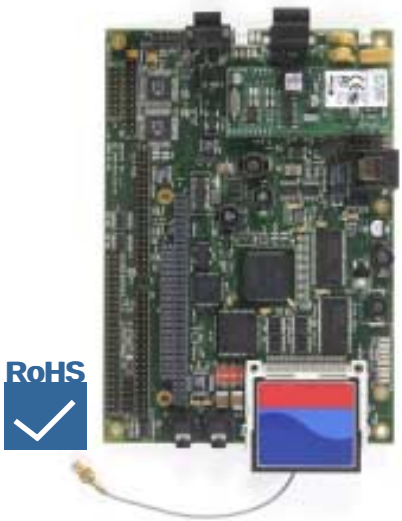
PXA270 EPIC Computer with Power Over Ethernet & Six Serial Protocols SBC4670



RoHS

Features

- ✔ 520MHz Low-power ARM processor w/ 800 x 600 Color LCD
- ✔ Power Over Ethernet and 10/100BASE-T Ethernet
- ✔ GPS module
- ✔ Socket Modem supporting GSM/ GPRS, CDMA, or Bluetooth
- ✔ CAN bus plus 5 serial ports
- ✔ Optional 14-bit A/D & D/A, 24 bits digital I/O

The SBC4670 brings the PXA270 ARM processor to an EPIC form-factor. The efficient XScale board has a maximum 720mA power draw at its full 520MHz speed. This low power draw enables the board to be powered by Power Over Ethernet technology. Other optional serial protocols supported on the SBC4670 include socket modem for GSM/ GPRS or Bluetooth wireless, industry standard CAN, GPS, five serial ports, and 10/100 BASE-T Ethernet. Extended temperature operation is available.

With up to 64MB of linear flash and 128MB of SDRAM, complex operating systems such as Linux and WindowsCE can run completely from soldered-on memory. Alternatively, the CompactFlash connector allows users other run time options.

For control applications, the onboard I/O includes 24 lines of digital I/O, three timer/counters, LCD support, debounced keypad interface, audio interface, and optional 14-bit A/D and D/A. Additional I/O can be plugged onto the SBC4670 using the PC/104 connector.

Software Support

Linux
Windows CE
VxWorks®
RTOS
C, compilers
[Items above in Section 6]

Compatible Hardware

PC/104 expansion cards
[Items above in Section 4]
RS232/RS485 devices
Custom

Mounting/Packaging

Standoffs, STDOFF01
[Items above in Section 5]
ENC104-4
FPKIT-6.4T
FPKIT-10.4T
Custom

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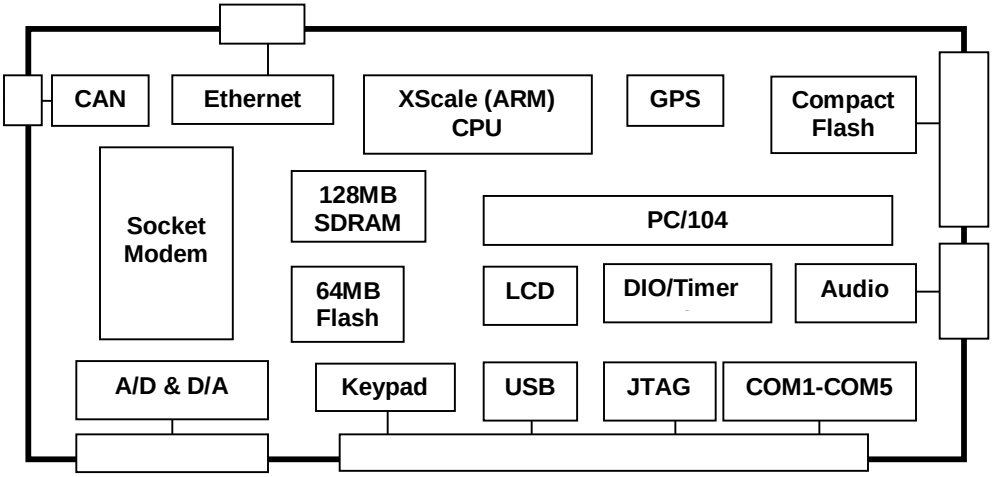

Technical Details:

The SBC4670 core is an Intel PXA270 XScale processor running at up to 520 MHz. This variation of the industry-standard ARM architecture is a RISC processor that is designed for low-power operation and still supports many user-interface options.

The PXA270 allows compatibility with 32-bit operating systems. The PXA270 also integrates many peripherals. A host USB port, an interrupt controller, three 16C550 UARTs, a watchdog timer, and an SDRAM controller are all present.

Complex user interface needs can be met with the built-in LCD interface, keypad inputs, and optional audio I/O. The LCD interface supports STN, DSTN, and TFT panels up to 800 x 600 pixels. The six keypad inputs are debounced and can be used for digital I/O if not needed for switches. An 82C55 digital I/O device provides an additional 24 lines of TTL I/O. Direction is programmable in two 8-bits groups and two 4-bit groups. The 82C55 TTL I/O lines can source and sink 2.5mA. A onboard 82C54 device provides three 16-bit timer/counters. The optional audio interface has line-level inputs and outputs and uses a standard AC97 CODEC.

