

Operator Manual

MET ONE 4500 SERIES AIRBORNE PARTICLE COUNTER



EXCELLENCE IN PROCESS ANALYTICS

Operator Manual

**MET ONE 4500 SERIES
AIRBORNE PARTICLE COUNTER**

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Manual Overview

About This Manual

The information in this manual has been carefully checked and is believed to be accurate. However, Hach Ultra assumes no responsibility for any inaccuracies that may be contained in this manual. In no event will Hach Ultra be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. In the interest of continued product development, Hach Ultra reserves the right to make improvements in this manual and the products it describes at any time, without notice or obligation.

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Safety Conventions



WARNING

A warning is used to indicate a condition which, if not met, could cause serious personal injury and/or death. Do not move beyond a warning until all conditions have been met.

CAUTION:

A caution is used to indicate a condition which, if not met, could cause damage to the equipment. Do not move beyond a caution until all conditions have been met.

Note:

A note is used to indicate important information or instructions that should be considered before operating the equipment.

General Safety Considerations

- Follow all procedures in “[Service Procedures](#)” on page 21 before shipping a unit to a service center for repair or recalibration.



WARNING

Attempts by untrained personnel to disassemble, alter, modify or adjust the electronics may result in personal injury and damage to the 4500 Series.

- Laser Safety — Class 1 Laser Product — complies with 21 CFR Chapter 1, Subchapter J.



WARNING

Use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CAUTION:

Observe standard electrostatic discharge (ESD) procedures when servicing or installing equipment to prevent damage.

Warranty

Hach Ultra warrants this instrument to be free of defects in materials and workmanship for a period of two (2) years from the shipping date. If any instrument covered under this warranty proves defective during this period, Hach Ultra will, at its option, either repair the defective product without charge for parts and labor, or provide an equivalent replacement in exchange for the defective product.

Hach Ultra warrants the Long Life Laser™ diode to be free of defects in materials and workmanship for a period of three (3) years from the shipping date. If any diode covered under this warranty proves defective during this period, Hach Ultra will, at its option, either repair the defective diode without charge for parts and labor, or provide an equivalent replacement in exchange for the defective product.

To obtain service under this warranty, the customer must notify the nearest Hach Ultra service support center on or before the expiration of the warranty period and follow their instructions for return of the defective instrument. The customer is responsible for all costs associated with packaging and transporting the defective unit to the service support center, and must prepay all shipping charges. Hach Ultra will pay for return shipping if the shipment is to a location within the same country as the service support center.

This warranty shall not apply to any defect, failure, or damage caused by improper use or maintenance or by inadequate maintenance or care. This warranty shall not apply to damage resulting from attempts by personnel other than Hach Ultra representatives, or factory-authorized and trained personnel, to install, repair or service the instrument; to damage resulting from improper use or connection to incompatible equipment; or to instruments that have been modified or integrated with other products when the effect of such modification or integration materially increases the time or difficulty of servicing the instrument.

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Revision History

- Edition 1, February 2006, Hach Ultra Analytics, Inc.

Acknowledgements

- Belden is a registered trademark of Belden Wire & Cable Company.
- HyperTerminal is a registered trademark of Hilgraeve, Inc.
- Long Life Laser is a trademark or registered trademark of Hach Ultra Analytics, Inc.
- Modbus is a registered trademark of Gould Inc.
- ProComm is a registered trademark of Datastorm Technologies, Inc.
- Velcro is a registered trademark of Velcro Industries Corporation.

1 Introduction

This manual describes use of the Met One 4500 Series Air Particle Counters, described in [Table 1-1](#). Refer to [“Performance Specifications” on page 23](#) for a complete list of specifications.

Table 1-1 : 4500 Series Air Particle Counter Model Numbers

Model Number	Minimum Particle Size Channel (μm)
4503	0.3
4505	0.5

The Met One 4500 Series Particle Counter is a particulate contamination monitoring device designed for remote sensing in environments where air cleanliness is critical. Both models have a 2.83 LPM (0.1 CFM) flow rate. Some environments where 4500 units are used include cleanrooms, clean manufacturing, and fabrication facilities. The 4500 meets stringent Japanese Industry Standards.

