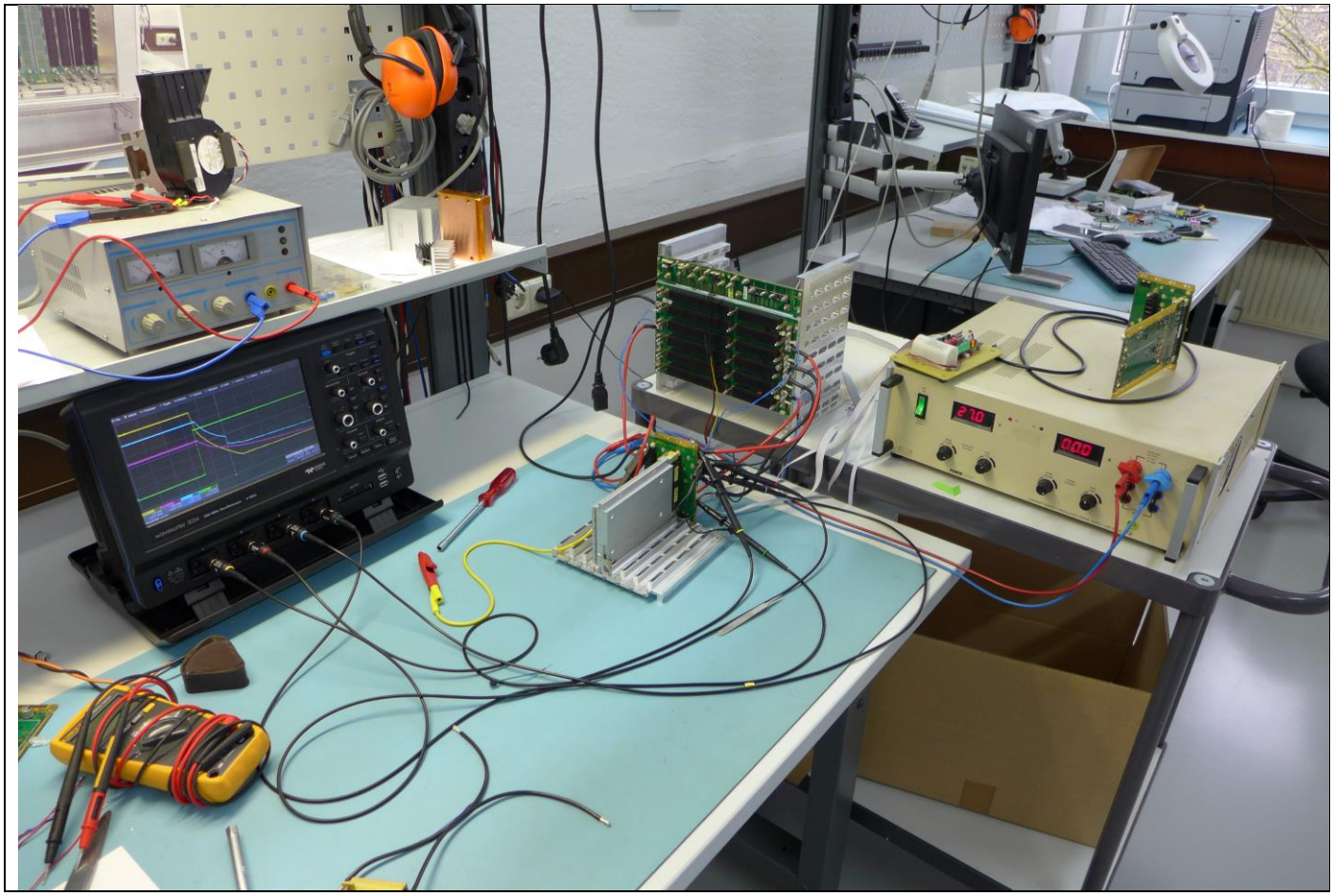
OpenVPX™	VPX Power 3U	HARTMANN ELECTRONIC A Phoenix Mecano Company

VPX

Power Supply 3U 5HP 600W, DC/DC



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Hartmann Electronic is an established leader in the design and manufacturing of backplanes and electronic packaging for micro-computer systems. With over 30 years of experience in high-speed backplane design and manufacturing, Hartmann offers an extensive range of standard backplanes and system platform products supporting architectures including VME/64x, CompactPCI/2.16, AdvancedTCA, VPX, VXS, VXI, CompactPCIe, and others.

