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INSTRUCTIONS

MODEL AVX-DD-A1-PS-UVE

**DIGITAL SCANNING
DELAY GENERATOR**

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

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INTRODUCTION

The AVX-DD-A1-PS-UVE is a special-purpose digital scanning delay generator. When triggered, an output is generated with a delay of

$$t_{\text{delay}} = t_{\text{ins}} + N \times t_{\text{step}}$$

where

$$t_{\text{ins}} \approx 80 \text{ ns (insertion delay, fixed)}$$

$$t_{\text{step}} = 27.55, 55.5, 111, \text{ or } 222 \text{ ns (user-selectable)}$$

N can vary between 0 and 100, and can vary with each trigger event.

N can be set to start at 0 and increase by 1 with each trigger event, up to a maximum value (set by the front-panel thumbwheel switches). When N reaches its maximum value, it can be set to either hold that value, or reset to zero.

Alternatively, N can be set to start at 100 and decrease by 1 with each trigger event, down to a minimum value (set by the front-panel thumbwheel switches). When N reaches its minimum value, it can be set to either hold that value, or reset to 100.

The instrument is triggered by TTL-level pulses. Two outputs are supplied, both of which generate TTL levels, and which can operate into loads as low as 50Ω . The first output is a buffered replica of the input. The second output is the delayed signal. The delayed output pulse width is fixed at 200 ns.

SPECIFICATIONS

Model designation:	AVX-DD-A1-PS-UVE
Delay control:	Thumbwheel
Step size:	27.7 ns, 55.5 ns, 111 ns or 222 ns. Selectable via a four-position switch.
Number of steps:	Adjustable from 0 to 100.
Up/Down switch:	Delay can increase or decrease, one step at a time.
Stepping sequence:	Delay increases or decreases (one step per input trigger) from the Reset Delay, depending on the settings of the "Up/Down" switch.
Reset delay:	$100 \times \text{Step Size}$ in "Down" mode, $0 \times \text{Step Size}$ in "Up Mode"
Lock switch:	The Lock switch can be set to "Reset" or "Freeze". In the "Reset" mode, the delay reverts to Reset Delay after specified number of input trigger pulses is received and then continues stepping action. In the "Freeze" mode, the delay is frozen at the last value after the specified number of pulses is received, rather than resetting.
Start/Stop switch:	When this switch is set to the "Start" position, the scanning sequence starts (from the Reset Delay), and the output is active. The output is disabled when the switch is in the "Stop" position.
Insertion delay:	≤ 100 ns
Input trigger:	TTL, PW > 50 ns
Max PRF:	2 kHz
Delayed output pulse:	TTL, 200 ns, will drive 50 Ohms
Sync output:	Buffered replica of input trigger, TTL, will drive 50 Ohms.
Connectors:	BNC

