Agilent 86122C
Multi-Wavelength Meter
Getting Started Guide
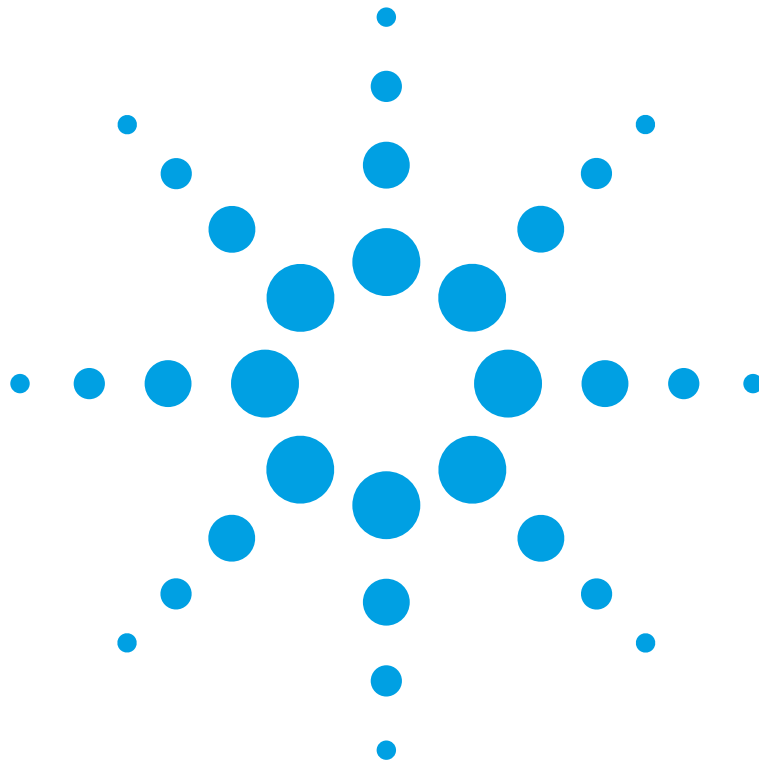
Agilent Technologies

Notices

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Manual Part Number

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Warranty

This Agilent Technologies instrument product is warranted against defects in material and workmanship for a period of five years from date of shipment. During the warranty period, Agilent will, at its option, either repair or replace products that prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by Agilent. Buyer shall prepay shipping charges to Agilent and Agilent shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to Agilent from another country.

Agilent warrants that its software and firmware designated by Agilent for use with an instrument will execute its programming instructions when properly installed on that instrument. Agilent does not warrant that the operation of the instrument, software, or firmware will be uninterrupted or error free.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

No other warranty is expressed or implied. Agilent Technologies specifically disclaims the implied warranties of Merchantability and Fitness for a Particular Purpose.

Exclusive Remedies

The remedies provided herein are Buyer's sole and exclusive remedies. Agilent Technologies shall not be liable for any direct, indirect, special, incidental, or consequential damages whether based on contract, tort, or any other legal theory.

Assistance

Product maintenance agreements and other customer assistance agreements are available for Agilent Technologies products. For any assistance contact your nearest Agilent Technologies Sales and Service Office.

Certification

Agilent Technologies Inc. certifies that this product met its published specifications at the time of shipment from the factory.

Agilent Technologies further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, NIST (formerly the United States National Bureau of Standards, NBS) to the extent allowed by the Institutes's calibration facility, and to the calibration facilities of other International Standards Organization members.

ISO 9001 Certification

Produced to ISO 9001 international quality system standard as part of our objective of continually increasing customer satisfaction through improved process control.

Safety Notices

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Warnings and Notices

WARNING

To avoid the possibility of injury or death, you must observe the following precautions before switching on the instrument.
Insert the power cable plug only into a socket outlet provided with a protective earth contact. Do not negate this protective action by the using an extension cord without a protective conductor.

WARNING

Never look directly into the end of a fiber or a connector, unless you are absolutely certain that there is no signal in the fiber.

Contents

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Getting Started

General Safety Considerations

This product has been designed and tested in accordance with the standards listed in the Manufacturer's Declaration of Conformity, and has been supplied in a safe condition. The documentation contains information and warnings which must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

Safety Symbols

CAUTION   The *caution* sign denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in damage to or destruction of the product. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

WARNING   **The *warning* sign denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning sign until the indicated conditions are fully understood and met.**

Instrument Markings

The instruction manual symbol. The product is marked with this warning symbol when it is necessary for the user to refer to the instructions in the manual.

The laser radiation symbol. This warning symbol is marked on products which have a laser output.

The AC symbol is used to indicate the required nature of the line module input power.

The ON symbols are used to mark the positions of the instrument power line switch.

The OFF symbols are used to mark the positions of the instrument power line switch.

The CE Marking to state compliance within the European Union. This product is in conformity with the relevant European Directives. This text denotes the instrument is an Industrial Scientific and Medical Group 1 Class A product.

The Safety Mark of the Canadian Standards Association CSA.

The C-Tick Conformity Mark of the Australian ACA for EMC compliance.

ISM1-A   This text denotes the instrument is an Industrial Scientific and Medical Group 1 Class A product.

This marking is for China only and states compliance with the chinese Toxic or Hazardous Substances and Elements requirments.

General Recycling Mark.

This product complies with the WEEE Directive (2002/96/EC) marketing requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste.

Product category: With reference to the equipment types in the WEEE Directive Annexure I, this product is classed as a "Monitoring and Control instrumentation" product.

Do not dispose in domestic household waste.

To return unwanted products, contact your local Agilent office, or see

www.agilent.com/environment/product/ for more information.

WARNING	**If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.**

WARNING	**No operator serviceable parts inside. Refer servicing to qualified service personnel. To prevent electrical shock do not remove covers.**

WARNING	**This is a Safety Class 1 Product (provided with protective earth). The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. Any interruption of the protective conductor inside or outside of the instrument is likely to make the instrument dangerous. Intentional interruption is prohibited.**

WARNING	**To prevent electrical shock, disconnect the instrument from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.**

CAUTION	This product complies with Overvoltage Category II and Pollution Degree 2. It has been designed for indoor use only.

CAUTION   Always use the three-prong AC power cord supplied with this instrument. Failure to ensure adequate earth grounding by not using this cord may cause instrument damage.

CAUTION   This instrument has autoranging line voltage input. Be sure the supply voltage is within the specified range.

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

CAUTION   The 86122C Multi-Wavelength Meter uses a specially designed Windows application program (Windows ® is a U.S. registered trademark of Microsoft Corp.) All 86122C Multi-Wavelength Meter functionality is directly available from within the 86122C Multi-Wavelength Meter application. Windows configuration changes made outside of the 86122C Multi-Wavelength Meter application may not work correctly and could cause the instrument to become inoperable. Do not try to access or make changes to the Windows Operating system. Repairs caused by the improper use of the 86122C Multi-Wavelength Meter will not be covered under warranty.

CAUTION   VENTILATION REQUIREMENTS: When installing the product in a cabinet, the convection into and out of the product must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the product by 4° C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used.

CAUTION   Install the instrument so that the detachable power cord is readily identifiable and is easily reached by the operator. The detachable power cord is the instrument disconnecting device. It disconnects the mains circuit from the mains supply before other parts of the instrument. The front panel switch is only a standby switch and is not a LINE switch. Alternatively, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.

Laser Safety Considerations

NOTE	Refer to the *Tunable Laser Modules User's Guide* for complete laser safety information.

WARNING	**Do NOT, under any circumstances, look into the optical output or any fiber/device attached to the TLS output while the laser is in operation.**

This system should be serviced only by authorized personnel.

Do not enable the laser unless fiber or an equivalent device is attached to the optical output connector.

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

Setting Up the 86122C

This section describes the steps required to properly set up your 86122C.

Step 1. Inspect the Shipment

1 Use proper lifting techniques to remove the items from the shipping container.

NOTE	Keep the shipping container and cushioning material until you have inspected the contents of the shipment for completeness and have inspected the instrument.

2 Inspect the shipment.
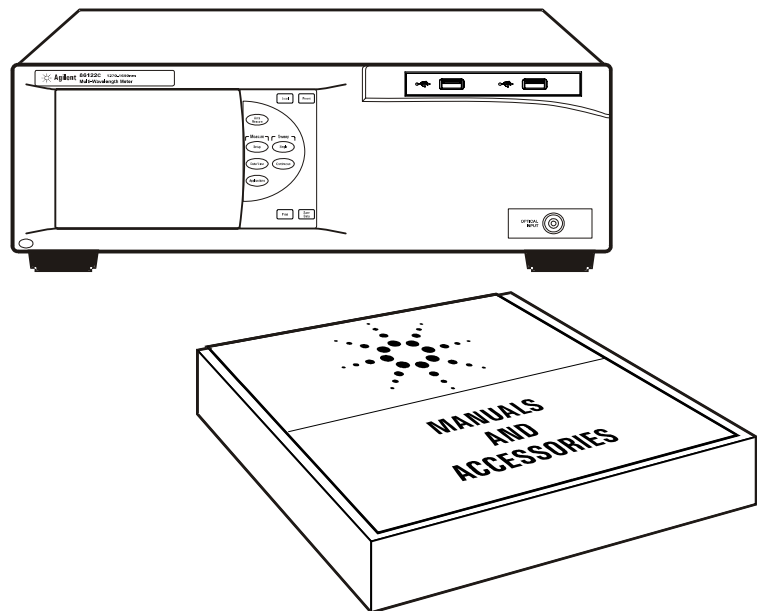
- Inspect the shipping container for damage.
- Inspect the instrument.
- Verify that you received the options and accessories you ordered.

If anything is missing or defective, contact your nearest Agilent Technologies Service Office. Refer to "Agilent Technologies Service Offices" on page 57. If the shipment was damaged, contact the carrier, then contact the nearest Agilent Sales Office. Keep the shipping materials for the carrier's inspection. The Agilent Sales Office will arrange for repair or replacement at Agilent's option without waiting for claim settlement.