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1 Power Supply 3U 5HP 600W, DC/DC, conduction cooled

1.1 Key Features

- Compliant to VITA 62 baseline specification
- Up to 600 W max. Power *
- 600 W over all with floating load distribution
- up to 50 A for +12 V :VS1 (50 A max usable, 40 A according to VITA62)
- 25 A power converter for +3V3 :VS2 (25 A max usable, 20 A according to VITA62)
- 20 A power converter for +5 V :VS3
- +12 V / -12 V AUX 1,5 A
- +3V3 AUX 6A
- up to 89 % efficiency
- -40 to +100 °C Operating Temperature **
- Parallel mode ***
- 19 – 35 VDC INPUT
- Minimum Input Voltage start up rise time > 50 V/s TBD

* Derating: ~0,6 amps. per Kelvin from 85 °C on **

** At hottest outer case temperature

*** Up to 4PSU in parallel mode possible

- MTBF = 187,455 hours G_M & 428,600 hours G_F @ 30° C, MIL-HDBK-217F-2
- Storage Temperature: -40 °C to +100 °C
- Isolation Resistance: More than 100 MΩ at 25 °C and 70 %RH
    - Input to Output Isolation 500 V
    - Input to Case Ground Isolation 500 V
    - Output to Case Ground Isolation 500 V

Order Number:

- **D575.00902 (VS1: 50 A, VS2: 25 A, VS3: 20 A)**

1.2 Compatibility

VDE 0805

IEC 950

Tested and passed: TBD

- Altitude: MIL-STD-810F, Methode 500.4, Procedure II
- Vibration: MIL-STD-810G, Methode 514.6 D-1, Category 12
- Shock: MIL-STD 810G, 40g, 11ms semisinusoidal
- Funktional Shock: MIL-STD-810G, Method 516.6, Procedure I
- Transportation Vibration: MIL-STD-810E, Method 514.4, Procedure I, Category 8 Table 514.4-AXVI

