°C Port™

Data Acquisition Instruments

User Manual

Index

Product Overview

The °C Port3600 and °C Port1200

Congratulations on your recent purchase of a °C Port Instrument!

You have joined hundreds of leading companies throughout the world who use Degree Controls' AccuSense™ line of airflow test and measurement instrumentation to develop better products, make environments safer, reduce their carbon footprint and to enhance personal comfort. We expect you will derive many years of use from your new test and measurement instrument. We are committed to your success, and we thank you for your purchase.

The intent of this manual is to introduce you to the °C Port3600 and °C Port1200, and to make set-up and installation fast and easy, and also to provide guidelines for successful testing.

Product Introduction

The °C Port product line is a multi-channel airflow measurement instrumentation line, specifically designed for the precision demands of multi-point air velocity and air temperature testing, as well as data logging and data acquisition. Thermocouple and humidity sensors are also available for use with any °C Port instrument, to enhance the scope of your environmental testing. To accommodate a range of sensor channels, we offer the °C Port3600 for up to 36 measurement points, and the 12 channel °C Port1200 for smaller-scale applications.

Who uses it?

Users choose a °C Port instrument when multiple sensor channels for air velocity, air temperature, surface temperature and humidity are needed. This type of multipoint testing has become the defacto standard in electronics design, where velocity profiles across blades, boards, heatsinks and power supplies are critical to understanding the cooling flow available during different operational scenarios and extremes.

Similarly, sensing air velocity at multiple locations in a planar area is a central R&D activity in assuring an optimal design has been achieved for industries such as biosafety and chemical hoods, laboratory and cleanroom spaces, datacenter racks, as well as in large ducts within buildings and outside plant facilities like telecommunication huts and mobile datacenters.

Engineers and technicians alike, who find single point measurement cumbersome, slow, and heavily impacting upon the flow profile, turn to the °C Port instrument and the miniature air flow sensors for their research work.

Features

The °C Port instruments are new and improved versions of the Cambridge AccuSense™ ATM2400, our legacy multi-point instrument with USB connectivity to a host PC, which has been discontinued. The key features of our °C Port3600 and °C Port1200 instruments include:

- Ethernet interface communication for remote monitoring of experiments, and multi-user support.
- Static or dynamically assigned IP addresses for easier network integration.
- Real-time experimental data is accessible on any mobile phone, tablet or computer with an internet connection.
- AccuTrac™ Plus software platform for robust multipoint analysis and datalogging.
- Barometric pressure and humidity compensation ***built-in*** for best accuracy and convenience.

Supported Sensors

The °C Port instruments leverage Degree Controls' Cambridge AccuSense™ line of USB sensors for quick and easy sensor connectivity. There are various sensors to choose from, so you can select the best style for your application and velocity range.

Air Velocity Sensors:

The UAS1000 series of air velocity sensors is available in 4 calibrated ranges, for your convenience, and are each rated at 5% or better, accuracy of reading. For full information of how to interpret accuracy ranges in velocity sensors, please see the UAS1000 datasheets or manual.

Velocity ranges:

- UAS1100 is designed for low velocity testing, such as in the down-flow region of a fume hood, or in large room-level fan testing, semiconductor manufacturing plenums, or in applications where airflow noise is not permissible, yet cooling flow is desired.
- UAS1200 is designed for mid-range velocity conditions such as general electronics and product design applications.
- UAS1300 is designed for rapid flow scenarios such as fan exhaust plenums, high speed servers and computing, or heat exchanger testing.
- UAS1500 is an ultra-wide velocity range sensor design to handle flow velocities ranging from very low to high speeds. This is typically for a user who is looking for a single sensor to run tests upon multiple products or across a wide flow range.

Please consult the UAS1000 datasheet for various sensor head styles which are available, from stainless steel probe-style sensor heads to miniature plastic housings for tight-fit applications.

