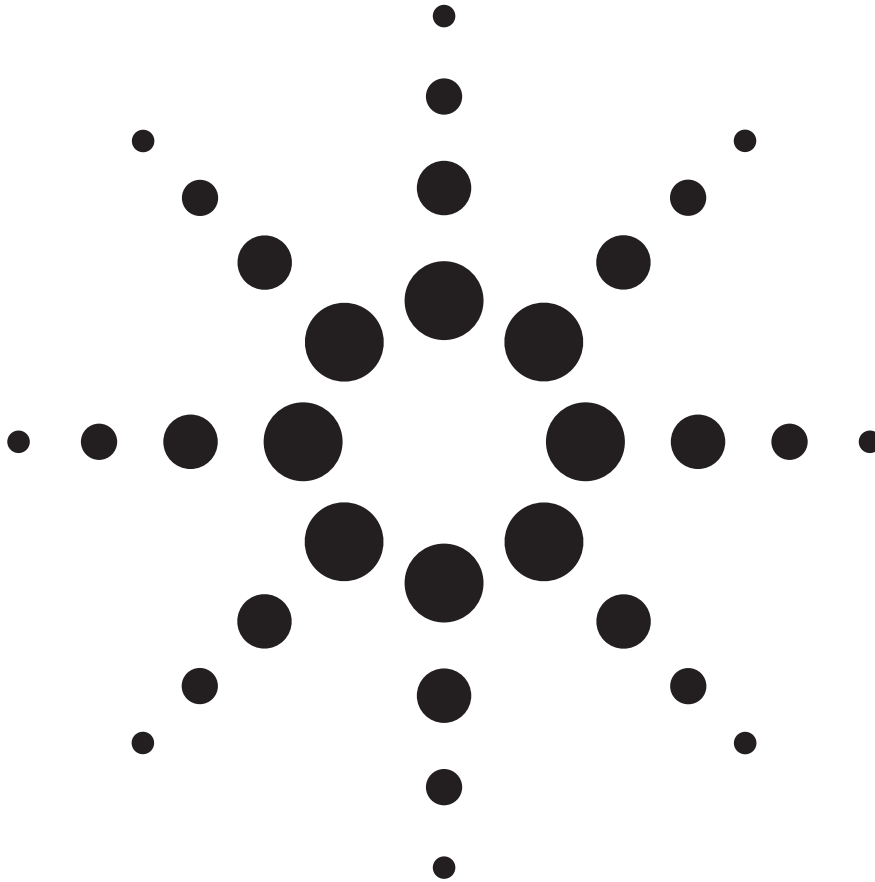


**Agilent 8163A/B Lightwave Multimeter**  
**Agilent 8164A/B Lightwave Measurement System**  
**Agilent 8166A/B Lightwave Multichannel System**  
**Configuration Guide**  
February 2002\_1



**This guide provides configuration details for the Agilent 816x family of mainframes and modules, including options and accessories.**



**Agilent Technologies**

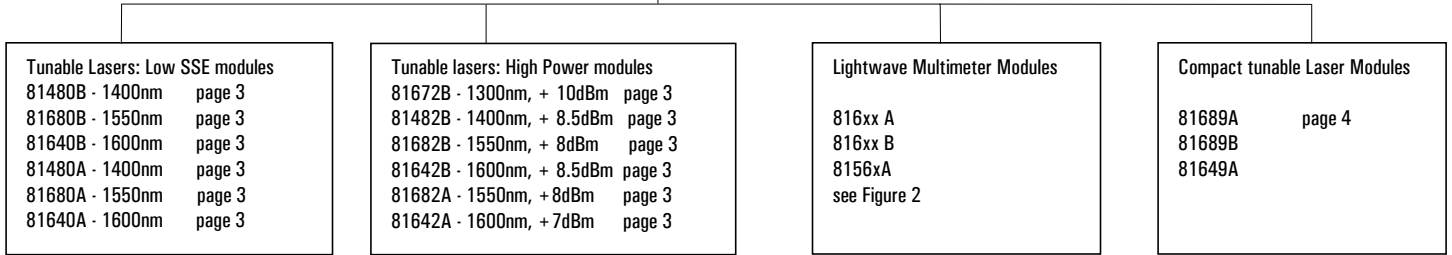
## 8164A/B Lightwave Measurement System



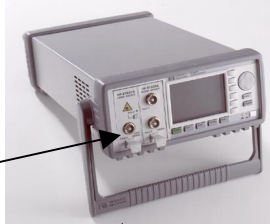
Any 816x and 8156x compact modules, also 8153A modules

