

User's Manual

VME Basic 7U 84HP VME64x Basic 7U 84HP



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Hartmann Elektronik is a longstanding partner of the embedded industry and has a variety of different backplanes. With our wide selection of backplanes and enclosure you can build your perfect system platform

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1 Applicability

System name	Order number
VME Basic 7 U 84 HP Depth 283 mm	LMH0000150
VME64x Basic 7 U 84 HP Depth 283 mm	LMH0000160

1.1 Background Information

- User Manual Hartmann VME Backplanes
- Technical Data Hartmann VME Backplanes
- User Guide Hartmann VME Backplanes
- IEC 60297-3-101
- ANSI/VITA 1-1994
- ANSI/VITA 1.1-1997
- IEC 1000-4-4 Electromagnetic Compatibility, Part 4, Section 4, Electrical fast transient/burst immunity test.
- EN60950-1
- Shock:
 - MIL-STD-810F 1 January 2000 Annex C, U.S highway truck
Figure 514.5C-1, vertical Shock test (Sawtooth) Figure 516.5-10
- Vibration:
 - DIN EN 61373:1999, Figure 2, Category 1, Class B
 - MIL-STD-810F 1 January 2000 Annex C, Shipboard: Figure 514.5C-15

2 Safety

2.1 Intended Application




The VME64x System Platform Basic subracks is intended as a platform for a microcomputer system based on the VME Standard ANSI/VITA 1- 1994 and VME64x Standard ANSI/VITA 1.1- 1997

VME / VME64x System Platform Basic subracks are not end-products, so there is no valid approval for this unit. In Order to enable stand-alone functionality, additional elements are required. An operational system is achieved only by way of appropriate VME / VME64x boards.


The completion and final testing of the units have been carried out, or at least supervised, by qualified technicians. These instructions are directed exclusively to these qualified technicians i.e. engineers, trained and qualified electricians etc.

Make sure that the finished system complies with the safety regulations currently applicable in the country it is going to be used.

2.2 Safety Symbols

	<p>Hazardous voltage! <i>Familiarise yourself with the danger of electrical voltages and the safety precautions before starting to work with parts that carry dangerous voltages</i></p>
	<p>Caution! <i>This symbol indicates a condition where damage of the equipment or injury of the service personnel could occur. To reduce the risk of damage or injury, follow all steps or procedures as instructed.</i></p>
	<p>Danger of electrostatic discharge! <i>Static electricity can damage sensitive components in a system. To avoid damage, wear ESD wrist straps or at regular intervals touch blank enclosure parts.</i></p>

2.3 General Safety Precautions

	<p>Warning! <i>Voltages over 60 VDC can be present in this equipment. This equipment is intended to be accessed, to be installed and maintained by qualified and trained service personnel only.</i> <i>This equipment is designed in accordance with protection class 1!</i> <i>It must therefore be operated only with protective GND/earth connection!</i></p>
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2.4 Safety Instructions

The intended audience of this User's Manual is system Integrators and hardware/software engineers.

The product has been designed to meet relevant standard industrial safety requirements. It must not be used except in its specific area of office telecommunication industry and industrial control. It shall not be used in safety-critical applications, life-sustaining appliances or in aircraft.

Only trained personnel or persons qualified in electronics or electrical engineering are authorized to install, operate or maintain the product.

This section provides safety information about:

- Protection Against Electromagnetic Interference (EMI)
- Electrostatic Discharge Precautions
- System Installation

2.4.1 Protection Against Electromagnetic Interference (EMI)



The product has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules, EN 55022 Class A.

To ensure proper EMC shielding, operate the subrack only with all free slots populated with filler panels.

Ensure that all EMI gaskets make correct contact.

2.4.2 Electrostatic Discharge Precautions



Electronic components can easily be destroyed by electrostatic discharge which can occur between subrack components and a person.

- Before working on the rack make sure that you are working in an ESD-safe environment.

2.4.3 Installation

To avoid subrack damage verify that the system environment meets the environmental and power requirements given in this guide before installation consider these guidelines:

2.4.4 Location

Locate the system in a stable area free of excessive movement and jarring, dust, smoke, and electrostatic discharge (ESD). Make sure that the temperature does not exceed the operating temperature given in the environmental requirements in this guide and allow room for proper air flow for cooling.

2.4.5 Voltage Hazards



The system is powered with a power supply the mains voltage is 115/230VAC. (Voltage range 85VAC to 265VAC)

This voltage is considered hazardous.

2.4.6 System Overheating

The boards are cooled by forced air convection through three DC axial fans (from bottom to top).

Ensure that other equipment below or on top of the subrack do not obstruct the airflow through the systems.

The subrack ambient temperature may not exceed 40 °C.

2.4.7 Mounting Considerations

During the course of handling, shipping, and assembly, parts could become loose or damaged.

Do not operate a shelf in this condition, as this may cause damage to other equipment.

2.4.8 Electrical Hazards

The caution label on the system's rear near the grounding studs shows that you have to create an earth connection because there may be a high leakage current which is considered hazardous.



High leakage current can cause injuries.

Ensure that the system is properly grounded at all times, the following conditions shall be met:

- This equipment shall be connected directly to the AC supply system earthing



2.4.9 Board Installation

Electrostatic discharge and incorrect board installation or removal can damage circuits or shorten their life.

