Symmetricom

bc637PCI-U

GPS Synchronized, PCI Time & Frequency Processor

KEY FEATURES

- PCI Local Bus Operation
- 3.3V and 5.0V Universal Signaling
- GPS Synchronized with 1 Microsecond Accuracy to UTC
- IRIG A, B, IEEE 1344 Time Code Inputs
- 1 PPS or 10 MHz Inputs
- IRIG B Time Code Output
- 1, 5, or 10 MHz Rate Generator Output
- Programmable <1 Hz to 250kHz Rate Synthesizer Output/Interrupt
- External Event Capture/Interrupt
- Programmable Time Compare Output/Interrupt
- Zero Latency Time Reads
- Battery Backed Clock
- Extensive Software Drivers/SDKs Available
- Optional OCXO Upgrade

Symmetricom's GPS referenced bc637PCI-U receiver module provides precision time and frequency to the host computer and peripheral data acquisition systems. Precise time is acquired from the GPS satellite system or from time code signals such as IRIG B. GPS synchronization provides 1 microsecond accurate time to UTC and enables the bc637PCI-U to be an ideal master clock for synchronizing multiple computers to UTC.

Integration of the module is facilitated with optional drivers for Windows NT/2000/XP, Linux, Solaris or VxWorks. The bc637PCI-U automatically supports both 3.3V and 5.0V PCI bus signaling.

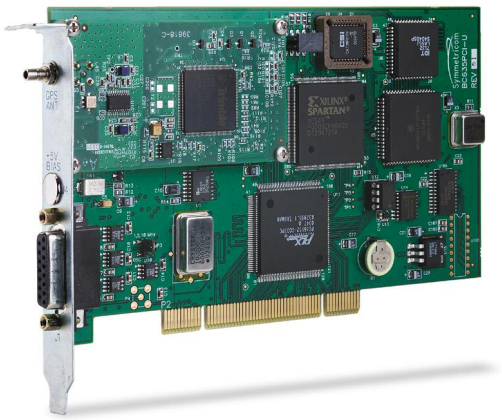
Central to the operation of the module is a GPS disciplined, 10 MHz oscillator and 100 nanosecond clock. Current time (days to 100 nanoseconds) can be accessed across the PCI bus with zero latency, which allows for very high speed time requests. The on-board oscillator is rate-matched (disciplined) to the input time source and drives the precision 10 MHz frequency output and time code generator circuitry. If the time input is lost, the module will continue to maintain time (flywheel). An optional OCXO oscillator substantially improves flywheel drift performance. If power is lost, a battery-backed clock is available to maintain time.

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 reads IRIG A, IRIG B and IEEE-1344 time codes.

An Event Time Capture feature provides a means of latching time for an external event input. The module can also be programmed to generate a periodic pulse rate as well as generate a single interrupt at a predetermined time (Time Compare).

A key feature of the bc637PCI-U is the ability to generate interrupts on the PCI bus at programmable rates. These interrupts can be used to synchronize applications on the host computer as well as signal specific events.

The external frequency input is a unique feature allowing the internal timing of the bc637PCI-U to slave to the 10 MHz output from a Cesium or Rubidium standard. This creates an extremely stable PCI based clock for all bc637PCI-U timing functions and is superior to any disciplining technique.



