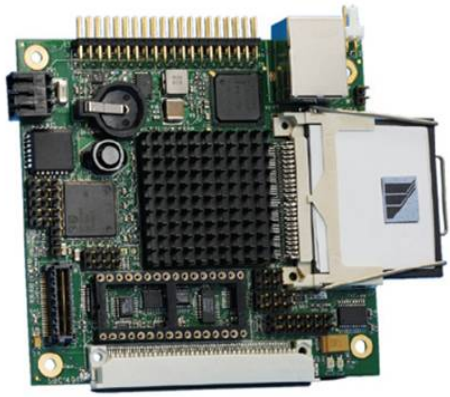
486/586 StackableUSB™ Computer with CompactFlash & Flat Panel SBC1496



Features

- ✓ 120 or 133MHz
- ✓ CRT and flat panel output
- ✓ 64MB SDRAM
- ✓ StackableUSB 2.0 with six (6) hosts in stackable format or plug/cable format for remote client devices
- ✓ CompactFlash connector
- ✓ 10/100BASE-T Ethernet
- ✓ Two (2) serial ports
- ✓ -40° to +85° operation

StackableUSB

RoHS COMPLIANT

The SBC1496 packs a fast 486DX processor, lots of memory, and expandable storage onto a 104™ Form Factor industry standard. This PC compatible CPU includes the StackableUSB interface, which enables the SBC1496 to act as the host device for up to four (4) USB devices which can directly stack onto the CPU without cables or be used with cables for USB devices located remotely to the CPU. The SBC1496 has six (6) USB ports, four (4) OHCI at version 2.0, and two (2) OHCI at version 1.1.

The SBC1496 supports CRTs, color TFT flat panels, and touchscreens making it ideal for OEM applications requiring graphical interfaces. Additional I/O includes digital I/O lines, dual serial ports, EIDE, LPT, keyboard, and mouse. The on-board Ethernet controller enables this CPU to connect directly into Ethernet networks.

With 1MB of on-board flash, accessible as a read/write disk, and 64MB of SDRAM, many large programs can be run from memory. However, if additional storage capacity is required, the on-board CompactFlash connector can provide gigabytes of removable program and data storage.

Software/Driver Support

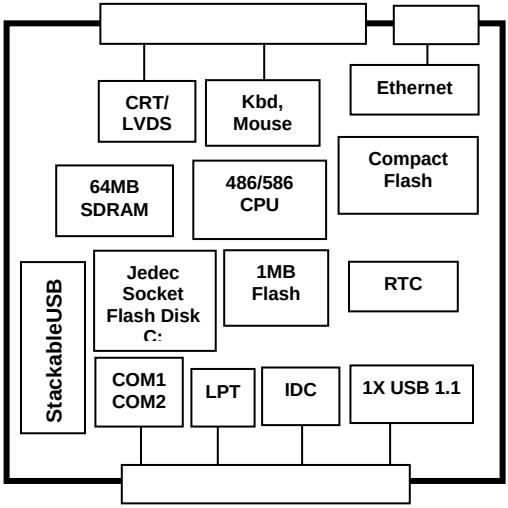
DOS emulation; MSDOS 6.22
Linux
Windows C
RTOS; Comm Library;
CommBLOK™; PID loop library; PidBLOK™
C, compilers

Compatible Hardware

StackableUSB Client devices
RS232/RS485 devices

Mounting/Packaging

Standoffs, STDOFFUSB



Technical Details:

The SBC1496 core is an ST Microelectronics STPC Atlas processor running at 120 or 133MHz. The STPC 486DX processor core is clocked at a rate of 133MHz, and includes hardware floating-point math. While other 486DX systems access RAM with a 32-bit data bus, the Atlas accesses RAM with a 64-bit wide data bus, offering performance similar to low-end Pentium-based designs.

