

COMPUTERISED SURFACE TESTING FACILITY OPERATING MANUAL

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European Declaration of Conformity

E DOC European Declaration of Conformity can be found within Related Documents at:

<https://www.ifdglobal.com/products/ansti-testing-equipment/ansti-computerised-surface-test-facility-cstf/>



Warnings

Electrical Warnings

The electricity supply used in the Computerised Surface Test Facility is at a voltage high enough to endanger life. Unauthorised maintenance is not permitted on any part of the system. If authorised maintenance is conducted, the person carrying out the work must ensure that the equipment is positively isolated from the electrical supply and tests made to verify that the isolation is complete before commencing work.

The electrical supply to the Computerised Surface Test Facility must have Residual Current Detection (RCD) and Surge Protection devices fitted, refer to 3.1.4.

The Computerised Surface Test Facility must be protectively earthed. Standard supply cables are fitted with earth cores.

Pressure Parts Warnings

The following Maximum Working Pressures must not be exceeded:

Mouth Pressure Transmitter : ± 50 mbar (± 0.725 psi)

Interstage Pressure Transmitter : 20 bar (290 psi)

Supply Pressure Transmitter & Gauge : 300 bar (4351 psi)

User Warnings

Users must never place their mouth over the mouthpiece.

All connections are to be visually inspected prior to each use.

Hose restraints are recommended.

All HP and interstage fittings are to be maintained and life limited in accordance with local regulations.

The Computerised Surface Test Facility (CSTF) has been designed to check a SCUBA supply pressure and the operating pressures of the mouthpiece only. Normal established safety procedures must be adhered to. The following instructions must not compromise safety to personnel.

The CSTF is designed for use only with Air. The facility is not oxygen clean and therefore must not be used with Oxygen, Oxygen rich air, Nitrox or any other potentially hazardous gas mixtures. Failure to comply may result in serious personal injury or death.

During operation the CSTF draws a high vacuum through the 2nd Stage mouthpiece adapter. It is imperative that nobody places their mouth over the 2nd Stage mouthpiece adapter as it could cause lung damage. It is the responsibility of the user to ensure that the test is not initiated until it is safe to do so.

Some low performance regulators may fail the CSTF flow performance test. It is the responsibility of the user to confirm with the appropriate regulator manufacturer that the model under test is able to flow at least 1000 litres/min of air under surface conditions.

Only clean, dry, and serviced regulators are to be tested on the CSTF. Ingress of water, sand, salt deposits or any foreign body into the CSTF will cause damage to the vacuum motor and may cause an electrical short. Premature failure of the motor or any other component due to this type damage will void the warranty.

Manual Handling of all components must be in accordance with Local Regulations.

Any modification to the equipment or use out with the operations and procedures detailed herein may compromise the protections built in to the equipment.

Competent Person

This manual is written for laboratory, production, or service personnel experienced in the use of high pressure air systems. Only **trained and qualified** personnel who are **competent** should connect to / use the CSTF and perform the operations described herein.

Connection / Calibration Warnings

It is recommended that the CSTF is used as a standalone machine and 3rd Party software should be closed before running the CSTF software to minimise any resource issues etc.. JFD shall not be responsible for any conflicts or installation issues due to 3rd party software, Internet Connection, Viruses, Malware, Spyware etc. Before installing the CSTF software a backup of your complete system is recommended.

For a client supplied Laptop / PC, It is recommended that a Windows 10 /11 Pro system is used with a minimum of two USB ports. If the CSTF software is installed on another version of Windows other than mentioned above the compatibility cannot be guaranteed.

Warning Symbols

The following symbols are used on the CSTF, they are defined as follows;



WARNING HIGH VACUUM

Users must never place their mouth over the mouthpiece.



Waste Electrical and Electronic Regulations (WEEE)

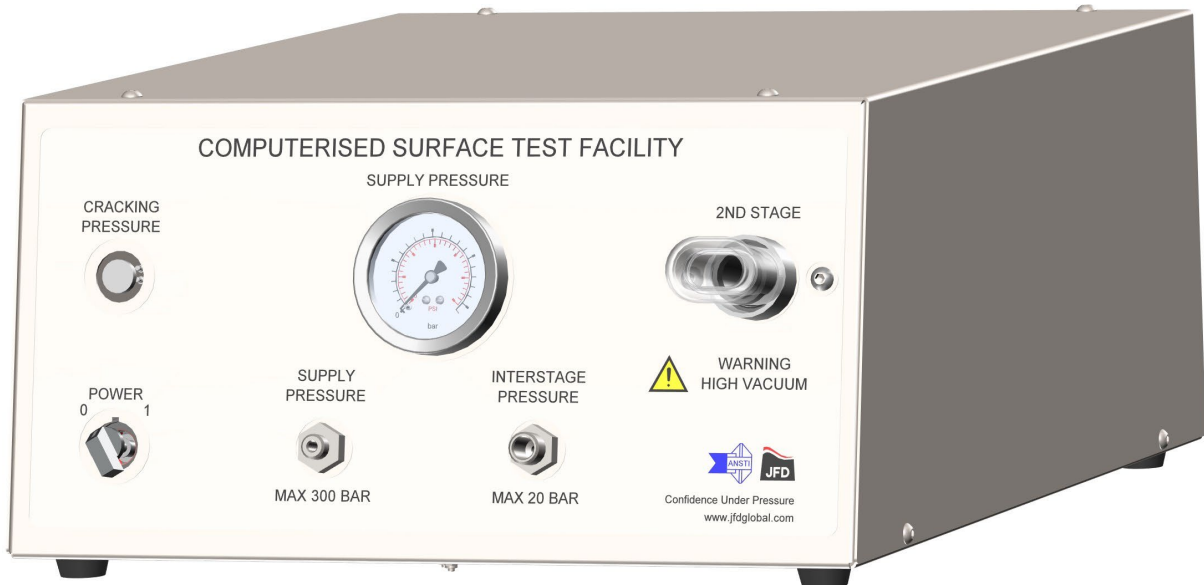
This product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.

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1 DESCRIPTION

- 1.1 The Computerised Surface Test Facility (CSTF) has been designed to check a SCUBA set's supply pressure and the operating pressures of its mouthpiece, by simulating a typical inhalation.