Agilent high performance tunable laser module- 1 per 8164A/B  
Use 81645A filler module if no tunable laser is installed

Figure 1

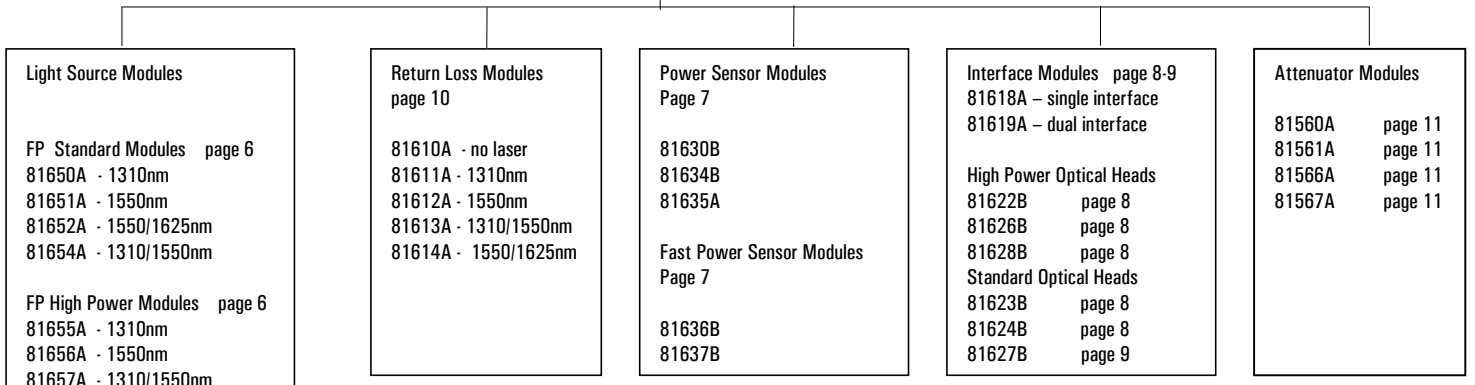


## 8163A/B Lightwave Multimeter



Any 816x and 8156x compact modules, also 8153A modules

Figure 2

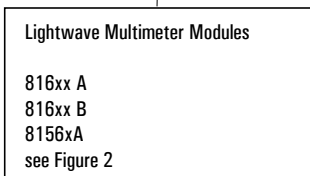


## 8166A/B Lightwave Multichannel System



Any 816x and 8156x compact modules  
(8153 modules not allowed)

Figure 3



Information about Agilent connectors and connector interfaces can be found at <http://www.agilent.com/comms/oct-accessories>

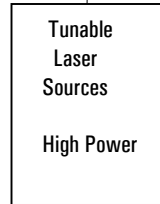
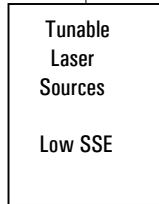
# High-Performance Tunable Laser Modules



For Laser Safety see page 12

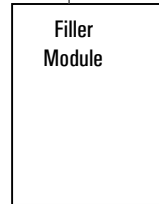
## Tunable Laser Sources Low SSE Modules

- 81480B · 1400nm
- 81680B · 1550nm
- 81640B · 1600nm
- 81480A · 1400nm
- 81680A · 1550nm
- 81640A · 1600nm