The Atlas allows compatibility with both real mode and 32-bit protected mode programs. The Atlas also integrates many PC-compatible peripherals. Dual USB ports, a keyboard and mouse controller, an EIDE controller, two (2) cascaded 82C59A interrupt controllers, dual 16C550 UARTs, three (3) timer/counters (82C54 compatible), and a dual DMA controller are all present. A hardware accelerated VGA controller, with support for both CRTs and TFT panels, is also implemented.

The SBC1496 supports the new StackableUSB specification which allows it to control up to five (5) StackableUSB peripheral cards without the use of a hub. This new stacking architecture provides a rugged StackableUSB interconnect architecture that eliminates the need for standard USB connectors and cables.

The memory subsystem on the SBC1496 allows many programs to be run without any external storage. 64Mbytes of synchronous DRAM (SDRAM) is more than sufficient for many complex, protected-mode programs and operating systems.

The 1Mbyte flash memory chip contains both the BIOS and a user application code space. The user space can be configured as a 768k read/write flash disk.

If a larger program or data storage space is required, or if removability is needed, the CompactFlash interface can provide gigabytes of storage. CompactFlash is used in the True IDE mode, where it is register-compatible with an EIDE hard drive. Thus, it does not require any special drivers for most operating systems.

The user byte-wide Jedec socket can accept a number of different devices. EPROM, 5v Flash, DiskOnChip™, or SRAM can all be plugged in. The SRAM can be battery-backed, which makes for fast storage for data that is updated often.

The VGA controller supports resolutions up to 1024 x 1024. It includes hardware acceleration for fast graphic updates. The output can drive a standard RGB CRT monitor, and an LCD flat panel display. Active matrix (TFT) LCD panels are supported, in 18-bit color. The LVDS interface is compatible with many displays and ensures that the signal integrity is maintained.

The Phillips 1561 USB 2.0 controller integrates USB OHCI cores, and Hi-Speed USB EHCI cores, that are compliant with USB 2.0 and USB 1.1 specifications. The 1561 can handle Hi-Speed USB transfer speed modes: High-speed (480Mbits/s), full-speed (12Mbits/s) and low-speed (1.5Mbits/s). The 1561 provides four (4) downstream ports that enable simultaneous connections of USB devices at different speeds.

Two (2) serial ports allow communication with many different devices. COM1 and COM2 are 16C550-compatible UARTs (with transmit and receive FIFOs). These serial ports are capable of speeds up to 115200 baud, have RS232 transceivers, and have RTS and CTS modem control lines. Additionally, COM1 is configurable for half-duplex RS485 communication with jumperable termination resistors.

The SBC1496 can support application development under numerous strategies. If 16-bit DOS or DOS-extended software is sufficient, Micro/sys offers a free DOS-compatible operating system preinstalled on the SBC1496. For a small royalty fee, true MSDOS 6.22 can be preinstalled. Powerful, cost-effective remote debug capabilities are provided through Borland's Turbo Debugger.

For true 32-bit application development, the SBC1496 supports a number of alternatives. Due to its PC-compatibility, 32-bit real time operating systems (RTOS) such as Linux, PharLap® ETS, and VxWorks® can be booted on the SBC1496. All support 32-bit linear protected mode operation, and have full tool suites available, including compilers and debuggers.

The firmware suite that is preinstalled in flash on the SBC1496 includes an industrial BIOS that allows configuration of many of its features. In addition to allowing configuration of the normal PC-compatible peripherals such as floppy drives and hard drives, it allows 768k of the system flash to be used as a read/write wear-leveled flash drive. Another feature of the BIOS is its ability to redirect the console out COM1, COM2, or the VGA/keyboard so that even "headless" systems can have a user console when needed for configuration or debug.

For pre-configured sets of options, Micro/sys can provide OEMs with a single part number for ordering. In addition, custom versions of the SBC1496 are available. Please call Micro/sys Technical Sales for details.

