ELMA BUSTRONIC



OpenVPX



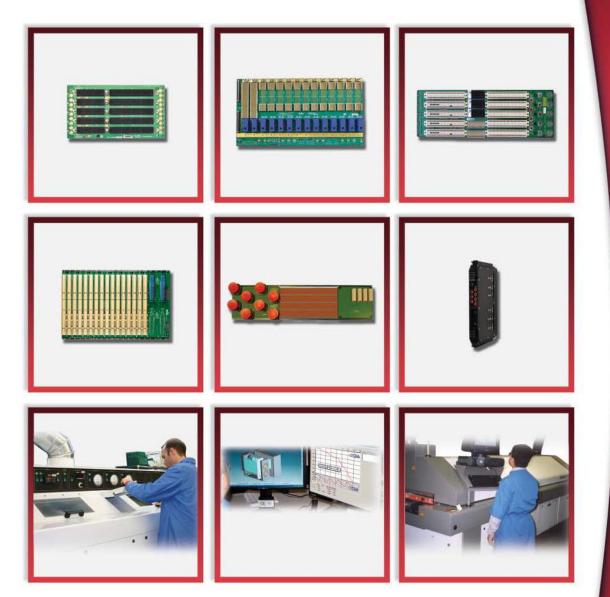
AdvancedTCA, MicroTCA

CompactPCI, 2.16

Custom Designs

System Accessories





High Performance Backplanes and System Accessories

ABOUT ELMA BUSTRONIC

Elma Bustronic is the industry expert in high-performance backplanes and related system accessories. Focused on backplanes, Elma Bustronic offers customers a unique level of design and manufacturing expertise, industry knowledge, and clarity of purpose not found elsewhere in the marketplace. The company is therefore on the leading edge of design innovations and new standardized backplane architecture development while forging key partnerships with other industry leaders.

Our standard product portfolio includes AdvancedTCA, CompactPCI/2.16, MicroTCA, OpenVPX, VME/64x, VXS, and more. Elma Bustronic also offers SFF (Small Form Factor), rigid-flex, and RTM designs, as well as various test/development accessories. Services offered by the company include contract assembly/build-to-print, simulation, testing, and custom design.

Elma Bustronic's design engineers are experts at developing custom backplanes to meet your specifications, from initial concept to volume production. These designs serve a wide array of industries, including aerospace, military, industrial automation, telecommunications, medical, and high-performance computers.

Since 2000, Elma Bustronic and European sister-company Elma TreNew have been leveraging each other's expertise and when appropriate, sharing resources. This combination offers one of the best teams in high-speed and high-complexity backplanes in the world. Elma Bustronic and Elma Electronic Inc. have their USA design and production headquarters conveniently side-by-side in Fremont CA. Elma offers system solutions from chassis platforms to fully integrated systems. Whether you prefer only a backplane or a turnkey chassis platform or an integrated system, we'll provide the level of service that suits your requirements.

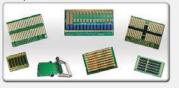
ELMA OFFERS

Elma Electronic offers also an extensive line of fully tested System Platforms (combining standard and/or custom mechanics, backplanes, power supplies and cooling), enclosures and chassis for 19" rack mount, cabinet enclosures/consoles and front panels, handles, switches, LEDs and knobs. Visit www.elma.com to get an overview of all of Elma's products.

ELMA PRODUCT DIVISIONS

System Solutions

Backplanes



Chassis Platforms, Embedded Products & Integrated Systems



Cabinets



Enclosures and Components

Enclosure Kits & Cases, Front Panels & Ejector Handles



Rotary Switches

Switches/Encoders, Knobs and LEDs



COMPANY PROFILE

INDUSTRIES

Communications Military and Aerospace Medical Transportation Scientific and Research Security Test and Measurement Industrial



WHY CHOOSE ELMA BUSTRONIC

- Vast experience in various open and custom architectures
- Renowned quality and design expertise
- State of the art assembly and testing equipment
- Local service, global reach
- In-house design, production, & testing
- Flexibility excellent service whether you buy one piece or one thousand

USA - Elma Bustronic Headquarters



USA - Elma Headquarters



USA - Lathrop



USA - Pennsylvania



Global Locations

Lawrenceville, GA USA - Optima EPS, An Elma Company Wetzikon, Switzerland - Elma Electronic AG Pforzheim, Germany - Elma Trenew Electronic GmbH Villemoirieu, France - Elma Electronic France SA

Shanghai, China - Elma Electronic China Sgula Petach Tikva, Israel - Elma Electronic Israel Ltd. Bedford, UK - Elma Electronic UK Ltd. Singapore, Asia Pacific - Elma Asia Pacific Pte. Ltd.

Elma Bustronic Company Profile

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ENGINEERING & CUSTOM DESIGN

Focused on backplanes, Elma Bustronic Corporation delivers high-performance products that are unsurpassed in design and quality. From custom designs to standard configurations, we provide the best in backplane technology serving the communications, military/aerospace, computer, instrumentation, industrial automation, and medical industries. Our expertise includes architectures in OpenVPX, AdvancedTCA, CompactPCI/2.16, MicroTCA, VME/64x, VPX, VXS and more. We also have extensive experience with custom and high-speed buses and fabrics. With speeds hitting 40Gbps per channel, Elma Bustronic has continued to expand our expertise in simulation, characterization, and model extraction.



Design and Engineering

The Elma Bustronic design and engineering team is often regarded as the best in the business. The Elma Bustronic team has constantly delivered innovative and intelligent solutions. The company has been the recognized leader in Switched Fabric designs, having developed the first PICMG 2.16 (Compact Packet Switching), PICMG 2.17 (StarFabric), VXS, AdvancedTCA and VPX backplanes on the market. Our leadership and expertise in the VITA and PICMG committees keeps us on the cutting edge of technology. With over 300 custom designs under our belt, Elma Bustronic can find a solution to almost any requirement you may have.



Design Center in Europe

Elma Bustronic's sister company, Elma Trenew is located in Germany, with several designers and engineers specializing in backplanes. Our European design and engineering staff are renowned for their experience in complex telecom backplanes with high layer counts, rigid-flex-rigid backplanes, active cards and backplanes, high-speed differential signals, switched fabrics, and hot swap solutions.

Custom Backplane Examples

Elma Bustronic is a global leader in customized backplanes with over 3,000 unique designs to date. Below are a few brief examples.



"Scientific" Backplane for Columbia University's 1024 Node SuperComputer for DOE





Rigid Flex

Telecom II

SIGNAL INTEGRITY STUDIES

Elma Bustronic Backplane Signal Integrity Initiative (SII)

With the advancement of newer multi-gigabit specifications (10GBASE-KR, 40GBASE-KR4, CEI-28G-VSR, etc), performing signal integrity analysis for backplane channels becomes not only recommendable, but mandatory. Pre-layout and post-layout simulations as well as actual lab measurements, followed by studies correlating the simulations with measurements should be in the toolkit of any designer working in the multi-gig channel realm. Backplanes present unique challenges with regard to embedding/de-embedding certain portions of a backplane channel and the accuracy in performing simulations and measurements to properly compare models to test results is crucial.

Elma Bustronic uses the following tools:

- Ansoft HFSS
- Ansoft DesignerSI
- HP 54750 TDR
- Specially designed probe cards
- Agilent N5230A 20 GHz VNA

Examples of possible measurement characteristics:

- Impedance for single ended and differential lines
- Cross-Talk
- Propagation Delay
- S-parameters
- Eye Diagram

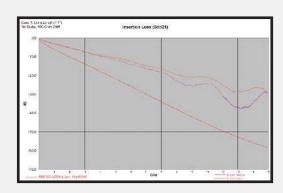


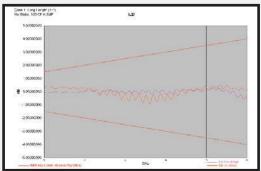
Above: Characterization of 14-slot ATCA backplane using Elma Bustronic's unique probe card.

