ORBIT POWER GROUP
Behlman Electronics

VPXtra™1000CD-IQ Data Sheet

P/N 94078-3

FEATURES

- **Open VPX VITA 62 compliant**
- **6U VPX, 1.0” pitch single slot**
- **Wide input range: 18-36V**
- **Input transient protection**
- **High power DC output: 12V/80A**
- **Auxiliary DC output: 3.3V/15A**
- **Low noise & ripple**
- **Parallelable output (12V/80A)**
- **Input-output isolation**
- **Excellent load regulation**
- **Overcurrent, Overvoltage, Over temperature protection**
- **Efficiency of 90% typical**
- **High power density**
- **Conduction cooled at card edge**
- **Conformal coating on PCB**
- **MIL-STD-461F, CE-102 compliant, with external filtering components**
- **ENABLE*, INHIBIT* controls per VITA 62**
- **Output voltage FAIL* signal**
- **LED indication**
- **Intelligent Communication, Measurement and Control**

OVERVIEW

The Behlman VPXtra™1000CD-IQ COTS DC to DC power supply is a rugged, highly reliable, conduction cooled, switch mode unit built for high-end industrial and military applications. The VPXtra™1000CD-IQ is a VITA 62, Open VPX compliant, 6U power supply that delivers 1000 Watts of DC power via two outputs. The 12V output can be paralleled for higher power and redundancy. The VPXtra™1000CD-IQ operates from a 28VDC input, IAW MIL-STD-704, and supplies a high power DC output. It has the ability to monitor and report status of multiple parameters as well as support ANSI/VITA 46 signals.

The VPXtra™1000CD-IQ power supply has no minimum load requirement and has overvoltage and short circuit protection as well as over current and thermal protection. The power supply is designed to support the rigors of mission critical airborne, shipboard, vehicle and mobile applications.

Designed and manufactured with Xtra-Cooling™ technology, Xtra-Reliable™ design and Xtra-Rugged™ construction makes the Behlman VPXtra™1000CD-IQ your best choice.

Absolute Maximum Ratings:
(Stresses above those listed below may cause permanent damage to the unit)

Parameter	Notes	Min	Typical	Max	Units
Input Voltage		18		36	V
Input Current	See figure 10			67	A
Operating Temperature	Measured at Card Edge	-40		71	°C
Storage Temperature		-40		105	°C
Isolation Voltage	Input to Output			500	V
Isolation Voltage	Input to Case			500	V
Isolation Voltage	Output to Case			100	V
Isolation Resistance	Input to Case	10			MΩ

Input Characteristics:

Parameter	Notes	Min	Typical	Max	Units
Operating Input Voltage Range		18	28	36	V
Turn-On Threshold			17.6		V
Turn-Off Threshold			16.9		V
Input Standby Current	28V Input, Enable De-asserted (Input Off), Inhibit Asserted (Output Off)		0.1		A
Input Standby Current	28V Input, Enable Asserted (Input On), Inhibit Asserted (Output Off)		0.14		A
Input No Load Current	28V Input, Enable Asserted (Input On) and Inhibit De-asserted (Output On)		0.72		A

Output Characteristics, +12V/80A Output:

Parameter	Notes	Min	Typical	Max	Units
Output Voltage Set Point		11.80	12.00	12.17	V
Line Regulation	(18-36V input range, 100% Output Load)		0.05	0.25	%
Load Regulation	(28V input)		0.05	0.25	%
Output Ripple/Noise Peak to Peak	See Note 1		35	120	mVp-p
Output Ripple/Noise RMS	See Note 1			25	mV_{rms}
Max. Capacitive Load				12,000	uF
Output Current Range		0		80	A
Output Voltage Remote Sense Range	Maximum DCR Losses to Remote Sense Connection			10	%
Output Overvoltage Protection		14.2	14.8	15.4	V
Output Overcurrent Protection		92	105	110	A
Transient Response	See Figures 4,6				

Output Characteristics, +3.3V Aux /15A Output:

Parameter	Notes	Min	Typical	Max	Units
Output Voltage Set Point		3.267	3.300	3.333	V
Line Regulation	(18-36V input range, 100% Output Load)		0.1	0.3	%
Load Regulation	(28V input)		0.75	1	%
Output Ripple/Noise Peak to Peak	See Note 1		14	50	mVp-p
Output Ripple/Noise RMS	See Note 1			25	mV_{rms}
Max. Capacitive Load				12,000	uF
Output Current Range		0		15	ADC
Output Overvoltage Protection		4.0	4.3	4.6	VDC
Output Overcurrent Protection		16.5	18	20	ADC
Transient Response	See Figure 5				

General Characteristics:

Parameter	Notes	Min	Typical	Max	Units
Power			1000		W
Efficiency 100% Load	12V@80A, 3.3VAux@15A, 28V Input.(Fig.6)		90		%
Efficiency 50% Load	12V@40A, 3.3VAux@7.5A, 28V Input		91		%
Turn-On Delay, 3.3V output	From application of input power (ENABLE* is asserted)		300		ms
Turn-On Delay, 12V output	From INHIBIT* de-assertion		110		ms

Controls and Signals:

Name	Function	Description
ENABLE* (Input)	Input power control	Active Low, referenced to SIG RTN. When asserted, internal input power bus is enabled and 3.3V Aux is enabled.
INHIBIT* (Input)	Output power control for 12V output	Active Low, referenced to SIG RTN. When asserted, all outputs except 3.3V Aux are disabled.
FAIL* (Output)	Reports out of tolerance output voltages	Open Drain Output (40V, 10mA) Active low, referenced to SIG RTN. When asserted indicates output voltage(s) out of tolerance; external pull-up resistor to 3.3V is required.
NVMRO (Input)	Non-volatile memory read only.	Active high, referenced to SIG RTN. When asserted it sets all non-volatile memory in power supply to read only mode. De-asserted by default.
INPUT_PWR_FAIL* (Output)	Reports input voltage out of tolerance	Active Low, referenced to SIG RTN. When asserted input voltage is out of tolerance. External pull-up to 3.3V is required.
SYSRESET* (Input)	Resets PMBus controller to startup state.	Active Low, referenced to SIG RTN. When asserted resets internal microprocessor to startup conditions. Process takes 2 seconds. See VITA 46 for pull-up/pull-down resistor requirements.
GAP*, GA4*, GA3*, GA2*, GA1*, GA0* (Inputs)	Geographical Addressing	Active Low, referenced to SIG RTN. Used to set address of PMBus communication. Complies with VITA 46.11.
ALERT* (Output)	PMBus SMBALERT* signal	Active Low, referenced to SIG RTN. When asserted signals that fault has occurred. Signal latches until cleared. External pull-up to 3.3V is required.
PMBUS SCL, PMBUS SDA	PMBus I2C Clock and Data signals	PMBus data and clock signals, external pull-up resistors to 3.3V are required.

Output power status vs. input power and control signals:

Input Power	ENABLE*	INHIBIT*	12V output	3.3VAux output
Not present	X	X	OFF	OFF
Present	Not asserted (high)	X	OFF	OFF
Present	Asserted (low)	Asserted (low)	OFF	ON
Present	**Asserted (low)**	**Not asserted (high)**	**ON**	**ON**

Indicators:

Indicator	Description
DC IN OK (Green LED)	Indicates Input Power is present, and within specification
OUT FAULT (Amber LED)	Indicates at least one Output Voltage is outside of specified range
DC OUT (Green LED)	Indicates 12V output is enabled
TEMP FAULT (Amber LED)	Indicates Power Supply is nearing over temperature shutdown point. Blinking LED indicates that geographical address is not valid.
ALET (Amber LED)	Indicates that PMBUS ALERT* signal is asserted
WP (Amber LED)	Indicates that all non-volatile memory inside of power supply is in read only mode.

