



BUY – SELL – REPAIR – CALIBRATE

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Simbol Test Systems is the one-stop shop for all your fiber optic test equipment and measurement needs. As we are exclusively focused on e-commerce and international distribution of photonic products since 2000, our customers rely on the [AssetRelay](#) catalog to find our stock listings of thousands of used and refurbished popular test equipment. They know they can get repair, customization and calibration services from our laboratory for their own fiber optic instruments from all renowned brand manufacturers.

If you wish to buy a JDS (Viavi) HA series attenuator or the MAP series visit our product page [here](#) to see our current stock with actual photos.

The Simbol Test Systems expertise

With more than 25 years of expertise in repairing OSA, Tunable Lasers, Wavemeters, **Attenuators**, Power Meters and many more, the quality of our services is renowned amongst the service centers community and highly appreciated by our partners and customers. We developed custom software allowing us to perform automatic calibration tests to cover the entire band of wavelengths and power levels that those modules operate at. Don't settle for a one-page summary assessment with only one wavelength tested at only one power level to trust that an Attenuator is operating through its full range at all power levels; our report contains the complete table of all results, confirming it has **really** been tested. We have seen ISO 17025 certified labs publishing such incomplete report making your operations at risk. So, a report from other labs with less data points than ours reflects a not completely calibrated unit. Also be careful of other sellers saying their equipment is "tested good", "powered on, self-tested", "pulled from a working environment". When you choose AssetRelay, you can be confident that we actually test everything we sell so you know it will work when it gets to your workplace. Optical equipment needs more than just power on to be proven working!

JDS HA series Attenuator Repair and Calibration Services

When the JDS Fitel (then JDS Uniphase) then JDS... now Viavi corporation was created, the HA series of attenuator was a major part of their business. In time, when most their products were moved to the MAP modular platform, the HA series was discontinued. Simbol Test Systems was given, by Viavi, all pertinent information as to how to calibrate and repair those attenuators. We are the best lab you can find to help you with any HA attenuator. When serviced at Simbol, the HA you buy or send for service goes through a premium calibration to ensure it meets or exceeds manufacturers' published specifications. The attenuator is shipped with a comprehensive 5-page calibration report including 2 pages of data with graph, a calibration sticker and a calibration certificate. A report from other labs with less data points reflects a not completely calibrated unit.

List of specifications calibrated

- | | |
|--------------------------------|--------------------------|
| - Insertion Loss | -Wavelength Dependence * |
| - Polarization Dependent Loss* | - Repeatability |
| - Linearity at 1300nm | - Return Loss |
| - Linearity at 1550nm | - Beam Block Isolation |
| *if applicable | - High Power * |

Traceability: Instrumentation used during this calibration is traceable to N.I.S.T (National Institute of Standards and Technology) or C.N.R.C. (Canadian National Research Council).



OLDER HA1/HA3 Series with JDS was JDS FITEI, newer models JDS Uniphase specifications follow these 3 pages

Specifications

Model	HA1	HA3
Wavelength range	1200 to 1700 nm	1200 to 1700 nm
Attenuation range	100 dB	60 dB ¹
resolution	0.001 dB nominal	0.0005 dB nominal
repeatability ²	±0.01 dB	±0.006 dB
change rate	≤2.5 seconds	≤2.5 seconds
accuracy ³	0 to 100 dB	0 to 60 dB
Insertion loss ⁴⁵	±0.1 dB	
Return loss ⁴⁵	<2.0 dB	
Maximum optical input power	>60 dB ⁶	
Recalibration period (recommended)	200 mW	
Polarization dependent loss ⁴⁵	1 year	
Beam block attenuation	0.02 dB typical, 0.08dB max	
Beam block speed	>1 10 dB	
Fiber type	<20 msec	
Input voltage	Siecor 9/125 um single-mode	
Power consumption	90 VAC to 240 VAC, 50 Hz to 60 Hz	
Dimensions (WxHxD)	80 VA max	
19" rack mounting	21.2 x 8.9 x 35.5 cm	
Weight	21 high, 1/2 rack width, compatible with HP™8156A	
Operating temperature	4 kg	
Storage temperature	0 to 40°C	
Humidity' range	-40 to 60°C	
	95% up to 40°C decreasing at 5% per °C from 40°C to 60°C	

