Anville Instruments

Series 825 Thermal Validation Interface

Hardware User Manual
(QMF 37-1)

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CONTENTS

AN OVERVIEW OF THIS USER MANUAL

This manual is divided into 4 parts. Part I introduces you to the SERIES 825. Starting with Part II, the manual shows you how to configure and operate the unit. After mastering the system, you can use the manual as a handy reference. When you need help with a specific problem, turn to the appropriate area of the manual that describes that part of the system.

To give you an idea of the manual's layout, here is a description of each part of the manual:

- Part I describes the hardware for both the SERIES 825 and the computer system.

- Part II tells you how to connect the SERIES 825 unit to your computer.

- Part III describes system hardware configuration and tells you how to connect the different types of sensors.

- Part IV provides specifications for the SERIES 825 equipment.

PART I: INTRODUCTION TO SERIES 825

OVERVIEW

Welcome to the Series 825 Thermal Validation Interface which provide a combination of 16 thermocouple and 2 4-20mA analogue inputs. The unit can operate in conjunction with a wide variety of bespoke or SCADA computer based software packages. The Series 825 is connected to a compatible computer system which provides the SCADA software operating environment working under Windows 2000 or Windows XP.

The compact hardware provides 16 thermocouple and 2 4-20mA analogue inputs. Connection to a computer, using the supplied cable, is made via a USB serial link. The SERIES 825's internal microcontroller converts all inputs into their correct engineering units for transmission to the host computer.

COMPATIBLE COMPUTER SYSTEM

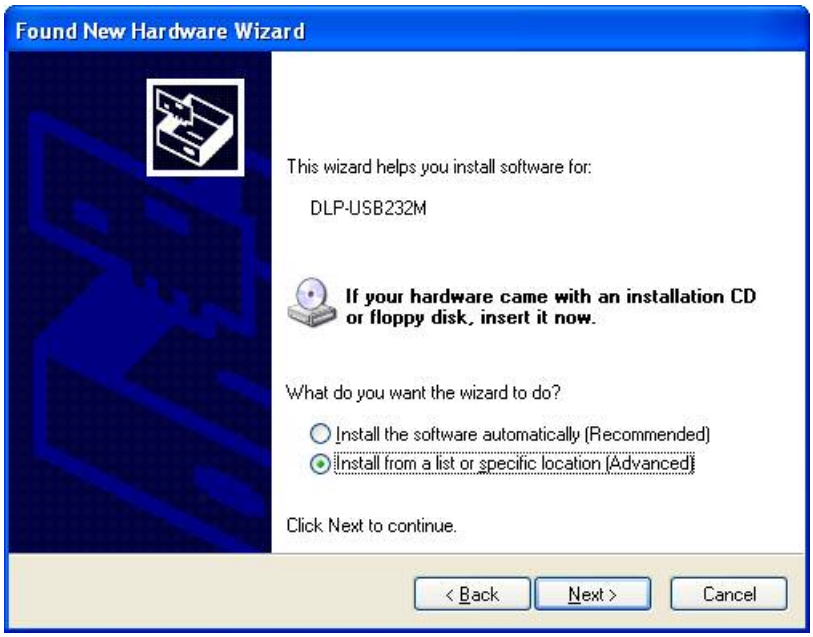
Any currently available computer having a Pentium 4 or similar processor. The computer; whether a desktop or portable model should contain a CD-ROM drive and a free USB port. The supplied USB cable is then used to connect the data logger and computer together. Please note that you may need to be an Administrator on the computer account to install hardware or software.