Designed to meet MIL-STD-461F

1.3 Block diagram

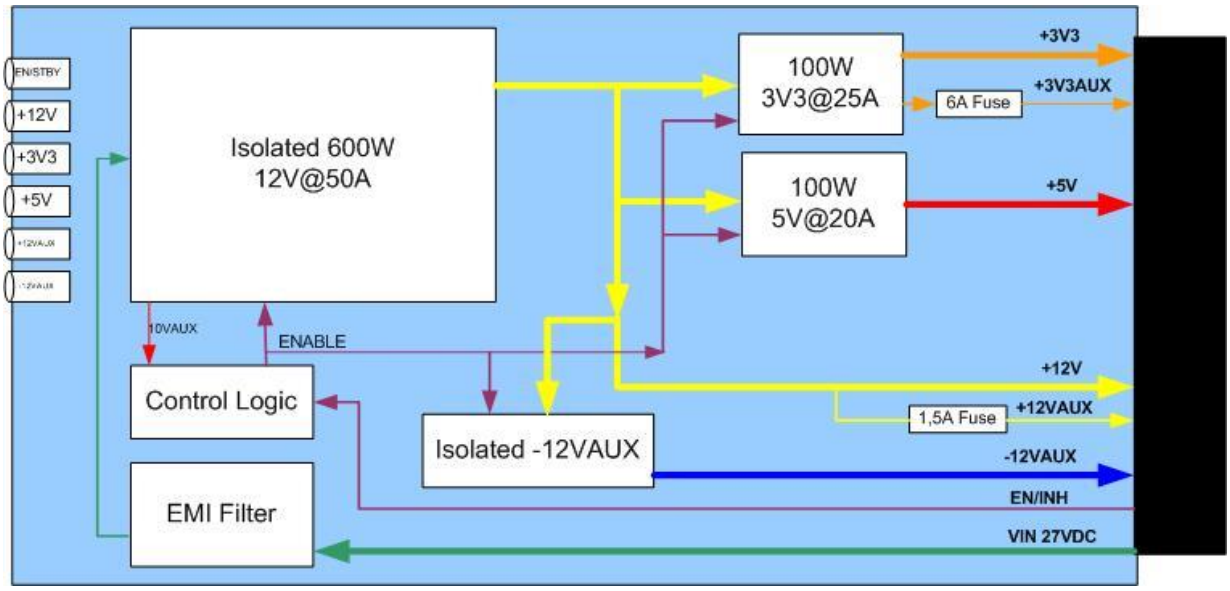


Figure 1 Block diagram D575.00902

The 12 V channel is isolated and fed via a common filter network from the 27 VDC main supply (19 V – 35V, shortly 36 V). 3V3AUX and +12 V AUX are not independent but protected by a not resettable fuse. The main channels 3V3 and 5 V are not independent and share the Power of the 12 V channel.

Depending on the power required, the output channels can be loaded in a floating power. The total load must not exceed 600 W.

Any failure on the output voltages are signaled on the FAIL-Signal. If all internals are normal then all LEDs lights GREEN, If the PSU not enabled, the EN/STANDBY-LED lights RED.

For overload and hard short conditions, overcurrent protection reduces the regulator RMS the respective output current to much less than full load by putting the controller into hiccup mode.

A delay equal to three soft-start intervals is entered to allow time to clear the disturbance.

After the delay time, the controller initiates a soft-start interval.

If the output voltage comes up and returns to regulation, The FAIL-Signal transitions high.

For correct operation all sense signals has to be connected

1.4 Front panel

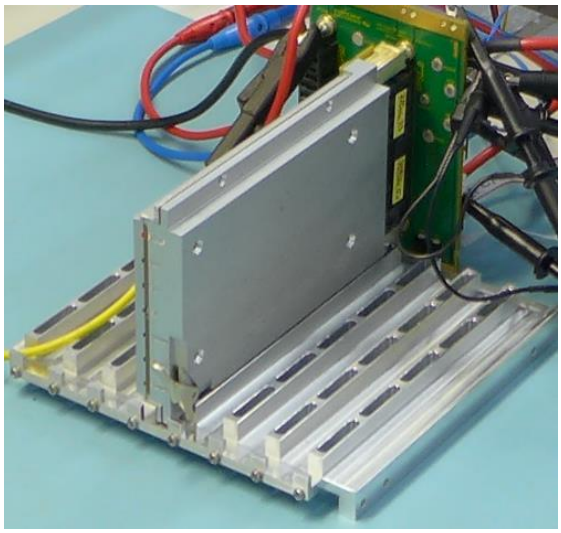


Figure 2 Front panel functional elements of the VPX3C Power Supply

1.5 Switch-On Behavior

All voltage outputs are switched on exponentially with relatively short rise times of 10 milliseconds to the final voltage.