Options and Accessories

The following table lists the accessories that may be on the 86122C shipping list. The information on your actual shipping list is more accurate and should supersede the information in this table.

Table 1 Accessories Included

Accessories	Part Number
Stylus	1150-7997
Getting Started	86122-90A02
Power Cord	depends on country
86122C-UK6	Commercial Calibration Certificate with Test Data

The following table lists the available product options. Make sure that you received all of the options that you ordered.

Table 2 Instrument Options

Option	Description
86122C-100	Multi-Wavelength Meter, 1270 nm to 1650 nm, ±0.2 ppm
86122C-UG1	Upgrade 86122A to 86122C Multi-Wavelength Meter
86122C-UG2	Upgrade 86122B to 86122C Multi-Wavelength Meter
Optical Connectors	
86122C-021	Straight (non-angled) Contact Interface-PC (default)
86122C-022	Angled Contact Interface-APC
Accessories	
86122A-1CM	Rack Mount Kit without Handles
86122A-1CN	Rack Handle Kit
86122A-1CP	Mount Kit plus Handles

Table 3 Fiber-Optic Adapters

Agilent Part Number	Description
81000FI	Connector Interface FC/PC/SPC
81000HI	Connector Interface E-2000(PHYSICAL CONTACT)
81000KI	Connector Interface SC
81000LI	Connector Interface LC
81000NI	Connector Interface FC/APC, narrow key
81000SI	Connector Interface DIN 47256/4108
81000VI	Connector Interface ST
81000MI	Connector Interface MU

Step 2. Consider Environmental Specifications

Review the following specifications to ensure that your operating or storage environment is suitable for the instrument

General	Indoor use only
Temperature	
Operating	+15°C to +35°C
Non-operating	-40°C to +70°C
Humidity	
Operating	< 75% relative humidity at +35°C, 5 day soak
Non-operating	Noncondensing 95% relative humidity at +40°C for 5 day cycle
Altitude	
Operating	Up to 2000m (6600 ft)

NOTE   *Humidity* is type tested. Type tested means tested, but not warranted, for continuous operation.

Shock   120 g, half sine, 2 ms pulse

NOTE   *Shock* is type tested.

Vibration   Random, 2 g rms, 5-500 Hz, 10 minutes per axis
                 Sine, 0.5 g (0 to peak), 5 to 500 Hz, 1 octave per minute

NOTE   *Vibration* is type tested.

Power Requirements	
Voltage	100-240 V~
Frequency	50-60 Hz
Maximum Power	240 W
Weight	14.5 kg (32 lb)
Dimensions	
Height	138 mm (5.2 in)
Width	425 mm (16.7 in)
Depth	520 mm (20.5 in)

Step 3. Configure for Bench Top or Rack Mount Use

The 86122C is shipped ready for bench-top use. To configure the instrument for rack mount use, follow the steps below.

| NOTE | You must have a rack mount kit to continue with this procedure. Refer to "Accessories" on page 15. |

1 Ensure that the rack mount kit is complete.

> **If any items are damaged or missing from the kit, contact the nearest Agilent Technologies sales or service office to order a replacement kit. Items within the kit are not individually available.**

Table 4

Qty	Description
2	Rack Mount Flange
6	Screws
4	Dress screws
2	Front Handle Assembly (86122A-1CP only)

2 Remove the side trim strips.

3 Attach rack mount flange with three screws per side.

| WARNING | **Use only the screws the come with the rack mount kit. Longer screws may damage the instrument, and shorter screws may be unsafe.** |

4 Remove feet before rack mounting
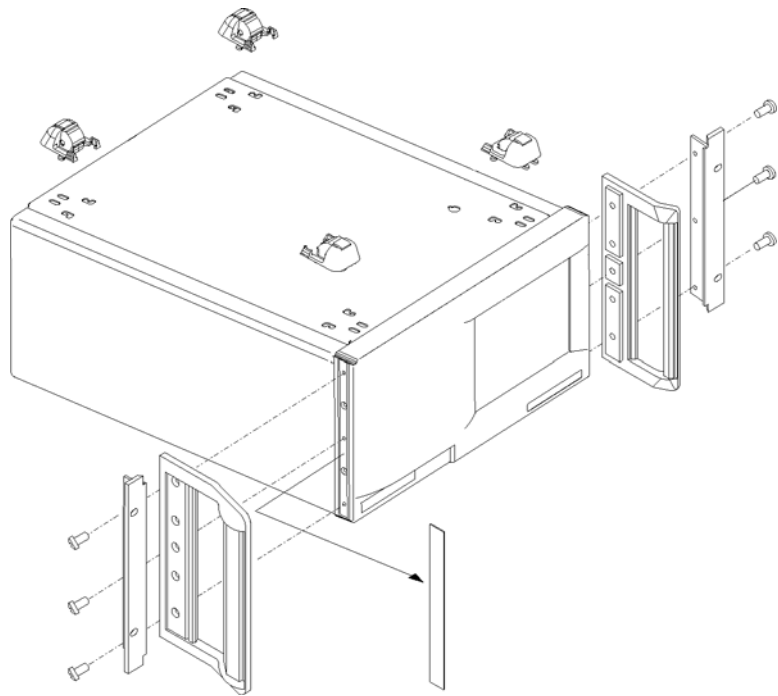
Front Handle Assembly are included with Option 86122A-1CP only.

Step 4. Connect a Keyboard and Mouse (Optional)

You may connect a standard PC-compatible mouse and keyboard to the instrument. Refer to the figure below for PS/2 connections. You can also use the USB port for a USB keyboard and mouse. You can also connect USB mouse and keyboard with the USB port in the fornt panel of the instument.

NOTE	A keyboard and mouse are not supplied with the 86122C.
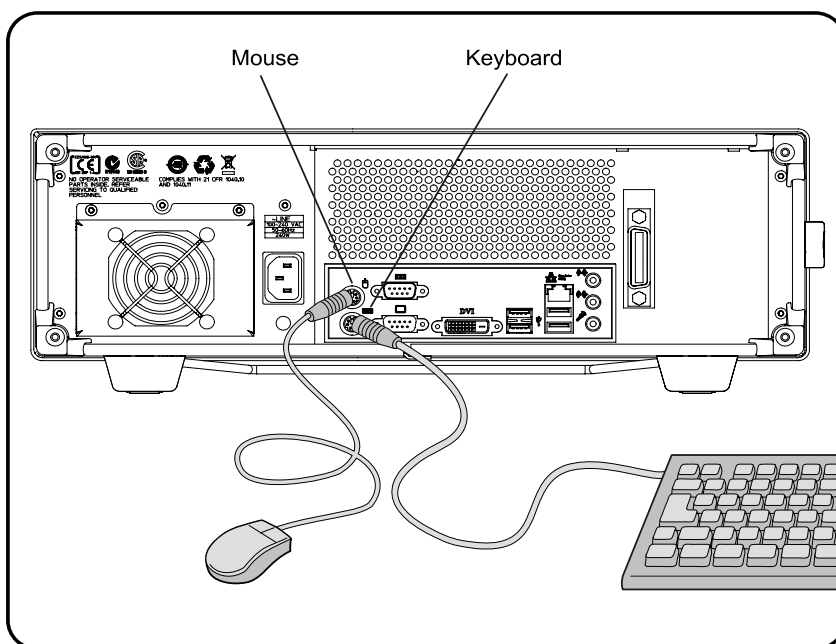
NOTE	Do *not* stack other objects on the keyboard; this will cause self-test failures at power-on.

Step 5. Connect the Line Cord

Connect the line cord as shown in the figure below.
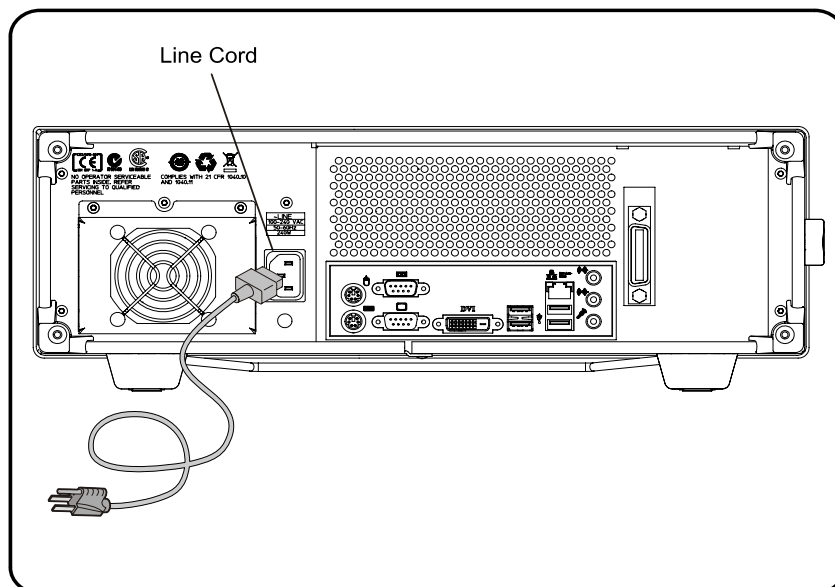
The product can operate from any single-phase AC power source
supplying 100 – 240 V in the frequency range from 50 – 60 Hz. The
maximum power consumption is 240 W. The power supply automatically
adapts to the applied AC power (Auto Selection) and monitors the AC
power range. The mains supply voltage fluctuation shall not exceed 10% of
the specified supply voltage.

CAUTION   The product must be operated from a power source providing Line,
grounded Neutral and Protective Earth (PE) connections. The
instrument is not intended for operation from two phases of a multi-
phase ac system or across the legs of a single-phase, three-wire AC
power system. Crest factor (ratio of peak voltage to rms.) should be
typically within the range of 1.3 to 1.6 at 10% of the nominal rms.
mains voltage.