Figure 1. CSTF Control Console



- 1.2 Using breathing air (BS EN 12021:2014 or equivalent) stored under pressure in the SCUBA bottle, the operator can monitor the first stage supply regulator, cracking pressure of the second stage regulator and the inhalation pressure, at approximately 1000 LPM.
- 1.3 The software is intuitive to use providing a comprehensive customer and regulator database, digital readings for set-up purposes and a fully automated cracking pressure / high flow performance test.
- 1.4 The system functions using PC based software. A log of regulator types and serial numbers are captured prior to a test. Second stage cracking pressure can be manually checked before an automated test lasting twelve seconds is performed. Following the test, a certificate with results is generated showing the below pressure profiles and interactions over the duration of the test:
- Mouthpiece Pressure: The pressure on the mouthpiece at cracking and during maximum flow of approximately 1000 LPM.
 - Cylinder Pressure: The source pressure supplying the 1st Stage regulator.
 - Interstage pressure: The pressure delivered to the 2nd stage regulator, from the 1st.

- Cracking pressure: The pressure at which the 2nd stage regulator begins to open.
- 1.5 The operator can use the results from the test to adjust the SCUBA set as required, in simple terms, the mouthpiece pressure must not exceed -25 mbar during the automated test, as per EN250.
- 1.6 The CSTF is designed to be checked daily for manufacturer's tolerances by the operator via test orifice/s provided with the unit and set during manufacture as per the test orifice calibration certificate/s.
- 1.7 To allow set-up of the regulator after servicing, the CSTF digitally displays; (1) the interstage pressure for setting the 1st stage and (2) the cracking pressure for setting the 2nd stage. The fully automated, computer controlled flow test may then be initiated. This will measure / display the cracking pressure and during the high flow test measure / display the mouth pressure, interstage pressure drop and supply pressure drop. Upon completion of the test, the test data can be stored and also printed in the form of a Test Certificate, providing a record of the test for the customer. A regulator / customer history can be built up over a period of time for statistical records.
- 1.8 The high flow demanded by the CSTF approaches the peak flow requirements equivalent to a depth of 50 metres and 62.5 litres/min ventilation.
- 1.9 The CSTF features include:
- Real-time display of mouth pressure, interstage pressure and cylinder pressure.
 - Computer controlled cut-off if pressures exceed set tolerances.
 - Automatic cracking pressure and flow tests.
 - Quick test certificate printing.
 - Customer database facility linked to demand regulator test results.
 - Demand Regulator database facility.
 - Easy access and retrieval of archived test data.
 - Day Summary Record file and printout.
 - Limited User Calibratable (Mouth Pressure Only)

2 FACILITY SPECIFICATION / REQUIREMENTS

2.1 Control Console

Manufacturer	JFD Ltd.
Model	CSTF
Power Supply	AC 100 – 240·V (-15% / +10%)
Mains frequency	50 – 60·Hz ±6%
Current Rating	2.4 Amps
Power Rating	180 Watts
Weight	Approx 15 kg
Mouth Pressure Transmitter Range	± 50 mbar
Interstage Pressure Transmitter Range	0 to 20 bar
Supply Pressure Transmitter	0 to 350 bar
Supply Pressure Gauge	0 to 400 bar
Surface Flow Demand	1000 litres/min
Noise Level	< 70 dBa
Nameplate Details	Voltage Frequency Current Model No Serial No
Serial No. Marking	On rear of console

2.2 Laptop (If Supplied)

Operating System	Windows 10 or 11 Pro
Power Supply	AC 100 – 240·V (-15% / +10%)
Mains frequency	50 – 60·Hz ±6%

2.3 Operating Conditions

Temperature	22 ±5 °C
Relative Humidity	< 75% with no condensation
General Environment	Clean

2.4 Environmental Conditions

Location	Indoor use only
Altitude	< 2,000·m
Over Voltage Category	OVC II
Pollution Degree of the Intended Environment	PD2

3 OPERATING INSTRUCTIONS

Instructional videos are available to supplement the following instructions. Please refer to the following links.

<https://www.jfdglobal.com/products/ansti-testing-equipment/ansti-computerised-surface-test-facility-cstf/>



3.1 Assembly

- 3.1.1 The CSTF must be installed and operated in a clean, dry, indoor environment.
- 3.1.2 The CSTF comprises the following main components:
- Control Console : Weight approximately 15 kg
 - Laptop : Weight approximately 5 kg
(If supplied)
 - Printer (not supplied by JFD)
 - USB Memory Stick (If supplied)
- 3.1.3 Unpack each component and connect the Laptop and printer in accordance with the manufacturer's instructions. Ensure that they are positioned and organised to provide a safe and comfortable work environment. Refer to relevant documentation supplied with the Laptop and printer. If you have opted to supply your own PC please refer to Appendix 1 for instructions on installation and setup.
- 3.1.4 It is strongly recommended that a Belkin 'SurgeMaster' (or similar) device is used to provide protection for the CSTF components against mains electrical noise / voltage surges.
- 3.1.5 Position the control console a with minimum of 50-mm clear space at the rear of the unit and allowing easy access to disconnect the mains supply.

WARNING
USE OF INADEQUATE MAINS POWER SUPPLY CABLES IS
HAZARDOUS AND MAY INVALIDATE CERTIFICATES GENERATED.
REFER TO SECTION 6 FOR COMPATIBLE MAINS SUPPLY CABLES.

- 3.1.6 Position the laptop/PC and printer adjacent to the control console. Connect the USB cable from the laptop/PC to the rear of the control console. Plug in the electrical supply cable into the socket in the rear of the control console.
- 3.1.7 Plug the laptop/PC, control console and printer (not supplied) into the Surge / Filter strip and then plug it into an electrical socket that has Residual Current Detection protection.
- 3.1.8 Ensure all power and USB cables are routed and retained correctly. No cables should be laid across the floor.
- 3.1.9 Disassembly of the CSTF is the reverse of the above.

