



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
<http://www.avtechpulse.com>

□ P.O. BOX 5120 STN. F
OTTAWA, ONTARIO
CANADA K2C 3H4
TEL: (613) 226-5772
FAX: (613) 226-2802

INSTRUCTIONS

MODEL AVR-G1-C-EMRA PULSE GENERATOR

S.N.:

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

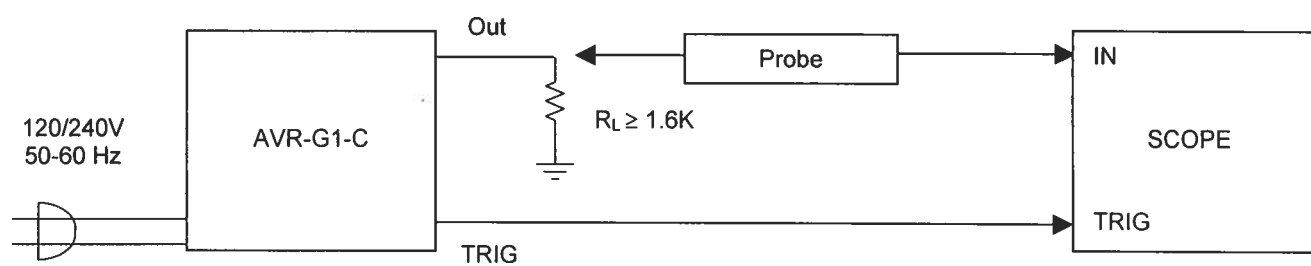
E-mail: info@avtechpulse.com

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

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FIG. 1: PULSE GENERATOR TEST ARRANGEMENT



GENERAL OPERATING INSTRUCTIONS

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 100 MHz.
- 2) This unit was specifically designed to drive high impedance loads ($R_L \geq 1.6K$). The unit may fail if operated into low impedance loads (eg. 50 Ohms).
- 3) The TRIG output channel provides TTL level signals. The TRIG output precedes the main output when the front panel ADVANCE-DELAY switch is in the ADVANCE position. The TRIG output lags the main output when the switch is in the DELAY position.
- 4) To obtain a stable output display the PW and PRF controls on the front panel should be set mid-range. The front panel mode switch should be in the INT position. The DELAY controls and the scope triggering controls are then adjusted to obtain a stable output. The scope may then be used to set the desired PRF by rotating the PRF control.
- 5) The output pulse amplitude is controlled by means of the front panel one-turn AMP control.
- 6) The rear panel M BNC connector provides DC output voltage (to $R_L \geq 1$ Meg) which is proportional to the peak load current (33 mV/mA). For a peak load current of 150 mA, the output will be +5.0 Volts.
- 7) An external clock may be used to control the output PRF of the AVR unit by setting the front panel TRIG MODE switch in the EXT position and applying a 50 ns (or wider) TTL level pulse to the TRIG BNC connector input. For operation in this mode, the scope time base must also be triggered by the external clock. When triggered externally, the output pulse width will equal the input trigger pulse width if the MODE switch is in the EXT B position. When the switch is in the EXT A position, the output pulse width is controlled by the front panel controls.
- 8) The source impedance of the pulser may be varied between about 5 Ohms and 50 Ohms by varying the value of the 2 Watt resistor on the carrier PCB on the output of the -PG module. The unit was shipped with a 50-Ohm resistor in place. The higher the value of the resistor, the longer the rise-fall time. The resistor may be accessed by removing the four Philips screws on the top panel. The top cover may then be slid back and off.