PMBus Information:

Parameter	Notes	Min	Typical	Max	Units
Bus Frequency	Bus operates at 100KHz only.		100		KHz
Voltage Measurement Accuracy			1	2	%
Current Measurement Accuracy				3	%
Temperature Measurement Accuracy				3	%
Voltage Measurement Resolution				10	mV
Current Measurement Resolution				10mA	mA
Temperature Measurement Resolution				0.5	°C

Note 1: Ripple and noise measured at output connector, across parallel connection of 10uF tantalum and 0.1uF ceramic capacitors, 20MHz Bandwidth
Note 2: All measurements are performed at Nominal Input (28VDC) and at ambient temperature of 25° C, unless otherwise specified.

Output voltages start up sequence

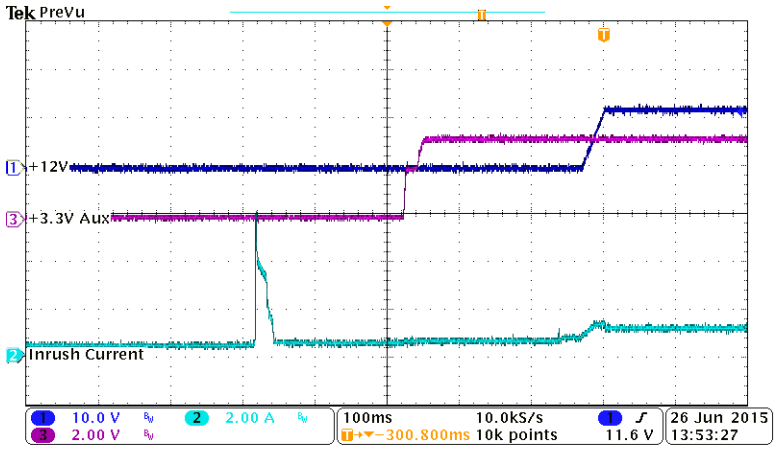

Figure 1: 3.3VAux and 12V Turn-on delay from application of input power, ENABLE* asserted, INHIBIT* de-asserted

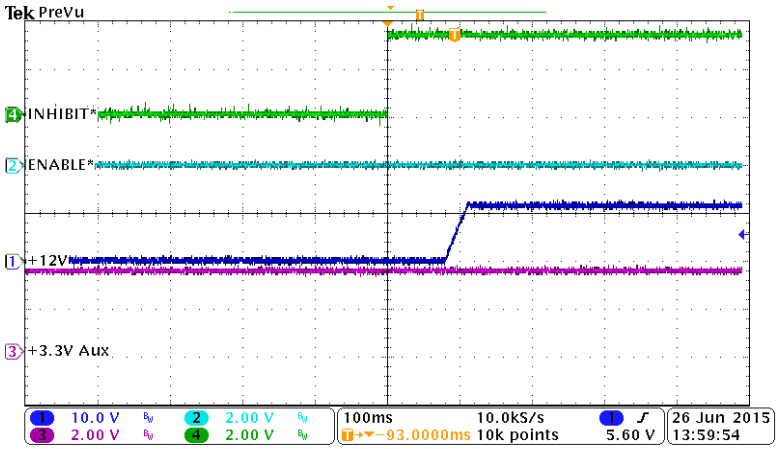

Figure 2: 12V output Turn-on delay from INHIBIT de-assertion

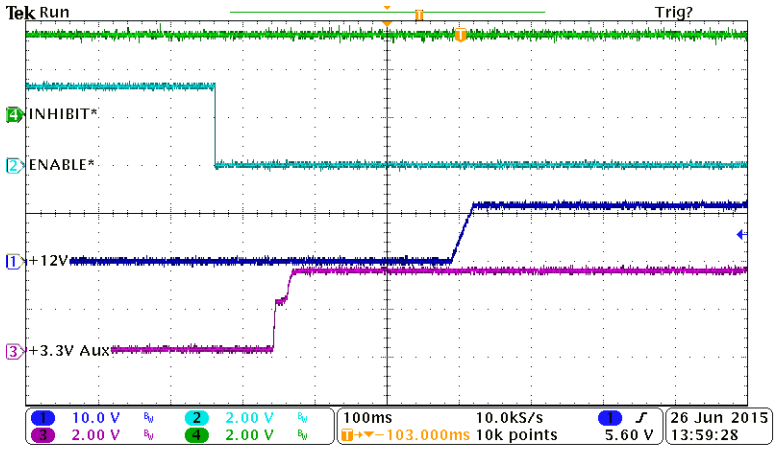

Figure 3: Turn-on delay from ENABLE* assertion, +12V, +3.3V Aux

Output voltages load transient response:

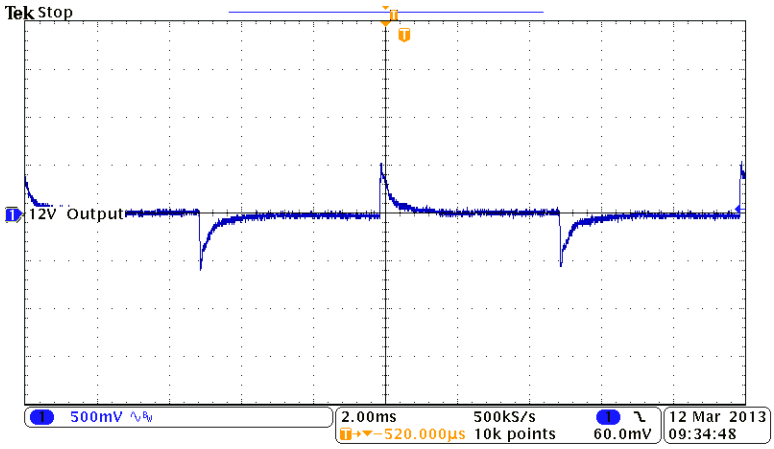

Figure 4: 12V output transient response, 50-75% load change

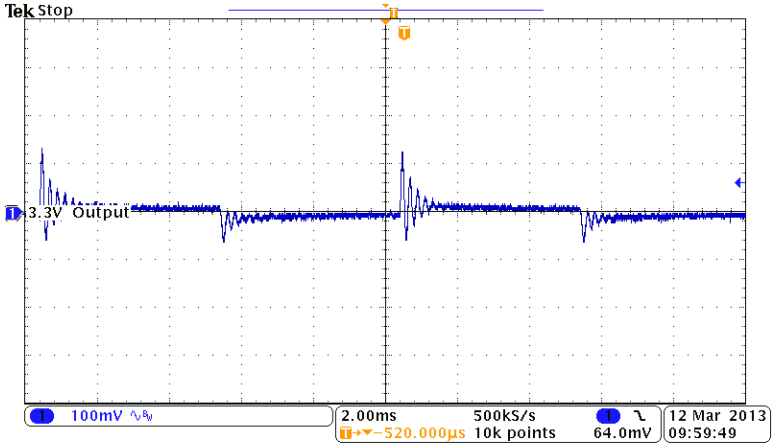

Figure 5: 3.3VAux output transient response, 50-75% load change

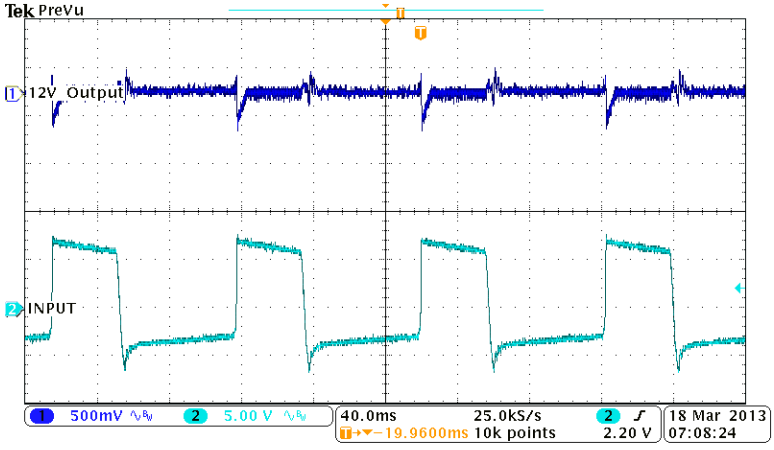

Figure 6: 12V output transient, Input line change, 24V to 34V

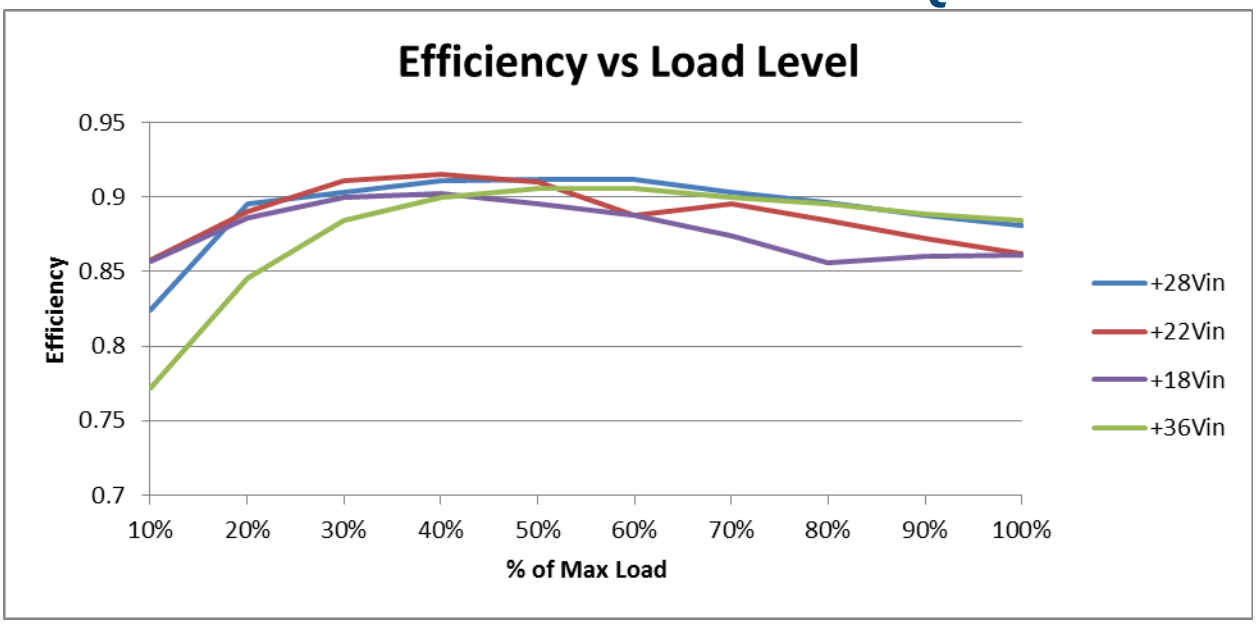

Figure 7: Efficiency vs. Load for Minimum, Nominal and Maximum input voltage

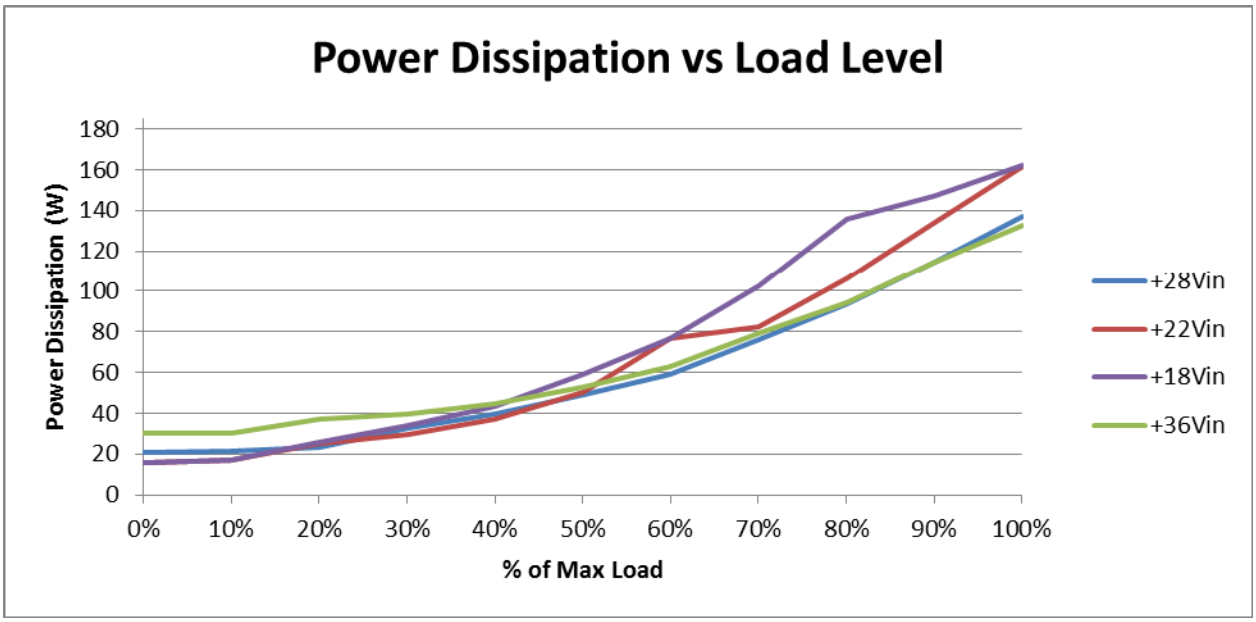

Figure 8: Power dissipation vs. Load for Minimum, Nominal and Maximum input voltage