1.1 General Equipment Description

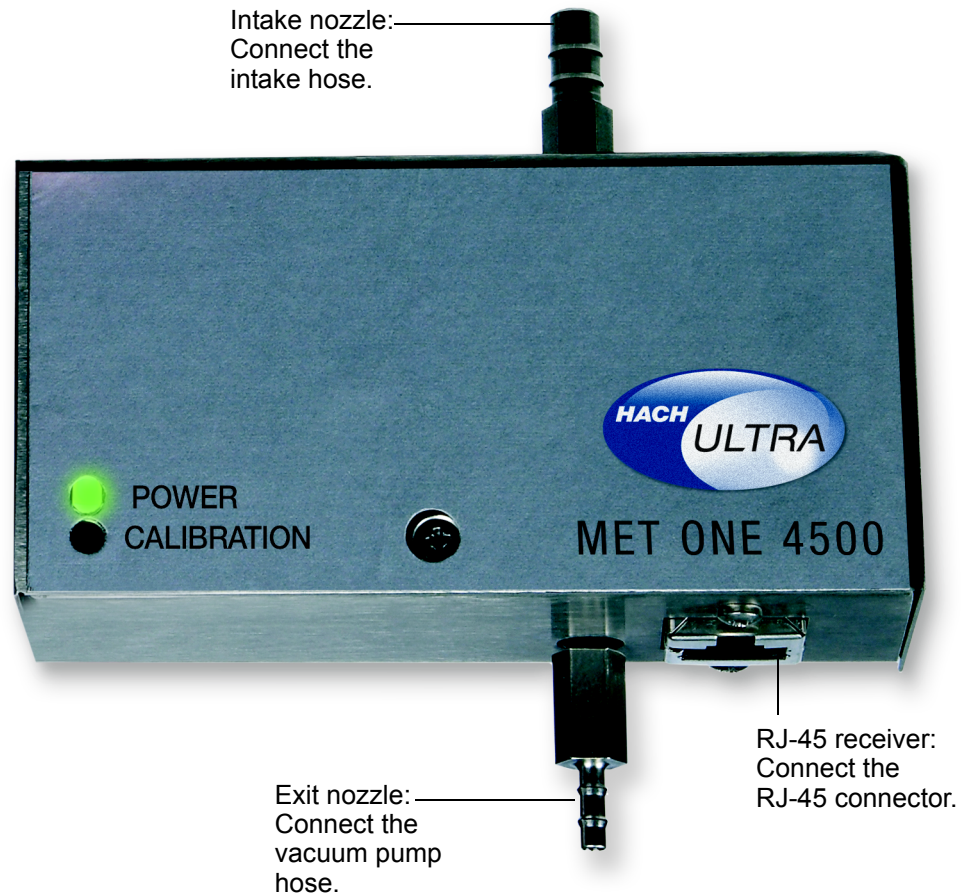


Fig 1-1 : 4500 Series General View

1.2 Unpacking Instructions

The 4500 comes in a reusable shipping container. Remove any cardboard packaging material and place the shipping container on a level surface with the lid oriented on the top.

The particle counter is thoroughly inspected and tested at the factory and is ready for use upon receipt. When received, inspect the shipping carton for damage. If the carton is damaged,

notify the carrier and save the carton for carrier inspection. Inspect the counter for broken parts, scratches, dents, or other damage.

- 1) Lift the 4500 from the shipping container and place it on a flat surface.
- 2) Remove the protective layer of plastic.
- 3) The 4500 is now ready to set up and operate.

1.3 4500 Orientation

The housing for a 4500 unit contains three informative labels. [Table 1-2](#) describes each label, its location, and the information it contains.

Table 1-2 : Information Labels

Label	Location	Description
Company label	Front	Company label with logo and unit name
Specification label	Left side	Unit specification information
Calibration label	Right side	Factory set calibration information for this unit. This label identifies the factory configured channel settings for this specific unit.

A sample specification label that appears on the left side of the 4500 is displayed in [Figure 1-2](#). The label contains the factory-specified settings for each unit.

Met One 4500 Series Particle Counter	
Model	4503
Min. Size	0.3 μ m
Power Source	9-28 VDC 2.4VA
Environment	10-40°C 20-95% RH
Serial Number	0234589-001
Manufacturer	Hach Ultra Analytics
Laser Safety	Complied with 21 CFR Chapter 1, Subchapter J

Fig 1-2 : Sample 4500 Specification Label

1.4 Accessories

Several accessories are available to tailor the counter's functioning. Refer to ["Accessories" on page 24](#) for a complete list. These accessories can be ordered from a local Hach Ultra representative or from the factory by calling either a local representative or the factory at 800.866.7889 or +1 541.472.6500 during the week from 8:00 a.m. to 5:00 p.m. PT.

2 Installation

2.1 Preparing for Installation

The following items will be needed to install each 4500.

- RJ-45 connector
- Eight-wire twisted pair cable, used for telephone or computer network applications
- RJ-45 crimping tool
- Isokinetic probe with an intake hose, or just an intake hose
- Exit hose
- External vacuum source
- A Phillips-head screw driver

Note:

See [“Preparing for Network Installation \(Modbus Protocol\)”](#) on page 15 for networked 4500s.

2.2 RJ-45 Connector Configuration

The RJ-45 connector has a specific assignment for each of its eight pins. The pin assignment is based on standard pin-outs. The following two precautions should be reviewed and verified before completing this connection.

CAUTION:

Power must be connected to the correct pin. Incorrectly applied power can damage the unit.

CAUTION:

Transmit and receive pins must be configured correctly and they must match the transmit and receive pin setup at the data collection equipment. Incorrect configuration can damage the unit and cause data collection errors.

