

OPERATING MANUAL

**DOCUMENT NUMBER: 51A14261**

**INTEGRATED ACOUSTO-OPTIC 1 X 1 SWITCH  
AND FREQUENCY SHIFTER SYSTEM**

MODEL NUMBER:

**54035-1.55-.5DS-1**

APPROVED: \_\_\_\_\_ DATE: APRIL 2002 \_\_\_\_\_

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## **SECTION I**

### **INSPECTION PROCEDURE**

Examine the shipping carton for damage. If the shipping carton or packing material is damaged it should be kept for the carrier's inspection. Check the contents of the shipment for completeness, mechanical damage, and then test the equipment electronically. Operating procedures are contained in Section VI. Notify the carrier and NEOS Technologies. If the contents are incomplete, or the equipment does not pass the electrical testing please notify NEOS Technologies.

If there is any problem with the use of this equipment, or if the equipment fails to function as expected contact NEOS Technologies, do not try to trouble shoot or repair this equipment. Consult with a NEOS service engineer. If the equipment needs repair or replacement, contact NEOS Technologies, Inc for a Return Authorization Number.

**SECTION II**  
**INTEGRATED ACOUSTO-OPTIC 1 X 1 SWITCH**  
**AND FREQUENCY SHIFTER SYSTEM**

54035-1.55-.5DS-1

The integrated acousto-optic 1 x 1 switch and frequency shifter system consists of a highly efficient acousto-optic modulator assembly that is fiber coupled with single mode fibers, a RF driver, and a universal power supply to supply the needed power.

The AOM is designed for operation at 1.55  $\mu\text{m}$ . Its operation is independent of optical polarization. Normally the standard configuration is to couple the diffracted plus first order out of the AOM, see Figure 1, however, optional configurations are possible upon request to couple the minus first order or the zero order out of the AOM. The plus first order output will have the light frequency shifted up by 35 MHz from the light frequency applied at the input. The AOM is not direction sensitive, so either fiber can be used for input or output. The standard fiber connector used is the FC/PC.

RF driver is designed to provide the needed 35 MHz RF power for the AOM. The RF power is set to 0.5Watts. The front panel has a "MODE" switch, which allows the system to be turned on "CW" producing a low loss optical path through the system without external input. With the front panel "MODE" switch in the "NORMAL" position the driver can be modulated with a digital TTL signal. The digital input is internally pulled "high" which causes the driver to apply RF power to the AOM and produces a low loss path through the fiber. It requires a TTL "low" to turn it off.

