ORTEC®

AMETEK®

995
Dual Counter

- **Two 8-decade counters with the configuration flexibility to serve a variety of measurement needs**
- **RS-232-C option provides CCNIM™ capability with full computer control and readout**
- **Can directly drive printers having RS-232-C ports**
- **An 8-decade LED display provides instantaneous readout of the entire counter capacity, even in dimly lighted rooms**
- **All commonly used controls are easily accessible on the front panel**
- **100-MHz counting rate capability**
- **All options are field-installable**



The ORTEC Model 995 Dual Counter incorporates two 8-decade counters and an 8-decade LED display that offers instantaneous visual readout of the full contents of Counter A or B, even in a dimly lighted room. By adding field-installable options, considerably enhanced readout and control capabilities can be incorporated.

The full power of CCNIM™ (Computer-Controlled NIM) can be obtained by adding the RS-232-C option. This plug-in board yields computer control of all functions normally selectable from the front panel, including start and stop count, readout, reset, and selecting the displayed counter. To eliminate accidental operator interference, the computer can disable all front-panel controls in the Remote mode. Computer readout with the CCNIM option includes A and B counts, and which counter is being displayed. The CCNIM option can directly drive printers having RS-232-C ports.

The inputs to Counters A and B are individually selectable as either positive or negative sensing inputs by changing the Input Polarity Jumpers on the counter printed wiring board (PWB). The negative input mode is designed to accept NIM-standard, fast-negative logic pulses with a fixed threshold of –250 mV on a 50-Ω input impedance. The negative inputs can handle counting rates up to 100 MHz.

The positive input mode can accept counting rates up to 25 MHz on a 1000-Ω input impedance. To enhance the flexibility of the positive input mode, precision discriminators are included on both counters. The discriminator thresholds are variable over the range from +100 mV to +9.5 V using front-panel, 25-turn trimpots. The thresholds can be adjusted to suit the amplitude of a specific source of logic pulses or used as precision integral discriminators on analog pulses. For the latter application, the TTL logic outputs of the discriminators are provided as test points on the front panel. These outputs can be used to trigger an oscilloscope while viewing the analog signal at the counter input on the oscilloscope. The oscilloscope trace will show the signals that are being counted by the Model 995, thus permitting a very selective adjustment of the threshold.

All the commonly used functions are conveniently accessible on the front panel. Manual control of the Count, Stop, and Reset functions is via three push buttons. The Gate LED is illuminated when the Model 995 is enabled to count. The Display push button switches the display to show the contents of Counter A, or the contents of Counter B. The display contains LED flags to indicate whether overflows have occurred in Counter A or B, and to advise when the front-panel controls are disabled by the computer in the Remote mode.

The counting function of the entire module can be disabled by holding the Enable input below +1.5 V using an external signal source. This condition also turns Off the Gate LED. Open circuit or >+3 V at the Enable input allows the instrument to count, if the Count mode has been activated. The Interval output of another ORTEC timer can perform this function to synchronize the Model 995 counting with the other timer. The Interval outputs on all ORTEC timers provide nominally +5 V when counting and <+0.5 V when counting is inhibited.

Independent gating of the A and B Counter inputs can be achieved with the Gate A and Gate B inputs on the rear panel. The interface connector for the RS-232-C option is located on the rear panel. Each counter has a rear-panel output dedicated to signaling overflows. Counting these overflows on another counter extends the counting capacity of the Model 995.

The Model 995 derives its power from the ±12 V and +6 V supplies in a standard NIM bin with power supply. For bins that do not contain a +6 V supply, an Internal +6 V Supply option is available. This option is field-installable and derives its power from the 117 V AC lines in the bin.

Specifications

PERFORMANCE

COUNT CAPACITY 8 decades for counts ranging from 0 to 99,999,999 in each of 2 counters.

MAXIMUM COUNTING RATE 100 MHz for negative inputs, 25 MHz for positive inputs.

POSITIVE INPUT DISCRIMINATOR Threshold variable from +100 mV to +9.5 V with a 25-turn trimpot.

PULSE PAIR RESOLUTION <10 ns for negative inputs; <40 ns for positive inputs.

INDICATORS

COUNTER DISPLAY 8-digit, 7-segment LED display with leading zero suppression.

OVERFLOW INDICATORS LED indicators labeled OVFL A and OVFL B illuminate when the corresponding A or B Counter exceeds its capacity of 8 decades. The indicator remains On until a reset is generated.

DISPLAY Two LEDs labeled A and B indicate the information being displayed in the counter display. Counter A or Counter B value may be displayed by repeatedly pressing the Display push-button until the desired LED is illuminated.

995
Dual Counter

GATE A single LED indicates that the entire instrument is enabled to count. For the Gate LED to be illuminated, the module must be placed in the Count mode (either manually or via the interface option), and the Enable input must be above +3 V.

