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Dawn VPX 3U Intelligent Extender Board



Document Number

59-1017471-01 Rev. A

Document Title

Product Information Sheet, VPX 3U Intelligent Extender

Assembly P/N

Board 11-1017332 (RT2 = Gen1 & 2)

11-1020829 (RT3 = PCIE Gen 1 through 4)

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Revision History			
Revision	Release Comments	ECO Number	Release Date
1	Preliminary Release	6877	02/01/12
A	ECO 7812. Per ECR# 1041 note# 6	7812	4/28/17

The Dawn IEB (Intelligent Extender Board) has features not normally found in conventional implementations. The Dawn product has two microcontrollers, FET switches for voltage switching, 12 channels of A/D for monitoring voltages, Hall-Effect current sensors on each voltage rail for current monitoring and overcurrent protection, and a RESET generator and a serial port RS-232/USB port. The IEB even calculates the total number of watts that the board is dissipating.

QUICK START:

The product can be used stand-alone right out of the box. In this case, simply plug the extender in to the backplane and plug the Unit Under Test (UUT) into the extender.

When you apply power to the backplane, the extender will quickly perform a self-test, load its default parameters and will turn on its BLUE LED.

The meanings of the LEDs are as follows:

BLUE – Power applied but voltages to UUT turned OFF.

GREEN – Power applied to UUT

RED – Fault condition (overcurrent or overvoltage).

If you have applied power and wish to shut OFF the UUT, press the pushbutton on the front of the extender. The LED will turn BLUE, indicating that the power to the UUT has been removed. Pressing the pushbutton one more time will again apply power to the UUT and the LED will turn GREEN. Note that only the power supply rails are switched by the extender's FET switches.

ADVANCED OPERATION:

If you wish to take advantage of the special features of the Dawn IEB, connect an ordinary RS-232 cable to the DB-9 connector on the bottom of the unit, and the other end to a PC running any ordinary terminal program (HYPERTERM, Bray's TERMINAL, Terra-term, etc). Set the serial port to 9600, N-8-1 and NO handshaking (sometimes called Flow Control).

For USB connection, note that the USB port will not be recognized until power is applied to the board. If using Windows, go into DEVICE MANAGER to determine which COM port is being used by the USB device. Choose the same port to use with your TERMINAL program.

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When you first apply power to the IEB, you should see the following:

Dawn VME Intelligent Extender board
DAWN VME Products, Fremont CA. 510-657-4444 www.dawnvme.com
CodeVer 64-1017471A(M)

Press 'S' at any time to enable scrolling display
<ESC> brings up change menu
Holding PWR button on power up resets to defaults

Autostart = Y

At this point, the board should be ON. You will notice the “Autostart = Y” in the display above. This is the default, but like virtually everything else on the board, can be changed by the user. “Autostart” means that the board will automatically start by applying power – no user intervention is required.

Pressing “S” at any time will toggle (Start or Stop) the continuous update of voltage and current readings.

Pressing <ESC> will allow you to view and/or change system settings - Voltage and current shutdown levels as well as power supply sequencing. You can also turn Autostart off.

The first screen shown is the currently-set thresholds, and the power-on sequence.

Pressing “C” at this point will allow you to change

Both HIGH and LOW voltage threshold settings can be changed. The HIGH thresholds are important, since exceeding any of the set voltages will cause the system to shut down (power will be removed from the UUT). The Low thresholds are for information only, and are reported only in the error bytes. Voltages lower than the set thresholds will not remove power from the UUT.

If you do not wish to change a threshold, simply press <ENTER>, and the currently-set value will be maintained.

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The CURRENT thresholds are the values – if exceeded, will shut down ALL power to the UUT. It is important that all voltages be shut down even if only one rail is in an over-current condition. Many processors will be damaged if some voltages are applied, but not others. A good example is if -12V is applied, and +12V is shut off (or has a blown fuse). In this case, it is likely that some internal circuit s that use both +12V and -12V will have components that are reverse-biased because they have only -12V applied. Similar situations can arise with other voltage rails.

