Computer

VMEbus & cPCI Series

CM-ATR-25/35/45

Full Range of ATR Military Chassis for Next Generation Systems

CM-ATR-X5 Series

The CM-ATR-25/35/45 is a range of new generation chassis which introduce the concept of Universal Military ATR Enclosures capable of accommodating and freely intermixing all standard conduction cooled and air cooled Eurocard formats.

Decidedly well suited for critical defense and aerospace systems requiring premium quality that can be provided only by leading-edge technology.

Setting Chassis Standards

CM Computer has established a market first by offering the military ATR chassis as a truly organized and universal product range able to meet the complete spectrum of 6U & 3U military applications.

In fact, other manufacturers offer the market only a limited and incomplete set of individual costly enclosures, each designed to solve a single, isolated application.

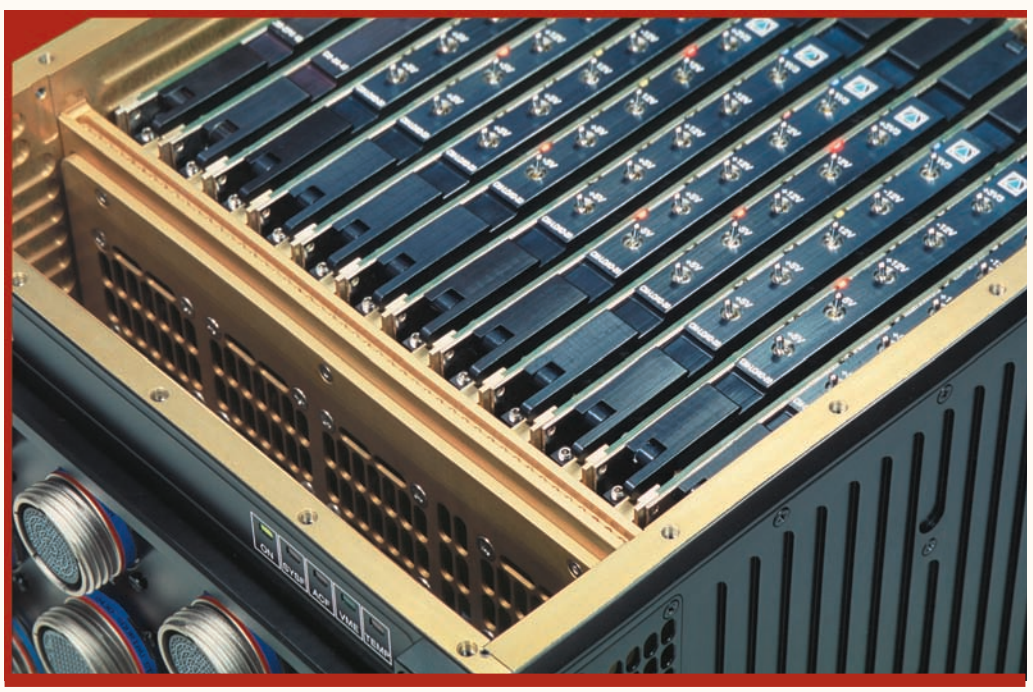
This new series is more compact, lighter, powerful and flexible than their notable CM-RA-X0 predecessors. Our multiple innovations introduce many unmatched firsts in the industry. Until now, no other chassis has been able to supply more than 1KW of PSU power on the backplane, integrate four heat exchangers on the chassis structure, improve temperature of enclosed boards by up to 15 ºC, offer unlimited I/O interconnection capability and accept all standard power voltages.

Experience Makes the Difference

The CM-ATR-X5 chassis are the result of the combined effort of our most experienced electrical, power electronics, thermodynamic and mechanical engineers. Since 1989 our design team has earned a solid reputation by releasing three successful generations of ATR chassis and designing scores of different military VME boards.

Our company brings customers long-term availability products, crafted with all-embracing indispensable features and blessed with outstanding critical aspect performance.

We were careful to design this catalog to be useful to you and to facilitate your product evaluation task. Don´t miss the *Features* section to discover forty substantial reasons that make our product the unparalleled chassis your professional application deserves.



Four Off-the-Shelf Cooling Options

Low cost standard dry-air enclosure with inner fans for internal air re-circulation. Chassis generated heat is dissipated by a combination of cold-plate conduction, radiation and free-air convection through ambient air. This minimum maintenance option is ideal for low wattage applications where ambient air is laden with hostile or harmful contaminants. Available in size ½ ATR *(CM-ATR-25/S)*, ¾ ATR *(CM-ATR-35/S)* & 1 ATR *(CM-ATR-45/S)*.

Standard Sealed

Sealed with Extended Fins

Ultimate self-dissipation sealed enclosures that also incorporate internal air re-circulation fans. These dry-air chassis are fitted with over-size cooling fins on top cover, rear panel and side-walls in order to maximize radiation and natural convection. Cold-plate mounting is recommended. These low maintenance sealed chassis are suitable for medium wattage military and aerospace applications. Size options are: ½ ATR *(CM-ATR-25/SEF)*, ¾ ATR *(CM-ATR-35/SEF)* & 1 ATR *(CM-ATR-45/SEF)*.

Non-sealed chassis in which ambient air is directly forced over the electronic modules using rear mounted exhaust fans. This highly efficient thermal management technique is suitable for full PSU wattage applications. This type of chassis is a medium cost option available in three standard sizes ½ ATR *(CM-ATR-25/FAC)*, ¾ ATR *(CM-ATR-35/FAC)* & 1 ATR *(CM-ATR-45/FAC)*.

Flowthrough Air Cooled

Heat Exchanger Sidewalls

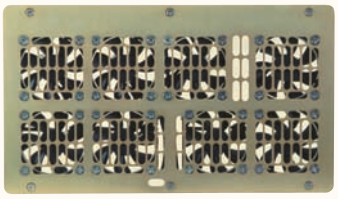
High performance dry-air chassis incorporating air re-circulation fans inside. Heat generated within the enclosure is conducted to the hollow sidewalls & rear panel heat exchangers where it is dissipated to the ambient environment by forced air cooling rear fans or by vehicle platform air plenum. A top cover heat exchanger is optional. This chassis version is suitable for sealed applications up to 3/4 of total PSU wattage. Cooling technique available in ½ ATR (CM-ATR-25/HES), ¾ ATR (CM-ATR-35/HES) & 1 ATR size (CM-ATR-45/HES).

Chassis Cooling Technique

Military Enclosure heat management is a complex matter and is affected by specific environmental factors and field deployment limitations.

