

VOA Array Rack System

(net-ready, high precision, 70dB, high speed, SM/MM, broadband)

(US patent 8,666,218 and other patents pending)

The VOA Array Rack System is highly versatile that is cable of meeting performance requirements for all application scenarios. The system intergrades feedback minoring power taps to provide high-precision attenuation or output laser power control. Power control is lower in cost than attenuation control. Many types of VOAs can be selected. MEMS VOAs offer low cost and up to 70dB shut-off. Electro-optical NanoSpeed™ VOAs offer 800ns fast response and a high-speed laser power stabilization function that eliminates fluctuations and surges. Fiber-Fiber™ VOAs offer ultra-broadband covering from 200 to 2500nm with all types of fibers and ultra-low insertion loss.

The system is a modular pluggable design that accommodates any number of channels in a single system with various corresponding rack heights. Each standard plug-in contains up to 8 channels using compact LC connectors, and a 1U system can be configured to have 24 channels. Only the VOAs on the same plug-in module can be controlled simultaneously. There is a short time delay to control VOAs between modules. A special unit can be made in which all channels are controlled simultaneously. The same system can further integrate other modules, such as switches, power monitors, and dispersion compensators.... The standard control interface is ethernet. Other control methods may be available per request. A standard Web-based GUI is included.



Specifications

Features

- Very Low Loss
- Highly Repeatable
- Latching
- High Resolution
- Large Attenuation

Parameters	Min	Typical	Max	Unit
Operation Wavelength	300		2500	nm
Insertion Loss		0.3	0.5 ^[1]	dB
Polarization Dependent Loss		1	1.5 ^[2]	dB
Wavelength Dependence Loss		0.15	0.5	dB
Attenuation Range		0.1	0.2	dB
Attenuation Setting Repeatability	35	60	78 ^[3]	dB
Extinction Ratio (PM version only)			0.05	dB
Polarization Mode Dispersion (SM version only)	18	23	25	dB
Return Loss		0.01	0.05	ps
Response Time	45			dB
Optical Power handling (CW)			100	ms
Operating Temperature		0.3	20 ^[4]	W
Storage Temperature	-20		75	°C
Electrical Power Input	-40		85	°C
Communication Interface (Ethernet)	100		230	VAC
	SNMP	Telnet		

Notes:

- [1]. Use Ultra-broad band Precision MEMS VOA with build-in position sensor. The loss is without the connectors. Each connector adds 0.1 to 0.3dB (<https://agiltron.com/product/high-precision-optical-variable-attenuator/>)
- [2]. Conventional MEMS VOAs with tap monitor. It has a limited wavelength range due to coatings. The loss is without the connectors. Each connector adds 0.1 to 0.3dB depending on mating condition.
- [3]. 60dB and 78dB uses special MEMS VOAs and Precision MEMS VOAs
- [4]. 1W single mode and 3W multimode are only available with Precision MEMS VOAs (<https://agiltron.com/product/high-precision-optical-variable-attenuator/>)

Warning: The device mounted on the PCB is an OEM module designed for system integration only, not for general uses. Do not touch the PCB by hand. The electrical static can kill the chips even without a power plug-in, and unpleasant electrical shock may also be felt. For laboratory use, please buy a protected Turnkey system.