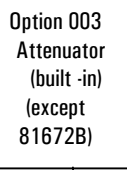


## Tunable Laser Sources High power Modules

- 81672B · 1300nm, + 10dBm
- 81482B · 1400nm, + 8.5dBm
- 81682B · 1550nm, + 8dBm
- 81642B · 1600nm, + 8.5dBm
- 81682A · 1550nm, +8dBm
- 81642A · 1600nm, +7dBm



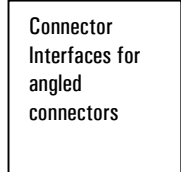
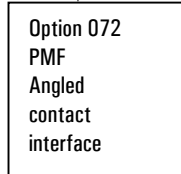
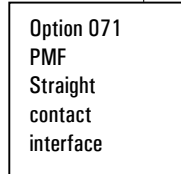
Specify 81645A Filler Module if no high performance tunable laser is installed



## Connector Interfaces for straight connectors

- 2 ea required for 81480B, 81680B, 81640B, 81480A, 81680A, 81640A
- 1 ea required for 81672B, 81482B, 81682B, 81642B, 81682A, 81642A

- 81000AI Diamond HMS-10
- 81000FI FC/PC/SPC
- 81000GI D4
- 81000HI E-2000
- 81000KI SC/PC/SPC
- 81000SI DIN 47256
- 81000VI ST
- 81000WI Biconic



## Connector Interface for angled connectors

- 2 ea required for 81480B, 81680B, 81640B, 81480A, 81680A, 81640A
- 1 ea required for 81672B, 81482B, 81682B, 81642B, 81682A, 81642A

- 81000HI E-2000 APC
- 81000KI SC/APC
- 81000NI FC/APC
- 81000SI DIN 47256/4108.6



Note: Option 072 is highly recommended over Option 071 to reduce front-panel connector reflections which will greatly reduce interference noise and spectral ripple in the test setup.

# Compact Tunable Laser Module

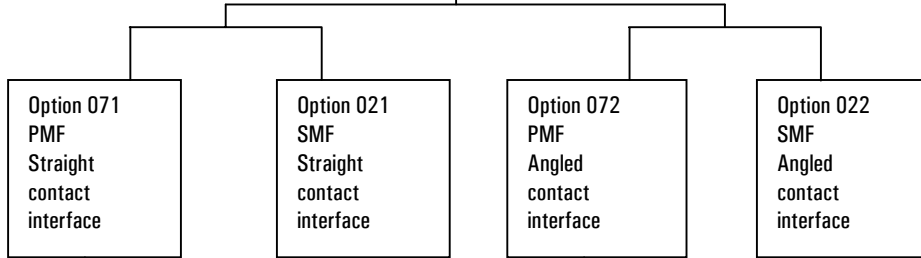
For Laser Safety see page 12



Compact  
Tunable  
Laser

## Compact Tunable Laser Module

- 81689A Compact Tunable Laser 1550nm
- 81689B Compact Tunable Laser 1550nm
- 81649A Compact Tunable Laser 1600nm



### Connector Interfaces for straight connectors

- 81000AI Diamond HMS-10
- 81000FI FC/PC/SPC
- 81000GI D4
- 81000HI E-2000
- 81000KI SC/PC/SPC
- 81000SI DIN 47256
- 81000VI ST
- 81000WI Biconic

Connector  
Interfaces  
for straight  
connectors



### Connector Interfaces for angled connectors

- 81000HI E-2000 APC
- 81000KI SC/APC
- 81000NI FC/APC
- 81000SI DIN 47256/4108.6

Connector  
Interfaces  
for angled  
connectors



Note: Options 022 or 072 are highly recommended over Option 021 and 071 to reduce front-panel reflections which will greatly reduce interference noise and spectral ripple in the test setup.