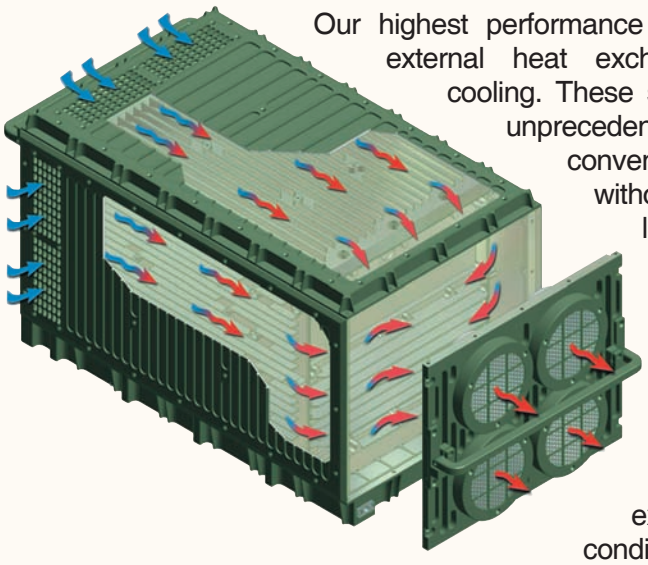
At CM we are convinced that each application requires a different type of chassis, a conclusion that led us to offer twelve CM-ATR-x5 COTS versions allowing our customers to select the optimum enclosure depending on predominant cooling technique, number of slots and internal power dissipation.

Optimum Cooling & Thermal Efficiency



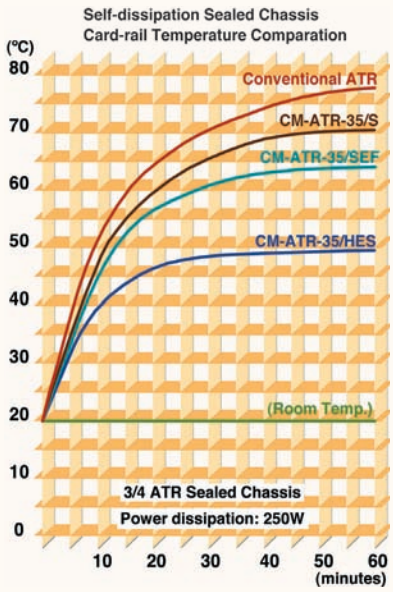
Common sealed enclosures have static air inside and therefore are only conduction-cooled. CM has strengthened this model by using internal air-recirculation fans fitted on card-cage slots. These drain away heat dissipated by the system electronics towards the cooler metal walls of the enclosure. Internal forced-air is crucial for the effective deployment of systems installing fiberglass boards, but also enhances dissipation of conduction cooled modules.

Chassis side and rear walls are externally finned to improve radiation and free-air convection. Our basic Sealed unit achieves a total external surface of 1.5 times its equivalent size “flat surface box”, a ratio only exceeded by our Sealed Extended Fins version, with a surface up to 3 times the “flat-box”.



Our highest performance flag-ship chassis combines four external heat exchangers with internal forced-air cooling. These sealed units (HES), constitute the unprecedented state-of-the-art reference for conventional, self-dissipation chassis without needing to resort to unpractical liquid-cooled alternatives.

CM enclosures exhibit superior intrinsic cooling performance irrespective of the application platform. However, the user can improve dissipation by providing effective conduction to the cold plate and facilitating optimum external operation and environmental conditions.



The CM-ATR-X5 series successfully combines various cooling techniques to establish the maximum number of simultaneous thermal paths to the outside world. The outcome is a chassis family that achieves higher power dissipation, lower system card temperature and longer module MTBF than any other similar size and slot capacity unit on the market.

Complete In-house Manufacturing

CM Computer has in-house ISO-9001 certified facilities for design, testing, CNC machining, chemical coating and painting for the complete chassis metalwork and electronics. We do not subcontract chassis sub-modules to other companies. Therefore, the entire product is designed, manufactured and tested in a coherent manner by our senior engineering staff.

Our integral production results in remarkable delivery times that preserves your precious time to market and guarantees the quality of each intermediate manufacturing process.

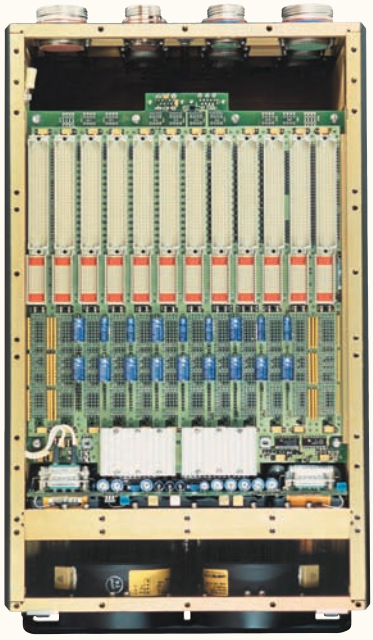
Partner with CM and you will secure a better chassis in a fraction of the time that you would expect.

Relentless Attention to Detail

History demonstrates that designs hatched in an attempt to upgrade industrial products to military standards run the risk of failure. Because your credibility in the eyes of your customer is at stake you demand superior performance and finish throughout.

We know ATR chassis are critical to your application. They reflect the integrity of the system inside and bear responsibility for the protection and reliability of your valuable electronics.

At CM, we consider and implement the most challenging design parameters from the start. The result is effortless integration, lower production costs and a standout chassis on every critical concern; one that accords you a decisive competitive advantage.



Power to Succeed

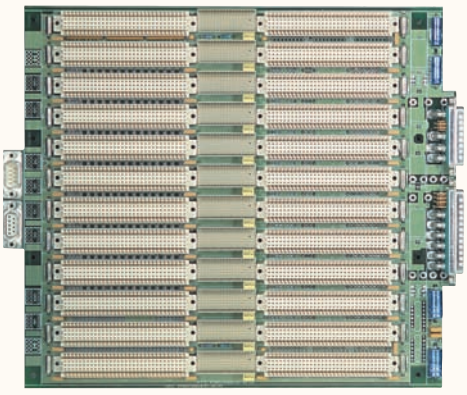
The impressive range of CM military Power Supplies constitutes a key point in your system success. The three chassis sizes have been fitted with an oversized total output power of 400W (5 slot), 500W (7 slot) and 1050W (12 slot) to satisfy the full range of applications regardless of card-cage power needs.

This extraordinary capacity improves PSU efficiency and MTBF when the chassis is loaded below its maximum power limits. Furthemore, it allows ample reserve for system upgrades and provides additional power for internal and external auxiliary devices, such as platform sensors, signal adapters, remote sub-systems, etc.

All PSU models are fitted with Power Fail Monitor, MIL-STD-461E power filter, remote voltage sensing, output voltage trim-up, time-delayed protection fuses, rear fan EMI-filter & fuse and DC/DC converter remote shutdown.

