

**FLUKE**®

**985**

Airborne Particle Counter

**Getting Started**

PN 4136462

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# Table of Contents

Title	Page
Introduction .....	1
How to Contact Fluke .....	1
Safety Information .....	2
Battery .....	3
Product Overview .....	3
The Buttons .....	5
Product Connections .....	6
Charge Base Connections .....	7
Product Test .....	8
How to Purge the Product Sensor .....	8
How to Take a Sample .....	8
Navigation Menu .....	9
Sample Setup Submenus .....	9
Communication Setup Submenus .....	10
Sample Screen Menu .....	10

Maintenance .....	11
Specifications .....	12
General .....	12
Environmental .....	13

## ***Introduction***

The Fluke 985 Airborne Particle Counter (the Product) is a portable instrument that measures and reports air contamination.

The Product stores 10,000 samples in memory and records the date, time, counts, and sample volume of each sample.

Use the supplied USB cable, an Ethernet connection, or a flash USB drive (not supplied) to download data to a PC.

See the *985 Users Manual* on the Product CD for complete use instructions.

## ***How to Contact Fluke***

To contact Fluke, call one of the following telephone numbers:

- Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
- Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
- Canada: 1-800-36-FLUKE (1-800-363-5853)
- Europe: +31 402-675-200
- Japan: +81-3-6714-3114
- Singapore: +65-6799-5566
- Anywhere in the world: +1-425-446-5500

Or, visit Fluke's website at [www.fluke.com](http://www.fluke.com).

To register your product, visit <http://register.fluke.com>.

To view, print, or download the latest manual supplement, visit <http://us.fluke.com/usen/support/manuals>.

## Safety Information

### Warning

To prevent possible electrical shock, fire, or personal injury:

- The Product contains a laser device and a rechargeable lithium battery pack. Do not disassemble this Product, it contains no user-serviceable parts.
- Do not use, and disable the Product if it is damaged.
- Use the Product only as specified or hazardous laser radiation exposure can occur.
- Do not open the Product. The laser beam is dangerous to eyes. Have the Product repaired only by an approved technical site.
- Do not look directly into the laser with optical tools (for example, binoculars, telescopes, microscopes). Optical tools can focus the laser and be dangerous to the eye.
- Do not use the Product if it operates incorrectly.
- Read the entire Users Manual before using the Product.

Table 1 tells you about symbols used on the Product and in this manual.

**Table 1. Symbols**

Symbol	Description
	Risk of Danger. Important information. See Manual.
	Hazardous voltage. Risk of electrical shock.
	Do not dispose of this product as unsorted municipal waste. Go to Fluke's website for recycling information.
	Conforms to European Union directives.
	Warning. Laser.
	Conforms to relevant Australian standards.
	This product contains a Lithium-ion battery. Do not mix with the solid waste stream. Spent batteries should be disposed of by a qualified recycler or hazardous materials handler per local regulations. Contact your authorized Fluke Service Center for recycling information.

## **Battery**

After you unpack and examine the Product, fully charge the battery before the first use. After the initial charge, charge the battery when the battery icon on the screen shows that battery power is low.

To charge the battery:

1. Put the Product on the Charge Base.
2. Connect the ac adapter to a power source.
3. Connect the ac adapter to the dc input socket on the Charge Base.

An amber light on the front of the Charge Base shows that the base is powered. The light changes to green when the Product is connected to the base.

If the ac adapter cord is connected to the Product, a green light shows above the power jack.

If the Product is on, the battery icon flashes as the battery charges. The icon is solid (does not flash) when the battery is fully charged. Approximately 3.5 hours is necessary to charge a discharged battery. The battery is not user-serviceable.

## **Product Overview**

See Figure 1 and Table 2 to see the items that are shipped with the Product.