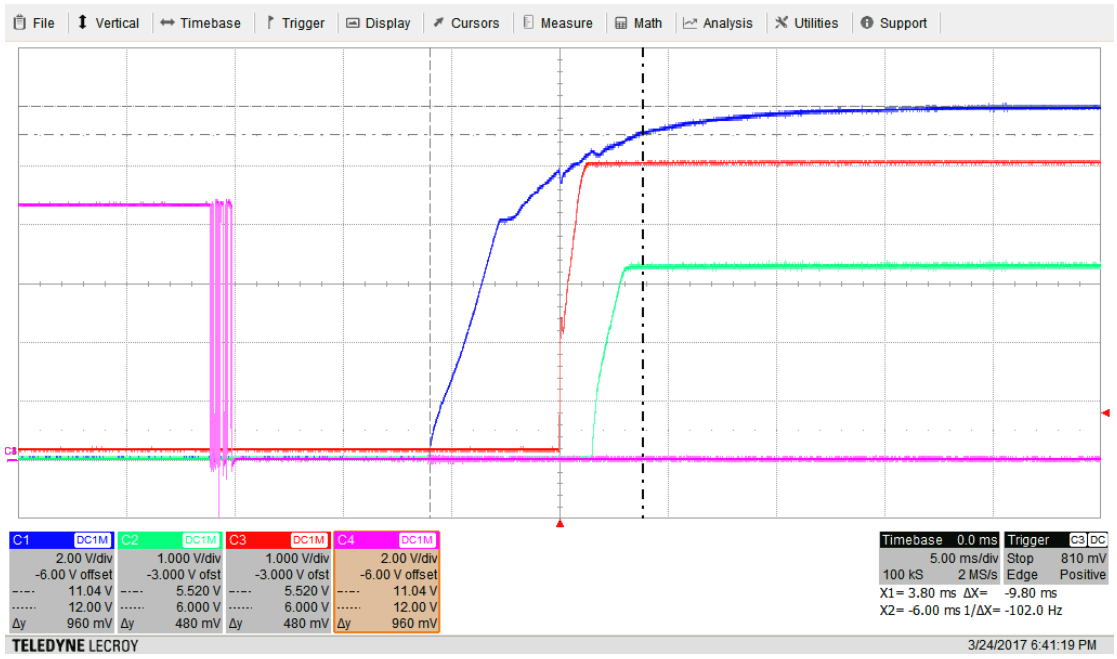


Figure 3 Startup Delay and Exponential Rise of VS1 = 12 V(blue), VS2=3V3(green), VS3=5 V(red)

1.6 Fall Up Time

The fall time is dependent on the load. In this case without load.

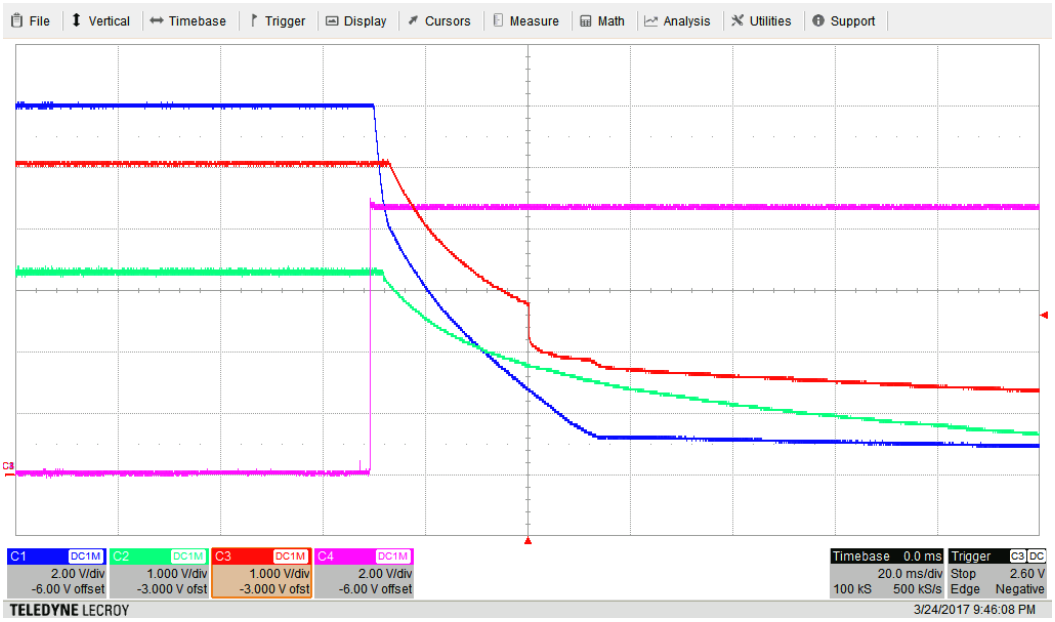


Figure 4 Fall Up Delay and Exponential Rise of VS1 = 12V (blue), VS2=3V3(green), VS3= 5V(red)

1.7 Derating

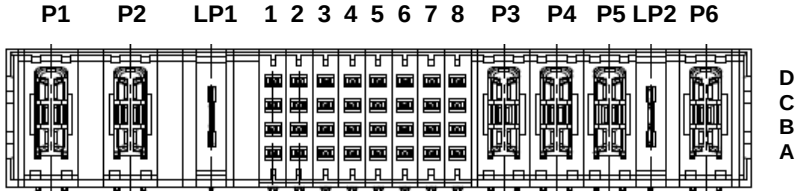
Alternatively as orientation the derating of power plays a role for case temperatures above 60 °C this can be derived as rule of thumb from the air-conditioned data of the individual converters. Figure 4 gives an example for the VS1 12 V main voltage.