Step 6. Turn On the Line Power

Press the power switch at the lower left-hand corner of the front panel. After stabilisation of the internal reference laser the instrument will show application screen and is ready to use.
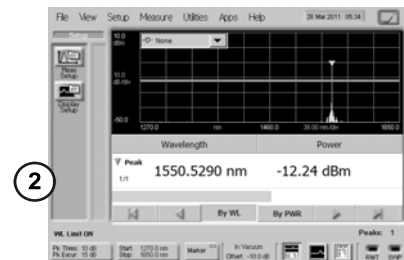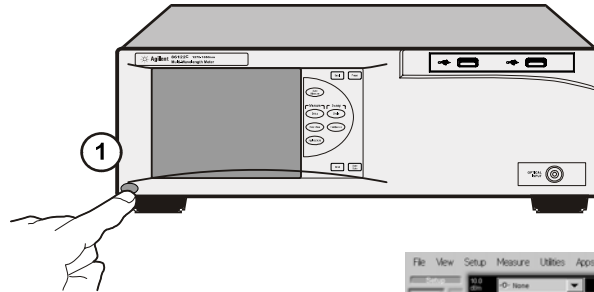
Interacting With the Display

The 86122C is equipped with a touch screen display. You can explore the instrument's functions and settings by touching elements on the display (such as menus, buttons, and other controls) with your finger or the supplied stylus.

You can also operate the instrument by using an optional mouse. For simplicity, the term "click" is used throughout this book to represent *clicking or touching* an element on the display. When you see the term "click," please remember that you can always touch with your finger or stylus instead.

NOTE	The display will always function as a touch screen, even when a mouse and keyboard are connected.

CAUTION	Avoid touching the screen with a sharp object, as this could result in damage to the display. Use your finger or the supplied stylus.
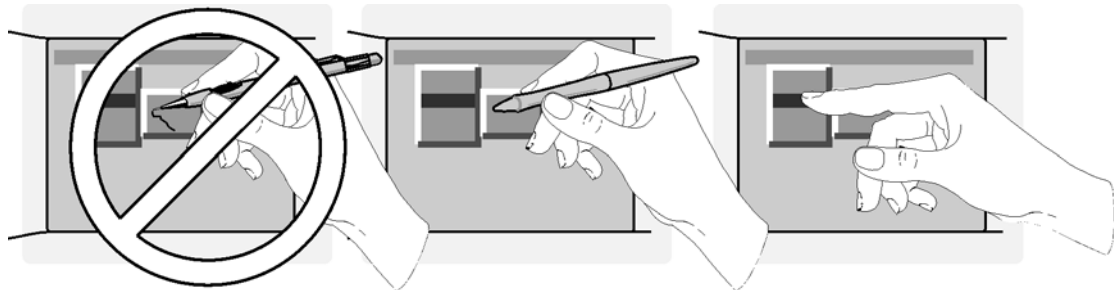
Step 7. Calibrate the Touch Screen (Optional)

NOTE	The touch screen calibration rarely needs to be performed.

Touch screen calibration ensures that the touch screen is both accurately aligned and orientated with the display. Therefore, when you touch an element on the display screen, the instrument can detect the task you want to perform.

1 On the Utility menu, click Touch Screen Calibration. The touch screen calibration utility opens.
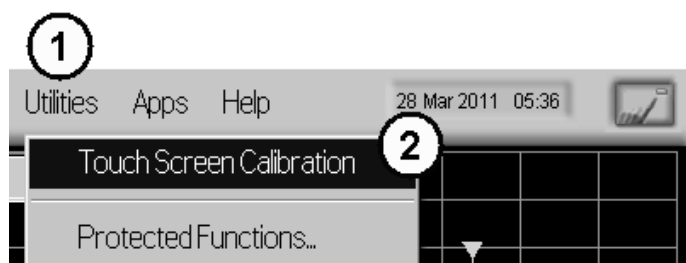
2 Touch the center of the X with your finger or a stylus. Several X will appear on different positions of the display screen. Touch them precisely as the first one. When the display is calibrated, the touch screen configuration utility closes.
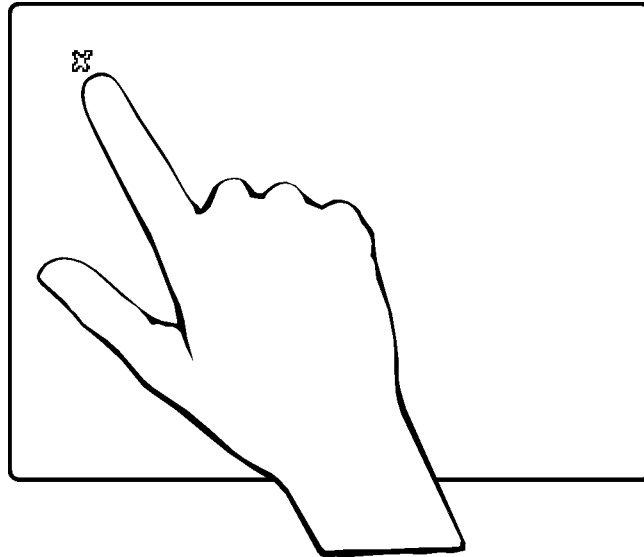
The calibration will time out within 10 seconds if you do not touch the center of the X. You can also press Esc on an optional keyboard to exit the touch screen calibration.

NOTE   If you miss the center of the X by a significant amount, the instrument will display an error message and revert back to the previous calibration. This will prevent the touch screen from being rendered useless due to a poor calibration.

In case a failed touch screen calibration leads to a non-working condition, you can restart the touch screen calibration by using a USB mouse.

Step 8. Set the Time and Date

1 Click the current time and date shown near the top of the display. The Set Time and Date dialog box opens.

2 Enter the current time and date in one of the following ways:

• Click the time and date text boxes, and enter the desired number.

• Click the up or down arrows next to the time and date text boxes until the desired number is displayed.

3 Click **Set Time & Date Now** to apply the changes and close the dialog box.
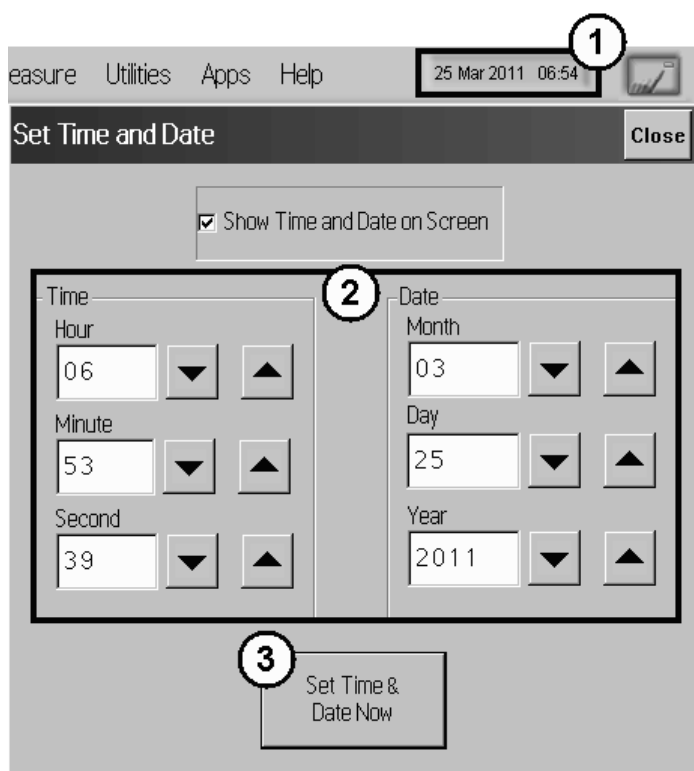
Step 9. Set the System Standby Mode

If the multi-wavelength meter has been inactive for a specified period of time, it will be switched into standby mode. When this happens, two things will occur:

• The LCD display indicates the standby mode.

• If the instrument is in Continuous sweep mode, the motor movement, and any related data collection, will be suspended.

NOTE   The internal reference laser is always on to allow the instrument to immediately make accurate measurements when it is reactivated.

Any subsequent activity, front-panel or remote, will reactivate the instrument and return it to it's previous state. Using this feature can help extend the life of your instrument. To extend the life of the reference laser, you should turn off the instrument during long periods of inactivity (e.g. several hours or over night).

To configure standby mode

1 On the Setup menu, click Preferences.

2 Select a time-out period from the System Standby list. You can choose 15 min., 30 min., 1 hr., 4 hrs., or Never. Selecting **Never** disables this feature.
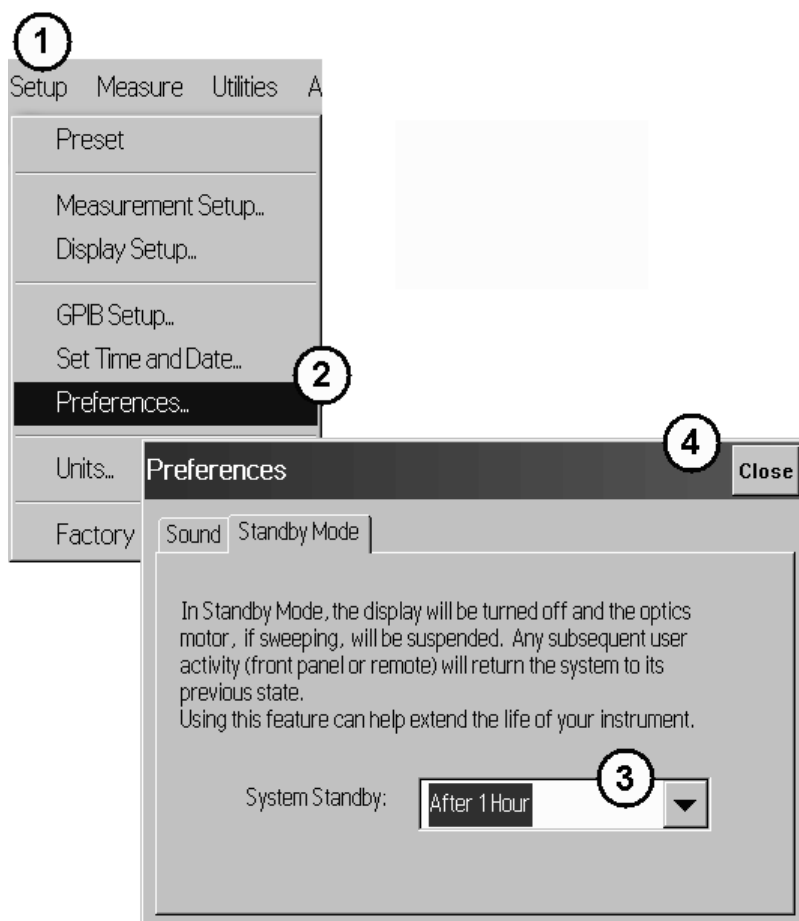
To reactivate the display

- Touch the display screen or a front panel button

- Move the mouse or press a key on the external keyboard (if attached)

- Send a remote command

Step 10. Add a Printer

Use of a printer with the 86122C is optional. Follow the steps of your printer's documentation.

