CONFIGURATION GUIDE

Lightwave Solution Platform

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

KEYSIGHT TECHNOLOGIES

8163B Lightwave Multimeter

Main features:
- Ideal for laboratory and portable usage
- 2 compact module slots
- Built in applications:
- Return Loss, Passive Component Test, Stability, Logging
- GPIB and LAN interface for remote control
- Full backward compatibility for 815xx and 816xx series modules.

8164B Lightwave Measurement System

Main features:
- Ideal for laboratory or rack mount usage
- 1 extended module slot for back-loadable tunable laser sources (if used without this laser module, add 81645A filler module)
- 4 compact module slots
- Built in applications:
  - Passive Component Test, Stability, Logging
- GPIB and LAN interface for remote control
- Full backward compatibility for 815xx and 816xx series modules.

8166B Lightwave Multichannel System (discontinued)

Main features:
- Ideal for laboratory or rack mount usage for applications that require high port counts
- 17 compact module slots
- GPIB Interface for remote control
- Backward compatibility for 8156x, 8157x, 8159x and 816xx series modules.

Mainframe and Module Firmware:

For Firmware upgrades and download tools see **http://www.keysight.com/find/octfirmware**

Module compatibility

		8163B Slots 1 – 2	8164B Slot 0	8164B Slots 1 – 4	8166B Slots 1 – 17
81600B TLS family	page 4		X		
81606A/7A/8A/9A TLS family	page 4		X		
81960A compact TLS	page 5	X		X	X
81980A compact TLS	page 5	X		X	X
81940A compact TLS	page 5	X		X	X
81989A compact TLS	page 5	X		X	X
81949A compact TLS	page 5	X		X	X
81950A compact TLS	page 5	X		X	X
81662A DFB source module	page 6	X		X	X
81663A DFB source module	page 6	X		X	X
81650A FP source module	page 7	X		X	X
81651A FP source module	page 7	X		X	X
81654A FP source module	page 7	X		X	X
81655A FP source module	page 7	X		X	X
81656A FP source module	page 7	X		X	X
81657A FP source module	page 7	X		X	X
81630B power measurement module	page 8	X		X	X
81634B power measurement module	page 8	X		X	X
81635A power measurement module	page 8	X		X	X
81636B power measurement module	page 8	X		X	X
81618A interface module	page 9/10	X		X	X
81619A dual interface module	page 9/10	X		X	X
81623B optical head	page 9	X		X	X
81624B optical head	page 9	X		X	X
81626B high power optical head	page 9	X		X	X
81628B high power optical head with integrating sphere	page 10	X		X	X
81610A return loss module	page 11	X		X	X
81613A return loss module	page 11	X		X	X
81490A reference transmitter	page 11	X (dual)		X (dual)	X (dual)
81495A reference receiver	page 11	X		X	X
81570A attenuator module (SM)	page 12	X		X	X
81571A attenuator module (SM)	page 12	X		X	X
81576A attenuator module with p/c	page 12	X (dual)		X (dual)	X (dual)
81577A attenuator module with p/c	page 12	X (dual)		X (dual)	X (dual)
81578A attenuator module (MM)	page 12	X		X	X
81595B optical switch module 1x4	page 13	X		X	X

Legacy Module compatibility

The discontinued 8163A, 8164A and 8166A mainframes are functionally compatible with the B versions.

	8163B Slots 1 – 2	8164B Slot 0	8164B Slots 1 – 4	8166B Slots 1 – 17
814xxA/B backloadable TLS modules		X		
816xxA/B backloadable TLS modules		X		
816xxA/B compact TLS modules	X		X	X
Other 816xx series modules	X		X	X
8156xA, 8157xA attenuator modules	X		X	X
8159xA/S switch modules	X		X	X
All other 815xx series modules	X		X	

81600B Tunable Laser Source family

OPTIONAL

MANDATORY AND MUTUALLY EXCLUSIVE

For Laser Safety information see page 14

- 81600B #201: 1455 nm - 1640 nm
- 81600B #200: 1440 nm – 1640 nm
- 81600B #160: 1495 nm – 1640 nm
- 81600B #150: 1450 nm – 1590 nm
- 81600B #140: 1370 nm – 1495 nm
- 81600B #130: 1260 nm – 1375 nm

