



**AVTECH ELECTROSYSTEMS LTD.**

NANOSECOND WAVEFORM ELECTRONICS  
SINCE 1975

P.O. BOX 265  
OGDENSBURG, NY  
U.S.A. 13669-0265  
TEL: (315) 472-5270  
FAX: (613) 226-2802

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 AV-1011-GSB

+5V to +100V, 50 ns to 1 us

EXTERNALLY TRIGGERED

PULSE GENERATOR MODULE

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: 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)

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Manual Reference: T:\instructword\av-1011\AV-1011-GSB,edition1.sxw.  
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## INTRODUCTION

The AV-1011-GSB is a high performance DC-powered module capable of generating up to +100V into loads with resistances of 10 kilohms or higher, and capacitances of 130 pF or lower. The module requires +24V DC prime power, as well as a DC input voltage equal to the desired output amplitude (up to +100V). The module is triggered by an externally-generated TTL pulse applied to an SMA input connector. The input impedance is 50 Ohms. The output pulse width is approximately equal to the input pulse width.

This instrument is intended for use in research and development laboratories.

## ORIGINAL QUOTATION / SPECIFICATIONS

Date: Thu, 02 Sep 2004 15:23:32 -0400  
 From: Avtech Sales  
 To: Greger Eriksson  
 Subject: Re: Pulse module for fast gating?

To: Greger Eriksson  
 Gammadata Scienta  
 Uppsala, Sweden  
 greger.eriksson@gammadata.se

Greger,

In response to your questions:

- 1) We can provide operation at 50 ns. I will re-quote below.
- 2) A 100V unit will have roughly the same rise and fall times at 10V, 50V, and 100V, especially since we have quoted on a unit with 50 Ohm output impedance, and the load is 130 pF. The transition times will be dominated by the RC time constant of 50 Ohms x 130 pF = 6.5 ns. We have specified a 50 Ohm output impedance because this provides transmission line back-matching, to minimize ringing.
- 3) A 50V unit would not be faster, again because of the RC time constant.
- 4) We could provide an internal bias tee circuit capable of handling an externally-generated 200V DC offset.
- 5) I will quote below for a unit with an internal high-voltage supply.

I have quoted below on a model AV-1011-GSB which has reduced minimum pulse width, and a model AV-1011-GSC which has reduced minimum pulse width and an internal HV power supply, and lastly an option for adding up to 200V offset:

Quote number: 12245.01

Model number: AV-1011-GSB

Description: Pulse Generator Module

Amplitude: +5V to +100V. The amplitude is controlled by an externally-generated voltage (in the range of +5V to +100V). This voltage must be supplied to the module, through a solder terminal.

Load capacitance: < 130 pF

Load resistance: > 10 kilohms

Output impedance: 50 Ohms (installed internally, in series with the output)

Pulse width: 50 ns - 1 us. The output pulse width is equal to the input trigger pulse width.

Rise and fall times: < 8 ns (20%-80%)

Maximum repetition rate: 1 kHz

Output connector: SMA female

External trigger: TTL (low = 0V, high = +3V to +5V), 100 ns to 1 us in width. The trigger input connector is SMA female, with 50 Ohm input impedance.

Power requirement: 1) +24V, 500 mA  
 2) +5V to +100V (amplitude control)

Dimensions (HxWxD): 43 mm x 66 mm x 107 mm (1.7" x 2.6" x 4.2")

Chassis material: cast aluminum with blue enamel

Price: \$2998 US each, Ex-works, Ottawa, Canada. Before discount.

Estimated delivery: 60 days after receipt of order.

Quote number: 12245.02

Model number: AV-1011-GSC

Description: Pulse Generator Module with Internal High-Voltage Power Supply

Amplitude: +5V to +100V. The amplitude is controlled proportionally by an externally-generated voltage in the range of 0 to +10V applied to a solder terminal. The input impedance of the control voltage input is greater than 10 kilohms.

Load capacitance: < 130 pF

Load resistance: > 10 kilohms

Output impedance: 50 Ohms (installed internally, in series with the output)

Pulse width: 50 ns - 1 us. The output pulse width is equal to the input trigger pulse width.

Rise and fall times: < 8 ns (20%-80%)

Maximum repetition rate: 1 kHz

Output connector: SMA female

External trigger: TTL (low = 0V, high = +3V to +5V), 100 ns to 1 us in width. The trigger input connector is SMA female, with 50 Ohm input impedance.

Power requirement: +24V, 500 mA

Dimensions (HxWxD): 9.32" X 4.22" X 1.72", approximately

Chassis material: cast aluminum with blue enamel

Price: \$4298 US each, Ex-works, Ottawa, Canada. Before discount.

Estimated delivery: 60 days after receipt of order.

Quote number: 12245.03

Model number: -OS option for either of the above models

Description: Internal Bias Tee Option. An externally-generated DC offset voltage in the range of 0 to +/- 200V may be applied to a solder terminal. This DC offset will be added to the output pulse.

Additional cost: \$698 US each, Ex-works, Ottawa, Canada. Before discount.

