



**AVTECH ELECTROSYSTEMS LTD.**

NANOSECOND WAVEFORM ELECTRONICS  
SINCE 1975

□ P.O. BOX 265  
OGDENSBURG, NY  
U.S.A. 13669-0265  
TEL: (315) 472-5270  
FAX: (315) 883-1328

TEL: 1-800-265-6681  
FAX: 1-800-561-1970

e-mail: [info@avtechpulse.com](mailto:info@avtechpulse.com)  
<http://www.avtechpulse.com/>

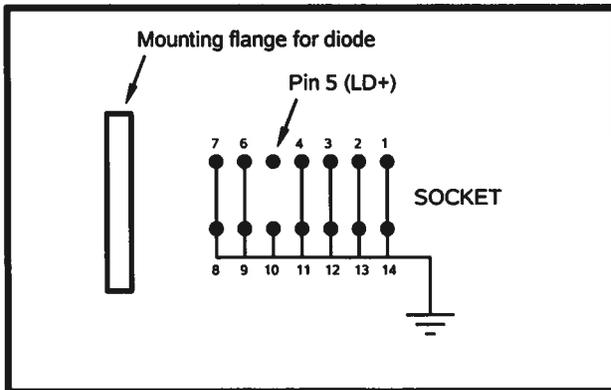
☒ BOX 5120, LCD MERIVALE  
OTTAWA, ONTARIO  
CANADA K2C 3H4  
TEL: (613) 226-5772  
FAX: (613) 226-2802

INSTRUCTIONS

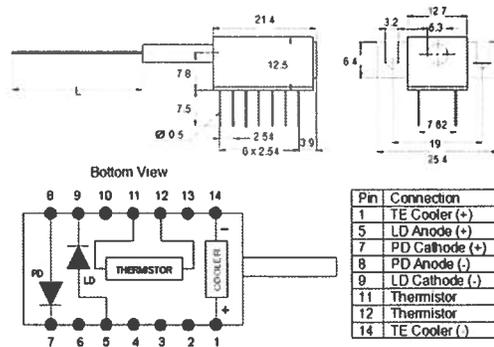
MODEL AVX-S1-P4-ARA

PLUG-IN SOCKET OUTPUT MODULE

SERIAL NUMBER: 11808



**AVX-S1-P4-ARA OUTPUT MODULE, SOCKET VIEW**



**MATCHING USER-SUPPLIED  
DIODE PACKAGE**

### WARRANTY

Avtech Electrosystems Ltd. warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery to the original owner, and after prepaid return by the original owner, this Avtech product is found to be defective, Avtech shall at its option repair or replace said defective item. This warranty does not apply to units which have been disassembled, modified or subjected to conditions exceeding the applicable specifications or ratings. This warranty is the extent of the obligation assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

### TECHNICAL SUPPORT

Phone: 613-226-5772 or 1-800-265-6681

Fax: 613-226-2802 or 1-800-561-1970

E-mail: [info@avtechpulse.com](mailto:info@avtechpulse.com)

World Wide Web: <http://www.avtechpulse.com>

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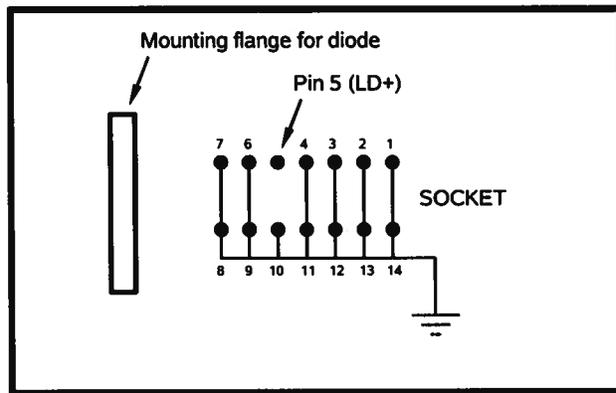
Manual Reference: T:\instructword\avx-s\AVX-S1-P4-ARA,sn11808.odt.  
 Last modified July 19, 2007.  
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## INTRODUCTION

