

Application Note

PM 6680

Timer/Counter

Advanced Arming – Delay by Event Counts

A manufacturer of check processing equipment needed to test the performance of his envelope stuffing machines prior to shipment to customers. The check stuffing machines are specified at a certain rate (in checks per minute). The complexity arises in the fact that the machine does not reach full speed until after it has processed a specified number of checks. (Takes the machine awhile to get its rhythm.) Being in a production environment, the customer wanted a simple test that required little operator intervention.

Using Frequency Measurements

The frequency function of the PM 6680 will measure the rate of the envelopes being stuffed in Hertz, or the number of events per second. Using MATH to multiply the result by 60 will result in a display of the rate in terms of checks per minute.

Using this method will result in a correct measurement regardless of the gate time chosen. So, the customer could use a gate time shorter than one minute for the test. In addition, measurements made with different gate times would be directly comparable.

Using Arming Delay

Arming signals are used to tell the counter what part of the signal to measure. Normally, this requires that a second signal be provided by the user to indicate where the measurement is to begin. In this application, such a signal did not exist. That's where the PM 6680's advanced arming capabilities come in. The PM 6680's arming delay by counts mode allows it to use the input signal as the arming signal. By using arming delay of the desired number of counts, the measurement will not begin until the required number of checks has been processed.

Programming It

Use the DEFAULT key to reset the counter to its default settings. Connect the signal to be measured to input A. Proper input settings are required with these low-frequency signals:

- Press the COUPL button to set the counter for DC coupling.
- Press the SET A button and set the trigger level to a non-zero value (to prevent false triggering as a result of noise.)
- Press COM via A to send the input signal to the B input for arming.

Next, the counter must be set up to make a frequency measurement. Since that is its default function, nothing further is required. To assure that enough envelopes are measured for reliable results, a minimum measurement time of five seconds is recommended. Program as follows:

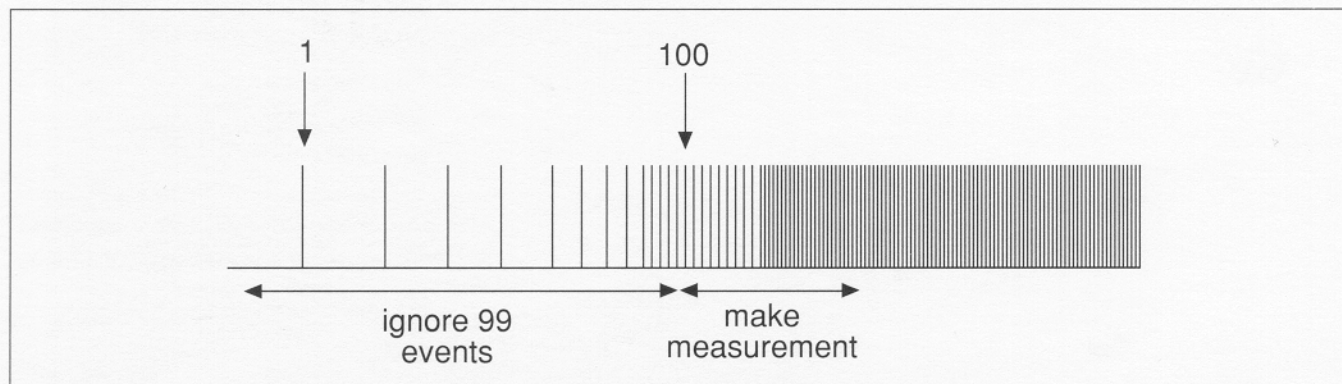


Figure 1. Start arming delay by events forces the counter to wait for a specified number of event occurrences before beginning the measurement.



PHILIPS

- Press the SET MEAS TIME button and enter a measuring time of 5.0.

To set up the MATH function to convert Hertz to envelopes per minute:

- Press the K=key under the heading PROCESS.
- Use the numeric keypad to enter the value 60. Press ENTER.
- Turn on MATH by pressing MATH under the heading PROCESS. Use the SELECT key to select the formula $(K \cdot X + L) / M$. (Make sure you don't get the formula $(K / X + L) / M$.) Press ENTER.

Next, we must set up the arming so that the counter will wait until the 100th pulse before beginning measurements.

- Press the AUX MENU button to access the auxiliary functions.

- Press the SELECT key until **Ar.Start** is displayed. Press ENTER.

- Use the SELECT key to set the arming source as **Chan b**. Press ENTER.

- Use the SELECT key to choose arming delay by event counts (**delay cnt.**) Press ENTER.

- Use the keyboard to enter the number of counts to delay (99). Press ENTER.

Finally, start arming must be enabled.

- Press the START button under the heading ARM.
- Use the SELECT key to choose a positive edge. Press ENTER.

Press RESTART to set the counter up to make the measurement. At this point the signal may be input to the counter.

Literature

Request literature #G0285A for a PM 6680 Timer/Counter brochure.

For information on additional PM 6680 Timer/Counter applications, request:

- Lit.# G0293A TimeView brochure
- Lit.# B0226A Characterizing Frequency Bursts
- Lit.# B0227A Characterizing Rapidly Changing Frequencies
- Lit.# B0230A Sources of Error in Time Interval Measurements
- Lit.# B0231A Exploring the Modulation Domain

John Fluke Mfg. Co., Inc.
PO Box 9090, Everett, WA 98206
Tel. (206) 347-6100

For more information call:
(800) 443-5853 (toll-free) in the U.S.A.
(416) 890-7600 in Canada.
(206) 356-5500 from other countries.

Philips International B.V.
T&M Dept., Building TQIII-4
5600 MD Eindhoven, The Netherlands
Telex: 35000 PHTC NL/NLFEVSI

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