Tunable Laser Sources

Two Outputs: High Power, Low SSE

Tunable Laser Sources

One Output: High Power only

- 81600B #142: 1370 nm – 1495 nm, +8.5 dBm
- 81600B #132: 1260 nm – 1375 nm, +9 dBm

Tunable Laser Sources

One Output: High Power, Low SSE

- 8160xA #216: 1450 nm - 1650 nm
- 8160xA #116: 1490 nm - 1640 nm

81600B-003 with built-in attenuator (81600B #142 only)

81600B-071 PMF Straight contact connector

81600B-072 PMF Angled contact connector

Connector Interfaces for straight connectors

Connector Interfaces for straight connectors

Connector Interface for straight connectors

2 ea required for 81600B #200, 160, 150, 140, 130.
1 ea required for 81600B #142, 132.

- 81000FI FC key width 2.2 mm
- 81000HI E-2000
- 81000KI SC
- 81000LI LC
- 81000MI MU
- 81000SI DIN 47256
- 81000VI ST

Connector Interface for angled connectors

2 ea required for 81600B #201, 200, 160, 150, 140, 130.
1 ea required for 81600B #142, 132 and for 8160xA.

- 81000FI FC key width 2.2 mm
- 81000NI FC key width 2.0 mm
- 81000HI E-2000
- 81000KI SC
- 81000LI LC
- 81000MI MU
- 81000SI DIN 47256
- 81000VI ST

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

High Power Compact Tunable Laser Source modules

OPTIONAL

MANDATORY AND MUTUALLY EXCLUSIVE

For Laser Safety information see page 14

High Power Compact Tunable Laser Source module

High Power Compact Tunable Laser module

- 81980A Compact Tunable Laser 1465 nm – 1575 nm
- 81940A Compact Tunable Laser 1520 nm – 1630 nm
- 81989A Compact Tunable Laser 1465 nm – 1575 nm
- 81949A Compact Tunable Laser 1520 nm – 1630 nm

- 81950A Compact Tunable Laser 1527.6 nm - 1565.5 nm/ 1570.01 nm - 1608.76 nm
- 81960A Fast-Swept Compact Tunable Laser 1505 nm - 1630 nm

819xxA-071 PMF Straight contact connector

819xxA-072 PMF Angled contact connector

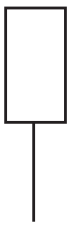
Connector Interfaces for straight connectors

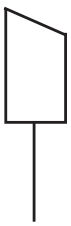
Connector Interfaces for angled connectors

Connector Interface for straight connectors

1 ea required

- 81000FI FC key width 2.2 mm
- 81000HI E-2000
- 81000KI SC
- 81000LI LC
- 81000MI MU
- 81000SI DIN47256
- 81000VI ST





Connector Interface for angled connectors

1 ea required

- 81000FI FC key width 2.2 mm
- 81000NI FC key width 2.0 mm
- 81000HI E-2000
- 81000KI SC
- 81000LI LC
- 81000MI MU
- 81000SI DIN47256
- 81000VI ST

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

DFB Source modules

OPTIONAL

MANDATORY AND MUTUALLY EXCLUSIVE

For Laser Safety information see page 14

DFB Source

– 81663A DFB Source, +13 dBm C- and L-band

Wavelength option

Wavelength determined by option number
For special wavelengths, contact Keysight.

Connector Interfaces for angled contact connectors

Connector Interface for angled connectors

1 ea required

– 81000FI FC key width 2.2 mm
– 81000NI FCkey width 2.0 mm
– 81000HI E-2000
– 81000KI SC
– 81000LI LC
– 81000MI MU
– 81000SI DIN 47256
– 81000VI ST

Fabry-Perot Laser modules

OPTIONAL

For Laser Safety information see page 14

Source Modules

SMF,
Straight contact
interface

FP High Power Source Modules 13 dBm

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

FP Standard Source Modules 3 dBm

- 81655A #E03 850 nm

Connector
Interfaces for
straight
connectors

Connector Interfaces for straight connectors

1 ea required

- 81000FI FC key width 2.2 mm
- 81000NI FC key width 2.0 mm
- 81000HI E-2000
- 81000KI SC
- 81000LI LC
- 81000MI MU
- 81000SI DIN 47256
- 81000VI ST

Optical Power Measurement modules

OPTIONAL

Sensor Module Interface (for both angled & straight connectors)