Our Power Supplies feature extraordinarily versatile input voltage options. This facilitates worldwide operation by accepting all North American and European DC and AC (single & 3-Phase) voltage standards.

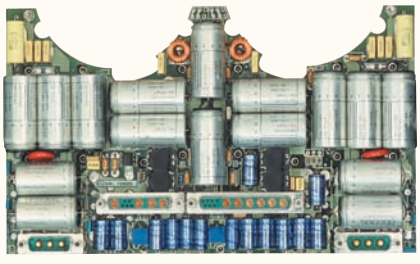
Backplanes that Provide More



CM ATR chassis integrated Backplanes are low noise, full military VMEbus or cPCI compatible. In addition to providing fully standard bus slot & signal daisy-chain functionalities, they have been designed to improve card-cage mechanical performance and to offer additional electronics and options.

The Backplane interfaces the Power Fail Monitor and drives the front panel LED indicators. Other functionalities administer the DC/DC redundant serial communication bus, wire the Temperature Supervisory with the PSU shutdown gate and monitor the internal re-circulation fan rotation speed.

CM Backplanes support one or two 100W power sockets for optional micro-size DC/DC military converters with user defined output voltage. The converters are useful for increasing the +5VDC or +3.3VDC power lines or for generating isolated positive, negative or bipolar auxiliary DC voltages.



The last slot of our Backplanes allows for bus functionality, but also contains power and control provisions to accept a Eurocard-size metallically caged Redundant PSU. This single slot RPSU has the same capacity as the main PSU and both operate on a load-sharing basis to minimize component stress. An optional Temperature Supervisory Unit can be fitted on the RPSU for protecting card-cage electronics against fan failure or extreme climatic conditions.

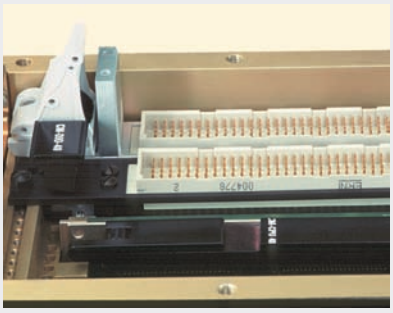
CM Computer Cots Products

The chassis product described in this catalog is part of a complete CM Computer 3U & 6U VME and cPCI board set available in four temperature ranges (Commercial, Industrial, Rugged+ and MIL-STD-883).

This set comprises CPU & Memory boards, I/O & Graphic Controllers, A/D & D/A conversion modules, Synchro/Resolver modules, SCSI, ARINC-429 & MIL-STD-1553 controllers, Ethernet boards, Discrete I/O modules, CM-RA-20/30/40 ATR enclosures, Power Supplies, Backplanes, etc.

Contact CM Computer to request other product data-sheets and for further information.

Chassis Features

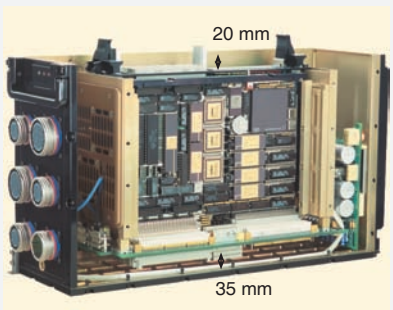


Slot-by-slot customer configured card cage allows accommodation and intermixing of wedgelock IEEE P1101.2 conduction cooled boards, IEC-297 air cooled modules or Compact PCI 1101.1/IEC-48D/118/CD air cooled boards.

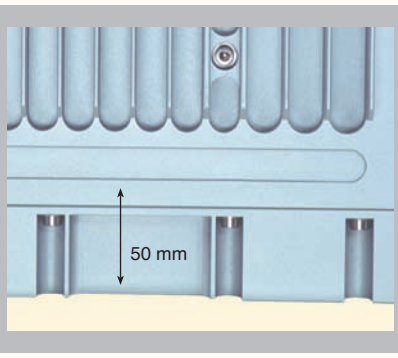
CM front panel incorporates a ready-made general purpose set of MIL-C-38999 connectors designed to support a wide variety of applications. See number of I/O and power pins in *Chassis Specifications Guide*.

Top and bottom I/O wiring plates can be installed on the card-cage for cable guiding, clamping, organization & protection. Two general purpose top wiring plates and one bottom plate are supplied to support most applications.

A customized front panel with customer company logo, connector set and layout can be supplied upon request. See front panel user area in *Chassis Specifications Guide.* Requires customer drawings. *(Ordering ref: UDP).*



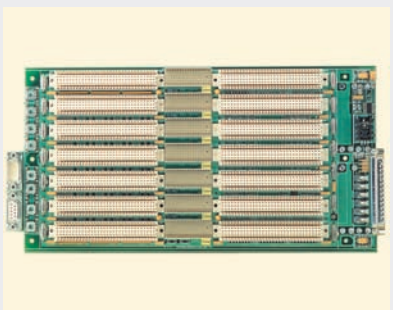
Card-cage has dual unlimited I/O wiring capability per slot both through the 20 mm wiring clearance in the Top Cover area and via the 35 mm of clearance available between the Backplane and the Bottom Cover.



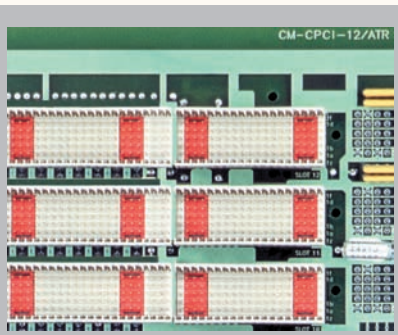
The high-profile Top Cover extends wiring clearance up to 35 mm from the board front panels. Systems needing extra bottom wiring space (up to 50 mm) may install the high profile Bottom Cover. *(Ordering ref: HTC & HBC).*

Front panel LED indicators are directly driven by the PSU & Backplane circuitry for monitoring power on/off status, system board failure, correct input voltage range, VMEbus data transfers and chassis over/under temperature.

Chassis front panel can be equipped with a SYSFAIL* magnetic latching indicator, an elapsed time indicator to monitor in-service hours, a momentary reset switch wired to VMEbus Backplane SYSRESET*, etc.



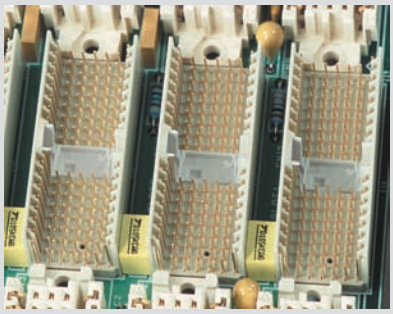
True military VME64x monolithic Backplane incorporates active auxiliary electronics and is custom made to match the enclosure mechanics. It is fitted with J0/J1/J2 Class I connectors.