INSTALLATION

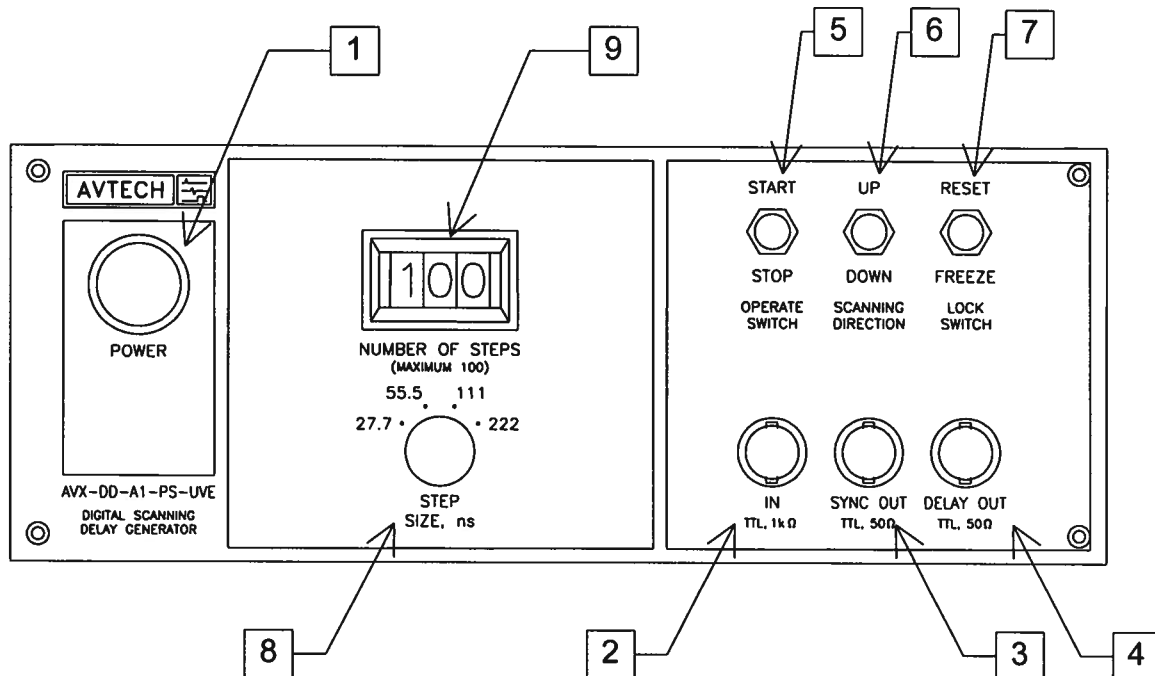
VISUAL CHECK

After unpacking the instrument, examine to ensure that it has not been damaged in shipment. Visually inspect all connectors, knobs, and the handles. Confirm that a power cord and this manual are with the instrument. If the instrument has been damaged, file a claim immediately with the company that transported the instrument.

PLUGGING IN THE INSTRUMENT

Examine the rear of the instrument. There will be a male power receptacle, a fuse holder and the edge of the power selector card visible. Confirm that the power selector is in the correct orientation - it should be marked either 120 or 240, indicating whether it expects 120V AC or 240V AC. 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 1/4A slow blow fuse is required. In the 240V setting, a 1/8A slow blow fuse is required.

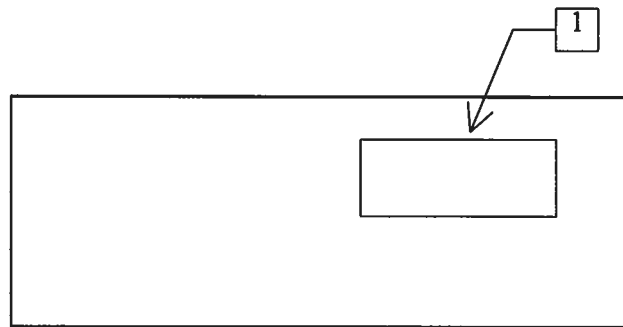
FRONT PANEL CONTROLS



1. **POWER Switch.** The POWER push button switch applies AC prime power to the primaries of the transformer, turning the instrument on. The push button lamp (#382 type) is connected to the internal +15V DC supply.
2. **IN Connector.** The TTL-level (i.e., 0 and 3-5V) input trigger is applied to this connector. The input impedance is 1 k Ω .
3. **SYNC OUT Connector.** This TTL-level output is a buffered replica of the signal on the IN connector. This output will drive loads as low as 50 Ω .
4. **DELAY OUT Connector.** This TTL-level output is delayed relative to the signal on the IN connector. The delay time is determined by controls 5-9. (No output is generated if the Operate Switch is in the "Stop" position.) This output has a fixed pulse width of 200 ns, and will drive loads as low as 50 Ω .
5. **OPERATE Switch.** When this switch is set to the "Start" position, the scanning sequence starts from the Reset Delay (N=0 in the "Up" mode, N=100 in the "Down" mode), and the delayed output is active. The delayed output is disabled when the switch is in the "Stop" position.

6. SCANNING DIRECTION Switch. The scan count "N" (where $t_{\text{delay}} = t_{\text{ins}} + N \times t_{\text{step}}$) can be set to increase with each trigger when this switch is in the "Up" position, or decrease when it is in the "Down" position.
7. LOCK Switch. The Lock switch can be set to "Reset" or "Freeze". In the "Reset" mode, the delay reverts to Reset Delay after specified number of input trigger pulses is received and then continues stepping action. In the "Freeze" mode, the delay is frozen at the last value after the specified number of pulses is received, rather than resetting.
8. STEP SIZE Switch. With this switch, t_{step} (where $t_{\text{delay}} = t_{\text{ins}} + N \times t_{\text{step}}$) can be set to 27.7 ns, 55.5 ns, 111 ns, or 222 ns.
9. NUMBER OF STEPS Thumbwheel Switch. This switch controls the range of value over which N can vary. When the Scanning Direction switch is in the "Up" position, N varies from 0 to the value programmed by this switch, K. When in the "Down" position, N varies from 100 to 100-K.