The UAS2000 air velocity sensors use a micro-sensor element, less than 1mm in size, which is used to sense air velocity and temperature within very tight spaces. This is a special-use sensor designed for flow testing where the change of air velocity from test-to-test is the critical parameter being examined, rather than the absolute accuracy of the reading. The UAS2000 has excellent repeatability characteristics, which help users determine the air velocity change due to blocked inlet, failed fan, or clogging filter.

Temperature Sensors:

The UTS1000 thermocouple sensors are used to augment air velocity studies, by enabling a user to determine case temperatures of components, while simultaneously analyzing flow conditions. This allows for excellent airflow-to-case-temperature correlation studies. The UTS1000 is a unique T-type, thermocouple sensor which has 1500V of isolation built-in, and so studies can be conducted on many electronics components, *while* powered. The UTS1000 thermocouple wire and bead is disconnectable from the main electronics housing for easy replacement of the thermocouple wire.

Humidity Sensors:

The UHS1000 humidity and temperature sensors are used to monitor and measure humidity while simultaneously analyzing air flow conditions. Some users conducting measurements inside environmental chambers change the humidity throughout the experiment and monitor this with the UHS1000.

In test applications involving different streams of airflow, multiple UHS1000 sensors may be used. This is useful in studying airflow applications which use controlled humidity for curing or deposition of droplets.

Although your ^{0}C Port instrument has built-in humidity compensation, there are many experimental cases where a UHS1000 humidity sensor should be used to compensate for humidity changes, at or inside the test location. During AccuTrac™ Plus setup, the user can specify which humidity sensor should drive the compensation, the humidity sensor in the ^{0}C Port3600, or the UHS1000 whose sensor element is routed to the experimental air flow.

NOTE

For critical testing, where highest air velocity accuracy is desired, using a remote humidity sensor (UHS1000) has the distinct advantage of measuring humidity in the test environment itself, whereas the internal humidity sensor inside the ^{0}C Port3600 and ^{0}C Port1200 will read humidity in its own operating environment.

With this clear understanding of the sensors available for your experimentation, you are now ready to set-up your new °C Port Instrumentation product!

Special Companion Product Note:

A useful accessory for your empirical measurements derived from your °C Port instrumentation system, is a Flow Visualization Fogger, a handheld portable fog system for visualization of airflow turbulence, directionality and potential "dead" spots with the touch of a button. This product is FDA-safe and leaves no residue.

For more information, please visit,
http://www.degreec.com/en/airflow-sensing-products/development-use/flowmarker.html

What you have received

Your °C Port instrument is contained in a robust carrying case with all the necessary pieces to start experimentation. Inside you will find:

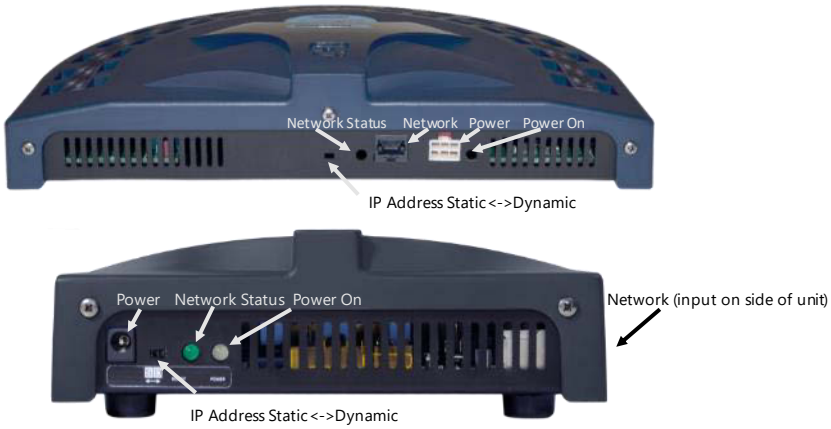
- °C Port3600 / °C Port1200 Instrument
- Wall pluggable power adapter
- 3m [10 ft] Ethernet cable
- Sensor mounting hardware (50 pcs in °C Port3600 and 15 pcs in °C Port1200)
- Calibration Certificate
- °C Port Instrument Manual
- AccuTrac™ Plus software and manual download instruction card.

°C Port3600

°C Port1200
Note: Case is a purchased option for °C Port1200.

