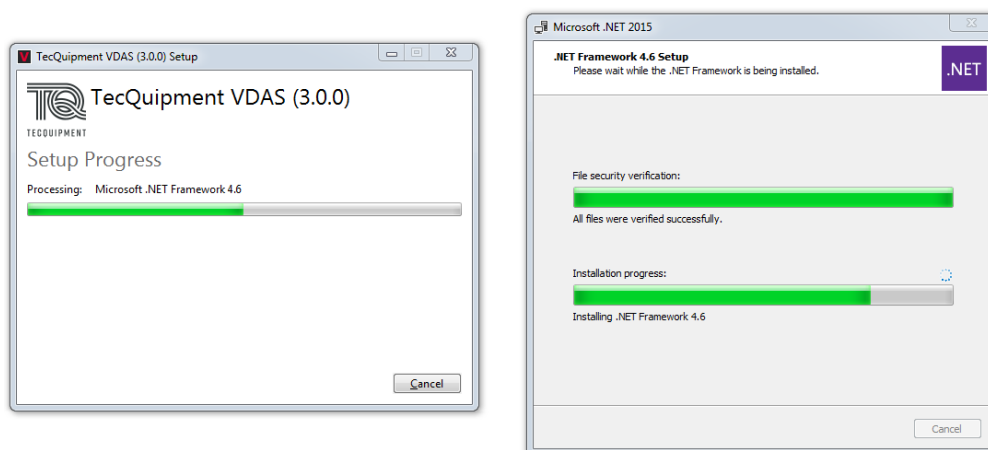Figure 18 First VDAS® Installation Screen

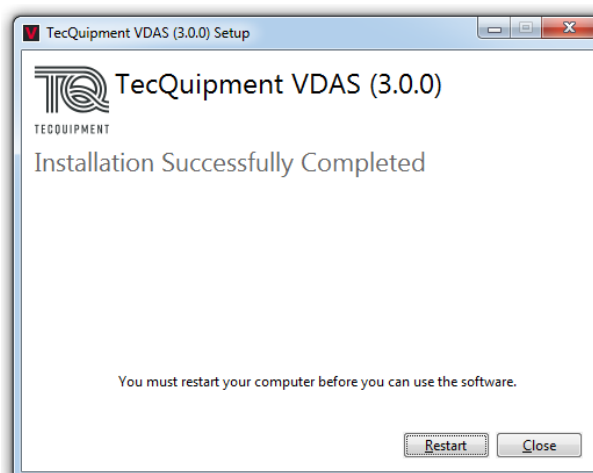Figure 19 Microsoft .NET Framework Setup

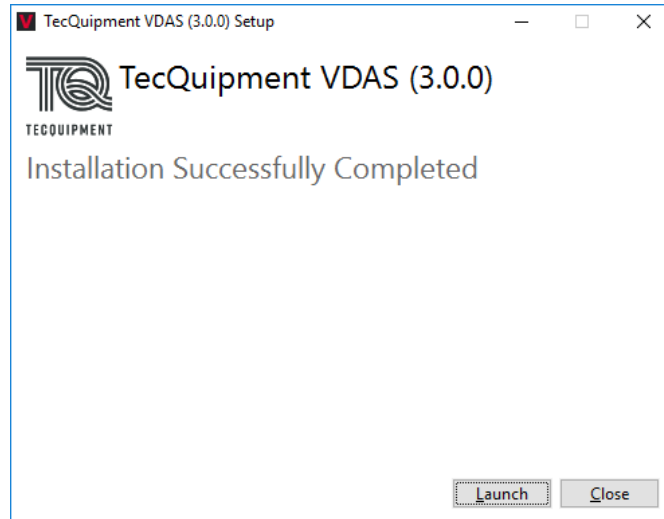Figure 20 Installation Completed - Restart

Figure 21 Installation Completed - Launch

7. The first time that VDAS® is used, the software will show a 'Select TecQuipment Application' Screen (see Figure 22). Use this screen to select the TecQuipment VDAS® compatible product that the VDAS® Software is to be used with. The software will then load the correct settings and Layout for the product.
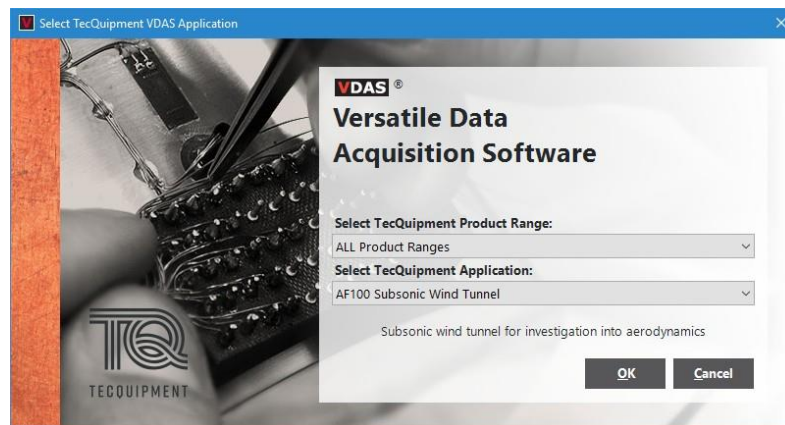

Figure 22 The 'Select TecQuipment Application' Screen

Starting the VDAS® Software

1. Switch on the computer and the VDAS® Hardware.

2. On the computer, double-click on the "TecQuipment VDAS" Icon on the desktop (see Figure 23).

3. A 'Splash Screen' will appear as in Figure 24.

4. After a few seconds, the VDAS® Window will open.

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

Figure 23 Desktop Icon

Figure 24 The VDAS® 'Splash Screen'.

For further information on how to use the VDAS® Software, please go to the VDAS® Help - Help Menu or press F1 on the keyboard within the VDAS® Software (Figure 25).
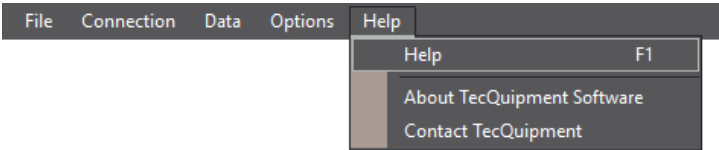

Figure 25 VDAS® Help - Help Menu

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

Only the VDAS-F has a renewable fuse, it is located at the IEC socket at the rear of the box.

- Isolate the apparatus from the electrical supply.
- Use a small flat bladed screwdriver to open the fuse carrier.
- Renew the fuse.
- Reconnect the apparatus to the electrical supply and switch on.
- If the apparatus fails again, contact TecQuipment Ltd or the local agent for advice.

NOTE

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

Spare Parts

Check the Packing Contents List to see what spare parts are sent with the apparatus.

If technical help or spares are needed, please contact the local TecQuipment Agent, or contact TecQuipment direct.

When asking for spares, please tell us:

- Contact Name

- The full name and address of the college, company or institution

- Contact email address

- The TecQuipment product name and product reference

- The TecQuipment part number (if known)

- The serial number

- The year it was bought (if known)

Please give us as much detail as possible about the parts needed and check the details carefully before contacting us.

If the product is out of warranty, TecQuipment will advise the price of the spare parts.

Customer Care

We hope our products and manuals are liked. If there are 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.