PART II: CONNECTING THE SERIES 825 TO YOUR COMPUTER

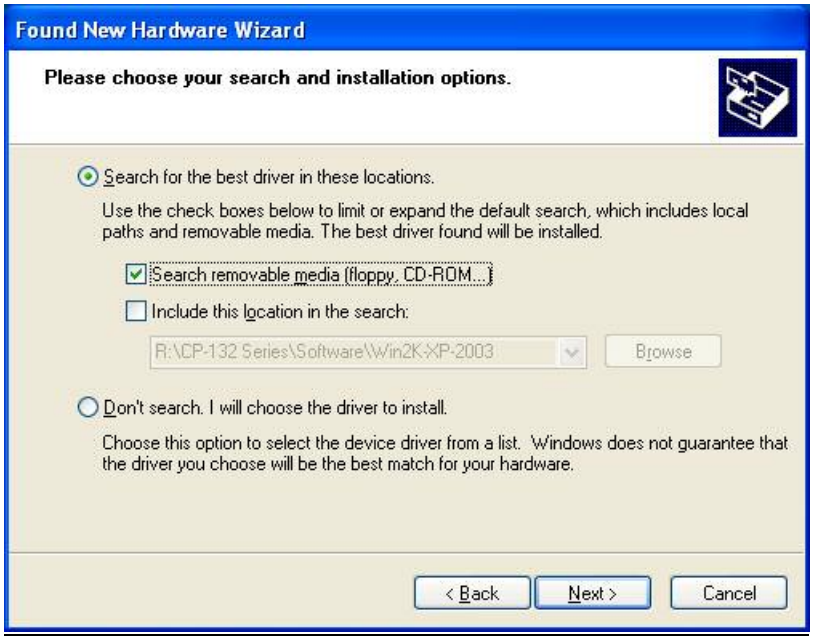
Installing the USB drivers

Before using the system for the first time it is necessary to install some USB drivers on to your PC. To do this first plug the USB cable into the data logger and the computer. You do not need to power the data logger as the USB port is powered by the computer. You will see a message in the bottom right-hand corner of your screen 'Found new hardware'. Follow the on screen instructions.

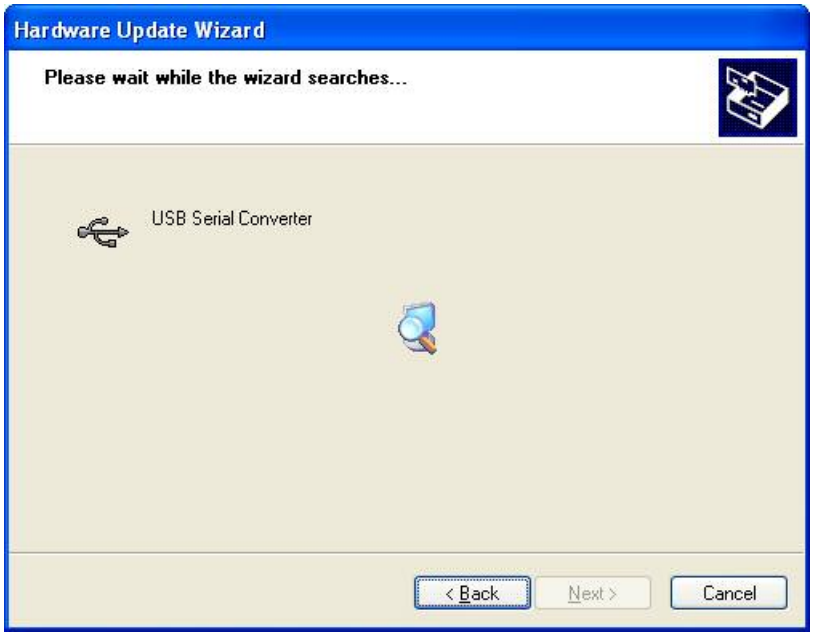
You are asked to connect to Windows Update choose No, not this time.
Insert the EaziVal™ CDROM into your drive.



Choose the install from a specific location option and click next.



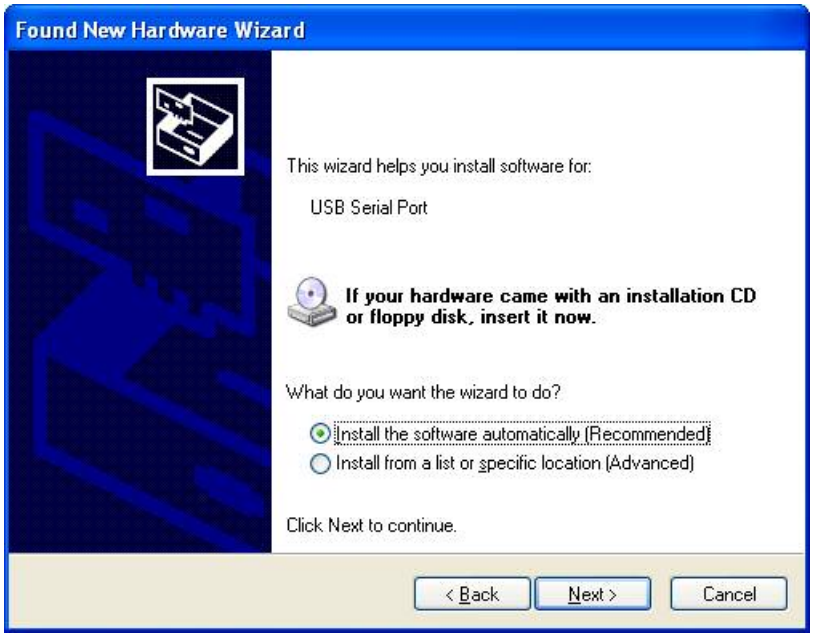
Check the search for the best driver in these locations and check the search removable media option then click next. You will see the following message whilst Windows looks for the drivers.



