

## **Agilent Technologies** **81490A Reference Transmitter**

### Technical Specifications



**Agilent Technologies**

## 81490 Reference Transmitter

Agilent's 81490A Reference Transmitter is designed to offer excellent eye quality as a reference for testing 10 GbE-L and 10 Gb-E according to IEEE 802.3ae and according to 10 GFC Fibre Channel specifications. The module is fully integrated into the industry standard LMS 816xB platform.

Offering both 1310 and 1550 nm in one module gives the fastest reconfiguration between these two transmission bands without reconnecting.

The integration in the LMS mainframe offers an integration of the reference transmitter into the 4917A stressed eye software package. Of course a separate usage of the transmitter is also supported with SCPI language.

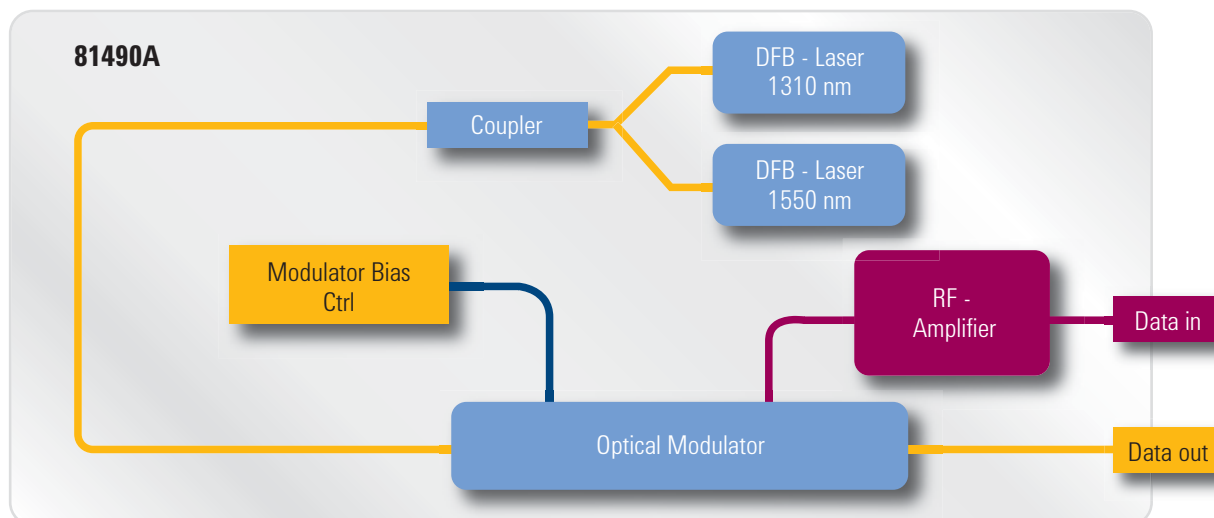
The separation of the signal source and the modulator is the only way to offer a zero-chirp modulation. This is essential for a clean and repeatable eye diagram when modulating with an appropriate clean external source to fulfill the requirements of the IEEE standard. Another advantage of this design compared to directly modulated transmitters is the wide extinction ratio range that can only be achieved with this design.

## Benefits

- **Repeatable and reproducible measurements permit lower production test margins and improved specifications of the characterized devices.**
- **Reliable measurements ensure comparability of the test results.**
- **Support for full compliance to IEEE 802.3 stressed eye test in combination with the N4917A Optical Receiver Stress Test solution.**
- **Wide extinction range offers highest test range coverage to ensure best quality of the tested devices under all target operating conditions.**
- **Rapid test reconfiguration with dual-wavelength to switch between 1310 nm and 1550 nm by remote control or manually without exchanging a module.**
- **Scalability with integration into industry-standard Agilent LMS platform extends your optical workbench capabilities.**

## Applications

- Reference transmitter for stressed eye compliance test according to IEEE 802.3.
- Creation of arbitrary optical modulation signals in combination with waveform generators.
- General transmission system test with special pulse patterns in combination with a pattern generator.



