OCTAGON SYSTEMS
• 6510 W. 91st Ave • Westminster CO 80031 • USA
* PH: 303-430-1500 * FAX 303-412-2050

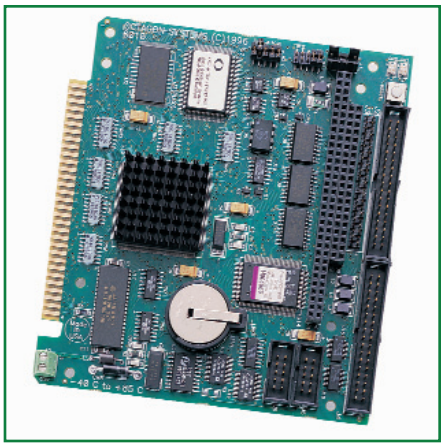
- Embedded rugged computers
- –40° to 85° C
- Embedded operating systems
- COTS—high reliability

Reliability in the toughest environment

The 6010 PC microcontroller is a 386–powered Micro PC™ computer with the essential I/O functions for embedded applications. It integrates serial ports, digital I/O, floppy and hard drive, and LPT1 into a single card. The 6010 is ideal for applications in transportation, security, military, communications, distributed control, point–of–sale, ticketing machines, weighing equipment, and other similar applications. The low–power requirements make it suitable for situations where battery life or heat dissipation is a concern.

The 6010 comes loaded with ROM DOS 6.22, and is ready to go right out of the box. The built–in INT17 functions for DOS provide easy access to the enhanced features such as watchdog timer, read/writes to serial EEPROM, and user jumper.

Micro PC cards plug into any ISA expansion slot or Micro PC card cage, or can be mounted with standoffs. The Octagon family of Micro PC controllers, expansion cards, and card cage provide a complete solution for embedded applications.



Octagon products are designed and manufactured under the supervision of an ISO 9001-2000 certified quality management system. The 6010 will withstand high shock and vibration, and operates in temperature ranges from –40° to +85° C. This rugged single board computer will provide years of reliable service in the most challenging environments.

Features

System:

- CPU: ALi M6117 386SX, medium–performance, low–power microprocessor with a clock speed of 40 MHz. The ALi contains the complete x86 core, and is 100 percent object code compatible with the Intel x86 microprocessors.
- Super I/O: Controls the two 16C550 COM ports, floppy and hard drives, and LPT1.
- Operating system: Preloaded with Datalight ROM DOS 6.22. It fully compatible with early versions of Windows® and QNX.
- BIOS: AT BIOS with industrial extensions. The BIOS is fully PC–AT compatible. It supports two IDE hard drives, along with keyboard, mouse, and other PC peripherals. The BIOS also has additional Octagon BIOS extensions for watchdog timer, serial EEPROM access, and user jumper. At power–on, the BIOS performs a Power–On–Self–Test (POST) and outputs the results via an LED.
- DRAM: 4 MB surface–mount fast page DRAM.
- Data storage: A 1 MB flash contains software, with 512 KB available to user. SSD2 is a 128 KB SRAM for data storage with battery backup. Both appear as a hard drive to the system.
- Watchdog timer: A fail–safe against program crashes or processor lockups. It has a timeout period of 1.6 seconds. INT17 calls are used to enable, strobe, and disable the watchdog timer from your application. If the timer expires, it performs a hardware reset.

Drives:

- EIDE: Industry–standard 44–pin, 2–mm connector for EIDE devices such as hard drives, EIDE flash drives or CR–ROMs. For those hard drives that use a 40–pin connector Octagon has a 44–pin to 40–pin adapter cable. An EIDE cable connects to the 6010 connector and provides two connectors for the devices. The individual devices have a switch to designate them as a master or a slave device. The IDE channels are ATA–4 compliant.
- Floppy: On–board floppy drive controller supports floppy drives through a standard 34–pin connector.

I/O:

- Keyboard: PS/2 (not required for operation).
- PC/104 interface:16–bit interface on the 8.33 MHz ISA Bus. Up to four cards can be stacked on these connectors. The 6010 provides +5 VDC through the PC/104 interface to power expansion cards.
- LPT1: IEEE 1248A compliant and provides EPP and ECP modes. It can also be configured as a floppy drive interface or as digital I/O. Industry–standard interfaces allow it to be used for matrix keypads, LCD displays, or opto racks.
- Digital I/O: The LPT port can be configured as 17 lines of digital I/O. These lines will interface with logic devices, switch inputs, LEDs, and industry–standard opto module racks. All lines can be programmed as inputs or outputs according to the PC XT/AT standard. Octagon has a variety of opto modules and termination boards for easy access for field wiring.
- COM1 and COM2: Two 16C550–compatible serial channels are provided. Each channel is an eight–wire, full duplex, asynchronous RS–232C interface with a double 16–bit FIFO buffer. The baud rate is programmable with rates from 9600 bps to 115.2 kbps. The ports provide backdrive protection as well as ESD protection according to IEC 1000, level 3; contact discharge of ±6 kV, and air–gap discharge of ±8 kV.