3.2 Start Up

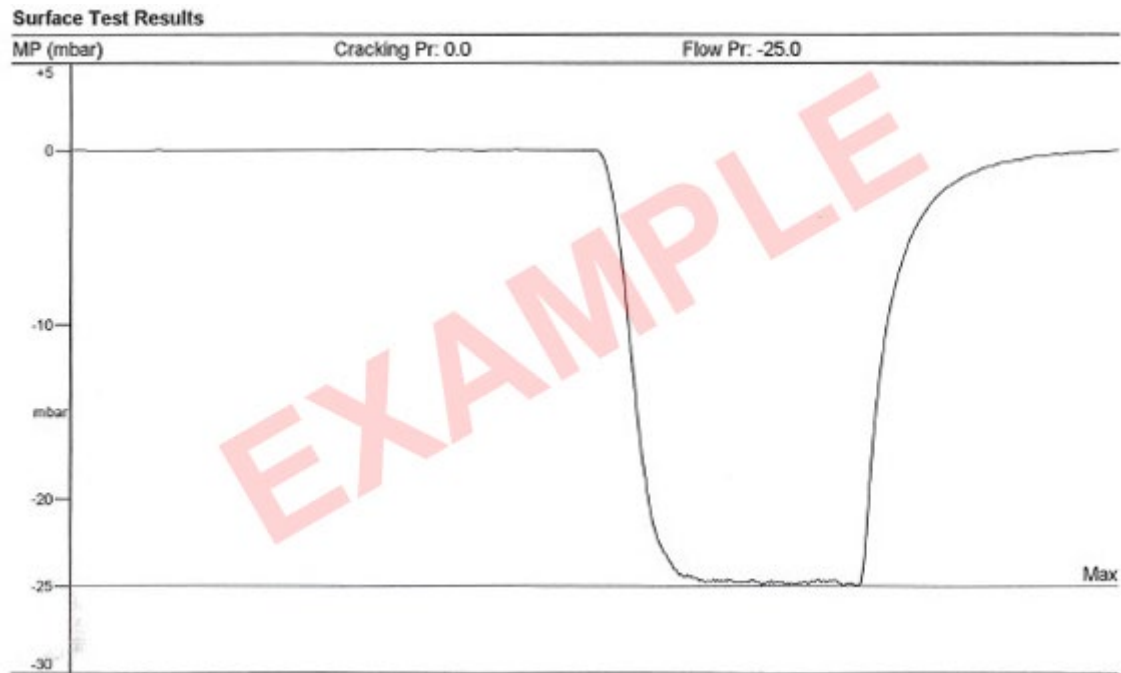
- 3.2.1 Ensure there is a minimum of 60 bar air supply to conduct the tests.
- 3.2.2 Check the threads of the Supply and Interstage Pressure connectors are sound and not damaged.
- 3.2.3 Ensure the 2nd Stage silicone mouthpiece adapter is not obstructed, is not split and in general good condition.
- 3.2.4 Turn on power to the Laptop/PC and printer. The computer will boot into the Windows desktop. To start the program, double click the ANSTI icon (shortcut) on the desktop.
- 3.2.5 When the program loads, it first carries out an initialization test to ensure the computers speed is adequate. This takes 2 seconds, during which it is important not to use the mouse or keyboard. If you experience an error message when loading the program, consult the troubleshooting section for assistance.
- 3.2.6 Once the program has loaded, the main screen is displayed. This consists of three Y-Time plots that display mouth pressure (top), interstage pressure (centre), and cylinder pressure (bottom).
- 3.2.7 Turn the mains power switch on CSTF Control Panel to the I position. A green light indicates a healthy power supply. See troubleshooting if there is no green light.

- 3.2.8 The yellow on black LED readouts on the right display the current readings for these three pressures respectively. All pressures should read zero. However, the mouth pressure sensor is very sensitive, so a small variation in readings will be apparent.
- 3.2.9 Due to the sensitivity of the mouth pressure sensor, it will occasionally, show a zero drift depending on the current atmospheric pressure conditions. Consequently, it is important to zero the mouth pressure on a regular basis. To zero the CSTF, ensure that there is no 2nd stage in the mouthpiece adapter and it is clear and unobstructed. Either click on the 'Zero (F12)' button with the mouse or press the 'F12' button on the keyboard. The program will then take a short sample to determine the new zero. No further action is necessary from the user.
- 3.2.10 At the bottom of the screen is a status bar. This is used to give important information while the program is running. When a saved results file is being viewed the file's details are displayed at the bottom of the screen.

3.3 Daily Calibration Check

- 3.3.1 Check the accuracy of the CSTF at the beginning and end of each day using the Test Orifice/s supplied. Subject to satisfactory orifice test results, this then qualifies all tests conducted that day.
- 3.3.2 Place the Test Orifice in the 2nd Stage silicone mouthpiece adapter; ensuring it is fully engaged up to the shoulder. Press 'F1' and enter in the 'Remarks' box 'Test Orifice Check'. Select the 'Orifice Test' Check Box located at the bottom of the screen. Press 'OK' to accept the test details entered and then press 'OK' again to start the test.

Figure 2. Example Surface Test Results



- 3.3.3 Save the test results and print a copy of the Test Certificate for your records.
- 3.3.4 Repeat instructions for second test orifice if supplied.
- 3.3.5 To validate the daily checks the Flow must be within the values and tolerances as displayed in the test orifice certificate originally provided with the CSTF.

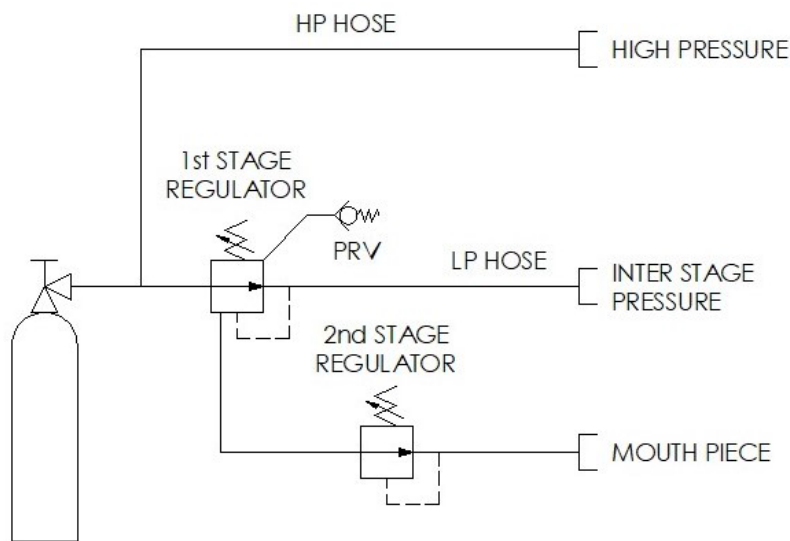
3.4 Demand Regulator Set-up

- 3.4.1 After the demand and interstage regulators have been serviced and dried (if not new), the interstage pressure and the 2nd stage cracking pressure can be set using the CSTF.
- 3.4.2 Clean using a locally approved non-alcohol based disinfectant.
- 3.4.3 Check SCUBA set is fully functional and setting of the first stage regulator is adjusted to the manufacturer's recommendations of the 2nd stage regulator, prior to connection to the CSTF.

WARNING
ENSURE THE INTERSTAGE PRESSURE HOSE AND DEMAND
REGULATOR IS PROTECTED BY A PRESSURE RELIEF VALVE OR
OTHER MEANS OF PRESSURE RELIEF PRIOR TO CONNECTION TO
THE CSTF.

3.4.4 Line up the connections to the CSTF in accordance with Figure 3 as follows:

Figure 3. Test Set-up Schematic



3.4.5 Connect the 1st stage to a cylinder containing air at the appropriate pressure. **Do not open the cylinder valve.**

3.4.6 Check condition of the hose prior to connecting to the CSTF. Connect an HP hose from the **high pressure** port on the 1st stage to the $\frac{7}{16}$ -20 UNF 'Supply Pressure' connector on the CSTF, ensuring the small 'flanged' seal pin is in position. The hose swivel nut should only be screwed **hand tight** on the CSTF connector. Use of a hose restraint is recommended.