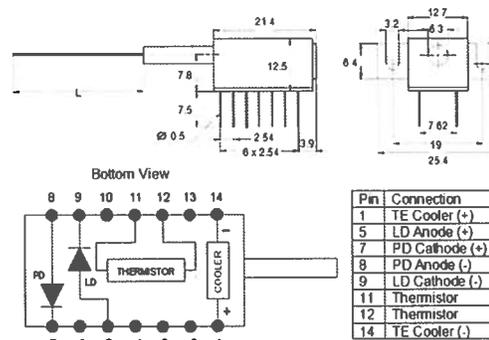
The AVX-S series of bias insertion units is designed to combine a pulse signal with a DC bias, and supply the resulting signal to a laser diode, which is inserted into a high quality socket included on the mount. The bias insertion module includes the necessary networks to match the laser diode to the pulse source, as well as networks for applying DC bias to the diode.

This bias insertion unit is intended for use with the existing AVO-9H-B-P1B-T1B-P mainframe (S/N 11807). A 20 dB attenuator is provided, to limit the maximum pulse current to < 200 mA. This attenuator must be installed between the mainframe output and the output module.

The AVX-S1-P4-ARA is specifically designed to accommodate the Qphotonics QFLD-905-10S laser diode, as shown below:



**AVX-S1-P4-ARA OUTPUT MODULE, SOCKET VIEW**



**MATCHING USER-SUPPLIED  
DIODE PACKAGE**

ORIGINAL QUOTATION

Date: Tue, 19 Jun 2007 11:17:00 -0400  
From: Avtech Sales  
To: XXXXX  
Subject: Re: AVO-9H-B  
June 19, 2007

XXXXX,

Following your recent inquiry, I am pleased to re-quote to offer rush delivery as follows:

Quote number: 13858.01

Model number: AVO-9H-B-P1B-T1B-P

Description: Standard Laser Diode Driver (Pulsed Voltage) with IEEE-488.2 GPIB and RS-232 Computer Control Ports

Polarity: positive

-P1B-T1B standard options: Specifies an output module with sockets designed to accept the Lumics LU1064M010 laser diode.

Pricing, manuals, datasheets: <http://www.avtechpulse.com/laser/avo-9h>

PDF datasheet:

[http://www.avtechpulse.com/catalog/page064\\_cat11\\_avo-9\\_rev14.pdf](http://www.avtechpulse.com/catalog/page064_cat11_avo-9_rev14.pdf)

Price: \$XXXXX US each, FOB destination (includes a 15% premium for rush delivery).

Quote valid for: 60 days

Estimated delivery: By July 20 provided by the order is received by June 20/07.

Quote number: 13858.02

Model number: AVX-S1-P4-ARA

Description: Customized output module with sockets for the Qphotonics QFLD-905-10S laser diode. Suitable for use with the AVO-9H-B-P1B-T1B-P mainframe as a replacement for the -P1B-T1B output module.

-P4-ARA customized option: Provides a socket pinout suitable for use with the Qphotonics QFLD-905-10S laser diode. The signal will be applied to pin 5, the laser anode. All other pins (1-4, 6-14) will be grounded. No access is provided to the thermal control pins. (This can be provided if required, at additional cost. Let me know if you need another quote.) A 20 dB attenuator will be provided, to limit the maximum pulse current to < 200 mA. This attenuator must be installed between the mainframe

output and the output module.

Pricing, manuals, datasheets: <http://www.avtechpulse.com/laser-bias/avx-s1>

PDF datasheet:

[http://www.avtechpulse.com/catalog/page074\\_cat11\\_avx-s\\_rev4.pdf](http://www.avtechpulse.com/catalog/page074_cat11_avx-s_rev4.pdf)

Price: \$XXXXX US each, FOB destination (includes a 15% premium for rush delivery).

Quote valid for: 60 days

Estimated delivery: By July 20 provided by the order is received by June 20/07.