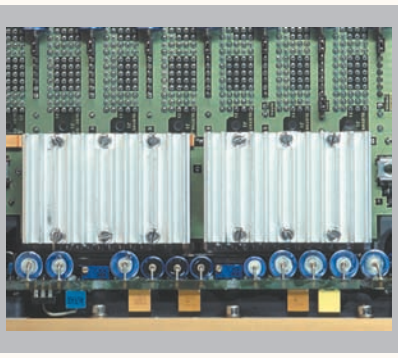
Compact PCI monolithic Backplane is fitted with rear panel I/O on P3, P4 and P5 connectors. It is designed to match the enclosure mechanics & incorporates active auxiliary electronics *(Ordering ref: cPCI).*

STANDARD EQUIPMENT OPTIONAL EQUIPMENT OPTIONAL EQUIPMENT AT EXTRA COST

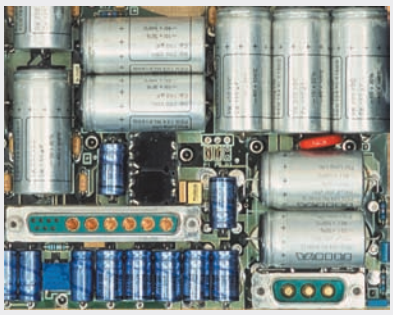
Chassis Features



Slot coding keys on Backplane J0 connectors protect against card insertion errors. 80 pin J0 parts have polarizing keys so that any given board fits only in its connector-coded slot. *(Ordering ref: VME64xK).*

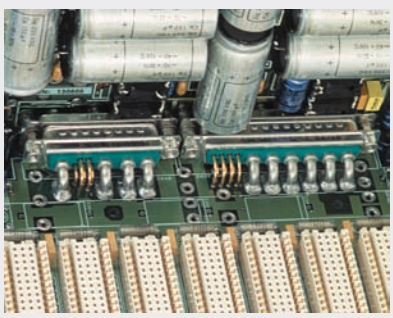


DC/DC converters on backplane (100W ea) provide any positive, negative or symmetric user defined output voltages for supplying additional power or meeting special system power requirements. *(Ordering ref: Converter code)*

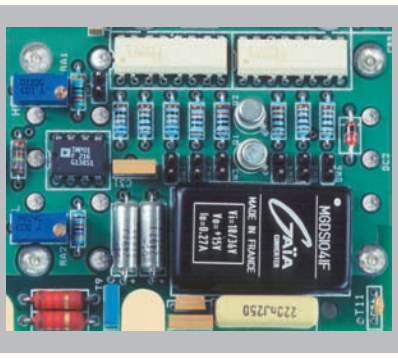


The PSU incorporates new generation isolated DC/DC converters & oversized hold-up capacitors to ensure proper operation during short power line failures. Outputs are protected against short-circuit, thermal-shutdown etc.

A plug-in Redundant Power Supply Unit can be installed to provide dual power redundancy for highly critical applications. Includes independent power input voltage and private interface bus to share load with main PSU.



Class I military power connectors on Power Supply & Backplane offer shock & vibration reliable interconnectivity between chassis internal modules and allow high DC current rates with low voltage drops and minimum contact heating.

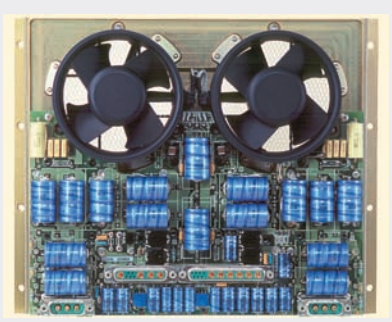


Temperature Supervisory Unit with programmable low/high threshold points monitors internal chassis temperature and controls ON/OFF operation of Power Supply converters and rear panel cooling fans. *(Ordering ref: TSU)*

FAC & HES Versions.
Rotron series PX2 fans rated for 28 VDC input voltage require an auxiliary DC/AC converter enclosed in a separate shielded area. Converter is integrated in chassis structure.

FAC & HES Versions.
Extended capacity AC/DC high altitude PX3/PX2 military fan assembly at the rear provides direct or indirect cooling airflow up to 480 CFM. Fan input voltage is independent of Power Supply input voltage.

HES Versions.
Rear panel can be supplied without fans and specially adapted for vehicle air plenum or external forced air applications.
Note: requires customer drawings.
(Ordering ref: VAP)

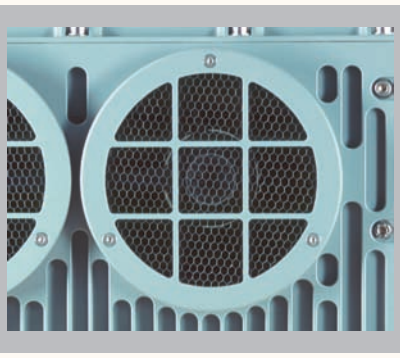


Chassis Front & Rear panels are removable for inspection & maintenance. The inside wall of the rear panel integrates the fans & Power Supply board constituting a single compact unit that significatly improves DC /DC heat dissipation.

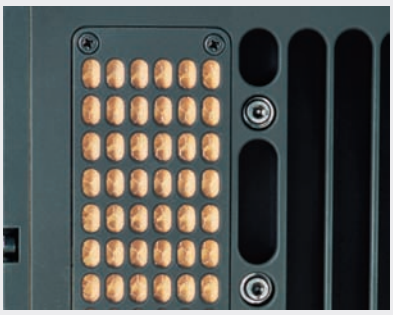
STANDARD EQUIPMENT OPTIONAL EQUIPMENT OPTIONAL EQUIPMENT AT EXTRA COST

Chassis Features

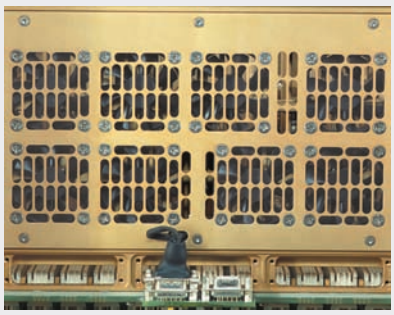
FAC & HES Versions. Rotron series PX2 & PX3 low profile standard fan figer guards are fitted in each fan ventilation opening to allow safe chassis manipulation.