Table 2-1 identifies each pin with its associated wire and intended use.

Table 2-1 : Pin Assignments

Pin	Color	Usage
1	White/Orange	Ch 1 B+
2	Orange	Ch 1 A-
3	White/Green	Ch 2 B+
4	Blue	Alarm A-
5	White/Blue	Alarm B+
6	Green	Ch 2 A-
7	White/Brown	Power
8	Brown	Digital and power ground

2.3 Installing the 4500

Use these steps to install the 4500 unit.

- 1) Remove the unit from the box. Store the packing material for return shipment when the unit requires service.
- 2) Remove the paper from the Velcro® on the back of the unit.
- 3) The unit must be installed with the intake nozzle up. If the labels on the housing are right-side up, then the intake nozzle is up. Firmly press the unit to the surface on which it is being installed, until the Velcro is securely fastened.

Note:

In certain situations, the unit may not be installed vertically. Ensure that the sampling of air is representative for the positioning and the location of the unit. Refer to ISO/FDIS 14644-1.

- 4) Attach the intake hose, or attach the intake hose that comes from the Isokinetic-sampling probe, to the intake nozzle, sliding it over the barbed connector.

Note:

If only an intake hose is used, it must be positioned so the last six inches leading into the intake nozzle are straight. This straight section is important because the particles must follow the flow for accurate detection.

- 5) Connect the vacuum pump hose to the exit nozzle with the critical orifice. Make sure the connection is snug and that there are no leaks.
- 6) Verify that the power supply for the unit is turned off.
- 7) Insert the RJ-45 connector into the receiving jack.
- 8) For an RS-422 installation, connect the other end of the RJ-45 to the data collection equipment.

Note:

For an RS-485 installation, see [“Preparing for Network Installation \(Modbus Protocol\)”](#) on [page 15](#) for information on completing the installation.

- 9) Turn on the power supply. The unit powers up as indicated by the steady green LED.

3 Operation

3.1 Understanding the LED Indicator Lights

The unit uses two indicator lights, located on the front, to report its status. The lights provide the information shown in [Table 3-1](#) and [Table 3-2](#):

Table 3-1 : LED Indicator Lights - Pulse Mode Units

Light	Status Description
Green light	Unit is powered and ready for use.
Red light	Has two signals: <ul style="list-style-type: none"> • Steady indicates high calibration error • Blinking indicates low calibration error

Table 3-2 : LED Indicator Lights - Network Units

Light	Status Description
Green light	Has two signals: <ul style="list-style-type: none"> • Steady indicates powered and ready for use • Blinking indicates network alarm
Red light	Has two signals: <ul style="list-style-type: none"> • Steady indicates high calibration error • Blinking indicates low calibration error

The two green light signals indicate the following:

- A steady signal means the unit is powered and ready for use. If the green light is not on, verify that the power is applied to the proper pin. If the green light still does not come on, the unit needs to be returned for service. Contact Hach Ultra at 800.866.7889 or +1 541.472.6500.
- A blinking signal on network units (Modbus[®] protocol) is an alarm. Pulse mode units should never have a blinking green light. This indicates that the controlling computer has issued an alarm command.

The two red light signals indicate the following:

- A steady signal is a high calibration error. This indicates that the unit is contaminated or the photodiode is saturated. The unit requires cleaning using a zero count filter. To clean the unit, run with the zero count filter in place for 30 minutes. If the high calibration failure mode persists return the unit for service.
- A blinking signal is a low calibration error. This indicates that the laser diode is losing power and needs to be adjusted or replaced. The unit needs to be returned for service. Contact Hach Ultra at 800.866.7889 or +1 541.472.6500.

3.2 Alarm Output

As indicated in [Table 2-1 on page 11](#), pin 4 of the RJ-45 connector is Alarm (A-) and pin 5 is Alarm (B+).

A Pulse mode unit will have an active alarm when there is a calibration error. There will be approximately 4 volts from B+ with respect to the A- pin. When the alarm is not active there will be approximately -4 volts from B+ with respect to the A- pin.

A Network unit will have an active alarm when the controlling computer has issued the alarm command. There will be approximately 4 volts from B+ with respect to the A- pin. When the alarm is not active there will be high impedance from B+ with respect to the A- pin.

3.3 Counting Mode Configuration (Pulse Mode Units)

The 4500 counting mode can be configured by the factory for the user's installation requirements. The unit's configuration determines whether the data is transferred in differential or cumulative mode.

- **Differential mode** — For each particle with a size between the first size threshold and the second size threshold a pulse is transferred only on the first channel signal line. For each particle larger than the second size threshold a unit pulse is transferred only on the second channel signal line.
- **Cumulative mode** — For all particles larger than the first size threshold a unit pulse for each particle is transferred on the first channel signal line. The second channel signal line only transfers pulse for particles larger than the second size threshold.

Note:

The factory default setting is differential mode.

