bc635PCI-V2
PCI Time and Frequency Processor

Features

- IRIG A, B, G, E, IEEE 1344, NASA 36, XR3, and 2137 time code inputs and outputs
- Simultaneous AM and DCLS time code inputs and outputs
- 100 ns clock resolution for time requests
- Programmable <<1PPS to 100MPPS DDS rate synthesizer output/interrupt
- 1, 5, or 10MPPS rate generator output
- 1PPS and 10 MHz inputs
- Three external event time capture/interrupts
- External event time capture/interrupt
- Programmable time compare output/interrupt
- Zero latency time reads
- Battery-backed real-time clock (RTC)
- PCI local bus operation
- Universal signaling (3.3 V or 5.0 V bus)
- CE(RoHS)-compliant
- Linux, Solaris, and Windows software drivers/SDKs included

The Microsemi bc635PCI-V2 timing module provides unparalleled precise time and frequency to the host computer and peripheral data acquisition systems. Time is typically acquired from time code signals such as IRIG B.

Central to the operation of the module is a disciplined 10 MHz oscillator that is either an on-board TCXO (or optional OCXO) or an off-board external oscillator that can provide the timing module’s 100-nanosecond clock. Current time (days to 100 ns) can be accessed across the PCI bus with no PCI bus wait states, which allows for very high-speed time requests. The selected on-board or off-board 10 MHz oscillator drives the module’s frequency and time code generator circuitry. If the input reference is lost, the module will continue to maintain time (flywheel) based on the selected 10 MHz oscillator’s drift rate. If power is lost, a battery-backed real-time clock (RTC) is available to maintain time.

Extensive time code generation and translation are supported. The generator outputs either IRIG A, B, G, E, IEEE 1344, NASA 36, XR3, or 2137 in both amplitude modulated (AM) and DC level shift (DCLS) formats. The translator reads and may be used to discipline the 10 MHz oscillator to either the AM or DCLS format of IRIG A, B, G, E, IEEE 1344, NASA 36, XR3, or 2137 time codes.

The module also has a state-of-the-art direct digital synthesizer (DDS) rate synthesizer capable of 0.000001PPS to 100MPPS. The module may also be programmed to generate a single interrupt at a predetermined time based on a time compare (strobe). An event time capture feature provides a means of latching time of an external event.

A key feature of the bc635PCI-V2 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 time and frequency of the bc635PCI-V2 to be derived from an external oscillator that may also be disciplined (DAC voltage controlled) based on the selected input reference. The module may be operated in generator (undisciplined) mode where an external 10 MHz from a Cesium or Rubidium standard is used as the frequency reference. This creates an extremely stable PCI-based clock for all bc635PCI-V2 timing functions.

The bc635PCI-V2 automatically supports both 3.3 V and 5.0 V signaling of the PCI bus. Integration of the module is easily facilitated with optional drivers for Windows, Linux, or Solaris.
bc635PCI-V2
PCI Time and Frequency Processor

Precision Time and Frequency in the PCI Form Factor (100-Nanosecond Precision)

Reading the Precise Time
The bc635PCI-V2 provides precise time on request and extremely fast response to host applications. This request for time is made using the included SDK software functions. Time can be provided in binary or decimal form.

A Multitude of Time Codes
The bc635PCI-V2 has the widest time code input and output support available in any bus level timing card. Support is available for 30 different time codes including IRIG A, B, G, E, IEEE 1344, NASA 36, XR3, and 2137 in AM and DCLS formats.

Measure External or Internal Events
Measure the exact time up to the occurrence of three independent external events occur. Bus interrupts instantly notify the CPU that the measurements are made and waiting. Similarly, host application-generated interrupts to the bc635PCI-V2 card over the bus can be precisely time stamped for precise host application-based processes.

Flexible Rate Generation
The DDS on board bc635PCI-V2 can be programmed to generate rates up to 100MPPS or as little as once every 115 days. These rates are available as timing signal outputs or as interrupts on the bus. The rate adjustment resolution is as small as 1/32 Hz.