Applications

- Power Control
- Power Regulation
- Channel Balance
- Instrumentation

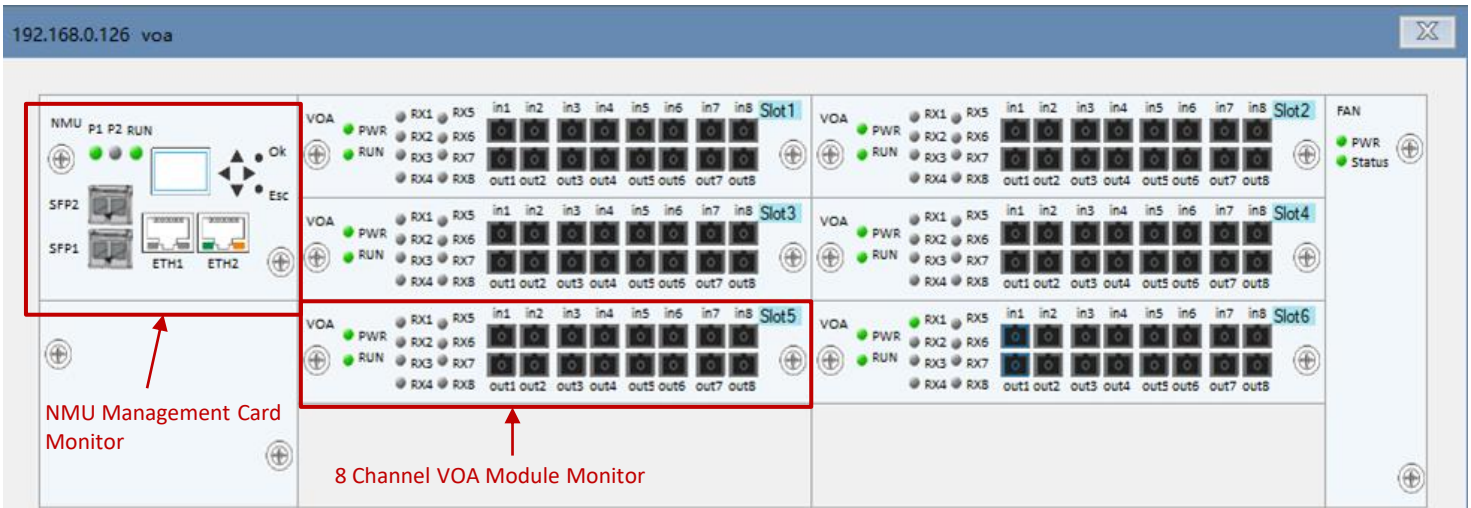
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GUI Software

- The system contains tap monitor on each channel output providing attenuation and power control function.



Business information		Topology information		Basic information						
State		Auto Mode		Manual Mode		Alarm Threshold				
	Power	Configuration		Attenuation	Configuration		Threshold			
VOA1	-45.99	20.00	dBm	set	0.0	0.0	dB	set	-20.00	set
VOA2	-45.07	15.10	dBm	set	0.0	0.0	dB	set	-20.00	set
VOA3	-43.88	-3.00	dBm	set	17.3	17.3	dB	set	-20.00	set
VOA4	-42.65	7.00	dBm	set	0.0	0.0	dB	set	-20.00	set
VOA5	-43.71	-50.00	dBm	set	0.0	0.0	dB	set	-20.00	set
VOA6	-45.39	-50.00	dBm	set	0.0	0.0	dB	set	-20.00	set
VOA7	-45.99	3.00	dBm	set	0.0	0.0	dB	set	-20.00	set
VOA8	-40.21	5.00	dBm	set	0.0	0.0	dB	set	-20.00	set

Actual Output Power

Configure Output Power

Actual Attenuation

Configure Attenuation

We provide a command list for customers to write their control code, such as Python



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Mechanical Footprint Dimensions (mm)

19" rack. The unit will select the minimum height to accommodate the channel count and connector type

For 1U chassis

- Choose LC connectors up to 32 Channels; 4 pluggable cards
- Choose FC, SC, or ST connectors for up to 16 Channels; 2 pluggable cards

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

Ordering Information

- The system includes a rack-mount box of from 1U up to 6U with multiple plug-in modules
- Pluggable module order information below, each module accommodate up to 8 channels power control with LC connectors

Prefix	Channel	Speed	Configuration ^[1]	Test Wavelength	Fiber type	Attenuation	Connector
VOAS-	8 = A8 16 = 16 24 = 24 32 = 32 ... 96 = 96	MEMS10ms = 1 NS 100ns = 2	Transparent with Auto Output Control = 1 Transparent with Auto Attenuation Control = 2 Opaque with Auto Output Control = 7 Opaque with Auto Attenuation Control = 5 5W NS Transparent/Auto Output Control = H Special = 0	1260-1620 = C 488 = 4 532 = 5 630 = 6 780 = 7 850 = 8 980 = 9 1060 = 1 1310 = 3 1550 = A 2000 = 2 Special = 0	Pick from the below table	35dB = 1 60 dB = 2 65 dB = 3 70 dB = 4	FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 Duplex LC/PC = 8 MTP = 9 LC/APC = A LC/UPC = U Special = 0

[1]. **Transparent:** The device passes light without applying electrical voltage.