You will see the message above then the following message.

Next you will see the found new hardware message again.

Follow the same procedure as before, select No, not this time and click next. You will see the following message.



Choose install the software automatically and click next.

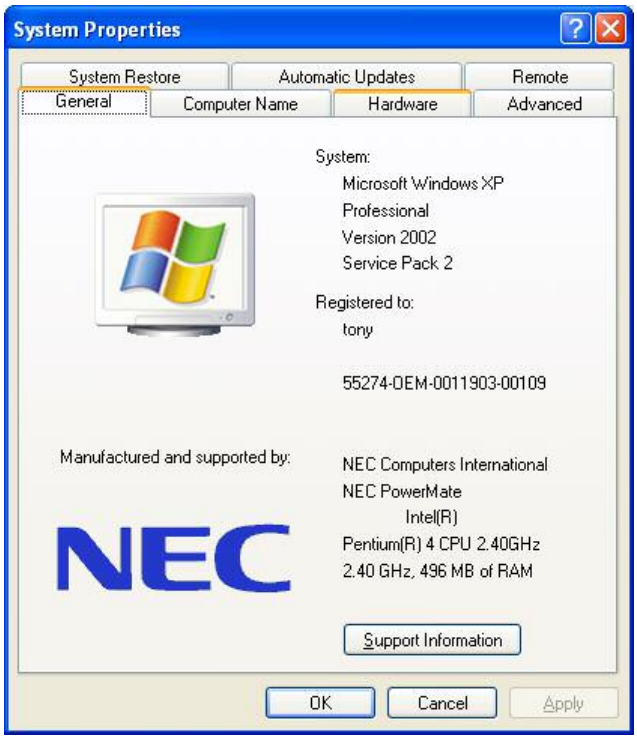
You will see the following two messages.

Finally you should see the following message.

Click on the finish button. The drivers are now installed. Please note that you will not need to repeat this procedure unless the drivers are uninstalled.

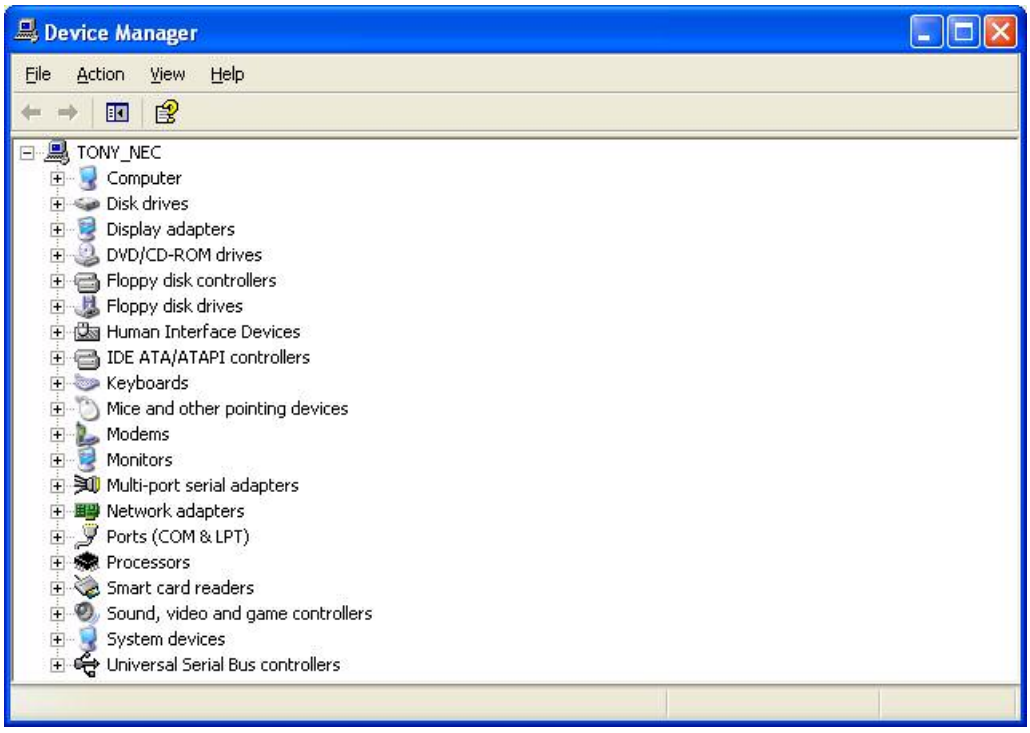
Finding out which com. Port the logger is connected to