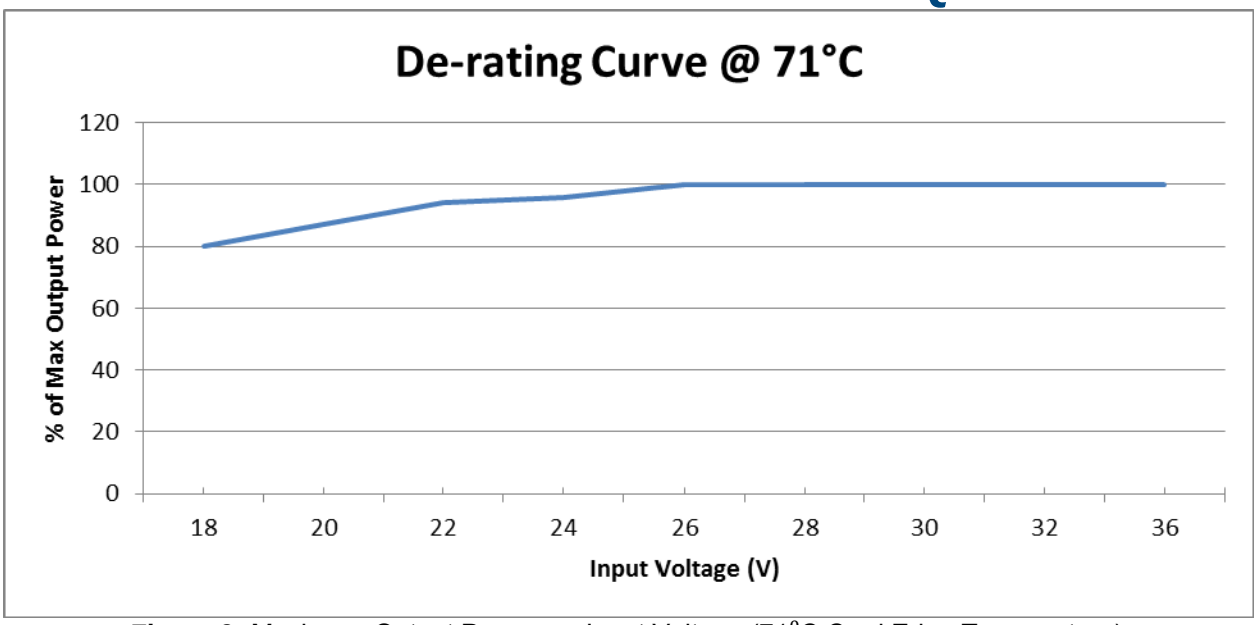

Figure 9: Maximum Output Power vs. Input Voltage (71^{0}C Card Edge Temperature)

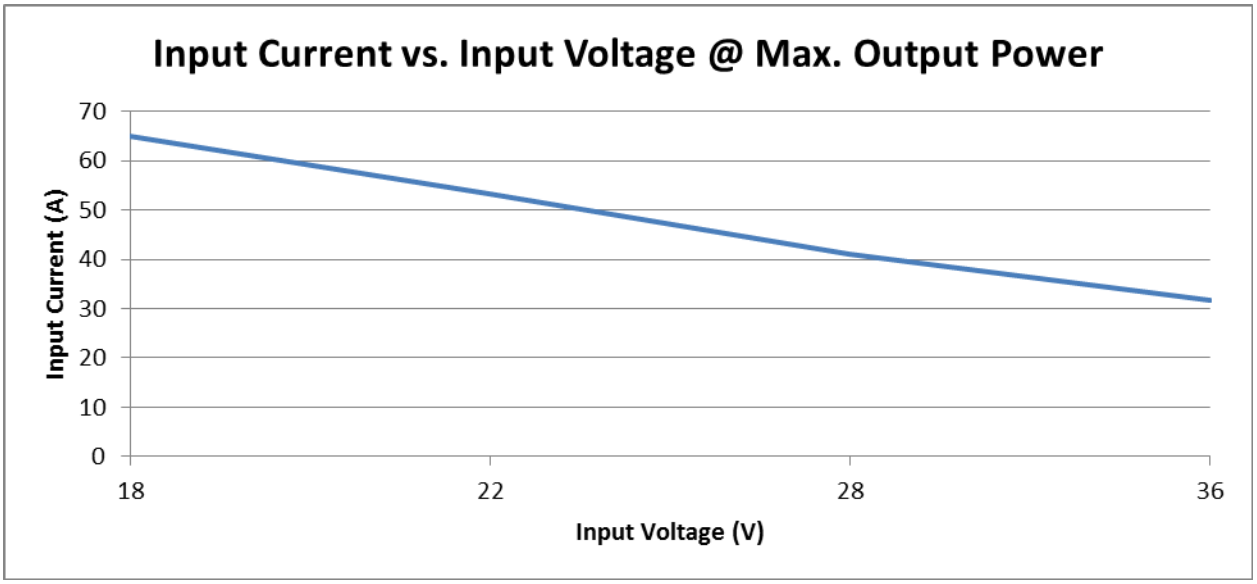

Figure 10: Input Current vs. Input Voltage at maximum output loads.

Paralleling options

The high power +12V/80A output of Behlman VP*Xtra*™1000CD-IQ series power supplies can be paralleled for higher output power and redundancy with the +12V output of another VP*Xtra*™1000CM-IQ or VP*Xtra*™1000CD-IQ by connecting together the two dedicated share signals to all power supplies to be paralleled as well as the outputs of the power supplies. There is also two synchronization lines (one for 3.3V Aux, one for all other outputs) that can be bussed together to guarantee that multiple power supplies turn on at same time.

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MIL-STD-461, CE-102 Test Results

Vin=28V, 100% Output load, External Filtering Inductor CWS P/N: C-36A29-07

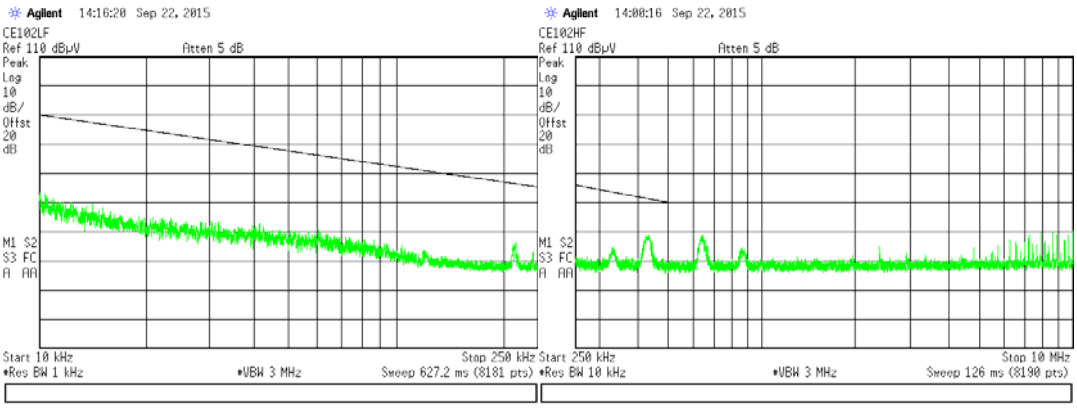

Figure 11: CE102

Note External Filtering required to meet CE-102, above spectrum taken with common mode inductor CWS P/N C-36A29-07 (110µH/60A) on the input.

PMBus Application Introduction

The VPXtra™1000CD-IQ has PMBus capability built in that provides the ability to monitor and report power supply status. The PMBus interface allows the user to monitor the output voltage of each output as well as output current measurements for select outputs. It also provides input voltage and current measurements as well as internal temperature at 3 locations inside of the power supply. The PMBus interface also contains an extensive fault reporting method to quickly and definitively identify issues with the power supply.

To use this communication bus the I^2C SCL and SDA lines shall be connected to the hosts SDA and SCL lines. Pull-up resistors are required as defined in the I^2C specification to 3.3V. A valid address will need to be set before application of power using the geographical addressing pins (see details in section below) by leaving address line open for a high (U) or pulled to SIG RTN for a low (G). If the ALERT* signal functionality is desired the alert signal should be pulled up to 3.3V using an appropriate resistor (220Ω is recommended).

