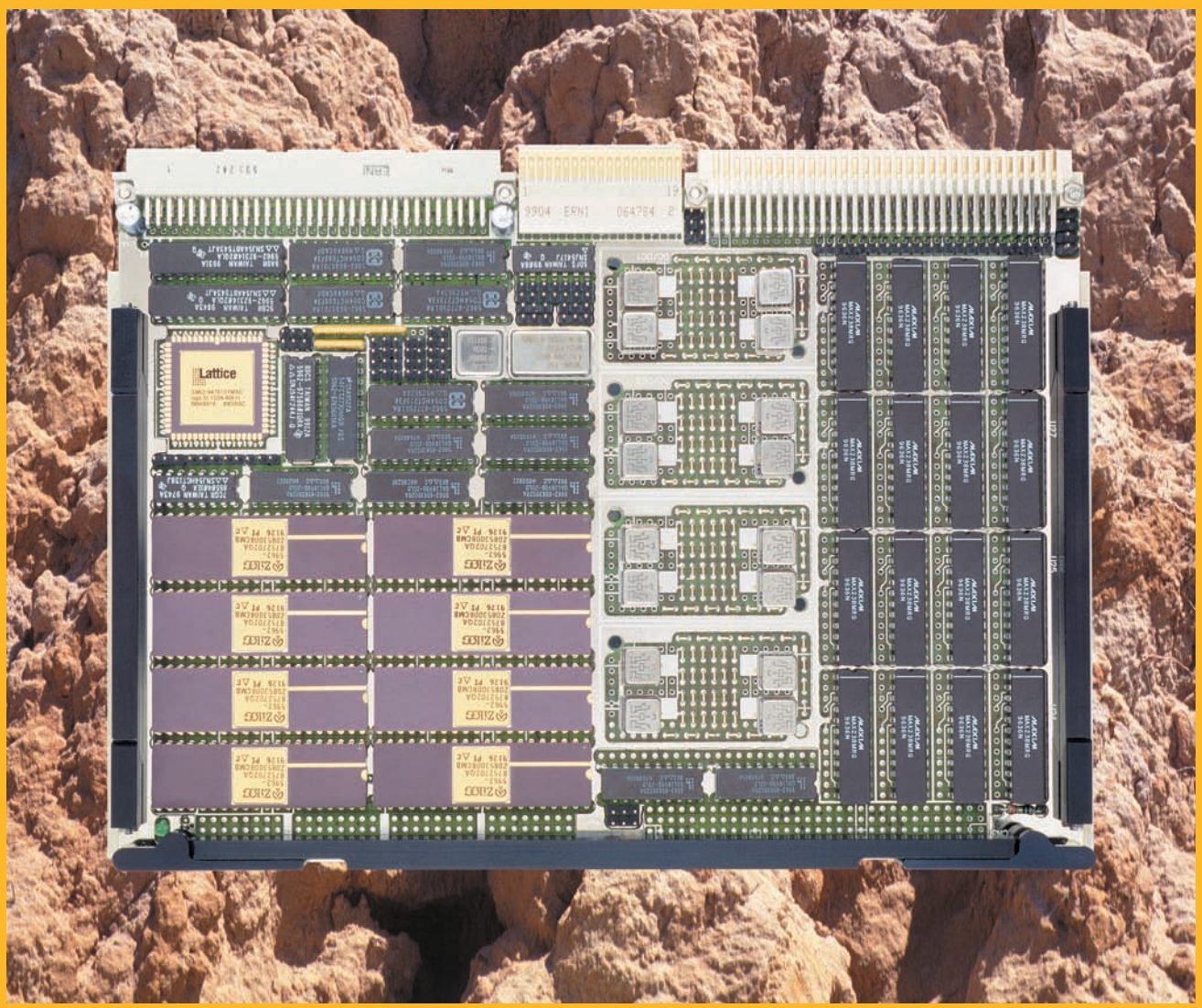
Computer

6U VMEbus Series

CM-IOC-40



16 Serial Channel I/O Module

Commercial, Industrial, MIL-Rugged & MIL-STD-883 Versions

FEATURES

- 16 full-duplex serial channels per board.
- Channels can be factory fitted to RS-232, RS-423, RS-422, or RS-485 standard levels.
- Optional full galvanic isolation >1000 Vp on serial channels including handshake lines.
- Supports a wide set of military or industry standard transceivers from leading vendors.
- Built-In-Test wraparound loop allows testing of all TTL chips and serial controllers.
- Serial line Built-In-Test wraparound loop allows testing of all on-board transceivers.
- Overvoltage protection for most transceivers.
- 64 LED indicators on front panel show all channel TxD, RxD, CTS, and RTS status.
- VMEbus Interrupter supplies independent Status-ID vector per serial controller.
- Serial I/O signals via 160 pin VME64x connectors on front panel, P2 and P0.
- Versatile baud generator covers any serial rate.
- Industrial, MIL-Rugged & MIL-883 versions.
- IEC-297 mechanics with I/O via front panel and military P1101.2 wedge-lock mechanics.
- Conduction cooled PCB with thermal overlay in MIL-Rugged and 883 versions.
- Extensive software support.
- Excellent price/performance ratio.
- Low power CMOS design.
- Two year guarantee.

MILITARY DESIGN

- -55 to +125 ºC ceramic military ICs.
- MIL-STD-883 FPGAs and TTL chips.
- MIL-C-55302 Class I Connectors.
- MIL-R-39016 BIT Relays in 883 version.
