CM Computer
True Military COTS Products

Short Form Edition

COTS MILITARY ATR CHASSIS

CM 2017 PRODUCT RANGE SHORT FORM CATALOG

35 MODELS

FULL RANGE OF HIGH PERFORMANCE ENCLOSURES

- UP TO 35 OFF-THE-SHELF MILITARY ATR CHASSIS MODELS
- ALL 3U & 6U MODULE FORMATS / VITA BUSES SUPPORTED
- EXTENSIVE PSU POWER SUPPLY & BACKPLANE COMBINATIONS
- MIL-STD-461F & MIL-STD-810F CERTIFIED BY INDEPENDENT LABS
- COMPLETE CHASSIS THERMAL TESTING PROCEDURES & GUIDELINES

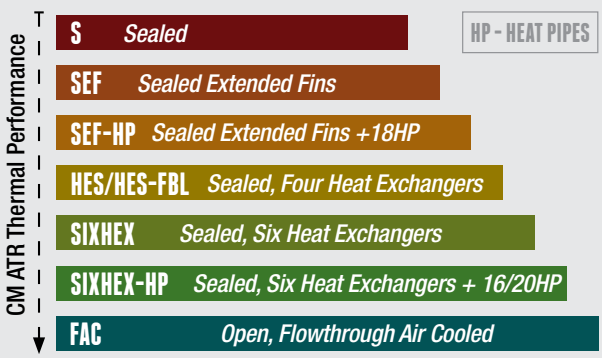
MILITARY COTS ATR CHASSIS

The Leading military ATR & VME I/O manufacturer in Europe and the USA

CM COMPUTER MILITARY COTS TECHNOLOGIES

CM Computer has designed and manufactured high performance military COTS electronic modules since 1988 and ATR Chassis since 1993. The company has provided COTS solutions to over 200 avionics, defense & military programs over the past 25 years.

CM has in-house ISO-9001 certified facilities for design, testing, CNC machining, electronics, chemical coating and painting. We do not subcontract components or assemblies to other companies. CM Computer is committed to long-term product availability.

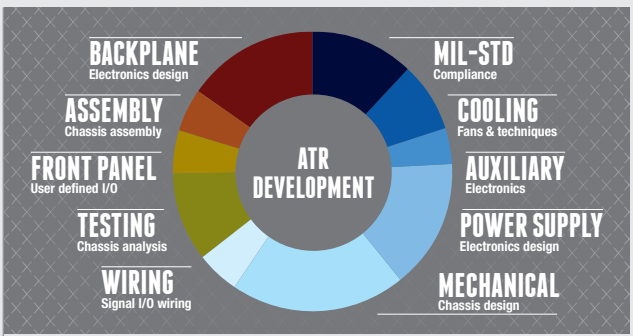


EXTENSIVE ATR PRODUCT LINE

CM chassis line comprises of 35 enclosures that operate under seven different cooling techniques. This wide product range has been developed to guarantee that end application systems meet thermal performance, power dissipation & payload MTBF demands.

CRITICAL MILITARY SYSTEMS

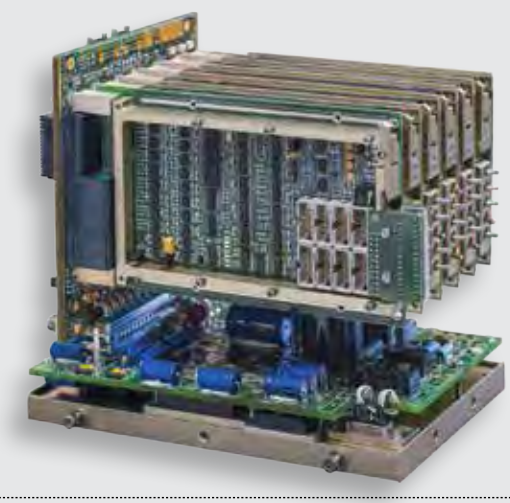
All our products are expressly designed for the most demanding applications that require uncompromising quality and reliability. First rate US military grade components and materials have been selected throughout and sourced only from reputable manufacturers to ensure true MIL-STD compliance.



ATR THERMAL PERFORMANCE & RELIABILITY

COTS ATR chassis have become the backbone of today's complex military systems. Service-life statistics demonstrate that high performance enclosures mitigate the risk of system failure and significantly increase system longevity.

CM chassis adopt a combination of highly optimized conventional cooling techniques that operate in parallel to achieve superior thermal dissipation rates. Thermodynamic processes include conduction cooling, card-cage direct forced-air cooling, integration of four or six forced-air heat exchangers, up to 20 sealed heat pipes, and natural free air convection.



Custom Chassis Solutions

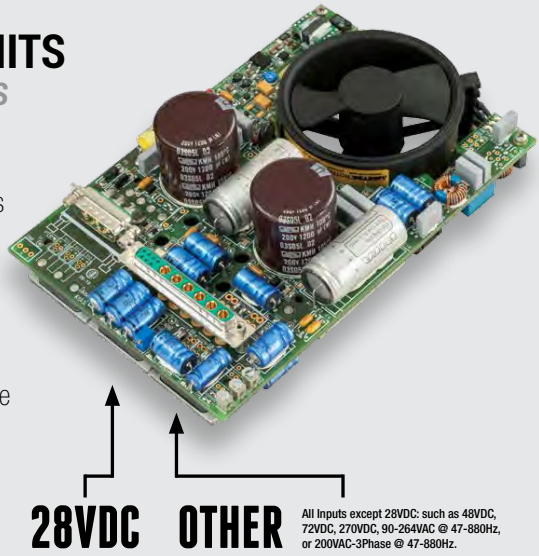
CM provides customization support for customers who wish to develop systems that are not available from our cataloged line of COTS ATR chassis models. Our senior specialized in-house engineering has a long history of developing non-standard custom military ATR enclosures, allowing us to undertake any modification proposal or tailored solution.