°C Port3600/°C Port1200 Up-Close

Back view



Power Port – Connect the included AC power adapter to this port. Power Indicator – This white LED will light when powered.

> ***CAUTION***
> *Use only the power adapter that came with your °C Port Instrument. The supplied AC power adapter is designed for 100-250 VAC, 50/60Hz.*

Ethernet Port – Connect the Ethernet cable (also called network cable) to this input and to your PC or into your network switch or router.

> ***NOTE***
> *For best performance please used the included CAT5E or higher rated cables in Ethernet ports.*

Unit Ready Indicator – This green LED will be lit when the unit is ready to communicate, and will blink when network is disconnected.

Mode Switch – This switch sets the °C Port for Static (left) vs dynamic (right) addressing.

Top View

USB ports – Connect your UAS1000 series velocity sensors to these ports. Also available: UTS1000 thermocouple sensors, UHS1000 humidity sensors and UAS2000 micro-velocity sensor.

> ***NOTE***
> *USB ports do not need to be plugged sequentially.*

Bottom View

(°C Port 1200 not shown)

Labeling – The label on the bottom denotes the °C Port Instrument part number, and the serial number. Both should be noted when calibration or RMA work is to be performed.

Calibration Label – The calibration label contains the date (month/year) the unit needs to come back for calibration

Venting – During operation maintain proper venting.

You are now acquainted with your °C Port Instrument!

Setting Up your °C Port Instrument

Setup for the °C Port is designed to be very quick and easy. Prior to setting up the °C Port, ensure that you have installed AccuTrac™ Plus on your windows based-PC. AccuTrac™ Plus is the interface software which allows you to configure and extract data from the °C Port Instrument.

Installing AccuTrac™ Plus

Where do I find it?

To ensure you are accessing the latest version, AccuTrac™ Plus is available for download on http://www.degreec.com/en/airflow-sensing-products/development-use/accutrac.html.

The AccuTrac™ Plus installation is easy, and contains an auto-extract executable program to help walk you through the install steps.

> ***NOTE***
> *If you need more detailed instructions about AccuTrac™ Plus please refer to the AccuTrac™ Plus User Guide for installation details and computer requirements.*

> ***NOTE***
> *If you have an older version of AccuTrac™ installed, please use the Program Uninstall utility in Windows Control Panel. Then, install AccuTrac™ Plus.*

Configuring the °C Port Instrument

First, connect the power supply cable to the back of the unit, and plug the grounded connector into a wall receptacle. The white LED will illuminate.

Now, wait a few seconds for the "Communication-ready" Green LED to illuminate (blink), and then connect the Ethernet cable to the connector in the rear of the °C Port, and then to your network switch, or your computer. When a network connection is established, the green LED will stop blinking.

As the user, you can decide whether the °C Port will use a static IP address, or allow your network DHCP to assign one dynamically. Consult with your IT team to determine what is most suitable for your company, and make the appropriate switch selection on the rear of the °C Port. The default setting is static, and the corresponding IP address is 192.168.9.104.

> ***NOTE***
> *Generally, using a static IP address is simpler for remote monitoring of your experiments so you can set-up an internet shortcut in your browser. Also, it makes it easier to share the IP address with your peers. The default IP address can be updated using the latest version of AccuTrac™ Plus software.*

Static IP address Configuration

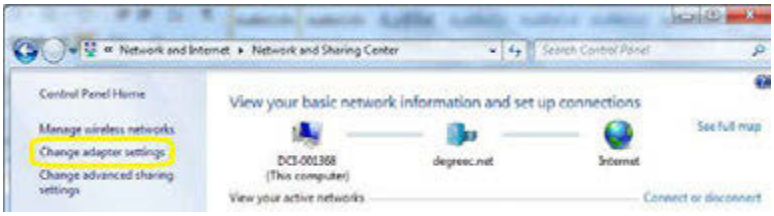
If you have elected to use the static IP address, there are a few computer hardware configuration steps to follow, to allow your computer to communicate with the °C Port. This only needs to be done once for each PC which will communicate to the °C Port, and consists of 5 steps.