Specifications:

Mechanical:

- ❑ PC/104 mounting holes
- ❑ 3.55" (plus I/O region) x 3.775" x .6"
- ❑ Installed CompactFlash card extends past edge of board opposite the StackableUSB connector
- ❑ If installed, Ethernet connector on top side has height of .535"

Power Requirements:

- ❑ +5v ±5% at 1.8A max, 1.3A typical (with Ethernet)
- ❑ +12v required only if used by PC/104 modules

Power Connector	
Pin	Signal
1	+5V
2	+12V
3	GND

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

Processor Core Section:
- ❑ STPC Atlas
- ❑ 120 or 133MHz clock rate
- ❑ Hardware floating point math
- ❑ AT-compatible timers, interrupts, DMA

On-Board Memory:
- ❑ 64MB Synchronous DRAM based at address 0
- ❑ 1MB of flash at top of memory map with BIOS and operating system installed; 768k available for user application
- ❑ JEDEC 32-pin socket for 128k/512k SRAM for battery-backed RAM, or DiskOnChip

Watchdog Timer:
- ❑ Program must refresh watchdog timer periodically, or system will be reset
- ❑ Enabled through software

Keyboard, Mouse, and Speaker:
- ❑ PS/2-compatible keyboard port
- ❑ PS/2-type mouse port
- ❑ AT-compatible TTL speaker output

SVGA Video Output:
- ❑ CRT and color LCD outputs
- ❑ Resolutions to 1024 x 1024
- ❑ Direct connect to TFT flat panels
- ❑ 3.3V 18-bit panel color support
- ❑ LVDS (PanelLink/FPD-Link) drivers

USB:
- ❑ Four (4) USB 2.0 OHCI ports, StackableUSB connector
- ❑ Transfers at 480, 12, or 1.5Mbit/sec
- ❑ One (1) USB 1.1 OHCI port, StackableUSB connector
- ❑ One (1) USB 1.1 OHCI port, Main I/O connector

COM1-COM2 Serial Ports:
- ❑ Two (2) async serial ports, PC- compatible
- ❑ 16550-compatible
- ❑ RTS and CTS modem controls
- ❑ RS232 on all channels
- ❑ COM1 RS485 half duplex

Serial Port Connector

Pin	Signal	Signal	Pin
1	RX COM1	RTS COM1	2
3	TX COM1	CTS COM2	4
5	-	-	6
7	GND	RX COM2	8
9	RTS COM2	TXCOM2	10
11	CTS COM2	-	12
13	-	GND	14

User Interface Connector

Pin	Signal	Signal	Pin
1	GND	TXCLK+	2
3	TXCLK-	GND	4
5	TXOUT2+	TXOUT2-	6
7	GND	TXOUT1+	8
9	TXOUT1-	GND	10
11	TXOUT0+	TXOUT0-	12
13	GND	GND	14
15	TFT VCC	TFT VCC	16
17	TFT PWM	TFT EN3.3V	18
19	GND	GND	20
21	MOUSE CLK	MOUSE DTA	22
23	+5V	+5V	24
25	KBD DTA	KBD CLK	26
27	SPKR	-	28
29	-	I2C CLK	30
31	12C DTA	HSYNC	32
33	GND	VSYNC	34
35	GND	BLUE	36
37	GND	GREEN	38
39	GND	RED	40

Digital I/O:
- ❑ Six (6) LVTTL bi-directional signals
- ❑ 5v-tolerant

Parallel Printer Port:
- ❑ Bi-directional LPT standard

Real Time Clock:
- ❑ RTC with on-board battery
- ❑ Driver software in BIOS

CompactFlash Interface:
- ❑ Supports Type I CompactFlash
- ❑ Operates in True IDE mode
- ❑ CF+ cards not supported
- ❑ Not hot-swappable

Development Kit:
- ❑ SBC with all options installed
- ❑ Complete cable set
- ❑ Documentation, schematics, sample software

External Connections:
- ❑ 80-pin connector for IDE, USB, LPT, and digital I/O
- ❑ 14-pin header for COM1-COM2
- ❑ 40-pin header for CRT, flat panel, key-board, mouse, speaker
- ❑ 3-pin removable terminal strip for power input