Please call or email me if I can be of further assistance.

Thank you for your interest in our products!

Regards,  
Dr. Michael J. Chudobiak  
Chief Engineer

--- Avtech Electrosystems Ltd. ----- since 1975 ---

PO Box 265	ph: 888-670-8729 or 613-226-5772	Box 5120
Ogdensburg	fax: 800-561-1970 or 613-226-2802	LCD Merivale
New York		Ottawa, Ontario
USA 13669-0265	email: <a href="mailto:info@avtechpulse.com">info@avtechpulse.com</a>	Canada K2C 3H4
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Pulse Generators - Laser Diode Drivers - HV Amplifiers  
Monocycle Generators - Impulse Generators - Pulse Amplifiers  
Current Pulsers - Function Generators - Frequency Dividers - and more!  
-----

## SPECIFICATIONS

Model:	AVX-S1-P4-ARA
Peak diode current:	400 mA
Max. input amplitude:	20 Volts
Pulse width:	0.4 - 200 ns
Rise time:	0.2 ns
Pulse PRF range:	DC - 25 MHz
Max. bias current:	100 mA
Max. bias voltage:	50 Volts
Input impedance:	50 Ohms
$R_s + R_{diode}$ :	50 Ohms
IN connector:	SMA female (one)
Other connectors:	MV, MI, MD: SMA (female), DC bias: solder terminal
Diode socket:	-P4-ARA customized option: Provides a socket pinout suitable for use with the Qphotonics QFLD-905-10S laser diode. The signal will be applied to pin 5, the laser anode. All other pins (1-4, 6-14) will be grounded. No access is provided to the thermal control pins. A 20 dB attenuator will be provided, to limit the maximum pulse current to < 200 mA. This attenuator must be installed between the mainframe output and the output module.
Dimensions:	H x W x D: 41 mm x 66 mm x 76 mm (1.6" x 2.6" x 3.0")
Material:	Cast aluminum, blue enamel

## EUROPEAN REGULATORY NOTES

### EC DECLARATION OF CONFORMITY

We            Avtech Electrosystems Ltd.  
                 P.O. Box 5120, LCD Merivale  
                 Ottawa, Ontario  
                 Canada K2C 3H4

declare that this pulse generator meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance pertains to the following specifications as listed in the official Journal of the European Communities:

EN 50081-1 Emission

EN 50082-1 Immunity

and that this pulse generator meets the intent of the Low Voltage Directive 72/23/EEC as amended by 93/68/EEC. Compliance pertains to the following specifications as listed in the official Journal of the European Communities:

EN 61010-1:2001 Safety requirements for electrical equipment for measurement, control, and laboratory use



### DIRECTIVE 2002/95/EC (RoHS)

This instrument is exempt from Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the Restriction of the use of certain Hazardous Substances (RoHS) in electrical and electronic equipment. Specifically, Avtech instruments are considered "Monitoring and control instruments" (Category 9) as defined in Annex 1A of Directive 2002/96/EC. The Directive 2002/95/EC only applies to Directive 2002/96/EC categories 1-7 and 10, as stated in the "Article 2 - Scope" section of Directive 2002/95/EC.

### DIRECTIVE 2002/96/EC (WEEE)

European customers who have purchased this equipment directly from Avtech will have completed a "WEEE Responsibility Agreement" form, accepting responsibility for

WEEE compliance (as mandated in Directive 2002/96/EC of the European Union and local laws) on behalf of the customer, as provided for under Article 9 of Directive 2002/96/EC.

Customers who have purchased Avtech equipment through local representatives should consult with the representative to determine who has responsibility for WEEE compliance. Normally, such responsibilities will lie with the representative, unless other arrangements (under Article 9) have been made.