Inputs
- AM time codes
- DCLS time codes
- External events (3x)
- 10 MHz
- 1PPS
- GPS (bc637PCle model)

Outputs
- AM time codes
- DCLS time codes
- Programmable alarm (strobe/time compare)
- <=1PPS to 100MPPS rates
- 1PPS
- 1, 5, or 10MPPS
- Oscillator control voltage

Over the PCIe Bus
- Precise time
- Event interrupts
- Alarm interrupts (time compare/strobe)
- Programmable interrupt rates
- Configuration and control

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bc635PCI-V2
PCI Time and Frequency Processor

**Frequency Outputs**
Precise clocks are excellent sources of frequency outputs. The bc635PCI-V2 offers 1, 5 or 10MPPS outputs directly from the steered internal oscillator of the clock.

**External Frequency Inputs and DAC Control**
The external frequency input is an unique feature that allows the time and frequency of the bc635PCI-V2 to be derived from an external oscillator such as a 10 MHz Cesium or Rubidium standard. This creates an extremely stable PCI based clock for all bc635PCI-V2 timing functions. For closed loop control, an external oscillator may be disciplined using DAC voltage control output from the bc635PCI-V2.

**Time Compare/Strobe/Alarm**
A useful feature of any precise clock is the ability to notify when a particular time is reached (like an alarm clock). When the preset time precisely matches the actual time, an external signal and an interrupt to the bus are instantly generated, signaling an application that point in time has just occurred.

**Over-the-Bus Features**
Beside from precise time stamps, the bc635PCI-V2 can provide very precisely timed interrupts on the bus at fixed rates, predetermined times, or to signal an event has occurred on the card. These interrupts can be integrated into user applications requiring more deterministic behavior or application synchronization with other computers. Similarly, user applications can use interrupts as markers in time and later retrieve exactly when the interrupt occurred.

**Configuration and Control**
The bc635PCI-V2 includes easy-to-use programs to easily configure the card and validate operations. This software is also included with the SDKs and driver software.

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**PCle Card Integration Made Easy with Included SDKs and Drivers**

**Windows, Linux, and Solaris SDKs Speed PCI Integration**
The PCI card includes standard full-featured software development kits, speeding the integration of Microsemi PCI cards into any application.

Using an SDK is an easy-to-integrate and highly reliable alternative to writing lower-level code to address a card’s memory registers directly with just a driver. The function calls and device drivers in the SDKs make interfacing to a Microsemi PCI card straightforward and help keep the software development focused on the end application.

**SDKs Save Time and Money**
Programmers find the SDK an invaluable resource in accelerating the integration of Microsemi PCI cards into applications, saving both time and money. The SDK functions address each Microsemi PCI timing card feature, and the function names and parameters provide insight into the capability of each function.

By using the SDK, one can leverage Microsemi’s timing expertise and confidently integrate a Microsemi PCI card into your application.

**License-Free**
Distribution of embedded Microsemi software in customer applications is royalty free.
Driver Comparison

<table>
<thead>
<tr>
<th>Windows SDK and Driver</th>
<th>Linux SDK and Driver</th>
<th>Solaris SDK and Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Windows XP/Vista/7/10</td>
<td>• Up to Linux Kernel 4.6</td>
<td>• Solaris kernel mode driver</td>
</tr>
<tr>
<td>• Windows Server 2003/2008</td>
<td>• 32- and 64-bit kernel support</td>
<td>• 64-bit Solaris 8–10</td>
</tr>
<tr>
<td>• 32- and 64-bit support</td>
<td>• Code examples</td>
<td>• Code examples</td>
</tr>
<tr>
<td>• Kernel mode driver</td>
<td>• Test application program</td>
<td>• Test application program</td>
</tr>
<tr>
<td>• Code examples</td>
<td>• Complete documentation</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>• Complete documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Timekeeping utility program</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Windows SDK for bc635PCI-V2 cards include a Windows XP/Vista/Server/7/10 kernel mode device driver for the 32- and 64-bit PCI interface. The SDK includes .h, .lib, and DLL files to support both 32- and 64-bit applications development.

The target programming environment is Microsoft Visual Studio (Microsoft Visual C++ V6.0 or higher). Both Visual C++ 6.0 and Visual Studio 2008 project files are supplied with the source code.