NOTE	The 86122C only supports USB and LAN printers (no parallel printer port).

1 In the File menu of the 86122C software, click Print Setup.
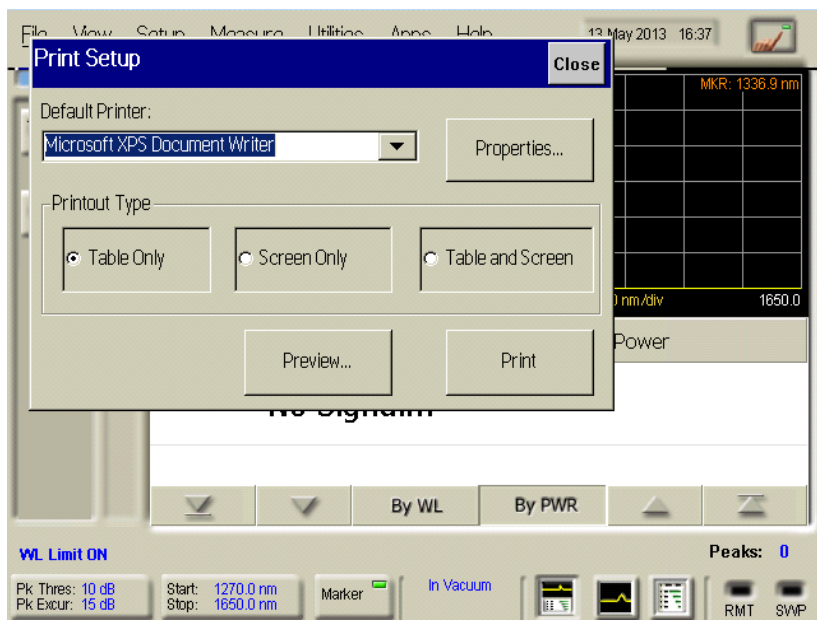
2 In the Print Setup window, click Properties...

   a If the setup window is not fully visible, move the cursor to the lower edge of the display to pan and scan the window within the visible area of the display.
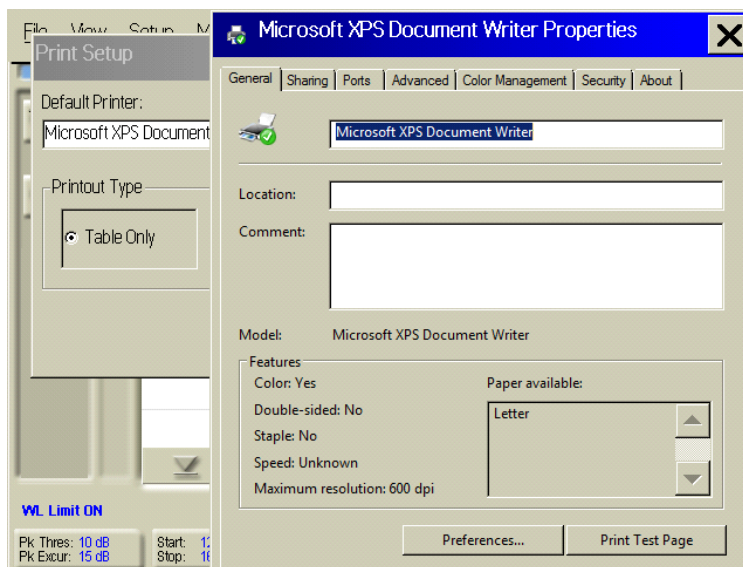

   b Using the pan and scan function, the lower end of the Printer Properties window becomes accessible.

   c Click OK /Cancel/Apply button to confirm, cancel or apply your changes.
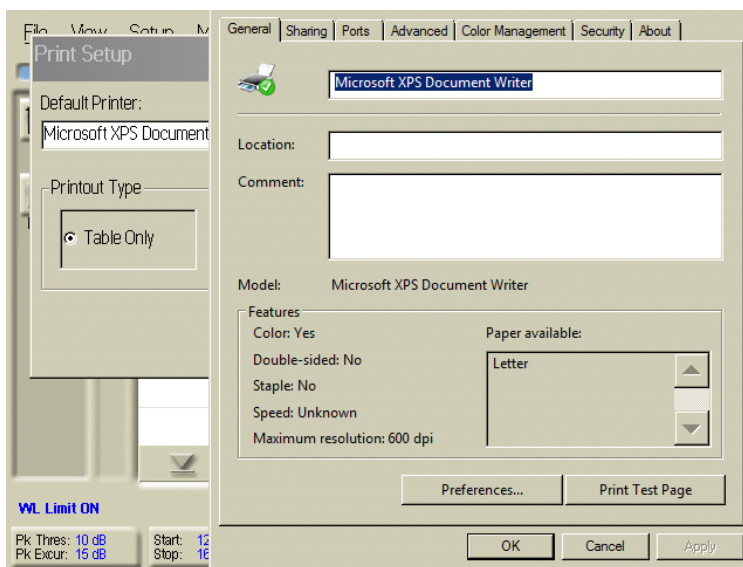
CAUTION	Installation of programs other than drivers necessary for your printer is not recommended or supported. Installation of additional software could render the 86122C software inoperable.

Step 11. Change Region and Language Settings

Follow the steps to change the region and language settings.

1 Exit the 86122C software.

   a On the Utilities menu, click Protected Functions.

   b Enter the protected functions password "exit to windows" and click Activate.
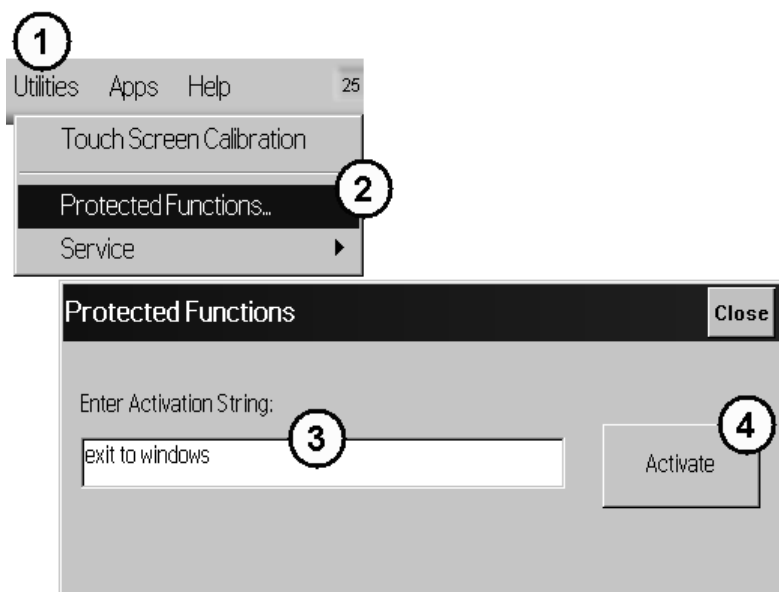
2 From the Windows 7 Start menu, open the Control Panel.