The default voltage and current limits on the 3U extender are:

3.3V Main Lower Voltage Limit = 3.135
3.3V Main Upper Voltage Limit = 3.465
3.3V Main Current Limit = 22A

5V Main Lower Voltage Limit = 4.750
5V Main Upper Voltage Limit = 5.250
5V Main Current Limit = 22A

12V Main Lower Voltage Limit = 11.400
12V Main Upper Voltage Limit = 12.600
12V Main Current Limit = 22A

-12V Aux Lower Voltage Limit = 11.400
-12V Aux Upper Voltage Limit = 12.600
-12V Aux Current Limit = 1A

3.3V Aux Lower Voltage Limit = 3.135
3.3V Aux Upper Voltage Limit = 3.465
3.3V Aux Current Limit = 1A

12V Aux Lower Voltage Limit = 11.400
12V Aux Upper Voltage Limit = 12.600
12V Aux Current Limit = 1A

All can be changed by the user. **Note that ALL voltage limits are entered in millivolts and ALL current limits are entered in milliamperes. 12.0 volts should be entered as 12000 and 6.2A should be entered as 6200.**

Currents of up to 200% of the set values are tolerated for 250mSec after startup to handle inrush conditions.

If you decide (or your system doesn't use one of the 6 rails), you can select to ignore one or more voltages. Ignored voltages will not be tested – or turned on – BUT you must also adjust the sequence if you do not use all the voltages.

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The Power up Sequence can be changed as well. You will be asked for a time delay. The first delay is after "T0" (power button pushed or power applied).

Any value from 0 to 65000 milliseconds can be chosen.

After selecting a time delay, a menu will prompt you for the voltage. Choose a number corresponding to the voltage rail you want to start after the first time delay. Next, you will be asked for a second time delay. Not that this delay is AFTER the first delay (and after the first voltage rail has been started).

Continue entering delay times and voltages until you get to the DONE prompt. You are required to enter 6 voltage rails, but if you should decide not to enable one rail, simply enter one of the rails you DO want to enable twice. So, you can wait 10mSec, start +12V Main, wait 0 mSec, start +12V Main wait 10 mSec, start +12V Aux, wait 10 mSec, start +5V, wait 10 mSec, start +3.3V. You will note that -12V Aux is not in the list. In this case, it will not be started.

RESET GENERATION:

The Dawn IEB has an on-board open-collector RESET generator that will hold RESET for 200 mSec after the last voltage has stabilized. The RESET generator is also activated whenever the RESET button on the bottom of the extender is pressed, and whenever a RESET signal is present on the backplane.

Pressing the RESET button on the extender does NOT produce a backplane reset unless the jumper on the extender board labeled "RESET PASS THROUGH" is installed. In this case, all RESETs generated by the extender reset both the UUT and the backplane.

The MASKABLE RESET line from the backplane is passed through to the UUT.

FAULTS:

If an over-voltage or over-current condition forces a shutdown, the RED LED on the extender is lit. An error is generated and the UUT is shut down. It is necessary to shut down and re-establish backplane power to restart the system after such a fault.

The faults are indicated by one of two error bytes: OVErrorbyte and OCError byte. Each byte has a bit position indicating the fault that caused the shutdown.

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The interpretation is as follows:

OverVOLTAGE:

Bit 0 = +3.3 Main
Bit 1 = +3.3V Aux
Bit 2 = +5V Main
Bit 3 = +12V Main
Bit 4 = +12V Aux
Bit 5 = -12V Aux
Bit 6 = unused

OverCurrent:

Bit 0 = +3.3 Main
Bit 1 = +3.3V Aux
Bit 2 = +5V Main
Bit 3 = +12V Main
Bit 4 = +12V Aux
Bit 5 = unused
Bit 6 = -12V Aux

Bits are read RIGHT to LEFT. That is Bit "0" is on the right.

4 Versions are available:

3U air-cooled with RS-232 port
3U air-cooled with USB port
3U conduction-cooled with RS-232 port
3U conduction-cooled with USB port