9) AVR units with a serial number higher than 5600 are protected by an automatic overload protective circuit which controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a short circuit), the protective circuit will turn the output of the instrument OFF and turn the indicator light ON. The light will stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds. If the overload condition has been removed, the instrument will turn on and resume normal operation. Overload conditions may be removed by:

- 1) Reducing PRF (i.e. switch to a lower range)
- 2) Reducing pulse width (i.e. switch to a lower range)
- 3) Removing output load short circuit (if any)

10) For further assistance:

Tel: 613-226-5772

Fax: 613-226-2802

Email: info@avtechpulse.com

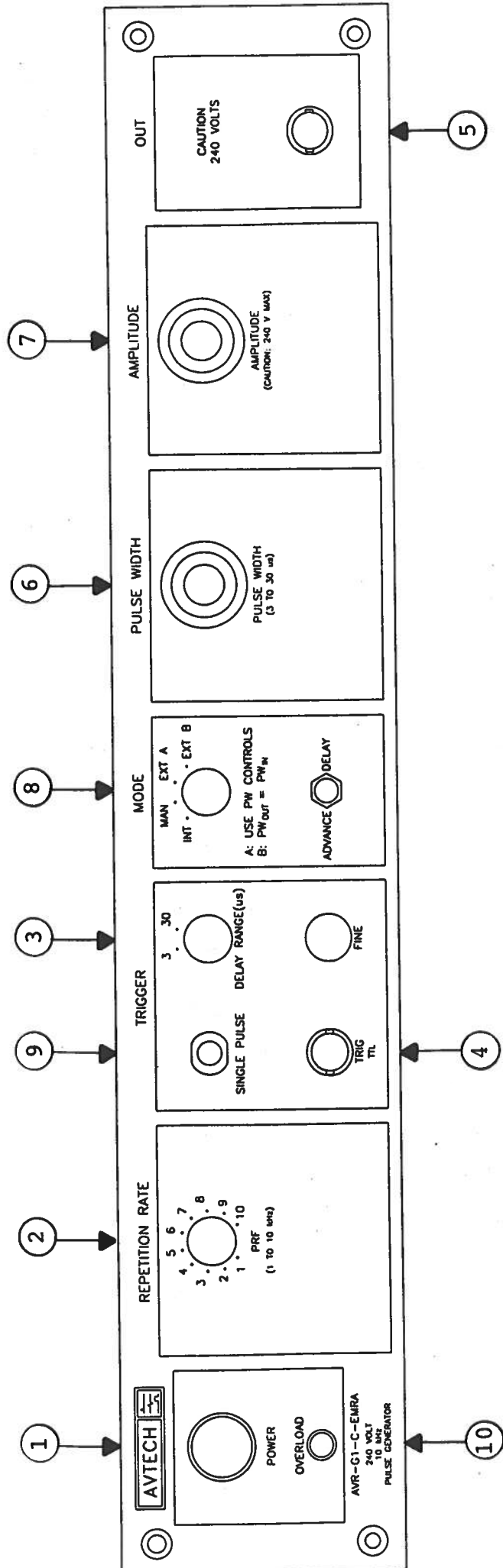


FIG. 2: FRONT PANEL CONTROLS

FRONT PANEL CONTROLS

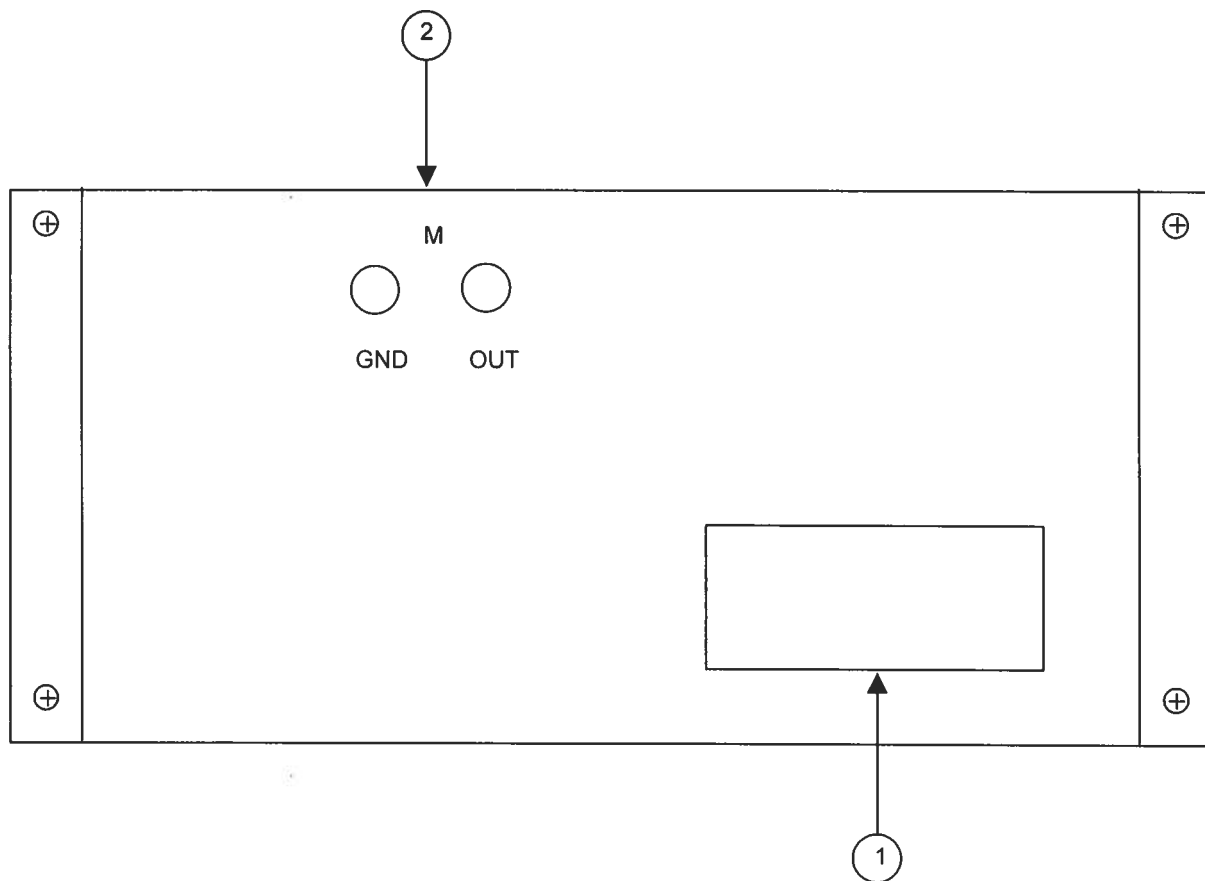
- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PRF Control. Varies PRF from 1 kHz to 10 kHz.
- (3) DELAY Control. Controls the relative delay between the reference output pulse provided at the TRIG output (4) and the main output (5). This delay is variable over the range of 3 to about 30 μ s. Delay LEADS or LAGS depending on the position of the ADVANCE-DELAY switch.
- (4) TRIG Output. This output is used to trigger the scope time base. The output is a TTL level 100 ns (approx.) pulse capable of driving a fifty-Ohm load. This output precedes the output at (5) if the two-position ADVANCE-DELAY switch is in the ADVANCE position. This output follows the output at (5) if the switch is in the DELAY position. The delay range is variable from 3 μ s to 30 μ s. The external trigger signal is applied at this input when the EXT-INT toggle switch is in the EXT position.