CM MILITARY POWER SUPPLY UNITS

THE WIDEST RANGE OF MILITARY CERTIFIED PSUS

CM Computer has developed over 40 military ATR power supply options that are expressly tailored to suit the demand of COTS open bus systems. CM PSUs support all American and European standard AC/DC input voltages to facilitate easy integration and deployment in the field. Our oversized PSUs provide up to 1550 watts of output power to satisfy the full range of military applications.

All our PSU models are specified for -40ºC to +90ºC operating and fit a Temperature Supervisory Unit (TSU) for payload protection. Modules incorporate full military DC/DC Converters, output voltage trim-up resistors, remote voltage sensing and PSU shut down control. Dual redundant PSU models (operating on a load sharing basis) are available for mission critical applications.



CM Military Chassis PSU Options

		Vin Options		Backplane DC Options				Suggested Bus			ATRs Supported									
											6U Models						3U Models			
		28VDC	OTHER	+5	+3.3	+12	-12	VME	cPCI	VPX/cPCIS	FAC	S / SEF	SEF-HP	HES	SIXHEX	SIXHEX-HP	FAC	S / SEF-HP	HES	HES-RBL
5 SLOT ATR	300W	●		20A	5A	8A	8A	●	●	●	●	●	●	○						
	400W		●	20A	5A	12A	12A	●	●	●	●	●	●	○						
	A-475W	●		40A	22A	8A	8A	●				●	●	●	●	●		●	●	●
	A-575W		●	40A	22A	12A	12A	●				●	●	●	●	●		●	●	●
	B-450W	●		20A	45A	8A	8A		●			●	●	●	●	●		●	●	●
	B-550W		●	20A	45A	12A	12A		●			●	●	●	●	●		●	●	●
	C-475W	●		20A	22A	16A	8A			●		●	●	●	●	●		●	●	●
	C-575W		●	20A	22A	21A	12A			●		●	●	●	●	●		●	●	●
3U 5 SLOT, 6U 7 SLOT, 6U 5 SLOT (1" ONLY) ATR	400W	●		40A	5A	8A	8A	●	●	●	●	●	●	○						
	500W		●	40A	5A	12A	12A	●	●	●	●	●	●	○						
	A-475W	●		40A	22A	8A	8A	●				●	●	●	●	●			●	●
	A-575W		●	40A	22A	12A	12A	●				●	●	●	●	●			●	●
	A-675W	●		80A	22A	8A	8A	●				●	●	●	●	●			●	●
	A-775W		●	80A	22A	12A	12A	●				●	●	●	●	●			●	●
	B-450W	●		20A	45A	8A	8A		●			●	●	●	●	●			●	●
	B-550W		●	20A	45A	12A	12A		●			●	●	●	●	●			●	●
	B-564W	●		20A	80A	8A	8A		●			●	●	●	●	●			●	●
	B-664W		●	20A	80A	12A	12A		●			●	●	●	●	●			●	●
	C-475W	●		20A	22A	16A	8A			●		●	●	●	●	●			●	●
	C-575W		●	20A	22A	21A	12A			●		●	●	●	●	●			●	●
	C-775W	●		20A	22A	41A	8A			●		●	●	●	●	●			●	●
	C-825W		●	20A	22A	41A	12A			●		●	●	●	●	●			●	●
	D-550W	●		40A	45A	8A	8A	●	●			●	●	●	●	●			●	●
	D-650W		●	40A	45A	12A	12A	●	●			●	●	●	●	●			●	●
	E-550W	●		20A	45A	16A	8A		●	●		●	●	●	●	●			●	●
	E-650W		●	20A	45A	21A	12A		●	●		●	●	●	●	●			●	●
	F-575W	●		40A	22A	16A	8A	●		●		●	●	●	●	●			●	●
	F-675W		●	40A	22A	21A	12A	●		●		●	●	●	●	●			●	●
12 SLOT ATR	950W	●		80A	45A	16A	16A	●	●	●	●	●	●	○						
	1050W		●	80A	45A	21A	21A	●	●	●	●	●	●	○						
	A-950W	●		80A	45A	16A	16A	●	●	●				●	●	●				
	A-1050W		●	80A	45A	21A	21A	●	●	●				●	●	●				
	B-950W	●		40A	45A	33A	16A	●	●	●				●	●	●				
	B-1100W		●	40A	45A	41A	20A	●	●	●				●	●	●				
	B-1065W	●		80A	80A	16A	16A	●	●	●				●	●	●				
	B-1165W		●	80A	80A	21A	21A	●	●	●				●	●	●				
	C-864W	●		40A	80A	16A	16A	●	●	●				●	●	●				
	C-964W		●	40A	80A	20A	20A	●	●	●				●	●	●				
	C-1225W	●		80A	160A	16A	16A	●	●	●				●	●	●				
	C-1425W		●	80A	160A	21A	21A	●	●	●				●	●	●				
	D-1350W	●		160A	80A	16A	16A	●	●	●				●	●	●				
	D-1550W		●	160A	80A	21A	21A	●	●	●				●	●	●				