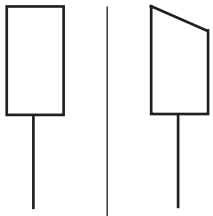
Optical Power measurement modules

- 81630B +28 dBm to –70 dBm
- 81634B +10 dBm to –110 dBm
- 81635A +10 dBm to –80 dBm (dual channel)
- 81636B +10 dBm to –80 dBm (Fast Power Sensor)

Connector Interfaces

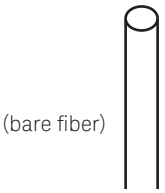
Connector Interfaces for straight connectors

1 ea required or 81630B, 81634B, and 81636B
2 ea required for 81635A



- 81000FI FC key width 2.2 mm
- 81000NI FC key width 2.0 mm
- 81000KI SC
- 81000SI DIN47256
- 81000VI ST
- 81000LI LC (81635A, 81636A only)
- 81002LI LC (81630B, 81634B only, reduced accuracy)
- 81000MI MU (81635A, 81636A only)
- 81002MI MU (81630B, 81634B only, reduced accuracy)
- 81000HI E2000 (81635A, 81636A only)
- 81000PI E-2000 (81630B, 81634B only, reduced accuracy)

Bare Fiber Connectivity (for 81630, 81634 series) 81000BI



- 81000BI Bare Fiber Connectivity Set for 81630B, 81634B Sensors (not to be used for 81635A and 81636B)

- 81004BH 10 Bare Fiber Holder for fibers <400µm diameter
- 81009BH 10 Bare Fiber Holder for fibers 400 - 900µm diameter

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

Optical Heads (5 mm sensor)

OPTIONAL

For advanced accuracy see „Special Calibration“ options C01/02 and C85/86

Interface Module

Interface Modules

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

Accessories

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

Optical Heads for: connectorized fiber, bare fiber and open beam NA ≤ 0.3

Optical Heads

- 81623B Ge
  +10dBm to –80 dBm (spec for 750 – 1800nm)
- 81624B InGaAs
  +10dBm to –90 dBm
- 81626B InGaAs
  +27dBm to –70 dBm

D-Shaped Adapter 81624DD
(supplied with head, removable)

Filter Holder

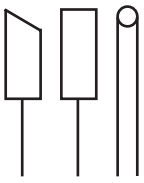
Filter / Holder

- 81010BL Lens for 1300/1550 nm, single mode
- 81050BL Lens for 1300/1550 nm, multi mode

Connector Adapters (threaded)

Connector Adapters (threaded)

- 81000BT Bare Fiber Connectivity Set (Threaded)
- 81000FA FC
- 81000KA SC
- 81000VA ST
- 81003LA LC
- 81000PA E-2000

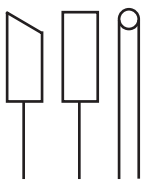


Integral D-Shaped Adapters

Magnetic Connector Adapters (with integral D-Shape)

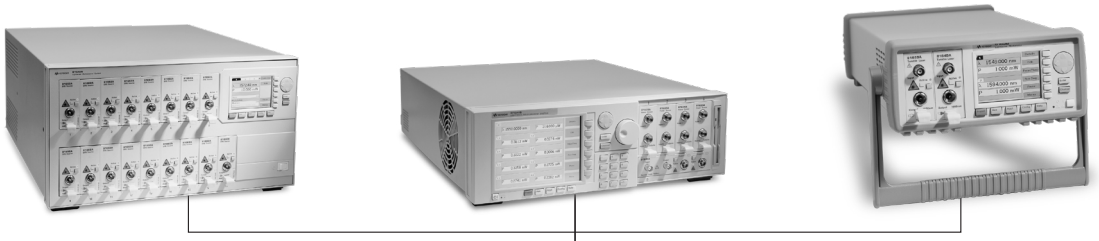
81624DD D-Shaped adapter not required

- 81000BC Bare Fiber Connectivity Set (D-shaped)
- 81001FA FC
- 81001KA SC
- 81001LA LC
- 81001MA MU
- 81001PA E-2000
  81001ZA BLANK



High Power Optical Head (with integrating sphere)

OPTIONAL



Interface Module

Interface Modules

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

High Power
Optical Head for:
Connectorized Fiber,
Bare Fiber and
Open beam NA ≤ 0.3