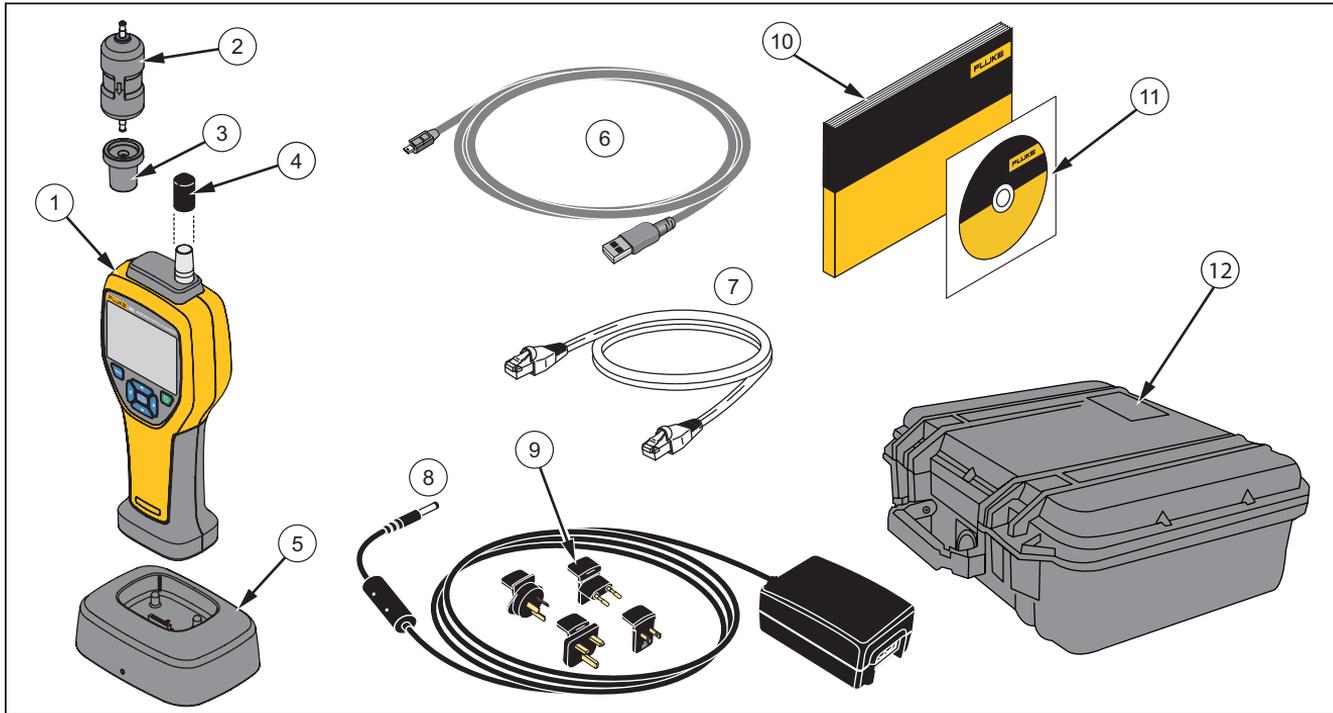


Figure 1. Product Components

gud003.eps

**Table 2. Product Components**

Item	Description
①	The Product
②	Zero-Count Filter
③	Filter Adapter
④	Probe Cap
⑤	Product Charge Base
⑥	USB Cable
⑦	Ethernet Cable
⑧	AC Adapter
⑨	International Power Plug Adapters
⑩	<i>985 Getting Started</i>
⑪	<i>985 User Manual CD</i>
⑫	Product Carrying Case

**The Buttons**

See Table 3 for a description of the Product buttons. For more information on the buttons, see the “Operation” section.