Open the Network and Sharing center, to configure your LAN settings.

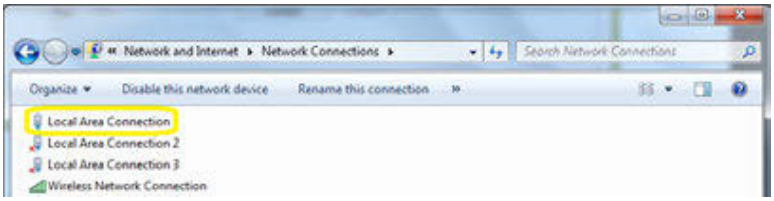
How?

Step 1: From the Start Menu, select Control Panel and Choose "Network and Internet" and "Network and Sharing Center".

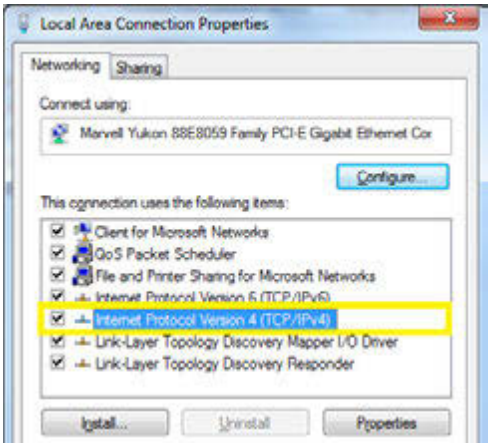
Step 2: In the upper left, select "Change Adapter Settings" as per screenshot below.



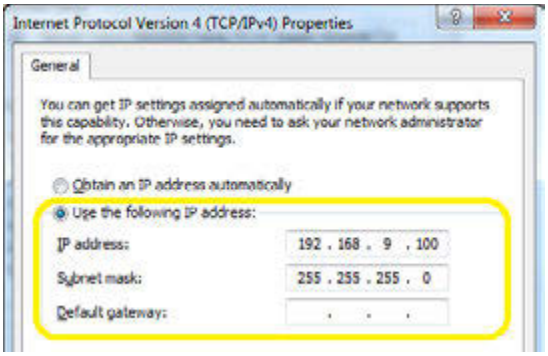
Step 3: Select Local Area Connection, right click and select "Properties", as per screenshot below.



Step 4: Choose "Internet Protocol Version 4 (TCP/IPv4)" and select "Properties" as per screenshot below.



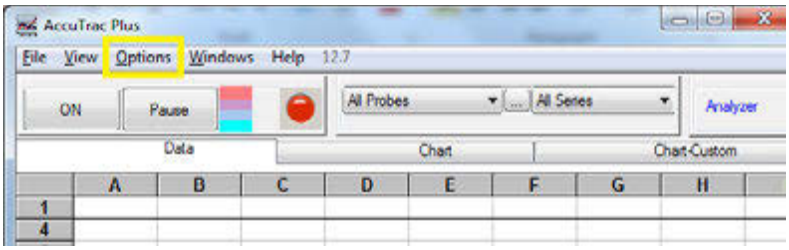
Step 5: Enter the IP address data as per the screenshot below, and select "OK".



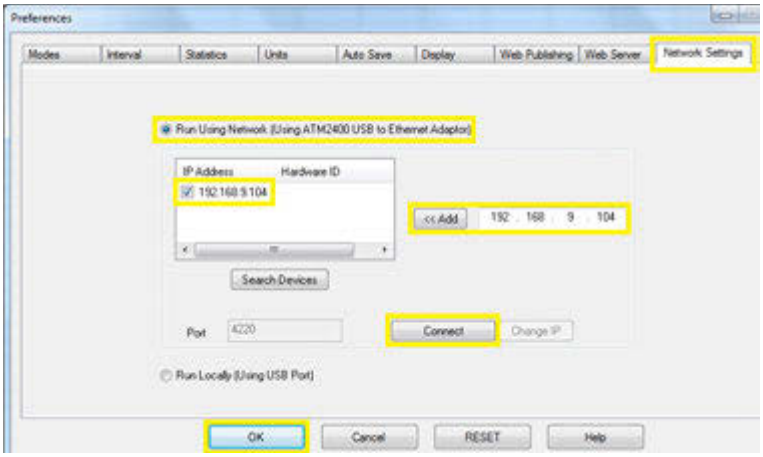
The final configuration steps involve opening AccuTrac™ Plus software and setting your Network Preferences.