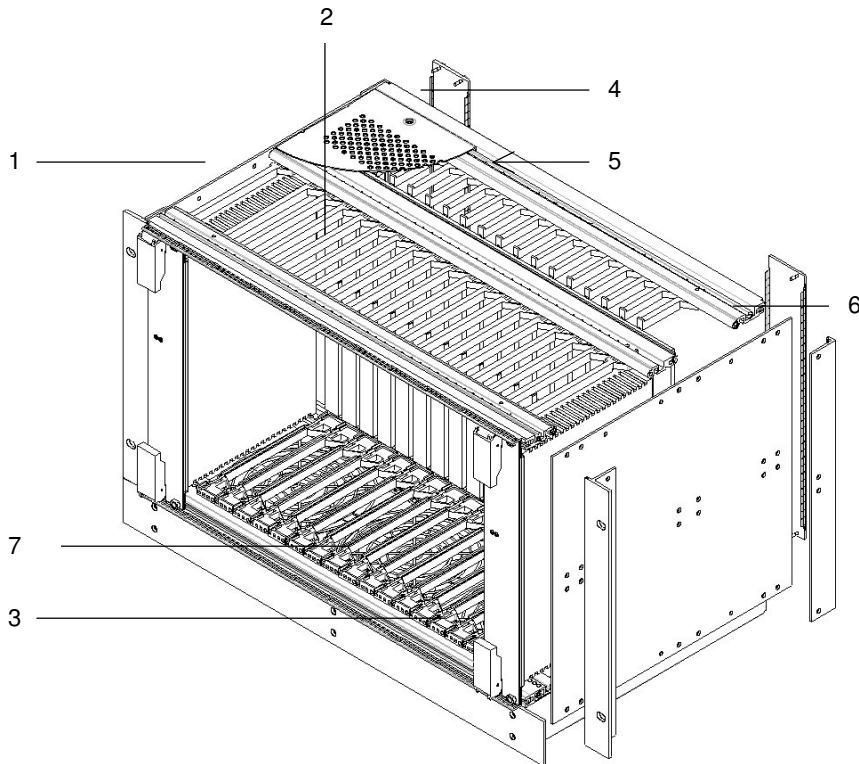
- Before touching the boards, rear transition module or electronic components, make sure that you are working in an ESD-safe environment
- Boards should be inserted and removed using their handles, do not force the board by applying pressure to the front panel.



3 Product Description

3.1 System Overview

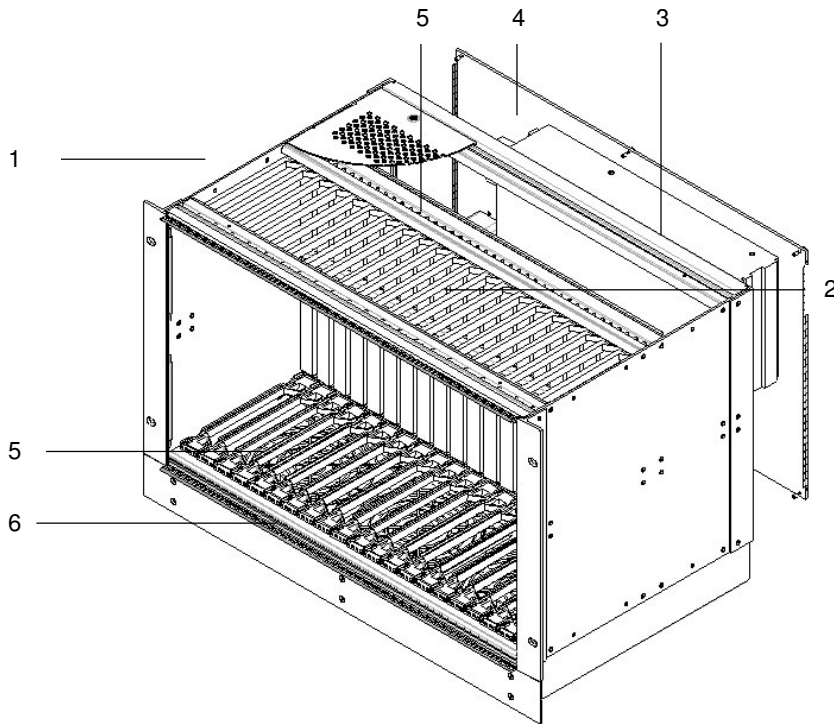
3.1.1 VME64x Basic 7 U 84 HP



1	VME64x card rack, 7 U, 84 HP	5	Power entry module with switch, fuse and filter
2	VME64x backplane: 6 U, J1/J0/J2, 17+2 slots, with ADC (Automatic Daisy Chain), with 2x P47 connectors for 6 U CompactPCI power supply units	6	Filler panel 8HP, 6U with EMC gasket
3	CompactPCI power supply unit 400 W with wide range input 90 – 264 VAC, with PFC	7	3 x DC Fans: 119 x 119 x 38 mm, 180m ³ /h, 49 dB(A)
4	Partial rear panel 8 HP / 6 U with EMC gasket, with cutout for power entry module		

Figure 3-1: VME64x Basic 7 U 84 HP

3.1.2 VME Basic 7 U 84 HP



1	VME card rack, 7 U, 84 HP	4	Rear panel 84 HP, 6U with EMC gasket with cutout for power entry module
2	VME backplane: 6 U, J1 / J2, 21 slot, active termination, ADC (Automatic Daisy Chain)	5	Power entry module with switch, fuse and filter
3	Openframe power supply unit 400 W with wide range input 85 – 264 VAC, with PFC	6	3 x DC Fans: 119 x 119 x 38 mm, 180m ³ /h, 49 dB(A)

Figure 3-2: VME Basic 7 U 84 HP

3.2 Subracks

The VME and VME64x subrack made of chromated aluminum. Cover and bottom plate perforated. At the VME64x subrack are IEEE guide rails and ESD clip mounted at the bottom.

