



AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS  
SINCE 1975

P.O. BOX 265  
OGDENSBURG, NY  
U.S.A. 13669-0265

TEL: 888-670-8729 (USA & Canada) or +1-613-686-6675 (Intl)  
FAX: 800-561-1970 (USA & Canada) or +1-613-686-6679 (Intl)

info@avtechpulse.com - <http://www.avtechpulse.com/>

BOX 5120, LCD MERIVALE  
OTTAWA, ONTARIO  
CANADA K2C 3H4

INSTRUCTIONS

MODEL AV-141C1

×10 GAIN, ±3V OUTPUT

PULSE AMPLIFIER

WITH 800 ps RISE AND FALL TIMES

SERIAL NUMBER: \_\_\_\_\_

### 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: 888-670-8729 (USA & Canada) or +1-613-686-6675 (Intl)

Fax: 800-561-1970 (USA & Canada) or +1-613-686-6679 (Intl)

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

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

TABLE OF CONTENTS

**WARRANTY.....2**

**TECHNICAL SUPPORT.....2**

**TABLE OF CONTENTS.....3**

**INTRODUCTION.....4**

**SPECIFICATIONS.....4**

**EUROPEAN REGULATORY NOTES.....5**

**EC DECLARATION OF CONFORMITY.....5**

**DIRECTIVE 2002/95/EC (RoHS).....5**

**DIRECTIVE 2002/96/EC (WEEE).....5**

**CONTROLS.....7**

**POWER SUPPLIES.....7**

**PROTECTING YOUR INSTRUMENT.....7**

**BASIC TEST ARRANGEMENT.....8**

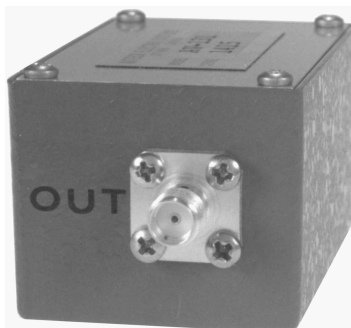
**PERFORMANCE CHECK SHEET.....9**

Manual Reference: /fileserver/officefiles/instructword/av-141/av-141c1,edition5.odt.  
Last modified December 3, 2008.  
Copyright © 2008 Avtech Electrosystems Ltd, All Rights Reserved.

## INTRODUCTION

The Model AV-141C1 is a DC-powered amplifier module, designed to amplify bipolar nanosecond rise time baseband pulses in the pulse width range of 1.5 ns and higher and CW signals in the frequency range of DC to 800 MHz.

This instrument is intended for use in research, development, test and calibration laboratories by qualified personnel.



## SPECIFICATIONS

Model:	AV-141C1
Bandwidth:	DC - 800 MHz
Gain: in dB:	20 dB
voltage gain (V/V):	10
Rise/fall time <sup>1</sup> :	800 ps
Input impedance:	50 $\Omega$
Peak output: (to 50 $\Omega$ )	$\pm 3$ V
Output impedance:	3 $\Omega$ , approx.
Min. input pulse width:	1.5 ns
Max. input pulse width:	No limit.
Equivalent input noise:	4 nV / $\sqrt{\text{Hz}}$
Connectors:	SMA
Prime power:	$\pm 15$ V, 100 mA
Dimensions:	1.4" x 1.1" x 2.3"

<sup>1</sup>) Measured for a pulse from 0V to maximum positive voltage output, between the 20% and 80% amplitude points.

## 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.

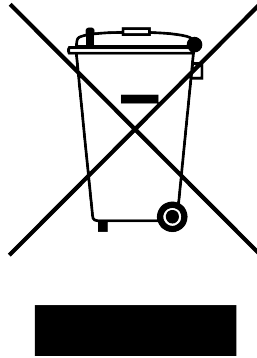
### DIRECTIVE 2002/96/EC (WEEE)

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

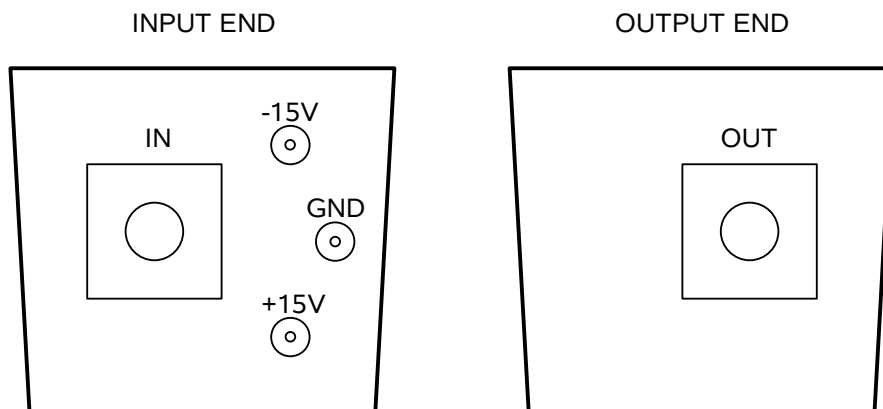
compliance (as mandated in Directive 2002/96/EC of the European Union and local laws) on behalf of the customer, as provided for under Article 9 of Directive 2002/96/EC.