- No signal PCB tracks in external layers.
- MIL-E-5400 for avionics equipment class 1B (Temperature and Altitude).
- MIL-STD-810 E Temperature (Methods 501.3 & 502.3).
- MIL-STD-810 E Shock and Vibration (Methods 516.4 & 514.4).
- MIL-STD-810 E Humidity & Salt Fog (Methods 507.3 & 509.3).
- Military Class V Printed Circuit Board.

DESCRIPTION

❑ The **CM-IOC-40** is a universal 16 serial channel VMEbus board. This professional module is based on the industry-standard SCC Z-8530/85230 up to 20 MHz. It incorporates features most demanded in first class military and industrial applications.

❑ All serial channels can be factory fitted for RS-232, RS-423, RS-422, or RS-485 EIA standard levels.

❑ An extremely versatile baud rate generator allows any standard or non standard communication up to 5 Mbs.

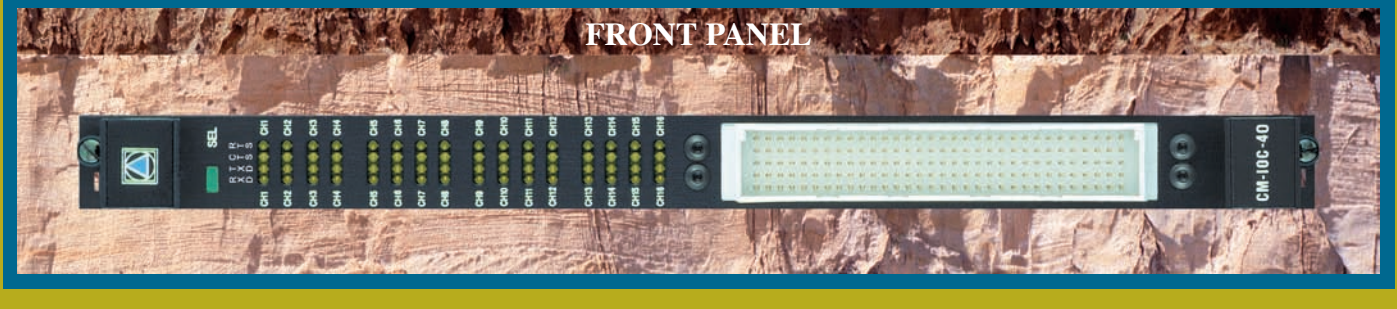
❑ Extensive Built-In-Test per channel is based on a dual wraparound loop that disconnects serial I/O signals and connects internal test signals in order to verify correct module operation.

❑ The **CM-IOC-40** offers a highly flexible I/O cabling solution using VME64x connectors on the front panel and P2/P0. Both connectors have identical pin-outs.

❑ Military versions, provided with conduction cooled thermal overlay, greatly improve capability to withstand shock and vibration.

❑ The metallic layer in the PCB also benefits heat dissipation and allows all components to work within homogeneous temperatures, thus greatly increasing component longevity and module MTBF.

❑ All **CM-IOC-40** versions are 100% compatible at the functional level, allowing software development to proceed with low cost Industrial versions.



TECHNICAL SPECIFICATIONS

Serial channels: 16 independent full duplex channels.

Serial controller (SCC): 8 industry standard Z-8530 or Z-85230 chips @ 8-10-16-20 MHz. Each serial controller has two complete serial ports.

Z-85230 features: Supports sync/async operation, on-chip baud generator, HDLC/SDLC protocols, digital PLL, automatic CRC, etc.

Serial levels: All serial channels can be factory fitted to operate at RS-232, RS-422, RS-423 or RS-485 EIA standard levels.

Serial signals: Support for TxD, RxD, CTS, RTS, DCD, DTR, CLK-in and CLK-out per channel.

Serial transceivers: Accept a wide set of I/O devices in all temperature ranges supplied by SIPEX, MAXIM, NATIONAL, LINEAR, etc. I.e. MAX490, LTC490, SP490, SP485, MAX485, LTC485, DS3695, MAX238, HIN208, SP238, DS14C238, etc.

Galvanic isolation: All serial channels optionally support isolated I/O lines (> 1000 Vp), offering fully floating serial lines with respect to other channels or VMEbus signals.

Front panel LEDs: 64 LEDs distributed with four LEDs per channel which are illuminated when the RxD, TxD, CTS or RTS lines are active.

Control Register: Activates the dual Built-In-Test circuitry.

Built-In-Test: Dual independent wraparound BIT loop:

TTL level Built-In-Test checks 100% of module TTL chips. Disconnects SCC serial lines to/from the transceivers and interconnects all serial channels amongst themselves in pairs.

Transceiver Built-In-Test determines any transceiver failure. A set of BIT relays isolate serial signals from the application and interconnects all serial channels amongst themselves.

RS-232/423 signals: Tx, Rx, CTS, RTS, DCD, DTR, 2xCLK.

RS-422 signals: Tx, Rx, CTS, RTS.

RS-485 signals: Tx, Rx (full duplex); bidi AB (half duplex).

VMEbus Interrupter: I(1-7). Manages IRQs from all SCCs.

VMEbus Interface: A24/D08 (EO) Standard slave interface.

VME Addressing: Two jumper blocks provide 256 mapping options in the A24 range.

Power consumption: +5VDC @ 450 mA. (non isolated version)

Weight: 570 gr. C & I ver.; 770 gr. R+ & 883 ver.

Mechanical size: Single slot 6U (233.4x160 mm).

Mechanical format:

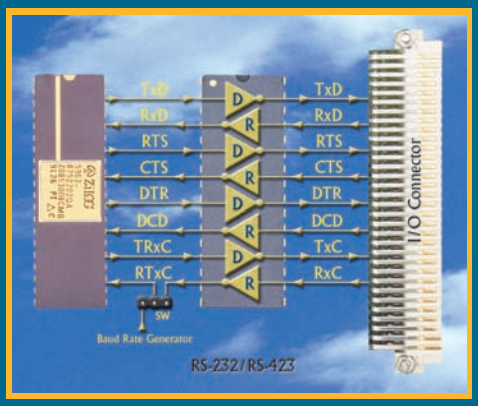
CM-IOC-40/A Classic IEC-297 mechanics for 19 inch racks with I/O on front panel.

CM-IOC-40/B Military IEEE P1101 wedgelock mechanics for ATR enclosures.

Humidity: Up to 95% RH non-condensing.

Altitude: Sea level up to 15 Km (50,000 ft.).

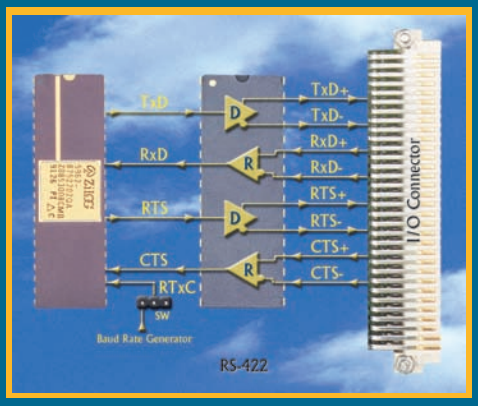
SERIAL I/O LINES PER CHANNEL



RS-232/RS-423 interface

Boards without galvanic isolation: ***TxD, RxD, CTS, RTS, DCD & DTR, TxC, RxC***

Boards with galvanic isolation: ***TxD, RxD, CTS, RTS***

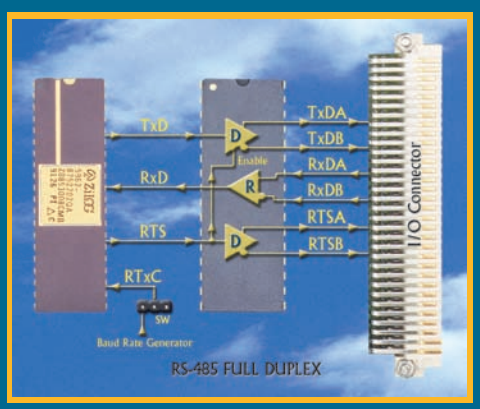


RS-422 interface

Boards without galvanic isolation: ***TxD±, RxD±, CTS±, RTS±***

Boards with galvanic isolation: ***TxD±, RxD±, CTS±, RTS±***

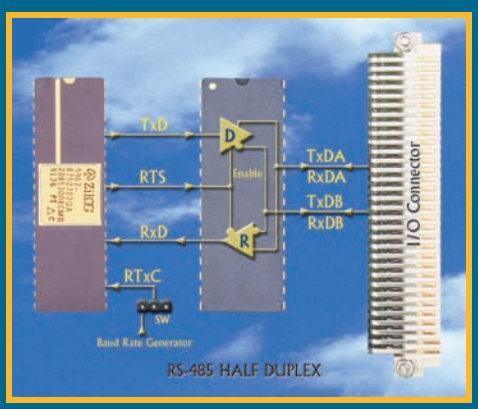
NOTE: TxC± and RxC± clock signals can be fitted instead of CTS± and RTS±



RS-485 Full-Duplex interface

Boards without galvanic isolation: ***TxDA/TxDB, RxDA/RxDB, RTSA/RTSB (Tx enable)***

Boards with galvanic isolation: ***TxDA/TxDB, RxDA/RxDB, RTSA/RTSB (Tx enable)***

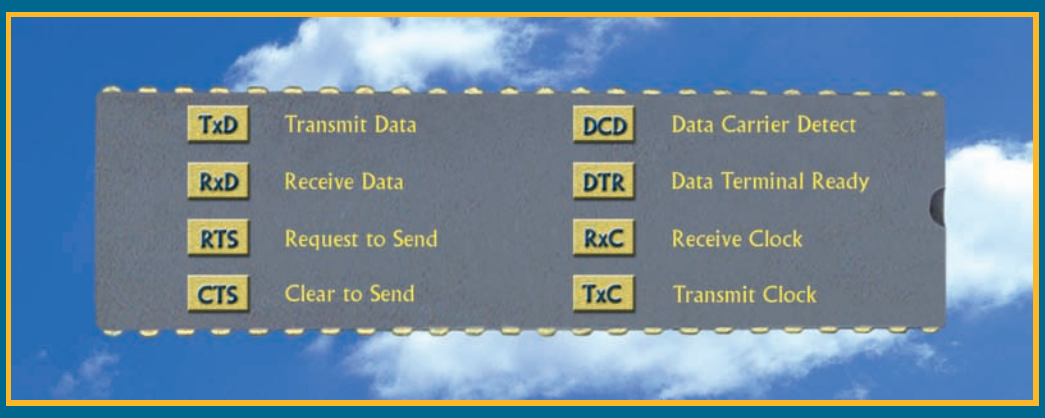


RS-485 Half-Duplex interface

Boards without galvanic isolation: ***TxDA/RxDA, TxDB/RxDB***

Boards with galvanic isolation: ***TxDA/RxDA, TxDB/RxDB***

NOTE: In order to improve clarity Built-In-Test and galvanic isolation sections are not shown in above figures.

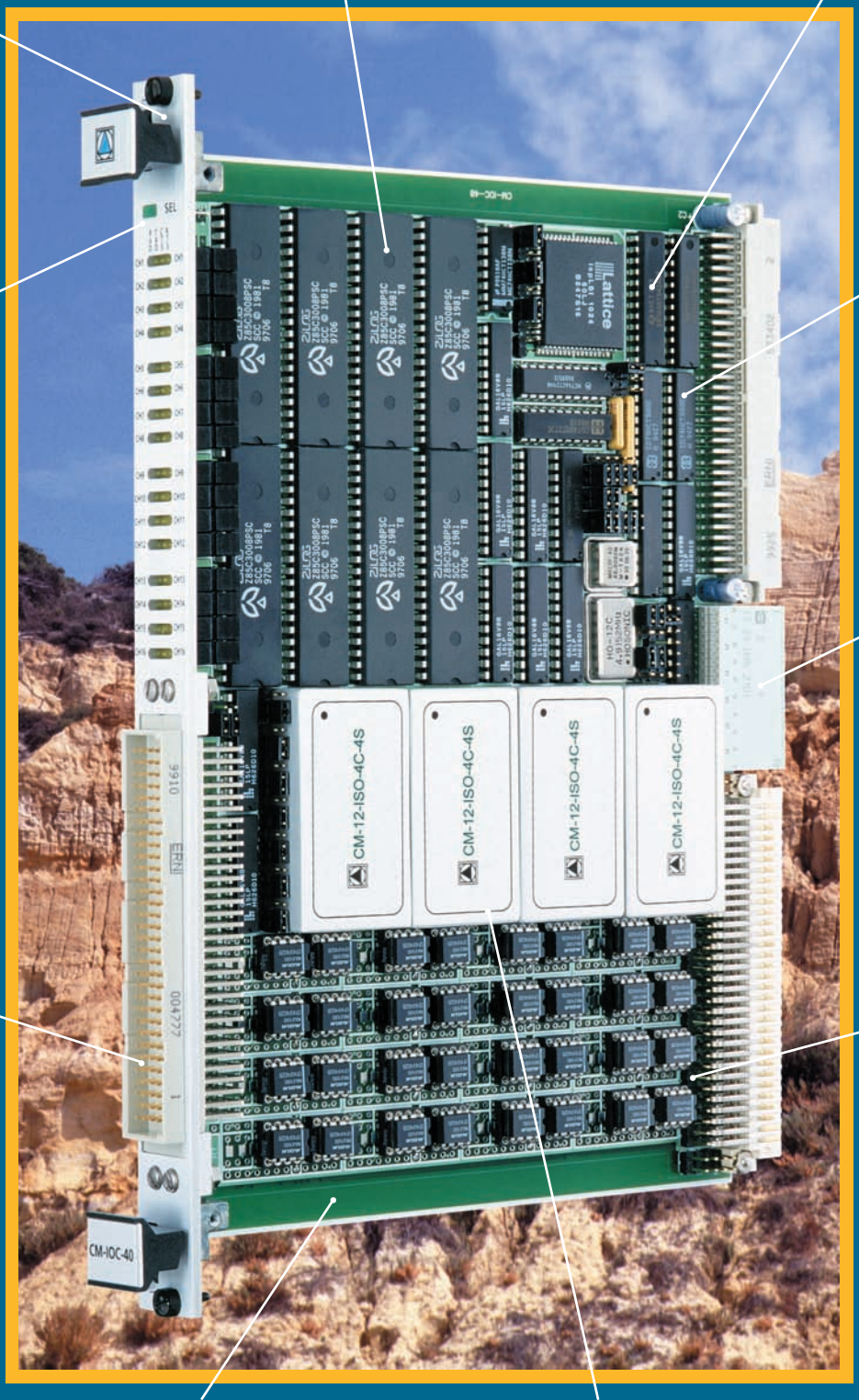


CM-IOC-40 TRANSCEIVER OPTIONS

IEC-297 6U MECHANICS fitted with I/O connectors on front panel

Z8530/85230 INDUSTRY STANDARD CONTROLLER operates at clock speed from 8 to 20 MHz, incorporating two independent full-duplex serial channels

A24/D08 (EO) VMEbus INTERFACE accesses serial controllers and Built-In-Test Registers



COMMERCIAL ICs in plastic package and 0 to +70 °C range

BOARD SELECT LED is illuminated when the VME master accesses the module

P0 CONNECTOR improves I/O capability and allows key slot configuration

FRONT PANEL VME64x connector wires the 16 serial I/O channels

JUMPER BLOCK connect-disconnects I/O signals to-from P2

FIBERGLASS PCB in Commercial version

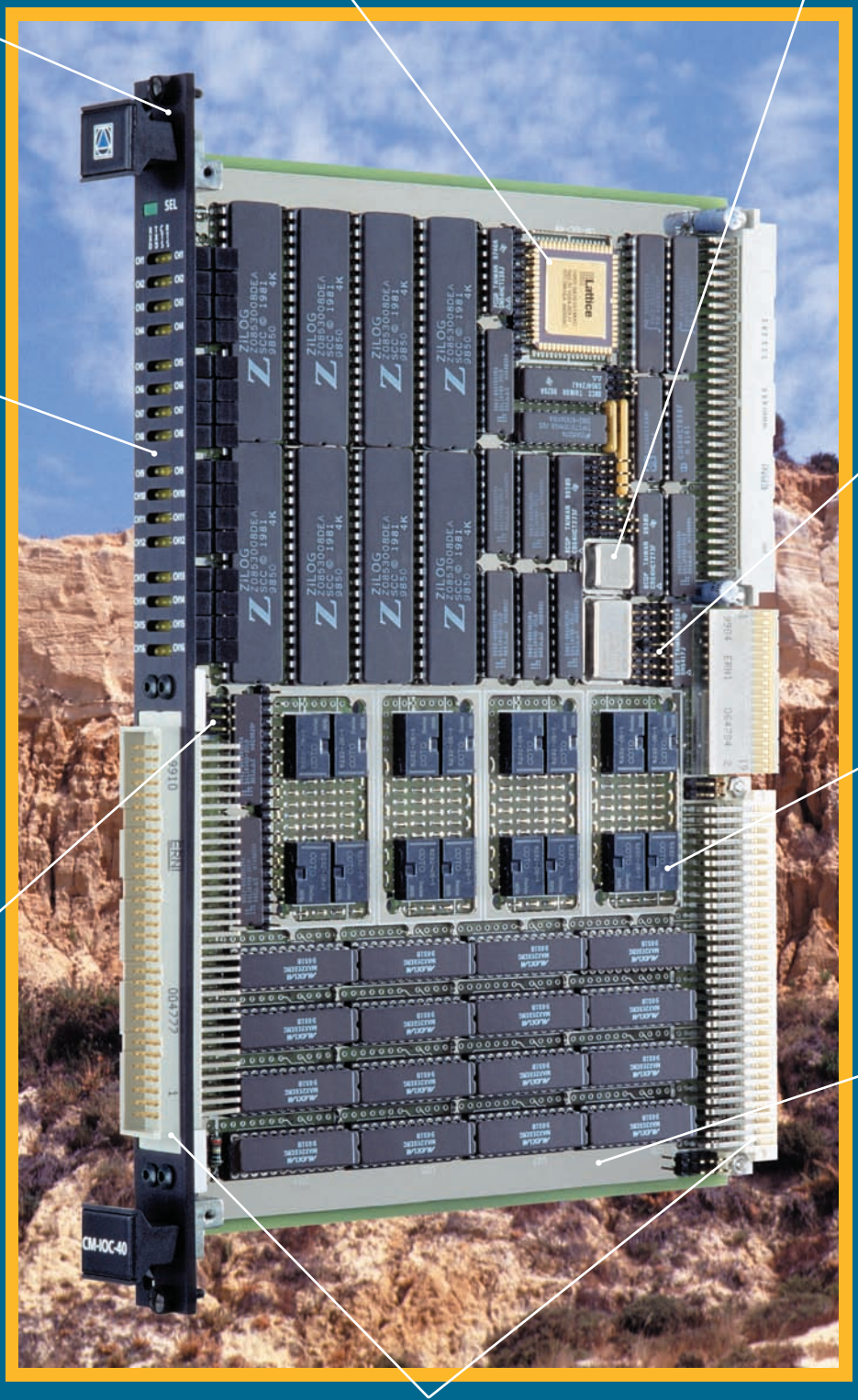
OPTIONAL ISOLATED MODULES provide galvanically isolated serial channels with floating I/O signals.

CM-IOC-40/C COMMERCIAL VERSION

IEC-297 MECHANICS
allows module insertion in 19 inch 6U VME racks

VME INTERRUPTER
offers programmable level and supplies a unique ID-vector for each SCC device

DUAL BAUD RATE GENERATOR
supports any oscillator from 4.9152 to 40 MHz, covering standard or non standard baud rates up to 5 Mb/s



64 CHANNEL LEDs on front panel show serial I/O signal status

JUMPER BLOCK
allows 256 addressing options in the VME A24 range

BIT RELAYS
allow testing of all onboard transceivers

CONDUCTION COOLED
thermal overlay PCB

TRANSMIT/RECEIVE
clock jumpers allow selection of the SCC master clock

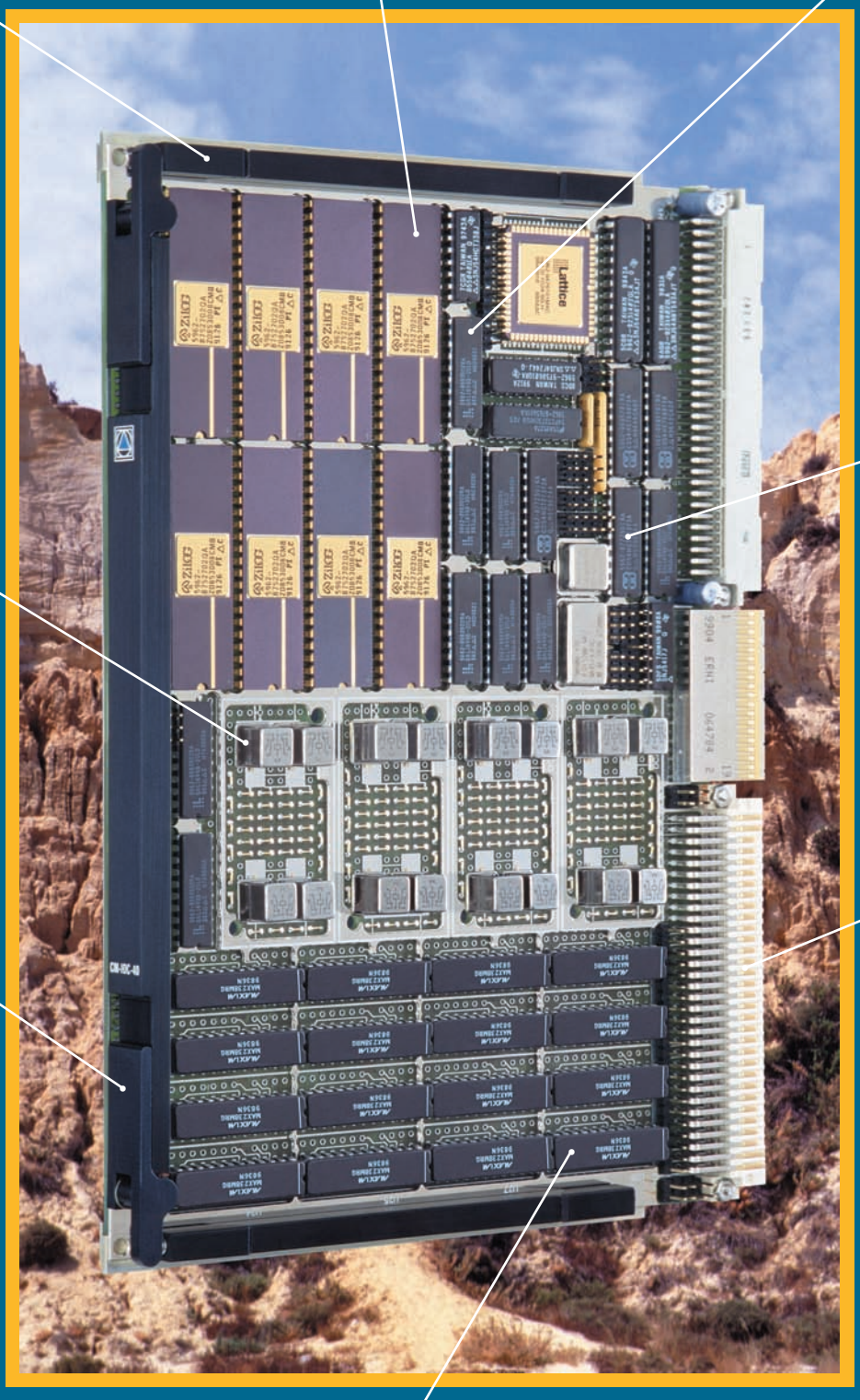
CLASS I MIL C-55302 & MIL C-24308 CONNECTORS
withstand > 500 insertion cycles