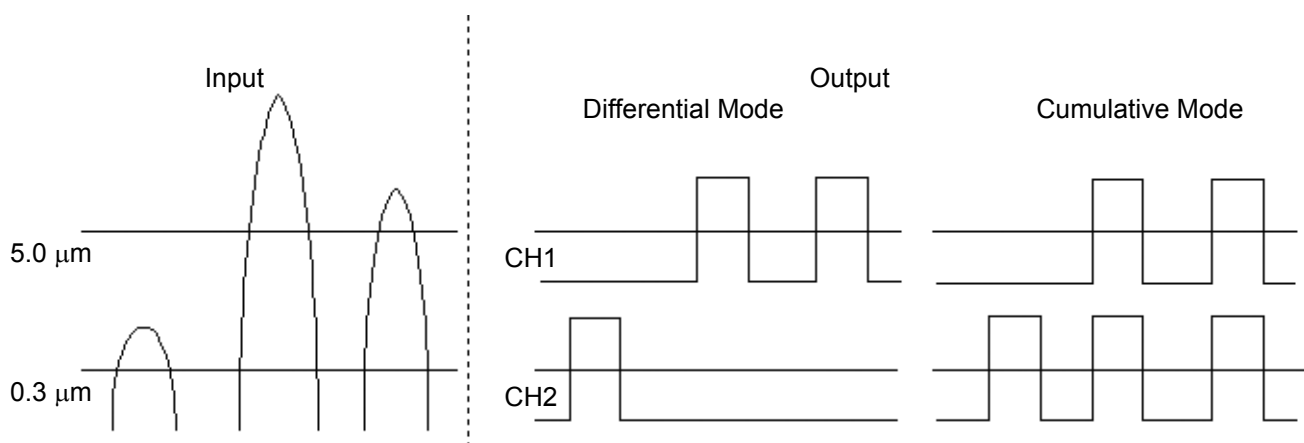


Fig 3-1 : 4500 Differential/Cumulative Mode Comparison Diagram

Note:

Output pulses are all 5 μs.

3.4 Pulse Mode Units

All 4500 units installed as stand-alone units with individual data collection equipment should be configured for pulse mode. There will be one pulse output per particle counted based on the [Figure 3-1](#).

3.5 Preparing for Network Installation (Modbus Protocol)

The following items will be needed for installing the networked 4500 units. These items are in addition to the items in the section, "[Preparing for Installation](#)" on page 11.

- 9-28 V power supply provided by the user. A network supporting 20 units requires a minimum power supply of 35 W.
- Power cable, 20-gage minimum, provided by the user.
- RS-232-C cable to connect from the computer to the RS-232-C/RS-485 converter.
- RS-232-C/RS-485 converter.
- Belden[®] 9841 or exact equivalent bus line for RS-485 connections from the RS-232-C/RS-485 converter to the 4500 sub-lines.
- Two 120 ohm terminators.
- One 100 ohm ½ W shield ground.
- The shield is part of the 9841 cable.
- Vacuum system providing 18 in Hg ± 0.9" at each unit. Must be provided by the user.
- Serial communication program supplied by the user; for example, ProComm[®] or HyperTerminal[®], used for address setup.
- Computer running the monitoring software that uses Modbus protocol. See document DC100001-01 for the 4500 Modbus protocol register definitions.

3.6 Network Software

The monitoring software controls the networked 4500 units by performing the following:

- Controls the counting process
- Controls obtaining data from the unit
- Controls alarms

3.7 Setting the Unit's Network Address: Modbus Protocol

When a 4500 unit is installed on a network, each unit requires a unique address. The address must be assigned prior to operating the unit on the network.

Note:

See document DC100001-01 for the 4500 Modbus protocol register definitions.

Each unit must be individually connected to the computer, and then a serial communication software such as HyperTerminal is used to assign the address. Use the following instructions to assign each address.

- 1) Select the address for each unit from 1 to 247.

Note:

If an address is duplicated, the units with the same address will cause network confusion.

- 2) Create a network address chart similar to the one shown in [Table 3-3](#).

Table 3-3 : Sample Network Address Chart - Modbus Protocol

Unit	Physical Address	Address Assigned
1	1	OK
2	2	OK
3	3	etc.
4	4	etc.
n	n	etc.

- 3) On unit 1, apply the “1” address label. Continue to physically label each unit with their assigned address.
- 4) Connect one unit to the computer.
 - Connect one end of the RS-232-C cable to the computer.
 - Connect the other end of the RS-232-C cable to the converter.
 - Connect the RJ-45 cable to the converter
 - Connect the other end of the RJ-45 cable to the receiving jack on the 4500 unit.
- 5) On the computer, start the serial communication software, such as HyperTerminal. Set the software for the following configuration:
 - 9600 baud
 - 8 data bits
 - No parity
 - 2 stop bits
- 6) Connect the 4500’s power supply. The unit powers up as indicated by the steady green LED.