Also included is Microsemi’s bc637PCIcfg application program that can be used to ensure proper operation of the PCI card, and the TrayTime application that allows the user to update the system clock in which the card is installed. Source code for these programs and smaller example programs are included.

Minimum System Requirements
Operating System
• Windows XP/Vista/7/10
• Windows server 2003/2008

Hardware
PC-compatible system with a Pentium or faster processor

Memory
24 MB

Development Environment
Microsoft Visual Studio (Visual C++) 6 or higher

Linux SDK and Driver

The Linux SDK for bc635PCI-V2 cards includes PCIe kernel mode device drivers for both 32-bit and 64-bit kernels, an interface library accessing all bc635PCI-V2 features, and example programs with he source code.

The target programming environment is the GNU compiler collection (GCC) and the C/C++ programming languages.

Also included is Microsemi’s bc63xPCIcfg application program which ensures proper operation of the PCI card in the host computer. The example program includes sample code, exercising the interface library, and conversion examples of the ASCII format data objects passed to and from the device into a binary format suitable for operation and conversion.

The example program is developed using discrete functions for each operation, allowing the developer to copy any useful code and use it in their own applications.

Minimum System Requirements
Operating System
Linux Kernel 4.6

Hardware
x86 processor

Memory
32 MB

Development Environment
GNU GCC recommended

Solaris SDK and Driver

Microsemi’s Solaris SDK includes bc63xPCIcfg, an application program to ensure proper operation of the PCI card in the host computer. The example program includes sample code and conversion examples of the ASCII format data objects passed to and from the device into a binary format suitable for operation and conversion.

The target programming environment is the Solaris application development tool chain and the C/C++ programming languages.

The Solaris SDK includes the Solaris device driver source code. Applications access the features of the hardware through the standard 'ioctl' Solaris system function. The ioctl codes are defined for all the features of the card. The bc63xPCIcfg program shows how to use most ioctl codes. Developers can copy any useful code from the bc63xPCIcfg source code and use it in their own applications.

Minimum System Requirements
Operating System
Solaris versions 8, 9, and 10

Hardware
SPARC and x86_64

Memory
32 MB

Development Environment
Solaris compilers
bc635PCI-V2
PCI Time and Frequency Processor

Windows and Linux SDK Function Reference

Note: For complete list of functions, see the manual.

Basic Time and Frequency Processor (TFP) Functions

- bcStartPCI/bcStopPCI Opens/closes underlying device layer.
- bcStartInt/bcStopInt Starts/stops the interrupt thread to signal interrupts.
- bcSetInt/bcReqInt Enables/returns enabled interrupt.
- bcShowInt Interrupt service routine.
- bcReadReg/ bcWriteReg. Returns/sets requested register contents.
- bcReadDPReg/ bcWriteDPReg Returns/sets requested Dual Port RAM register contents.
- bcCommand Sends SW reset command to board.
- bcReadBinTime/ bcSetBinTime Reads/sets TFP major time in binary format.
- bcReadDecTime/ bcSetDecTime Reads/sets TFP major time in BCD format.
- bcReqTimeFormat Returns selected time format.
- bcSetTimeFormat Sets the major time format to binary or grouped decimal.
- bcReqYear/bcSetYear Returns/sets year value.
- bcSetYearAutoIncFlag Included for backward compatibility to the bc635/637PCI-U card.
- bcSetLocalOffsetFlag Enables or disables local time offset in conjunction with bcSetLocOff.
- bcSetLocOff Sets board to report time at an offset relative to UTC.
- bcSetLeapEvent Inserts or deletes leap second data (in non-GPS modes).
- bcSetMode Sets TFP operating mode.
- bcSetTcIn Sets time code format for time code decoding mode.
- bcSetTcInEx Sets time code and subtype for time code decoding mode.
- bcSetTcInMod Sets time code modulation for time code decoding mode.
- bcReqTimeData Returns selected time data from the board.
- bcReqTimeCodeData Returns selected time code data from the board.
- bcReqTimeCodeDataEx Returns selected time code and subtype data from the board.
- bcReqOtherData Returns selected data from the board.