**Table 3. Buttons**

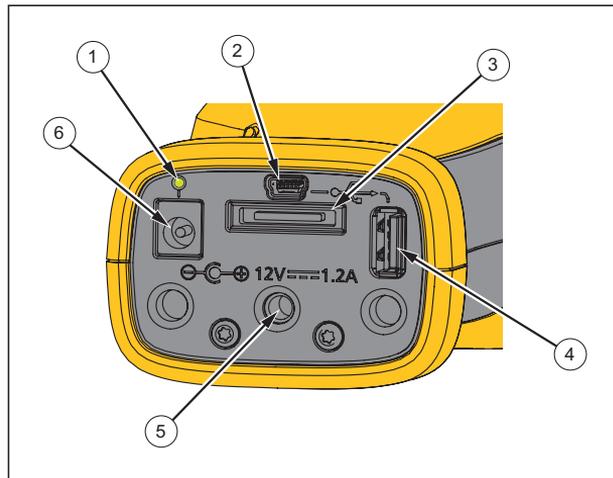
Button	Description
	<b>Power-</b> Push to turn the Product ON. Push again and hold for 3 seconds to turn the Product OFF .
	<b>Menu-</b> Push to access the Product menus. The Menus are: Sample Screen, Buffered Data Screen, Sample Setup, Communication Setup, and Trend Data. Sample Setup and Communication Setup also have submenus.
	<b>Enter/Select-</b> Push to select a menu option. Also use to start and stop a sample when in the Sample Screen.
	<b>Navigation-</b> Push to move through the Product menus, menu selections, and to change values.

### Product Connections

Power and data connections are on the bottom of the Product and on the rear of the Charge Base. The Ethernet connection is only available on the base. Table 4 and Figure 2 show you the Product connections.

**Table 4. Product Connections**

Item	Description
①	Power Charge LED
②	USB Port
③	Base Input
④	Flash USB drive Port
⑤	Tripod Mount
⑥	DC Power Input



gud001.eps

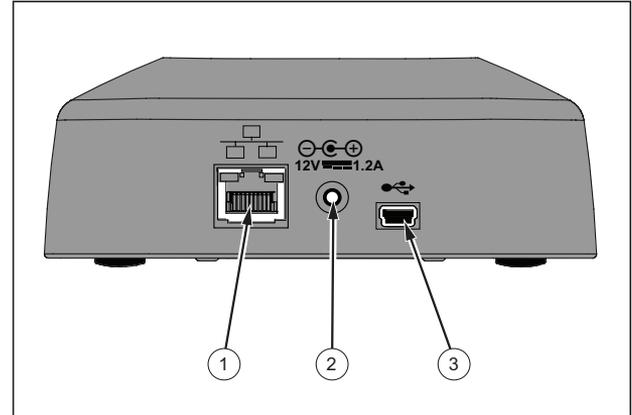
**Figure 2. Product Connections**

### **Charge Base Connections**

Power and data connections are also on the rear of the Charge Base. The Ethernet connection is only available on the base. Table 5 and Figure 3 show you these connections.

**Table 5. Charge Base Connections**

Item	Description
①	Ethernet Port
②	DC Power Input
③	USB Port



gud006.eps

**Figure 3. Charge Base Connections**

### **Product Test**

Electrical noise, sensor leakage, or other interference can cause the Product to give incorrect data.

To check operation:

1. Attach the Zero-Count Filter.
2. In the Data Display Setup screen, enable the 0.3  $\mu\text{m}$  channel and set Concentration mode to COUNTS.
3. In the Sample Setup screen:
  1. Set the sample time to 5 minutes
  2. Set the hold time to 00:00:00
  3. Set the delay time to 00:00:03
  4. Set the MODE to Automatic
  5. Set the number of CYCLES = 2.
4. Start the Product sampling and let it complete the 2 x 5 minute samples.
5. Examine the particle counts from the sample. Counts must align with these specifications for instrument operation to be verified:

No more than 1 particle  $>0.3 \mu\text{m}$  in 5 minutes

### **How to Purge the Product Sensor**

Particles must be purged (removed) from the Product sensor before use in a clean room or clean environment, and after each high-sampling count. To purge the sensor:

1. Attach the adapter and the Zero-Count Filter.
2. Set the Product to sample continuously (set the Count Mode to Cumulative.)
3. Start the count procedure. Continue the count procedure until there are no new counts.
4. Remove the Zero-Count Filter for normal operation.

### **How to Take a Sample**

Before you take a sample, make sure that you remove the protective cap. To take a sample, select the Sample screen and push . The Product samples with values in the Sample Setup menu. To stop a sample, let the sample procedure complete or push  again. See the "Sample Setup Menu" section to set the sample values.