Opaque: The device blocks light without applying electrical voltage

Fiber Type Selection Table:

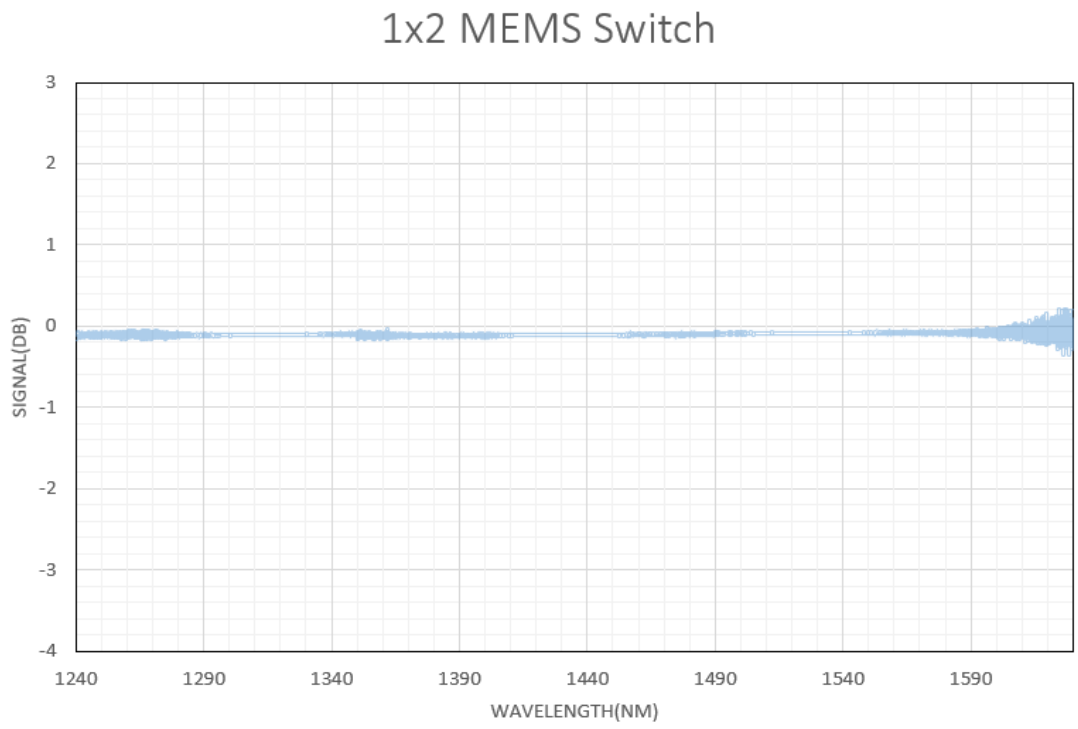
01	SMF-28	34	PM1550	67	OM1 (MMF 62.5/125µm)
02	SMF-28e	35	PM1950	68	OM2 (MMF 50/125µm)
03	Corning XB	36	PM1310	69	OM3 (MMF 50/125µm)
04	SM450	37	PM400	70	OM4 (MMF 50/125µm)
05	SM1950	38	PM480	71	GIF50 (GIF 50/125µm)
06	SM600	39	PM630	72	GIF625 (GIF 62.5/125µm)
07	Hi780	40	PM850	73	105/125um
08	SM800	41	PM980	74	FG105LCA
09	Hi980	42		75	FG50LGA
10	Hi1060	43		76	
11	Draka BBE	44		77	
12		45		78	

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Typical Insertion Loss vs Wavelength (1240-1630nm)



Application Notes

Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness

Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.



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Operation Manual

1. Connect a control signal to the SMA connector on the PCB.
2. Attach the accompanied power supply (typically a wall-pluggable unit).
3. The device should then function properly.

Note: Do not alter device factory settings.

Questions and Answers

Q: If the device were to fail, would the switch continue to pass the fiber light through the switch as configured before failure? When power is restored, does the IN/OUT configuration before failure remain in place?

A: This depends, if one mirror fails, it only affects the light go through that mirror. Yes, when power back up it will go to the previous points

Q: When power is restored, does the IN/OUT configuration before failure remain in place?

A: Yes, when power back up it will go to the previous flightpath

Q: If power to the device were shutoff, would the device continue to pass the fiber light as configured before failure?

A: This function is call latching. We uniquely offer MEMS latching switch but cost more.

Q: With the Ethernet Control Option, does the switch support SNMPv3

A: Yes. This internet standard protocol allows user to write their own control code

Q: With the Ethernet Control Option, what type of encryption does the SNMPv3 use?

A: MD5/DES

Q: With the Ethernet Control Option, could this device be controlled by multiple users at different locations and all users will also see the configuration updates?

A: Yes

Q: With the Ethernet Control Option, could this switch be controlled by multiple users at different locations and all users will also see the configuration updates?

A: Yes

Q: With the Ethernet Control Option, does the user need to install any software on their computer other than a web browser?

A: No