81628B InGaAs
+40 dBm to –60 dBm

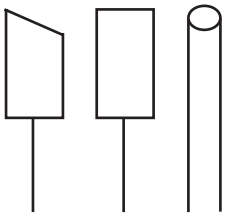
Accessories

- 81624CE 4 m extension cable

Connector Adapters
(threaded)

Connector Adapters (threaded)

- 81000BT Bare Fiber Connectivity Set (Threaded)
- 81000FA FC
- 81000KA SC
- 81000VA ST
- 81003LA LC
- 81000PA E-2000



Return Loss modules

OPTIONAL

For Laser Safety information see page 14

Return Loss Module

Angled contact interfaces

- 81610A Return Loss Module (without internal source)
- 81613A Return Loss Module (1310/1550 nm internal source)

Connector Interfaces for angled contacts

Connector Interfaces for angled connectors

2 ea required for 81610A.
1 ea required for 81613A,
(2 ea required if using external source input).

- 81000FI FC key width 2.2 mm
- 81000NI FC key width 2.0 mm
- 81000HI E-2000
- 81000KI SC
- 81000SI DIN47256
- 81000VI ST
- 81000LI LC
- 81000MI MU

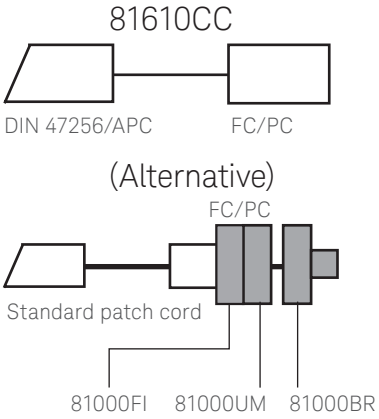
Reference Cable

81610CC Reference Cable – for calibration of all 8161xA Return Loss Modules

Connectors - DIN 47256/APC (connects to module) and FC/PC (supplied with calibrated return loss values to open air)

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

Caution: Do not make physical contact to the FC/PC connector and do not attach another connector to it. This could change the calibrated (open) return loss values.



Optical Attenuator modules

OPTIONAL

Optical Attenuators with Straight Contact Connectors

- 81570A (single slot) Optical Attenuator single-mode applications
- 81578A (single slot) Optical Attenuator multi-mode applications #050: 50µm fiber interface #062: 62.5µm fiber interface
- 81576A (dual slot) Optical Attenuator with Power Control for high power

Optical Attenuator Straight Contact Connectors

Optical Attenuator Angled Contact Connectors

Optical Attenuators with Angled Contact Connectors

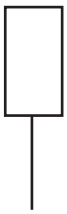
- 81571A (single slot) Optical Attenuator for high power
- 81577A (dual slot) Optical Attenuator with Power Control for high power

Connector Interfaces (input and output)

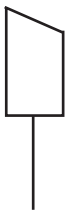
2 ea required

- 81000FI FC key width 2.2 mm
- 81000HI E-2000
- 81000KI SC
- 81000LI LC
- 81000MI MU
- 81000SI DIN 47256
- 81000VI ST

Connector Interfaces for straight connectors



Connector Interfaces for angled connectors



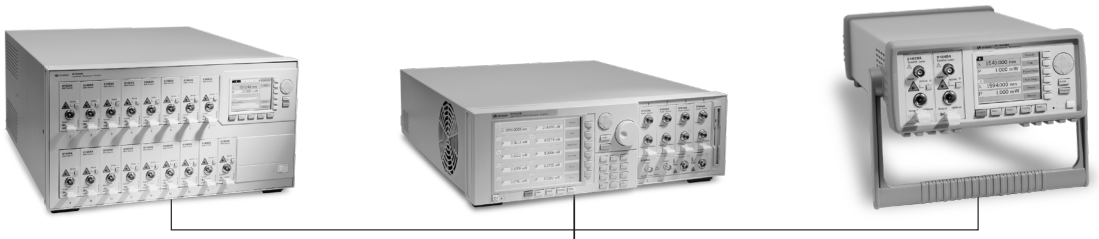
Connector Interfaces (input and output)

2 ea required

- 81000FI FC key width 2.2 mm
- 81000NI FC key width 2.0 mm
- 81000HI E-2000
- 81000KI SC
- 81000LI LC
- 81000MI MU
- 81000SI DIN47256
- 81000VI ST