Note:

If the power LED is not on, check the power supply connection. If the unit’s power LED still does not respond, the unit must be returned for repairs.

- 7) Type **SETUP** and press enter.
- 8) The unit responds with READY.
- 9) The setup command must be entered on the computer within 60 seconds of powering the 4500. If setup mode is not started within this time parameter, the user is locked out of the 4500 setup mode. The unit must be turned off and turned back on and the setup command reissued to re-enter setup mode.

Note:

Refer to [Table 3-4](#) for descriptions of the commands.

- 10) To set the unit's address, type the command, **L**, then space then followed by the unit's address, **1**, and press enter.
- 11) The 4500 responds with the following:

```
4500, CS100006-01, Rev1, 2006/11/10
COMMANDS
L = LOCATION [1]
M = MODEL [4500]
Q = QUIT
```

- 12) Type **Q** and press enter to quit setup mode.
- 13) The 4500 will automatically exit setup mode 60 seconds after the last keystroke.
- 14) Return to the network address chart and write OK in the *Address Assigned* column for this unit. Refer to step 2 of these instructions for an example of the chart.
- 15) Turn off the power to the 4500.
- 16) Disconnect the unit from the computer.

Continue with the multiple installation by connecting each unit to the computer and repeating the above steps.

Table 3-4 : Setup Mode Commands: Modbus Protocol

Command	Format	Use	Description
L	L <i>address</i>	Location	Set the unit's location address
M	M <i>model</i>	Model	Set the unit's model name
Q	Q	Quit	Quit the setup mode

3.8 Connecting Multiple Units to the Network

After each unit is assigned a network address, the user can complete the network connections. For additional information, refer to the wiring diagram, [Figure 3-2](#).

- 1) Connect one end of the RS-232-C cable to the computer.
- 2) Connect the other end of the RS-232-C cable to the RS-232-C/RS-485 converter.
- 3) Connect one end of the bus line to the converter.
- 4) Connect one end of the sub-line cable to the main bus line.
- 5) Insert a RJ-45 sub-line to the receiving jack on every 4500 unit.
- 6) Connect the other end of the RJ-45 cable to the sub line.
- 7) Connect all intake hoses.
- 8) Connect the vacuum pump hose to the exit nozzle on the bottom of the unit. Make sure the connection is snug and that there are no leaks.