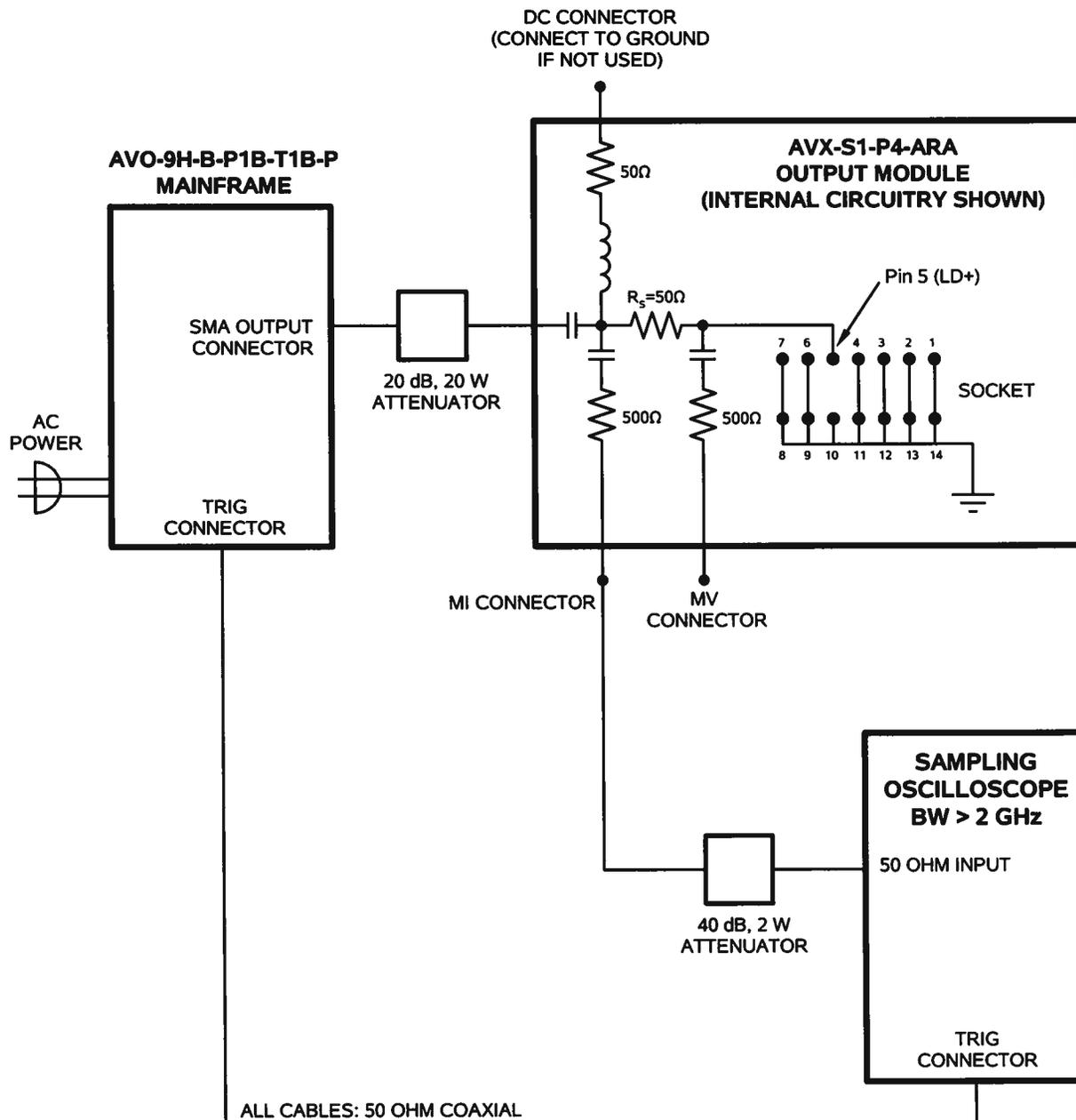
Requirements for WEEE compliance may include registration of products with local governments, reporting of recycling activities to local governments, and financing of recycling activities.