# DFB Source Modules

For Laser Safety see page 12



DFB Source  
PMF  
Angled  
contact  
interface

81662A DFB Source +10 dBm C- and L- band  
81663A DFB source +13 dBm C- and L-band  
(wavelength determined by option number)

Connector  
Interfaces  
for angled  
contact  
connectors

### Connector Interfaces for angled connectors

81000HI E-2000 APC  
81000KI SC/APC  
81000NI FC/APC  
81000SI DIN 47256/4108.6



# Fabry-Perot Laser Modules

For Laser Safety see page 12



### FP Standard Source Modules 0 dBm

- 81650A 1310nm
- 81651A 1550 nm
- 81652A 1550/1625 nm
- 81654A 1310/1550 nm

Source  
Modules  
0 dBm  
  
SMF,  
Straight  
contact  
interface

Source  
Modules  
13 dBm  
  
SMF,  
Straight  
contact  
interface

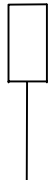
### FP High Power Source Modules 13 dBm

- 81655A 1310nm
- 81656A 1550 nm
- 81657A 1310/1550 nm

Connector  
Interfaces  
for straight  
connectors

### Connector Interfaces for straight connectors

- 81000AI Diamond HMS-10
- 81000FI FC/PC/SPC
- 81000GI D4
- 81000HI E-2000
- 81000KI SC/PC/SPC
- 81000SI DIN 47256
- 81000VI ST
- 81000WI Biconic



# Power Sensor Modules



### Power Sensors

#### High Performance Modules

- 81633A/B +10 dBm to -90 dBm
- 81634A/B +10 dBm to -110 dBm
- 81637B +10 dBm to -80 dBm (Fast Power Sensor)
- 81630B +28 dBm to -70 dBm

Sensor Module  
Interface for  
both angled  
and straight  
connectors

### Power Sensors Economy Modules

- 81632A/B +10 dBm to -80 dBm (single channel)
- 81635A +10 dBm to -80 dBm (dual channel)
- 81636B +10 dBm to -80 dBm (Fast Power Sensor)

### Connector Interfaces

- 81000AI Diamond HMS-10
- 81000FI FC/PC/SPC
- 81000GI D4
- 81000JI SMA
- 81000KI SC/PC/APC
- 81000PI E-2000
- 81000SI DIN 47256 / 4108.6
- 81000VI ST
- 81002LI LC

Connector  
Interfaces

Connector  
Interfaces

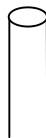
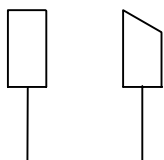
Bare  
Fiber  
Adapter

### 81000BB Bare Fiber Kit fits into connector interfaces:

- 81000AI Diamond HMS-10
- 81000FI FC/PC/SPC
- 81000KI SC
- 81000SI DIN 47256 / 4108.6
- 81000VI ST
- 81000PI E-2000

Following single  
Combination is available

- 81000FI FC
- 81000FB Bare Fiber Adapter



(bare fiber)

Note: All sensor inputs are non-contact and accept both straight and angled connectors.

**Optical Heads  
(5mm Sensor)**



**Connectorized  
Fiber,  
Bare Fiber and  
Open beam  
NA ≤ 0.3**

**Accessories**

- 81624CE 4m extension cable
- 81624DD additional D-shape quick change adapter
- 81624RM Half-rack Mount Kit for 2 Heads [1]
- 81625RM Rack Mount Kit for 4 Heads [1]

**Interface  
Module**

**Interface Modules**

- 81618A Single Interface Module
- 81619A Dual Interface Module

**Optical  
Heads**

**Optical Heads**

- 81622B Ge +27dBm to -55dBm
- 81623B Ge +10dBm to -80 dBm
- 81624B InGaAs +10dBm to -90 dBm
- 81626B In GaAs + 27dBm to -70 dBm
- 81628B In GaAs + 40dBm to -60 dBm (only with threaded Connector Adapters)

D-Shaped Adapter 81624DD – 1ea supplied with head [1]

**Integrating  
Sphere**  
81002FF

**Depolarizing  
Filter**  
8100DF

**Filter  
Holder [2]**

**Filter / Holder**

- 81000AF Filter Holder
- 81001FF 10 dB Filter and Holder
- 81000DF Depolarizing Filter and Holder