3.4.7 Check condition of the hose prior to connection to the CSTF. Connect an interstage hose from a **low pressure** port on the 1st stage to the $\frac{9}{16}$ -18 UNF 'Interstage Pressure' connector on the CSTF. The hose swivel nut should only be **hand tight** on the CSTF connector. Use of a hose restraint is recommended.



- 3.4.8 Slowly open the cylinder valve and check the test setup for leaks.
- 3.4.9 Check the supply pressure on both the monitor readout and the gauge. Purge the 2nd stage a few times to confirm correct function of the demand regulator.
- 3.4.10 Ensure the 2nd stage is clean / dry and push into the silicone mouthpiece adapter, making sure it's fully in.
- 3.4.11 Check the 1st stage using the interstage pressure reading on the monitor and ensure this is suitable according to the manufacturer's recommendation of the 2nd stage regulator.
- 3.4.12 Check the 2nd stage cracking pressure by depressing and holding the 'Cracking Pressure' button on the CSTF and observing the mouthpiece pressure reading on the monitor. Remove from CSTF and adjust if required.

3.5 Demand Regulator Testing

- 3.5.1 After the regulator has been satisfactorily set-up, a full flow test may be initiated. If the 2nd stage has any adjustments, make sure to set the dive / venturi / breathing resistance as required. Check the Interstage Pressure and Supply Pressure readings to ensure there is air to conduct the test. To start the test press 'F1'. Alternatively, click 'Start / Stop Controls' from the main tool bar, and then click 'Begin Test Sequence F1'.
- 3.5.2 The 'Test Details' window will be displayed. Here you can specify all the information about the test you are about to carry out. In the first box you can allocate your own Job Reference. Then choose the customer whose regulator you are testing from the pull-down box. If the test is for a new customer click the "New Customer" button to add a new customer to the database. See Customer Database – Section 3.8 for further details.
- 3.5.3 Next you can select the 1st and 2nd stage regulators from the pull-down box. If the regulator you are testing is not listed click the "New Regulator" button. See Regulator Database – Section 3.9 for further details. Enter details of 1st and 2nd stage; it is important to record the serial numbers.
- 3.5.4 The next box is for 'Service Information'. The default comment is 'Full Service Kit'. However, you can add further details or you can delete this comment and enter other details.
- 3.5.5 In the 'Remarks' box you can enter any remarks specific to the test. It is recommended to note the 2nd stage adjustment settings. Note that you will have the opportunity to add / edit the remarks after the test.
- 3.5.6 At the bottom of the window is a section showing results. At this stage, these all read zero because the test has not taken place. Click the 'OK' button to continue.
- 3.5.7 You are now prompted to click OK when you are ready to begin the test. When ready, press the 'Enter' key or click 'OK' to start the test. The test is controlled by the computer so no further action is required.

IMPORTANT – TO STOP THE TEST AT ANY TIME PRESS 'ESC' KEY

- 3.5.8 The test is 12 seconds long. The first 3 seconds allows the system to stabilise. Between 3 and 6 seconds the cracking test is carried out. A flow test follows for a further 3 seconds, after which the pump turns off. The last three seconds allow the regulator to recover. Regulators with venturi and sensitivity controls may tend to continue flowing air and should be manually turned to their non-venturi operating position.

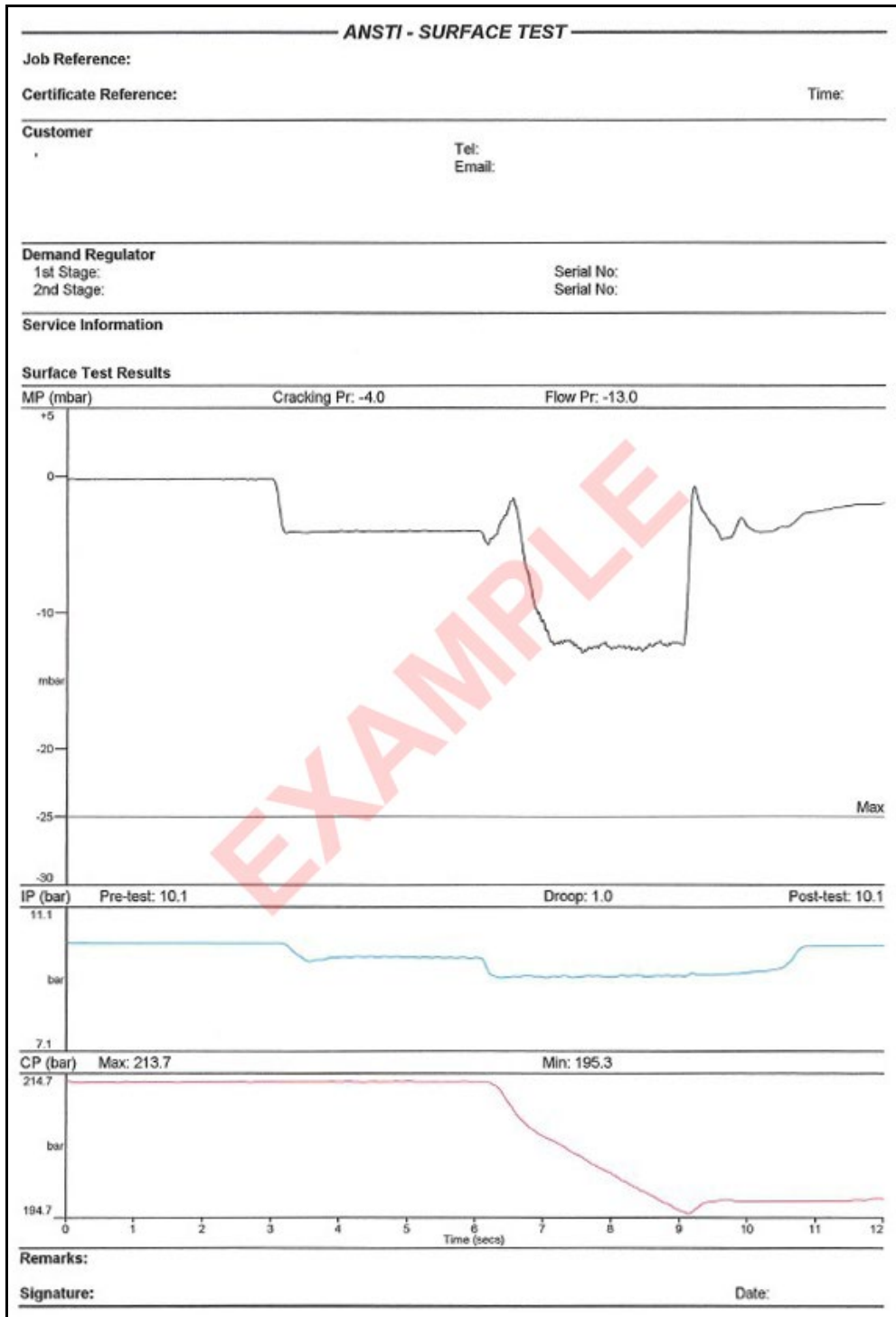
- 3.5.9 During the test, the 3 pressures are plotted in real-time. On completion of the test a screen box is displayed to allow you to edit / add remarks following the test. Click 'OK' to continue.
- 3.5.10 Click the 'Y' button to save the test results. Otherwise, the results are cleared immediately and the system becomes available for a repeat or new test. Note if 'N' is chosen, the results cannot be viewed or printed. Thus, in order to print a certificate or view the results you must choose the 'Y' option and save the results. The default is 'Yes'. The certificate may then be printed at a later date by opening the file and clicking 'File' then 'Print'.
- 3.5.11 If the mouth pressure drops below -40 mbar, the test will automatically stop. A warning window will appear stating 'MP is too Low. Test Stopped'. Press 'OK' to clear warning window. The 'Test Details' window opens presenting the same test data. Press 'OK' and save the test details. Note: if you do not save the test details, when you wish to re-test the regulator you will have to re-enter the test details.
- 3.5.12 Press 'F5' to re-test the regulator after any adjustments required. This will then open the saved test details window. Edit the remarks box as appropriate and press 'OK' to conduct re-test.