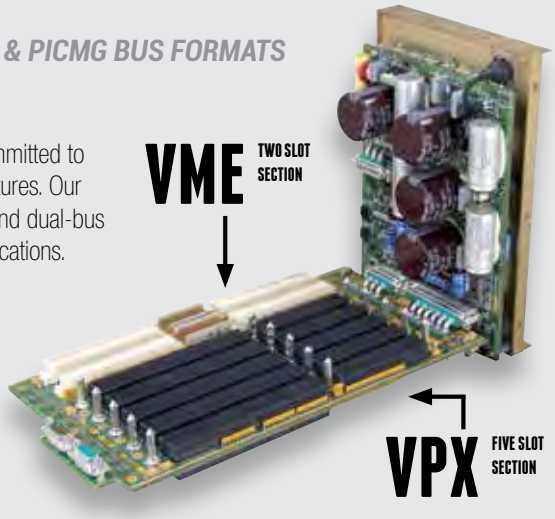
● *Available for selected model* ○ *Only available for 0.8" pitch version*

CM MILITARY BACKPLANES

INTEGRATED OFF-THE-SHELF UNDER VITA & PICMG BUS FORMATS

CM designs and develops VPX, VME, cPCI, and Hybrid backplanes in accordance with VITA/PICMG Technologies specifications. We are committed to open system, real-time critical embedded computing system architectures. Our knowledge, experience, and flexibility enables us to develop custom and dual-bus backplanes based on customer criteria, required topology, and specifications.

CM COTS backplanes are available in 6U and 3U formats, supporting 5, 7, or 12 slots and 0.8", 0.85", and 1" pitch sizes. Printed circuit boards are manufactured to MIL-S-13949, incorporating active semiconductors and passive components rated for -40°C to +85°C operating. All CM chassis incorporate true military monolithic backplanes that are engineered to match enclosure mechanics.



CM COTS Backplane Bus Standards

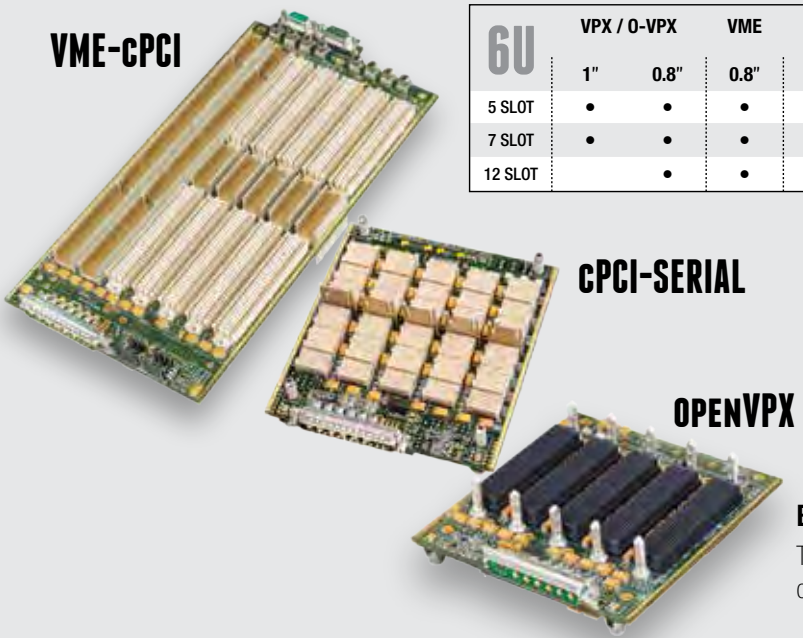
All CM military ATR chassis integrate backplanes compatible with *VITA-VPX, VITA-VME64x,* and *PICMG-cPCI* standard bus formats. Several *Dual Redundant or Hybrid dual-bus* backplanes are also readily available or can be designed upon specifications to suit any special system requirement.

Our low noise COTS backplanes provide conduction and air-cooled *IEEE/IEC* bus slots, standard signal connector pin-outs, and daisy-chains, etc. Motherboard assembled connectors are military VITA parts, allowing system integrators to find corresponding mating connectors on the open market.

CM backplanes allow flexible top and bottom system integration and unlimited pin I/O wiring (all slot pins are user accessible for I/O). Our chassis provide sufficient bottom cavity clearance to facilitate several I/O wiring techniques, avoiding the requirement for a custom backplane in most applications.

CM Backplane Availability

CM supplies up to 30 COTS military backplane models as standard. This compressive line of backplanes is subject to increase as new emerging applications or customer demands present themselves.



6U	VPX / O-VPX		VME	CPCI	DUAL REDUNDANT	HYBRID VME-VPX	HYBRID VME-CPCI
	1"	0.8"	0.8"	0.8"	0.8"	0.8"	0.8"
5 SLOT	•	•	•	•	•	•	•
7 SLOT	•	•	•	•	•	•	•
12 SLOT		•	•	•	•	•	•

3U	VPX / O-VPX		VME	CPCI-S
	1"	0.85"	1"	1"
3 SLOT	•			•
5 SLOT	•		•	•
6 SLOT		•		
7 SLOT	•			•
9 SLOT	•			•

BACKPLANE SELECTION GUIDE

The tables above illustrate CM's standard line of COTS backplanes available at publication.

CM ATR MILITARY CERTIFICATES

DELIVERED FULLY QUALIFIED PER MIL-STD-461 & MIL-STD-810

CM enclosures are delivered Tested, Qualified, and Certified per Military Standards to guarantee immediate fault-free operation in the most severe Military/Aerospace environments.

AT4 Wireless Labs, an independent European/American Official Laboratory, conducts our qualification programs in accordance with Military MIL-STD testing procedures and guidelines. Certificates and Testing Reports are delivered to our ATR customers.

MIL-STD tested chassis greatly reduce application risks, mitigate against uncertainty, and provide customers with total confidence in program success. CM chassis materials and electronic parts are fully compliant with manned space flight requirements.