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.



## CONTROLS



The input and output SMA connectors are located on opposite ends of the module, as shown above.

The +15V, -15V, and GND input solder terminals are located on the input end.


A DC offset nulling trimpot is accessible from the bottom side. It may be adjusted using a small screwdriver, if necessary.

### POWER SUPPLIES

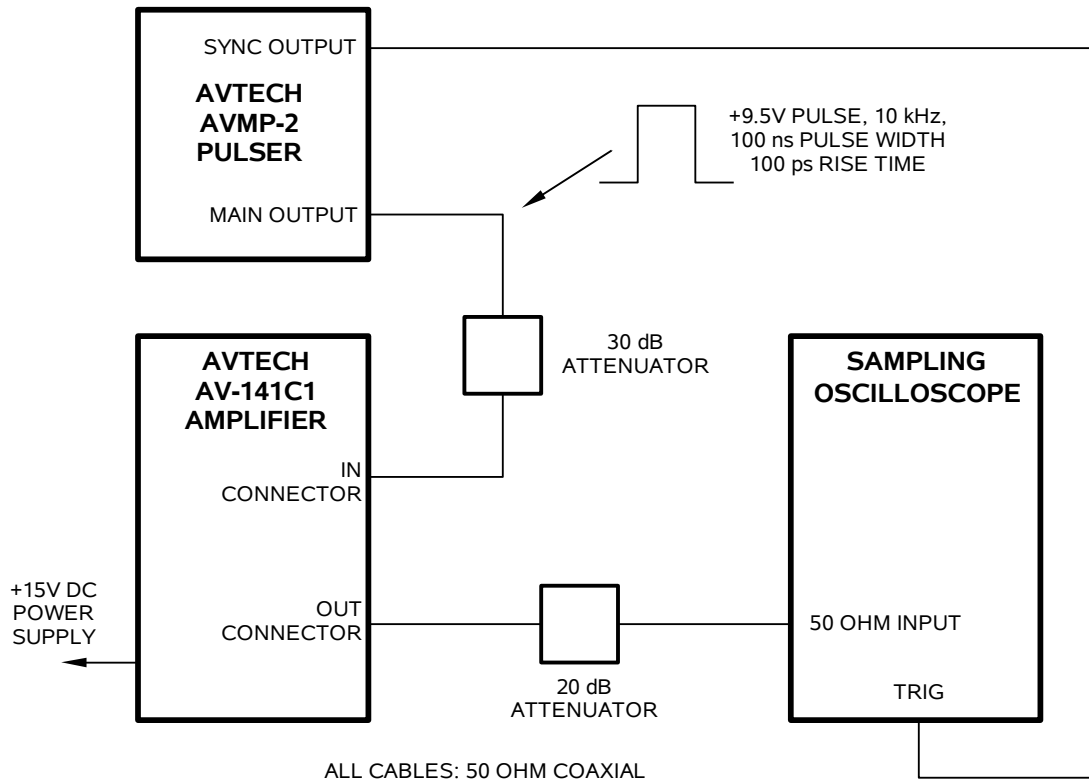
The AV-141C1 must be supplied with DC power supplies of nominally +15V and -15V (as well as a ground connection). In practice, the supplies may be as low as  $\pm 8V$ . The DC power supplies are internally regulated.

The power supply inputs are protected from excessive voltages and incorrect polarities by externally-mounted (and replaceable) 1N4746A Zener diodes. These diodes may be damaged by reversed polarities, or voltages exceeding  $\pm 17V$ .

### PROTECTING YOUR INSTRUMENT

 To obtain maximum performance, the input of the AV-141C1 is not protected against excessive input voltages. The input signal **MUST NOT EXCEED  $\pm 300$  mV!** It may be damaged by voltages greater than  $\pm 300$  mV. Failures due to the application of excessive input voltages are not covered by warranty.

## BASIC TEST ARRANGEMENT



The recommended test set-up is shown above.

The Avtech AVMP-2 series can be used to generate a +9.5V pulse at 10 kHz, with 100 ns pulse width. The rise time will be 100 ps. The 30 dB attenuator will reduce this signal to 300 mV.

The AV-141C1 amplifier will amplify the signal to 3V. The output rise time should be 800 ps or less. (Note that if a slower input signal is used, the observed output signal will be correspondingly slower.)

A 20 dB attenuator should be placed at the input of the oscilloscope, to avoid over-driving the input. Most high-bandwidth sampling oscilloscopes do not tolerate inputs of more than  $\pm 1V$ .

The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed several gigahertz.



PERFORMANCE CHECK SHEET