3.6 Interpretation of Results

- 3.6.1 Following a regulator test, the software will present the results in a certificate. Refer to Figure 4 for example certificate.
- 3.6.2 The first graph on the test results is the mouthpiece pressure against time. The first piece of data to note is the cracking pressure, this must be checked against the figure on the manufacturer's specification for the regulator. The flow pressure from the mouthpiece is also displayed on this graph and needs to be greater than -25 mbar as outlined in BS EN:250. It should be noted that due to the tolerances of the CSTF and variations in atmospheric conditions, the reading should be taken as + or - the allowable tolerance as per the test orifice certificate. For example if there is an allowance of + or - 2 mbar anything below -23 mbar should be treated as a potential fail.
- 3.6.3 The interstage pressure (IP) graph shows the pressure feed from the first stage regulator at the start of the test and at the end of the test, this is handy to see to make sure there is a consistent feed of pressure to the 2nd stage regulator. The drop is also displayed in order to determine the maximum pressure drop whilst the 2nd stage regulator is operational.
- 3.6.4 The final graph plots the cylinder pressure against time. Here you can see the pressure in the cylinder decreases under normal operation of the 2nd stage regulator. The figures at the top of this graph display the maximum pressure of

the cylinder supply, this will be the pressure of air inside the cylinder at the start of the test and also the minimum supply pressure, which will be the pressure in the cylinder at the end of the test.

Figure 4. Example Certificate



3.7 Opening a Saved File

- 3.7.1 From the main toolbar select 'File' and then 'Open'. The Open File window comprises two parts. The first is a table displaying the files on disk that can be loaded. To load a file simply double-click from the list or alternatively click it once to select it and then click the 'Open Selected File' button at the bottom of the window.
- 3.7.2 Additionally, there are 3 options to help find the desired file. The default option is 'None (Display All)' that shows all files on disk. To only show files from a certain date click the circular radio button then use the box to enter the date. The table will then update to show only those tests carried out on the specified date. Alternatively, you can choose to show only those files for a particular customer by clicking the circular button and then choosing the customer from the drop-down box. The last option allows you to search for files on job number. Enter the job number you wish to search for in the box and then click the 'Search for Job Reference' button.
- 3.7.3 Once a file is opened, it is plotted on the screen. Click on 'Test Details' from the main menu to review the test information. Note that once a test is saved, it cannot be changed. You may also wish to print a copy of the test certificate. Simply click 'File' then 'Print' from the main toolbar.

3.8 Customer Database

- 3.8.1 The program provides the facility for storing customer information. If the customer database is used, you can select the customer whose equipment you are testing so that their details are printed on the test certificate.
- 3.8.2 To view or make changes to the customer database choose 'Customers' from the main toolbar. To add new customers click the 'New Customer' button. A new window will be displayed to allow you to enter the name, address, telephone number, and email address of the customer. To save the new customer details click the 'Save Record' button. Otherwise, click the close button in the top right of the window to cancel the new customer record.
- 3.8.3 To view / edit the details held for a particular customer select their name from the list and press 'Edit Selected Customer' button. Their details may be edited as required. Click the 'Save Record' button to save any changes made.

3.9 Regulator Database

- 3.9.1 The regulator database can be used to store the different makes / models of regulators. The regulators stored here are the ones that are available to select

from when you carry out a test. To enter the database click 'Regulators' from the main toolbar. Select '1st Stage' or '2nd Stage' as desired.

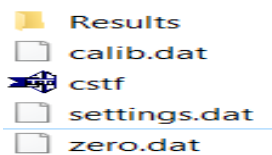
- 3.9.2 The regulators on file are shown in this window. To add a new regulator use the button provided. To edit or delete a regulator first select it from the list by clicking on it, then use the appropriate button or right-click menu.

3.10 Day Summary

- 3.10.1 This option prints a list of all the tests carried out on a certain day. The Day Summary window shows the tests carried out on the date specified in the calendar at the top. Click on the down arrow to change the date you wish to view. You can customise what items you want on your Day Summary print out by ticking the appropriate checkboxes in the 'Day Summary Options' panel. Use the radio buttons in 'Print Options' to choose the print orientation. When you are ready; click the 'Print' button to print the Day Summary.

3.11 System Menu

- 3.11.1 The system menu contains 4 options: Units, Information, Backup, and Password.
- 3.11.2 Clicking Units displays a window to enable you to change the unit system (imperial or metric). Click the appropriate option and then 'OK' to change the program's units.
- 3.11.3 The Information option shows when the CSTF was manufactured and its Serial Number.
- 3.11.4 It is recommended to backup your data regularly. Storing your backup files on a dedicated Solid State Drive or similar is the suggested method with a new folder created labelled per date, for instance CSTFBackup09Jan2023. Please see below, the following files and Results folder should be captured within your backup.



- 3.11.5 As a default there is no password set. If you wish to set a password to restrict access to the CSTF program, select 'Password' from the system menu. Click the 'Password Required to Run CSTF' box, enter password in both boxes and click 'OK'. You have the option to change the password or to cancel password access to the program. To do this you will need to enter the existing password and reset as required.