3.3 Backplanes

General and technical information

The VMEbus, based on the IEEE 1014 and IEC 821 standards, has become an established industrial standard worldwide.

All Hartmann VMEbus boards are based on the HIGH-SPEED DESIGN concept. Low reflection is achieved by means of uniform signal line surge impedance.

Shielding of each individual signal line assures minimal coupling and therefore guarantees trouble-free operation even when expanded to the 64-bit mode with the 2e protocol (160 MByte/s).

The **VME64** represents an extension of the VME family according to ANSI/VITA 1-1994 and permits 64-bit data traffic. The VME64x extends the VME family according to ANSI/VITA 1.1-1997 and is available with the optional 95/133-pin, 2 mm connector J0. VME64 and VME64x use 160-pins connectors. This system is downward-compatible, so that assemblies with 96-pin connectors to DIN 41612 can still be used.

Termination

In order to prevent interference on signal lines which might result from reflection at open line ends, these lines must be terminated on the VMEbus. ON/IN-board (on the backplane) or OFF-board (external) termination is possible. A distinction is made between passive and active termination. The advantage of active termination is reduced closed-circuit current consumption. Passive termination features better frequency response and a wider temperature range.

Daisy chain wiring

A distinction is made between manual daisy chaining and automatic daisy chaining. Automatic daisy chaining works without jumpers, i. e. the user does not need to bother with plugging in and removing jumpers.

CHASSIS GND connection

There is a solid electrically conductive chassis GND surface in the backplane- to-card rack mounting area. This guarantees EMC-tight mounting of the bus board on the card rack.

HF coupling of card rack and system ground is implemented for **VME64 and VME64x** by capacitors (10nF, 200 V in each slot). Static charges are discharged via a resistor ($\geq 1 \text{ M}\Omega$). A combination element (M4 screw and Faston 2.8 or 6.3 x 0.8 mm) is provided for the chassis ground connection.

Power connections

The main operating voltage of +5 V / +3.3 V and GND is supplied via terminal bars with M6 screw connections. The auxiliary operating voltages are supplied via dual Fastons with an additional M4 thread. Optimal daughter board supply and troublefree operation are ensured by the arrangement of the feed modules on the backplane.

Utility connector

The special signals to the power supply unit and external LEDs are brought out to a separate connector on the backplanes. Depending on the backplane type, a 7-pin, a 10-pin or a 14-pin connector with a contact spacing of 2.54 mm is used.

Live Insertion

Live Insertion does not require additional modules; these have already been integrated in the backplane.

3.3.1 VME 6U, 21 Slot

This VME-backplane 6U, J1/J2 21 slot is used in the VME Basic 7U (order no.: LMH0000150)

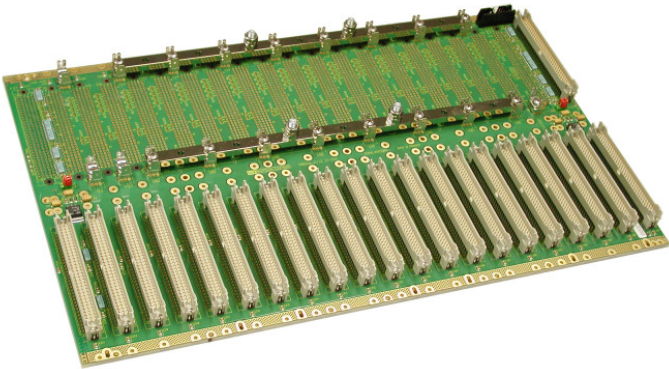


Figure 3-3: Backplane VME 6U 21 Slot (rear)

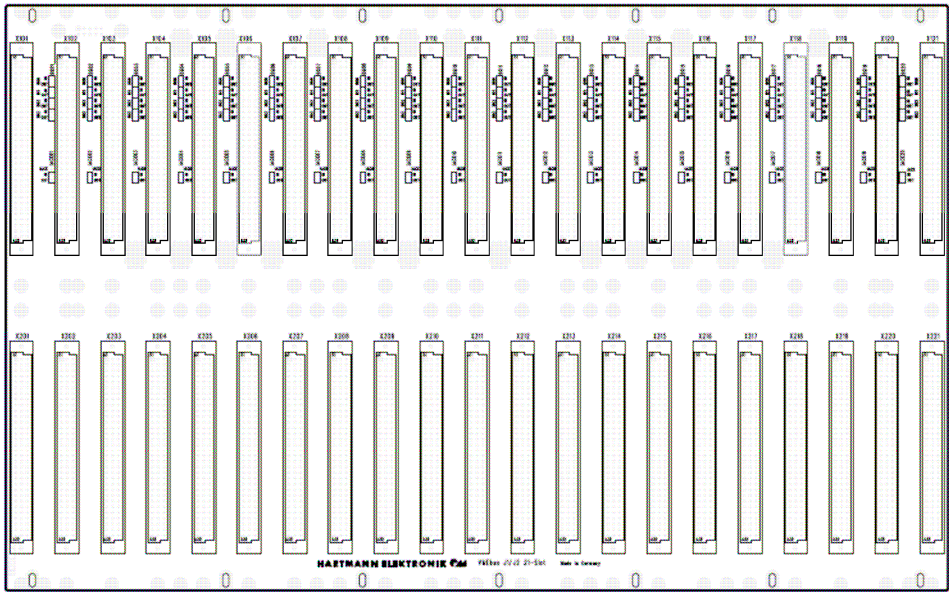


Figure 3-4: Backplane VME 6U 21 Slot (front)