Main I/O Connector

Pin	Signal	Signal	Pin
A1	GND	IDE RESET#	B1
A2	USB D0-	GND	B2
A3	USB D0+	IDE D7	B3
A4	USB VCC	IDE D8	B4
A5	GND	IDE D6	B5
A6	NC	IDE D9	B6
A7	NC	IDE D5	B7
A8	USB VCC	IDE D10	B8
A9	GND	IDE D4	B9
A10	GPIO0	IDE D11	B10
A11	GPIO1	IDE D3	B11
A12	GPIO2	IDE D12	B12
A13	GPIO3	IDE D2	B13
A14	GPIO4	IDE D13	B14
A15	GPIO5	IDE D1	B15
A16	GND	IDE D14	B16
A17	-	IDE D0	B17
A18	GND	IDE D15	B18
A19	RS485+	GND	B19
A20	RS485-	-	B20
A21	+5V	IDE DRQ	B21
A22	LPT STB#	GND	B22
A23	LPT AFD#	IDE IOW#	B23
A24	LPT D0	GND	B24
A25	LPT ERR#	IDE IOR#	B25
A26	LPT D1	GND	B26
A27	LPT INIT#	IDE IORDY	B27
A28	LPT D2	GND	B28
A29	LPT SLIN#	IDE DACK#	B29
A30	LPT D3	GND	B30
A31	GND	IDE IRQ	B31
A32	LPT D4	IDE IO16#	B32
A33	LPT D5	IDE DA1	B33
A34	LPT D6	IDE PDIAG#	B34
A35	LPT D7	IDE DA0	B35
A36	LPT ACK#	IDE DA2	B36
A37	GND	IDE CS1#	B37
A38	LPT BUSY	IDE CS3#	B38
A39	LPT PE	IDE DASP#	B39
A40	LPT SLCT	GND	B40

Ordering Information:

OEM Single Board Computers:

SBC1496	486/586 CPU, 133MHz, 64MB RAM, 1M Flash
SBC1496-1	486/586 CPU, 133MHz, 64MB RAM, 1M Flash, 10/100 BASE-T Ethernet
SBC1496-ET	486/586 CPU, 120MHz, 64MB RAM, 1M Flash, -40° to +85°C operating temperature
SBC1496-1-ET	486/586 CPU, 120MHz, 64MB RAM, 1M Flash, 10/100 BASE-T Ethernet, -40° to +85°C operating temperature
CS1496	Complete cable set
1496OPT40	Color TFT (LVDS) panel support

Related Products:

CA4089	Breakout cable to two (2) COM port connectors
CA4097	Breakout cable for EIDE, USB, LPT, Digital I/O
CA4098	Breakout cable for CRT, Kbd, mouse, speaker, TFT panel
KA1010-1	Keyboard, Mouse breakout
RAM128	128RAM device
RAM512	512RAM device
SBCOPT16ST	Stackthrough PC/104
CF-FL128	128MB CompactFlash Card
CF-FL256	256MB CompactFlash Card
CF-FL512	512MB CompactFlash Card
USB3368	8 port USB adapter board with StackableUSB stackthrough connector

Cables nominally 15", other lengths available
StackableUSB trademark Micro/sys, Inc.

Development Board Kits*

DK1496-1-ET-x86	486/586 CPU, 120MHz, 64MB RAM, 1M Flash, 10/100 BASE-T Ethernet, -40° to +85°C operating temp, DOS-installed Windows-ready development kit
DK1496-1-ET-WinCE	486/586 CPU, 120MHz, 64MB RAM, 1M Flash, 10/100 BASE-T Ethernet, -40° to +85°C operating temp, WinCE-ready development kit
DK1496-1-ET-Linux	486/586 CPU, 120MHz, 64MB RAM, 1M Flash, 10/100 BASE-T Ethernet, -40° to +85°C operating temp, Linux-ready development kit

**See Development Kit Specifications*