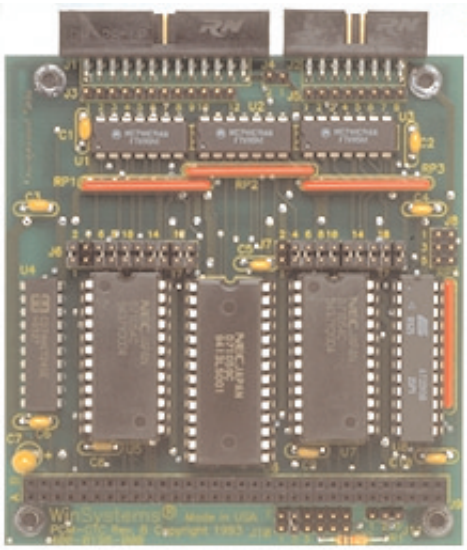
# WinSystems®
## PC/104 MODULE

# PCM-CTC
# 6 Channel, 16-Bit Counter/Timer

## FEATURES

- Six independent 16-bit Counter/Timers
- Uses two 82C54 Programmable Interval Timers
- Six programmable counter modes per channel
- Handles inputs from DC to 8 MHz
- Binary or BCD counting
- Clock, Gate, and Out signals from 6 channels buffered and accessed via 2 connectors
- Direct interface to WinSystems' TRM-500-3 flow meter termination card
- Onboard 82C59A Interrupt Controller generates eight vectored interrupts
- Two additional external interrupt input sources
- 8-bit stackthrough PC/104
- Two system time base selections
- Jumper selectable board I/O address
- Single +5 volt supply
- Operating Temperature: -40°C to +85°C
- Low cost



The PCM-CTC card is designed to solve the common timing problems in industrial systems design. Six independent 16-bit channels are capable of frequency/event counting from DC to 8 MHz, pulse marker or square-wave generation, time interval measurements, and one-shot simulation. All six channels have a buffered Clock, Gate, and Output available. Jumper headers provide source selection and cascading to yield maximum configuration flexibility.

## FUNCTIONAL CAPABILITY

**PC/104 Interface** - The PCM-CTC is an 8-bit stackthrough card which is I/O port mapped. The I/O address is jumper selectable for 8 different locations.

**Counters/Timers** - The PCM-CTC utilizes two 82C54 programmable interval timers that can be individually configured to be realtime clocks, event counters, digital one-shots, square wave generators, or programmable rate generators. Each 82C54 contains three independent software programmable counter/ timers yielding a total of six, 16-bit channels. The individual channels can be cascaded for longer count sequences.

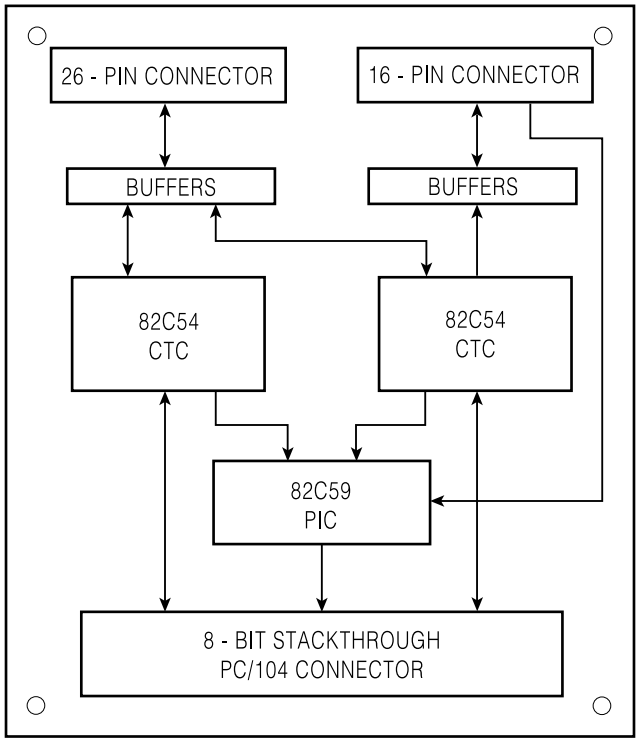
The three counters inside the 82C54 chip are identical in operation. Each consists of a single, 16-bit, preset-table, DOWN counter. The counter can operate in either binary or BCD and its input, gate and output are configured by the selection of modes stored in the Control Word Register. The status of the contents of each counter is available to the computer with a simple Read operation for event-counting applications. Special logic is included so that the contents of each counter can be read "on the fly" without having to inhibit the clock input.