PMBus Addressing (Geographical Addressing)

The addressing is based on the Geographical Addressing approach defined in VITA 46.11

The PMBus address is dependent on six input signals: GA0*, GA1*, GA2*, GA3*, GA4*, and GAP*. These pins on each VPX slot in the backplane should be grounded (G) for logic 1, or left open (U) for logic 0 to set the address of the board according to Table 1. The GA[4:0]* pins represent the address, while the GAP* provides a parity check. Odd parity is required in the address so the sum of all the grounded address, GA[4:0]* and GAP*, pins must be an odd number.

When the geographical address is incorrect after power application or after a reset, the power supply:

- will not be assigned a PMBus address, and the Device will not be connected to the PMBus until the correct geographical address is set,
- TEMP FAULT LED indicator will be blinking. If the geographical address is set to a valid address the TEMP FAULT LED will stop blinking, and the Device will be connected to PMBus.
- SMBALERT# signal line will not operate and will not indicate faults from the power supply.

Table 1: Valid Geographical Addresses

VPX IPMB SLOT ID: IPMB Address	GEOGRAPHICAL ADDRESS						Hardware Address
	GAP*	GA4*	GA3*	GA2*	GA1*	GA0*	
1: 82h	U	U	U	U	U	G	41h
2: 84h	U	U	U	U	G	U	42h
3: 86h	G	U	U	U	G	G	43h
4: 88h	U	U	U	G	U	U	44h
5: 8Ah	G	U	U	G	U	G	45h
6: 8Ch	G	U	U	G	G	U	46h
7: 8Eh	U	U	U	G	G	G	47h
8: 90h	U	U	G	U	U	U	48h
9: 92h	G	U	G	U	U	G	49h
10: 94h	G	U	G	U	G	U	4Ah
11: 96h	U	U	G	U	G	G	4Bh
12: 98h	G	U	G	G	U	U	4Ch
13: 9Ah	U	U	G	G	U	G	4Dh
14: 9Ch	U	U	G	G	G	U	4Eh
15: 9Eh	G	U	G	G	G	G	4Fh
16: A0h	U	G	U	U	U	U	50h
17: A2h	G	G	U	U	U	G	51h
18: A4h	G	G	U	U	G	U	52h
19: A6h	U	G	U	U	G	G	53h
20: A8h	G	G	U	G	U	U	54h
21: AAh	U	G	U	G	U	G	55h
22: ACh	U	G	U	G	G	U	56h
23: AEh	G	G	U	G	G	G	57h
24: B0h	G	G	G	U	U	U	58h
25: B2h	U	G	G	U	U	G	59h
26: B4h	U	G	G	U	G	U	5Ah
27: B6h	G	G	G	U	G	G	5Bh
28: B8h	U	G	G	G	U	U	5Ch
29: BAh	G	G	G	G	U	G	5Dh
30: BCh	G	G	G	G	G	U	5Eh
31: BEh	U	G	G	G	G	G	5Fh

PMBus Data Format

The Data values transmitted to or received by the Host are in DIRECT format, as described in the PMBus specification, Section 7.2, unless otherwise specified.

The DIRECT data format is a two byte, two's complement binary integer where the low byte of data is received or transmitted first.

The Host should use the following equation to convert data received from the Device to real world data:

$$X = {}^{1}/_{m}\ (Y * 10^{-R} - b)$$

The Host should use the following equation to convert real world data to a value to be transmitted to the Device:

$$Y = (mX + b) * 10^{R}$$

Where:

X = real word value in the appropriate units (A, V, °C, etc.)
m = slope coefficient integer
Y = two byte two's complement data that is transmitted or received

b = offset
R = exponent

The parameters and coefficients are shown in the following sections, unless otherwise specified in the command summary for a specific command.

The transmit and receive parameters are the same in all cases.

PMBus Voltage and Current Conversion Parameters

For the Host to correctly convert values to and from the Device, the following parameters are used:
m = 100,
b = 0,
r = 0.

The equivalent simplified conversion equations are:
Receiving: $X_{VI} = Y_{VI} / 100$
Transmitting: $Y_{VI} = Y_{VI} * 100$

Where:
X_{VI} is the real world Voltage (Volts) or Current (Amps),
Y_{VI} is the two byte two's complement data received or transmitted.

Voltage and Current values can only be positive.
Resolution for all Voltage and Current related Read and Write commands is 10mV and 10mA respectively.

Accuracy for all Voltage related Reading commands and Voltage Threshold setting commands is +/- 2% of the corresponding nominal values.
Accuracy for all Current related Reading commands and Current Threshold setting commands is +/- 3% of the corresponding maximum nominal values.

PMBus Temperature Conversion Parameters

For the Host to correctly convert values to and from the Device, the following parameters are used:
M = 256
b = 0
r = 0

The equivalent simplified conversions are:
Receiving: $X_T = Y_T / 256$
Transmitting: $Y_T = X_T * 256$
Where:
X_T is the real world temperature (^oC),
Y_T is the two byte two's complement data received or transmitted.

Resolution for all Temperature related Read and Write commands is 0.5 °C

Temperature Threshold values transmitted to the Device can only be positive because the Under Temperature Threshold limits are fixed, negative and cannot be written.

Accuracy for all Temperature readings and Threshold settings commands in the range from -40 °C to +125 °C is +/-3%.

The Device can report temperature values that may be positive or negative. Since the data are, by definition, two's complement, negative values are indicated by the Most Significant Bit in Yi being set high. Positive values are represented by their simple binary value. The negative temperature representation is a little more complex and an example of two's complement data conversion for negative temperatures is explained below.

Negative Temperature Conversion Example

The Host should use the following approach to convert the temperature data bytes it receives if the Most Significant Bit of the data is set:

Step 1: Invert all bits of the received data
Step 2: Add 1 to the received data
Step 3: Use $X_T = Y_T/256$

For Example:

The Host reads UT_FAULT, and receives the following two bytes, in order, 7Eh & D3h. Since the transmitted byte order is LSB first, this converts to D37Eh. Notice that the MSB in the value is set, meaning that the value is negative. To obtain the numerical value of the temperature:
Inverting all bits of the value:
D37Eh = 1101 0011 0111 1110b → 0010 1100 1000 0001b = 2C81h
Add 1 to the inverted value:2C81h + 1h = 2C82h= 11394d
$X_T = Y_T/256$ = 11394/256 = 44.5
So the reading was -44.5°C

PMBUS Paged Access Scheme

The PMBus utilizes a paged access scheme for providing data and controlling device outputs. When a command is sent such as READ_VOUT, the device will return information based on the currently selected page. So in order to read or set something pertaining to a specific output the user must first select the correct page number for the desired output using the PAGE command, then send the command to perform the desired action. See table 2 below for page listings:

Table 2: Page Descriptions

Table 4.3 ("D") PAGE Descriptions

PAGE	VOLTAGE	CURRENT	TEMPERATURE
00h	Not used	12V_B module	Temperature Sensor 1
01h	3.3V output	3.3V output	Temperature Sensor 2
02h	12V output	12V_A module	Temperature Sensor 3
03h-09h	Special function		
0Ah	3.3V HSKPR		
FFh	Special Function		

PMBus Command Summary

The following tables provide a list of available commands while using the Behlman VPXtra™ Power Supplies with Smart Card. See separate programing manual for more information on application of PMBus interface.