3 In the Control Panel, click Clock, Language and Region.

a The Region and Language window is not fully visible. Move the cursor to the lower edge of the display to pan and scan the window within the visible area of the display.
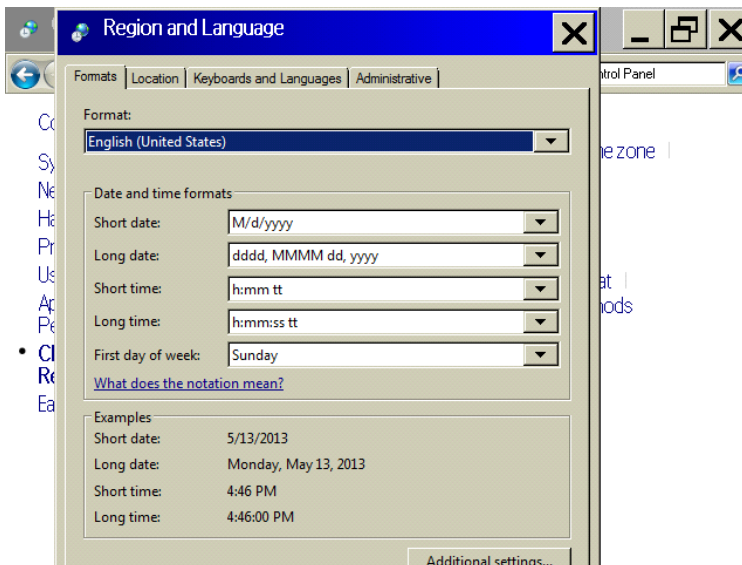
b The Windows 7 taskbar may come up. In that case, move the cursor slightly upwards until the taskbar disappears, and the lower edge of the active window becomes visible again.
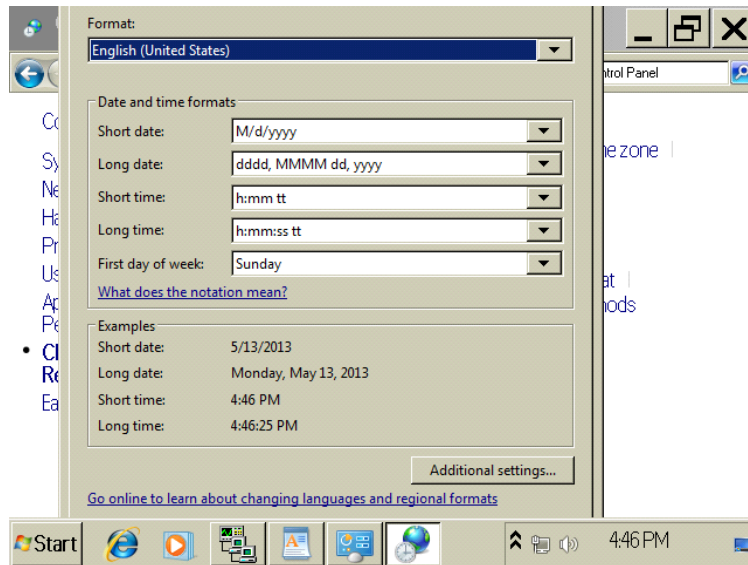
c Click OK /Cancel/Apply button to confirm, cancel or apply your changes.
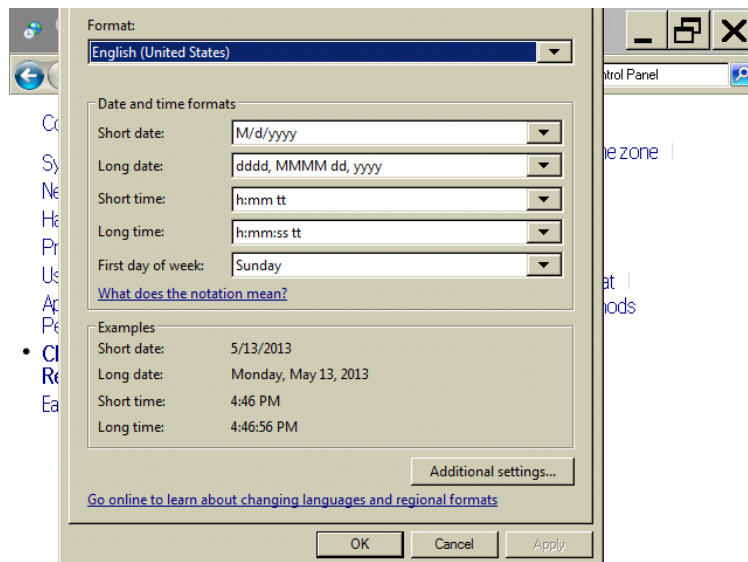
Step 12. Avoid Costly Repairs
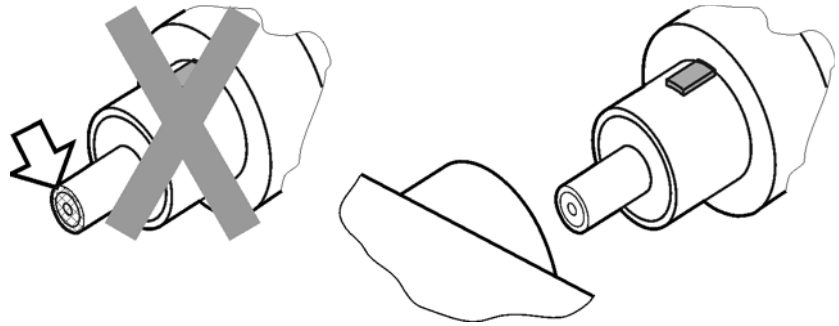
|	
CAUTION	Optical channel fiber-optic connectors are easily damaged when connected to dirty or damaged cables and accessories. When you use improper cleaning and handling techniques, you risk expensive instrument repairs, damaged cables, and compromised measurements. Before you connect any fiber-optic cable to the instrument, refer to 86122C User's Guide for the chapter "Cleaning Information".

Step 13. For More Information

There are several ways to learn more about your 86122C.

- Refer to 86122C User's Guide for the chapter "Using the 86122C". It will help you get started using this instrument.

- Refer to the Help. The Help opens the user's and programmer's guide in PDF format.

- Visit our website at http://www.agilent.com. Use the keyword "86122C" in your search.

Making Measurements

This chapter explains the steps required to make a measurement.

Step 1. Consider Measurement Limitations

Before connecting a signal and making a measurement, please consider
the following measurement limitations:

NOTE   The front-panel OPTICAL INPUT connector uses a single-mode input fiber.

CAUTION   +10 dBm is the maximum total displayed input power. Do not exceed
+18 dBm source power. The Agilent 86122C's input circuitry can be
damaged when total input power exceeds this level.
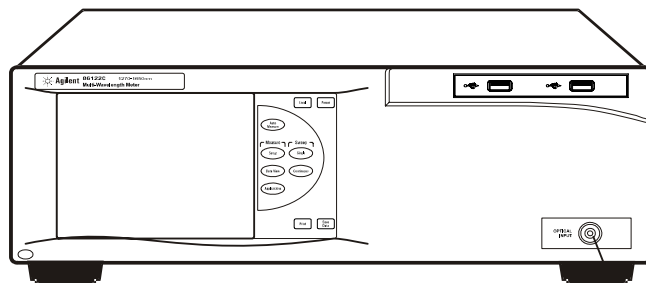
≤ 10 dBm

> 18 dBm

CAUTION	Optical channel fiber-optic connectors are easily damaged when connected to dirty or damaged cables and accessories. When you use improper cleaning and handling techniques, you risk expensive instrument repairs, damaged cables, and compromised measurements. Before you connect any fiber-optic cable to the Agilent Variable Optical Attenuator modules and Agilent Variable Optical Attenuator modules with Power Control, refer to 86122C User's Guide for the chapter "Cleaning Information".
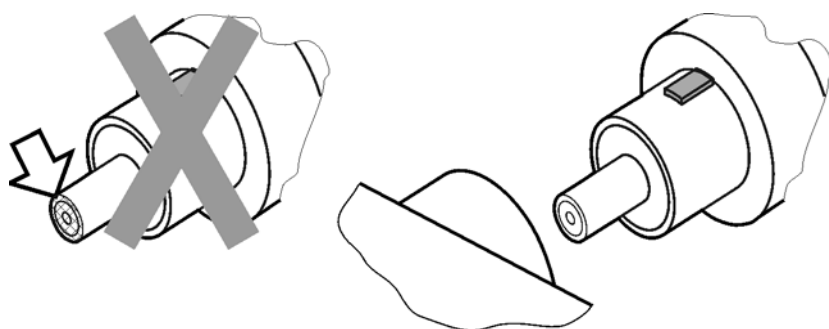
WARNING	**Always remove both ends of fiber-optic cables from any instrument, system, or device before visually inspecting the fiber ends. Disable all optical sources before disconnecting fiber-optic cables. Failure to do so may result in permanent injury to your eyes.**
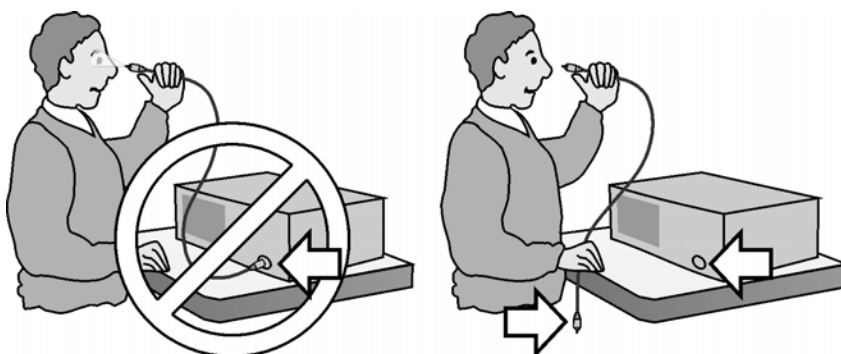
- If the measured amplitudes are low, clean the front-panel OPTICAL INPUT connector.

- 1270 - 1650 nm is the maximum input wavelength range

- Laser line widths are assumed to be less than 2.5 GHz

Step 2. Select Basic Measurement Setup Parameters

Basic measurement setup parameters that you should choose before making a measurement are medium, device type, units, and sweep mode.

Select the Medium

The 86122C can display wavelength values in a vacuum, or in standard air.

1 Press   Setup   and click [Meas Setup icon] .

2 Click the Medium tab, and select In Air or In Vacuum.

3 Click Close.
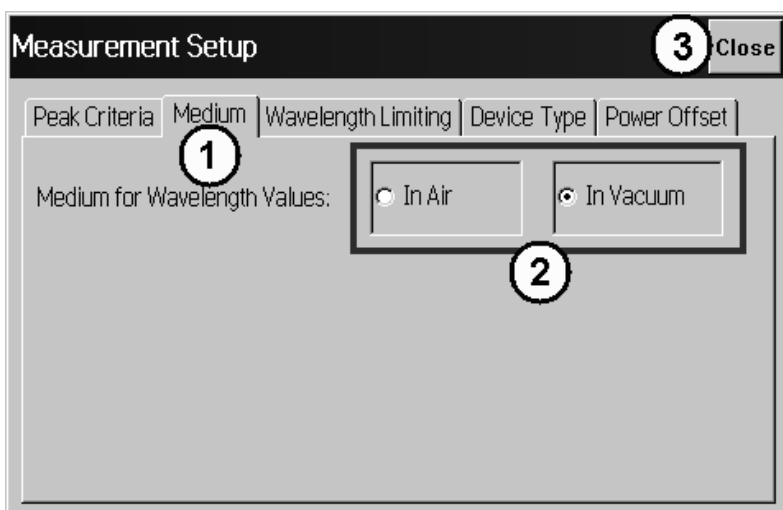
Select the Units

The 86122C can display wavelength and amplitude values in several types of measurement units.