3.3.2 VME64x 6U 17 Slot plus 2 Slot P47

This VME64x-Backplane 6U, J1/J0/J2 17 slot + 2 slot P47 is used in the VME Basic 7U (order no.: LMH0000160)

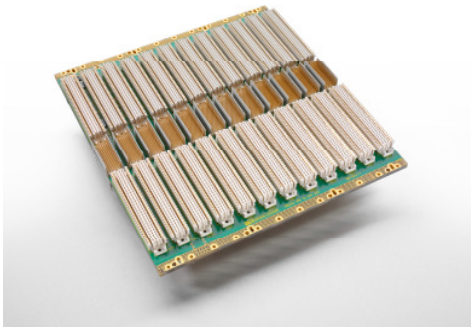


Figure 3-5: Backplane Sample VME64x 6U 12 Slot (front)

The VME64x-Backplane 6U, 17 + 2 slot consists of a 17 slot VME64x J1/J0/J2 area in the middle with a P47 slot (8HP, for one 6U CPCI power supply) on the left side and on the right side.

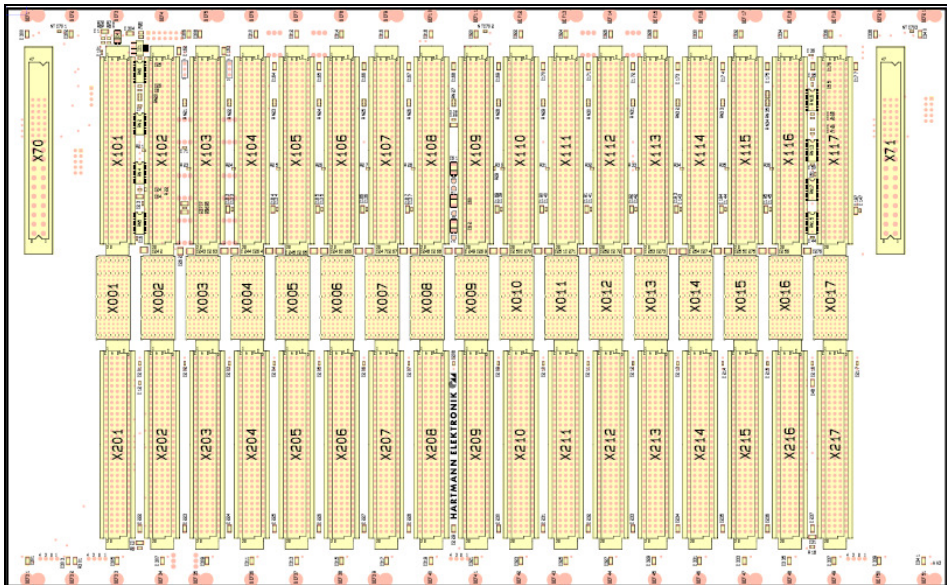


Figure 3-6: Backplane VME64x 6U 17 Slot + 2 slot P47 (front)

3.4 Electrical Connection and Power Supply

3.4.1 Power Entry Module

The power input module is provided with an IEC 320-C14 connector, integrated Filter, fuseholder 1-pole and Mains Switch 2-pole.

Technical Data

Ratings IEC	1 - 10 A @ Ta 40 °C / 250 VAC; 50 Hz
Ratings UL/CSA	1 - 8 A @ Ta 40 °C / 250 VAC; 60 Hz
Leakage Current	standard < 0.5 mA (250 V / 60 Hz)
Dielectric Strength	>1.7 kVDC between L-N >2.7 kVDC between L/N-PE Test voltage (1 min/50 Hz)
Allowable Operation Temp	-25 °C to 85 °C
Climatic Category	25/085/21 acc. to IEC 60068-1
Degree of Protection	from front side IP 40 acc. to IEC 60529
Protection Class	Suitable for appliances with protection Class 1 acc. to IEC 61140
Terminal	Quick connect terminals 6.3 x 0.8 mm
Panel Thickness	Screw-on mounting, max 8 mm
Material Housing	Thermoplastic, black, UL 94V-0
Appliance-Inlet/-Outlet	C14 acc. to IEC/EN 60320-1 UL 498, CSA C22.2 no. 42 (for cold conditions) pin-temperature 70 °C, 10 A, Protection Class 1
Fuseholder	1 pole, Shocksafe category PC2 acc. to IEC 60127-6, for fuse-links 5 x 20 mm
Rated Power Acceptance @ Ta 23 °C	5 x 20 2 W (1 pole)/ 1.6 W (2-pole) per pole
Power Acceptance @ Ta > 23 °C	Admissible power acceptance at higher ambient temperature see derating curves
Mains Switch	Rocker switch 2-pole, non-illuminated, acc. to IEC 61058-1
Line Filter	Standard Version, IEC 60939, IEC 60601□1, UL 1283, UL 544, EN 133 200, CSA C22.2 no. 8
MTBF	> 2'000'000 h acc. to MIL-HB-217 F

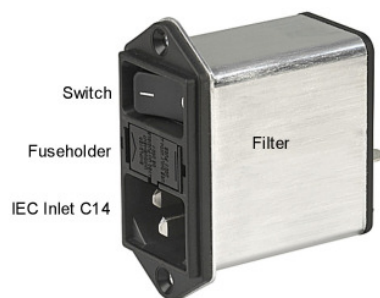


Figure 3-7 Power Entry Module

Subrack system LMH0000150 will be delivered with fuse: 5x20mm 250V/6,3A T m. UL/CSA:

Subrack system LMH0000160 will be delivered with fuse: 5x20mm 250V/10A T m. UL/CSA:

3.4.2 Grounding/Protective Earthing

The system contains gaskets at the subrack and board level to guard against electromagnetic interference (EMI). Each of the subrack's individual components make contact with the gaskets.