	CE101	CE102	CS101	CS114	CS116	RE101	RE102	RS101	RS103
Surface Ships		A	A	A	A	A	A	A	A
Submarines	A	A	A	A	A	A	A	A	A
Aircraft, Army	A	A	A	A	A	A	A	A	A
Aircraft, Navy	L	A	A	A	A	L	A	L	A
Aircraft, Air Force		A	A	A	A		A		A
Space Systems		A	A	A	A		A		A
Ground, Army		A	A	A	A		A	L	A
Ground, Navy		A	A	A	A		A	A	A
Ground, Air Force		A	A	A	A		A		A

CM ATR MIL-STD-461F ELECTROMAGNETIC COMPATIBILITY MATRIX

CE Conducted Emissions | RE Radiated Emissions | A Applicable & Certified
CS Conducted Susceptibility | RS Radiated Susceptibility | L Limited & Certified

Certificates per MIL-STD-461

The following testing procedures have been carried out on CM COTS chassis according to severity levels and stringent criteria requirements of the US Navy and Air Force for military transport aircraft (>25m), military fighters (<25m), space systems, helicopters, and submarines.

MIL-STD-461F CONDUCTED EMISSIONS

- CE101 115V (60Hz-10kHz), CE101 28V (30Hz-10kHz), CE102 115V & 28V (10kHz-10MHz). Power Lead ON.

MIL-STD-461F CONDUCTED SUSCEPTIBILITY

- CS101 (30kHz-150kHz), CS114 (10kHz-200MHz), CS116 (10kHz-100MHz). Conducted Immunity.

MIL-STD-461F RADIATED EMISSIONS

- RE101 Radiated H Field ROD Navy Fixed & AF (30Hz-100kHz).
- RE102 Radiated E Field ROD Navy Fixed & AF (10kHz-1GHz).
- RE102 Radiated Field ER BILOG Navy Fixed & AF (30MHz-1GHz), Horizontal & Vertical Polarization.
- RE102 Radiated E Field HORN Navy Fixed & AF (1GHz-18GHz).

MIL-STD-461F RADIATED SUSCEPTIBILITY

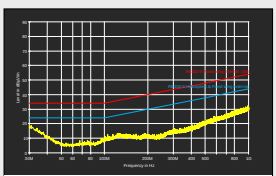
- RS101 Radiated H Field (30Hz-150kHz), RS103 Radiated E Field (2MHz-1GHz). Radiated Immunity.

Conducted Susceptibility: Cables and power leads 10kHz to 100MHz.

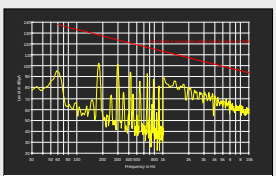
Radiation Emissions: Radiated E field 30MHz to 1GHz vertical polarization.

Radiated Emissions: Electric field, HORN,1GHz up to 18GHz.

Radiated Susceptibility: Radiated H field 30Hz - 150kHz, 2MHz - 100MHz.



RE102. Radiated Electric field - Horizontal, 30 MHz - 1 GHz.



CE101. Conducted Emissions - 30 Hz - 10 kHz.

Certificates per MIL-STD-810

- **MIL-STD-810F HIGH TEMPERATURE (M. 501.4)**
- **MIL-STD-810F LOW TEMPERATURE (M. 502.4)**
- **MIL-STD-810F HUMIDITY (M. 507.4)**
- **MIL-STD-810F FUNGUS (M. 508.5)**
- **MIL-STD-810F SALT FOG (M. 509.4)**
- **MIL-STD-810F VIBRATION (M. 514.5)**
- **MIL-STD-810F SHOCK (M. 516.5)**
- **MIL-STD-1474D FOR ACOUSTIC NOISE**

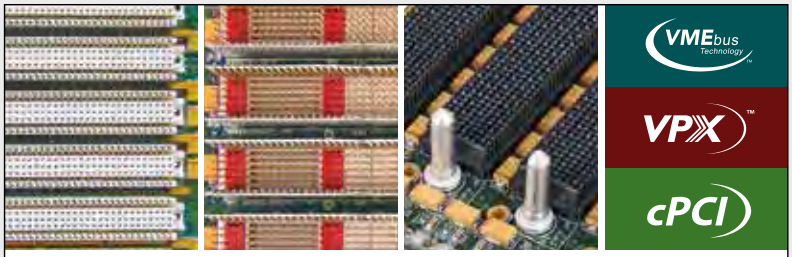
Note regarding the obtained MIL-STD-810 certificates: Chassis tests were performed without shock absorbers during shock and vibration procedures.

Vibration: X-Axis. 12grms @ 15Hz to 20kHz, 1 hour per axis.

Shock: Z-Axis. Sawtooth pulse 20grms @ 11ms, 18 pulses per axis.

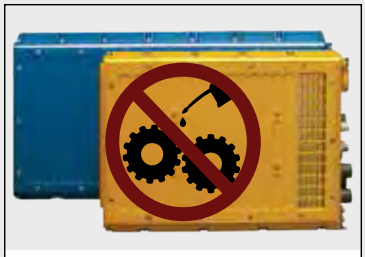
Salt Fog: ATR components subjected to 5% NaCL pH 6.3 solution for 96 hours.

Temperature (operating): 2hrs @ -55ºC and 2hrs @ +80ºC.