1. The attenuation range is a continuous function of wavelength

2. U constant temperature, wavelength and polarization state.

3. With optimization of die calibration wavelength or user slope. If optimization is not performed, accuracy is the greater of ±0.1 dB or ±0.004 dB/DB from 1260 to 1360 nm and from 1450 to 1570 nm. At other wavelengths, the accuracy is the greater of ±0.1 dB or ±0.015dB/DB if optimization is not performed

4. Measured at 23°C with a laser source.

5. Not including connectors, switch or coupler (if installed)

6. Total of discrete reflections, does not include distributed reflection in fiber

Ordering Information

Indicate your application requirements by selecting one feature from each configuration table. For more information on this or other products and their availability, please contact your local JDS FITEI sales representative, or JDS FUEL directly at (613)727-1303, or by fax at (613)727-8284 or via e-mail at sales@jdsfitel.com.

A. Model	Check One
1. HA1	
2. HA3	
B. Options ¹	Check One
1. None	
2. 50/50 coupler	
3. 10/90 coupler	
4. 2/98 coupler	
5. 1:2 switch	

1. Trunk fiber of optional derive is connected internally to attenuator.

C. Port Type	Check One
1. Pigtails (with or without connectors)	
2. Panel mounted connectors	

I). Connector Type	Check One
1. FC/PC	
2. FC/APC	
3- SC/PC	
4. SC/APC	
5. No connector	

All information contained herein is believed to be accurate and is subject to change without notice. So responsibility is assumed for its use. JDS FITEI, or manufacturer reserves the right to make changes, without notice, to product design, product components and product manufacturing methods.

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Switch

A 1:2 optical fiber switch (SW12) can be installed (in addition to the built-in on/off switch) to allow the instrument to select one of two inputs or outputs. If a switch is installed, the 5V output is not externally available.

Analog Option

Attenuators made with this option are designed for use in demanding applications such as multi-channel AM systems. They have ≤ 60 dB backreflection and extremely smooth variation of attenuation with wavelength. The option is available for the HA9503 version only.

Specifications

			HA9—3		HA9_8		
Optical (model specific)	Wavelength Range		1200-1700		750- 1700		nm
	Attenuation Range		1200 - 1700 nm	100 dB	750 - 1500 nm	100 dB	
					1500 - 1700 nm	60 dB	
	Insertion Loss ^u		≤2.0 (SM) ≤2.2 (MM, NA = 0.2) ≤2.9 (MM, NA = 0.3)		≤5.0 ³ (SM) ≤3.2 ³ (MM, NA = 0.2) ≤3.9 ³ (MM, NA = 0.3)		dB
	Attenuation Accuracy	Entire Range	±0.15 dB or ±0.015 dB/dB ⁴		±0.15 dB or ±0.015 dB/dB ⁴		
1280- 1340 nm		±0.1 or ±0.004 dB/dB ⁴					
1470 - 1550 nm		±0.1 or ±0.004 dB/dB ⁴					
Optical (common)	Attenuation Settability (@ 1300 nm)		0.01				dB
	Attenuation Repeatability ³		±0.015				dB
	Backreflection* ⁻¹		Code	SM	FIBER MM (NA = 0.2)	MM (NA = 0.3)	dB
		low	L	<45	<40	<-35	
		analog	S	<-60	-	-	
	Maximum Optical Input Power		200	200	300	mW	
	Recalibration Period		Not required				
	Polarization Sensitivity		<0.1 P - P across the attenuation range				dB
	Attenuation change rate		≤2.5 sec, 0 to 100 dB				
	ON/OFF Switch		>110				dB
	ON/OFF Switch speed		<20				msec
Environmental	Operational Temperature Range		0 to 40				°C
	Storage Temperature Range		- 40 to ±60				°C
	Humidity Range		95% up to 40° C decreasing at 5% per °C from 40° C to 60° C				
Mechanical	Dimensions (L x W x H)		35.5 x 21.2 x 8.9				cm
	Weight		3.75				kg

Notes: 1. Measured at 23°C with a laser source.

2. Not including connectors, switch or coupler (if installed).

3. Highest at 750 and 1600 nm, will be 1 dB less at 980 nm.

4. Whichever is greater.

5. At constant temperature and wavelength.

JDS FUEL

Ordering Information

HA9 ☐ ☐ ☐ - ☐ ☐ ☐ ☐

Fiber Type	Code
50/125	0
62.5/125	1
85/125	2
100/140	3
9/125	5
Special(specify)	Z

Options	Code
None	0
AC11 50/50 SpUtter	1
SW12 1:2 Switch	8
AC19 10/90 Splitter	9

Model	Code
1200 - 1700 range	3
750 - 1700 range	8

Port Type	Code
pigtails front panel	1
bulkheads front panel	2

Backreflection*	Code
low	L
analog (HA9503 only)	S

* Excluding connectors.