### Navigation Menu

The navigation menu lets you move through the five different sections of the Product software. To go to the Navigation menu, push . The live navigation icon in the middle of the screen is larger and brighter than the other icons. There are five main menus. See Table 6. The Sample Setup and Communication Setup menus also have submenus. See the “Sample Setup Submenus” section of the Users Manual.

**Table 6. Main Menu Icons**

Icon	Menu Item
	Sample Screen
	Buffered Data Screen
	Sample Setup
	Communication Setup
	Trend Data

### Sample Setup Submenus

The Sample Setup Menu includes three submenus. Submenu icons are shown in Table 7 and the subsequent sections tell you about these submenus.

**Table 7. Sample Setup Submenus**

Icon	Submenu Item
	Alarm Setup
	Data Display Setup
	Location Setup

### Communication Setup Submenus

The Communication Setup Menu includes two submenus. Submenu icons are shown in Table 8 and the subsequent sections tell you about these submenus.

**Table 8. Communication Submenu Icons**

Icon	Submenu Item
	General Setup
	Diagnostics
	Login

### Sample Screen Menu

The sample screen is the default screen that shows after the Product is turned-on. The screen shows the current sample settings as you take samples. Push  $\leftarrow$  or  $\rightarrow$  to select from loaded locations. See Figure 4.



samplescreen.jpg

**Figure 4. Sample Screen**

## **Maintenance**

### **⚠⚠ Warning**

To prevent possible electrical shock, fire, or personal injury:

- Have an approved technician repair the Product.
- Use only specified replacement parts.
- Do not put battery cells and battery packs near heat or fire. Do not put in sunlight.
- Do not disassemble or crush battery cells and battery packs.

For safe operation and maintenance of the product:

- Repair the Product before use if the battery leaks.
- Connect the battery charger to the mains power outlet before the Product.
- Do not keep cells or batteries in a container where the terminals can be shorted.

## Specifications

### General

Particle-Size Range .....	(0.3, 0.5, 1.0, 2.0, 5.0, 10.0) $\mu\text{m}$
Channels .....	6
Flow Rate .....	0.1 cfm (2.83 L/min)
Light Source .....	775 nm to 795 nm, 90 mW class 3B laser
Calibration .....	PSL particles in air (NIST Traceable)
Counting Efficiency .....	50 % @ 0.3 $\mu\text{m}$ ; 100 % for particles >0.45 $\mu\text{m}$ (per ISO 21501)
Zero Count Level .....	1 count / 5 minute (per JIS B9921)
Concentration Limits .....	10 % at 4,000,000 per cubic ft (per ISO 21501)
Count Mode .....	raw counts, #/ft <sup>3</sup> , #/m <sup>3</sup> , #/l in cumulative or differential mode
Data Storage .....	10,000 records (rotating buffer)
Delay Time .....	0 hours to 24 hours
Sample Inlet.....	Isokinetic Probe
Security.....	Administrator password controlled (optional)
Communication Modes .....	USB or Ethernet
Display .....	QVGA color with backlight
Alarms .....	User defined for each particle size
Dimensions.....	(27.2 x 9.9 x 5.3) cm (10.7 x 3.9 x 2.1) inches

Weight ..... 680.39 g (1.5 lb)

**Environmental**

IP Rating ..... 40

Operating Humidity..... <95 % RH non-condensing

Protection Class ..... Pollution Degree 2

Operating Temperature..... 10 °C to 40 °C (50 °F to 104 °F)

Operating Altitude..... up to 6000 ft. ASL

Storage Humidity..... up to 98 % RH non-condensing

Storage Temperature ..... -10 °C to 50 °C (14 °F to 122 °F)

Power ..... AC Adapter, 100 to 240 Vac, 12 Vdc, 2.5 A

Battery Type ..... LI-Ion 7.4 V, 2600 mAh

Charge time..... 3.5 hours

Battery Duration ..... 5 hours continuous sampling. 10 hours with typical use model.

Agency Approvals ..... , 