Event Functions

- bcReqVerData Returns firmware version data from the board.
- bcReqSerialNumber Returns board serial number.
- bcReqHardwareFab Returns hardware fab part number.
- bcReqAssembly Returns assembly part number.
- bcReqModel Returns TFP model identification.
- bcReqTimeFormat Returns selected time format.
- bcReqRevisionID Returns board revision.

- bcReadEventTime Latches and returns TFP time caused by an external event.
- bcReadEventTimeEx Latches and returns TFP time caused by an external event with 100 ns resolution.
- bcSetHbt Sets a user programmable periodic output.
- bcSetPropDelay Sets propagation delay compensation.
- bcSetStrobeTime Sets strobe function time.
- bcSetDDSFrequency Sets DDS output frequency.
- bcSetPeriodicDDSSelect Selects periodic or DDS output.
- bcSetPeriodicDDSEnable Enables or disables periodic or DDS output.
- bcSetDDSDivider Sets DDS divider value.
- bcSetDDSDividerSource Sets DDS divider source.
- bcSetDDSSyncMode Sets DDS synchronization mode.
- bcSetDDSMultiplier Sets DDS multiplier value.
- bcSetDDSTimeSet Returns TFP oscillator data.
- bcSetDDSTuningWord Sets DDS turning word value.

Oscillator Functions

- bcSetClkSrc Enables or disables on-board oscillator.
- bcSetDac Sets oscillator DAC value.
- bcSetGain Modifies on-board oscillator frequency control algorithm.
- bcReqOscData Returns TFP oscillator data.

Generator Mode Functions

- bcSetGenCode Sets time code generator format.
- bcSetGenCodeEx Sets time code and subtype generator format.
- bcSetGenOff Sets an offset to the on-board timecode generation function.
GPS Mode Functions

- **bcGPSReq/bcGPSSnd**: Returns/sends a GPS receiver data packet.
- **bcGPSTmp**: Manually sends and retrieves GPS receiver data packets.
- **bcSetGPSOperMode**: Sets the GPS receiver to function in static or dynamic mode.
- **bcSetGPSTmFmt**: Sets TFP to use GPS or UTC time base.

Real-Time Clock (RTC) Functions

- **bcSyncRtc**: Synchronizes RTC to current TFP time.
- **bcDisRtcBatt**: Sets RTC circuit and battery to disconnect after power is turned off.

Solaris SDK Function Reference List

The Solaris SDK uses custom ioctl commands to facilitate easy communication and control of the bc635PCI-V2 card. The commands cover basic operational functions, event management, oscillator controls, and mode-related functions.

The following list is an overview of the Solaris SDK’s ioctl functions.

- Interrupt management
- Read/write dual port RAM. Send command to timing engine for processing
- Read and write time
- Timing mode and time format
- Read and write the card control register
- Input time code format and modulation selection
- Set local time
- Leap seconds control
- Read various version information and miscellaneous data
- Reset the board
- Clock source and JamSync management
- DAC control
- On-board oscillator frequency control
- Advance or retard the internal clock
- Read event time latched by external event
- Read event time latched by software event
- Event source/sense control
- Set propagation delay
- Periodic output and output frequency control
- Strobe control
- DDS frequency output control
- Set output time code format
- Set offset for output time code generation
- GPS control
- Sync real time clock
- Disconnect between RTC and battery after power-off

Backwards Compatibility Provides Seamless Migration Paths

The PCI-based bc635 cards have long product lifecycles since the first introduction of PCI timing cards in the mid 1990s. To preserve the customer’s time and money investments in integrating bc635PCI cards into their systems, Microsemi has maintained the bc635PCI cards’ existing features and software interface while adding new features and keeping their bus signaling and form factors up to date. This commitment to backward compatibility and current bus architectures assures the bc635PCI cards integrate smoothly into any workstation currently available in the market with little to no impact on customer application software.