Before attempting to use the system you need to find out which COM port the data logger has been allocated by Windows. To do this you need to open your Windows device manger. The quickest way to do this is to hold down the Windows button and press the break (pause) key.

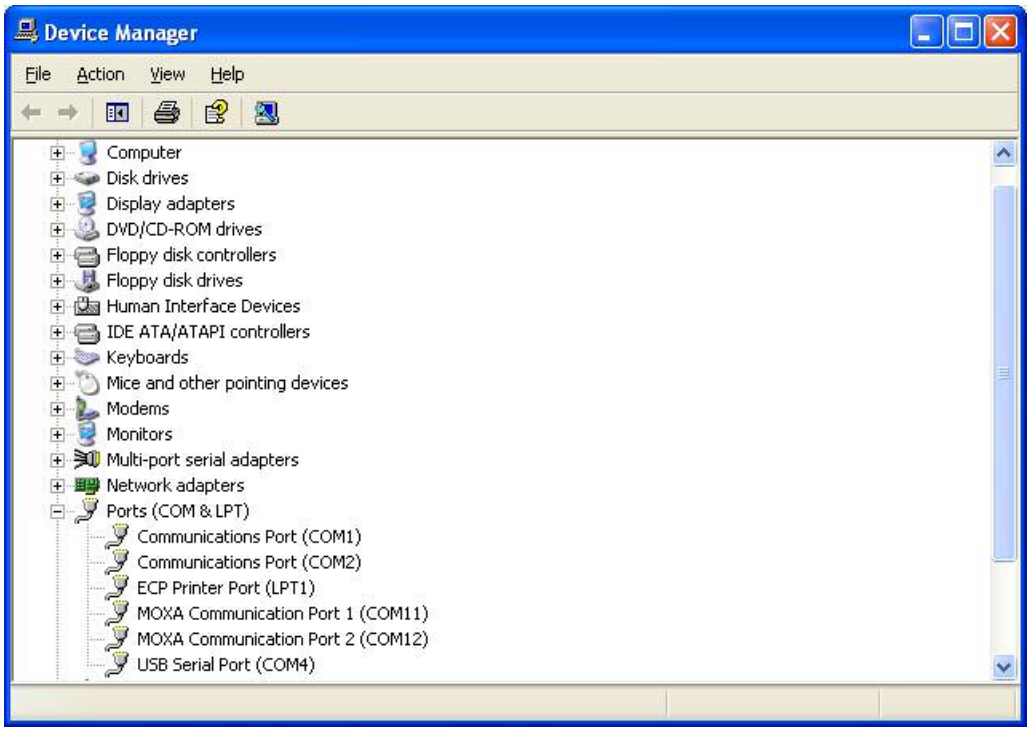


Click on the hardware tab then click device manager.

You will see a screen similar to that below.



