

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

RMB-S CORE™ rugged mobile server for extreme environments

The RMB-S CORE is an advanced mobile computer/server system with the most efficient fanless system available. This allows true industrial temperature range operation at CPU speeds of 1.5 GHz.

The RMB-S is a part of Octagon's growing family of CORE SYSTEMS™ that address reliability and versatility in harsh environments. The tightly integrated design intimately combines the electrical, thermal and mechanical components into a complete system with no compromise to any one segment. The Pentium platform operates equally well under a Windows® or Linux environment. The built-in, mobile power supply operates over a five-to-one input range with dependable protection from transients and reverse voltage. It also affords the critical brown-out protection, often missing in mobile supplies.

The RMB-S was designed for applications where severe environment and high performance meet, requiring a COTS-level solution. The interior electronics use high reliability interconnects rather than cables to minimize complexity and maximize reliability. Various heat-producing components are directly coupled to the case for maximum heat transfer. The RMB-S is designed to absorb the shock and vibration in transportation, marine and aeronautical environments.

Fast, easy development platform

The RMB-S is designed to accelerate the system design process. By using a stock RMB-S, prototypes can be available in days to weeks rather than months. Your project meets its schedules and budgets without the high NRE and long lead times associated with custom products.

This enclosure offers a solid platform on which to build your application. Expansion can be through Mini PCI and/or PC/104 modules.

The option panel lets you prototype custom I/O for proof-of-concept, both for your development team and for potential customers. The packaging and interconnects are already done. Your time can be spent on completing the systems rather than starting from a paper spec.

More importantly, software developed for the RMB-S can be used over and over again, to develop families of products by simply changing the optional I/O and installing new drivers. OEMs can rapidly provide proof-of-concept systems to prospective orders to help close sales.

Once a prototype is proven, contact Octagon for a quote to deliver your "custom" product on-time, tested, with your logo on a splash screen and with your software installed. We can even drop-ship it anywhere in the world in packaging with your company name on it.



Expansion options

As a stand-alone, rugged system, the RMB-S contains a rich mix of I/O that will satisfy many applications, as is. Should additional functionality be required, only a few steps are needed to seamlessly integrate the new functionality into the RMB-S. For example:

- 1) Choose a PC/104 GPS card from a number of vendors and plug it into the internal PC/104 sockets.
- 2) Drill or punch the option panel for the antenna connector.
- 3) Install the GPS driver into the OS.

Upgrading units in the field is done by sending out a kit including the GPS card, finished option panel, and software upgrade. The original option panel is removed, the kit is installed and the software upgraded—a simple process for technical or nontechnical persons.

Mass data storage

The RMB-S includes 1 GB of industrial grade, error-correcting CompactFlash. This can be increased to 16 GB or more as it becomes available. The system also supports USB drives, CD-ROMs, internal hard drives and internal solid-state drives. The latter will operate over the entire current range and withstand the full shock and vibration specification. There are two SATA and two PATA ports for internal drives. External drives can be used with an added connector on the option panel.

Power supply

The power supplies in mobile systems are often a weak link. Modern CPU systems require five or more different voltages, supplied in a specified sequence, and mobile systems are rife with voltage transients both negative and positive.

Octagon has leveraged its 20 years of experience to develop a world-class power supply for mobile applications. It operates reliably from 8–42V, over the full –40° to 85° C temperature range. The three-stage, positive transient suppression is able to absorb 15 kW jolts. It can also withstand an input transient of 200 VDC. The unit is diode-protected for reverse battery dump.

The output has overcurrent and overload protection. The power supply also protects against a common failure that occurs when starting at engine at low temperatures: The advanced brown-out protection prevents the restart supply sequencing from getting scrambled, causing CPU lockup or supply failure.

PROCESSOR SUBSYSTEM:

- ◆ CPU: 1.5 GHz, low power, Pentium M compatible (400 MHz to 2.0 GHz under OEM contract)
- ◆ 533 MHz FSB
- ◆ SDRAM: 1 GB, industrial temperature, DDR2 SDRAM, expandable to 2 GB
- ◆ CompactFlash: 1 GB, industrial temperature, error-correcting
- ◆ BIOS: General Software with Octagon industrial extensions in 512K flash
- ◆ General Software BIOS with fast boot and industrial extensions
- ◆ 512 KB flash contains BIOS
- ◆ Sockets for up to 2 GB, DDR2 SDRAM (1 GB standard)
- ◆ 1024 bytes user-available serial EEPROM
- ◆ CPU supervisor includes watchdog timer with 1-, 10- and 60-second timeout periods; software controlled

INCLUDED I/O AND FUNCTIONALITY:

- ◆ Mini PCI socket for GPS, WiFi, radio, etc.
- ◆ Dual Ethernet 10 Base-T, 100 Base-TX
- ◆ Four external and two internal USB ports, 2.0 compliant
- ◆ LVDS supports flat panels to 1920 x 1440 x 24, while the VGA supports CRTs and flat panels, to 1920 x 1440 x 24
- ◆ Audio: Stereo MIC, Line in and Line out. PC97 compatible
- ◆ PATA: Connector for two EIDE drives
- ◆ SATA: Connectors for two internal SATA drives (external through option panel)
- ◆ Four serial ports, RS-232/422/485
- ◆ 24 digital I/O lines, 15 mA sink/source, bit-programmable, TTL levels
- ◆ PS/2 keyboard and mouse



