



# Linux Software for bc635/637PCI-V2

## Linux Software Development Kit for Symmetricom bc635/637PCI V2 Cards

### KEY FEATURES

- Full-Featured Function Set for Faster PCI Timing Card Integration
- Linux Kernel Mode Driver
- 32-bit and 64-bit kernel support
- Code Examples
- Test Application Program
- Complete Documentation

The Linux<sup>®</sup> SDK for Symmetricom bc635/637PCI-V2 Cards is a full-featured Software Development Kit that speeds integration of Symmetricom PCI products into an application. The SDK is an easy-to-integrate and highly reliable alternative to writing lower-level code to address a card's memory registers directly. Interfacing the Linux function calls to a Symmetricom PCI card is straightforward and helps keep your software development focused on the end application. The SDK includes PCI kernel mode device drivers for both 32-bit and 64-bit kernels, an interface library accessing all bc635/637PCI-V2 features, and example programs with source code.

The SDK functions address each Symmetricom PCI timing card feature, and the function names and parameters provide insight into the capability of each function. The target programming environment is the GNU Compiler Collection (GCC) and the C/C++ programming languages.

Programmers will find the SDK an invaluable resource in accelerating the integration of Symmetricom PCI cards into applications, saving both time and money. By using the SDK, you can leverage Symmetricom's timing expertise and confidently integrate a Symmetricom PCI card into your application.

Symmetricom's Linux SDK includes pcidemo, an application program to ensure 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 was developed using discrete functions for each operation, allowing the developer to copy any useful code and use it in their own applications.



bc635/637PCI-V2 Software Developer's Kit for Linux

## Linux SDK Function Reference List

### BASIC TIME AND FREQUENCY PROCESSOR (TFP) FUNCTIONS

- bcStartPCI: Opens underlying device layer.
- bcStopPCI: Closes underlying device layer.
- bcStartInt: Starts the interrupt thread to signal interrupts.
- bcStopInt: Stops the interrupt thread and releases any used resources.
  
- bcSetInt: Enables an interrupt source.
- bcReqInt: Returns the currently enabled interrupt.
- bcShowInt: Interrupt service routine.
- bcReadReg: Returns requested register contents.
- bcWriteReg: Sets requested register contents.
- bcReadDPRReg: Returns requested Dual Port RAM register contents.
- bcWriteDPRReg: Sets requested Dual Port RAM register contents.
- bcCommand: Sends SW reset command to board.
- bcReadBinTime: Reads TFP major time in binary format.
- bcSetBinTime: Sets TFP major time in binary format.
- bcReadDecTime: Reads TFP major time in BCD format.
- bcSetDecTime: Sets TFP major time in BCD format.
- bcReqTimeFormat: Returns selected time format.
- bcSetTimeFormat: Sets the major time format to binary or grouped decimal.
  
- bcReqYear: Returns year value.
- bcSetYear: Sets year value.
- bcSetYearAutoIncFlag: This function is a NOP for the bc635/637PCI V2 card. 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.
- bcSetTcln: Sets time code format for time code decoding mode.
- bcSetTclnEx: Sets time code and subtype for time code decoding mode.
- bcSetTclnMod: 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.
- 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.

### EVENT FUNCTIONS

- bcReadEventTime: Latches and returns TFP time caused by an external event.
- bcReadEventTimeEx: Latches and returns TFP time caused by an external event with 100 nanosecond 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.
- bcSetDDSPeriodValue: Sets DDS period value.
- bcSetDDSTuningWord: Sets DDS tuning word value.

### OSCILLATOR FUNCTIONS

- bcSetClkSrc: Enables or disables on-board oscillator.
- bcSetDac: Sets oscillator DAC value.
- bcSetGain: Modifies on-board oscillator frequency control algorithm.
  
- bcSetJam: Enables or disables jamsync feature.
- bcForceJam: Forces TFP oscillator to jamsync.
- bcAdjustClock: Advances or retards TFP internal clock.
- 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: Returns a GPS data packet.
- bcGPSsnd: Sends a GPS receiver data packet.
- bcGPSMan: Manually sends and retrieves GPS receiver datapackets.
  
- 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.

The PCI cards have different user-configurable operating modes. Some of the above functions may not be available depending on the mode selected or if GPS is installed.

### LICENSING

The Symmetricom SDK is sold as a seat license. Distribution of embedded Symmetricom software in customer applications is royalty free.

### MINIMUM SYSTEM REQUIREMENTS

- Software/operating system: Linux Kernels 2.4, 2.6.
- Hardware: PCI/CPCI/PMC x86 processor.
- Memory: 32 MB.
- Development environment: GNU GCC recommended.

### PRODUCT INCLUDES

The SDK CD includes the interface library, example programs and source code utilizing the interface library, and a Developer's Kit Manual containing the library definitions.



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