3.12 Error Messages

3.12.1 The following error message may be seen when the program loads:

System has failed sampling rate test. Application closing.

- There are background applications running which affect the running of the Ansti software. Close any applications that are running and try again.
- After double-clicking the icon to load the program, wait at least 2 seconds to let the system test finish. If you click on a menu, the test will be disrupted to the effect that the program will deem your system below specification.

Calibration file missing.

- This error occurs if the calibration file has been deleted or corrupted, if you have saved a backup of this system you should be able to recover this by copying the CALIB.dat file from your backup to your CSTF folder, however, please contact JFD if any assistance is required. Please note, if a service has been carried out it is important to create a backup immediately after to ensure the new calibration data is backed up.

Device cannot be opened

- This means the program was unable to open the data acquisition device. Contact JFD to check whether the device drivers have been deleted.

3.13 Keyboard Shortcuts

F1	Starts a new test
Esc	Stops the current test
F5	Regulator Re-Test
F12	Acquires new zero for mouth pressure
Ctrl + P	Prints test certificate

3.14 Facility Shut Down

3.14.1 Close cylinder valve and depressurise the regulator by purging the 2nd stage.

3.14.2 Remove the HP hose, interstage hose, and 2nd stage from the CSTF.

3.14.3 Turn the power switch to the **0** position. Close Windows and turn off power supplies to the laptop and printer.

4 TROUBLESHOOTING

4.1 No power/Green Illuminated power light

Possible Causes

- An external fuse (e.g. at mains plug) damaged or weakened over time and need to be replaced. DO NOT REPLACE WITH A LARGER FUSE, if after replacing the fuse it blows immediately, return the CSTF to JFD for inspection and repair.
- One or both unit fuses damaged or weakened over time and need to be replaced. DO NOT REPLACE WITH A LARGER FUSE, if after replacing the fuse it blows immediately, return the CSTF to JFD for inspection and repair. Refer to Section 6 for replacement fuses.
- An internal fault within the CSTF has caused the power supply to withhold DC voltage. Return to JFD for inspection and repair.

4.2 Test orifice check failure

Possible Causes

- Environmental conditions have caused the unit to temporarily read outside of allowable test variations. Please repeat the test to confirm the CSTF has failed the test orifice check and report to JFD.
- Test orifice not aligned correctly inside the mouthpiece. Ensure test orifice is pushed hard to the shoulder and repeat test.
- An obstruction in the path of the mouthpiece. Repeat test and ensure there are no obstructions internal or external of the mouthpiece.
- The unit has fallen out of calibration and will need to be calibrated. Please refer to section 5 to calibrate the unit. (This option is only available on units if marked 'Remove Bolt for User Calibration'. If after following this procedure the unit is still outside its calibration tolerance as per the orifice certificate return the unit to JFD for recalibration or repair.
- The test orifice has been physically damaged and caused the readings to change. Please inspect the test orifice and note any physical damage, ensure the orifice is within the same environmental conditions as the main unit (See Section 2.4). To replace the test orifice, contact JFD.

5 MAINTENANCE

- 5.1 A small flat screwdriver can be used to calibrate the Mouth Pressure. There are no user-serviceable internal components.
- 5.2 Clean the CSTF with damp cloth using a locally approved non-alcohol based disinfectant
- 5.3 Regular visual inspection of the following is required every week:
- Check threads on the Supply and Interstage Pressure connections are sound and not damaged. To be leak tested weekly by owner/operator.
 - Check silicone mouthpiece adapter for splits and general wear.
 - Check electrical supply leads
- 5.4 If the Test Orifice checks are passed the unit is deemed to be within calibration which is validated by your daily calibration tests certificates. Accordingly, if the unit falls out of calibration please complete the following steps to calibrate.

5.4.1 User Calibration

Warning – This option is only available on units with the inscription ‘Remove Bolt for User Calibration’.

Prior to carrying out the below steps, ensure the environmental conditions are within the parameters below and the unit has been switched on for a minimum of four hours.

Temperature $22 \pm 5 \text{ }^\circ\text{C}$

Relative Humidity < 75% with no condensation

General Environment Clean

Perform at least 5 consecutive Orifice Tests without saving any results prior to following the steps below to warm up the motor.

- 5.4.1.1 Step 1, Locate the ‘Remove Bolt for User Calibration’ arrow on the side of the CSTF. Remove this bolt.
- 5.4.1.2 Step 2, Using a small torch identify the potentiometer shaft located in-line with the now exposed hole. The Pot is supplied in the approximate middle position, and will allow approximately +/- 1mBar of adjustment. The potentiometer is a 5 turn type (2.5

turns either side of the middle). Apply only gentle adjustment with a small flat blade screwdriver.

- 5.4.1.3 Step 3, To calibrate the unit, use the Test Orifice CSTF1002013, use the data contained upon the CSTF1002013 certificate as your reference value. If the vacuum reading needs to be increased adjust the pot clockwise, to decrease adjust the pot anti-clockwise. Perform tests without saving results until you have provisionally calibrated the unit to the value and tolerance of the CSTF1002013 test certificate.
- 5.4.1.4 Perform three consecutive tests and take the average. The final average value must be within the original test certificate value to confirm calibration.
- 5.5 Please return the CSTF for calibration or service if this cannot be carried out by a competent person in your country. JFD recommends the CSTF is serviced every five years by JFD and pressure transmitters and gauge are calibrated annually to validate any certificates issued.

For service and re-calibration of the CSTF please contact your nearest JFD office.

6 ACCESSORIES

6.1 The following accessories are available for the CSTF:

Part Number	Description
HP80274	HOSE, HP, 300 BAR, 1MT, 7/16" UNFM, C/W RESTRICTOR
DD041300/1	HOSE, LP, 2TE, 1/4"B, 3/8" UNF M - 9/16" 'O', 1M
EM80170	POWER CABLE, SCHUKO CEE 7/4 TO IEC C13, 2.5M (CSTF100)
EM80656	POWER CABLE, SCHUKO CEE 7/4 TO IEC C5, 2M (Laptop)
EM75646	6.3A CERAMIC CARTRIDGE FUSE, 5 X 20MM

7 CALIBRATION CERTIFICATION

7.1 The CSTF instruments are calibrated and certified by JFD Ltd. prior to delivery.

7.2 JFD recommends the following instruments are confirmed to be within calibration annually with records retained for future reference.