**Time Base Clock** - Two jumper selectable clock sources are available for use as a time base for the six channels. Either the PC/104 System Clock (pin B20) or the PC/104 14.3818 MHz OSC (pin B30) can be selected for the board. The clock is divided by 2 and then is available at each of the 82C54's CLK input.

**Configuration Headers** - Access to the Clock, Gate and Out signals for each channel plus the time-base clock (divided by 2) is provided for maximum board configuration flexibility.

**Connector Configuration** - The PCM-CTC has two, connectors that permit access to the Clock, Gate and Out signals for each channel. The first connector, J1, has 26-pins and is grouped with 4 CTC channels. Its pin-out is compatible with WinSystems TRM-500-3 termination board.

J2, the second connector, is wired to the remaining 2 counter/timer Clock, Gate, and Out signals. Two additional interrupt inputs are wired from J2 to the 82C59A PIC. This offers more external interrupt sources for greater system flexibility.




PCM-CTC BLOCK DIAGRAM

All the counter/timer signals are fully buffered on and off the board. Each signal line is paired with a ground line to prevent adjacent noise and crosstalk. All input lines have Schmitt trigger circuits with 100 mV hysteresis to prevent oscillation from signals with slow rise and fall times.

J1 and J2 Connector Pin out

| Pin | J1 Description |
|---|---|
| 1 | GATE 0 |
| 3 | CLK 0 |
| 5 | OUT 0 |
| 7 | GATE 1 |
| 9 | CLK 1 |
| 11 | OUT 1 |
| 13 | GATE 21 |
| 15 | CLK 2 |
| 17 | OUT 2 |
| 19 | GATE 3 |
| 21 | CLK 3 |
| 23 | OUT 3 |
| 25 | +5 V |
| 2 - 26 | Ground |

| Pin | J2 Description |
|---|---|
| 1 | GATE 4 |
| 3 | CLK 4 |
| 5 | OUT 4 |
| 7 | GATE 5 |
| 9 | CLK5 |
| 11 | OUT 5 |
| 3 | INT 6 |
| 15 | INT 7 |
| 2-16 | Ground |

**Interrupts** - All six of the CTC channels plus 2 additional external interrupt input sources are wired to the onboard 82C59A PIC. The PCM-CTC can generate an IRQ on channels 2, 3, 4, 5, 6 or 7.

Even though this card is PC compatible, the 82C59A can generate a vectored interrupt to improve interrupt handling. This is done on the PCM-CTC by generating an interrupt acknowledge signal to the PIC after the second sequential Read to the board.

**TRM-500-3** - The TRM-500-3 board is a signal conditioning unit for up to three flow meters. It accepts a low level input and provides a TTL level that is accepted by the timers on the PCM-CTC. A jumper block is available to allow selection of either a low level analog or TTL input on each channel.

The PCM-CTC provides a jumper enabled +5 volt line to power to the TRM-500-3 via the J1 connector.

## SPECIFICATIONS

### Electrical

PC/104 Bus: 8-bit, stackthrough
System Clock: Up to 8 MHz
Interface: Inputs - All inputs are 74HC/TTL levels
Outputs - All outputs are 74HC/TTL levels
Power Requirements: +5V ±5% @ 40mA (typ.)

### Mechanical

Dimensions: 3.6"x 3.8" plus connector overhang

### Connectors

J1: 26-pin dual on 0.100 inch grid
J2: 16-pin dual on 0.100 inch grid
Jumpers: 0.025 inch square posts

### Environmental

Operating Temperature: -40°C to +85°C
Non-condensing relative humidity: 5% to 95%

## ORDERING INFORMATION

| | |
|---|---|
| PCM-CTC | Six channel PC/104 module with 82C59A PIC |

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