Symmetricom®

bc635/637PCI

PCI 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
- Battery Backed Clock
- IEEE 1344 Compliant IRIG B Time Code
- Windows 98/NT/2000/XP Support

Symmetricom's bc635/637PCI receiver module provides precision time and frequency reference to the host computer and peripheral data acquisition systems. Time is acquired from either the GPS satellites using a supplied antenna/receiver (bc637PCI only) or from time code signals, typically IRIG B. Integration of the module is facilitated with optional drivers for Windows 98/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 nanseconds) 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 time is lost, the module will continue to maintain time (flywheel). If power is lost, a 10 PPM 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 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 predeter-mined time.

PCI Time & Frequency Processor (shown with optional GPS module and antenna)

bc635/637PCI 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 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
	* 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 50Ω
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. 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, 50Ω):	Programmable Periodic, <1 Hz to 250 kHz
Time strobe (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:	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:	Meets PCI Local Bus™ Specification 2.2
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)
Power:	+5 VDC @ 350 mA +12 VDC @ 10 mA (bc635PCI) +12 VDC @ 100 mA (bc637PCI) - 12 VDC @ 10 mA

- GPS subsystem (bc637PCI only)

Time accuracy:	<1 µSecond
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:	Worst case: 5 to 15 minutes
Solution modes:	1, 3, and 4 satellites

- Connector Types

J1 - Module I/O:	15-pin 'DS'
J2 - GPS ANT:	SMB socket
+5V BIAS:	SMB socket

ENVIRONMENTAL SPECIFICATIONS

- Environment

Temperature	Module	Ant/Rcvr
Operating:	0º C to 70º C	-40º C to 70º C
Storage:	-30º C to 85º C	-55º C to 85º C
Humidity		
Operating:	5% to 95%* *non-condensing	95%
Operating altitude:	Up to 18,000 meters MSL	

OPTIONS

- GPS receiver**
- GPS firmware**
- Bullet GPS antenna**
- Airborne GPS antenna
- Magnetic GPS antenna
- Extended length GPS antenna cable
- Isolation transformer time code input
- Ovenized crystal oscillator
- 'D' connector (J1) to BNC adapter
- Drivers: Windows 98/NT/2000/XP, Linux, Solaris, VxWorks Contact factory for additional driver support

** Included with bc637PCI

ORDERING INFORMATION

BC12083-1000	bc635PCI Time & Frequency Processor
BC12083-2000	bc637PCI 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
PCI-SDRV32	PCI 32-bit Solaris Driver (Solaris 5 & Solaris 6)
PCI-SDRV64	PCI 64-bit Solaris Driver (Solaris 7 & Solaris 8)
BC12083-3000	Ovenized oscillator option (factory installed)
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)
PCI_OPT_01	GPS upgrade kit (includes antenna, cable, and receiver)
GPS-BUANT	Spare RF bullet antenna
GPS-RFCAB50	Spare RF 50' (15 m) antenna cable*
PCI_OPT_20G	Spare RF 100' (30 m) antenna cable*
PCI_OPT_20B	Spare RF 200' (60 m) antenna cable*

* Contact factory regarding longer cabling requirements.