Picture coming soon

Figure 5 Derating curves

1.8 P1 Connector Pin Out

The pin out corresponds to vita 62 specifications.



Pin Number	Rated Current (A)	Pin Name
P1	40 A	- DC_IN/ACN
P2	40 A	+ DC_IN/ACL
LP1	20 A	CHASSIS
A1	<1 A	UD1
B1	<1 A	UD2 (occupied)
C1	<1 A	UD3 (occupied)
D1	<1 A	UD4
A2	<1 A	VBAT
B2	<1 A	FAIL*
C2	<1 A	INHIBIT*
D2	<1 A	ENABLE*
A3	<1 A	UD0 (occupied for CLK-Signal)
B3	<1.5 A	+12V_AUX
C3	<1 A	NED
D3	<1 A	NED_RETURN
A4	<1.5 A	3,3V_AUX
B4	<1.5 A	3,3V_AUX
C4	<1.5 A	3,3V_AUX
D4	<1.5 A	3,3V_AUX
A5	<1 A	GA0*
B5	<1 A	GA1*
C5	<1 A	SM0
D5	<1 A	SM1
A6	<1 A	SM2
B6	<1 A	SM3
C6	<1.5 A	-12V_AUX
D6	<1 A	SYSRESET*
A7	<1 A	PO1_SHARE (VS1)
B7	<1 A	PO2_SHARE (VS2)
C7	<1 A	PO3_SHARE (VS3)
D7	<1 A	SIGNAL_RETURN
A8	<1 A	PO1_SENSE (VS1)
B8	<1 A	PO2_SENSE (VS2)
C8	<1 A	PO3_SENSE (VS3)
D8	<1 A	SENSE_RETURN
P3	40 A	PO3 (VS3)
P4	40 A	POWER_RETURN
P5	40 A	POWER_RETURN
LP2	20 A	PO2 (VS2)
P6	40 A	PO1 (VS1)

Figure 6 Connector Pin Out

1.9 FAIL Signal (TBD)

The FAIL* signal is activated when PO1, PO2, PO3, or AUX voltages are not within their voltage specifications. The signal complies with VITA 65 for active low.

The intent of the FAIL signal is to indicate to other modules in the system a failure has occurred in the power supply.

Picture coming soon
Figure 7 Fail Signal Diagram D575.00902

1.10 Current sharing

Combined with the Hartmann electronic GmbH VPX Power Backplanes up to 4 VPX Power Supplies D575.00902 can be used in parallel operation.

1.11 Mean Time Between Failures

The MTBF calculation is based on MILHDBK-217F-2 and ANSI/VITA 51.1

Temperature in °C	*MTBF (GB)*	*MTBF (GF)*	*MTBF (GM)*	*MTBF (AUC)*
-40	6.592.693	2.643.401	819.715	441.784
-35	6.250.061	2.484.327	781.275	422.847
-30	5.862.286	2.311.635	739.453	402.212
-25	5.431.810	2.127.384	694.317	379.877
-20	4.965.404	1.934.851	646.171	355.942
-15	4.474.151	1.738.344	595.587	330.630
-10	3.972.476	1.542.783	543.397	304.282
-5	3.476.324	1.353.142	490.637	277.354
0	3.000.955	1.173.864	438.443	250.372
5	2.558.981	1.008.416	387.944	223.887
10	2.159.142	859.050	340.134	198.424
15	1.805.995	726.792	295.792	174.427
20	1.500.359	611.607	255.436	152.230
25	1.240.213	512.662	219.317	132.047
30	1.021.691	428.600	187.455	113.968
35	839.983	357.792	159.688	97.983
40	690.010	298.531	135.727	84.001
45	566.874	249.160	115.212	71.881
50	466.114	208.152	97.754	61.446
55	383.820	174.148	82.961	52.512
60	316.656	145.970	70.464	44.893
65	261.828	122.617	59.927	38.413
70	217.030	103.246	51.050	32.910