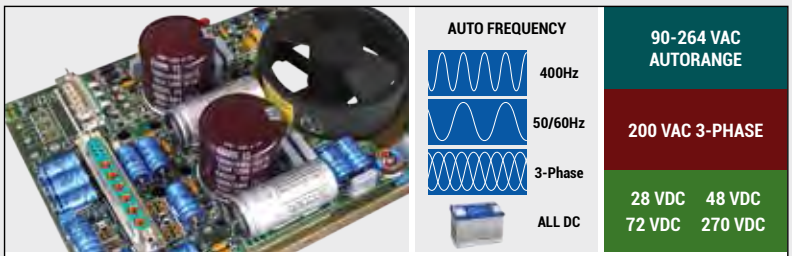
THREE COTS OPEN BUS ARCHITECTURES SUPPORTED

CM chassis fit the most popular open bus standards. Full military VPX, VMEbus, and cPCI backplanes are readily available and supplied with standard VITA/PICMG topology for universal compliance and easy integration with all COTS payload module types.



MAINTENANCE-FREE

CM Sealed enclosures offer lifetime operation. Periodic adjustment or replacement of parts is not required.

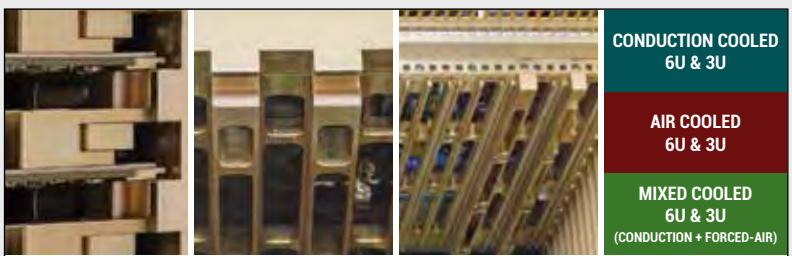


PSUs ACCEPT ALL STANDARD AC/DC INPUT VOLTAGES

CM PSUs accept American & European AC/DC input voltages. Supported AC input voltages; single-phase autorange 90-264VAC @ 47-880Hz or 3-phase 200VAC @ 47-880Hz. Supported DC input voltages; 28VDC, 48VDC, 72VDC, & 270VDC.

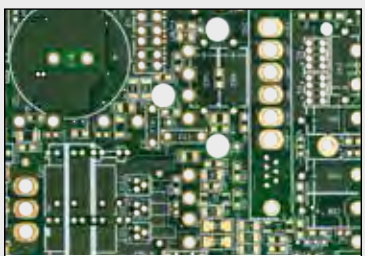
EXTRA HOLD-UP TIME

CM PSUs incorporate oversized hold-up capacitors to maintain backplane DC voltages in the event of power loss.



COMPATIBILITY WITH ALL BOARD MECHANICAL FORMATS

6U/3U board integration via a universal 'MCS' (mixed card-cage) that accepts any COTS conduction & air-cooled modules. A 'CCS' (conduction-cooled card-cage) is available for systems using only conduction-cooled boards. 0.8" or 1" slot pitch may be selected.



QUALITY CIRCUIT BOARDS

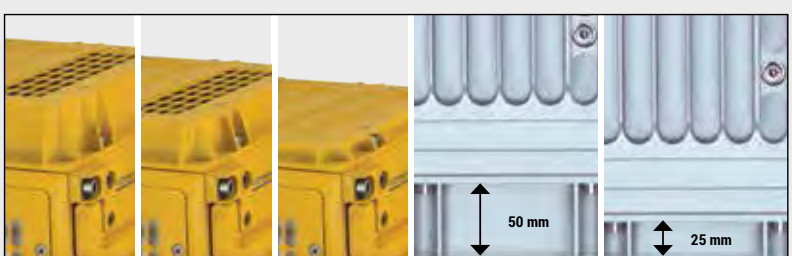
PCBs are up to 16 layers & conformal coated. Nickel-gold plated for superior conductivity & corrosion-resistance.

STANDARD OR CUSTOM FRONT PANELS AT NO COST

Customers may select a general purpose CM front panel, incorporating a set of MIL-DTL-38999 connectors or a customized front panel supplied free of charge. Custom panels include customer defined connectors, layout, silk screening, and company logo.

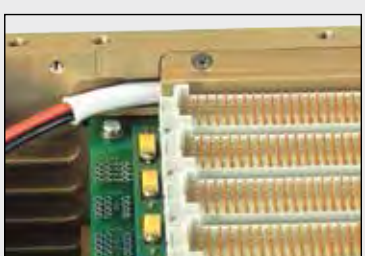
PANEL GROUNDING POINT

A NAS6204 or M5 bonding point is commonly fitted for external GND. Six M3 terminals for Internal grounding.



REMOVABLE TOP & BOTTOM COVER OPTIONS

A variety of extended, heat exchanger or finned covers can be selected for extra wiring clearance or superior cooling. Extended covers provide additional space for I/O wiring or custom electronics. All covers are removable for maintenance.

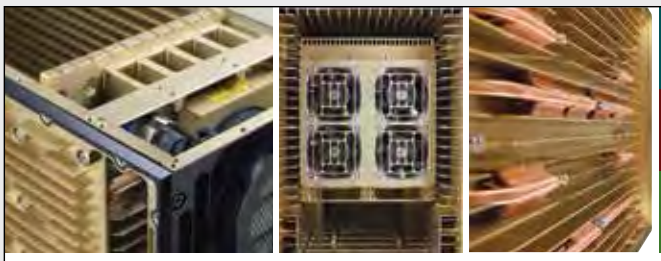


SIDE WIRING CORRIDORS

Chassis side wall corridors ensure PSU & fan cable EMI shielding and may also be used for sensitive I/O signals.

SHIELDED PSU CAVITY

An independent metallic partition for housing the PSU module reduces PSU heat and electrical noise on payload.