- (5) OUT Connector. BNC connector provides output to a high impedance load ($\geq 1.6K$).
- (6) PW Control. This ten-turn control varies the output pulse width from 3 to 30 μ s.
- (7) AMP Control. A ten-turn control, which varies the output pulse amplitude from 0 to 240V (To $R_L \geq 1.6K$).
- (8) MODE Control. With this switch in the INT position, the PRF of the AVR unit is controlled via an internal clock, which in turn is controlled by the PRF control. With the toggle switch in the EXT position, the AVR unit requires a 50 ns (or wider) TTL level pulse applied at the TRIG input in order to trigger the output stages. In addition, in this mode, the scope time base must be triggered by the external trigger source. With the MODE switch in the EXT A position the output pulse width is controlled by the PW controls. With the MODE switch in the EXT B position, the output pulse width equals the input trigger pulse width. For single pulse operation, set the INT-EXT-MAN switch in the MAN position.
- (9) SINGLE PULSE. For single pulse manual operation, set the front panel INT-EXT-MAN switch in the MAN position and push the SINGLE PULSE button.
- (10) OVERLOAD INDICATOR. AVR units with a serial number higher than 5600 are protected by an automatic overload protective circuit, which controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a short circuit), the protective circuit will turn the output of the instrument OFF and turn the indicator light ON. The light will

stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds.

If the overload condition has been removed, the instrument will turn on and resume normal operation. Overload conditions may be removed by:

- 1) Reducing PRF (i.e. switch to a lower range)
- 2) Reducing pulse width (i.e. switch to a lower range)
- 3) Removing output load short circuit (if any)

FIG. 3: BACK PANEL CONTROLS



BACK PANEL CONTROLS

- (1) FUSED CONNECTOR, VOLTAGE SELECTOR. The detachable power cord is connected at this point. In addition, the removable cord is adjusted to select the desired input operating voltage. The unit also contains the main power fuse.

For AC line voltages of 110-120V, the power selector card should be installed so that the "120" marking is visible from the rear of the instrument.

For AC line voltages of 220-240V, the power selector card should be installed so that the "240" marking is visible from the rear of the instrument.

If it is not set for the proper voltage, remove the fuse and then grasp the card with a pair of pliers and remove it. Rotate horizontally through 180 degrees. Reinstall the card and the correct fuse.

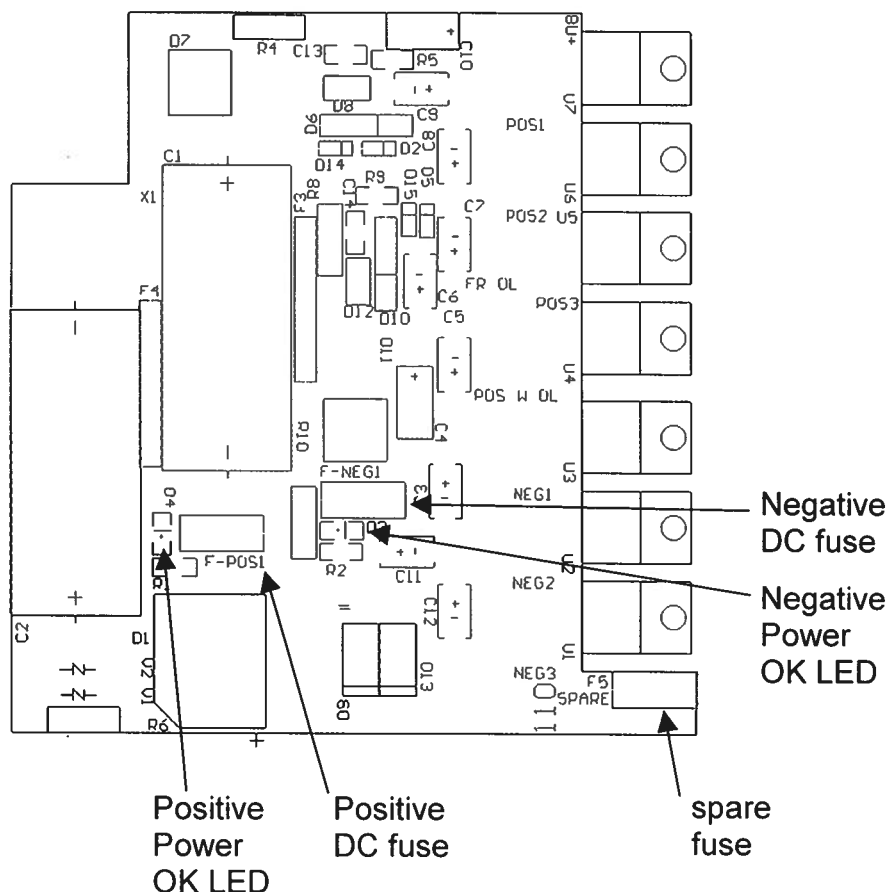
In the 120V setting, a 0.5A slow blow fuse is required. In the 240V setting, a 0.25A slow blow fuse is required.