The guide rails in the VME64x Basic System are also fitted with electrostatic discharge (ESD) contacts for each blade and RTM. These ESD contacts ensure that the boards are fully discharged to prevent static caused by static as they are plugged into the subrack.


	<p>Caution!</p> <p><i>The subrack is designed in accordance with protection class 1! It must therefore be operated with protective earth/GND connection. Use only a three conductor AC power cable with a protective earth conductor that meets the IEC safety standards!</i></p>
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Figure 3-8: Power Connection (sample VME64x Basic 7U)

3.4.3 CPCI Power Supply

The power supply has the following main features:

- 400W 6U x 8HP
- Meet IEC 61000-3-2 harmonic correction
- Internal OR-ing diodes for N+1 redundancy
- Hot - swappable
- Third-wire current sharing
- EMI meet EN 55022 / FCC class B
- CE marking compliance
- Fully compliant with PICMG

Technical data

INPUT SPECIFICATION	
Input Voltage	Typ. 90-264Vac.
Input On/Off switch	Option
Power Factor Correction	Meet Harmonic Correction IEC 61000-3-2. Power Factor typ. 0.99.
Input Connector	Positronic 47-pin PCIH47M400A1.
Input Frequency	47-63Hz.
Inrush Current	Typ. 30Arms @ 230Vac. (active)
Input Current	5.1A @115Vac/2.6A @230Vac.
Dielectric Withstand	Meet IEC 60950-1 regulation.
Transient Protection	MOV withstands transient as specified by EN 61000-4-4 level 3
EMI	Meet EN 55022 / FCC Class B.
Hold-up Time	30ms @ 115Vac, 34ms @230Vac.
Earth Leakage	Less than 0.5mA @230Vac.
Remote ON/OFF	Available at [INH#] & [EN#] pins.
Power Fail Signal	Available at [FAL#] pin.
Status LED	<Green> means valid input voltage. <Amber> means a critical fault.
Thermal Protection (OTP)	Installed NTC and thermostat for thermal sensor at [DEG#] pin.
OUTPUT SPECIFICATION	
Output Voltage	+5V; +3.3V; +12V; -12V
Output Current	+5V: 33.0A; +3.3V: 33; +12V: 6A; -12V: 1.5A
Output Wattage	Typ. 400 - 450W continuous.
Output Connector	Positronic 47-pin PCIH47M400A1.
Line Regulation	Typ. 0.1%.
Load Regulation	VO1 typ. $\pm 1.0\%$, VO2 typ. $\pm 1.5\%$. VO3 typ. $\pm 3.0\%$, VO4 typ. $\pm 3.0\%$.
Noise & Ripple	Typ. 1% peak to peak or 50mV, whichever is greater.
OVP	Built-in at all outputs.
Adjustability	Available at VO1,2 & 3.
Output Trim	Electrical trim available at VO1/VO2.[ADJ #]
Remote Sensing	Available at VO1,VO2 & VO3.
Hot-Swap	Available.
N+1 Redundancy	Installed with internal OR-ing diodes at all outputs and third-wire current sharing method for N+1 redundancy operation.
Current Sharing	Third-wire current sharing at VO1,2 &3.
DC OK Signal	Available for all output.
Power OK Signal	Available for all output.
Over Current Protection (OCP)	Installed at each rail.
Overload Protection (OLP)	Fully protected against output

	overload or short circuit. Typ. 120-130% max. load. Consult the factory for special OLP setting. Typical 120% max. load
GENERAL SPECIFICATION	
Efficiency	Typ. 76-81 %.
Switching Frequency	120K Hz.
Circuit Topology	Forward circuit.
Transient Response	Peak transient less than 250mV and returns to within 1% less than 1.0mS for 25% load-change.
Safety Standard	IEC 60950-1 Class I.
Construction	Eurocard 6U X 8HP X 160mm CompactPCI format
Operating Temperature	0 to +50 °C at full load with specified air flow. Derates linearly to 50% at +70 °C.
Storage Temperature	-40 to +85 °C.
Temperature Coefficient	Typ. ±0.04% / °C.
Cooling	At least 20 CFM(600 LFM) moving air is required to achieve full rating power 400W in a confined area.
Power Density:	3.98 Watts/ Cubic Inch.

Output Current

+5V			+3,3v			+12V				-12V			
Min	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Pk	Min.	Typ.	Max.	Pk.
2,0A	40,0A	55,0A	0A	20,0A	55,0A	0A	10,0A	14,0A	15A	0A	3,0A	4A	5,0A

Remark:

Peak load less than 60sec. with duty cycle <10%. Max. load is the continuous operating load of each rail. But the max. load of each rail can't be drawn from all outputs at the same time. Total max. power of VO1 and VO2 should be less than 300W.

For DC Power Supply, please ask Hartmann Elektronik.