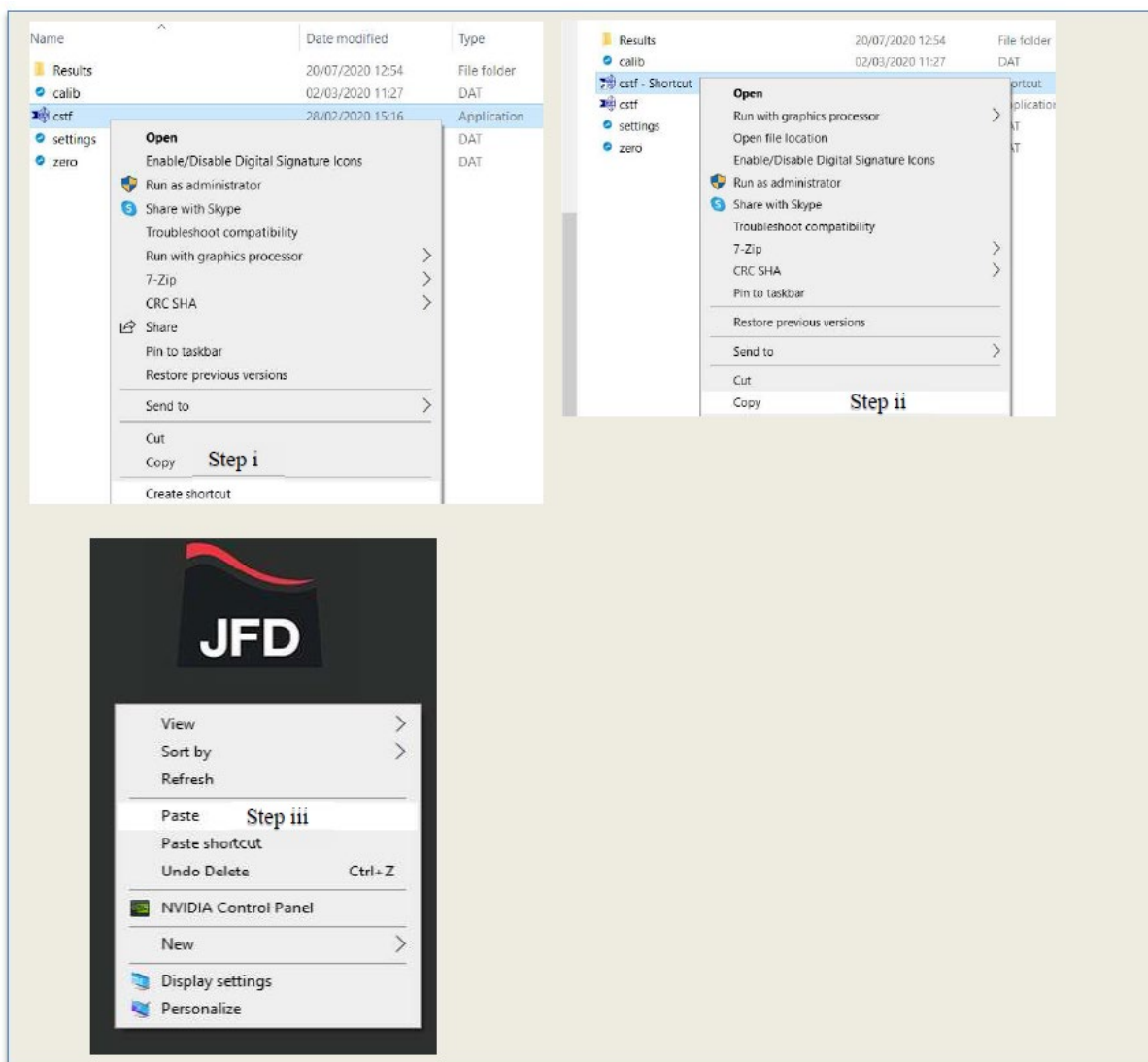
- Mouth Pressure Transmitter (-25 mBar +/- 2.5 mBar)
- Interstage Pressure Transmitter (+ 20 Bar +/- 1 Bar)
- Supply Pressure Transmitter (+ 300 Bar +/- 10 Bar)
- Supply Pressure Gauge. (+ 300 Bar +/- 10 Bar)

8 APPENDIX ONE

To install your Ansti software on your Laptop/PC please follow the below instructions.

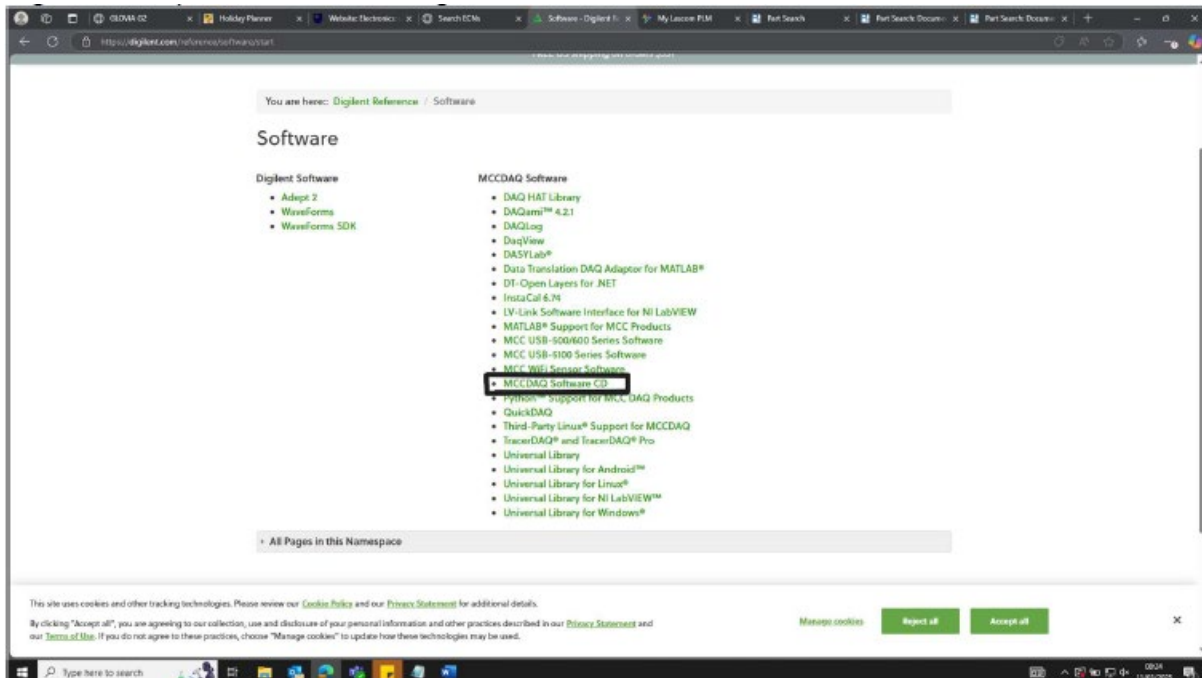
Part A

1. Ensure your operating system is fully up to date by checking on the Microsoft Website.
2. Copy the Ansti Folder from the USB stick to the main drive of your PC.
3. Create a shortcut for your desktop within this Ansti folder and move it to the desktop. See Steps i, ii and iii.