FAC & HES Versions. Shielded fan finger guards fitted with honeycomb filter improve chassis EMI and EMC performance in noise sensitive applications *(Ordering ref: EMIG)*

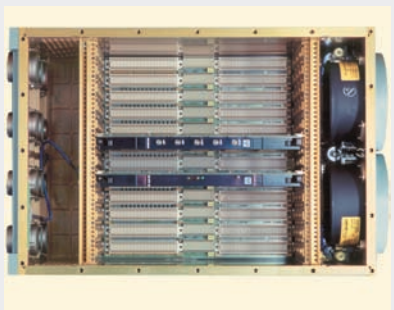


FAC Versions. Chassis sidewall and top cover air intakes are fitted with removable low pressure-drop EMI/EMC metal screen & honeycomb filters. This prevents the entry of debris and improves chassis noise performance.



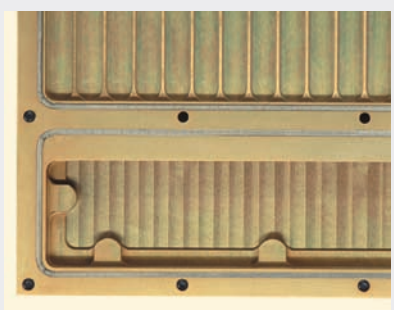
S, SEF & HES Vers. All sealed chassis install internal low profile air recirculation fans to improve card-cage electronics heat dissipation and simultaneously accept conduction cooled and convection cooled boards.

Airflow in card cage can be optimized slot by slot using screw removable blanking plates. To prevent airflow in unused areas, plates can be inserted in empty slots to increase airflow over critical modules.

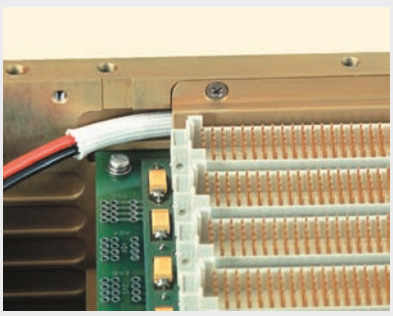


CM chassis internal layout is divided into 3 independent metallic partitions: I/O section at the front, card-cage in the middle & PSU section at the rear. This improves EMI/EMC performance & reduces PSU noise on system electronics.

Removable top and bottom covers provide access to circuit cards, PSU and Backplane I/O wiring area. Stainless steel captive screws are installed on all covers to facilitate maintenance operations.



All chassis panels & covers have conductive interior surfaces and incorporate EMI O-ring gaskets in all metal-to-metal joints to create an effective shielded Faraday cage for the enclosed electronic payload.

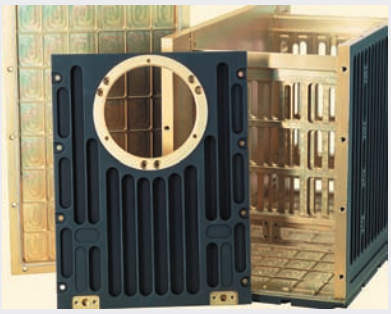


Two metallic wiring corridors integrated lengthwise within the chassis side panel ensure proper EMI shielding of PSU & Fan power cables. Corridors may also be used for shielding noise sensitive I/O application signals.

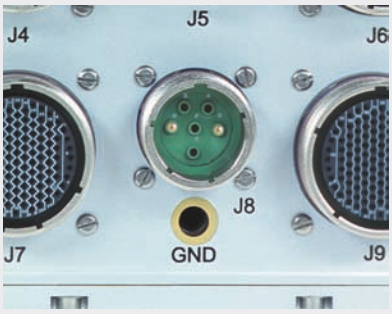
All chassis metalwork internal and external aluminium surfaces are MIL-C-5541 E chemical conversion coated (chromate) for excellent corrosion resistance and optimum electrical conductivity.

STANDARD EQUIPMENT OPTIONAL EQUIPMENT OPTIONAL EQUIPMENT AT EXTRA COST

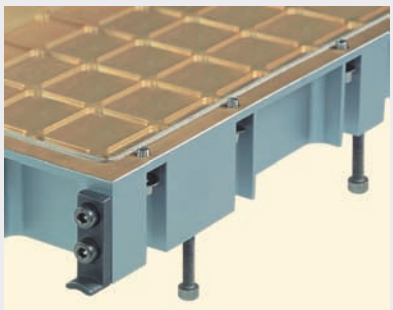
Chassis Features



All chassis parts are precision machined by CNC in aeronautical aluminium in order to achieve an ultra compact lightweight metal structure with no burrs sharp edges and an outstanding externalfinishthroughout.



A NAS6204 or metric M5 bonding point can be installed on front panel to allow chassis external grounding. Additionally there are six specific M3 thread terminals fitted in the inside of the chassis structure for general grounding purposes.



As an alternative to classic front panel NAS-622 steel hooks, enclosure mounting/ fixing to base plate may be easily accomplished through a set of M4 fixing screws fitted at the chassis base structure.

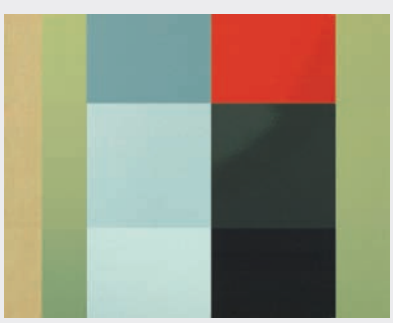
Well suited for military applications, CM mounting trays offer low weight, minimum outline dimensions, fast enclosure insertion/removalcapability and easy installation on vehicle´s hull.

Enclosure sidewalls and rear panel are externally finned to decrease weight up to 50% without sacrificing mechanical performance. Fins also improve heat dissipation through free air natural convection.

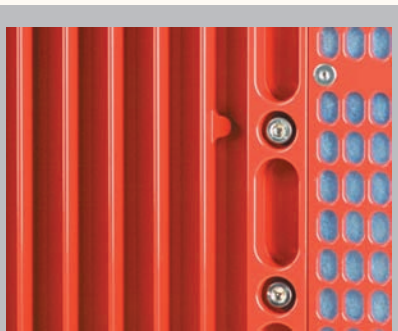
Chassis are equipped with NAS-622 hooks on front panel and stainless steel centering plates (pin receptacles) at the rear. Often used threads have stainless steel helicoils to withstand severe shock and vibration.

A practical retractile carrying handle is fitted on chassis front panel. An additional retractile handle is also incorporated on the CM-ATR-45 rear panel due to its increased size and weight.

HES Versions.
Heat Exchanger Top Cover has identical design and operation as heat exchanger sidewalls, increasing cooling performance approximately 35% with respect to basic chassis model.
(Ordering ref: HETC).