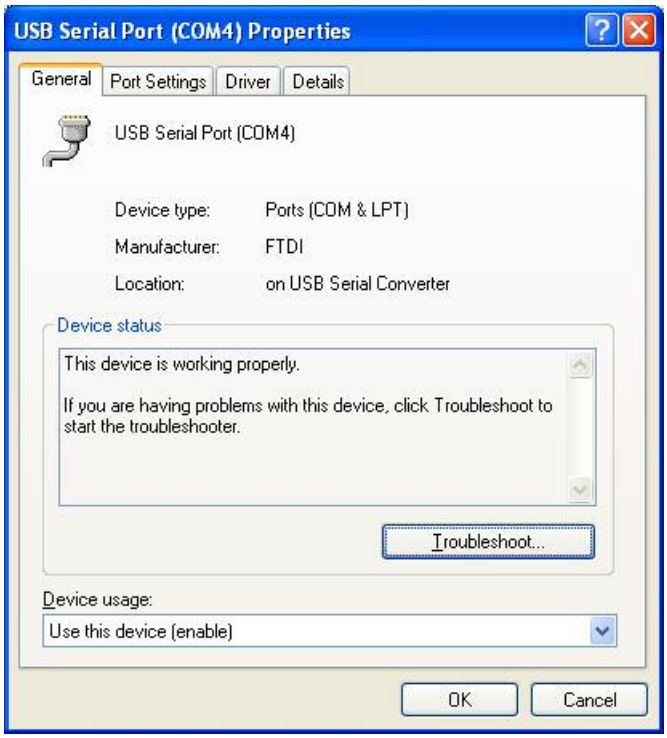
Click to expand the Ports object.



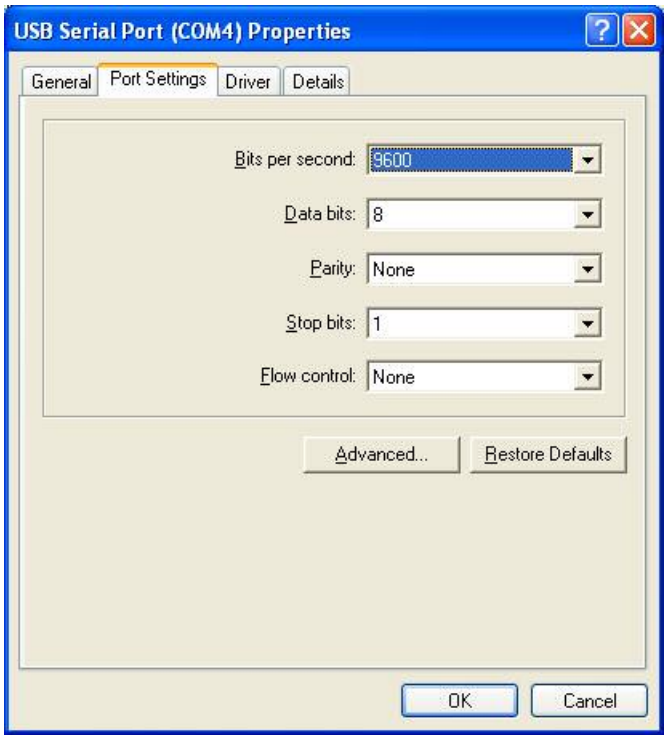
The port number is in brackets after the text USB Serial Port, (COM4) in the example above.

Changing the COM Port number

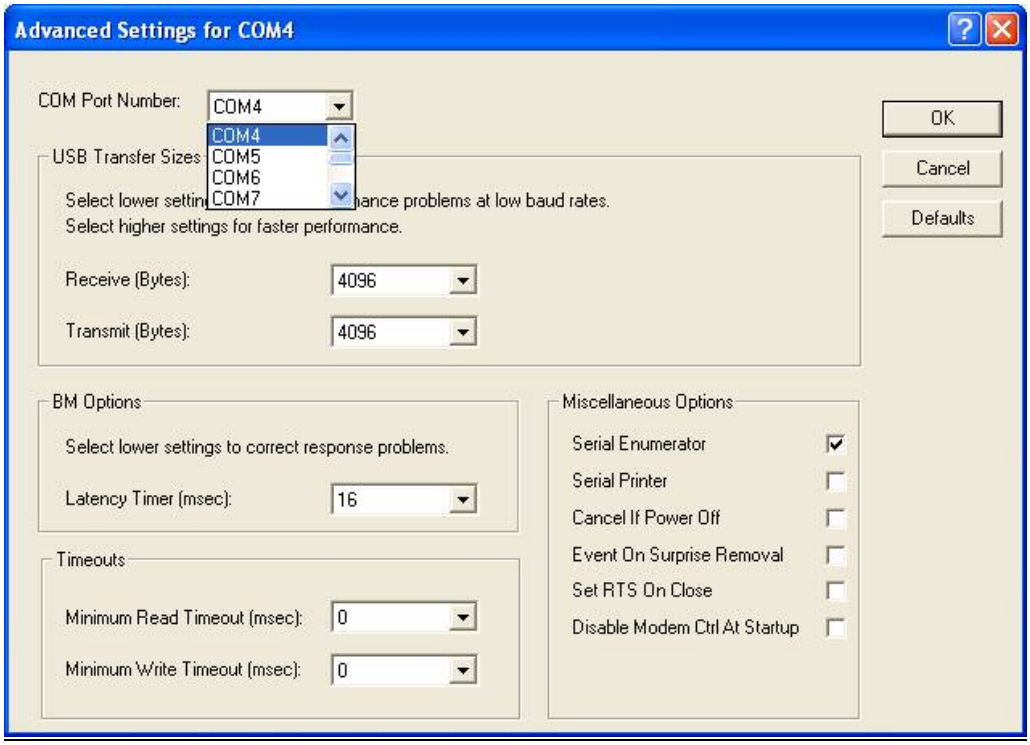
If the port number is not compatible with your software you can change it by double clicking the port.