Figure 3-9: CPCI Power Supply 400W, 6U 8HP

3.4.4 Open Frame Power Supply

The power supply has the following main features:

- Current share on all outputs with ratings of 10 A or greater
- Remote sense on all outputs with ratings greater than 2 A
- Overload protection on all outputs
- Voltage adjustment on all outputs
- Margining on all single output modules
- Input OK signal and status indicator LED
- Global DC OK signal and status indicator LED
- Global and individual module inhibits/enable
- Forced air cooling, field replaceable fan
- Isolated 5 V bias voltage
- Power factor correction
- EN61000-3-2 harmonic distortion compliance
- CISPR 22, EN55022 Curve B conducted / radiated EMI
- European CE Mark requirements
- Optional VME timing and system DC OK module
- EN61000 immunity standards

Input	
Input voltage	85-264 VAC, 120-350 VDC
Frequency	47-440 Hz
Inrush current	40 A peak max. (soft start)
Efficiency 70-80% typ.	@ full case load
Power factor 0.99 typ.	meets EN61000-3-2
Turn-on time	AC on 1.5 sec typ.,
Inhibit / Enable	150 ms typ.
EMI filter standard	CISPR 22, EN55022 Level "B"
EMI filter(low leakage option)	CISPR 22, EN55022 Level "A"
Leakage current standard	2.0 mA max. @ 240 VAC
Leakage current(low leakage option)	300 μ A max. @ 240 VAC
Radiated EMI	CISPR 22 EN55022 Level "B"
Holdover storage	20 ms minimum, (independent of input VAC)
AC OK	>5 ms early warning min. before outputs loose regulation Full cycle ride thru (50 Hz)
Harmonic distortion	Meets EN61000-3-2
Isolation	Meets EN60950
Global Inhibit/Enable	TTL, Logic "1" and Logic "0"
Input fuse (internal)	10 A
Warranty	2 years
Output:	
Adjustment range	\pm 10% min. all outputs
Margining	\pm 4-6% nom.1
Overall reg	0.4% or 20 mV max. (36 W modules 4% max.)
Ripple RMS	0.1% or 10 mV, whichever is greater Pk-Pk 1.0% or 50 mV
Dynamic response	<2% or 100 mV, with 25% load step.
Recovery time	To within 1% in <300 μ sec.
Overcurrent protection	Single, main of dual output module 105-120% of rated output current. Aux output of dual output module 105-140% of rated output current
Short circuit protection	Protected for continuous short circuit Recovery is automatic upon removal of short.
Overvoltage protection (measured at sense connection)	Single output modules 2-5.5 V 122-134%, 6-60 V 110-120%, Dual output module, 2-6 V 122-134%, 8-28 V

	110-120%. Recycle the AC input voltage to reset OVP circuit
Reverse voltage protection	100% of rated output current
Thermal protection	All outputs disabled when internal temp exceeds safe operating range. >5 ms warning (AC OK signal) before shutdown
Remote sense	Up to 0.5 V total drop
Single wire parallel	Current share to within 2% of total rated current ²
DC OK	-2% to -8% of nominal for any monitored output ²
Minimum load	Not required on single output modules. 10% required on main of dual output modules ³
Housekeeping bias voltage	5 VDC @1.0A mA max. present whenever AC input is applied
Module inhibit	TTL, isolated, singles and dual (both outputs) only
Switching frequency	250 kHz
Output/Output isolation	>1 Megohm
VME signal option board	POR signal & quad external DC OK
Hold-up module (HUP)	1-slot module providing an additional 34mSec (60mSec total) hold-up @ 600W loading.
Environmental	
Operating temperature	-20°C to 50°C (start @ 0°C) (derate each output linearly to 50% at 70°C) (-20°C to 40°C max. with rear air option)
Shock/Vibration	Mil-Hdbk 810E
Humidity	95% non-condensing
Storage temperature	-40°C to +85°C
Temperature coefficient	0.02% per °C
Cooling	Internal DC fan or customer provided air (option)
Safety	UL UL1950 CSA CSA22.2 No. 234 Level 5 IEC IEC950, Class 1 VDE EN60950, BABT Compliance to EN 60950, BS 7002 CB Certificate and report CE Mark

Output Current

+5V			+12V			-12V		
Min	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
0A	60,0A	60,0A	1,0A	10,0A	10,0A	0A	4,0A	4,0A

Total load at +12V and -12V together should not to exceed 144 W.



Figure 3-10: Open Frame Power Supply 400W,

3.5 Cooling

The operating temperature is from 0°C to 40°C.

The front boards at VME Basic 7U and VME64x Basic 7U are cooled by forced air convection through three DC axial fans 119 x 119 x 32 mm. The rear I/O boards are cooled by heat dissipation through convection,

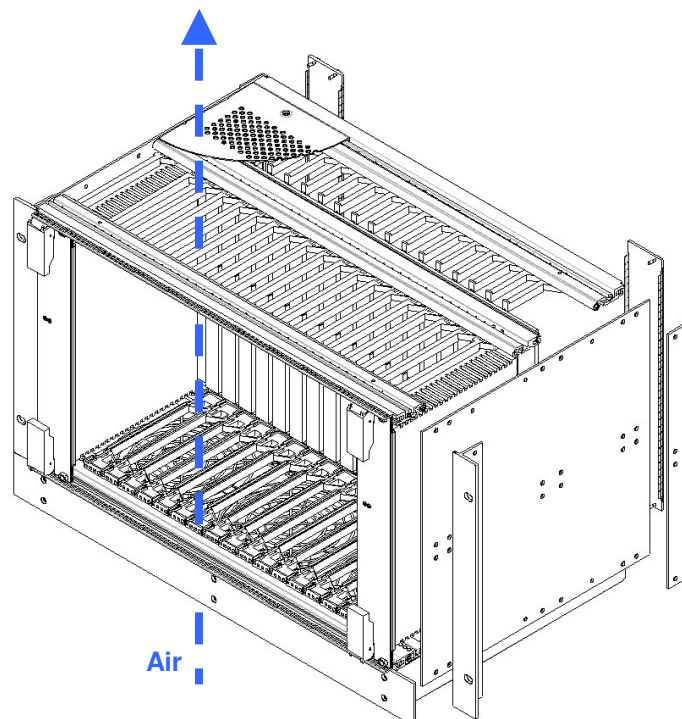



Figure 3-11: Air Flow

	<p>Caution!</p> <p>To ensure proper air flow within the system make sure that all slots are populated with either boards or filler panels.</p>
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3.5.1 Fans VME Basic 7 U

