



PIC32™ Microcontroller with Ethernet, CAN, High Current DIO, 12-Bit Analog USB3031



Features

- ✓ PIC32 CPU, 80MHz/105 DMIPS
- ✓ 512KB Flash, 128KB RAM Memory
- ✓ 1 Ethernet, 1 CAN, 1 RS232, 1 USB
- ✓ 20 DIO, 1 RTC, Temp Sensor
- ✓ 9-Channel, 10-bit A/D, plus 8-Channel, 12-bit A/D option
- ✓ Optional 4-Channel, 12-bit D/A
- ✓ MPLAB® IDE tools
- ✓ -40° to +85°C operation



Ideal for data collection and communication, the USB3031 combines web hosting, networking, and industrial control on a compact PC/104 footprint. Multiple on-board protocols, including 10/100 Ethernet, CAN, RS232, RS485, USB, I2C, and SPI, makes protocol conversion a snap. Microchip's PIC32 gives 105 DMIPS performance under 100mA of power, making the USB3031 battery friendly.

For control, there are (16) 200mA digital I/O lines as well as (4) digital output lines with 500mA sink. USB3031 has 9 channels of 10-bit A/D and an optional 8 channels of 12-bit A/D that, plus an optional (4) channels of 12-bit D/A. Other industrial I/O features include three timers, a programmable LED, battery-backed real-time clock, watchdog timer, and a temperature sensor. I/O expansion is available with StackableUSB™, which accommodates up to (10) client industrial I/O boards.

USB3031 connects to desktop PCs and laptops via ICSP for development with Microchip's easy-to-use MPLAB® IDE software tools.

UB3031 is the ideal solution for cost-sensitive control applications requiring supervisory management, mid-range data acquisition, and peripheral control.

Software/Driver Support

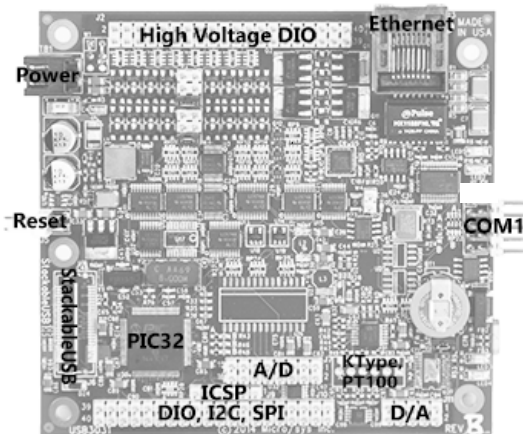
- Windows XP, Vista
- MPLAB IDE
- MPLAB C32 C Compiler
- USB Host stack
- TCP/IP Stack with SSL
- 16 and 32-bit File System
- Sample software

Compatible Hardware

- StackableUSB Client single board computer and microcontroller
- PC host desktops and laptops
- SPI, I2C, UART
- ICE
- ICD2

Mounting/Packaging

- 104™ Form Factor
- Standoffs, STDOFFUSB



Specifications:

Mechanical:

- PC/104 Form Factor
- 3.550" x 3.775" (plus I/O region)

Power Requirements:

- +5v \pm 5% at 100mA typical, or
- 6.3V to 36V input

Environmental:

- 40° to +85°C operating
- 40° to +85°C storage
- 5%-95% relative humidity, non-condensing

Processor:

- MIPS M4K® 32-bit Core
- 80MHz, 105 DMIPS
- 5 Stage pipeline, 32-bit ALU
- Single cycle multiply and high-performance divide unit
- User and kernel modes to enable robust embedded system
- Flash prefetch cache module
- 512KB flash, 128KB SRAM

EEPROM:

- 256Kbits EEPROM

Ethernet Port:

- (1) 10/100BASE-T Ethernet port
- Standard RJ45 connector
- On-board PHY
- Factory installed MAC address

Temperature Sensor:

- 55° to +125°C sensing range
- \pm 2°C accuracy on -25°C to +100°C Range
- K-type interface
- PT100 interface

CAN Bus:

- (1) CAN controller from PIC32
- Supports CAN specification 2.0B

USB:

- (1) Full-Speed On-The-Go Type A to Mini-AB USB 2.0 Host port, transfers at 12Mb/s or 1.5Mb/s
- StackableUSB, Host or Client (Option)

Serial Ports:

- (1) RS232 on COM1
- (1) RS485 configurable (Option)

Watchdog Timer:

- Program must refresh watchdog timer periodically or system will be reset
- Enabled through software

Real Time Clock:

- (1) Battery-backed Real Time Clock

LEDs:

- (1) User programmable LED

PIC32 Digital Interfacing:

- 4-Channel Hardware DMA Controller with Automatic Data Size Detection
- USB 2.0 Compliant Full-Speed Controller with dedicated DMA Channel
- (2) I2C Modules
- (1) UART Module with:
 - RS232 and LIN 1.2 support
 - IrDA® with On-Chip Hardware encoder and decoder
- Parallel Master and Slave port
- (5) 16-bit Timers/Counters (two 16-bit pairs combine to create two 32-bit timers)
- (5) Capture Inputs
- (5) Compare/PWM Outputs
- (5) External Interrupt Pins

Digital I/O:

- (16) high current digital inputs and/or open drain outputs, 200mA sink
- (4) high current outputs, 500mA sink
- Separate pull-up voltages
- Configurable open-drain output
- High-Speed I/O pins capable of toggling at up to 80MHz
- High-Current Sink/Source (18 mA/18 mA) on all I/O pins

Analog Features:

- 9-Channels, 10-bit A/D
- 8-Channels, 12-bit A/D (Option)
- 4-Channels, 12-bit D/A (Option)
- Conversion During Sleep and Idle
- (2) Analog Comparators
- 5.5V tolerant input pins (digital pins only)

Debug Features:

- 2-wire ICSP interface with unobtrusive Access and Real-time Data Exchange with Application
- 4-wire MIPS Standard Enhanced JTAG interface
- Unobtrusive Hardware-Based Instruction Trace
- IEEE Std 1149.2 Compatible (JTAG) Boundary Scan

External Connections:

- 2-pin power terminal
- 2-pin reset header
- RJ45 Ethernet
- USB OTG Mini-AB
- 6-pin ICSP/JTAG debug port
- 6-pin header for CAN, K-Type and 3 wire PT100 Interface
- 10-pin RS232, RS485 header
- 16-pin A/D header
- 10-pin D/A header
- (2) 40-pin headers for I/O, peripherals
- StackableUSB, Host or Client (Option)

Development Kit:

- Base module
- Complete cable set
- Microchip MPLAB ICD3 Debugger
- Documentation, sample software

Ordering Information:

OEM Modules:

USB3031	PIC32 Microcontroller
3031OPT8	COM2 RS485
3031OPT11	8-Channel, 12-bit A/D
3031OPT12	4-Channel, 12-bit D/A
3031OPT60-1	StackableUSB Host (Top)
3031OPT60-2	StackableUSB Client (Bot)

Development Board Kits*

DK3031	PIC32 Microcontroller with Ethernet, CAN, DIO, and 12-Bit Analog Development Kit
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*See Development Kit Specifications