Choose Port Settings and click on the advanced button.



You can now alter the port number by selecting from the drop down list.



Click OK to complete the change.

PART III: SERIES 825 CONFIGURATION

Communication Baud Rate

Your SERIES 825 is supplied with the baud rate pre-set to 19200. Please note that if you are using a SCADA package you must also set the same baud rate either in the SCADA package or in Windows Control Panel to match.

Communication Format

The communication format is fixed and will consist of 8 data bits, 1 stop bit, no parity, flow control- none. Please note that if you are **not** using the software supplied it is very important that you set the communication format and baud rate for the chosen serial port using Windows device manager before operating the SERIES 825.

Communication Protocol

The protocol used is Modbus®. For a table of addresses for use with SCADA software please contact Anville Instruments Ltd.

Front Panel Connection Details

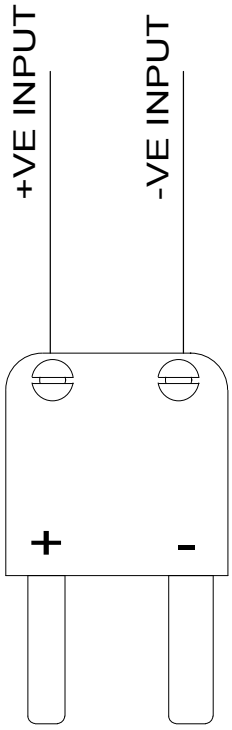
All connections are made using miniature plugs.

Thermocouple Inputs (channels TC1 to TC16)

CAUTION
Where thermocouples are used involving fluids or condensing gases, for example with Autoclaves, they must be connected to the data logger in one of two ways:

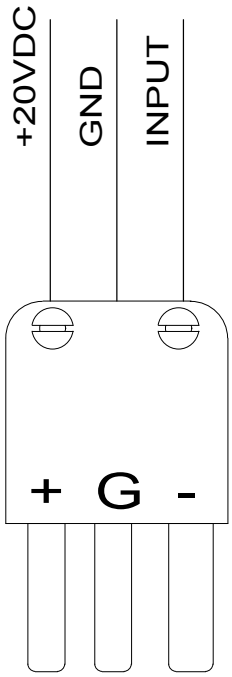
1. ***At a point lower than the logger, remove at least 2.5cm of insulating material from the thermocouple wire.***
2. ***Make thermocouple connections to the logger via flying leads, either below logger level or at a distance of 0.5 metres, with an in-line cable mounting socket attached.***

Both of these methods ensure that any liquids migrating up the thermocouple wire due to the capillary effect, escape before reaching the logger. Serious damage to the logger will result if liquid is allowed to enter.



4-20mA Analogue Input (channels PR1 and PR2)

On this input connector, +20V dc is supplied out of the +ve pin. This voltage is designed for use with instruments such as pressure transducers that are loop powered. The maximum available current is 100mA. The negative lead of the transducer should be connected to the –ve input pin. For devices that are self powered e.g. gas or conductivity sensors, connect the transducer positive output to the –ve (thick) input pin and the transducer –ve output to the GND (middle) pin.