How do I do this?

Step 1: Start AccuTrac™ Plus, and in the Menu Bar, Select "Options" and then "Preferences", as per the screenshot below.



Step 2: In the Preferences window, select the Tab called "Networking", and select the button "Run Using Network". Then, type in the IP address as shown, and click "Add". Finally, click the check box in the IP Address field and click "Connect". Then click "OK", as per the screenshot below.



Congratulations, your computer is now set-up to work with the °C Port with a static IP address!

Dynamic IP address Configuration

If you have selected the dynamic IP address allocation switch position on the back of your °C Port, then there are just a few steps needed to assert communication to your PC.

> ***NOTE***
> *When you switch from Static IP to Dynamic IP using the switch on the rear of the °C Port, be sure to power cycle the unit for the change to take effect.*

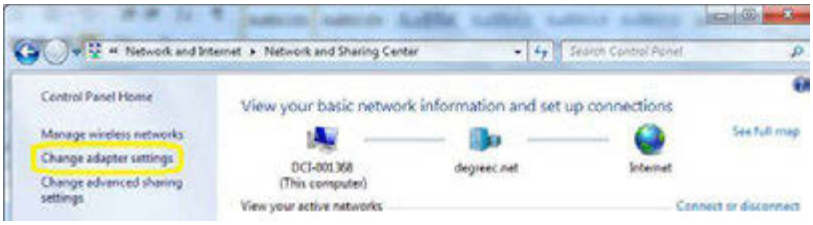
How do I do this?

Open the Network and Sharing center, to configure your LAN settings.

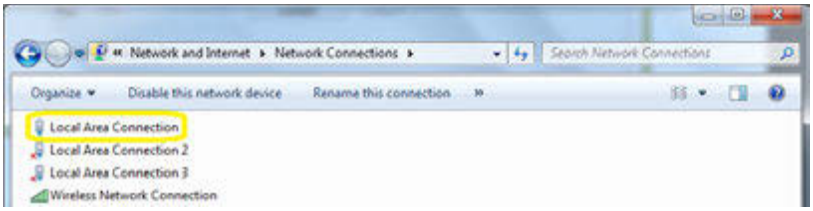
How?

Step 1: From the Start Menu, select Control Panel and Choose "Network and Internet" and "Network and Sharing Center".

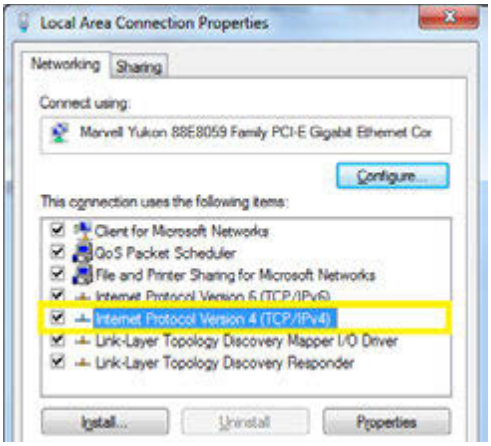
Step 2: In the upper left, select "Change Adapter Settings" as per screenshot below.