INCREASED SURFACE AREA

COMBINED COOLING TECHNIQUES

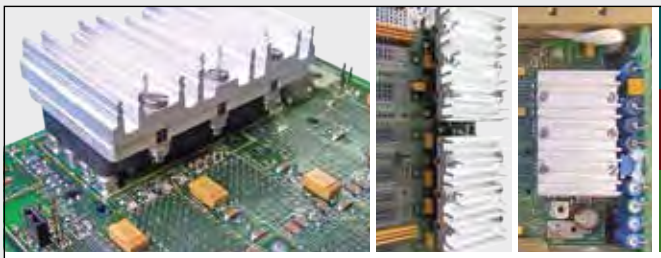
HIGH VOLUME AIRFLOW

OPTIMIZED THERMAL PERFORMANCE

Parts machined from high thermal conductivity aluminum provide greater thermo-active area than traditional chassis. Forced air in card-cage slots, heat exchangers & finned chassis walls improve convection. Integrated heat pipes on HP models further improve performance.

AIRFLOW SLOT PLATES

Card-cage airflow may be optimized slot-by-slot using blanking plates to increase airflow over critical cards.



USER DC/DC CONVERTERS (100W EACH)

SINGLE OR DUAL OUTPUT

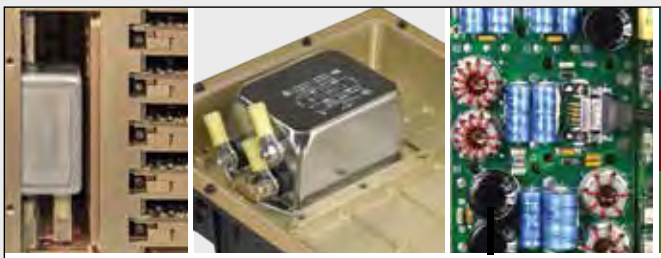
ISOLATED OUTPUT POWER

BACKPLANE AUXILIARY USER-DEFINED CONVERTERS

CM backplanes support one or two DC/DC power converter sockets that can be populated with any Vicor micro converter (100W each). Auxiliary DC/DC converters provide any positive, negative, or symmetric user-defined output voltages for special (non-VITA) power requirements.

FAN DC/AC CONVERTERS

AC military fans operating inside a 28 VDC PSU chassis integrate an auxiliary DC/AC military converter.



IN-LINE AC/DC INPUT FILTER

VICOR FARM & FIAM FRONT-END FILTERS

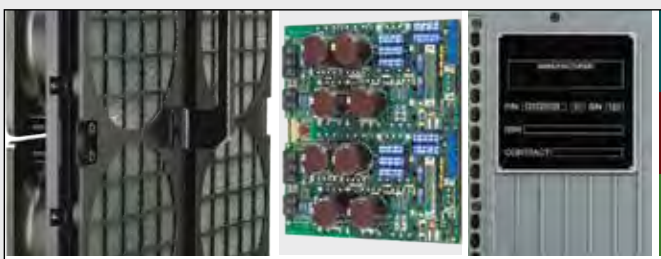
PSU MODULE DISCRETE PARTS LC FILTERS

3 STAGE EMI/EMC PSU INPUT FILTERS

CM chassis incorporate three EMI/EMC filters for MIL-STD-461 compliance. DC PSUs fit VICOR FIAM modules for inrush current limiting, transient protection and EMI filtering. Single-phase AC PSUs fit VICOR FARM modules for autoranging line rectification and EMI filtering.

PSU POWER CONNECTORS

Military power connectors offer reliable shock and vibration interconnectivity between chassis PSU and backplane.



DUAL REDUNDANT SYSTEMS

CUSTOM & HYBRID BACKPLANES

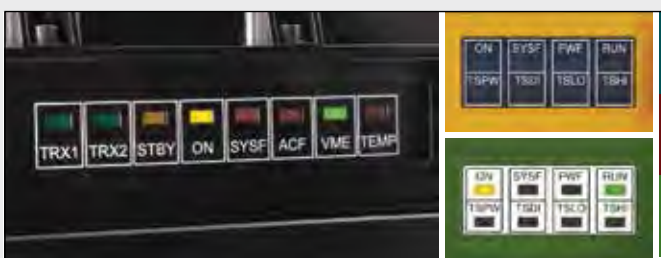
CUSTOM METALWORK SOLUTIONS

CHASSIS CUSTOMIZATION CAPABILITIES

CM designs & manufactures all aspects of our ATR products in-house. We deliver customized parts & integrated solutions to meet client project needs, these may include hybrid backplanes, dual redundant power supplies, special fan assemblies, non-standard chassis dimensions, etc.

USER POWER OUTPUTS

Independent output voltage tabs are available to allow access to +3.3VDC, +5VDC, +12VDC, -12VDC, & GND.



TEMPERATURE STATUS

DC/AC POWER FAIL STATUS

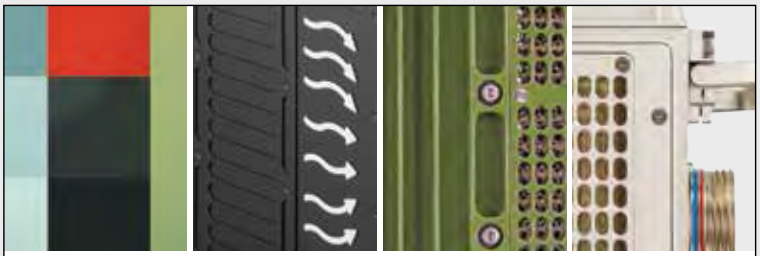
SBC & SYSTEM FAIL STATUS

CHASSIS FRONT PANEL LED INDICATORS

Front panels incorporate up to 8 LED/SMD indicators. They are driven by logic circuitry on the Backplane & TSU. Panel indicators monitor: power on/off/standby status, system board failure, PSU input voltage fail, backplane DC voltages within range, over/under temperature, etc.