Rear Panel Connection Details

Power

Note: *in order to comply with European EMC legislation the Series 825 must be connected to mains earth. No action is necessary if the supplied mains adapter is used.*

The SERIES 825 is dc powered requiring +24V at 0.65A. The unit is supplied with a 100-240V AC mains adapter which will provide correct input voltage. Power enters the SERIES 825 via the 4 pin latching connector on the rear panel. To connect push the plug into the socket until you hear a slight click. To disconnect squeeze the lever on the side of the plug then pull gently.

Pin	Signal name
1	Earth
2	0V
3	+24V
4	NC

USB

The USB port is located above the power input socket. The USB plug should be inserted until you feel it engage with the detents. To remove the USB plug pull.

Switch

The Switch input is supported in the Eazival software and can be used to place marks in the data. An on/off push button switch with 5m cable and 6.35mm jack plug is supplied with the unit.

PART IV: SPECIFICATIONS

DATA LOGGER

Construction

The SERIES 825 data logger is enclosed in a metal housing. Four plastic feet are fitted to the bottom.

Dimensions: 287mm long, 234mm wide, 143mm deep (including feet).

Connectors

- 18 inputs (combination of 16 thermocouple and 2 4-20mA connectors).
- 1 USB port
- 1 power input
- Switch input

Mounting and Ventilation

The unit is designed to be a bench instrument. It requires no special ventilation requirements.

Cleaning

Use a non-abrasive or foam cleaner.

ANALOGUE INPUTS

Direct Current

Range	Resolution	Accuracy
0-20mA	1uA	±0.1%

Thermocouples

Input range °C	Input function	Resolution °C	Accuracy °C*
-200 to -50	T thermocouple	0.01	± 0.35
-50 to +300	T thermocouple	0.01	± 0.25

* Note: accuracy includes cold junction error over an ambient range 0°C to +50°C.

Signal conditioning

For thermocouple and 4-20mA transducers.

Transducer energisation

- For 4-20mA current loop: constant voltage of 20V 100mA maximum current, short circuit protected.

Engineering units

As appropriate or selectable:
C, uA.

Scan speed

18 inputs per second.

Serial link

USB 1.1 and USB 2.0 compatible.

Cable length

Maximum cable length for USB direct operation is approximately 5 metres. This can be extended by the use of powered hubs.

Baud rate

19200.

Environmental Operating Range

0°C to 50°C.

Power requirements

+24V @ 0.65 Amps.

EMC standards Emissions EN61326 Class A. Immunity EN61326 Industrial locations.

Safety Specification EN61010-1

POWER SUPPLY HES18

The power supply is an AC/DC switching power supply providing 18 watts maximum continuous output power. The supply is enclosed in plastic case with IEC320 inlet connector to mate with interchangeable mains cable for world-wide use. This model complies with CE requirements.

Input

Voltage: 90 to 264 VAC
Current: 0.75A
Frequency: 47 to 63Hz
Efficiency: 80% min at 17W output

Output

Voltage: +24V DC @ 0.75A max, ripple and noise 28mV
Power range: 0 to 18 watts.

Line regulation at full load Min. 90VAC Max. 264VAC
Min. 23.77
Max. 23.77

Load regulation at 230VAC:
Full load +24V= 23.77V.
Half load +24V= 23.82V.
Short circuit protection: yes

DC connector pin chart

Wire	Pin	Voltage
Blue	1	earth
Black	2	0V
Red	3	+24V
Orange	4	NC

General

Efficiency: 80% min at 17W output
Over voltage protection: 20% of full load.
Isolation: I/P to O/P >3000Vac
EMC standards EN55022 radiated and conducted Class B, EN61000-3-2 Class D, EN61000-4-1 to 4-11, ENV 50204.

COMPUTER (Depends on software to be used)

- Processor type: Pentium P4
- Processor speed: 2.5GHz
- Machine memory (RAM): 256Mb
- Display type: SVGA
- Hard-disc size: 20Gb
- Pointer device: Mouse or other compatible pointing device.
- USB:

DISPOSAL AT END OF PRODUCT LIFE

The product should be returned to Anville Instruments Ltd at the end of its useful life for correct disposal and recycling.

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Notes: