



PIC32™ Microcontroller with 122 DIO, 10-Bit Analog, plus LCD and Keypad USB3033



Features

- ✓ PIC32 CPU, 80MHz/105 DMIPS
- ✓ 512KB Flash, 128KB SRAM Memory
- ✓ 1 USB On-the-Go
- ✓ 1 CAN, 2 RS232
- ✓ 122 DIO, 5 Timers, Real Time Clock
- ✓ 14-Channel, 10-Bit A/D
- ✓ LCD, Keypad Interface
- ✓ MPLAB® IDE tools
- ✓ -40° to +85°C operation



The USB3033 is designed for data collection and industrial applications requiring communication functions and alpha numeric output. Condensed onto a PC/104 footprint, communication interfaces include CAN, RSS232, USB, I2C, and SPI, making protocol conversion a snap. Powered by Microchip's PIC32 microcontroller, USB3033 gives 105 DMIPS performance consuming under 100mA of power which can be supplied by batter.

Onboard industrial I/O includes 10-bit A/D, four programmable LEDs, 122 DIO from 82C55s, five timers, real time clock, and a watchdog timer. A USB 2.0 On-the-Go port provides the plug and play advantages of USB for memory expansion, data download, or peripheral expansion.

For development, USB3033 is supported by Microchip's easy-to-use MPLAB® IDE software tools and connects to a desktop or laptop PC via ICSP.

USB3033 is the ideal solution for cost-sensitive control applications requiring supervisory management, mid-range analog, and peripheral control common to most industrial automation applications.

Software/Driver Support

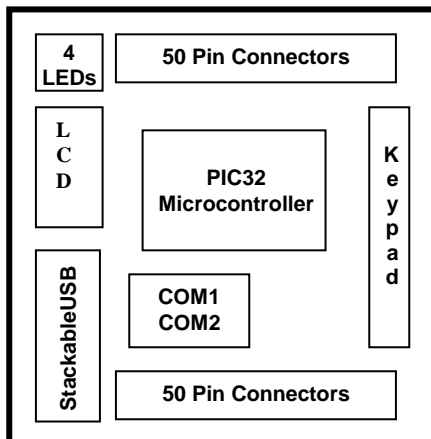
- Windows XP, Vista
- MPLAB IDE
- MPLAB C32 C Compiler
- USB Client stack
- TCP/IP Stack with SSL
- Graphics & audio library
- 16 and 32-bit File System
- Sample software

Compatible Hardware

- StackableUSB Host 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

Environmental:

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

Processor:

- MIPS32® M4K™ 32-bit Core
- 80MHz, 1.56 DMIPS/MHz
- 5-stage pipeline, 32-bit ALU
- Single-Cycle Multiply and High-Performance Divide Unit
- User and Kernel Modes to Enable Robust Embedded System
- Prefetch Cache Module to Speed Execution from flash
- 512KB flash, 128KB SRAM

EEPROM:

- 256Kbits EEPROM

LCD Interface:

- 20-pin header pinout to 4x40 LCD Character Display

LCD Adjustable Voltage Supply:

- 7V to -22V contrast voltage adjustable supply
- Constant current backlight voltage source

Keypad Interface:

- 19-pin header pinout to 4x5 Keypad

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
- (1) StackableUSB, Host or Client (Option)

Serial Ports:

- COM1 and COM2 RS232

Watchdog Timer:

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

Real Time Clock:

- ❑ (1) Real Time Clock

LEDs:

- ❑ (4) User programmable LEDs

PIC32 Digital Interfacing:

- ❑ 4-Channel Hardware DMA Controller with Automatic Data Size Detection
- ❑ USB 2.0 Compliant Full-Speed Controller
- ❑ USB has a Dedicated DMA Channel
- ❑ (2) I2C Modules
- ❑ (2) UART Modules with:
 - RS232 and LIN 1.2 support
 - IrDA® with On-Chip Hardware Encoder and Decoder
- ❑ Parallel Master and Slave Port
- ❑ Hardware Real-Time Clock/Calendar
- ❑ (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:

- ❑ (72) lines of 82C55 TTL-level digital I/O, 2.5mA source/sink, with:
 - Software-configurable pull down/up on I/O for initialization after reset
 - 470-ohm current limiting resistors
 - Individual grounds for most signals
- ❑ (50) lines from PIC32
- ❑ 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:

- ❑ 14-Channel, 10-bit A/D
- ❑ 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
- ❑ 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
- ❑ 14-pin COM1 and COM2 header
- ❑ (2) 50-pin headers for I/O, peripherals
- ❑ (3) 26-pin headers for 82C55 I/O
- ❑ 20-pin LCD Display Interface header
- ❑ 19-pin Keypad header
- ❑ 6-pin ICSP/JTAG debug port
- ❑ StackableUSB, Host or Client (Option)

Development Kit:

- ❑ Base Module
- ❑ Complete cable set
- ❑ Documentation, schematics, sample software

Ordering Information:

OEM Modules:

- | | |
|---------|---|
| USB3033 | Microchip PIC32 Client Microcontroller with 122 DIO, 10-Bit Analog, plus LCD and Keypad |
|---------|---|

Development Board Kits*

- | | |
|--------|---|
| DK3033 | PIC32 Host StackableUSB Microcontroller Development Kit |
|--------|---|

*See Development Kit Specifications