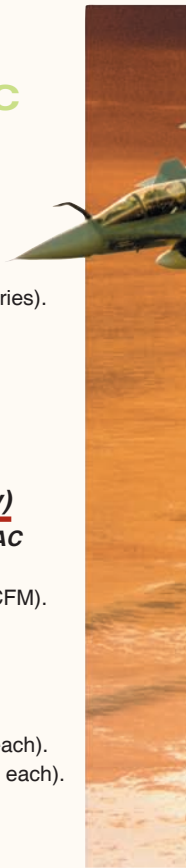
All chassis external surfaces are painted with a 3-layer military grade epoxy paint with primer (paint sample is supplied upon request). Most prevalent standard colors are Black (B) and Navy Grey (G).



A wide variety of special paint colors such as Blue (BLU), Red (R), Green (GN), Army dark Earth (E), Platinum (PT), White (W) and Yellow (YW) are available upon request to suit specific applications. *(Ordering ref: color code).*

STANDARD EQUIPMENT OPTIONAL EQUIPMENT OPTIONAL EQUIPMENT AT EXTRA COST

Chassis Ordering Information



P/N: CM-ATR-S5 /CT /B /I /W /3.3 /D1 /D2 /R /S /FP /TC /BC /F /G /C

S5: Enclosure Size

CM-ATR-25: 1/2 ATR Long size. 5 slots 6U.
CM-ATR-35: 3/4 ATR Long size. 7 slots 6U.
CM-ATR-45: 1 ATR Long size. 12 slots 6U.

/CT: Enclosure Cooling Technique

FAC: Flowthrough Air Cooled.
S: Sealed.
SEF: Sealed with Extended Fins.
HES: Sealed with Heat Exchange Sidewalls.

/B: Backplane Type

VME64x: Military VME64x Backplane.
VME64xK: Military VME64x Backplane Key-slot J0.
cPCI: Military cPCI Backplane.

/I: PSU Input Power Voltage

28VDC: 28VDC Input.
48VDC: 48VDC Input.
270VDC: 270VDC Input.
90-264VAC: Autorange 90-264VAC@47-880 Hz Input.
200VAC-3Ph: 200VAC 3 Phase@47-880 Hz Input.

/W: Power Supply Unit Watts

➢ ***PSUs available for CM-ATR-25***
300W: 28 VDC input only.
400W: All PSUs except 28 VDC input.
➢ ***PSUs available for CM-ATR-35***
400W: 28 VDC input only.
500W: All PSUs except 28 VDC input.
➢ ***PSUs available for CM-ATR-45***
950W: 28 VDC input only.
1050W: All PSUs except 28 VDC.

/3.3: 3.3 VDC

Optional DC/DC AUX0 converter on Backplane fitted for 3.3 VDC (CM-ATR-25 & CM-ATR-35 only).
3.3-75W: 3.3 VDC @ 22 A (in lieu of 3.3 VDC @ 5A).
Note: if /3.3 is not selected, DC/DC AUX0 remains free to user.

/D1: DC/DC AUX1 (Only CM-ATR-35 & CM-ATR-45)

Optional user defined output DC/DC Converter on Backplane.

/D2: DC/DC AUX2 (Only CM-ATR-45)

Optional user defined output DC/DC Converter on Backplane.

/R: Redundant PSU

➢ ***1 Slot plug-in Optional RPSUs available for CM-ATR-25***
R375W: 28 VDC input only
R475W: All PSUs except 28 VDC input
➢ ***1 Slot plug-in Optional RPSUs available for CM-ATR-35***
R475W: 28 VDC input only
R575W: All PSUs except 28 VDC input
➢ ***1 Slot plug-in Optional RPSUs available for CM-ATR-45***
R950W: 28 VDC input only
R1050W: All PSUs except 28 VDC

/S: Temperature Supervisory Unit

Optional Module Fitted on 1 slot plug-in RPSUs.
TSU: Temperature Supervisory Unit incorporated in RPSU module.

/FP: Front Panel Layout

CMP: CM Computer front panel fitted with MIL-C-38999 connectors.
UDP: User defined front panel layout (requires customer drawings).

/TC: Chassis Top Cover

STC: Standard Low-profile Top Cover.
HETC: Heat Exchanger Top Cover (HES series only).
HTC: Extended High-profile Top Cover (15 mm extra clearance).
FTC: Low-profile Top Cover with cooling fins (standard on SEF series).

/BC: Chassis Bottom Cover

SBC: Standard Low-profile Bottom Cover. Chassis vertical wiring clearance below backplane: 25 mm.
HBC: Extended High-profile hat Bottom Cover. Chassis vertical wiring clearance below backplane: 50 mm.

/F: Rear-mounted Fan assembly (FAC Series only)

➢ ***Rotron Fans available for CM-ATR-25/FAC & CM-ATR-35/FAC***
F115-400: 1x PX2 Military fan for 115 VAC @ 400 Hz (65 CFM).
F200-400: 1x PX2 Military fan for 200 VAC @ 400 Hz 3-Ph (120 CFM).
F28: 1x PX2 Military fan for 28 VDC (55 CFM).
F115-60: 1x Rugged fan for 115 VAC @ 60 Hz (20 CFM).
F220-50: 1x Rugged fan for 220 VAC @ 50 Hz (20 CFM).
➢ ***Rotron Fans available for CM-ATR-45/FAC***
F115-400: 2x PX3 Military fan for 115 VAC @ 400 Hz (100 CFM each).
F200-400: 2x PX3 Mil. fan for 200 VAC @ 400 Hz 3-Ph (140 CFM each).
F28: 2x PX3 Military fan for 28 VDC (110 CFM each).
F115-60: 2x Rugged fan for 115 VAC @ 60 Hz (35 CFM each).
F220-50: 2x Rugged fan for 220 VAC @ 50 Hz (35 CFM each).

/F: Rear-mounted Fan Pack assembly (HES Series only)

➢ ***Rotron Fan Packs available for CM-ATR-25/HES & CM-ATR-35/HES***
F115-400: 2x PX2 Mil. fan for 115 VAC @ 400 Hz (65 CFM each).
F200-400: 2x PX2 Mil. fan for 200 VAC @ 400 Hz 3-Ph (120 CFM each).
F28: 2x PX2 Military fan for 28 VDC (55 CFM).
F115-60: 2x Rugged fan for 115 VAC @ 60 Hz (20 CFM each).
F220-50: 2x Rugged fan for 220 VAC @ 50 Hz (20 CFM each).
VAP: Vehicle Air-Plenum fitting (according to customer specifications).
➢ ***Rotron Fan Packs available for CM-ATR-45/HES***
F115-400: 4x PX2 Mil. fan for 115 VAC @ 400 Hz (65 CFM each).
F200-400: 4x PX2 Mil. fan for 200 VAC @ 400 Hz 3-Ph (120 CFM each).
F28: 4x PX2 Military fan for 28 VDC (55 CFM each).
F115-60: 4x Rugged fan for 115 VAC @ 60 Hz (20 CFM each).
F220-50: 4x Rugged fan for 220 VAC @ 50 Hz (20 CFM each).
VAP: Vehicle Air-Plenum fitting (according to customer specifications).