PCI Card Developments

- **bc635PCI**
  - Mid-1990s
  - First PCI timing card introduced

- **bc635PCI-U**
  - 2003
  - 3.3 V and 5.0 V universal signaling backward compatibility retained

- **bc635PCI-V2**
  - 2008
  - Electronics updated backward compatibility retained
  
- **bc635PCI-V2**
  - 2010
  - Electronics updated backward compatibility retained
Optional Accessories Speed, Test, and Simplify Integration

Breakout cables with BNC connectors simplify access to the in and out timing signals of the PCI card. These labeled cables mitigate the need to create special cables during project development and ensure that the correct timing signals are being accessed.

For more integrated rack mount systems that require easy access to timing signals, the 1U patch panel and high-frequency signal breakout exposes all available signals. The panel provides an organized and professional appearance to the external timing I/O of the PCI card functions. The 1U panel fits with standard or half rack size chassis. The high-frequency breakout adapter exposes the high-frequency signal as well as the external DC DAC control signal and ground.

**Input/Output Signals D to BNC Connector Breakout Cables**

### Timing Input/Output Breakout Cable and Patch Panel BNC Map

<table>
<thead>
<tr>
<th>Outputs</th>
<th>bc11576-1000</th>
<th>bc11576-980115</th>
<th>Patch/Breakout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time code (AM)</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Time code (DCLS)</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>1, 5, 10MPPS</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Periodic/DDS</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Strobe</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>1PPS</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Oscillator control voltage</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Inputs</td>
<td>bc11576-980115</td>
<td>bc11576-980115</td>
<td>bc11576-980115</td>
</tr>
<tr>
<td>Time code (AM)</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Time code (DCLS); event2</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>External event1</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>External 1PPS; event3</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>External 10 MHz</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

**1U Patch Panel of Input/Output and High Frequency Signals for Standard Rack Mount Size Chassis**
bc635PCI-V2
PCI Time and Frequency Processor

Specifications

Electrical

- Real-time clock (RTC)
- Bus request resolution 100 ns BCD
- Latency Zero
- Major time format Binary or BCD
- Minor time format Binary 1 μS to 999.999 mS
- Synchronization sources Time code, 1PPS
- Time code translator (inputs)
  - Time code formats IRIG A, B, G, E, IEEE 1344, NASA 36, XR3, 2137
  - Time accuracy <5 μS (AM carrier frequencies 1 kHz or greater)
    <1 μS (DCLS)
  - AM ratio range 2:1 to 4:1
  - AM input amplitude 1 Vpp to 8 Vpp
  - AM input impedance >5 kΩ
  - DCLS input 5 V HCMOS >2 V high,
    <0.8 V low, 270 Ω
- Time code generator (outputs)
  - Time code format IRIG A, B, G, E, IEEE 1344, NASA 36, XR3, 2137
  - AM ratio 3:1 ±10%
  - AM amplitude 3.5 Vpp ±0.5 Vpp into 50 Ω
  - DCLS amplitude 5 V HCMOS, >2 V high,
    <0.8 V low into 50 Ω
- Timing functions (outputs are rising edge on time)
  - DDS rate synthesizer
  - Frequency range 0.0000001PPS to 100MPPS
  - Output amplitude 5 V HCMOS, >2 V high,
    <0.8 V low into 50 Ω, square wave
  - Jitter <2 nS p-p
  - Legacy pulse rate synthesizer (heartbeat, aka periodic)
  - Frequency range <1 Hz to 250 kHz
  - Output amplitude 5 V HCMOS, >2 V high,
    <0.8 V low into 50 Ω, square wave
- Time compare (strobe)
  - Compare range 1 μs through days
  - Output amplitude 5 V HCMOS, >2 V high,
    <0.8 V low into 50 Ω, 1 μs pulse
- 1PPS output 5 V HCMOS, >2 V high,
  <0.8 V low into 50 Ω, 60 μs pulse
- 1PPS input 5 V HCMOS, >2 V high,
  <0.8 V low, 270 Ω
- External event input 5 V HCMOS, >2 V high,
  <0.8 V low, 270 Ω, zero latency
- External 10 MHz oscillator Digital 40% to 60% or sine wave, 0.5 Vpp to 8 Vpp,
  >10 kΩ
- Oscillator control voltage Jumper selectable
  0 VDC-5 VDC or 0 VDC-10 VDC into 1 kΩ
- On-board disciplined oscillator
  - Frequency 10 MHz
  - 1, 5, or 10 MHz output 5 V HCMOS, >2 V high,
    <0.8 V low into 50 Ω
  - Stability 5.0×10⁻⁸ short term tracking
  5.0×10⁻⁷/day long term flywheeling
  - Real-time clock (RTC) Battery-backed time and year information
- PCI specification
  - 2.2 compliant
  - 2.3 compatible
  - PCI-X compatible
- Size Single-width (4.2” x 6.875”)
- Device type PCI target, 32 bit, universal signaling
- Data transfer 8-bit, 32-bit
- Interrupt levels Automatically assigned (PnP)
- Power
  - 12 V at 50 mA
  - TCXO: 5 V at 700 mA,
  OCXO: 5 V at 350 mA,
  1.1 A at start-up
- Connector
  - Firmware update port 6-pin, PS2 mini-DIN J2
  - Timing I/O 15-pin ‘DS’ J1