CORROSION PROTECTION

All aluminum surfaces are MIL-DTL-5541F chemical coated (chromate) for excellent corrosion resistance.



MILITARY PAINT OPTIONS

External surfaces are painted with a 3-layer military grade epoxy paint with primer. Traditional military colors are Black (B) & Navy Grey (G). Complementary colors such as Blue, Red, Green, Army Dark Earth, Platinum, White, and Yellow (YW) are available.

I/O WIRING GUIDES

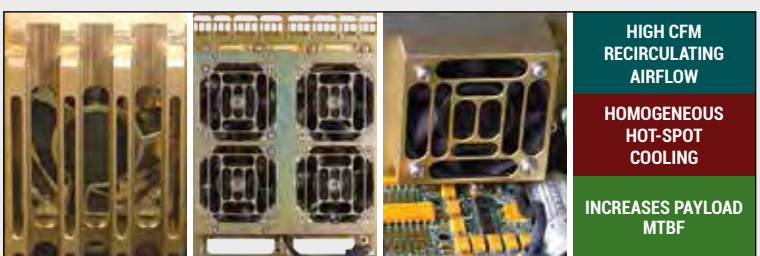
Top & bottom I/O wiring plates are supplied for cable guiding, clamping, organization, and protection.

UNLIMITED CHASSIS I/O WIRING OPTIONS

Wiring harnesses, wire wrapping, discrete backplane I/O wiring, routing cables, or flexible I/O interconnection wiring circuits, etc., may be adopted. I/O wiring harnesses may be distributed in functional cable arrays to minimize EMI noise or interference.

MILITARY ROTRON FANS

CM employ rear military Rotron tube-axial fans that are MIL-STD certified, providing up to 140 CFM air-flow.



CARD CAGE INTERNAL RECIRCULATION AIRFLOW

CM Sealed chassis install internal fans to recirculate & force air across payload components, convecting heat and dispersing it throughout chassis. Recirculation airflow reduces module hot-spot temperatures & improves payload MTBF.

ATR MOUNTING TRAY

CM Mounting Trays are low profile & weight, fast installation and enclosure insertion with shock absorber support.

SYSTEM TEMPERATURE SUPERVISORY UNIT (TSU)

The TSU protects electronics against extreme climatic conditions, switching all DC outputs ON/OFF when chassis internal temperature is under, or over, user selected trip points. Card-cage heaters & cooling fans are optionally controlled by the TSU.

CARRY HANDLE

A retractable handle is fitted on all front panels. An additional rear handle is fitted on larger CM chassis models.

CHASSIS FIXING OPTIONS

All chassis are equipped with avionic NAS-622 hooks on the front panel & stainless steel centering plates (pin receptacles) at the rear. Chassis may be mounted to a base plate using a set of M4 stainless steel threads that are factory fitted.

35 MODELS
2nd Edition

6U SERIES
SEALED EXTENDED FINS + 18/20 HEAT PIPES

PERFORMANCE
Delivering up to 1550 Watts

Meeting the current demands for high power dissipation advanced military systems.

RELIABILITY
Proven Military Technology

Developing consolidated state-of-the-art chassis solutions that have been field demonstrated to be most efficient.

AVAILABILITY
A Complete Product Range

Reducing your system time to market by offering the widest variety of COTS ready ATR solutions.

OVER 25 YEARS AS THE LEADING HIGH PERFORMANCE ATR CHASSIS SUPPLIER

LEARN MORE: WWW.CMCOMPUTER.COM
CALL: +34 954 253 116 | FAX: +34 954 253 119

6U SERIES
6 HEAT EXCHANGERS + 20 HEAT PIPES
1" PITCH VPX

MILITARY ATR CHASSIS

S — SEALED

2
3
4

5-SLOT ↑100W
7-SLOT ↑130W
12-SLOT ↑180W
PAYLOAD POWER DISSIPATION

1

5-SLOT ↑80W
PAYLOAD POWER DISSIPATION

6U 0.8" PITCH

3U 1" PITCH

NATURAL AIR CONVECTION, LOW COST & WEIGHT, SILENT NO EXTERNAL FANS, INTERNAL FORCED-AIR

CONTAMINANT FREE, NATURAL AIR CONVECTION, LOW COST & WEIGHT, SILENT NO EXTERNAL FANS, INTERNAL FORCED-AIR, SUPPORTS CONDUCTION & AIR-COOLED MODULES

SEF — SEALED WITH EXTENDED FINS

5
6
7

5-SLOT ↑120W
7-SLOT ↑160W
12-SLOT ↑180W
PAYLOAD POWER DISSIPATION

6U 0.8" PITCH

INCREASED NATURAL FREE-AIR CONVECTION, LOW COST & WEIGHT, DRY AIR CONTAMINANT FREE APPLICATIONS, SILENT NO EXTERNAL FANS, INTERNAL FORCED-AIR RECIRCULATION, SUPPORTS CONDUCTION & AIR-COOLED BOARDS

SEF-HP — SEALED WITH EXTENDED FINS + 18 HEAT PIPES

INCREASED NATURAL FREE-AIR CONVECTION + 18/20 HEAT PIPES, ALL BOARD FORMATS, SILENT NO EXTERNAL FANS, INTERNAL FORCED-AIR RECIRCULATION, CONTAMINANT FREE