CM-IOC-40/R+/A MILITARY RUGGED+ VERSION

P1101.2 6U MECHANICS
fitted with wedge-locks for
insertion in ATR enclosures

QUALIFIED MIL-STD-883
ICs in ceramic packages.
-55 to +125 °C range

BUILT-IN-TEST MATRIX
interconnects serial channel
I/O signals for testing 100%
of the module TTL chips



THERMAL PASTE
behind ICs improves
heat dissipation with
the thermal overlay

MIL-R-39016 RELAYS
in 883 version

FRONT PANEL with
extraction handles
improves mechanical
performance

P2 CONNECTOR
wires all application
serial I/O signals

FLEXIBLE I/O STAGE PER CHANNEL
can be factory fitted with a wide variety
of industry standard transceivers

CM-IOC-40/883/B MILITARY 883 VERSION

BOARD RANGE

COMMERCIAL (C):

Implements low cost commercial plastic IC's rated for 0 to +70 ºC. Continuous board operation range from 0 to +60 ºC. Class II industrial quality connectors.

INDUSTRIAL (I):

Manufactured with Industrial range plastic or ceramic IC's rated for -40 (-25) to +85 ºC. Continuous module operation from -20 to +75 ºC. Class II industrial quality connectors.

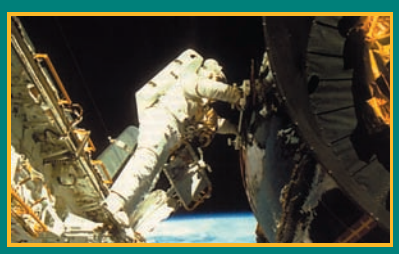
MILITARY-RUGGED (R+):

Implements ceramic IC's rated from -55 to +125 ºC. Class I MIL-C-55302 connectors. Conduction cooled PCB. Board operation from -40 to +85 ºC. Storage from -55 to +125 ºC.

MILITARY-STD-883 (883):

Manufactured with conduction cooled PCB and MIL-STD-883 B/C qualified military ceramic parts (-55 to +125 ºC). Class I MIL-C-55302 military connectors. MIL-R-39016 BIT Relays. Continuous board operation from -50 to +90 ºC. Storage from -55 to +125 ºC.

SOFTWARE SUPPORT



Wind River Systems VxWorks Tornado

The **CM-IOC-40** is supported by VxWorks Tornado. This operating system is ideal for developing real time software in UNIX environments. A complete "C" language driver in source code is available at low cost. Drivers include a floppy disk and user´s manual.

Mentor Graphics MCC-68K Drivers

A "C" language source code driver written for the popular MCC-68K cross-compiler from Microtec is also available. This low cost option is intended for using a PC as host.

Note: Drivers for other leading operating systems can be optionally supplied upon request.

DOCUMENTATION

LEVEL 1, CM-IOC-40 MAP: User´s manual. Module hardware functional description oriented toward software development.

LEVEL 2, CM-IOC-40 MMT: Maintenance manual. Extended description intended for failure location in the module.

ORDERING INFORMATION

CM-IOC-40 /V /T /M

PCB Mechanical Version
- **A:** IEC-297 Standard mechanics with front panel I/O connectors.
- **B:** P1101.2 Military mechanics with dummy front panel & wedgelocks.

Board Temperature Range
- **C:** Commercial range. Available only with fiberglass PCB.
- **I:** Industrial range. Available only with fiberglass PCB.
- **R+:** Military Rugged+ range. Available only with conduction cooled PCB.
- **883:** Military 883 range. Available only with conduction cooled PCB.

Board Version
- **1:** 8 serial I/O channels, without galvanic isolation.
- **2:** 16 serial I/O channels, without galvanic isolation.
- **3:** 8 serial I/O channels, full galvanic isolation.
- **4:** 16 serial I/O channels, full galvanic isolation.

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