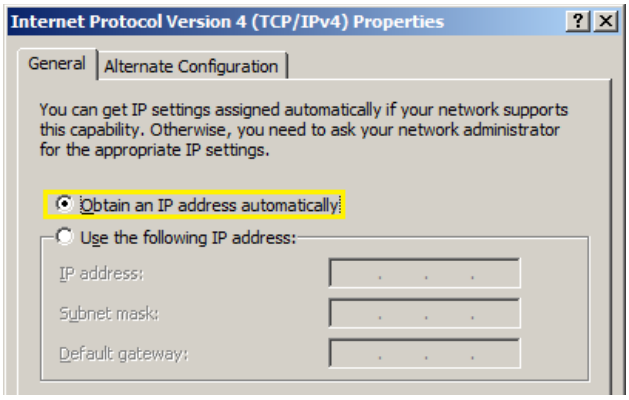
Step 3: Select Local Area Connection, right click and select "Properties", as per screenshot below.



Step 4: Choose "Internet Protocol Version 4 (TCP/IPv4)" and select "Properties" as per screenshot below.



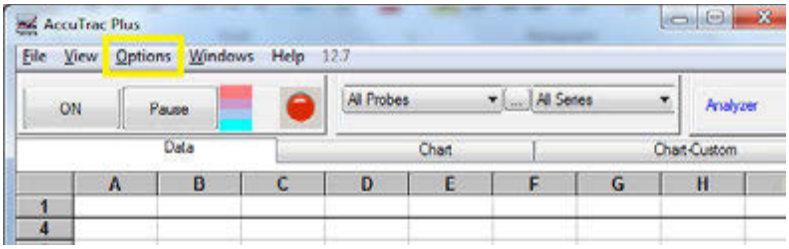
Step 5: Select "Obtain an IP address automatically", as per the screenshot below, and select "OK".



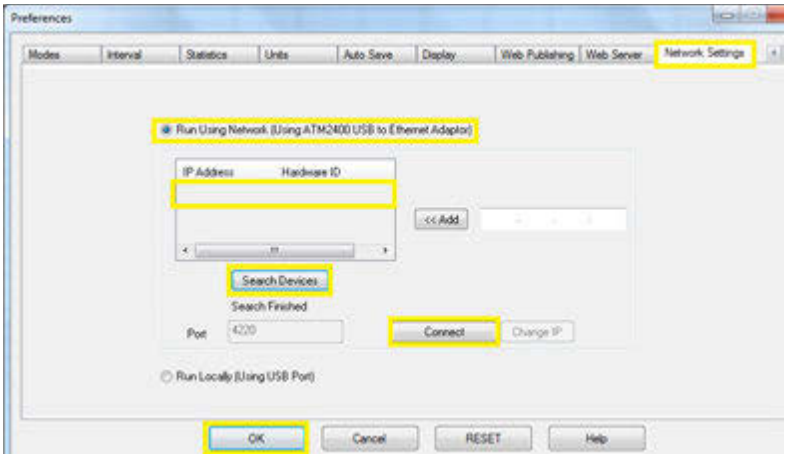
The final configuration steps involve opening AccuTrac™ Plus software and setting your Network Preferences.

How do I do this?

Step 1: Start AccuTrac™ Plus, and in the Menu Bar, Select "Options" and then "Preferences", as per the screenshot below.



Step 2: In the Preferences window, select the Tab called "Networking", and click on the button "Run Using Network". Then, click the button named "Search Devices", and this will display a list of IP addresses which includes the °C Port. Select the IP address corresponding to the °C Port, by clicking the checkbox ON. Finally click "Connect" and then "OK", as per the screenshot below.



Congratulations, your computer is now set-up to work with the °C Port using a dynamic IP address!

Calibration

°C Port Calibration:

Your °C Port has arrived pre-calibrated. The °C Port uses sensing hardware inside for compensation of air velocity readings which require periodic calibration. Degree Controls suggests that the unit be calibrated annually, or as per your current ISO or procedural requirements. You can determine date (month/year) that the unit needs to come back to DegreeC for calibration by looking on the bottom of the unit.

Sensor Calibration:

Please refer to your UAS1000 manual for complete information regarding the calibration of your air velocity and temperature sensors.

NOTE

All air velocity and temperature sensors should be periodically re-calibrated to ensure accurate readings. Please note that when Degree Controls performs a recalibration, we exercise the sensors across their performance range, and reprogram the electronics inside. Any ongoing improvements to our internal algorithms are also programmed in at this time to ensure our user base is using the best available internal firmware. These updates are included as part of your sensor recalibration.