General Specification

- Motor Protection: Auto Restart/Polarity Protection
- Isolation Resistance: 10M Ω or over with a DC500V Megger
- Dielectric Withstand Voltage: 700VAC 1s
- Ambient Temperature Range: -10°C - +70°C (Operating)

Technical data

Dimensions:	119mm x 119mm, 38mm thick
Rated Voltage:	12V
Operating Voltage	6,0 – 13,8V
Rated Current	0,55A
Rated Input:	6,6W
Rated Speed:	2950min ⁻¹
Air Flow:	108 cfm (3,7 m ³ /min)
Static Pressure:	68,2Pa (0,27 inchH ₂ O)
Noise:	42,5dB(A)
Bearing	Ball Bearing
Operating Temperature	-10°C - +70°C
Storage Temperature	-40°C to +70°C
Life Expectancy	50.000h (25°C)
Material	Casing: Plastic (black) 94V-0 Impeller: Plastic (black) 94V-0 Lead Wire: UL1007, AWG24, +red, -black

3.5.2 Fans VME64x Basic 7 U

General Specification

- Thermally speed controlled fan with built-in thermistor
- Motor Protection System: Current cut system (with reverse-connection protection)
- Isolation Resistance: 10M Ω or more at 500VDC megger (between lead conductor and frame)
- Dielectric strength: 500VAC 1 minute (between lead conductor and frame)
- Operation Temperature Range: -10°C - +60°C (non-condensing)

Technical data

Dimensions:	120mm x 120mm, 38mm thick	
Rated Voltage:	12V	
Operating Voltage	10,3 – 13,8V	
Operating Temperature	-10°C - +60°C (non-condensing)	
Storage Temperature	-30°C to +70°C	
Life Expectancy	40,000h(Survival rate: 90% at 60° C, rated voltage, and continuously run in a free air state)	
Material	Frame: Plastics (Flammability: UL94V-0), Impeller: Plastics (Flammability: UL94V-1)	
	Ambient temperature 40°C	Ambient temperature 30°C
Rated Current	0,48A	0,23A
Rated Input:	5,75W	2,76W
Rated Speed:	2600min ⁻¹	1300min ⁻¹
Air Flow:	102,4 cfm (2,9 m ³ /min)	49,4 cfm (1,4 m ³ /min)
Static Pressure:	64,7Pa	16,2Pa
Noise:	39dB(A)	24dB(A)

4 Installation

This section provides set up information and operation for the subrack:

- Subrack Components
- Inspecting the Components
- Protection Against Electromagnetic Interference
- Preparing the Subrack

4.1 Subrack Components

The subracks comes equipped with the following components:

- One power entry module with IEC 320-C14 connector, switch, fuse and filter.
- One VME backplane compliant with VME64x Standard ANSI/VITA 1.1- 1997 and ANSI/VITA 1- 1994 specification.

VME64x Basic 7U

- VME64x card rack, 7U, 84HP, 283mm deep
- 17-slot front and 17 RTM slots
- Two CPCI power supplies 400W AC
- Voltage monitoring with reset generator and AC-fail detection
- Three thermal controlled DC Fans: 120 x 120 x 38 mm

VME Basic 7U

- VME card rack, 7U, 84HP, 283mm deep
- 21-slot front
- One open frame power supply 400W AC
- Three DC Fans: 119 x 119 x 38 mm

4.2 Inspecting the Subrack Components

During the course of handling, shipping, and assembly, pins, shrouds, mounting screws, fans and other items can become damaged and/or loose.



WARNING: Before utilizing the subrack, perform a thorough inspection to ensure the subrack and its components are not damaged.

- To inspect the subrack:
 1. Visually inspect the subrack to ensure that all of the connector pins are straight, screws are tight, and so on.
 2. Check to ensure none of the EMI gaskets are damaged.

4.3 Protection Against Electromagnetic Interference

The subrack contains gaskets at the shelf and board level to guard against electromagnetic interference (EMI). Ensure that the subrack is grounded and that each of the subrack individual components make contact with the gaskets.

Follow the proper grounding and ESD handling procedures.

4.4 Preparing the Subrack

Side flanges are provided to allow the shelf unit to be mounted in a 19" (482.6 mm) cabinet. In preparing the subrack perform the following:

- Mounting the Subrack
- Powering the Subrack
- Installing Boards
- Installing Filler Panels

4.4.1 Mounting the Subrack

This subrack system can be installed in 19" equipment racks or cabinets

- Ensure that the rack or cabinet is constructed to support the weight and dimensions of the system.
- Incorrect system installation can cause the rack or cabinet to topple over, additional stabilization might therefore be required.
- Single system installations should be mounted at the bottom of the rack or cabinet. In multi system installations the bulk of the weight should be concentrated in the lower part of the rack or cabinet.