## GENERAL INFORMATION

### BASIC TEST ARRANGEMENT

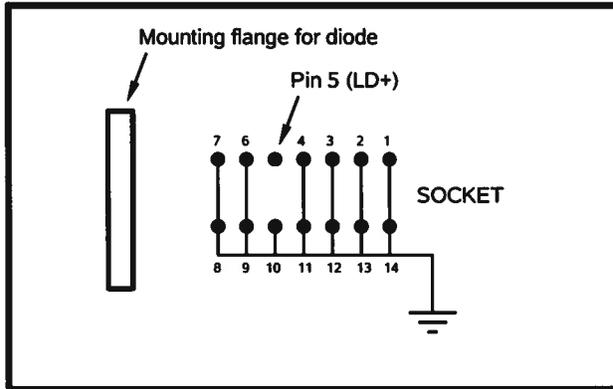
To fully test the AVX-S1-P4-ARA, and for normal operation, the output module should be connected as shown below:



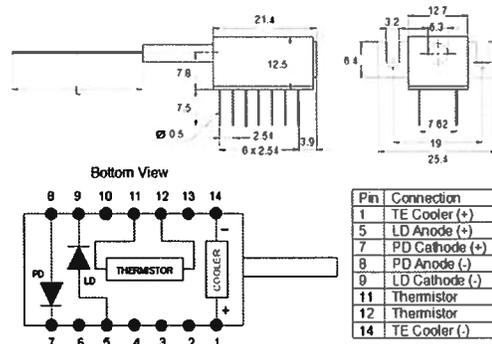
The 20 dB, 20 W attenuator included with the AVX-S1-P4-ARA should be installed between the AVO-9H-B-P1B-T1B-P mainframe and the output module, as shown

above, to limit the maximum diode current to 200 mA. (If the attenuator is not installed, up to 2A could be erroneously generated. Currents in excess of 200 mA may damage the AVX-S1-P4-ARA.)

The diode load is inserted into the socket on the output module. The mechanical layout of the socket is shown below:



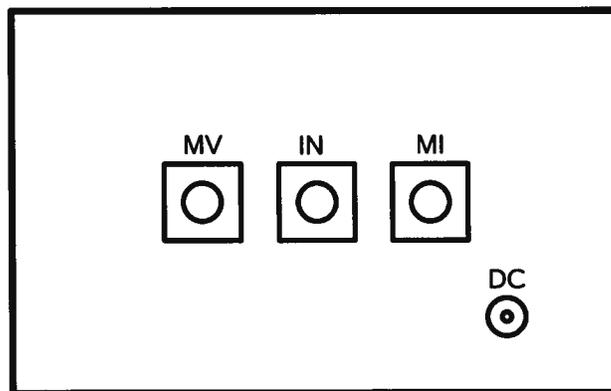
**AVX-S1-P4-ARA OUTPUT MODULE, SOCKET VIEW**



**MATCHING USER-SUPPLIED DIODE PACKAGE**

An oscilloscope may be used to monitor the MI and MD outputs, the locations of which are shown in the figure above. A forward DC bias may be applied to the laser diode by connecting a DC potential of 0 to +5 Volts to the DC solder terminal. The application of a small forward bias often yields a more ideal diode current waveform (as observed on the MI port).

**⚠** Note that the DC port must be shorted to ground if a bias is not applied. Waveform distortions will occur otherwise.



**AVX-S1-P4-ARA OUTPUT MODULE, CONNECTOR VIEW**

## AMPLITUDE CONTROL

When using the output module and the supplied 20 dB attenuator, the pulse current through the diode load is given by:

$$I_{\text{DIODE}} = (V_{\text{SET}}/10 - V_{\text{DIODE}}) / (50\Omega + R_{\text{DIODE}})$$

where  $V_{\text{SET}}$  is the amplitude setting on the mainframe (between 0 and +103V),  $V_{\text{DIODE}}$  is the forward voltage drop across the diode (typically 2V), and  $R_{\text{DIODE}}$  is the resistor internal to the laser diode (approximately 0 $\Omega$ ). The 50 $\Omega$  resistance is built into the AVX-S1-P4-ARA output module.

July 18/07