Top Left: Insertion loss measurement Bottom Left: ILD measurement

Examples of possible simulation characteristics:

- Impedance
- Cross-Talk
- Propagation Delay
- Attenuation
- Insertion & Return Loss
- Eye Diagram





The S-parameter models come from extracted empirical models captured by VNA and software driven TDT measurement techniques as well as the synthesized output of specialized 3D field solvers. The result is more accurately characterized via structures, accurate channel models and a more precise representation of layout transition features and unavoidable stubs.

Measurement, model extraction, and simulation services Elma Bustronic offers services to characterize the interconnect path and provide models of representative circuit paths. These models can be used to generate reports that confirm the performance of these backplanes and also allow full system simulations to be performed that will help in the design process. Elma Bustronic can also provide the integration of measurement-derived models into the application engineering process. This includes the ability to easily generate eye-patterns based on the customer's specific requirements including such questions as signal degradation through backplane IO connectors and specific lengths of I/O cabling.

AUTOMATED ASSEMBLY EQUIPMENT ROADMAP



The following equipment will be part of Elma Bustronic's assembly line in early 2012:

Automated Optical Inspection

Optical inspection equipment for co-planarity testing of BGA and CSP devices and enhanced solder paste measurement capability. Has five camera desktop AOI system, 9.8 micron pixel resolution, marking system, and barcode reader.

Selective Soldering

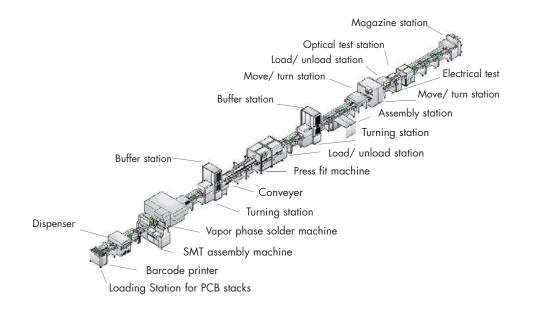
Precision solder for small boards and components. Programmable to set all process parameters, including immersion depths, pre-heat dwells, travel distances and speeds, solder temperature and wave height.

Laser Marking System

The laser marking system is fully programmable with servo controlled motion axis.

The Automated Assembly Line in Germany. For special projects, we are able to use our automated assembly line in Germany. Over 40 meters long, the line

For special projects, we are able to use our automated assembly line in Germany. Over 40 meters long, the line includes SMT assembly, vapor phase soldering, press fit capability, electrical, and optical testing. The facility is located in Pforzheim, Germany.



PRODUCTION CAPABILITIES

The Automated Assembly Line can support PCB sizes of up to 31.50" x 23.62" and thickness of up to 0.315". The SMT machines can assemble up to 10,000 components/hr with .03 mm precision. The Pressfit Assembly portion of the line has a cycle time of 3-5 seconds with 0.2 mm precision. Electrical and Optical testing can be performed including up to 21,620 electrical test points and a speed of 1000 measurements per second.

Automatic Assembly Line



Electrical Test



SMT Assembly



Optical Test



Pressfit Assembly



Vapor Phase Soldering



QUALITY & TESTING



Quality is a top priority at Elma Bustronic and we have been an ISO 9001 certified company since 1997, and are currently certified to the more stringent ISO9001-2008 standards. We are always searching for new ways to improve our already outstanding product quality.

Investing substantially in state-of-the-art testing technology allows Elma Bustronic to deliver the quality our customers have come to expect. Testing systems include driver hardware and test-point electronics in extremely high-density packaging, which enable full, simultaneous testing of dense, high pin-count connectors on backplane slots. The network connection allows engineers to download and upload test programs without disrupting backplane testing, making the process virtually seamless.