Connector Type*	Code
no connector	NC
FC	FC
FC/PC	FP
FC/APC	FA
Biconic	BC
ST	ST
ST/PC	SP
D4	D4

♦For other connector types,
please consult factory.

Information subject to change. **JDS FUEL** reserves the right without notice, to make changes in equipment design or components as progress in engineering or manufacturing methods may warrant

HA ATTENUATORS

PARAMETER	HA 1	HA 2	HA 9	HA 9W	HA 9P	HA 10	HA 11
Operating Wavelength range	1200-1700 nm	1280-1670 nm	1200-1700 nm	750-1700 nm	980-1100 nm	1520-1630 nm	1200-1700 nm
Attenuation range	100 dB	50 dB	100 dB	60 dB	60 dB	30 dB	60 dB
resolution	0.001 dB	0.01 dB	0.01 dB	0.01 dB	0.01 dB	0.01 dB	0.01dB
repeatability	+/- 0.01dB	+/- 0.01dB	+/- 0.01dB	+/- 0.01dB	+/- 0.01dB	+/- 0.01dB	+/- 0.01dB
change rate	< 2.5s	< 1.5s	< 2.5s	< 1.5s	< 1.5s	<1.0s	< 1.5s
accuracy	0-100 dB	0-50dB	0-100dB	0-60 dB	0-60 dB	0-30 dB	0-60 dB
Insertion loss single-mode (SM)	< 1.5 dB		< 1.5 dB	< 5.0 dB		<0.8dB	<2.2dB
HA2 from 1280 to 1375nm		< 1.5 dB					
HA2 from 1375 to 1670nm		< 1.0 dB					
multi-mode (MM), 50/125			< 2.2 dB	< 3.2 dB			
MM, other			< 2.9 dB	< 3.9 dB			
Flexcor 1060					<2.5dB		
Return loss SM			> 45dB	> 45dB			
SM, analog	> 60 dB	> 50 dB	> 60 dB	> 60 dB		> 60 dB	> 60 dB
MM, 50/125			> 35dB	> 35dB			
MM, other			> 30dB	> 30dB			
Flexcor 1060					> 60 dB		
Wavelength dependence (1530-1625 nm)						+/- 0.1 dB	
0 to 20 dB of attenuation		+/- 0.05 dB					
20 to 30 dB of attenuation		+/- 0.1 dB					
30 to 40 dB of attenuation		+/- 0.2 dB					
>40 dB of attenuation		+/- 0.4 dB					
PDL Polarization Dependent Loss	0.08dB Max.	0.08dB Max.	0.08dB Max.	0.08dB Max.	0.08dB Max.	0.08dB Max.	0.08dB Max.
Beam block Isolation	>90dB	>90dB	>90dB	>90dB	>90dB	>90dB	>90dB
Maximum optical input power	200 mW	1.0 W	200 mW	200 mW	200 mW	100 mW	500 mW
OPTIONS							
	HA 1	HA 2	HA 9	HA 9W	HA 9P	HA 10	HA 11
INSERTION LOSS SM (9/125)							
50/50 coupler (HA1 & HA9 only)	5.7 / 5.7		5.7 / 5.7	8.7 / 8.7			
2/98 coupler (HA1 & HA9 only)	18.5 / 2.5		18.5 / 2.5	21.5 / 5.5			
30/70 coupler (HA1 & HA9 only)	8.0 / 3.9		8.0 / 3.9	11.0 / 6.9			
1:2 switch (HA1 and HA9 only)	2.5 / 2.5		2.5 / 2.5	5.5 / 5.5			
10/90 coupler (HA1 & HA9 only)	14 / 3.0		14.0 / 3.0	17.0 / 6.0			
INSERTION LOSS MM (50&62.5/125)							
50/50 coupler (HA1 & HA9 only)	6.4 / 6.4		6.4 / 6.4	9.4 / 9.4			
2/98 coupler (HA1 & HA9 only)	19.2 / 3.2		19.2 / 3.2	22.2 / 6.2			
30/70 coupler (HA1 & HA9 only)	8.7 / 4.6		8.7 / 4.6	11.7 / 7.6			
1:2 switch (HA1 and HA9 only)	3.2 / 3.2		3.2 / 3.2	6.2 / 6.2			
10/90 coupler (HA1 & HA9 only)	14.7 / 3.7		14.7 / 3.7	17.7 / 6.7			
OPTICS							
LENS							
Single-Mode	ED010261-M-02	ED017587-M-13	ED010261-M-02	ED010263-M-02		ED017587-M-14	ED010261-M-28
Multi-Mode	ED010261-M-02		ED010261-M-02	ED010263-M-02			
Flexcor					ED010262-M-05		
PRISM							
Single-Mode	LW2C-CL	ED023655-M-00	LW2C-CL	SW2C-CJ		ED013056-M-00	ED012224-M-00
Multi-Mode	LW2C-CL		LW2C-CL	SW2C-CJ			
Flexcor 1060					ED002472-M-00		
FIRMWARE							
Single-Mode	10109349	10109361	10109348	10109359		10109355	10109354
Multi-Mode	10109349	10109361	10109348	10109359			
Flexcor 1060					10109358		