bc637PCI-U GPS Synchronized, Time & Frequency Processor

bc637PCI-U 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, IEEE 1344 (Modulated or DCLS)
  - Time accuracy: <5 µS (modulated) <1 µS (DCLS)
  - Modulation ratio: 3:1 to 6:1
  - Input amplitude: 500 mV to 5V P-P
  - Input impedance: >10KΩ, AC coupled
- Time code generator
  - Time code format: IRIG B
  - Modulation ratio: 3:1
  - Output amplitude: 4 V P-P (fixed) into 50Ω
  - DC level shift: TTL/CMOS, 50Ω
- Timing functions
  - Pulse rate synthesizer (TTL, 50Ω): <1 Hz to 250 kHz
  - Time compare (TTL, 50Ω): Programmable 1 µSec through hours
  - Event capture (TTL, 50Ω): 100 nSec resolution, zero latency
  - 1 PPS pulse rate (TTL, 50Ω): Positive edge on-time
- Disciplined oscillator
  - Frequency: 10 MHz
  - Outputs (TTL): 1, 5, or 10 MHz (selectable)
  - Rate stability
    - Standard VCXO: 5.0E-8 short term 'tracking' 5.0E-7/day long term 'flywheeling'
    - Optional oven osc: 2.0E-9 short term 'tracking' 5.0E-8 /day long term 'flywheeling'
  - Sync sources: GPS, Time Code, 1 PPS, 10 MHz
- PCI local bus™
  - Specification: PCI Local Bus™:
    - 2.2 compliant
    - 2.3 compatible: does not provide interrupts at system start-up and therefore does not support the PCI Local Bus Specification Revision 2.3 feature of software disable of interrupts at start-up
    - PCI-X compatible
    - Not compatible with dual core processors
  - Size: Single-width (4.2" x 6.875")
  - Device type: PCI Target, 32 bit, 5V signalling
  - Data transfer: Byte, Half Word, Word
  - Interrupt levels: Automatically Assigned (PnP), not supported in Windows 98
  - Power: +5V @ 470 mA +12V @ 400 mA -12V @ 70 mA

ENVIRONMENTAL SPECIFICATIONS

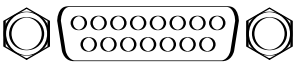
- Environment

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

Operating altitude: Up to 18,000 meters MSL

CONNECTOR

J2 - GPS ANT: SMB socket
J1 - Module I/O: 15-pin 'DS'



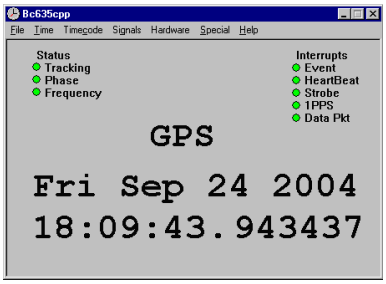
Pin	Direction	Signal
1	input	External 10 MHz input
2	n/a	Ground
3	output	Strobe output
4	output	I PPS output
5	output	Time Code output (AM)
6	input	External Event input
7	input	Time Code input (AM)
8	n/a	Ground (Recommended Time Code return)
9	output	Oscillator Control Voltage output
10	input	Time Code input (DCLS)
11	output	Time Code output (DCLS)
12	n/a	Ground
13	output	1, 5, 10 MHz output
14	input	External 1 PPS input
15	output	Periodic Pulse output

- Complete specifications can be found in the manual located at http://www.symmttm.com/pdf/Bus/bc635-637PCI-U.pdf

SOFTWARE

- The bc637PCI-U includes two Symmetricom Demonstration drivers, bc635cpp and bc637PCI GPS demo. Bc635cpp is an application program for Windows NT/2000/XP. Using this program you can review the bc637PCI-U card status and adjust board configuration and output parameters. Bc637PCI GPS demo provides direct access to the GPS receiver used on the bc637PCI-U board. An additional clock utility program, TrayTime, is provided to update the PC clock. This software operates as a background task keeping the host computer clock synchronized to the bc637PCI-U card.

The bc635cpp.exe utility can be used to query current settings, modify settings and retrieve or monitor data generated by the card.



PRODUCT INCLUDES

- bc637PCI-U Time & Frequency Processor board, one year warranty, PCI User's Guide, Windows Demonstration software CD, GPS Antenna Mounting Guide, 50 foot (15 m) RG58 RF GPS cable, Bullet style RF GPS antenna, 17 inch (43 cm) antenna mounting mast, x2 pipe straps, x2 hose clamps, x4 wood screws, and x4 screw anchors.

OPTIONS

- Extended length GPS antenna cable
- GPS In-line amplifier for extended cable runs up to 300' (91m)
- GPS Antenna down/up converter for long cable runs up to 1500' (457 m)
- Lightning arrestor
- GPS Antenna splitter kit
- Ovenized crystal oscillator for extended holdover
- 'D' connector (J1) to BNC adapter
- Isolation transformer time code input
- Drivers: Windows NT/2000/XP, Linux, Solaris, VxWorks (PPC target) Contact factory for additional driver support

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