INCREASED AIR CONVECTION + 18 HEAT PIPES, SILENT NO EXTERNAL FANS, INTERNAL FORCED-AIR

0.8" PITCH 6U

1" PITCH 3U

SEF-18HP

8

5-SLOT ↑180W
7-SLOT ↑220W
12-SLOT ↑300W
PAYLOAD POWER DISSIPATION

9
10
11

5-SLOT ↑150W
PAYLOAD POWER DISSIPATION

VPX CONDUCTION-COOLED APPLICATIONS, FOUR FORCED-AIR HEAT EXCHANGERS, LOW AIRFLOW RESISTANCE, DRY-AIR CONTAMINANT FREE, HIGH AIRFLOW REAR EXHAUST FANS, IMPROVED INTERNAL FORCED-AIR RECIRCULATION

1" PITCH 6U

HES

16
17

5-SLOT ↑400W
7-SLOT ↑450W
PAYLOAD POWER DISSIPATION

HES — SEALED WITH FOUR HEAT EXCHANGERS

13
14
15
12

5-SLOT ↑200W
7-SLOT ↑300W
12-SLOT ↑400W
PAYLOAD POWER DISSIPATION

5-SLOT ↑250W
PAYLOAD POWER DISSIPATION

6U 0.8" PITCH

3U 1" PITCH

CONTAMINANT FREE, WIDE RANGE OF APPLICATIONS FOUR FORCED-AIR HEAT EXCHANGERS

CONTAMINANT FREE, SUPPORTS CONDUCTION & AIR-COOLED MODULES, FOUR FORCED-AIR HEAT EXCHANGERS, COST EFFECTIVE PERFORMANCE, MEDIUM SIZE AND WEIGHT, INTERNAL FORCED-AIR RECIRCULATION, WIDE RANGE OF APPLICATIONS

HES-FBL — SEALED WITH FOUR HEAT EXCHANGERS FOR FRONT-TO-BACK LOADING

18
19
20
21

3-SLOT ↑200W
5-SLOT ↑250W
7-SLOT ↑270W
9-SLOT ↑300W
PAYLOAD POWER DISSIPATION

HES-FBL

3U 1" PITCH

CONVENTIONAL LAYOUT, DRY-AIR CONTAMINANT FREE, SUPPORTS CONDUCTION COOLED MODULES, FOUR FORCED-AIR HEAT EXCHANGERS, INTERNAL AIR RECIRCULATION

SIXHEX — SEALED WITH SIX HEAT EXCHANGERS

VPX CONDUCTION-COOLED APPLICATIONS, SIX FORCED-AIR HEAT EXCHANGERS, LOW AIRFLOW RESISTANCE, DRY-AIR CONTAMINANT FREE, HIGH AIRFLOW REAR EXHAUST FANS, EXTREME INTERNAL FORCED-AIR RECIRCULATION

1" PITCH 6U

SIXHEX

25
26

5-SLOT ↑500W
7-SLOT ↑600W
PAYLOAD POWER DISSIPATION

22
23
24

5-SLOT ↑450W
7-SLOT ↑500W
12-SLOT ↑600W
PAYLOAD POWER DISSIPATION

SIXHEX

6U 0.8" PITCH

DRY-AIR CONTAMINANT FREE, SUPPORTS CONDUCTION & AIR-COOLED MODULES, SIX FORCED-AIR HEAT EXCHANGERS, LOW AIRFLOW RESISTANCE, HIGH AIRFLOW REAR EXHAUST FANS, IMPROVED INTERNAL AIR RECIRCULATION

SIXHEX-HP — SEALED WITH SIX HEAT EXCHANGERS + 16 OR 20 HEAT PIPES

VPX CONDUCTION-COOLED APPLICATIONS, SIX FORCED-AIR HEAT EXCHANGERS + 20 HEAT PIPES, EXTREME LOW AIRFLOW RESISTANCE, EXHAUST AIRFLOW & INTERNAL FORCED-AIR RECIRCULATION, DRY-AIR CONTAMINANT FREE

1" PITCH 6U

SIXHEX-20HP

30
31

5-SLOT ↑600W
7-SLOT ↑700W
PAYLOAD POWER DISSIPATION

33
34
35

5-SLOT ↑400W
7-SLOT ↑450W
12-SLOT ↑700W
PAYLOAD POWER DISSIPATION

32

27
28
29

5-SLOT ↑500W
7-SLOT ↑600W
12-SLOT ↑700W
PAYLOAD POWER DISSIPATION

SIXHEX-16HP

6U 0.8" PITCH

DRY-AIR CONTAMINANT FREE, SUPPORTS CONDUCTION & AIR-COOLED MODULES, SIX HEAT EXCHANGERS + 16 HEAT PIPES, EXTREME LOW AIRFLOW RESISTANCE, EXHAUST AIRFLOW & INTERNAL FORCED-AIR RECIRCULATION

FAC — OPEN FLOWTHROUGH AIR COOLED

OPEN, NON-SEALED APPLICATIONS, HIGH COOLING EFFICIENCY, SUPPORTS CONDUCTION & AIR-COOLED MODULES, LOW COST & WEIGHT, LOW AIRFLOW RESISTANCE

OPEN, NON-SEALED, SUPPORTS CONDUCTION & AIR-COOLED MODULES, LOW COST & WEIGHT

0.8" PITCH 6U

1" PITCH 3U

FAC

5-SLOT ↑300W
PAYLOAD POWER DISSIPATION

COTS

VME, CPCI & VPX READY

CM Computer
True Military COTS Products

35 MODELS

MANUFACTURED IN THE EU — INSIDE US MILITARY COMPONENTS

2016 CM PRODUCT LINE