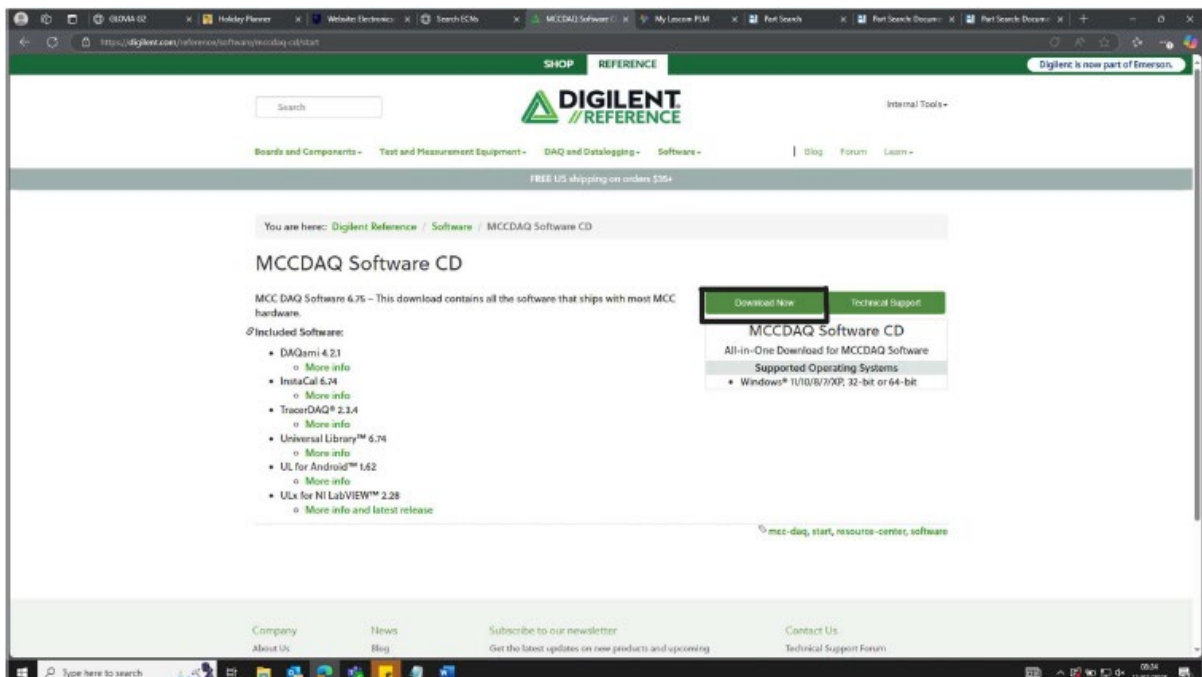


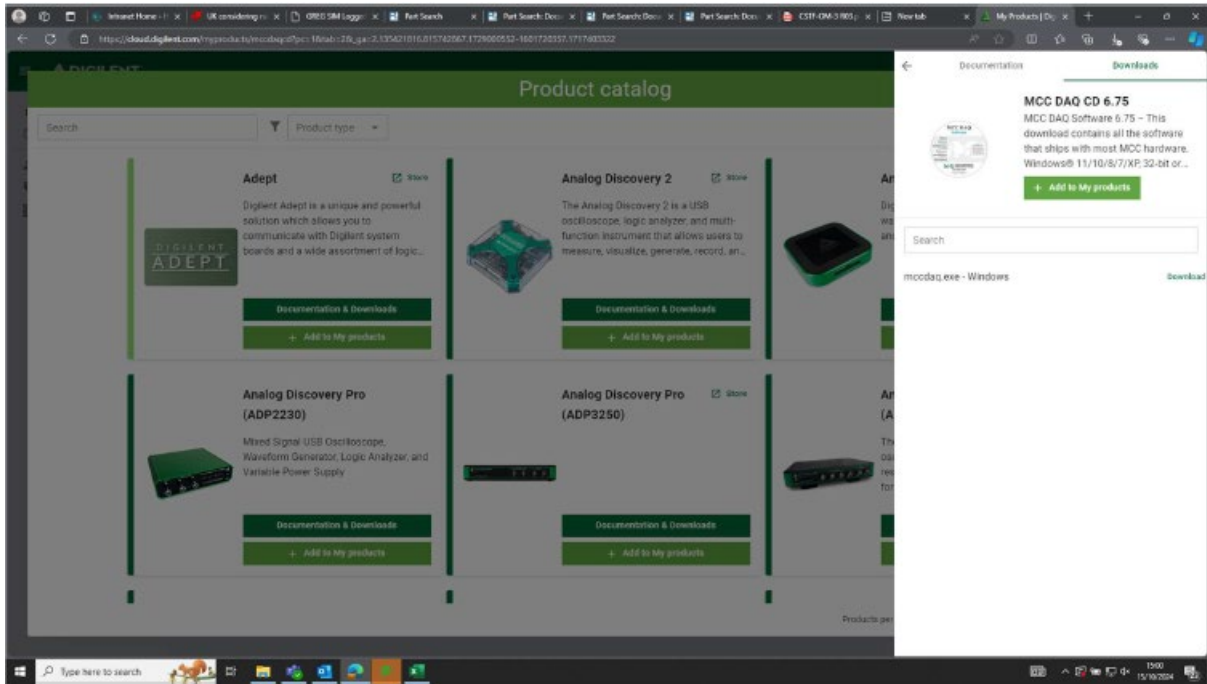
Part B (Please now plug the CSTF into your PC)

1. Go to <https://www.mcdda.com/Software-Downloads>.
2. Download the latest MCC DAQ Software – You will have to create a free account with digilent.com prior to downloading.



3. Click on the MCCDAQ Software CD as shown above, which will take you to the following page.





4. Following the onscreen instructions, install the MCCDAQ software including Installing Instacal (If you fail to install this you will need to run windows update and install all the updates).
5. Once successfully installed, Open Instacal (Under Measurement Computing).
6. Accept the new board that is found by Instacal (The CSTF must be plugged into the PC).
7. Select the board with the left mouse button, then right click to bring up the menu box, and change the board to #1.
8. Repeat step 7, this time select 'Configure' and then change the Input Mode on the drop down box to be 'Single Ended (8 ch)'.

Part C

1. With the CSTF plugged into the PC, now select your shortcut installed during part A.
2. The program should now be functional.

If there are any issues, please contact JFD on +44 (0) 1224 740 145.