I think that the resistive-divider voltage monitor would best be implemented at your end.

Regards,  
Dr. Michael J. Chudobiak  
Chief Engineer

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

PO Box 265	ph: 1-800-265-6681 or 613-226-5772	Box 5120,
Ogdensburg,	fax: 1-800-561-1970 or 613-226-2802	LCD Merivale
New York	email: info@avtechpulse.com	Ottawa, Ontario
USA 13669-0265	http://www.avtechpulse.com/	Canada K2C 3H4

Nanosecond Waveform Generators  
for general purpose, R&D and OEM applications

Pulse Generators - Laser Diode Drivers - Pulse Amplifiers  
Impulse Generators - Current Pulsers - Delay Generators - Splitters  
Function Generators - Monocycle Generators - Frequency Dividers + more!

## 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:

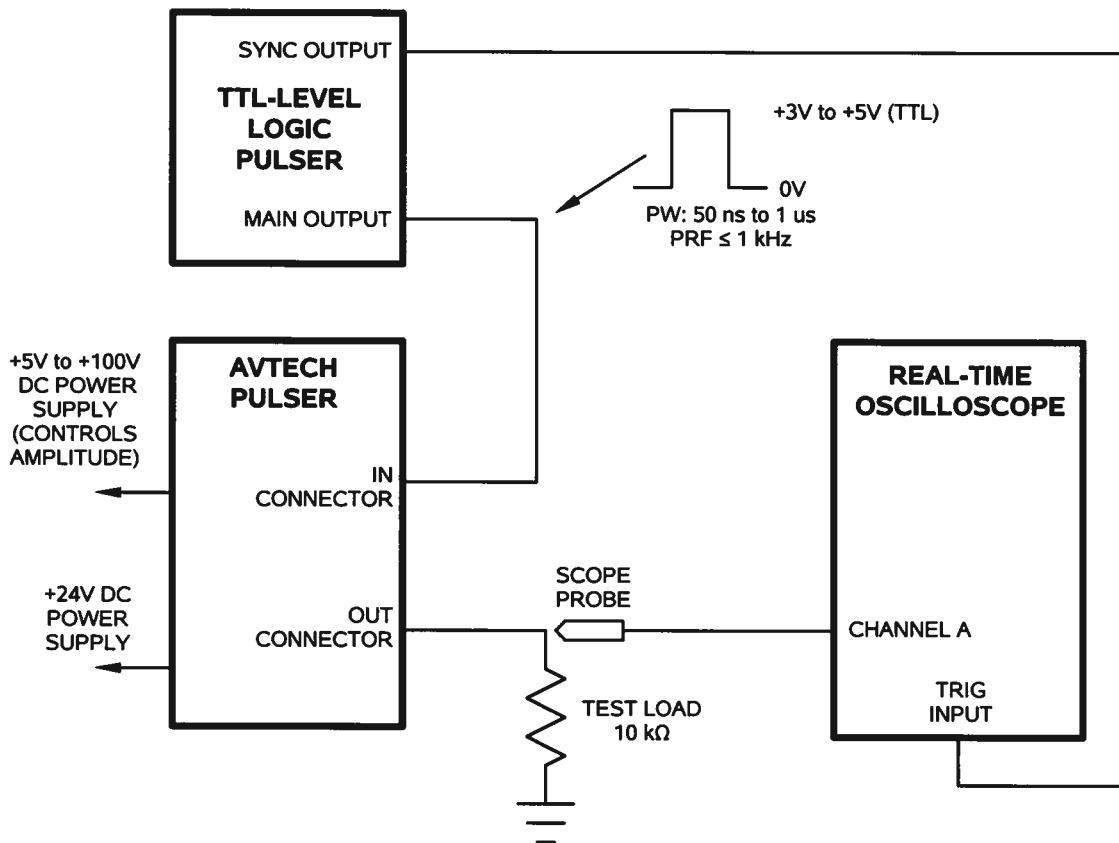
EN 61010-1:2001 Safety requirements for electrical equipment for measurement, control, and laboratory use



### 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.

## BASIC TEST ARRANGEMENT



### GENERAL OPERATING NOTES

- 1) The output impedance of the pulser (i.e., the internal resistance in series with the output) is 50 Ohms. This provides transmission line back-matching, which will act to suppress transmission line reflections. However, this resistance will act to degrade the output rise and fall times when a capacitive load is used. For non-capacitive loads, the 20%-80% rise and fall times are typically 5 - 6 ns. For the maximum rated capacitive load, the rise and fall times are typically 10 ns.
- 2) Coaxial cabling adds approximately 30 pF / foot (1 pF / cm) of capacitance.
- 3) The output amplitude is controlled by an externally-generated DC voltage in the range of +5V to +100V.
- 4) The output pulse width is approximately equal to the input pulse width of the trigger signal.
- 5) For additional assistance, contact:



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Fax: 613-226-2802  
Email: [info@avtechpulse.com](mailto:info@avtechpulse.com)

Dec 8/04