Symmetricom®

bc635PCI-U

PCI Time &Frequency Processor

KEY FEATURES

- PCI Local Bus Operation
- 3.3V and 5.0V Universal Signaling
- IRIG A, B and 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 Time Capture/Interrupt
- Programmable Time Compare Output/Interrupt
- Zero Latency Time Reads
- Battery Backed Clock
- Extensive Software Drivers/SDKs Available
- Optional OCXO Upgrade

Symmetricom's bc635PCI-U timing module provides precision time and frequency reference to the host computer and peripheral data acquisition systems. Time is typically acquired from time code signals such as IRIG B. The bc635PCI-U automatically supports both the 3.3V and 5.0V signaling of the PCI bus. Integration of the module is easily 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 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 bc635PCI-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 bc635PCI-U to slave to the 10 MHz output from a Cesium or Rubidium standard. This creates an extremely stable PCI based clock for all bc635PCI-U timing functions and is superior to any disciplining technique.
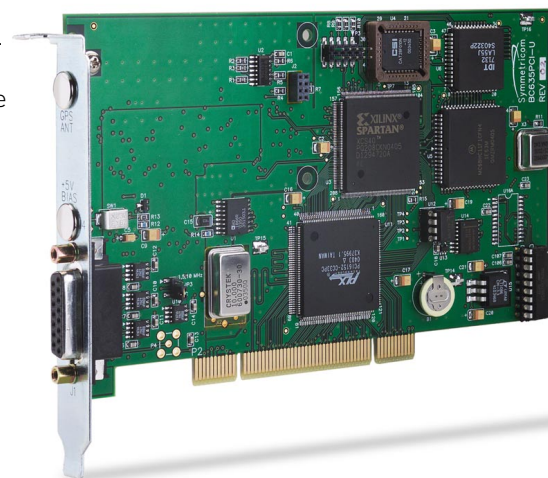

bc635PCI-U Time & Frequency Processor

bc635PCI-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
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 @ 350 mA +12V @ 400 mA -12V @ 70 mA

- Connector

J1 - Module I/O:	15-pin 'DS'
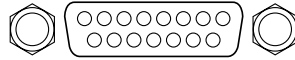
Pin	Direction	Signal
1	input	External 10 MHz input
2	n/a	Ground
3	output	Strobe output
4	output	I PPS output
5	output	Time Code output (AM)
6	input	External Event input
7	input	Time Code input (AM)
8	n/a	Ground (Recommended Time Code return)
9	output	Oscillator Control Voltage output
10	input	Time Code 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

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%*	95%
	*non-condensing	
Operating altitude:	Up to 18,000 meters MSL	

SOFTWARE

- The bc635PCI-U includes the Symmetricom Demonstration driver, bc635cpp, an application program for Windows NT/2000/XP. Using this program you can review the bc635PCI-U card status and adjust board configuration and output parameters. 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 bc635PCI-U card.

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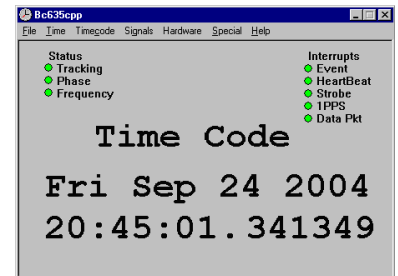
PRODUCT INCLUDES

- bc635PCI-U Time & Frequency Processor board, one year warranty, PCI User's Guide, Windows Demonstration software CD.

OPTIONS

- For GPS synchronization, see bc637PCI-U datasheet at http://www.symmttm.com/pdf/Bus/DS_bc637PCI-U.pdf
- Ovenized crystal oscillator for extended holdover
- 'D' connector (J1) to BNC adapter
- Drivers: Windows NT/2000/XP, Linux, Solaris, VxWorks Contact factory for additional driver support