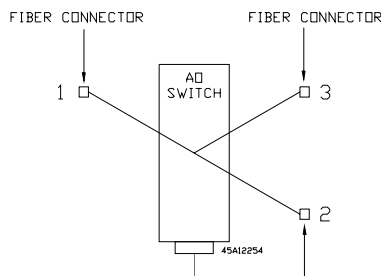


Figure 1

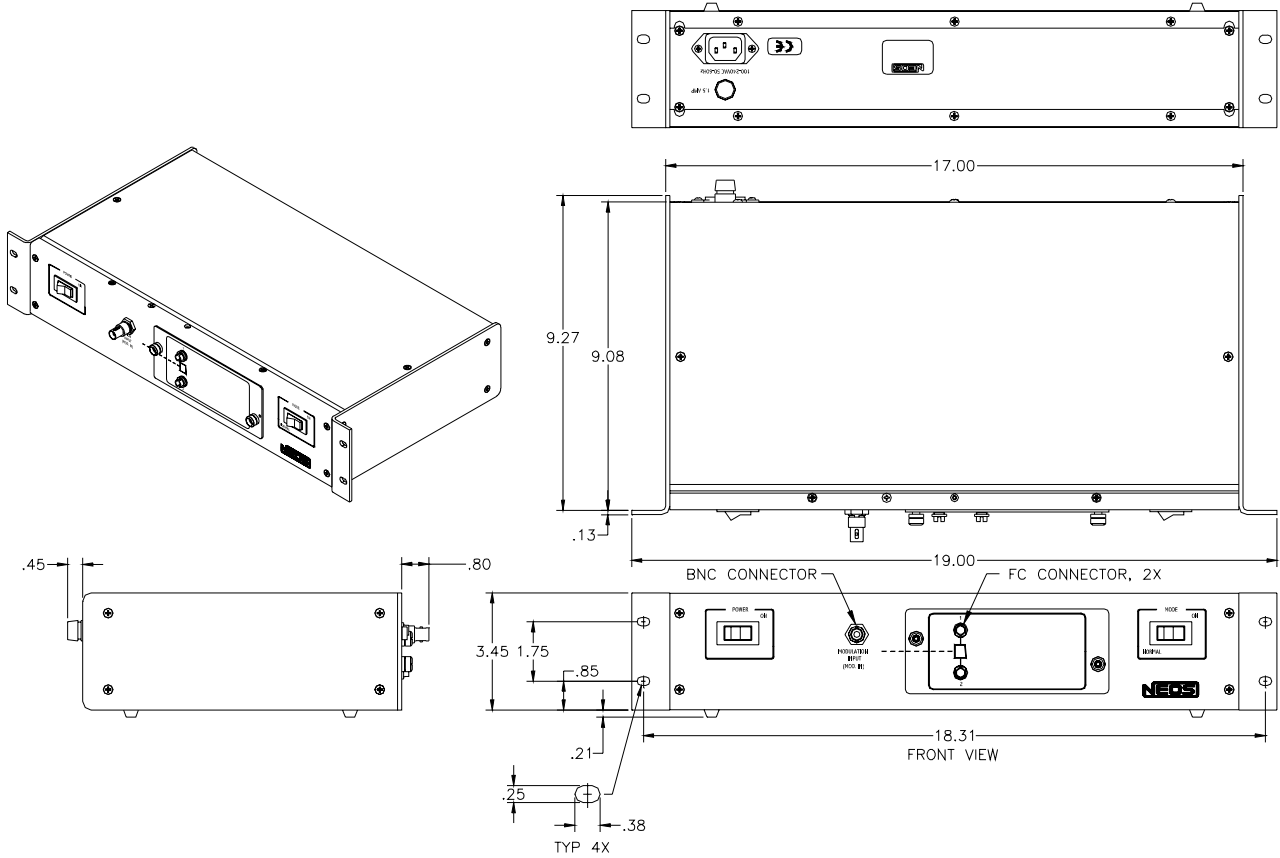
### SECTION III

#### DEVICE SPECIFICATIONS

##### MODEL NUMBER: 54035-1.55-.5DS-1

<u>PARAMETER</u>	<u>SPECIFICATION</u>
Channels	1
Interactive Material	AMTIR (GeSeAs)
Acoustic Mode	Longitudinal
Operating Wavelength	1520 nm to 1570 nm
Window Configuration	AR Coated
Operating Frequency	35 MHz
CW Insertion Loss, Excluding Connectors	2.4 dB Maximum @ 1550 nm
Insertion Loss Variation over Operating Wavelength	$\pm 0.125$ dB
Insertion Loss Variation, Between CW & Modulated	$\pm 0.125$ dB
Back Reflection	-50 dB
CW Extinction Ratio	55 dB
Modulation Extinction Ratio (modulation frequency 125KHz)	40 dB
Light Polarization	Random
Polarization Dependent Loss	0.15 dB normal 0.2 dB Max.
Rise Time	100 ns Maximum
Rise Time Symmetry	15%
AO Delay	$1.35 \mu\text{s} \pm 0.2 \mu\text{s}$
Modulation Input	TTL, TTL High = On
Input Power	100 to 240 Volts AC 50/60 Hz
Connector Type	FC/PC
Fiber	Single Mode 9/125
Package:	53D2044

# SECTION IV OUTLINE DRAWING



53D2044

## SECTION V CONNECTION AND CONTROLS

### **Front Panel:**

1. Power Switch: Applies the AC power and turns on the system.
2. BNC Connector: Input for the TTL control signal.
3. (2) FC/PC Fiber Optical connectors: input and output with 9/125 fiber.
4. Mode Switch: "CW" or "NORMAL" mode.
  - "CW"  
Produces a low loss path through the fiber and ignores the digital external input signals.
  - "NORMAL"  
Accepts a TTL digital modulating signal to control the output an optical signal through the fiber.

### **Back Panel:**

1. AC Power Connector: Accepts 100 to 240 Volts, 50 or 60 Hz
2. Fuse Holder: Accepts a 1 Amp Fuse.

**SECTION VI**  
**OPERATING PROCEDURE**

1. Attach a TTL modulating signal to the BNC "Mod In" connector.
2. Attach the mating fiber connectors to the system. When attaching a mating fiber to the fibers on the system, be sure the connector end is clean. Cleaning the connector ends with a cotton swab soaked with acetone will ensure there will be a low loss, dirt free connection. The use of index matching fluid is recommended if minimal connection loss is needed.
3. Apply AC power to the system.
4. Turn on the power switch.

**Testing System functions:**

5. Set the "MODE" switch to "CW". The system should be have a low loss path through the fiber.
6. With the "MODE" switch in "NORMAL" position, apply a digital modulating TTL signal to BNC connector to control the throughput of the optical signal. Test the various specifications as listed on the Acceptance Test Report included with this manual. The system is designed to meet or exceed the specification.

**Operation:**

With the "MODE" switch in "NORMAL" position.

7. Apply a digital modulating TTL signal to the BNC to control the throughput of the optical signal as desired. The system is now operating.