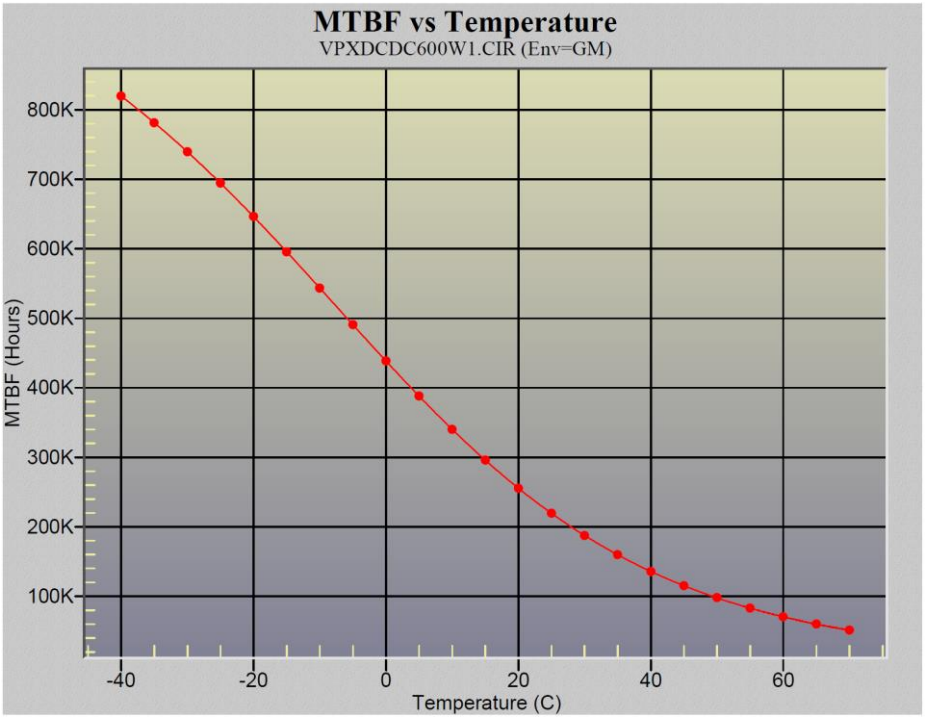


Figure 8 MTBF depending on the temperature, MILHDBK-217F-2

1.12 Wedge Lock

Allen screw M2,5 mm

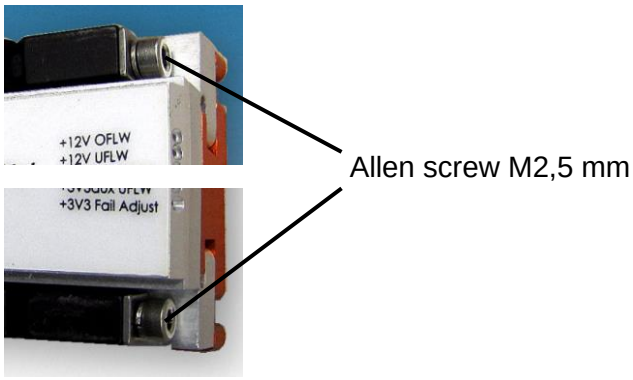


Figure 9 Allen Screw

2 Available Accessories

Hartmann Electronic produces different Power-Backplanes for Vita 62 VPX PSUs

Part Number	Description
B1931D4221	3U, 1Slot for Vin = 24VDC, designed for parallel Operation
B1932D4220	3U, 2Slot for Vin = 24VDC, designed for parallel Operation
VPXDC-3U-FILT1	3U, Filter Module, according to MIL-STD-461F
VPXDC-3U-HOLD	3U, Hold-Up Module, for 15 ms Hold-Up-Time with 715 W max.