Table 3: Supported Manufacturer Specific Commands

Command Code	Command Name	Description	Type	Paged
D0h	MFR_SPECIFIC_00_RESET	Initiates software reset of device	Write Byte	N
D1h	MFR_SPECIFIC_01_VOLT_MCC	Allows host to read or write voltage measurement correction coefficients.	R/W Word	N
D3h	MFR_SPECIFIC_03_CUR_MCC	Allows host to read or write current measurement correction coefficients.	R/W Word	N
D5h	MFR_SPECIFIC_05_INT_ADDR	Allows host to set the internal address of the EEPROM where the first byte will be read from.	R/W Word	N
D7h	MFR_SPECIFIC_07_WR_PROT	Allows host to limit write commands to EEPROM memory and/or device memory.	R/W Byte	N

Table 4: Supported PMBus Commands

Command Code	Command Name	Description	Type	Paged
00h	PAGE	Allows user to read or select the page for any commands that support paging.	R/W Byte	N
03h	CLEAR_FAULTS	Clears fault flags set in status registers.	Send Byte	Y
11h	STORE_DEFAULT_ALL	Stores measurement correction coefficients into device default memory.	Send Byte	N
12h	RESTORE_DEFAULT_ALL	Instructs device to load measurement correction coefficients from device default memory into operating memory.	Send Byte	N
15h	STORE_USER_ALL	Stores measurement correction coefficients into device user memory.	Send Byte	N
16h	RESTORE_USER_ALL	Instructs device to load measurement correction coefficients from device user memory into operating memory.	Send Byte	N
19h	CAPABILITY	Provides the host with capabilities of the device.	Read Byte	N
1Ah	QUERY	Allows host to query support of specific command.	Block R/W	N
1Bh	SMBALERT_MASK	Allows host to mask out future warnings or faults from triggering ALERT* signal.	Block R/W	Y
40h	VOUT_OV_FAULT_LIMIT	Allows host to set output over voltage fault limit for each output.	R/W Word	Y
42h	VOUT_OV_WARN_LIMIT	Allows host to set output over voltage warning limit for each output.	R/W Word	Y
43h	VOUT_UV_WARN_LIMIT	Allows host to set output under voltage warning limit for each output.	R/W Word	Y
44h	VOUT_UV_FAULT_LIMIT	Allows host to set output under voltage fault limit for each output.	R/W Word	Y
46h	IOUT_OC_FAULT_LIMIT	Allows host to set output over current fault limit for each output.	R/W Word	Y
4Ah	IOUT_OC_WARN_LIMIT	Allows host to set output over current warning limit for each output.	R/W Word	Y
4Fh	OT_FAULT_LIMIT	Allows host to set output over temperature fault limit.	R/W Word	Y
51h	OT_WARN_LIMIT	Allows host to set output over temperature warning limit.	R/W Word	Y
52h	UT_WARN_LIMIT	Allows host to set under temperature warning limit for each sensor.	R/W Word	Y
53h	UT_FAULT_LIMIT	Allows host to set under temperature fault limit for each sensor.	R/W Word	Y
55h	VIN_OV_FAULT_LIMIT	Allows the host to set input over voltage fault limit.	R/W Word	N
57h	VIN_OV_WARN_LIMIT	Allows the host to set input over voltage warning limit.	R/W Word	N
58h	VIN_UV_WARN_LIMIT	Allows the host to set input under voltage warning limit.	R/W Word	N
59h	VIN_UV_FAULT_LIMIT	Allows the host to set input under voltage warning limit.	R/W Word	N
5Bh	IIN_OC_FAULT_LIMIT	Allows the host to set input over current fault limit.	R/W Word	N
5Dh	IIN_OC_WARN_LIMIT	Allows the host to set input over current warning limit.	R/W Word	N
78h	STATUS_BYTE	Provides host with one byte general status register.	Read Byte	N
79h	STATUS_WORD	Provides host with two byte general status register.	Read Word	N
7Ah	STATUS_VOUT	Provides host with one byte status on currently paged output voltage.	R/W Byte	Y
7Bh	STATUS_IOUT	Provides host with one byte status on currently paged output current.	R/W Byte	Y

Command Code	Command Name	Description	Type	Paged
7Ch	STATUS_INPUT	Provides host with one byte status on device input.	R/W Byte	N
7Dh	STATUS_TEMPERATURE	Provides host with one byte status on device temperature.	R/W Byte	N
7Eh	STATUS_CML	Provides host with one byte status on communication.	R/W Byte	N
80h	STATUS_MFR	Provides host with one byte of device specific faults and warnings.	R/W Byte	N
88h	READ_VIN	Returns input voltage measurement.	Read Word	N
89h	READ_IIN	Returns input current measurement.	Read Word	N
8Bh	READ_VOUT	Returns output voltage measurement for currently selected page.	Read Word	Y
8Ch	READ_IOUT	Returns output current measurement for currently selected page.	Read Word	Y
8Dh	READ_TEMPERATURE_1	Returns temperature reading from sensor 1.	Read Word	N
8Eh	READ_TEMPERATURE_2	Returns temperature reading from sensor 2	Read Word	N
8Fh	READ_TEMPERATURE_3	Returns temperature reading from sensor 3	Read Word	N
98h	PMBUS_REVISION	Provides host with PMBUS revision device complies with.	Read Byte	N
99h	MFR_ID	Provides host with manufactures ID.	Read Block	N
9Ah	MFR_MODEL	Provides host with model number of device.	Read Block	N
9Bh	MFR_REVISION	Provides host with firmware revision level of device	Read Block	N
9Eh	MFR_SERIAL	Provides host with device serial number	Read Block	N
ADh	IC_DEVICE_ID	Provides host with devices' system on a chip ID code.	Read Block	N
AEh	IC_DEVICE_REV	Provides host with devices' system on a chip revision level	Read Block	N
B0h	USER_DATA_00	Provides the host with the ability to store user data inside device EEPROM	Block R/W	N
B1h	USER_DATA_01	Provides the host with the ability to store user data inside device EEPROM	Block R/W	N
B2h	USER_DATA_02	Provides the host with the ability to store user data inside device EEPROM	Block R/W	N
B3h	USER_DATA_03	Provides the host with the ability to store user data inside device EEPROM	Block R/W	N
B4h	USER_DATA_04	Provides the host with the ability to store user data inside device EEPROM	Block R/W	N
B5h	USER_DATA_05	Provides the host with the ability to store user data inside device EEPROM	Block R/W	N

Input and Output Connectors Information

P1

CONNECTOR, POWER/SIGNAL
MANUFACTURER: T.E. CONNECTIVITY (TYCO).
MANUFACTURES P/N: 6450839-6
6U P1 CONNECTOR PIN OUT CURRENT RATING

