Lightwave Solution Platform

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

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| Legacy Module compatibility |

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

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81600B Tunable Laser Source family

- 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

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

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

For Laser Safety information see page 14

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

For Laser Safety information see page 14

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

For Laser Safety information see page 14

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

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

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 DIN 47256
- 81000VI ST
Fabry-Perot Laser modules

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
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

Sensor Module Interface
(for both angled & straight connectors)

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
(bare fiber)

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)

Note: All sensor inputs are non-contact and accept both straight and angled connectors.
Optical Heads (5 mm sensor)

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
- 816238 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
- 81010BL Lens for 1300/1550 nm, single mode
- 81050BL Lens for 1300/1550 nm, multi mode

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

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

For advanced accuracy see „Special Calibration“ options C01/02 and C85/86
High Power Optical Head (with integrating sphere)

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

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

Connector Adapters
- 81628B InGaAs
  +40 dBm to –60 dBm

Interface Module

Accessories
- 81624CE 4 m extension cable

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

For Laser Safety information see page 14

Return Loss Module
Angled contact interfaces

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

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

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

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

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

Optical Switches (single-mode) with Angled Contact Connectors
- 81595B #009 (single slot) Optical switch 1x4 for single-mode applications

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

Reference Receiver Module, Reference Transmitter Module

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

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 connectorized 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

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)

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.

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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

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.

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%)

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).


Learn more at: www.keysight.com

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