Environmental

- Temperature
  - Operating 0 °C to 70 °C
  - Storage –30 °C to 85 °C
- Humidity
  - Operating 5% to 95% non-condensing
  - Operating altitude Up to 18,000 m MSL
- Certifications
  - FCC Part 15, Subpart B.
  - Emissions EN 55022
bc635PCI-V2
PCI Time and Frequency Processor

- Immunity EN 55024
- RoHS compliance
  - EU RoHS 6/6
  - China RoHS

Complete specifications can be found in the manual located at www.microsemi.com.

Pin Description

<table>
<thead>
<tr>
<th>Pin</th>
<th>Direction</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input</td>
<td>External 10 MHz</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Output</td>
<td>Strobe</td>
</tr>
<tr>
<td>4</td>
<td>Output</td>
<td>1PPS</td>
</tr>
<tr>
<td>5</td>
<td>Output</td>
<td>Time code (AM)</td>
</tr>
<tr>
<td>6</td>
<td>Input</td>
<td>External event</td>
</tr>
<tr>
<td>7</td>
<td>Input</td>
<td>Time code (AM)</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Ground</td>
</tr>
<tr>
<td>9</td>
<td>Output</td>
<td>Oscillator control voltage</td>
</tr>
<tr>
<td>10</td>
<td>Input</td>
<td>Time code (DCLS)</td>
</tr>
<tr>
<td>11</td>
<td>Output</td>
<td>Time code (DCLS)</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Ground</td>
</tr>
<tr>
<td>13</td>
<td>Output</td>
<td>1, 5, or 10MPPS</td>
</tr>
<tr>
<td>14</td>
<td>Input</td>
<td>External 1PPS</td>
</tr>
<tr>
<td>15</td>
<td>Output</td>
<td>Heartbeat/DDS</td>
</tr>
</tbody>
</table>

Software

The bc635PCI-V2 includes the Microsemi bc635pcidemo.exe application program for Windows. Using this program, you can review the bc635PCI-V2 card status and adjust board configuration and output parameters. An additional clock utility program, TrayTime, is provided that can be used to update the host computer's clock.

Control Panel Interface

Product Includes

This product also includes a bc635PCI-V2 time and frequency processor board, standard height and low-profile cover plates, one-year warranty, PCI user guide CD, Windows, Linux, and Solaris SDK/driver software CD.

Ordering Information

bc635PCI-V2 PCI time and frequency processor

Connector accessories that can be ordered.

- D connector to x5-BNCs adapter (provides TC in, TC out, 1PPS out, event in, periodic out) BC11576-1000
- D connector to x5-BNCs adapter with 1PPS in (provides TC in, TC out, 1PPS in, 1PPS out, event in) BC11576-9860115
- D connector to x6-BNCs adapter (provides TC in, TC out, 1PPS in, 1PPS out, event in, DCLS out) PCI-BNC-CCS

For GPS synchronization, see bc637PCIe PCI Express Time and Frequency Processor datasheet.

Contact Microsemi for pricing and availability.