**Connector Adapters (threaded)**

- 81000AA Diamond HMS-10
- 81000BA Bare Fiber (125um)
- 81000FA FC/PC/SPC/APC
- 81000GA D4
- 81000KA SC/PC/APC
- 81000MA MU
- 81000PA E2000
- 81000SA DIN 47256/4108
- 81000VA ST
- 81000ZA Blank Adapter (to be customized by user)
- 810003LA LC

**Connector Adapters  
(with integral D-Shape)**

- 81624DD D-Shaped adapter not required
- 81001BA Bare Fiber 125μm
- 81001FA FC/PC/SPC/APC
- 81001KA SC/PC/APC
- 81001LA LC
- 81001MA MU
- 81001PA E-2000
- 81001SA DIN 47256 / 4108.6
- 81001ZA BLANK Adapter

**High Return Loss Adapter**

(for use with straight connectors)  
81000RA High Return Loss Adapter

**High Return  
Loss  
Adapter**

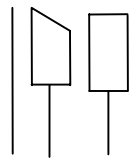
**Connector  
Adapters  
Threaded**

**Connector  
Interfaces**

**Connector Interfaces**

- 81000AI Diamond HMS-10
- 81000FI FC/PC/SPC
- 81000GI D4
- 81000HI E2000
- 81000KI SC/PC/SPC
- 81000SI DIN 47256
- 81000VI ST
- 81002LI LC

**Integral  
D-Shaped  
Adapters**



[1] Not applicable to 81628B

[2] For use with 81622B or 81626B and straight connectors  
If input power > +10dBm the use of the filter holder will result in better accuracy (refer to specs)



# Optical Heads

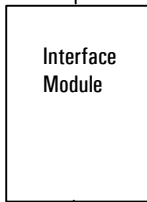
(3mm Sensor)

Configuration  
for  
connectorized  
fibers and bare  
fiber



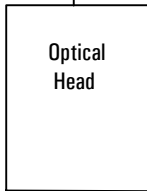
**Accessories**

- 81624CE 4m extension cable
- 81624RM Half-rack Mount Kit for 2 Heads
- 81625RM Rack Mount Kit for 4 Heads



**Interface Modules**

- 81618A
- 81619A



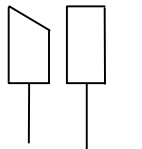
**Optical Heads**

- 81627B



**Connector Adapters  
(with integral D-Shape)**

- 81001BA Bare Fiber 125 $\mu$ m
- 81001FA FC/PC/SPC/APC
- 81001KA SC/PC/APC
- 81001LA LC
- 81001MA MU
- 81001PA E-2000,APC
- 81001SA DIN 47256 / 4108.6
- 81001ZA BLANK Adapter