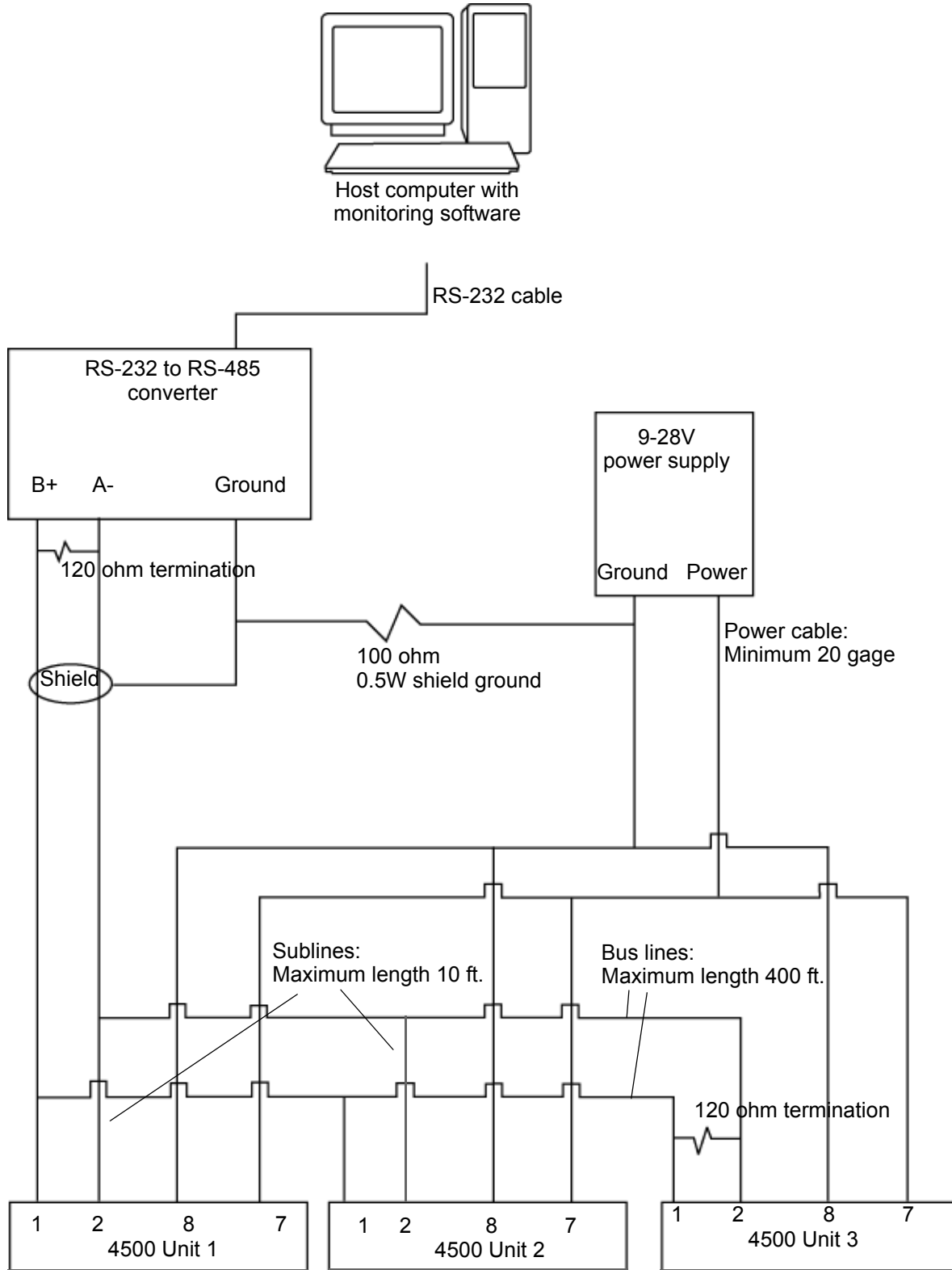


Fig 3-2 : Wiring Diagram of Networked 4500 Units

4 Maintenance and Troubleshooting

4.1 Annual Service

Contact a local agent for onsite calibration or return the 4500 unit for annual re-calibration service to maintain compliance with JIS.

- Place the 4500 in its original packing material.
- Refer to the [“Return Procedures” on page 21](#) to obtain a returned material authorization (RMA) number and to locate the user’s closest geographic location.

4.2 Troubleshooting Networked Units

Problem: 4500 unit is not responding to the monitoring software.

When two or more units have the same address, all units with identical addresses will respond to the monitoring software, causing network confusion. It may not appear that the units are responding. Use the following steps to correct the addressing problem:

- 1) Remove the units from the network that are not responding correctly.
- 2) Individually connect each problem unit to the computer running the serial communication software.
- 3) Follow the instructions in [“Setting the Unit’s Network Address: Modbus Protocol” on page 15](#) to reset the address for each problem unit.
- 4) Reinstall the unit on the network following the instructions in section [“Connecting Multiple Units to the Network” on page 17](#).

4.3 Troubleshooting Pulse Mode Units

When counting data output is not present on the data collection equipment, check the following items.

- Power is properly applied to the network and the green LED is displayed on all units.
- All cable connections are correctly installed.

Appendix A: Service Procedures

A.1 Return Procedures

The 4500 Series Air Particle Counter has a one-year calibration cycle. Return the 4500 Series to an authorized service center for recalibration after one year of the date of calibration, listed on the decal on the back of the 4500 Series.

To return the 4500 Series Air Particle Counter for repair or calibration, first obtain a returned material authorization number (RA#). The RA# is necessary for any instrument that requires repair or calibration by an authorized service center. Include the RA# on the shipping label when the instrument is returned.

For the most up-to-date RA# process information, including copies of all required forms, call Hach Ultra at 800.866.7889 or +1 541.472.6500.

To return an instrument for credit, please contact the local sales representative.



WARNING

The following actions must be performed when returning any unit for any reason to prevent personal injury and/or damage to the unit.

- When the sensor is not in use, or is being stored, verify that the flow cell is clean. Non-volatile compounds can coat the flow cell windows, making cleaning very difficult.

A.2 Technical Support Information

Technical Support Engineers are available to provide advice and recommendations for applications, product operation, measurement specifications, hardware and software, factory and customer site training.

Please provide name, company, phone number, fax number, model number, serial number and comment or question.

Call +1 541.472.6500

Toll Free 800.866.7889 (US/CA)

Fax +1 (541) 474-7414

6:30 AM to 5:00 PM Pacific Time

Monday through Friday

Email: TechSupportGP@hachultra.com

Appendix B: Specifications and Part Numbers

B.1 Performance Specifications

Minimum Sensitivity	4503	0.3 μm
	4505	0.5 μm
Size Range	4503	0.3 to 5.0 μm
	4505	0.5 to 10.0 μm
Flow Rate	2.83 LPM (0.1 CFM)	
Number of Channels	2	
Size Channels	4503	0.3, 0.5, 1.0, 2.0, 3.0, 5.0 μm
	4505	0.5, 1.0, 2.0, 3.0, 5.0, 10.0 μm
Counting Efficiency	4503	50% at 0.3 μm ; 100% for >0.45 μm
	4505	50% at 0.5 μm ; 100% for >0.75 μm
Coincidence Loss	5% at 70,600,000 particles/m ³ (2,000,000 particles/ft ³) Meets JIS B9921: 1997	
Light Source	Long Life Laser™ Diode	
Communications Protocol	Modbus or Pulse	
Communications Standard	Modbus	RS-485
	Pulse	RS-422
Output Connection	RJ-45	
Power	9-28 VDC	
Vacuum Requirements	>18 in. Hg	
LED Indicators	Power, Calibration	
Enclosure	Stainless Steel	
Weight	0.35 kg (12.3 oz.)	
Size	250 cm ³ (15 in. ³)	
Warranty	Instrument	2 years
	Long Life Laser diode	3 years
Power	9-28 VDC (100 mA @ 24 V max.)	
Operating Environment	10 to 40 °C (50 to 104 °F)	
	20 to 90% relative humidity, Non-condensing	
Storage Environment	-10 to 50 °C (14 to 122 °F)	
	Up to 90% relative humidity, Non-condensing	

