



# bc635/637PMC

## PCI Mezzanine Time & Frequency Processor

### KEY FEATURES

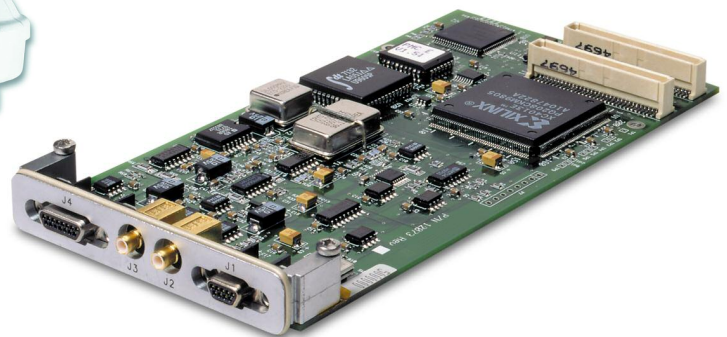
- PCI Local Bus Operation
- GPS or Time Code Inputs
- Time Code Outputs
- Pulse Rate Outputs
- Frequency Outputs (1, 5, or 10 MHz)
- External Event Capture Register/Interrupt
- Programmable Periodic Output/Interrupt
- Programmable Time Strobe Output/Interrupt
- 10 mm Stacking Height
- Micro-Miniature or SMB Output Connectors
- Fully Supports "BUSMODE" Enabling
- IEEE 1344 Compliant IRIG B Time Code

Symmetricom's bc635/637PMC receiver module provides precision time and frequency reference to the host computer system and peripheral data acquisition systems. Time is acquired from either the GPS satellites using a supplied antenna/receiver (bc637PMC only) or from time code signals, typically IRIG B. Integration of the module is facilitated with optional drivers for Windows NT/2000/XP, Linux, Solaris, or VxWorks. Central to the operation of the module is a disciplined 10 MHz oscillator and 100 nanosecond clock. Current time (days to 100 nanoseconds) can be accessed across the PCI bus with zero latency, which allows for very high speed time requests. The oscillator is rate-matched (disciplined) to the

input time source and drives the precision 10 MHz frequency output and time code generator circuitry. If time is lost, the module will continue to maintain time (flywheel).

Both time code generation and translation are supported. The generator supplies IRIG B time code output that is synchronized to the input time source. The translator decodes IRIG A, IRIG B or NASA 36.

An Event Time Capture feature provides a means of latching time for an event input. The module can also be programmed to generate a periodic pulse rate as well as to generate a single time strobe at a pre-determined time.



PMC Time & Frequency Processor (shown with optional antenna/receiver, bc637PMC)

# bc635/637PMC Specifications

## ELECTRICAL SPECIFICATIONS

- Real time clock
  - Bus request resolution: 100 nanoseconds
  - Latency: Zero
  - Major time format: Binary or BCD
  - Minor time format: Binary
- Time code translator
  - Time code formats: IRIG A, IRIG B\*, NASA 36 (Modulated or DCLS)
  - Time accuracy: <5  $\mu$ S (modulated)  
<1  $\mu$ S (DCLS)
  - Modulation ratio: 3:1 to 6:1
  - Input amplitude: 500 mV to 5V P-P
  - Input impedance: >10K $\Omega$
  - \* See IEEE 1344 compliance below
- Time code generator
  - Time code format: IRIG B\*
  - Modulation ratio: 3:1
  - Output amplitude: 4 V P-P (fixed) into 50 $\Omega$
  - DC level shift: TTL/CMOS
  - \* See IEEE 1344 compliance below
- IEEE 1344 compliance
 

