



**BAK ELECTRONICS, INC. *Biomedical Instrumentation***

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## ***Dual Time and Amplitude Window Discriminator***

### **Model DDIS- 1**



TWO TIME AND AMPLITUDE WINDOWS  
BUILT-IN X1 AND X2 ANALOG DELAYS FOR VIEWING  
ENTIRE WAVEFORM AFTER TRIGGER AND  
ACCEPTANCE OCCUR  
WINDOWS AND ANALOG SIGNAL MULTIPLEXED  
FOR SINGLE CHANNEL VIEWING

### ***Description:***

The Model DDIS- 1 is an instrument for the separation of either a single neural spike trains from a multiunit recording containing more than one neural element utilizing two point discrimination or two different class spike trains from a single multiunit recording. The Model DDIS-1 produces two windows in time as well as amplitude. The windows can be adjusted in height, above or below baseline and anywhere in time up to 5 msec after a trigger point for window A and up to 5 msec from window A for window B.

The trigger point is set by a continuously adjustable level control for either positive or negative slope detection. The signal and all window levels are multiplexed so that only one channel of the oscilloscope is necessary. Multiplexing eliminates adjusting the oscilloscope levels for drift; also, no z axis intensification is required. The DDIS-1 has an analog delay circuit with X1 and X2 delay capability built into it making this unit the complete spike recognition system.

The initial trigger threshold may be set while viewing the raw data inputted to the unit. The signal is then passed through the X1 analog delay before going to the multiplexed output circuitry so that one can view the entire waveform when setting up the discrimination parameters. An additional X2 delay is provided at the "DELAY OUT" output so that an acceptance pulse can trigger an additional oscilloscope which will still view the entire waveform giving visual confirmation of the discriminated spike.

A "SELECT AC" switch is provided to multiplex any of the acceptance pulse outputs as a low amplitude negative spike on the trigger output line with the positive TTL trigger pulse for quickly triggering the CRT from either the trigger pulse or acceptance pulse by adjusting the scope trigger level. Acceptance pulse is not changed. The Model DDIS-1 is of modular construction and slides easily into the Model RP-1 rack mount power supply module cage system.

## ***Specifications:***

|                          |   |
|--------------------------|---|
| Input Resistance         | 10 kilohms  |
| Input Coupling           | AC  |
| Input Dynamic Range      | 6 Volts peak to peak  |
| Delay and Multiplexed    | Output Resistance 100 ohms  |
| All Other Outputs        | TTL compatible  |
| Signal Polarity          | Same as input   |
| Gain                     | Unity   |
| Bandwidth                | 20 Hz to 20 kHz (3 db down)   |
| Window Widths            | Short 20 microseconds, Long 70 microseconds   |
| Window Delay             | 0.05 msec to 5 msec for window A, 0~5 msec from window A for window B (continuously adjustable) |
| Window Height            | Continuously adjustable   |
| Trigger Threshold Level  | Internal plus or minus along signal waveform or an external TTL pulse                           |
| Output Trigger Pulse     | TTL UL - 10 microsecond width with low level negative spike at selectable acceptance time       |
| Output Acceptance Pulses | TTL comparable .2 millisecond width (internally adjustable)                                     |
| Power Requirements       | 15 volt + 15 volt supplied by Model RP-1 Power Supply   |
| Size                     | 5.6"Wx5.25"H x 7.25"D   |
| Weight                   | 11/2 lbs.   |

## ***Warranty:***

Parts and labor or replacement in full for 1 year from date of delivery for defects in materials or workmanship.

## ***Other BAK equipment frequently used with DDIS-1:***

|       |                               |
|-------|-------------------------------|
| ISI-1 | Interspike Interval Converter |
| DD-I  | Digital Delay                 |
| RG-1  | Raster Stepper                |
| DTC-1 | Digital Time Counter          |

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