B.2 Accessories

Table B-1 : Included Accessories

Description	Part Number
Intake Nozzle, 1/8" Hose Barb	MP000026-01
Exhaust Nozzle, 1/4" Hose Barb	SA000054-01
Manual	701243
1/4" O.D. High Purity Tubing, 6"	VP792002

Table B-2 : Optional Accessories

Description	Part Number
RS-232 to RS-485 Converter kit	2082383-2
Zero Count Filter	VP212808
Isokinetic Probe, Hose Barb	MP000120-01
RS-232 Modular Cable	VP894408

Appendix C: Certifications

C.1 Overview

The following standards govern various aspects of the performance and use of particle counters described in this manual. All are available at cost from Hach Ultra Analytics.

- JIS B 9921-1997 Light Scattering Automatic Particle Counter
- Federal Standard 209E Standard Practice for Defining Size Calibration, Resolution, and Counting Accuracy of an Air-Borne Particle Counter Using Near-Monodispersed Spherical Particulate Material.

This appendix contains the Certificate of Conformity and the WEEE statement.

DECLARATION of CONFORMITY

We,

Hach Ultra Analytics
481 California Avenue
Grants Pass, OR 97526

declare under sole responsibility that the

Model 45XX, Part Number 2088100-XX

conforms to Directive 89/336/EEC for Electromagnetic Compatibility and Directive 73/23/EEC for Low Voltage. Compliance was demonstrated to the following specifications as listed in the official Journal of the European Communities:

EN 61326:1998, Class A / EN 50081-1:1992 Emissions:

EN 55011:1991 Class A Radiated
EN 55011:1991 Class A Conducted

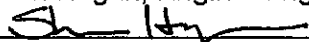
EN 61326:1998 / EN 50082-1:1997 Immunity:

EN 61000-4-2 Electrostatic Discharge
EN 61000-4-3 Radiated Immunity, Amplitude Modulated
EN 61000-4-4 Electrical Fast Transient
EN 61000-4-5 Surge Transients
EN 61000-4-6 Conducted Immunity
EN 61000-4-8 Immunity to Power Frequency Magnetic Fields
EN 61000-4-11 Voltage Dips and Interrupts

EN 61010-1:1993 Amendment 1 & 2, Safety Requirement for Electrical Equipment for Measurement, Control and Laboratory Use

EN 60825-1:1993 Safety of Laser Products, Equipment Classification, Requirements and User's Guide.

Hach Ultra Analytics
November 16, 2005
(Place and date of issue)

Shawn Hogan, Engineering Manager

(Name/signature of authorized person)



Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user. *Note: For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment for proper disposal.* Important document. Retain with product records.

GERMAN Elektrogeräte, die mit diesem Symbol gekennzeichnet sind, dürfen in Europa nach dem 12. August 2005 nicht mehr über die öffentliche Abfallentsorgung entsorgt werden. In Übereinstimmung mit lokalen und nationalen europäischen Bestimmungen (EU-Richtlinie 2002/96/EC), müssen Benutzer von Elektrogeräten in Europa ab diesem Zeitpunkt alte bzw. zu verschrottende Geräte zur Entsorgung kostenfrei an den Hersteller zurückgeben. *Hinweis: Bitte wenden Sie sich an den Hersteller bzw. an den Händler, von dem Sie das Gerät bezogen haben, um Informationen zur Rückgabe des Altgeräts zur ordnungsgemäßen Entsorgung zu erhalten.* Wichtige Informationen. Bitte zusammen mit den Produktinformationen aufbewahren.

FRENCH A partir du 12 août 2005, il est interdit de mettre au rebut le matériel électrique marqué de ce symbole par les voies habituelles de déchetterie publique. Conformément à la réglementation européenne (directive UE 2002/96/EC), les utilisateurs de matériel électrique en Europe doivent désormais retourner le matériel usé ou périmé au fabricant pour élimination, sans frais pour l'utilisateur. *Remarque : Veuillez vous adresser au fabricant ou au fournisseur du matériel pour les instructions de retour du matériel usé ou périmé aux fins d'élimination conforme.* Ce document est important. Conservez-le dans le dossier du produit.