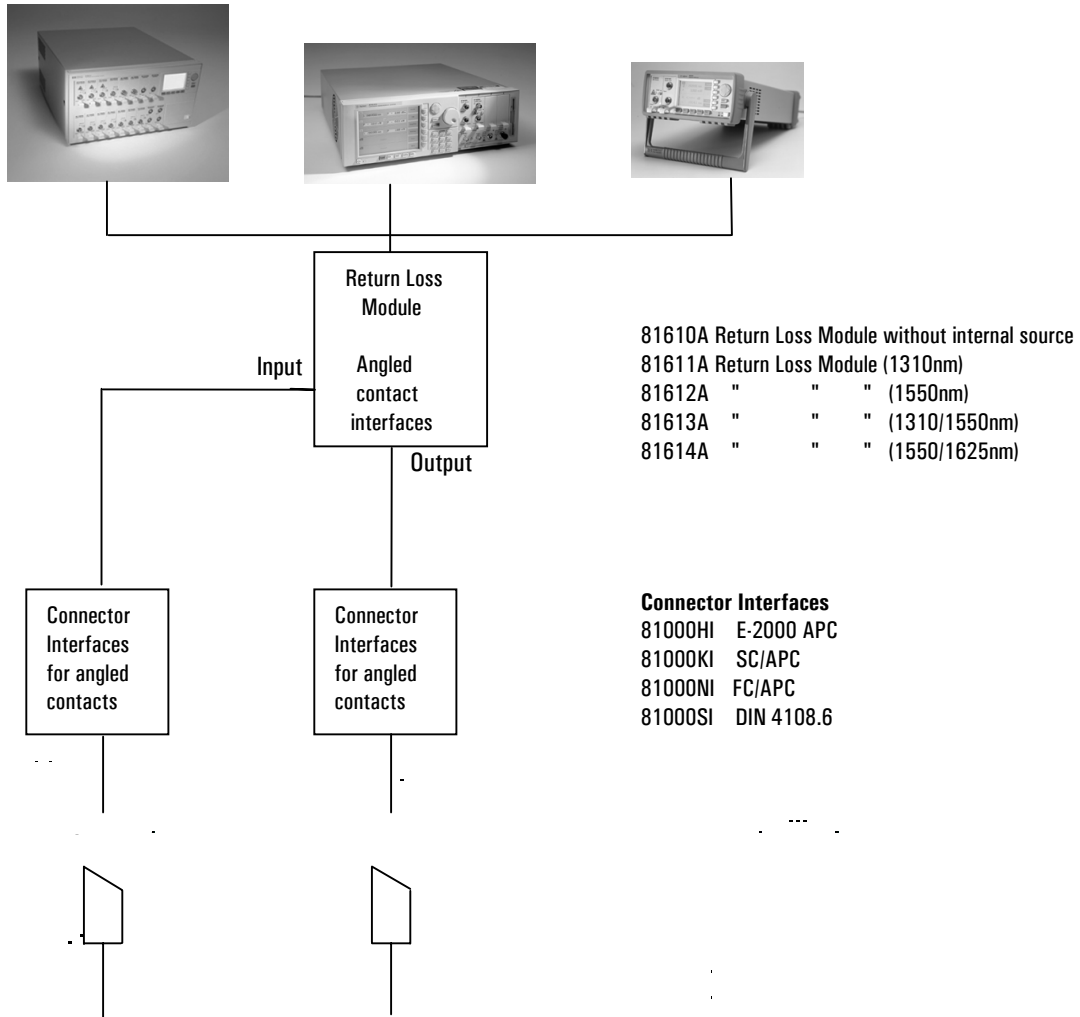


NA  $\leq$  0.11 (Single mode fiber)

NA  $\leq$  0.22 (Multi mode fiber)

# Return Loss Modules

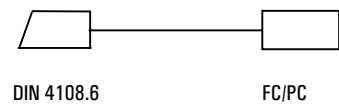
For Laser Safety see page 12



## Reference Cable

81610CC Reference Cable – for calibration of all 8161xA Return Loss Modules  
 Connectors - DIN 4108.6 (connectors to modules) and FC/PC supplied (w/calibrated return loss values)

An 81000SI connector interface is required to connect this cable to the module.  
 This cable is used for calibration only, not for measurements.



# Optical Attenuator Modules



81560A  
Optical Attenuator  
(single slot)

81566A  
Optical Attenuator  
with Power Control  
(dual slot)

81561A  
Optical Attenuator  
(single slot)

81567A  
Optical Attenuator  
with Power Control  
(dual slot)

Optical Attenuator  
Straight  
Contact  
Interface

Optical Attenuator  
Angled  
Contact  
Interface

Connector  
Interface for  
straight  
connectors

Connector  
Interface for  
angled  
connectors

**Connector Interfaces**

- 81000 AI HMS-10
- 81000 FI FC/PC/SPC
- 81000 GI D4
- 81000 HI E-2000
- 81000 KI SC/PC/SPC
- 81000 SI DIN 47256
- 81000 VI ST

**Connector Interfaces**

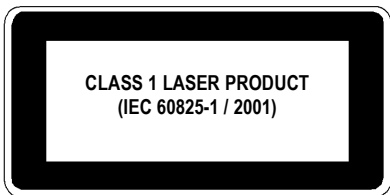
- 81000 HI E-2000 APC
- 81000 KI SC/APC
- 81000 NI FC/APC
- 81000 SI DIN 4108.6