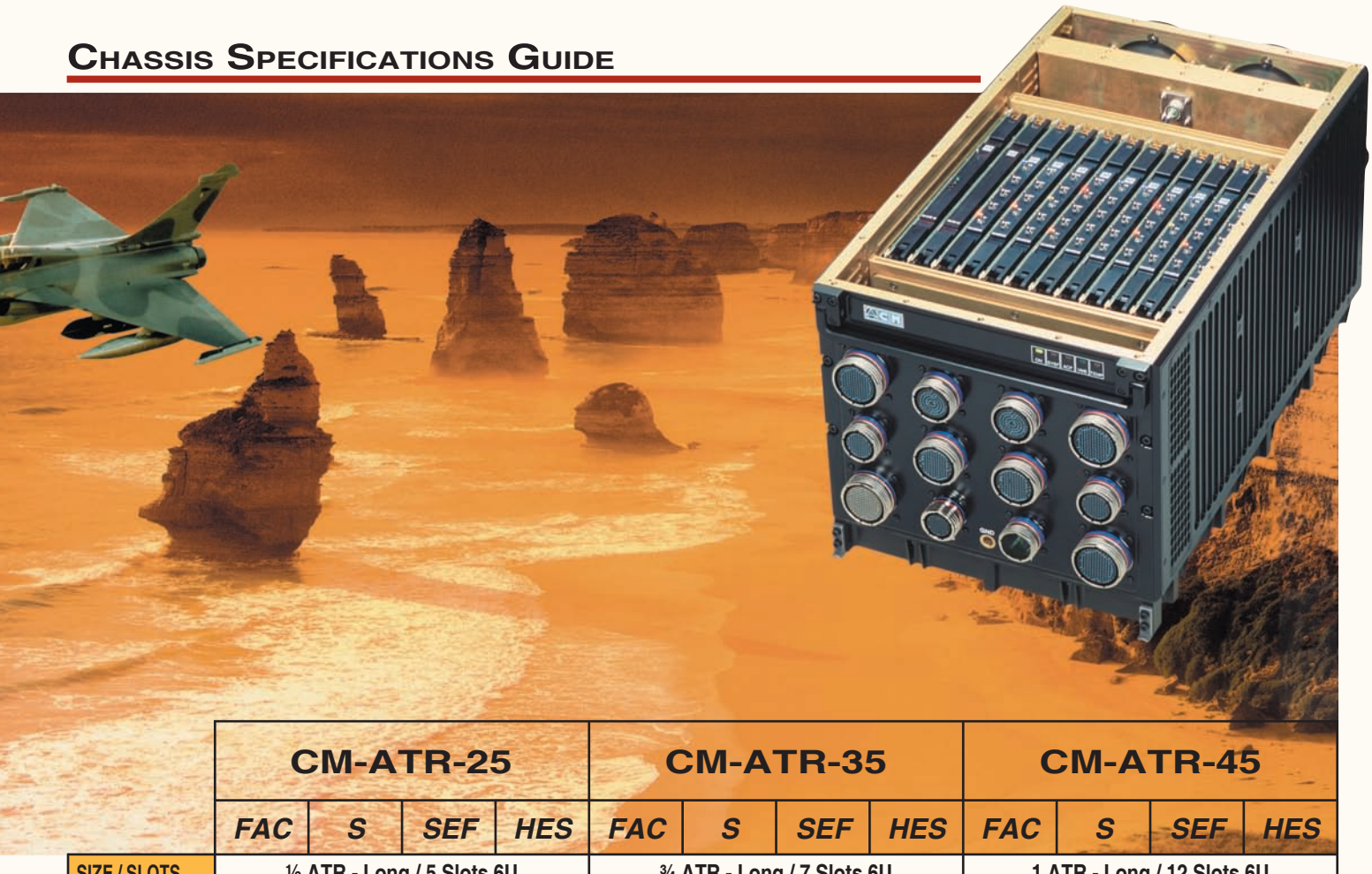
/G: Fan Finger Guards (FAC & HES only)

STDG: Standard Rotron PX2/PX3 finger guards.
EMIG: Optional EMI Shielding finger guards fitted with honeycomb filter.

/C: Chassis Color

B: Black.
G: Navy Grey.
E: Army Dark Earth.
W: White.
R: Red.
PT: Platinum.
YW: Yellow.
GN: Green.
BLU: Dark Blue.
CR: Chromate MIL-C-5541.
O: Other (user defined).

Chassis Specifications Guide



	CM-ATR-25				CM-ATR-35				CM-ATR-45			
	FAC	*S*	*SEF*	*HES*	*FAC*	*S*	*SEF*	*HES*	*FAC*	*S*	*SEF*	*HES*
SIZE / SLOTS	½ ATR - Long / 5 Slots 6U				¾ ATR - Long / 7 Slots 6U				1 ATR - Long / 12 Slots 6U			
WIDTH	130 mm	130 mm	155 mm	140 mm	170 mm	170 mm	195 mm	180 mm	271 mm	271 mm	296 mm	281 mm
HEIGHT	236 mm	236 mm	246 mm	236 mm	236 mm	236 mm	246 mm	236 mm	236 mm	236 mm	246 mm	236 mm
DEPTH	390 mm	390 mm	405 mm	455 mm	390 mm	390 mm	405 mm	455 mm	390 mm	390 mm	405 mm	455 mm
EXT. SURFACE	5,100 cm²	5,450 cm²	9,850 cm²	5,050 cm²	5,600 cm²	5,980 cm²	10,400 cm²	5,300 cm²	7,660 cm²	8,400 cm²	14,100 cm²	6,500 cm²
TOTAL WEIGHT	5.7 Kg	5.2 Kg	6.3 Kg	7.5 Kg	7.2 Kg	6.6 Kg	7.7 Kg	8.9 Kg	10.8 Kg	10 Kg	11.2 Kg	12.5 Kg
PSU WATTS	400 Watts (28 VDC PSU 300 Watts)				500 Watts (28 VDC PSU 400 Watts)				1050 Watts (28 VDC PSU 950 Watts)			
+5 VDC	20 Amp				40 Amp				80 Amp			
+12 VDC/-12 VDC	12 Amp each				12 Amp each				20 Amp each			
+3.3 VDC (STD)	5 Amp				5 Amp				45 Amp			
+3.3 VDC (OPT)	22 Amp (AUX0)				22 Amp (AUX0)				---			
RPSU WATTS	475 Watts (28 VDC RPSU 375 Watts)				575 Watts (28 VDC RPSU 475 Watts)				1050 Watts (28 VDC RPSU 950 Watts)			
PSU V-INPUT	28 VDC ±30%, 48 VDC ±30%, 270 VDC ±30%, Autorange 90-132 VAC RMS & 180-264 VAC RMS 47-880 Hz, 3-Phase 200 VAC ±30% 47-880 Hz											
PSU I-INPUT	28VDC@15A, 115VAC@5A, 3Ph-200VAC@1.5A				28VDC@20A, 115VAC@6A, 3Ph-200VAC@2A				28VDC@50A, 115VAC@14A, 3Ph-200VAC@5A			
BP DC/DC AUX1	Auxiliary DC/DC output options: +2VDC 50W, -2VDC 50W, +3,3VDC 75W, -3,3VDC 75W, +5VDC 100W, -5VDC 100W, +12VDC 100W, -12VDC 100W											
BP DC/DC AUX2	---				+15VDC 100W, -15VDC 100W, +28VDC 100W, -28VDC 100W, +48VDC 100W, -48VDC 100W							
REAR FAN	1 x PX2	---	---	2 x PX2	1 x PX2	---	---	2 x PX2	2 x PX3	---	---	4 x PX2
F115-400	65 CFM	---	---	130 CFM	65 CFM	---	---	130 CFM	200 CFM	---	---	260 CFM
F200-400 3Ph	120 CFM	---	---	240 CFM	120 CFM	---	---	240 CFM	280 CFM	---	---	480 CFM
F28	55 CFM	---	---	110 CFM	55 CFM	---	---	110 CFM	220 CFM	---	---	220 CFM
F115-60	20 CFM	---	---	40 CFM	20 CFM	---	---	40 CFM	70 CFM	---	---	80 CFM
F220-50	20 CFM	---	---	40 CFM	20 CFM	---	---	40 CFM	70 CFM	---	---	80 CFM
INTERNAL FAN	---	18 CFM	18 CFM	18 CFM	---	36 CFM	36 CFM	36 CFM	---	72 CFM	72 CFM	72 CFM
FP USER AREA	101 mm x 172.5 mm				141.5 mm x 172.5 mm				243 mm x 172.5 mm			
CM F. PANEL I/O	6 Power Pins (23 Amp) & 365 I/O Pins (5 Amp)				6 Power Pins (23 Amp) & 822 I/O Pins (5 Amp)				6 Power Pins (23Amp) & 1057 I/O Pins (5Amp)			
MTBF	25º GB 86,000 Hours, 65º AIC 28,000 Hours				25º GB 82,000 Hours, 65º AIC 26,000 Hours				25º GB 63,000 Hours, 65º AIC 21,000 Hours			
MOUNT. TRAY	CM-TR-25				CM-TR-35				CM-TR-45			

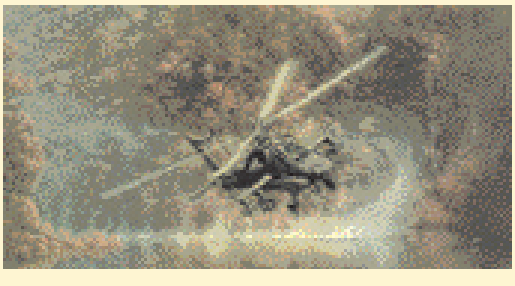
Chassis Environmental Specifications

- **MIL-STD-810F Temperature (Methods 501.4 & 502.4)**
  - -55 to +80 °C Operating.
  - -55 to +100 °C Storage.
- **MIL-STD-810F Altitude (Method 500.4)**
  - Up to 65,000 ft operating.
- **MIL-STD-810F Shock (Method 516.5)**
  - Sawtooth pulse 40g 11ms.
- **MIL-STD-810F Acceleration (Method 513.5)**
  - Up to 12g, 3 axes.
- **MIL-STD-810F Vibration (Method 514.5)**
  - Category 12 for Jet Aircraft.
  - 15 to 2000 Hz at 12g RMS.
- **MIL-STD-810F Humidity & Salt Fog (Methods 507.4 & 509.4)**
  - Relative humidity 0-95% 10 cycles 240 h.
  - Test 96 hours 5% NaCl salt (PH = 7).
- **MIL-STD-461E EMI & EMC (Electromagnetic compatibility)** CE101, CE102, CS101, CS114, CS115, CS116, RE102, RE103, RS103.
- **MIL-E-5400T for avionics class 1.**

Military Components

CM-ATR-X5 chassis materials & electronic parts are fully compliant to manned space flight requirements.

- **MIL-STD-461D Power Supply Front-end Modules.**
- **MIL-STD-704A & MIL-STD-1275A Power Supply.**
- **MIL-C-7438 EMI/EMC Honeycomb Filters.**
- **MIL-R-6130 EMI/EMC Gasket.**
- **MIL-STD-883 & MIL-PRF-38535 TTL Chips.**
- **MIL-S-13949 Class V Printed Wiring Boards.**
- **MIL-C-55302 Backplane Class I VME Connectors.**
- **MIL-C-24308 Backplane Class I Cannon Type D.**
- **MIL-C-24308 PSU & BP Class I Power Connectors.**
- **MIL-C-38999 Circular Connector on Front Panel.**
- **MIL-I-45208 & MIL-STD-810F DC/DC Converters.**
- **MIL-STD-810C, MIL-B-23071 & MIL-B-28873 Fans.**



- **AW6082-T651 Aeronautical Aluminium.**
- **AISI-316 Screws, Inserts & Chassis Accessories.**
- **MIL-I-45208 & MIL-STD-105 NAS-622 Hook.**
- **MIL-C-1291 Front Panel Bonding Point.**
- **MIL-F-85731 Mounting Tray Clamps.**
- **MIL-STD-1547B Corrosion Resistant Coating.**
- **MIL-C-83286 External Surface Painting.**

Military Design & Quality

CM chassis are designed using an advance 3D CAD facility. Product design includes thermal modelling and environmental testing. All units are individually tested after production and carefully screened per Military Standards before the release of a fully tested sub-system. All CM products have a 2 year warranty.

CM Computer

European Headquarters:
Avda. Alcalde Luis Uruñuela s/n.
Edificio Congresos, 3-14.
41020 Sevilla (SPAIN)
Tel: +34 954253116
Fax: +34 954253119
WebSite: www.cmcomputer.com
E-mail: cm@cmcomputer.com

Your local representative:

For more extensive information, contact CM Computer or your representative.