ITALIAN Le apparecchiature elettriche con apposto questo simbolo non possono essere smaltite nelle discariche pubbliche europee successivamente al 12 agosto 2005. In conformità alle normative europee locali e nazionali (Direttiva UE 2002/96/EC), gli utilizzatori europei di apparecchiature elettriche devono restituire al produttore le apparecchiature vecchie o a fine vita per lo smaltimento senza alcun costo a carico dell'utilizzatore. *Nota: Per conoscere le modalità di restituzione delle apparecchiature a fine vita da riciclare, contattare il produttore o il fornitore dell'apparecchiatura per un corretto smaltimento.* Documento importante. Conservare con la documentazione del prodotto.

DANISH Elektriske apparater, der er mærket med dette symbol, må ikke bortskaffes i europæiske offentlige affaldssystemer efter den 12. august 2005. I henhold til europæiske lokale og nationale regler (EU-direktiv 2002/96/EF) skal europæiske brugere af elektriske apparater nu returnere gamle eller udtjente apparater til producenten med henblik på bortskaffelse uden omkostninger for brugeren. *Bemærk: I forbindelse med returnering til genbrug skal du kontakte producenten eller leverandøren af apparatet for at få instruktioner om, hvordan udtjente apparater bortskaffes korrekt.* Vigtigt dokument. Opbevares sammen med produktdokumenterne.

SWEDISH Elektronikutrustning som är märkt med denna symbol kanske inte kan lämnas in på europeiska offentliga sopsstationer efter 2005-08-12. Enligt europeiska lokala och nationella föreskrifter (EU-direktiv 2002/96/EC) måste användare av elektronikutrustning i Europa nu återlämna gammal eller utstrangerad utrustning till tillverkaren för kassering utan kostnad för användaren. *Obs! Om du ska återlämna utrustning för återvinning ska du kontakta tillverkaren av utrustningen eller återförsäljaren för att få anvisningar om hur du återlämnar kasserad utrustning för att den ska bortskaffas på rätt sätt.* Viktigt dokument. Spara tillsammans med dina produktbeskrivningar.

SPANISH A partir del 12 de agosto de 2005, los equipos eléctricos que lleven este símbolo no deberán ser desechados en los puntos limpios europeos. De conformidad con las normativas europeas locales y nacionales (Directiva de la UE 2002/96/EC), a partir de esa fecha, los usuarios europeos de equipos eléctricos deberán devolver los equipos usados u obsoletos al fabricante de los mismos para su reciclado, sin coste alguno para el usuario. *Nota: Sírvase ponerse en contacto con el fabricante o proveedor de los equipos para solicitar instrucciones sobre cómo devolver los equipos obsoletos para su correcto reciclado.* Documento importante. Guardar junto con los registros de los equipos.

DUTCH Elektrische apparatuur die is voorzien van dit symbool mag na 12 augustus 2005 niet meer worden afgevoerd naar Europese openbare afvalsystemen. Conform Europese lokale en nationale wetgeving (EU-richtlijn 2002/96/EC) dienen gebruikers van elektrische apparaten voortaan hun oude of afgedankte apparatuur kosteloos voor recycling of vernietiging naar de producent terug te brengen. *Nota: Als u apparatuur voor recycling terugbrengt, moet u contact opnemen met de producent of leverancier voor instructies voor het terugbrengen van de afgedankte apparatuur voor een juiste verwerking.* Belangrijk document. Bewaar het bij de productpapieren.

POLISH Sprzęt elektryczny oznaczony takim symbolem nie może byćlikwidowany w europejskich systemach utylizacji po dniu 12 sierpnia 2005. Zgodnie z europejskimi, lokalnymi i państwowymi przepisami prawa (Dyrektywa Unii Europejskiej 2002/96/EC), użytkownicy sprzętu elektrycznego w Europie muszą obecnie przekazywać Producentowi stary sprzęt lub sprzęt po okresie użytkowania do bezpłatnej utylizacji. *Uwaga: Aby przekazać sprzęt do recyklingu, należy zwrócić się do producenta lub dostawcy sprzętu w celu uzyskania instrukcji dotyczących procedur przekazywania do utylizacji sprzętu po okresie użytkowania.* Ważny dokument. Zachować z dokumentacją produktu.

PORTUGUESE Qualquer equipamento eléctrico que ostente este símbolo não poderá ser eliminado através dos sistemas públicos europeus de tratamento de resíduos sólidos a partir de 12 de Agosto de 2005. De acordo com as normas locais e europeias (Directiva Europeia 2002/96/EC), os utilizadores europeus de equipamentos eléctricos deverão agora devolver os seus equipamentos velhos ou em fim de vida ao produtor para o respectivo tratamento sem quaisquer custos para o utilizador. *Nota: No que toca à devolução para reciclagem, por favor, contacte o produtor ou fornecedor do equipamento para instruções de devolução de equipamento em fim de vida para a sua correcta eliminação.* Documento importante. Mantenha junto dos registos do produto.

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