- ◆ Watchdog: Programmable to 1, 10 or 60 seconds.
- ◆ PC-compatible real time clock, with button cell battery backup

MOBILE POWER SUPPLY:

- ◆ Input voltage range: 8–42 VDC, 1.1A max. @ 26 VDC
- ◆ Inrush current: <20A for 20 mS typical @ 26 VDC
- ◆ Transient protection: Three-stage, 15 kW peak transient absorption
- ◆ Meets SAE J1113-11 and ISO-7637-2-2004 specifications
- ◆ Load dump and reverse voltage protection:
- ◆ Advanced brown-out protection: Precise shutdown and restart of power supply voltage to eliminate CPU lockup and power supply misstarts
- ◆ Conducted emissions: Internal filter components minimize conducted emissions
- ◆ Provisions for external UPS battery
- ◆ Battery connection: Military grade connector

INDICATORS:

- ◆ Power LED
- ◆ Two user-programmable LEDs

ENVIRONMENTAL:

- ◆ Ambient air temperature: –40° C to 85° C. Brief excursions higher are tolerated. Maximum temperature may be limited by customer added components. Derate the maximum temperature by 2 degrees per watt of dissipation of customer installed components. External air flow and vertical mounting improve the temperature rating. The CPU will automatically reduce the speed to stay within safe temperature limits
- ◆ Temperature sensor: The CPU case and the internal air temperature can be read using the supplied software
- ◆ Shock: 30G per MIL-STD 202G, method 213B, condition J
- ◆ Vibration: 5G per MIL-STD 214G, method 214A, condition A
- ◆ Internal temperature sensor
- ◆ Meets CE Class A requirements

SIZE:

- ◆ 102.6 mm high x 170.1 mm wide x 273.9 mm long (4.04" x 6.70" x 10.78")

MATERIALS:

- ◆ 6063-T6 aluminum extrusion
- ◆ 5032-H32 aluminum end plate
- ◆ Standard inside finish—MIL-C-5541E Iridite, xclass 3, gold
- ◆ Standard outside finish—powder coat, Federal Standard 595B 26044 (dark blue-gray)
- ◆ FS 33446, FS 37875 and other colors are available in OEM quantities. Contact the Octagon Sales Dept. at 303-430-1500.

HW ordering information

- #7542 RMB-S CORE, 1 GB SDRAM*, 1 GB industrial, 4-bit, error-correcting CompactFlash

Accessories ordering information

- #7202 Standard mounting plate system
- #7201 Shock and vibration dampening mounting system
- #7129 Quick-release mounting system
- #7755 SATA power cable
- #4907267R 2 GB industrial, error-correcting CompactFlash

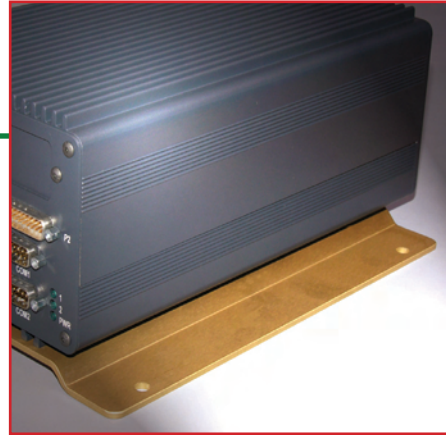
CORE SYSTEMS mounting options

PHOTO 1

STANDARD MOUNTING PLATE

FOR BENIGN ENVIRONMENTS, PHOTO 1

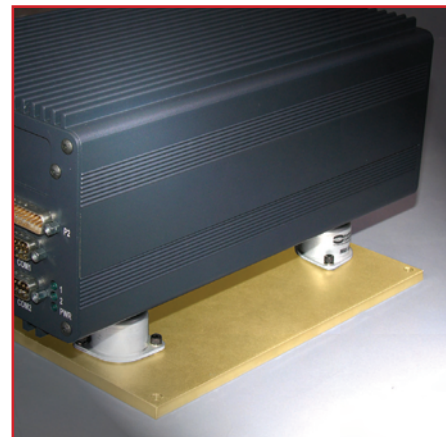
- ◆ Low-cost mounting for benign environments with low-stress vibration. Slotted holes are standard (photo shows round holes).



SHOCK AND VIBRATION DAMPENING SYSTEM, PHOTO 2

- ◆ Designed for use in trains, buses, planes and other mobile applications, especially where shock and vibration is more or less constant. The military grade dampers preserve their characteristics over wide temperatures and provide limited three axis movement. The dampers are “fail safe” and will not separate even under severe shock.

PHOTO 2



QUICK-RELEASE MOUNTING SYSTEM, PHOTO 3

- ◆ This mounting system provides a convenient way to quickly remove the RMB-S enclosure from a bulkhead or overhead location. Release is via two captive, Phillips-head screws. The system provides a small amount of vibration reduction.

PHOTO 3