- (2) MONITOR OUT. This female banana connector provides a DC output voltage (to $R_L \geq 1.0 \text{ MEG}$) which is proportional to the peak load current (33 mV/mA). For a peak load current of 150 mA, the output will be +5 Volts.

POWER SUPPLY AND FUSE REPLACEMENT

This instrument has three fuses (plus one spare). One, which protects the AC input, is located in the rear-panel power entry module, as described in the "Rear Panel Controls" section of this manual. If the power appears to have failed, check the AC fuse first.

The other two fuses (plus one spare) are located on the internal DC power supply, as shown below:



The positive fuse and the spare fuse on this circuit board are 2A slow-blow fuses, Littlefuse part number R452002. (This fuse can be ordered from Digikey, www.digikey.com. The Digikey part number is F1345CT-ND). The negative fuse is a 0.5A slow-blow fuse (Littlefuse R452.500, Digikey part number F1341CT-ND).

If you suspect that the DC fuses are blown, follow this procedure:

1. Remove the top cover, by removing the four Phillips screws on the top cover and then sliding the cover back and off.

2. Locate the two "Power OK" LEDs on the power supply circuit board, as illustrated above.
3. Turn on the instrument.
4. Observe the "Power OK" LEDs. If the fuses are not blown, the two LEDs will be lit (bright red). If one of the LEDs is not lit, the fuse next to it has blown.
5. Turn off the instrument.
6. If a fuse is blown, use needle-nose pliers to remove the blown fuse from its surface-mount holder.
7. Replace the fuse.



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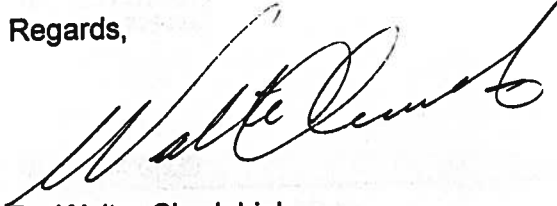
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File:	R:\QUOTES\Q9829.doc	Receiver's Fax:	609-799-5788
To:	Schlumberger	Receiver's Phone:	609-897-8153
Attn:	Greg Lavanda	Date:	April 12, 2000
Subject:	AVR-G1- C-P-EMRA	Number of pages:	4, including cover

- 1) Following your telephone request of April 12, 2000, I am pleased to provide a price and delivery quotation for a special purpose pulse generator meeting the following specifications:

Quote Number:	9829
Model designation:	AVR-G1-P-C-EMRA
Output Amplitude:	0 to +240 Volts (to $R_L \geq 1.6$ k, 150 mA max., $C_L \leq 900$ pfd). Ten-turn control
Pulse Width:	3 to 30 μ s. Ten-turn locking dial control. Unit will be used primarily at 20 μ s pulse width.
PRF:	1 kHz to 10 kHz. One-turn control.
Other:	See standard AVR-G1-C, pages 48 & 49, Cat. No. 10.
Current Monitor:	This option provides a 0 to +5 VDC output at a rear panel female banana connector. The output amplitude is proportional to the peak load current (+5 Volts out for 150 mA peak current).
Price - Qty of 1:	\$5,398.00 US, FOB destination.
Price - Qty of 2:	\$4,998.00 US, each, FOB destination
Delivery:	60 days, after receipt of order.

2) Thank you for your interest in our products. Please call or email me if you require any further information. For more complete information on our complete product line, please see www.avtechpulse.com.

Regards,



Dr. Walter Chudobiak
Chief Engineer

WC:mf