1 Press [Setup] and click [Display Setup] .

2 Click the Units tab, and select the wavelength and amplitude units.

3 Click Close.
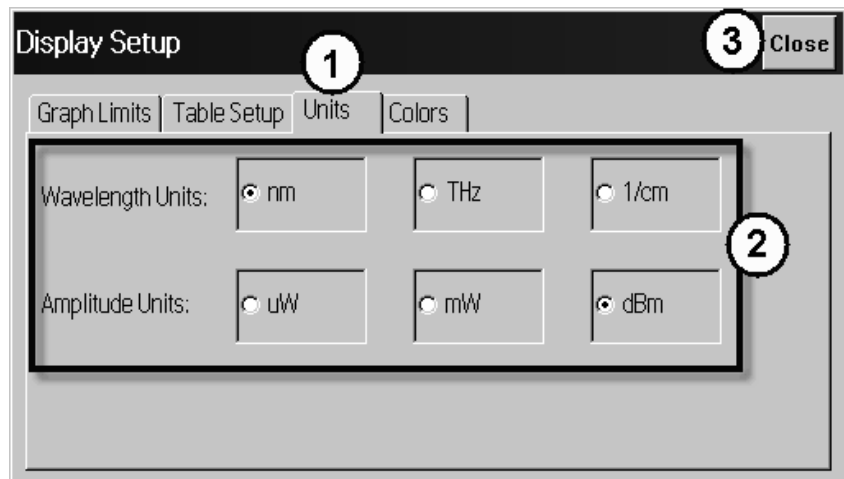
Select the Device Type

You can optimize (or match) the measurement technique of the 86122C to the type of device you are measuring — narrowband or broadband. Narrowband devices include DFB lasers and modes of Fabry-Perot lasers. Broadband devices include LEDs, optical filters, and chirped lasers.

1 Press [Setup] and click [Meas Setup] .

2 Click the Device Type tab, and select Narrowband or Broadband.

3 Click Close.
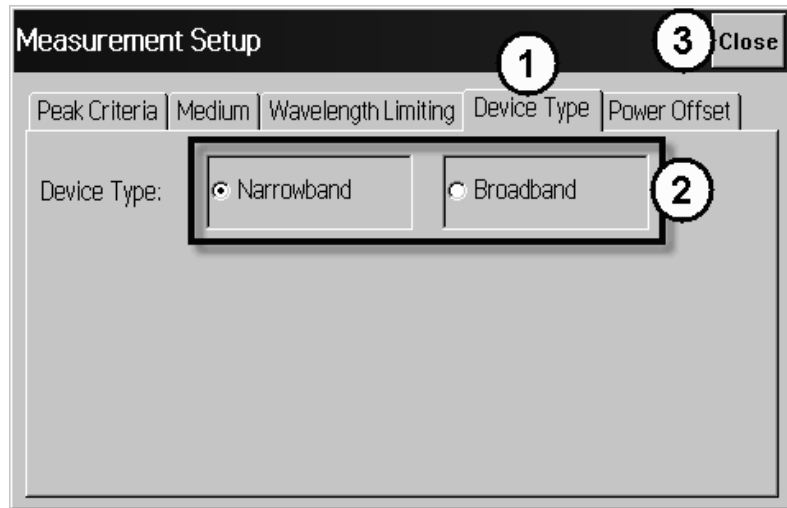
Select the Sweep Mode

•   Press [Single] to initiate one measurement sweep. This is useful if you want the data to remain static for saving results or printing.

•   Press [Continuous] to continuously measure the input spectrum. In this mode, a measurement sweeps occurs approximately every 0.5 seconds. This is useful if you want the data to be continuously updated.

You can also set up data logging to perform measurement sweeps at any desired interval. The green SWP indicator in the lower right-hand corner is lit when a measurement is being acquired.

Step 3. Define Laser-Line Peaks

Peak criteria settings and wavelength limiting allow you to define how laser line peaks are measured.

How Laser-Line Peaks are Defined

A laser line will only be measured as a peak if the amplitude is greater than the peak threshold limit and the rise-and-fall (excursion) is greater than or equal to the peak excursion. In addition, peaks are only measured within the wavelength limits that you specify.
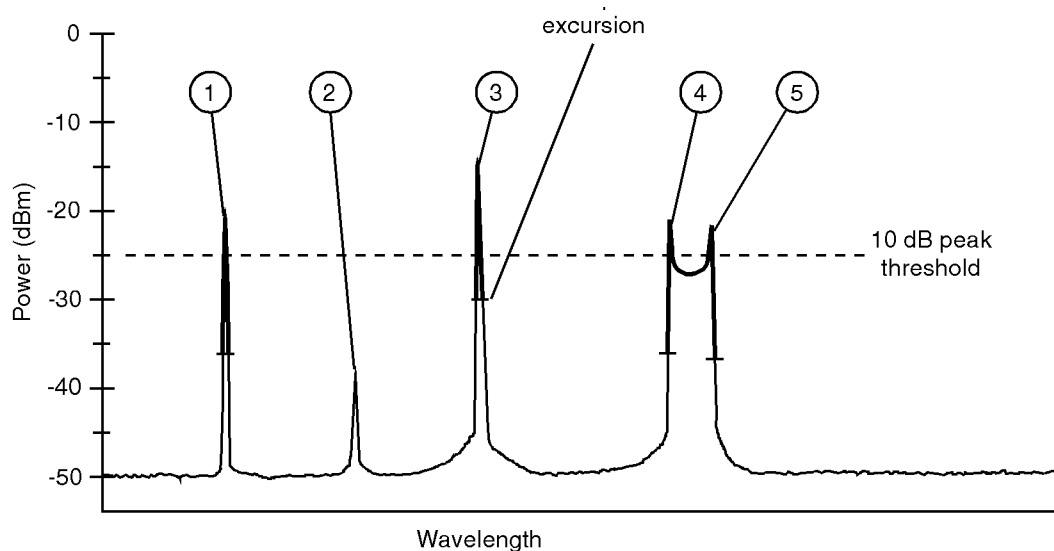

- In this figure, only three laser lines are identified as peaks: responses 1, 3, and 4.

- Response 2 is not identified as a peak because it is below the peak threshold.

- Responses 4 and 5 are identified as one peak laser line. This is because the minimum point between 4 and 5 does not drop to the peak excursion limit.

Use Peak Criteria to Define Peaks

1 Click `Pk Thres: 10 dB` `Pk Excur: 15 dB` .

2 Click the Peak Criteria tab.

3 Select Relative or Absolute threshold type.

4 Click the Threshold Value box and enter the threshold value.

5 Click the Peak Excursion box and enter the excursion value.

6 Click Close.
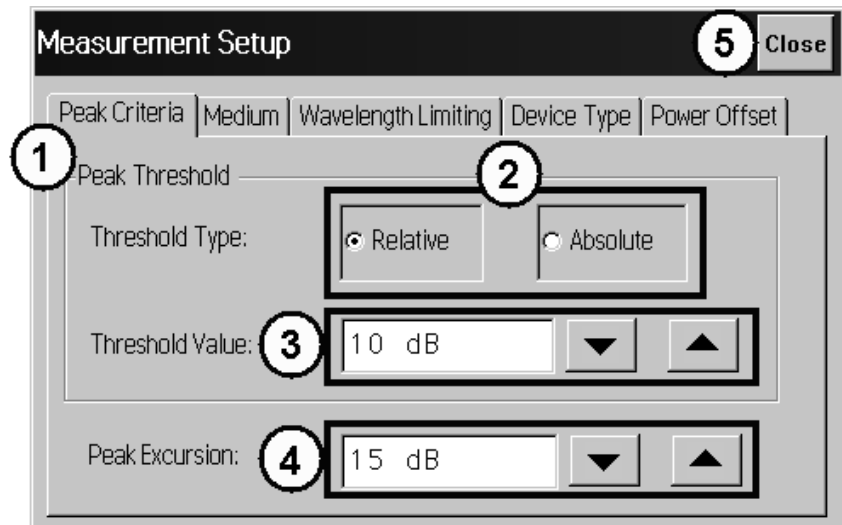
Use Wavelength Limiting to Define Peaks

1 Press [Setup] and click [Meas Setup].

2 Click the Wavelength Limiting tab.

3 Select On

4 Click the Limit Start Wavelength box and enter the start wavelength value.

5 Click the Limit Stop Wavelength box and enter the stop wavelength value.

6 Click Close.
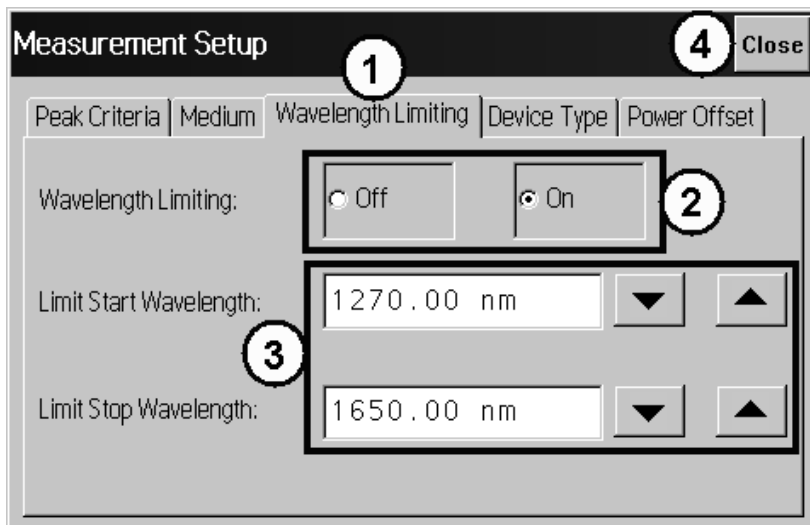
Step 4. Make Measurements

The 86122C can make a wide variety of wavelength and power measurements.