Programmable Attenuator

The JDS Uniphase Programmable Attenuator is a high-resolution, extended-range, programmable attenuator ideal for testing power meters and for general test and laboratory work. The attenuator has a nominal resolution of 0.01 dB (0.001 dB for the HA1 series) and an extended attenuation range of 100 dB. The standard operating wavelength is 1200-1700 nm (750-1700 nm is available to use with a reduced attenuation range of 60 dB for the HA9W attenuator).

The HA1 attenuator is a single-mode, ultra-high resolution, and programmable attenuator ideal for bit error rate testing and general laboratory work.

The new JDS Uniphase HA2 Programmable Attenuator provides a wavelength dependence of ± 0.05 dB and input power up to 1 W (30 dBm). The HA2 is suitable for a variety of applications including amplifier testing and DWDM system characterization.

HA attenuators are ideal for use in such demanding applications as multichannel AM systems and high bit-rate digital pulse code modulation (PCM) systems. Discrete internal optical reflections are minimized to better than 60 dB, and cavity effects are virtually eliminated. All HA attenuators are offered with high return loss and low spectral ripple for CATV AM systems.

The inherently linear design of these attenuators, combined with built-in calibration and offset functions, allows the user to match the display to an optical power meter over a wide power range. This feature is useful in tests requiring control of the absolute optical power source for the test device. The built-in beam blocking switch provides fast access from any attenuation setting to infinite attenuation (> 90 dB).



Key Features & Benefits

100 dB range

0.01 or 0.001 dB resolution

0.01 dB repeatability

Accuracy of ± 0.1 dB

Typical polarization dependent loss (PDL) of 0.03 dB

1200-1700 nm or 750-1700 nm wavelength ranges

Built-in beam block

GPIO and RS232 remote control

Single-mode or multimode fiber

SCPI compatible command set

Optional couplers or switches

High power input of 1000 mW

Wavelength dependence of less than ± 0.05 dB over 1530-1625 nm range

Complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1

Applications

Precise optical power control

Power meter linearity calibration

Analog transmission tests

Bit error rate tests

Loss simulation in fiberoptic links EDFA output power characterization

Front panel access provides the option of increasing functionality through the addition of other devices, such as couplers or switches. The 5 V driver key on the front panel (connected to the 5 V driver on the back) acts as a toggle for an external or internal (if installed) switch.

The HA9 and HA1 attenuators can be fitted with 2/98, 10/90, 30/70, or 50/50 couplers. Optional built-in couplers or switches provide an output tap or access to two inputs or outputs. Both models have a SCPI/HP8156A compatible command set and can be controlled from the front panel keyboard or by the GPIB or RS232 interfaces.