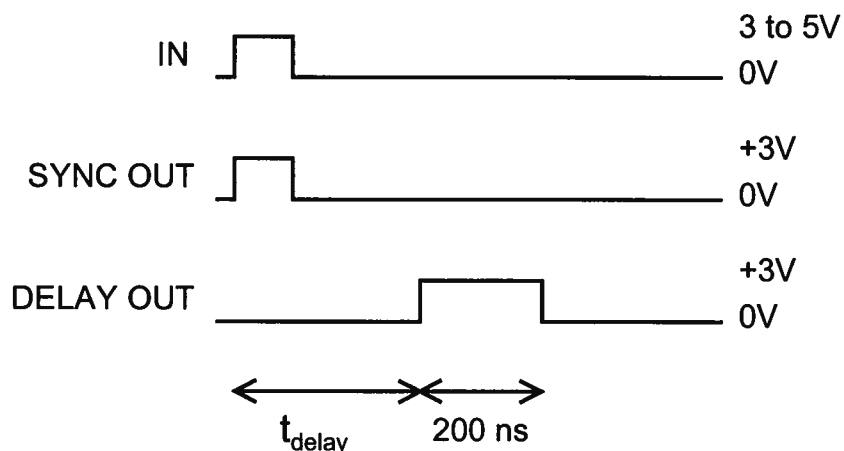
REAR PANEL CONTROLS



1. AC POWER INPUT. A three-pronged recessed male connector is provided on the back panel for AC power connection to the instrument. Also contained in this assembly is a slow blow fuse (1/4A for 120V operation, 1/8A for 240V operation) and a removable card that can be repositioned to switch between 120V AC in and 240V AC in.

GENERAL INFORMATION

BASIC OPERATION



The AVX-DD-A1-PS-UVE is a special-purpose digital scanning delay generator. When triggered, an output is generated with a delay of

$$t_{\text{delay}} = t_{\text{ins}} + N \times t_{\text{step}}$$

where

$$t_{\text{ins}} \approx 80 \text{ ns (insertion delay, fixed)}$$

$$t_{\text{step}} = 27.55, 55.5, 111, \text{ or } 222 \text{ ns (user-selectable)}$$

N can vary between 0 and 100, and can vary with each trigger event.

When the Scanning Direction switch is set to "Up", and the thumbwheel switch is set to a value of K (an integer between 0 and 100), N will increase by 1 with each trigger, from 0 to K . When N reaches K , it can be set to either hold that value, or reset to zero, depending on the position of the Lock switch.

When the Scanning Direction switch is set to "Down", and the thumbwheel switch is set to a value of K (an integer between 0 and 100), N will decrease by 1 with each trigger, from 100 to $100-K$. When N reaches $100-K$, it can be set to either hold that value, or reset to 100, depending on the position of the Lock switch.

INITIALIZATION

After power-up, the instrument resets itself to the proper state.

The instrument may be manually reset by setting the Operate switch to "Stop".

It is recommended that the Operate switch be set to "Stop" when changing the thumbwheel switch, or any of the other parameters.

CALIBRATION

If required, the basic step size (nominally 27.75 ns) can be adjusted within a range (a few percent) by accessing an internal trimpot. To access the trimpot, remove the top cover (see below), and locate the large "L"-shaped circuit board. The small blue trimpot is located where the two arms of the L-shape intersect. Rotate the protruding brass screw to adjust the step size.

TOP COVER REMOVAL

The interior of the instrument may be accessed by removing the four Phillips screws on the top panel. With the four screws removed, the top cover may be slid back (and off).

ELECTROMAGNETIC INTERFERENCE

To prevent electromagnetic interference with other equipment, all used outputs should be connected to shielded 50 Ω loads using shielded 50 Ω coaxial cables. Unused outputs should be terminated with shielded 50 Ω BNC terminators or with shielded BNC dust caps, to prevent unintentional electromagnetic radiation. All cords and cables should be less than 3m in length.

PERFORMANCE CHECKSHEET