## Laser Safety Information

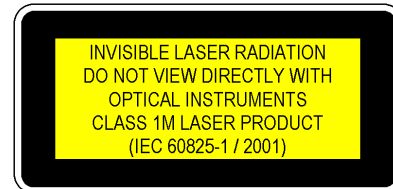
81611A 1310nm RL  
81612A 1550 nm RL  
81613 1310/1550nm RL  
81614 1550/1625nm RL  
81650A 1310 nm FP  
81651A 1550 nm FP  
81652A 1550/1625 nm FP  
81654A 1310/1550 nm FP

The laser sources listed directly above are classified as Class 1 according to IEC 60825-1 (2001).  
All laser sources comply with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated 2001-July-26.



81655A 1310nm FP  
81656A 1550 nm FP  
81657A 1310/1550 nm FP  
81662A C- and L-Band DFB  
81663A C-band DFB  
81480B 1400nm TLS  
81680B 1550nm TLS  
81640B 1600nm TLS  
81672B 1300nm TLS  
81482B 1400nm TLS  
81682B 1550nm TLS  
81642B 1600nm TLS  
81480A 1400nm TLS  
81640A 1600nm TLS  
81642A 1600nm TLS  
81680A 1550nm TLS  
81682A 1550nm TLS  
81689A 1550nm TLS  
81689B 1550nm TLS  
81649A 1595nm TLS

The laser sources directly listed above are classified as Class 1M according to IEC 60825-1 (2001).  
All laser sources comply with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated 2001-July-26.



Further information about Agilent connectors and connector interfaces can be found at <http://www.agilent.com/comms/oct-accessories>

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## Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

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Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

### Your Advantage

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**By internet, phone, or fax, get assistance with all your test & measurement needs**

#### Online assistance:

**[www.agilent.com/comms/lightwave](http://www.agilent.com/comms/lightwave)**

Phone or Fax  
United States:  
(tel) 1 800 452 4844

Canada:  
(tel) 1 877 894 4414  
(fax) (905) 206 4120

Europe:  
(tel) (31 20) 547 2323  
(fax) (31 20) 547 2390

Japan:  
(tel) (81) 426 56 7832  
(fax) (81) 426 56 7840

Latin America:  
(tel) (305) 269 7500  
(fax) (305) 269 7599

Australia:  
(fax) (61 3) 9210 5947

New Zealand:  
(tel) 0 800 738 378  
(fax) 64 4 495 8950

Asia Pacific:  
(tel) (852) 3197 7777  
(fax) (852) 2506 9284

Product specifications and descriptions in this document subject to change without notice.

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February, 12 2002  
**5988-1571EN**

#### Related Literature:

Agilent 8163B Lightwave Multimeter  
Agilent 8164B Lightwave Measurement System  
Agilent 8166B Lightwave Multichannel System  
Technical Specifications  
p/n 5988-3924EN

Agilent 8163A Lightwave Multimeter  
Agilent 8164A Lightwave Measurement System  
Agilent 8166B Lightwave Multichannel System  
Technical Specifications  
p/n 5988-1568EN

Agilent 81480/680/640B  
Agilent 81672/482/682/642B  
Tunable Laser Sources  
Technical Specifications  
p/n 5988-5508EN

Agilent 81480/680/640A Tunable Lasers  
Agilent 81682/642A Tunable Lasers  
Technical Specifications  
p/n 5988-4027EN

Agilent 81689A/81689B/81649A  
Compact Tunable Laser Modules  
Technical Specifications  
p/n 5988-3675EN

Agilent 81662A DFB Laser  
Agilent 81663A DFB Laser  
Agilent Fabry-Perot Laser  
Technical Specifications  
p/n 5988-1570EN

Agilent Power Sensor Modules  
Agilent Optical Heads  
Agilent Return Loss Modules  
Technical Specifications  
p/n 5988-1569EN

Agilent 81560A/81561A Optical Attenuators  
Agilent 81566A/81567A Optical Attenuators with Power Control  
Technical Specifications  
p/n 5988-2696EN



# Agilent Technologies