4.4.2 Powering the Subrack

Before inserting boards, power the shelf to ensure that it is operating properly. The power connections and the mains switch are located on the rear of the shelf

- Ensure that the AC switch is set to the off (O) position.
- Connect the mains AC cable (C14, 10 Amp, not supplied) to the AC inlet.
- Turn the AC switch to the on (I) position.



Figure 4-1: AC Input (sample VME64x Basic 7U)

4.4.3 Installing Boards

The shelves are compliant with VME64x Standard ANSI/VITA 1.1- 1997 and they are accepting boards compliant with the VME64x Standard ANSI/VITA 1.1- 1997 and ANSI/VITA 1- 1994 specification.



WARNING: Boards should slide easily when installing or removing them from the shelf. Forcing the boards may cause damage to the interface connector pins.

4.4.4 Installing Filler Panels

Filler panels consists of a front panel (with or w/o air baffles), EMC gasket and mounting screws.



WARNING:
Close all empty subrack slots with filler panels. The filler panel prevents fan air from escaping out open slots.

5 Service

5.1 Technical support and Return for Service Assistance

Please return the complete subrack system. For all product returns and support issues, please contact your Hartmann sales distributor or www.hartmann-elektronik.de

Please use the original packing material. Shipping without the original packing material might void the warranty.

5.2 Declaration of Conformity

The HARTMANN VME / VME64x system platform Basic subracks are developed and manufactured according to EN 60950-1.

The HARTMANN VME / VME64x system platform Basic subracks are not end-products with independent functionality according the EMC regulations, therefore CE marking is not required. Not before VME / VME64x boards are plugged into the subrack, the systems fulfill the requirements in accordance with EMC Directive 2004/108/EG and Low-voltage Directive 2006/95/EG.

With the EMC optimized enclosure design and the high quality power input filters for the mains connection offers HARTMANN VME / VME64x systems serve an ideal base for system Integrators, which comply with the limits of EN 6100-6-3 and EN 61000-6-2

A functionality test and protective earth test is carried out on each system.

The included power supplies are in accordance with EN 60950-1, EN 55022 / FCC Class A IEC 61000-3-2 HARMONIC.

5.3 Scope of Delivery

Subrack	Quantity	Description
VME64x Basic 7U	1	VME64x card rack, made of chromated aluminum, cover and bottom plate perforated, with IEEE guide rails and ESD clip mounted at the bottom.
	1	VME64x backplane: 6U, J1/J0/J2, 17 slot, ADC (Automatic Daisy Chain), active termination. Two CPCI-PSU slot (8HP) with P47 connector
	2	CompactPCI power supply unit 400W with wide range input 90 – 264 VAC (3.3V / 20A, 5V / 40A, 12V / 10A, –12V / 3A) with PFC, with P47 connector, incl. 6U / 8HP front panel,
	1	Power Entry Module with IEC 320-C14 connector, switch, fuse and filter
	3	DC Fans: 119 x 119 x 38 mm, 180m ³ /h, 49 dB(A)
	1	Rear panel 84HP, 6U with EMC gaskets and cutout for power entry module.
	1	Partial rear panel 8HP, 6U with EMC gaskets and cutout for power entry module.
	1	Partial front panel 8HP, 6U with EMC gaskets
VME Basic 7U	1	VME card rack, made of chromated aluminum, cover and bottom plate perforated.
	1	VME backplane 6U, J1/J2, 21 slot, ADC (Automatic Daisy Chain), active termination.
	1	Open frame power supply 400 W with wide range input 90 – 264 VAC (5V / 60A, 12V / 10A, –12V / 4A) with PFC,
	1	Power Entry Module with IEC 320-C14 connector, switch, fuse and filter
	3	DC Fans: 119 x 119 x 38 mm, 180m ³ /h, 49 dB(A)
	1	Rear panel 84HP, 6U with EMC gaskets and cutout for power entry module.

5.4 Subrack Specifications

Dimensions	Height	310,3mm
	Width	482,6mm
	Depth (front card cage)	for Boards: 160mm
	Depth (subrack)	283,1mm
Weight	VME64x Basic 7U	10,8kg
	VME Basic 7U	9,9kg
AC Power Supply (CPCI)	Input	90 – 264 VAC
	Frequency	47 – 63 Hz
	Output Power	400 - 450W
AC Power Supply (Open Frame)	Input	85 – 264 VAC 120 – 350 VDC
	Frequency	47 – 440 Hz
	Output Power	400 W
DC Power Supply	optional	
Cooling		3 x DC fans: 119 x 119 x 38 mm, 180m ³ /h, 49 dB(A)
Temperature:	Operating	0 °C to +40 °C
	Storage	-30 °C to +70 °C
	Transport	-30 °C to +70 °C
Humidity:	Operating	5% to 80% non-condensing
	Storage	5% to 80% non-condensing
	Transport	5% to 80% non condensing
Shock		MIL-STD-810F 1 Jan 2000 Annex C, U.S highway truck Figure 514.5C-1, vertical Shock test (Sawtooth) Figure 516.5-10
Vibration:		DIN EN 61373:1999, Figure 2, Category 1, Class B MIL-STD-810F 1 Jan 2000 Annex C, Shipboard: Figure 514.5C-15
EMC	Emissions	EN 61000-6-3
	Immunity	EN 61000-6-1
Safety		Test voltages according to EN 60950-1
Electromagnetic Shielding		Typ.40 dB at 1 GHz (with front panels)
Regulatory Compliance:		EN60950-1