Peak Wavelength and Power

Press and click .

Multiple Laser Lines

Press and click .

Average Wavelength and Total Power

Press and click .

Laser Channel Separation

It is often important to measure the wavelength and power separation between multiple laser lines. This is especially true in wavelength-division-multiplexed (WDM) systems where channel spacing must be adhered to. The Agilent 86122C can display the wavelength and amplitude of any laser line relative to another.

1 Press (Data View) and click [Delta WL] .

2 Select a channel as the reference by clicking in the "Ref" column of the desired row.

3 To determine channel spacing from the reference, simply read the relative wavelength values in the "Delta WL" column.

Laser Channel Flatness

You can use relative power measurements to measure flatness (pre-emphasis) in a WDM system. Simply select one carrier as the reference and measure the remaining carriers relative to the reference level. The power differences represent the system flatness.

1 Press (Data View) and click [Delta Power] .

2 Select the channel with the largest amplitude as the reference by clicking in the "Ref" column of that peak's row.

3 To determine channel flatness from the reference, simply read the relative power values in the "Delta Pwr" column.

Laser Channel Separation/Flatness

You can also measure channel separation and flatness at the same time.

Press (Data View) and click [Delta WL/Pwr] .

Laser Drift

Laser drift can be easily measured by using the drift application.

Press (Applications) and click [Drift] .

Signal-to-Noise Ratio

Signal-to-noise ratio can be easily measured by using the OSNR application.

Press ⬭Applications and click .

Fabry-Perot Lasers

Fabry-Perot lasers can be easily measured by using the Fabry-Perot Laser application.

Press ⬭Applications and click .

Power Greater than 10 dBm

The maximum total input power that can be measured is 10 dBm. However, with the addition of an external attenuator, more power can be applied. This may be necessary at the transmit end of a wavelength-division-multiplexed system where large signal levels are present. By entering a power offset equal to the amount of attenuation at the instrument's input, accurate amplitude measurements are shown on the display.

1 Connect an optical attenuator between the front-panel OPTICAL INPUT connector and the fiber-optic cable from your device. The attenuator must reduce the total input power to the Agilent 86122C so that it is below +10 dBm.

2 Press ⬭Setup and click .

3 Click the Power Offset tab.

4 Click the Power Offset box, and enter a power offset value.

5 Click Close.

Power offset values are added to the display power readings. For example, if you placed a 10-dB attenuator on the front-panel connector, you should enter a power offset value of +10 dB. Negative values can also be entered if you connect an amplifier instead of an attenuator.
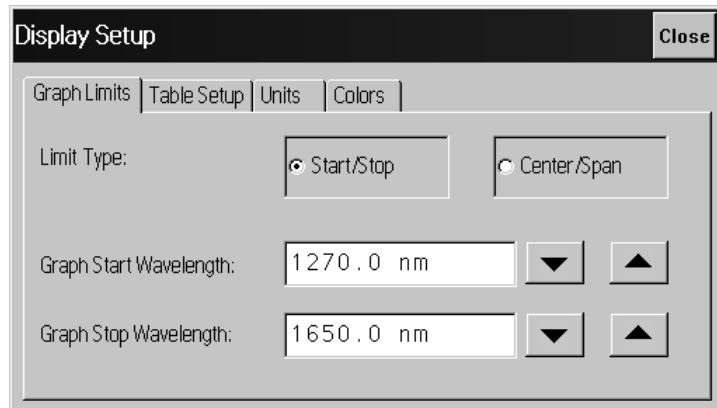
Step 5. Adjust the Graph to Your Preference

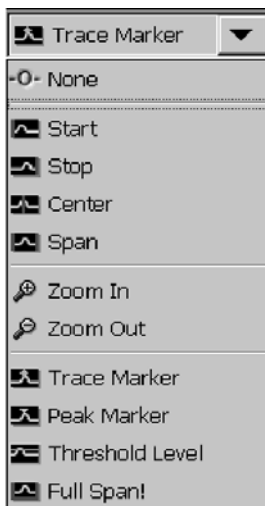After you have set up your measurement, you may wish to adjust the graph x-axis or move markers.

Adjust the X-Axis
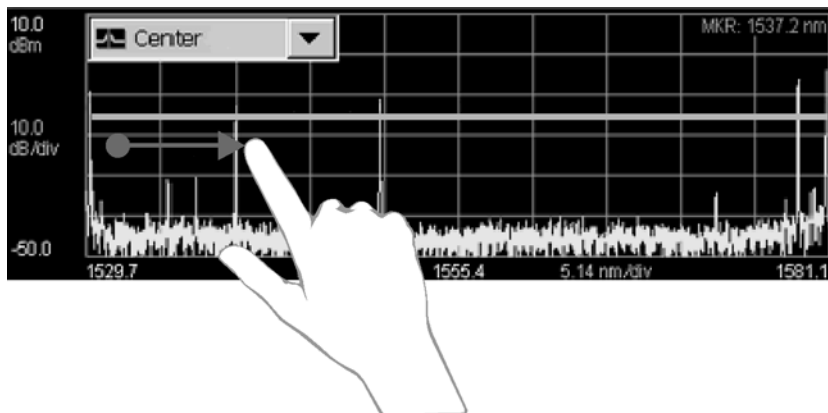
You can adjust the x-axis in any of the following ways:

- Click [Start: 1270.0 nm / Stop: 1650.0 nm] and enter graph limits as start/stop or center/span.

- Select an x-axis control from the Graph Control list. Click anywhere on the graph and drag to the left or right.
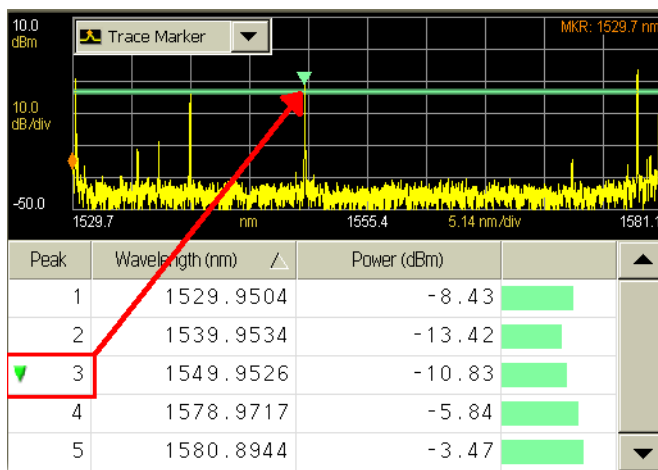
Move the Peak Marker
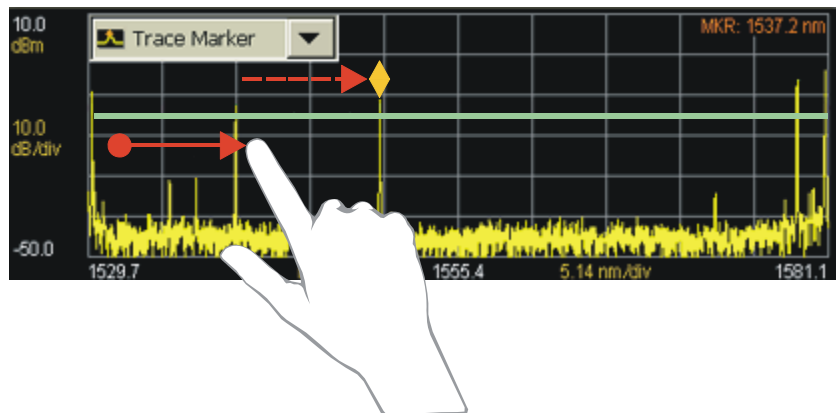
You can move the peak marker in any of the following ways:

- Click any cell in the "Peak" column of the table. The peak marker will move to the corresponding peak wavelength in the graph.

- If ClickZoom is enabled, click any cell in the "Wavelength" column of the table. The peak marker will move the corresponding peak wavelength in the graph, and the graph will zoom in to that peak. To zoom out, click the "Wavelength" cell again.
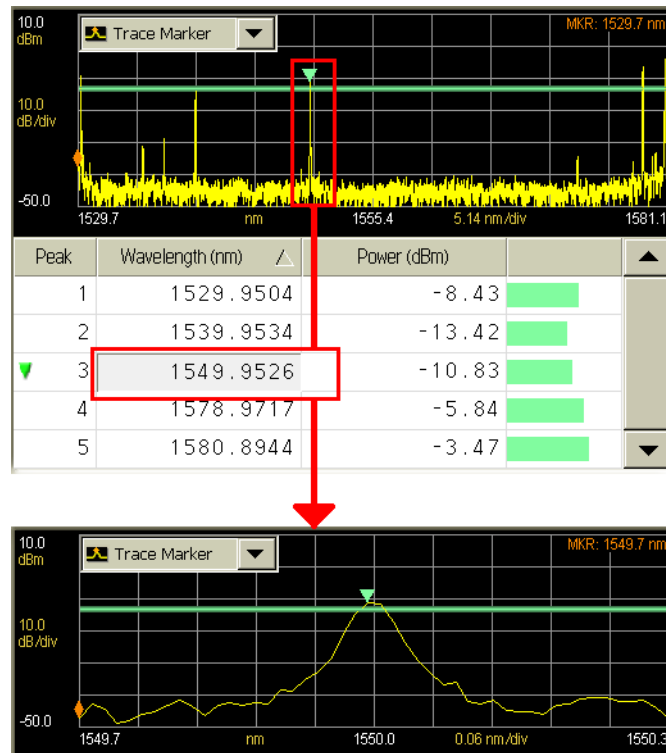
- Select Peak Marker from the Graph Control list. Click close to a peak on the graph.

- Select Peak Marker from the Graph Control list. Click anywhere on the graph and drag to the left or right.

- Select Peak Marker from the Graph Control list. Click close to a peak on the graph.