The translator processes the 27 control function bits of IRIG B time code as set forth in IEEE 1344 (see page 52 of this catalog). The 27 control function bits provided by the input IRIG B time code are output in the generated IRIG B time code one time frame after received. If the input IEEE 1344 bits are not present in the input IRIG B time code, the last two digits of year are placed in bits 1-9 of the control function field of the generated IRIG B time code.
- Timing functions
  - Heartbeat clock (TTL, 50 $\Omega$ ): Programmable Periodic, <1 Hz to 250 kHz
  - Time strobe (TTL, 50 $\Omega$ ): Programmable 1  $\mu$ Sec through hours
  - Event capture (TTL, 50 $\Omega$ ): 100 nSec resolution, zero latency
  - 1 PPS pulse rate (TTL, 50 $\Omega$ ): Positive edge on-time
- Disciplined oscillator
  - Frequency: 10 MHz
  - Outputs: 1, 5, or 10 MHz [selectable]
  - Rate stability: 5.0E-8 short term 'tracking'  
5.0E-7 /day long term 'flywheeling'
  - Sync sources: GPS, Time Code, 1 PPS, 10 MHz
- PCI local bus™
  - Specification: Fully compliant with IEEE P1386/Draft 2.0 and IEEE P1386.1/Draft 2.0\*
  - Size: Standard (2.913" x 5.866")
  - Stacking height: 10 mm
  - Device type: PCI Target, 32 bit, 5V signalling
  - Data transfer: Byte, Half Word, Word
  - Interrupt levels: Automatically Assigned (PnP)
  - Power: +5 VDC @ 350 mA

\*Does not fit in MVME5500 PMC2 slot  
For detailed information, access the Field Service Bulletin at:  
<http://www.symmetricom.com/Media/pdf/fsb/098-41620-011.pdf>

- GPS Subsystem (bc637PMC only)
  - Time accuracy: <1  $\mu$ Second
  - Position accuracy: 10 to 20 meters SEP (SA off)
  - Maximum velocity: 300 meters/sec (1,080 KPH)
  - Number of channels: 8
  - Receiver frequency: 1.575 GHz (L1, C/A code)
  - Time to first fix: Brief power off: 1.5 minutes  
(1, 3, and 4 satellites)  
Worst case: 5 to 15 minutes
  - Solution modes: 1, 3, and 4 satellites
- Connector types
  - J1 - GPS Interface 9-pin micro 'DP'
  - J2 - Time Code In SMB socket
  - J3 - Time Code Out SMB socket
  - J4 - Module I/O 15-pin micro 'DP'

## ENVIRONMENTAL SPECIFICATIONS

- | Temperature | Module          | Ant/Rcvr      |
|-------------|-----------------|---------------|
| Operating:  | 0°C to 70°C     | -40°C to 70°C |
| Storage:    | -30°C to 85°C   | -55°C to 85°C |
| Humidity    |                 |               |
| Operating:  | 5% to 95%*      | 95%           |
|             | *non-condensing |               |

## OPTIONS

- Extended length GPS antenna cable
- Isolation transformer time code input
- 'D' connector (J1) to BNC adapter
- 15 pin high-density 'DP' to 15 pin 'DP' adapter cable
- Drivers: Windows NT/2000/XP, and Linux, Solaris, VxWorks  
Contact factory for additional driver support

## ORDERING INFORMATION

- BC12073-1001 bc635PMC Time & Frequency Processor w/SMB-to-BNC I/O cables
- BC12073-2000 bc637PMC GPS Time & Frequency Processor (includes GPS antenna/receiver & 50' (15 m) cable)
- PCI-WINSDK PCI Windows software developer's kit
- PCI-LXDRV PCI Linux Driver
- PCI-VXDRV PCI VxWorks Driver (PPC target)
- PCI-SDRV32 PCI 32-bit Solaris Driver
- PCI-SDRV64 PCI 64-bit Solaris Driver
- BC11576-1000 'D' to BNC adapter (provides IRIG in, IRIG out, 1 pps out, event in, periodic out)
- BC11576-9860115 'D' to BNC adapter (provides IRIG in, IRIG out, 1 pps out, 1 pps in, event in)
- PCI-BNC-CCS 'D' to BNC adapter (provides IRIG in, IRIG out, 1 pps out, 1 pps in, event in, DCLS out)
- PMC-GPS PMC 9-pin micro-D to 15-pin HD Adapter
- PMC-I/O PMC I/O cable (15-pin micro-D to 15-pin DS)
- 812597-050 Spare RS422 50' (15 m) antenna cable\*
- 812597-100 Spare RS422 100' (30 m) antenna cable\*
- 812597-200 Spare RS422 200' (60 m) antenna cable\*

\* Contact factory regarding longer cabling requirements.



**SYMMETRICOM, INC.**  
2300 Orchard Parkway  
San Jose, California  
95131-1017  
tel: 408.433.0910  
fax: 408.428.7896  
info@symmetricom.com  
www.symmetricom.com