The memory subsystem on the SBC4670 allows many programs to be run without any external storage. 128 Mbytes of synchronous DRAM (SDRAM) is more than sufficient for many complex programs and operating systems.

The 64-Mbyte Flash memory contains the bootloader, operating system, and user application code space. A portion of the flash can be allocated as a read/write flash drive.

If a larger program or data storage space is required, or if removability is needed, the CompactFlash interface can provide Gigabytes of storage.

Five serial ports allow communication with many different devices. COM1 through COM5 are 16C550-compatible UARTs (with transmit and receive FIFOs). Of these serial ports, COM1-COM4 have RS-232 transceivers, and have RTS and CTS modem control lines. COM5 is set up for half-duplex RS-485 communication with jumperable termination resistors.

The data acquisition system on the SBC4670 provides eight analog inputs configurable for ±5V

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or ±10V ranges. The sampling can be configured via jumpers to be triggered by an external input, a onboard pacer clock, or the GPS pulse per second output. If the GPS is used for triggering, multiple boards at various locations can have their data acquisition synchronized to within 190ns.

The 14-bit analog outputs have full-scale output range of 0V to 5V. The eight channels can be updated simultaneously.

The on-board GPS provides two benefits. It can determine the location of the system for mobile applications. Additionally, it has a pulse-per-second clock that is accurate to ±95ns. This can be used to synchronize data acquisition in geographically distant systems.

The Power Over Ethernet option provides all the necessary IEEE 802.3af functions including detection, classification, under voltage lockout and inrush control, providing the user with 12W of power to power the SBC4670. Users need only connect the SBC4670 to a Power Over Ethernet hub to power the board when this option is installed.

The Universal Socket on the SBC4670 is capable of being populated with a SocketModem GSM/GPRS, SocketModem CDMA, or a SocketWireless Bluetooth option. The SocketModems are complete wireless modems that include the controller, RF transceiver, SIM socket (GSM), and antenna connector in one module. The Socket Wireless Bluetooth is a wireless serial adapter that utilizes Bluetooth technology to provide a secure, standards-based wireless connection between a host and peripheral device.

Additionally, the SBC4670 CAN Bus interface allows fast, reliable industrial or automotive network capability. This interface supports CAN v2.0, parts A and B.

The PC/104 connector provides support for both 8-bit and 16-bit I/O expansion boards. The default configuration is non-stackthrough connectors, allowing the SBC4670 to be the bottom card in a stack. The stackthrough option (SBCOPT16ST) allows the SBC4670 to be plugged into a custom-designed OEM I/O board as a programmable controller.

For application development, the SBC4670 supports a number of alternatives. 32-bit operating systems such as Linux and Windows CE can be booted on the SBC4670. All have full tool suites available, including compilers and debuggers. Other operating systems may also be available.

For pre-configured sets of options, Micro/sys can provide OEMs with a single part number for ordering. In addition, custom versions of the SBC4670 are available. Please call Micro/sys Technical Sales for details.

Specifications:

Mechanical:
- ❑ EPIC standard
- ❑ 4.53" x 6.50"x .45" standard SBC4670
- ❑ Installed CompactFlash card extends past edge of board

Power Requirements:
- ❑ +5v ±5% at 720mA max (no options installed)
- ❑ Off-board 3.6v battery can supply power if sleep mode is enabled

Environmental:
- ❑ Operating range 0° to +70°C
- ❑ ET-version operating range -40° to +85°C
- ❑ -40° to +85°C storage
- ❑ 5%-95% relative humidity, non-condensing

Processor Core Section:
- ❑ Intel PXA270
- ❑ 416 or 520 MHz clock rate
- ❑ StrongARM v5TE instruction set

On-board Memory:
- ❑ 64-128MB Synchronous DRAM

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- ❑ 32-64MB of linear flash for bootloader, operating system, and application

CompactFlash Interface:
- ❑ Supports Type I or II CompactFlash
- ❑ Not hot-swappable

LCD Graphics Port:
- ❑ Interfaces to STN, DSTN, or TFT panels
- ❑ Resolutions up to 800 x 600

Keypad I/O:
- ❑ Six input signals with pull-up resistors
- ❑ Programmable debounce period
- ❑ Interrupt generated on key press

AC97 Audio I/O (option):
- ❑ Line in and line output connector

Watchdog Timer:
- ❑ When enabled the program must refresh watchdog timer periodically, or system will be reset
- ❑ Enabled through software

JTAG Interface:
- ❑ Debug unit provides hardware break points and 256-entry trace history buffer
- ❑ IEEE 1149.1 JTAG compatible

USB Interface:
- ❑ USB v1.1
- ❑ USB host controller

COM1-COM5 Serial Ports:
- ❑ Five async serial ports
- ❑ 16C550-compatible
- ❑ RTS and CTS modem controls on COM1-COM4
- ❑ RS232 on COM1-COM4
- ❑ Half-duplex RS485 on COM5 with jumperable termination