- Select Peak Marker from the Graph Control list. Click anywhere on the graph and drag to the left or right.

Move the Trace Marker

You can move the trace marker in any of the following ways:

- Select Trace Marker from the Graph Control list. Click any point on the graph.

- Select Trace Marker from the Graph Control list. Click anywhere on the graph and drag to the left or right.
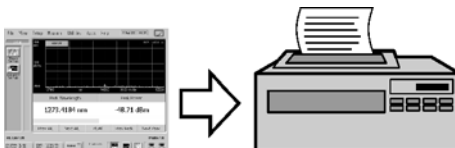
Step 6. Save Measurement Results

After you have set up your measurement and the graphical display, you may wish to save measurement results.

Save Data
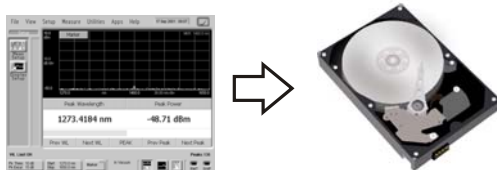
Press [Save Data] to open the Save Meas Data dialog box. Select a file name and click **Save**.

Print Data

Press [Print] to open the Print Setup dialog box. Select the Default Printer and Printout Type, and click Print.

Save Screen Image
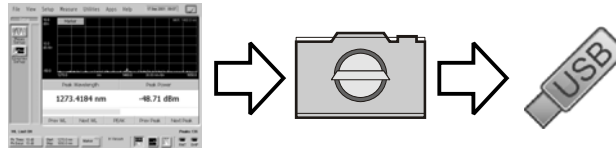
On the File menu, point to Save, and then click Save Screen Image. Select a file name and click Save.
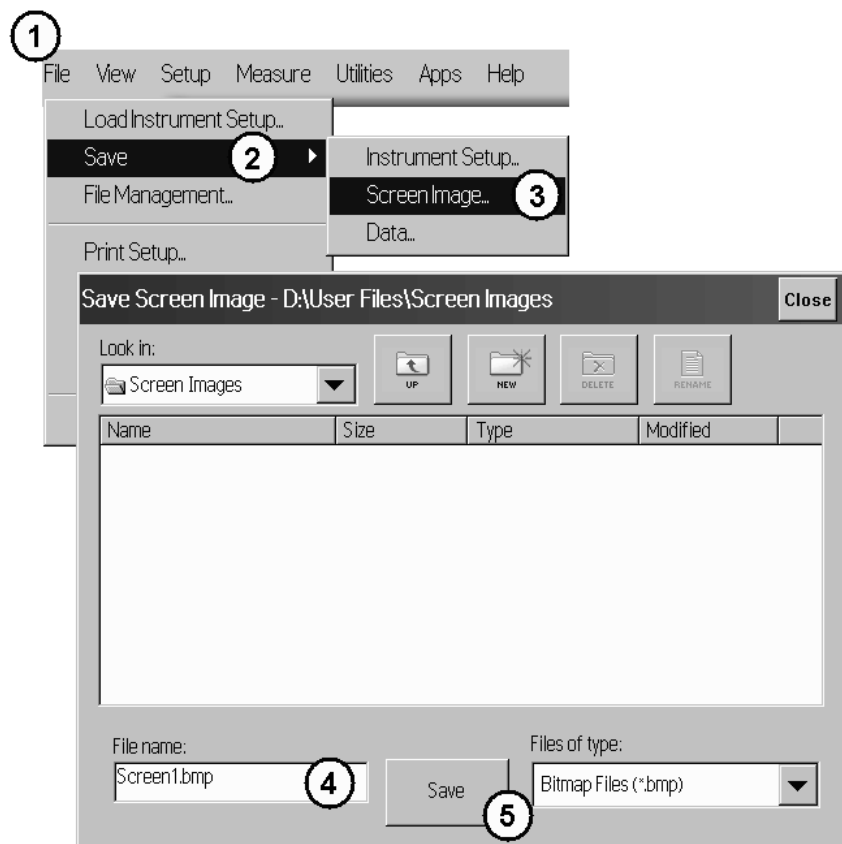
Data Logging

Data logging allows you to record measurement data over time for later analysis. Follow the steps below to set up data logging.

1 On the Measure menu, click Data Logging.

2 Enter the Logging Duration and Logging Interval time.

3 Click Start Data Logging.
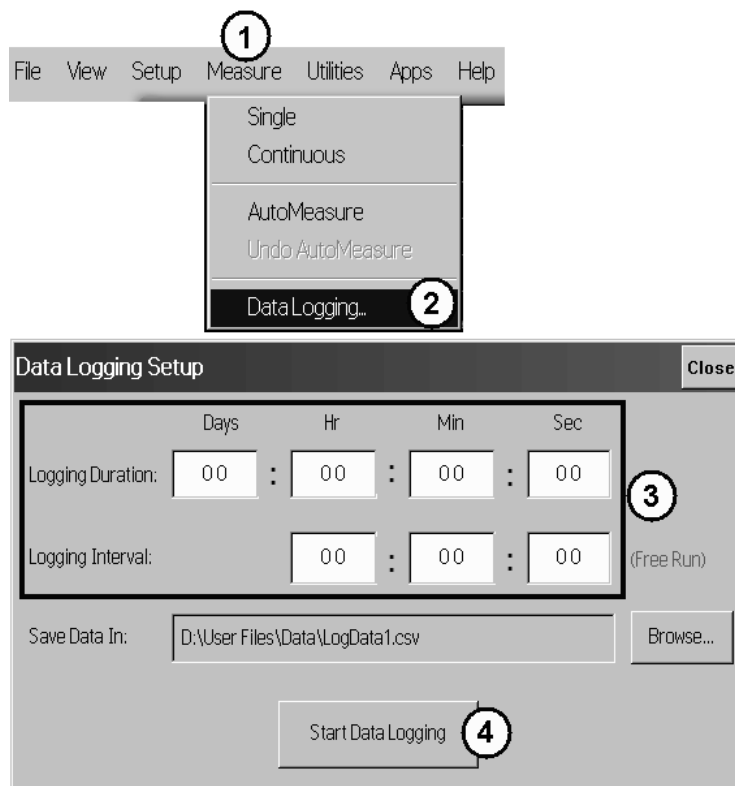
Consider the following example applications:

- To log data for a long-term stability/drift test, set the data logging duration to 24-hrs, and the interval to 5 minutes.

- To log data for a turn-on transient test (to observe how lasers change during warm-up), set the data logging duration to 5 minutes, and the interval to 0 time (free run).

Returning the Instrument for Service

The instructions in this section show you how to properly package the instrument for return to a Agilent Technologies service office. For a list of offices, refer to "Agilent Technologies Service Offices" on page 57.

If the instrument is still under warranty or is covered by an Agilent maintenance contract, it will be repaired under the terms of the warranty or contract (the warranty is at the front of this manual). If the instrument is no longer under warranty or is not covered by an Agilent maintenance plan, Agilent will notify you of the cost of the repair after examining the unit.

When an instrument is returned to a Agilent service office for servicing, it must be adequately packaged and have a complete description of the failure symptoms attached.

When describing the failure, please be as specific as possible about the nature of the problem. Include copies of additional failure information (such as the instrument failure settings, data related to instrument failure, and error messages) with the instrument being returned. Backup your measurement related data before returning the instrument to Agilent service.

Please notify the service office before returning your instrument for service. Any special arrangements for the instrument can be discussed at this time. This will help the Agilent service office repair and return your instrument as quickly as possible.

Preparing the instrument for shipping

1 Write a complete description of the failure and attach it to the instrument. Include any specific performance details related to the problem. The following information should be returned with the instrument.

- Type of service required.
- Date instrument was returned for repair.
- Description of the problem:
    - Whether problem is constant or intermittent.
    - Whether instrument is temperature-sensitive.
    - Whether instrument is vibration-sensitive.
    - Instrument settings required to reproduce the problem.
    - Performance data.
- Company name and return address.
- Name and phone number of technical contact person.
- Model number of returned instrument.
- Full serial number of returned instrument.
- List of any accessories returned with instrument.

2 Cover all front or rear-panel connectors that were originally covered when you first received the instrument.

CAUTION	Cover electrical connectors to protect sensitive components from electrostatic damage. Cover optical connectors to protect them from damage due to physical contact or dust.

CAUTION	Instrument damage can result from using packaging materials other than the original materials. Never use styrene pellets as packaging material. They do not adequately cushion the instrument or prevent it from shifting in the carton. They may also cause instrument damage by generating static electricity.

3 Pack the instrument in the original shipping containers. Original materials are available through any Agilent office. Or, use the following guidelines:

- Wrap the instrument in antistatic plastic to reduce the possibility of damage caused by electrostatic discharge.

- For instruments weighing less than 54 kg (120 lb), use a double-walled, corrugated cardboard carton of 159 kg (350 lb) test strength.

• The carton must be large enough to allow approximately 7 cm (3 inches) on all sides of the instrument for packing material, and strong enough to accommodate the weight of the instrument.

• Surround the equipment with approximately 7 cm (3 inches) of packing material, to protect the instrument and prevent it from moving in the carton. If packing foam is not available, the best alternative is S.D-240 Air Cap™ from Sealed Air Corporation (Commerce, California 90001). Air Cap looks like a plastic sheet filled with air bubbles. Use the pink (antistatic) Air Cap™ to reduce static electricity. Wrapping the instrument several times in this material will protect the instrument and prevent it from moving in the carton.

4 Seal the carton with strong nylon adhesive tape.

5 Mark the carton "FRAGILE, HANDLE WITH CARE".

6 Retain copies of all shipping papers.

Agilent Technologies Service Offices

Call Center

For technical assistance, you can contact your local Agilent Call Center.

*   Visit http://www.agilent.com and click Contact Us.

Service Center

Before returning an instrument for service, you must first call the Agilent Technologies Instrument Support Center.

*   Visit http://www.agilent.com and click Contact Us.

www.agilent.com

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