Specifications

PARAMETER	HIGH RESOLUTION HA1	HIGHLY CONFIGURABLE HA9	WIDE WAVELENGTH RANGE HA9W	FLEXCOR ¹ FIBER HA9P	HIGH POWER AND WAVELENGTH FLAT HA2
Operating wavelength range	1200-1700 nm	1200-1700 nm	750-1700 nm	980-1100 nm	1280-1670 nm
Attenuation ² range	100 dB	100 dB	60 dB	60 dB	50 dB
resolution	0.001 dB	0.01 dB	0.01 dB	0.01 dB	0.01 dB
repeatability ³	± 0.01 dB	± 0.01 dB	± 0.01 dB	± 0.01 dB	± 0.01 dB
change rate	< 2.5 s	< 2.5 s	< 1.5 s	< 1.5 s	< 1.5 s
accuracy ⁴	0-100 dB	0-100 dB	0-60 dB	0-60 dB	0-50 dB
	± 0.1 dB	± 0.1 dB	± 0.1 dB	± 0.1 dB	± 0.1 dB
Insertion loss ^{5,6,7} single-mode (SM)	< 1.5 dB	< 1.5 dB	< 5.0 dB	NA	< 1.0 dB ⁸
multimode (MM), 50/125µm	NA	< 2.2 dB	< 3.2 dB	NA	NA
MM, other	NA	< 2.9 dB	< 3.9 dB	NA	NA
Flexcor ¹ 1060	NA	NA	NA	< 2.5 dB	NA
Return loss ^{5,6} SM	NA	> 45 dB	> 45 dB	NA	NA
SM, analog ⁸	> 60 dB	> 60 dB	> 60 dB	NA	> 50 dB
MM, 50/125 µm	NA	> 35 dB	> 35 dB	NA	NA
MM, other	NA	> 30 dB	> 30 dB	NA	NA
Flexcor 1060	NA	NA	NA	> 60 dB	NA
Wavelength dependence ^{5,10} (1530-1625 nm)	NA	NA	NA	NA	± 0.05 dB (0-20 dB attenuation) ± 0.10 dB (20-30 dB attenuation)
Maximum optical input power	200 mW	200 mW	200 mW	200 mW	1000 mW
Recalibration period (recommended)	2 years				
Polarization dependent loss ^{5,6}	0.03 dB typical, 0.08 dB maximum				
Beam block attenuation	> 90 dB				
Input voltage	90-240 V AC, 50-60 Hz				
Power consumption	80 VA maximum				
Dimensions W x H x D	21.2 x 8.9 x 35.5 cm 19-inch (48.26 cm) rack-mounting 2U high				
Weight	4 kg				
Operating temperature	0 to 40 °C				
Storage temperature	- 40 to 60 °C				
Humidity	maximum 90 % up to 40 °C				

1. Flexcor is a trademark of Corning Incorporated

2. The attenuation range is a continuous function of wavelength.

3. At constant temperature, wavelength, and polarization state after half hour warm-up.

4. Up to 60 dB of attenuation for single-mode and 45 dB of attenuation for multimode. Maximum specification at calibrated wavelength ±15 nm. Outside these wavelength ranges, the typical accuracy is the greater of ± 0.1 dB or ± 0.003 dB.

5. Measured at 23 °C with a laser source.

6. Not including connectors, switch, or coupler (if installed).

7. Over 850-1600 nm. Insertion loss is typically highest at wavelength extremes.

8. Total of discrete reflections. Does not include distributed reflection in fiber.

9. From 1375-1670 nm, <1.5 dB from 1280 to 1375 nm.

10. Relative to reference 0 dB setting.

Ordering Information

Sample Order: HA097+28KFA1

HA +2

code	model
01	HA1 (high resolution, 1200-1700 nm)
02	HA2 (high power, wavelength flat)
09	HA9 (1200-1700 nm)
9P	HA9P (Flexcor 1060, 980-1100 nm)
9W	HA9W (750-1700 nm)

code	fiber type (μm)
1	50/125 (HA9 and HA9W only)
2	62.5/125 (HA9 and HA9W only)
7	9/125
8	Flexcor 1060 (HA9P only)

code	built-in options
0	None
1	50/50 coupler (HA1 and HA9 only)
4	2/98 coupler (HA1 and HA9 only)
5	30/70 coupler (HA1 and HA9 only)
8	1:2 switch (HA1 and HA9 only)
9	10/90 coupler (HA1 and HA9 only)

code	port type
1	Bulkheads on front
2	Bulkheads on back
3	Pigtails on front
4	Pigtails on back

code	connector type (all ports)
NC	No connector
FP	FC/PC
FA	FC/APC
SC	SC/PC
SU	SC/APC
SP	ST/PC

code	return loss
K	Standard
A	Analog

Indicate your requirements by selecting one option from each configuration table. Print the corresponding codes in the available boxes to form your part number.



If the configurations available do not meet your performance requirements, please contact our global sales and customer service team to discuss the potential for specialized solutions.

1. Flexcor is a registered trademark of Corning Incorporated.
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