CAN Bus (option):
- ❑ Uses Intel 82527 CAN controller
- ❑ Supports CAN specification 2.0, Parts A and B

10/100BASE-T Ethernet Port:
- ❑ 10/100 Ethernet port
- ❑ Standard RJ45 connector

Digital I/O:
- ❑ 24 bits of TTL-level, byte selectable I/O from 82C55 chip
- ❑ 470-ohm current limiting resistors

Analog Inputs (option):
- ❑ Eight channels with 14-bit resolution
- ❑ Jumper for ranges of ±10V or ±5V
- ❑ Capable of simultaneous sampling
- ❑ 0.35µs track/hold acquisition time
- ❑ 2.4µs conversion time per channel
- ❑ Sampling can be triggered by timers, external pin, or GPS
- ❑ On-board sensor for temperature compensation

Analog Outputs (option):
- ❑ Eight channels with 14-bit resolution
- ❑ Output range of 0-5V
- ❑ Simultaneous output update

GPS (option):
- ❑ Supports three popular protocols: TSIP (Trimble Standard Interface Protocol), TAIP (Trimble ASCII Interface Protocol), and NMEA 0183.
- ❑ Horizontal Accuracy: <6m (50%), <9m (90%)
- ❑ Altitude Accuracy: <11m (50%), <18m (90%)
- ❑ Pulse-per-second Accuracy: ±95ns

Power Over Ethernet (option):
- ❑ Complete IEEE 802.3af interface
- ❑ Fixed 140ma Inrush Limit

Universal Socket Modems (option):
SocketModem 56K
- ❑ Data/fax over phone lines
- ❑ 300 to 56K bps data rates

SocketModem GSM/GPRS
- ❑ GPRS Class 10
- ❑ Packet data up to 85k

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- ❑ Dual-band 850/1900 or 900/1800 MHz
- ❑ Embedded TCP/IP Stack
- ❑ SIM socket

SocketModem CDMA

- ❑ CDMA2000 1xRTT
- ❑ Packet data up to 153bps
- ❑ CDMA IS-95-A
- ❑ Dual-band 800/1900 MHz CDMA

SocketWireless Bluetooth

- ❑ Supports speeds from 1.2Kbps to 920Kbps
- ❑ RF Range Class 1 100 meters

PC/104 Interface:

- ❑ Non-stackthrough PC/104 connectors
- ❑ Standard mounting holes
- ❑ 8-bit and 16-bit PC/104 module support
- ❑ I/O accesses supported, memory accesses not supported
- ❑ Stackthrough option available (SBCOPT16ST)

DK4670 Development Kit:

- ❑ Free with first SBC4670 purchase
- ❑ Breakout cable to COM1-COM4
- ❑ Download cable and utilities
- ❑ Documentation, schematics, sample software

External Connections:

- ❑ 40-pin header for COM1-COM4, USB, JTAG
- ❑ 40-pin header for LCD
- ❑ 40-pin header for Digital I/O and Timers
- ❑ 16-pin header for analog input
- ❑ 10-pin header for analog output
- ❑ 8-pin modular RJ45 jack for Ethernet
- ❑ 1/8" phono jacks for audio I/O
- ❑ 2-pin locking header for reset
- ❑ 3-pin removable terminal strip for power input
- ❑ 4-pin removable terminal strip for CAN bus

Ordering Information:

Single Board Computer:

SBC4670	PXA270 CPU, 520MHz, 64MB RAM, 32MB Flash, Ethernet
SBC4670-ET	PXA270 CPU, 416MHz, 64MB RAM, 32MB Flash, Ethernet, -40° to +80°C
DK4670	No charge development kit, available with first order only
SDK-Linux-4670	Linux Development kit (must also purchase 4670OPT50)
SDK-WinCE-4670	WinCE Development kit (must also purchase 4670OPT55)
4670OPT3	128MB SDRAM
4670OPT6	64MB Flash
4670OPT11	14-Bit 8-Channel A/D Converter
4670OPT12	14-Bit 8-Channel D/A Converter
4670OPT19	GPS Module
4670OPT20-POE	Power Over Ethernet
4670OPT22	CAN Bus Interface
4670OPT45	AC97 Audio Interface
4670OPT50	Bootloader and Linux in flash
4670OPT55	Bootloader and sample WinCE image in flash
4670OPT60	Socket Modem 56K
4670OPT61	Socket Modem GSM/GPRS
4670OPT62	Socket Modem CDMA
4670OPT63	Socket Wireless Bluetooth

Add –ET to option for extended temp operation

Related Products:

CA4124	Breakout cable to four DB9 COM port connectors
BA4124	Breakout assembly to four DB9 COM port connectors, RS485, USB, JTAG
SBCOPT16ST	Stackthrough PC/104
CF-FL128	128MB CompactFlash Card
CF-FL256	256MB CompactFlash Card
CF-FL512	512MB CompactFlash Card

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Cables nominally 15”, other lengths available

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