## Specifications

### Data input (RF in)

Operational data rate	622 Mb/s to 12.5 Gb/s
Input voltage range for $\lambda_1 = 1310$ nm $\lambda_2 = 1550$ nm	up to $0.9 V_{pp}$ (typical) up to $1.1 V_{pp}$ (typical)
Maximum input voltage	$< 2 V_{pp}$ from -2V to +2V
Input impedance (nominal)	50 $\Omega$

### Data output (optical out)

Fiber type	Standard single-mode 9 / 125 $\mu$ m
Laser type	CW DFB laser with built in isolator
Optical wavelength	$\lambda_1$ : (1310 $\pm$ 10) nm $\lambda_2$ : (1550 $\pm$ 10) nm
Average optical output power <sup>[1][2]</sup>	> 5 dBm
Attenuation range (nominal)	6 dB
Electro-optical modulation bandwidth <sup>[3]</sup>	10 MHz to 33 GHz (typical)
Electrical-optical conversion ratio <sup>[2]</sup>	> 5 mW/V
Relative intensity noise (RIN) <sup>[4]</sup>	< -136 dB / Hz
Maximum extinction ratio (ER) <sup>[5]</sup>	>10 dB (dependent on input voltage amplitude)
Vertical eye closure penalty <sup>[6]</sup>	< 0.5 dB (typical)
Rise and fall time (20 % to 80 % ) <sup>[4]</sup>	< 25 ps 17 ps (typical)
Jitter (peak-peak) <sup>[7]</sup>	< 18 ps < 12 ps (typical)

[1] After TX\_Recal operation

[2] At attenuation 0 dB

[3] -6dB decrease relative to maximum response

[4] For 0.6  $V_{pp}$  to 0.85  $V_{pp}$  data at 1310 nm; for 0.6  $V_{pp}$  to 1.0  $V_{pp}$  data at 1550 nm

[5] At data rates 10.3125 Gb/s, 10.51875 Gb/s; for whole operational data range typical; temperature change  $< \pm 1$  K and operation point adjusted to 50 % eye crossing

[6] At 1% center region

[7] Jitter of input signal < 10 ps

## General specifications

### Optical connector interface

Agilent universal Adapter  
SMF 28, straight ferrule

### RF connector interface

2.4mm female

### Module size (H x W x D)

75 mm x 64 mm x 335 mm (2.8" x 2.6" x 13.2")

### Module weight

1.0 kg (2.2 lbs)

### Warmup time

60 min

### Operating temperature

+5° C to +40° C

### Storage Temperature

- 40° C to +70° C

### Humidity

5 % to 95 % relative humidity, non-condensing

### 816xA/B Firmware revision

5.01 and higher

### Recommended recalibration period

2 years

## Ordering Information

### 81490A Reference Transmitter

-135 1310 & 1550 nm

### Cal and Warranty

R 1280

Return-to-Agilent  
war ranty and service plan

R-51B-001-3A

3 month Return-to-Agilent  
warranty extended to 3 years

R-50C-011-3

Agilent Calibration Upfront  
Support Plan 3 year coverage



### Agilent Email Updates

#### [www.agilent.com/find/emailupdates](http://www.agilent.com/find/emailupdates)

Get the latest information on the products and applications you select.



#### [www.agilent.com/find/open](http://www.agilent.com/find/open)

Agilent Open simplifies the process of connecting and programming test systems to help engineers design, validate and manufacture electronic products. Agilent offers open connectivity for a broad range of system-ready instruments, open industry software, PC-standard I/O and global support, which are combined to more easily integrate test system development.



### Agilent Direct

#### [www.agilent.com/find/agilentdirect](http://www.agilent.com/find/agilentdirect)

Quickly choose and use your test equipment solutions with confidence

#### [www.agilent.com/find/photonic\\_forum](http://www.agilent.com/find/photonic_forum)

Agilent optical discussion forum

#### [www.agilent.com/find/ref](http://www.agilent.com/find/ref)

Additional informations, manual and software updates

### [www.agilent.com](http://www.agilent.com)

#### 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. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

##### Our Promise

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 receive your new Agilent equipment, we can help verify that it works properly and help with initial product operation.

##### Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and onsite education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office.

##### Phone or Fax

###### United States:

(tel) 800 829 4444  
(fax) 800 829 4433

###### Canada:

(tel) 877 894 4414  
(fax) 800 746 4866

###### China:

(tel) 800 810 0189  
(fax) 800 820 2816

###### Europe:

(tel) 31 20 547 2111

###### Japan:

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

###### Korea:

(tel) (080) 769 0800  
(fax) (080) 769 0900

###### Latin America:

(tel) (305) 269 7500

###### Taiwan:

(tel) 0800 047 866  
(fax) 0800 286 331

###### Other Asia Pacific Countries:

(tel) (65) 6375 8100  
(fax) (65) 6755 0042

Email: [tm\\_ap@agilent.com](mailto:tm_ap@agilent.com)

Contacts revised: 05/05/05

The complete list is available at:

#### [www.agilent.com/find/contactus](http://www.agilent.com/find/contactus)

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

© Agilent Technologies, Inc. 2007

Printed in USA, October 16, 2007

Rev 1.00

5989-7326EN



Agilent Technologies