REMOTE A single LED labeled REM indicates that the Model 995 is under computer control, and all front-panel controls are disabled. This mode is set by the ENABLE_ REMOTE command.

CONTROLS

DISPLAY Push-button selects the contents of Counter A or B for presentation in the 8-decade display. Repeatedly pushing the button cycles the selection through the two choices as indicated by the A and B LEDs.

STOP This push-button stops all sections of the instrument from counting.

RESET Depressing this button resets both counters to zero counts and turns Off both overflow indicators. When power is turned On to the module, a reset is automatically generated.

COUNT Pushing this button enables the counting condition for the entire instrument providing the Enable input is not held below +1.5 V.

THRESH ADJUST (A and B) Front-panel mounted, 25-turn trimpots to adjust the positive input thresholds for Counters A and B. The range is from +100 mV to +9.5 V. Adjacent test points provide the TTL logic signal outputs from the discriminators to facilitate adjustment using an oscilloscope.

INPUT POLARITY JUMPERS Two jumpers located on the printed wiring board (PWB) separately select the desired input polarities for inputs In A and In B. P = positive, N = negative.

INPUTS

IN A

Positive Input Front-panel BNC connector for Counter A accepts positive unipolar signals; minimum width above threshold, 20 ns at a 50% duty cycle. The threshold is adjustable from +100 mV to +9.5 V via a front-panel, 25-turn trimpot. Z_{in} = 1000 Ω to ground; dc-coupled.

Negative Input Changing the Input Polarity Jumper position on the counter board permits selection of the NIM-standard fast-negative logic input, which is designed to accept –600 to –1800 mV pulses with a fixed discriminator threshold of –250 mV. Z_{in} = 50 Ω; dc-coupled. Minimum pulse width above threshold is 4 ns.

IN B Identical to In A except that it feeds Counter B.

ENABLE Front-panel BNC input connector accepts NIM-standard, slow-positive logic pulses to control the counting condition of the entire module. A level of >+3 V or open circuit allows counting, provided the instrument is in the Count mode; <+1.5 V inhibits counting. The driving source must be capable of sinking 5 mA of positive current during inhibit; input protected to +25 V.

GATE A Rear-panel BNC input connector is identical to the Gate B input.

GATE B Rear-panel BNC connector accepts NIM-standard, slow-positive logic signals to control the counting in Counter B. A level >+3 V or open circuit allows counting; <+1.5 V inhibits counting; input protected to +25 V. The driving source must be capable of sinking 5 mA of positive current during inhibit.

OUTPUTS

OVFL A Rear-panel output BNC connector provides a NIM-standard, slow-positive logic signal each time Counter A overflows its 8-decade capacity. The signal has a nominal amplitude of +5 V; width ~20 µs.

OVFL B Rear-panel output identical to OVFLA except that it monitors overflows from Counter B.

INTERFACE

SERIAL When the RS-232-C option board is plugged in, it furnishes a rear-panel, 25-pin, male, D connector containing all signals for standard RS-232-C communications. It also contains connections for 20-mA current loop communications. The field-installable RS-232-C option provides computer control of the following functions: Count, Stop, Reset, Remote, and selecting the displayed counter. In the Remote mode, the computer can disable all front-panel controls. Computer readout includes: A and B counts and which counter is being displayed.

ELECTRICAL AND MECHANICAL

POWER REQUIRED The basic Model 995 derives its power from a NIM bin furnishing ±12 V and +6 V. For NIM bins that do not provide +6 V, an optional Internal +6 V Supply is available. This option is field-installable and draws its power from the 117 V AC lines in the bin. With the Internal +6 V Supply installed, the power requirements are shown in column 4 and not required in column 3.

	Power Required		Bin Supplied	Internal +6 Supply
	+12 V	–12 V	+6 V	117 V AC
Basic Model 995	20 mA	110 mA	700 mA	75 mA
Model 995 plus RS-232-C option	45 mA	135 mA	1300 mA	105 mA

WEIGHT
Net 2.4 kg (5.2 lb).
Shipping 3.7 kg (8.2 lb).

DIMENSIONS NIM-standard double-width module, 6.90 X 22.13 cm (2.70 X 8.714 in.) front panel per DOE/ER-0457T.

Ordering Information

Model	Description
995	Basic module without plug-in options.
99X-1	RS-232-C Interface option (cable not included).
99X-4	Internal +6 V Supply option.
C-75	Female-to-female RS-232-C null modem cable (3-meter length).
C-80	Male-to-female RS-232-C extension cable (3-meter length).

ORTEC®
AMETEK®
www.ortec-online.com
Tel. (865) 482-4411 ortec.info@ametek.com
801 South Illinois Avenue, Oak Ridge, TN 37830 U.S.A.
Visit Our Website For International Office Locations

Specifications subject to change
25-0522