CAUTION

Generic recalibration facilities will "spot check" a sensor at one or two flow points in the calibrated range of the sensor. While this is useful to predict functionality, it is not a rigorous and complete recalibration. Contact Degree Controls to understand the mechanics of complete recalibration and programming.

How do I do this?

To initiate a recalibration order, contact us at rma@degreeC.com and request a recalibration form, and we will walk you through the process.

Degree Controls will issue an RMA number, lead-time and associated quote. Generally, recalibration work is processed within 10 days of receipt.

Cleaning

Your °C Port should be cleaned with a damp cloth and non-etching cleaner. A mild detergent is acceptable for surfaces and cables do not employ alcohol or ammonia based cleaners.

> ***CAUTION***
> *Do not contact the sensor element of the UAS1000 series for cleaning purposes. The sensor element should be cleaned by Degree Controls, however for dust particles, carefully applying compressed air at a safe distance from the element is an acceptable cleaning method.*
>
> *Skilled users may clean the sensor head by means of ultra-sonic bath.*

Safety Guidelines

DANGER: Ensure proper grounding of all °C Port equipment.

CAUTION: Failure to connect the instrument to the proper electrical voltage as specified herein could result in damage to the power supply and instrument.

DANGER: Never operate °C Port in and around water.

DANGER: If smoke is present, or liquid has spilled, or the unit is physically damaged, disconnect °C Port immediately.

CAUTION: The °C Port and associated sensors should only be opened and repaired by Degree Controls, Inc. Failure to do so will void warranty.

CAUTION: Unplug the sensor before putting it into the ultrasonic bath.

CAUTION: The °C Port and Sensors are ESD sensitive devices. When shipped, the units are packaged in ESD safe bags. The instrument and sensors should be returned to their respective ESD safe bags when they are placed back into the carrying case.

CAUTION: The °C Port and associated sensors are designed for clean air. Air containing chemicals (for example, hazardous gases) may damage the sensor head irreversibly

Warranty

The °C Port3600 and °C Port1200 is warranted to be free from defects in workmanship and materials for a period of one (1) year from receipt. Degree Controls will at its option replace or repair defective parts within the warranty period. Damage resulting from misuse, wear and tear, and tampering is not covered by the warranty.

Specifications °C Port3600

Model Name	°C Port3600
Description	Multi-point Airflow and Temperature Instrument
Part Number	SH65100
Ports	Power, Ethernet, IP Address Switch
LEDs	Power Indicator, Communication Ready Indicator
PC Support	Windows 7, Windows 8, and Windows 10
Country of Origin	Made in USA

Environmental

Dimensions	250 x 220 x 40 mm (9.90" x 7.90" x 1.60")
°C Port Weight / Kit Weight	0.91 Kg [2 lbs.] / 5 Kg [11 lbs.]
Power	100-250VAC, 50/60Hz, 2A max
Operating Temperature	10 to 40°C (50 to 104°F)
Storage Temperature	-20 to 60°C (-4 to 140°F)
Operating Humidity	10 to 80%, relative humidity, non-condensing
Storage Humidity	5 to 90% non-condensing

Specifications °C Port1200

Model Name	°C Port1200
Description	Multi-point Airflow and Temperature Instrument
Part Number	SH65200
Ports	Power, Ethernet, IP Address Switch
LEDs	Power Indicator, Communication Ready Indicator
PC Support	Windows 7, Windows 8, and Windows 10
Country of Origin	Made in USA

Environmental

Dimensions	168 x 152 x 570 mm (6.6" x 6" x 2.25")
°C Port Weight / Kit Weight	0.45 Kg [1 lbs.] / 1.13 Kg [2.5 lbs.]
Power	100-250VAC, 50/60Hz, 2A max
Operating Temperature	10 to 40°C (50 to 104°F)
Storage Temperature	-20 to 60°C (-4 to 140°F)
Operating Humidity	10 to 80%, relative humidity, non-condensing
Storage Humidity	5 to 90% non-condensing

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