Mounting:

- Panel mounting: You can panel mount the 6010 using eight #4–40 standoff and screws (not provided). The 6010 SBC User's Manual shows the center–to–center mounting hole dimensions.

User interfaces:

- Monitors: Can be connected to the 6010 through Micro PC or PC/104 expansion cards.
- Serial console: You can establish communication with the 6010 using a host computer as a serial console. COM1 is connected to a COM port on the host PC. A program such as Hyperterminal on the host PC directly communicates to the 6010. This allows you to download programs or configure the 6010.

Technical specifications

System:

- ALi M6117 386SX
- 40 MHz clock speed, jumperable to 25 MHz
- PC–compatible DMA controllers, interrupt controllers, and timers
- Datalight ROM–DOS 6.22 in ROM
- Phoenix BIOS with industrial extensions
- 4 MB surface–mount fast page DRAM
- Interrupt routing for flexibility
- 768 words available in serial EEPROM for user
- Watchdog timer with 1.6 seconds timeout, software controlled
- Power management, for battery–operated environments
- Boots from on–card solid–state disk, floppy, or hard drive

Drives:

- Solid–state disk 0 (SSD0), 1 MB flash contains software, with 512 KB available to user; appears as hard drive to system
- SSD2, 128 KB SRAM for data storage with battery backup; appears as hard drive to system
- Standard EIDE interface supports two devices (CD–ROM, hard drive, EIDE flash drives, other EIDE devices)
- Floppy interface supports two device

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I/O:

- 17 digital I/O lines, accessed through LPT1
- Two eight–wire serial ports; 16C550 compatible, RS–232, 16–byte FIFO buffered, ESD protected
- PC/104 16–bit ISA Bus

User interface:

- CRT through PC/104 or Micro PC expansion card
- PS/2 keyboard (requires custom cable or breakout board)
- Speaker port
- Serial console through COM1 to host computer

Connectors:

- Standard 44–pin EIDE connector
- Standard 34–pin floppy connector
- 10–pin connector for each COM port; Octagon cable provides standard DB–9 interface
- 2–pin connector for power, 4–pin connector for AT battery
- Standard PC/104 connector
- Auxiliary I/O connector is 34–pin header; an optional breakout board provides LPT1, keyboard, and AT battery through this connector

Mounting:

- Micro PC card cage or ISA expansion bus
- Panel mounted with standoffs
- Accepts PC/104 cards

Environmental:

- AT battery port for real time clock (no battery necessary for operation)
- Size 4.5" x 4.9", Micro PC form factor
- Power 5V ±0.25V @ 1.0A maximum; full 40 MHz operation 480 mA typical, suspend mode 167 mA typical
- –40° to +85° C operating range at 25 MHz
- 0° to +60° C operating range at 40 MHz
- Relative humidity 5 to 95%, noncondensing

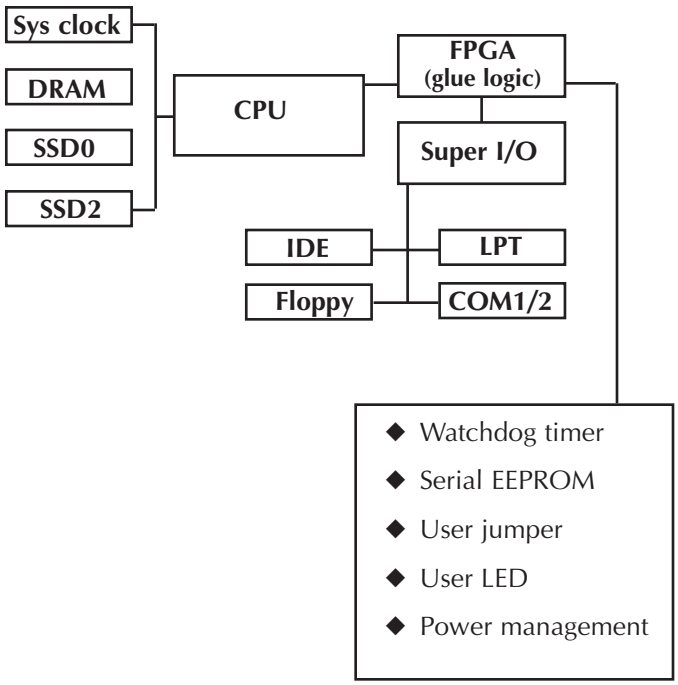
Ordering information

#4735 6010 PC microcontroller, manual and utilities
#3970 2430 PC/104 SVGA CRT/flat panel card

Accessories

#2746 VTC–9F, serial cable, 10–pin female
#2472 VTC–9M, serial cable, 10–pin male
#4080 IDE cable, 44–pin to 40–pin
#2470 Null modem adapter
#4808 PCA–36, Centronics printer cable, 36–in.
#4697 BOB Breakout board, providing LPT, PS/2 keyboard, AT battery, and two opto–isolated inputs

Functional diagram



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