Optical Switch modules

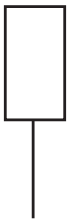
OPTIONAL



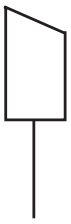
Optical Switches (multi-mode) with Straight Contact Connectors

– 81595B #062 (single slot) Optical switch 1x4 for multi-mode applications

Multi-mode Optical Switch with Straight Contact FC/PC Connectors



Single-mode Optical Switch with Angled Contact FC/APC – R Connectors (key width 2.0mm)



Optical Switches (single-mode) with Angled Contact Connectors

– 81595B #009 (single slot) Optical switch 1x4 for single-mode applications

Optical-Electrical Measurement modules

OPTIONAL

Reference Receiver Module,
Reference Transmitter Module

Reference Transmitter

- 81490A-135 1310 nm and 1550 nm, single mode
- 81490A-E03 850 nm multimode

Straight contact interface

Reference Receiver

- 81495A-085 850 nm, 1310 nm and 1550 nm, single mode and multimode

Connector Interfaces

- 81000FI FC key width 2.2 mm
- 81000HI E-2000
- 81000KI SC
- 81000LI LC
- 81000MI MU
- 81000SI DIN 47256
- 81000VI ST

Accessories

Threaded head adapter

(Threaded adapter for 8152x Optical Heads, 8162x Optical Heads with 81624DD and 81628B Optical Heads)

81000FA
FC

81000KA
SC

81000PA
E-2000

81000VA
ST

81003LA
LC/F3000

Optical head adapter

These adapters are to be used with Keysight optical heads only. The connector adapters are needed to attach connecterized fibers. Optical head adapters – with integral D-shape attachment for 8162xx optical head (except 81628B – see threaded version)

81001FA
FC

81001KA
SC

81001PA
E-2000

81001LA
LC/F3000

81001MA
MU

81003TD - MPO/MTP connector adapter

Optical head adapter with integral D-shape attachment for 8162xx optical head (except 81628B) for connection of ribbon cables with MT/MPO connectors. The adapter has connector guide pins and should be used with female cable connectors.

81001ZA - Blank adapter

Plug-in D-shape adapter for 8162x Optical Heads To be customized by customer. Doesn't match to 8152x and High Power Optical Heads

81624DD - D-shape adapter

To connect threaded adapters to 8162x D-shape receptable. Included with new heads except 81628B. Remove for using head with D-shaped adapters.

Bare fiber adapters and interfaces

The Keysight Bare Fiber Connectivity Solutions enable the easy and repeatable adaptation of optical components to Keysight's standard optical heads (all 8152x and 8162x series) and sensor modules 81630B, 81634B.

81000BC	Bare fiber connectivity set for 81623B, 81624B and 81626B (1x head adapter, 1 x 0-400 um holder, 1 x 400-900 um holder, 1 x gauge)
81000BI	Bare fiber connectivity Set for 81630B and 81634B (1 x sensor adapter, 1 x 0-400 um holder, 1 x 400-900 um holder, 1 x gauge)
81000BT	Bare FC set for 8152x and 8162x optical heads and threaded interface
81004BH	Bare fiber holder Set (10 x 0-400 um holder)
81009BH	Bare fiber holder Set (10 x 400-900 um holder)
81004BM / 9BM	Bare fiber holder Set (4 x 0-400 um or 0-900 um holder, 1 x gauge)

N7740KI - SC
4-port SC connector for the multiport power meter series N7744A and N7745A.

N7740FI - FC
4-port FC connector for the multiport power meter series N7744A and N7745A.

N7740BI - Bare fiber adapter
Fiber holders not included; please add 81004BM or 81009BM

N7740ZI - Zeroing adapter

N7740LI - LC
4-port LC connector for the multiport power meter series N7744A and N7745A.

N7740MI - MU
4-port MU connector for the multiport power meter series N7744A and N7745A.

www.keysight.com/find/oct

Accessories

81000HI - E-2000 Connector interface

For **physical** contact connections
Recommended for angled and straight connector interfaces. Use with sources. Not for sensors.

81000LI - LC/F3000 Connector interface

For **physical** contact connections
Recommended for angled and straight connector interfaces. Use with sources.