PIN NUMBER	RATED CURREN (A)	PIN NAME	FUNCTION	COMMENTS
P10	40	PO1	+12V	80A MAX TOTAL OUTPUT CURRENT
D9	40	PO2	+12V	
A9	<1A	PO1_SENSE	+SENSE, +12V	CONN-CT TO +12V
B9	<1A	PO2_SENSE	N/U	
C9	<1A	PO3_SENSE	N/U	
D9	<1A	UD0	+12V SYNC	CONNECT TO +12V SYNC OF ALL PARALLELED CARDS
A8	<1A	PO1_SENSE_RTN	SENSE RTN,+12V	CONNECT TO +12V RETURN
B8	<1A	PO2_SENSE_RTN	N/U	
C8	<1A	PO3_SENSE_RTN	N/U	
D8	<1A	UD1	+3.3V AUX SYNC	CONNECT TO +3.3V AUX SYNC OF ALL PARALLELED CARDS
A7	<1A	PO1_SHARE	SHARE+, +12V	CONNECT TO SHARE AND SHARE PINS OF ALL PARALLELED CARDS
B7	<1A	PO2_SHARE	SHARE-, +12V	
C7	<1A	PO3_SHARE	N/U	
D7	<1A	SIGNAL_RETURN	OUTPUT RETURN COMMON	RETURN PATH FOR ALL SIGNALS
P8	40	POWER_RETURN	+12V RETURN	POWER RETURN, +12V
P7	40	POWER_RETURN	+12V RETURN	
A6	<1A	SM2	N/U	
B6	<1A	SM3	N/U	
C6	<1.5A	-12V AUX	N/U	
D6	<1A	SYSRESET* [1]	RESET	HARDWARE RESET FOR PMBUS CONTROLLER
A5	<1A	GAP* [1]	PMBUS ADDR	ADDRESS PARITY BIT
B5	<1A	GA4* [1]	PMBUS ADDR	ADDRESS BIT4
C5	<1A	SM0	N/U	
D5	<1A	SM1	N/U	
A4	<1A	GA3* [1]	PMBUS ADDR	ADDRESS BIT3
B4	<1A	GA2* [1]	PMBUS ADDR	ADDRESS BIT2
C4	<1A	GA1* [1]	PMBUS ADDR	ADDRESS BIT1
D4	<1A	GA0* [1]	PMBUS ADDR	ADDRESS BIT0
A3	<1A	UD2	SDA	PMBUS SDA (DATA)
B3	<1.5A	+12V AUX	N/U	
C3	<1A	NC	N/U	
D3	<1A	NC_RETURN	N/U	
P6	40	PO3	-12V	80A MAX TOTAL OUTPUT CURRENT
P5	40	PO3	-12V	
P4	40	POWER_RETURN	+12V RETURN	POWER RETURN, +12V
P3	40	POWER_RETURN	+12V RETURN	
A2	<1A	VBAT	N/U	
B2	<1A	FAIL* [1]	OUT VOLTAGES MON	OPEN DRAIN (EXTERNAL PULL-UP REQUIRED) HIGH OK LOW: FAULT
C2	<1A	INHIBIT* [1]	OUTPUT INHIBIT	CONNECT TO SIGNAL RETURN TO DISABLE ALL OUTPUTS EXCEPT 3.3V AUX
D2	<1A	ENABLE* [1]	INPUT ENABLE	CONNECT TO SIGNAL RETURN TO ENABLE INPUT POWER
A1	<1A	UD3	SCL	PMBUS SCL (CLOCK)
B1	<1A	UD4 [1]	INPUT VOLTAGE FAIL	INPUT VOLTAGE STATUS
C1	<1A	UD5	NVMRO	NON-VOLATILE MEMORY READ ONLY
D1	<1A	UD6 [1]	ALERT	PMBUS ALERT SIGNAL
P2	40	+3.3V_AUX	+3.3V AUX	15A MAX OUTPUT CURRENT
P1	40	POWER_RETURN	+3.3V AUX RETURN	POWER RETURN, +3.3V AUX

[1] ACTIVE LOW OPERATION

PART NUMBER	ROWS		POWER		SIGNAL		POWER				SIGNAL				POWER		SIGNAL			POWER	
			P1	P2	1	2	P3	P4	P5	P6	3	4	5	6	P7	P8	7	8	9	P9	P10
6450839-6	D		TM	TM	J	J	TM	TM	TM	TM	J	J	J	J	TM	TM	J	J	J	TM	TM
	C				K	K					K	K	K	K			K	K	K		
	B				N	N					N	N	N	N			N	N	N		
	A				S	S					S	S	S	S			S	S	S		
2ACP+8S+4ACP+16S+2ACP+12S+2ACP																					

Figure 12: Output connector P1, pin assignment and signal description

P0

CONNECTOR, POWER
MANUFACTURER: T.E. CONNECTIVITY (TYCO)
MANUFACTURES P/N: 6450833-7

6U P0 CONNECTOR PIN OUT CURRENT RATING

PIN NUMBER	RATED CURRENT (A)	PIN NAME	FUNCTION	NOTES
P7	40	+DC_IN	INPUT POWER (POS)	+28VDC NOMINAL INPUT VOLTAGE (18V TO 36V)
P6	40	+DC_IN	INPUT POWER (POS)	
P5	40	−DC_IN	INPUT POWER RTN	
P4	40	−DC_IN	INPUT POWER RTN	
P3	40	POS_FILT_OUT	CONNECTED TO +DC_IN	
P2	40	NEG_FILT_OUT	CONNECTED TO −DC_IN	
P1	40	CHASSIS		

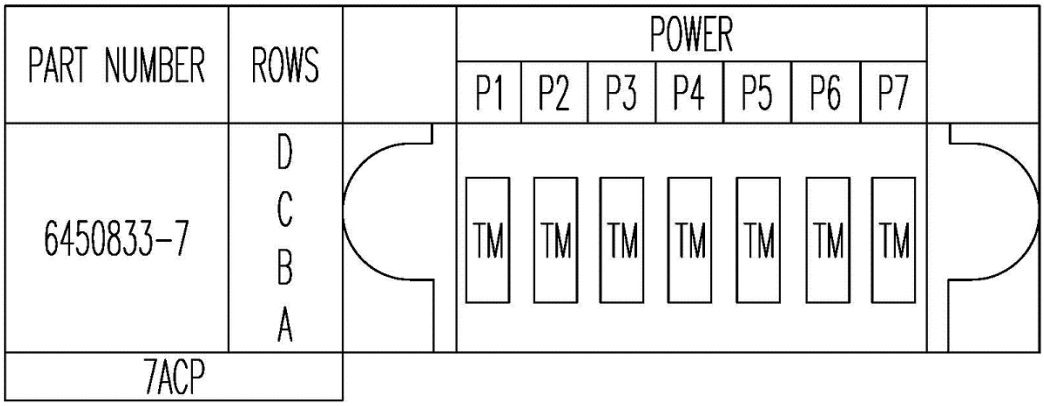

Figure 13: Input Connector P0, pin assignment and signal description

Mechanical drawings:

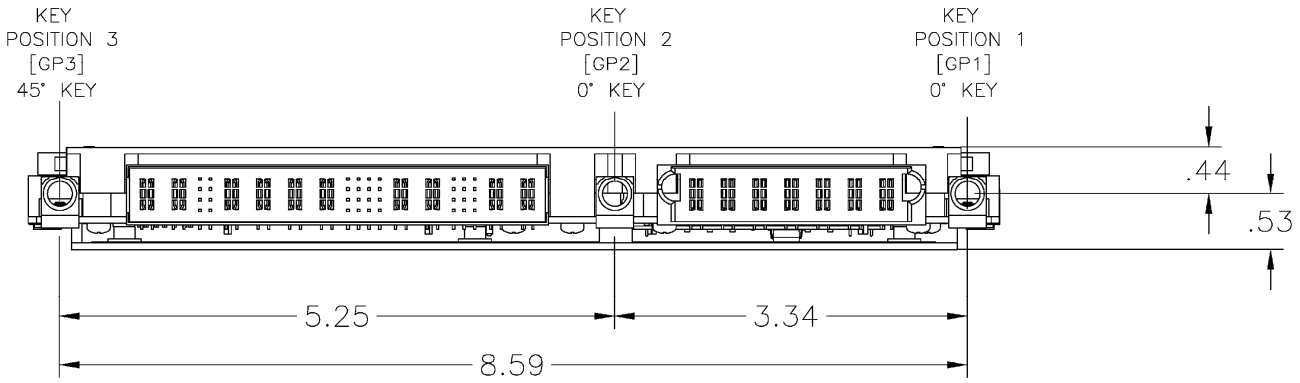

Figure 14: VPX*tra* 1000CD-IQ Power Supply, Connector View

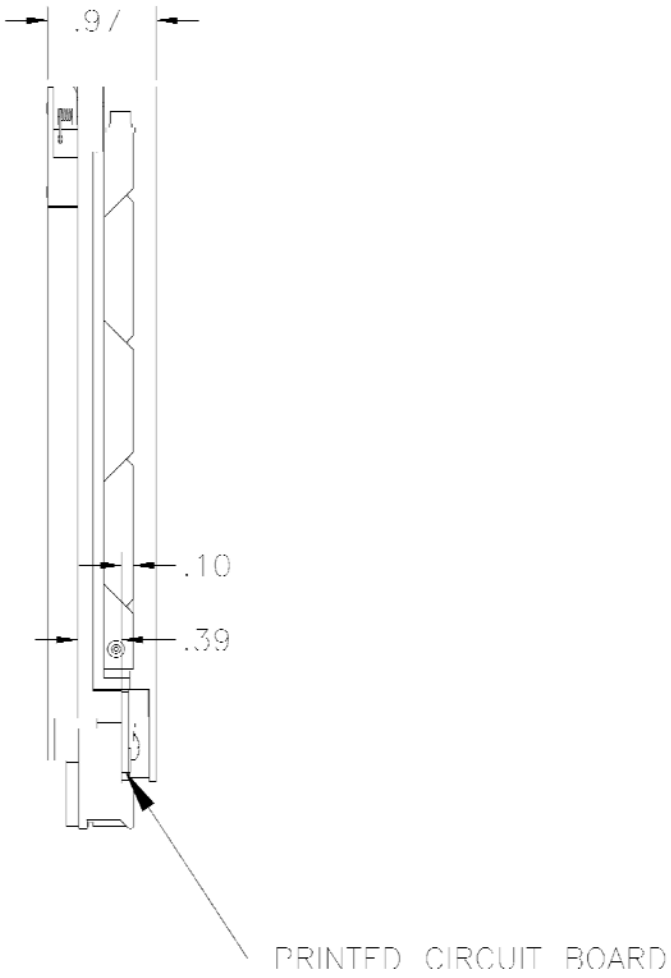

Figure 15: VPX*tra* 1000CD-IQ Power Supply, Side View

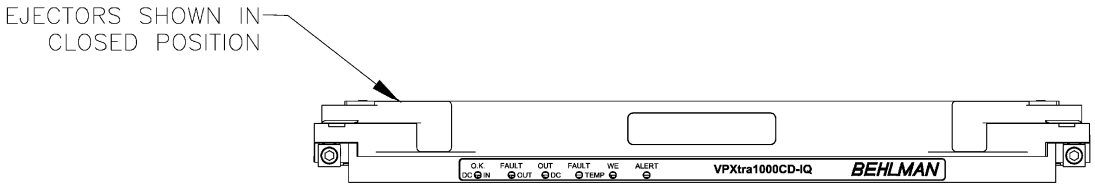

Figure 16: VPX*tra* 1000CD-IQ Power Supply, Face View

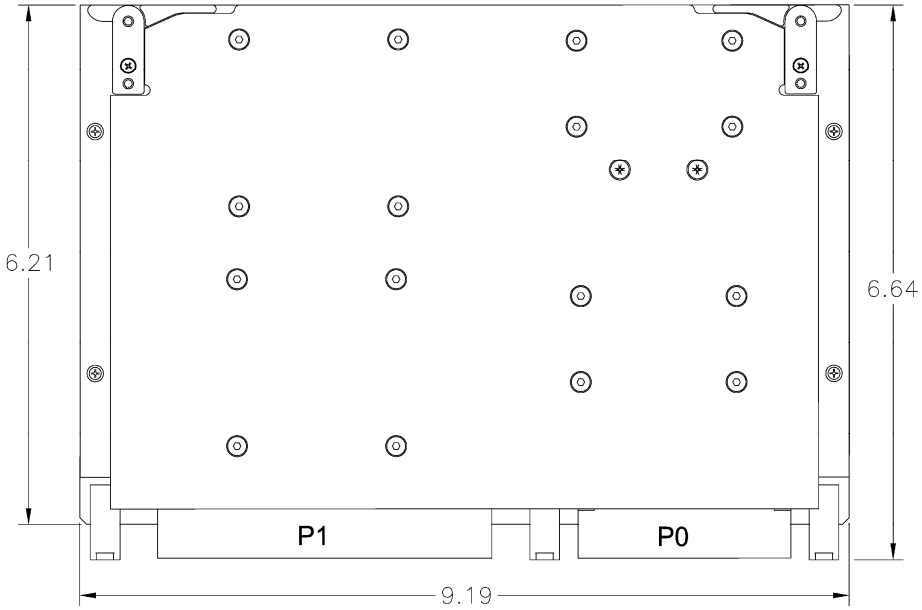

Figure 17: VPX*tra* 1000CD-IQ Power Supply, Top View

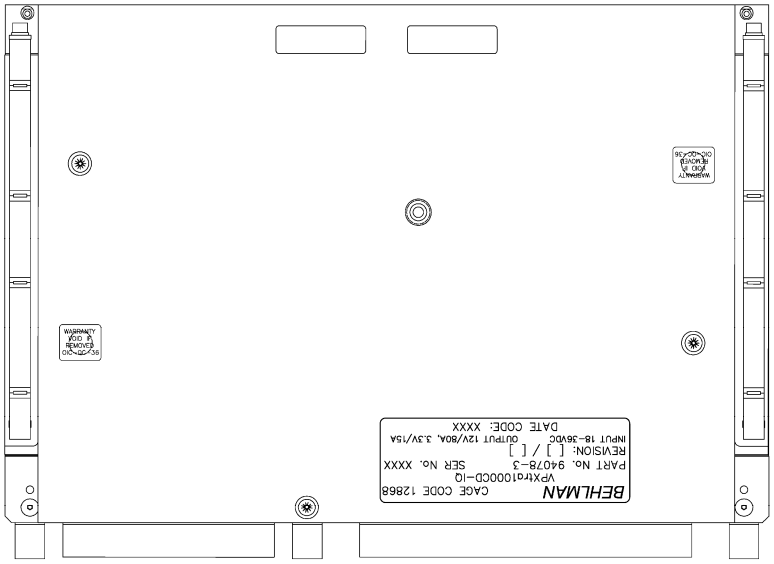

Figure 18: VPX*tra* 1000CD-IQ Power Supply, Bottom View