81000FI - FC Connector interface

N-keying (key slot = 2.20 mm nominal)
For physical and non-physical contact connections
Recommended for angled and straight connector interfaces

81000MI - MU Connector interface

For **physical** contact connections

Recommended for angled and straight connector interfaces. Use with sources.

81000KI - SC Connector interface

For physical and non-physical contact connections
Recommended for angled and straight connector interfaces

81000SI - DIN 47256 Connector interface

For physical and non-physical contact connections
Recommended for angled and straight connector interfaces

81000BR - HMS-10 Reference reflector

- Return loss = 0.18 dB ± 0.1 dB (96% ± 2%) typ.
- Wavelength range: 1200 to 1600 nm

A gold-plated HMS-10 connector for use in measuring return loss of optical connectors. It allows you to establish a precise reference for reflection measurements. Return loss is 0.18 dB ± 0.1dB (96% ± 2%)

81000PI - E-2000 Connector interface

For **non-physical** contact connections
Recommended for angled and straight connector interfaces. Use with sensors.

81002LI - LC/F3000 Connector interface

For **non-physical** contact connections
Recommended for angled and straight connector interfaces. Use with sensors.

81000NI - FC Connector interface

R-keying (key slot = 2.00 mm nominal)
For physical and non-physical contact connections
Recommended for angled and straight connector interfaces

81002MI - MU Connector interface

For **non-physical** contact connections
Recommended for angled and straight connector interfaces. Use with sensors.

81000VI - ST Connector interface

For physical and non-physical contact connections
Recommended for angled and straight connector interfaces

81000UM - Universal feed-through adapter

To adapt 81000BR or HMS-10 connectors to any other appropriate connector. In combination with a Keysight 81000xI connector interface, this adapter allows you to mate an HMS-10 connector to another HMS-10, FC/PC/SPC, APC, DIN, ST, E-2000, or SC connector. It can also be used to mate a Keysight 81000BR reference reflector to a connector under test. The Keysight 81000UM is a through adapter only. It can not be used at the fiber interfaces of the modules.

www.keysight.com/find/oct

Laser Safety Information

81613A 1310/1550 nm RL

81650A 1310 nm FP (discontinued)
81651A 1550 nm FP (discontinued)
81654A 1310/1550 nm (discontinued)

The laser sources listed directly above are classified as Class 1 according to IEC 60825-1 (2007).

All laser sources comply with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated 2007-June-24.

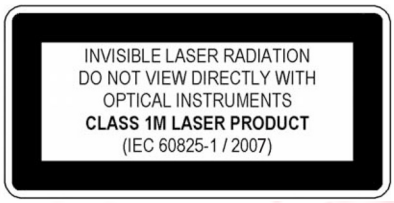
81655A#E01 850 nm FP
81655A 1310 nm FP
81656A 1550 nm FP
81657A 1310/1550 nm FP

81662A C- and L-Band DFB (discontinued)
81663A DFB

81600B #201 1455 nm–1640 nm All-band TLS
81600B #200 1440nm–1640 nm All-band TLS
81600B #140 1370nm–1495 nm low SSE TLS
81600B #150 1450nm–1590 nm low SSE TLS
81600B #160 1495nm–1640 nm low SSE TLS
81600B #130 1260nm–1375 nm low SSE TLS
81600B #132 1260nm–1375 nm high power TLS
81600B #142 1370nm–1495 nm high power TLS
81606A/8A/9A #216 1450 nm-1650 nm high power/low SSE TLS
81606A/8A/9A #116 1490 nm-1640 nm high power/low SSE TLS
81607A #116 1490 nm–1640 nm low SSE TLS
81940A 1520nm–1630 nm compact TLS
81944A 1525nm–1625 nm compact TLS (discontinued)
81949A 1520nm–1630 nm compact TLS
81980A 1465nm–1575 nm compact TLS
81989A 1465nm–1575 nm compact TLS
81950A #210 1527.6 nm–1565.5 nm compact TLS
81950A #201 1570.01 nm–1608.76 nm compact TLS
81960A #162 1505 nm–1630 nm fast-swept compact TLS
81490A #135 reference transmitter 1310/1550 nm
81490A #E03 reference transmitter 850 nm

All laser sources specified directly above are classified as Class 1M according to IEC 60825-1 (2007).

All laser sources comply with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated 2007-June-24.



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