Sharing resources with our Elma team in Europe gives Elma Bustronic one of the most impressive combined measurement and testing capabilities you can find. Elma Bustronic and Elma TreNew have integrated our engineering resources, including use of modeling systems, testing equipment, mechanical drawing software, measurement devices, and more.

X-ray Inspection Machine (Scienscope)

The x-ray inspection system provides a way to ensure proper and consistent soldering. With the ability to see under the surface of the BGA or other soldered component, the unit ensures that we don't have any opens or shorts, have proper solder filling, etc. The X-scope features a wide inspection area with tilting x-ray tube and detector capability. It also has computer controlled kV and mA settings and variable speed X-Y stage. The benefit is high spatial contrast, maximum magnification at even extreme angles, higher inspection speed, and ability to detect subtle density/grayscale differences.



PRODUCTION CAPABILITIES

SMT Line

The Elma Bustronic SMT line is over 80' long and includes an in-line printer, a pick-and-place SMT assembly machine, re-flow soldering system, and a multi-solvent backplane cleaning machine. Our customers benefit with faster turnaround times, increased volume and board complexity capabilities, and higher precision quality.



SMT2220 In-Line Printer

The production line utilizes a SMT2220 In-Line printer for pick-and-place SMT assembly.



Samsung Advanced Component Placer

The Samsung Advanced Component Placer can place 21,000 Components Per Hour (CPH) utilizing the Dual Servo-Flying Vision System with Sliding Type Feeders. This machine can handle small components and BGAs and boards up to 20" x 24".



Thermal Processing Oven (Blue M)

The oven is used for pre-baking, drying, and curing. We pre-bake the backplanes and boards to get rid of moisture inside the PCB. This helps provide more reliable soldering and functionality. After washing the unit, boards can also be dried or cured in the processing oven. The Blue M oven features superior heat ramp up and recovery, thick insulation for uniformity, and consistent/efficient heating.



Vitronics Soltec Thermal Processing System

The Vitronics Soltec XPM thermal processing system produces outstanding levels of uniformity and repeatability in solder re-flow.



The Nu/Clean 318 Aqueous Cleaner

This Nu/Clean 318 Cleaner is a high-pressure DI-Water base cleaner. It has a prewash chamber with 32 high-pressure spray nozzles, the wash chamber has 64 highpressure spray nozzles, the rinse chamber has 80 high-pressure spray nozzles and the final rinse chamber has 12 high-pressure spray nozzles.



Rework Station (VJ Electronix)

This machine is used to rework BGA and other fine-pitch components to ensure proper functionality and placement. The rework station's thermal, optical, and software features provide high reliability and ease of use together with the capability to handle the large assemblies (18" x 22") and wide range of components.



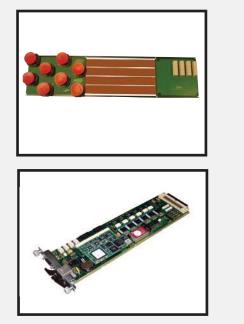
Carousel

A vertical carousel is an automated storage and retrieval device consisting of a series of carriers (pans) mounted on a vertical closed-loop oval track, inside a metal enclosure. When activated, the pans rotate to bring requested items to the operator. The result is significant time and space savings, and a more accurate, efficient process

CONTRACT ASSEMBLY

Elma Bustronic offers Contract Assembly services for various boards, adapters, monitors, and system accessories. From design services to boards assembly, Elma Bustronic can provide a solution for you.

Our assembly line includes a state-of-the-art Pick & Place machine which can support any components, from BGAs to items requiring the most accurate alignment. Details on our in-line printer, re-flow soldering system, and multi-solvent cleaner are available here http://www.elmabustronic.com/aassembly.htm. The company also has a wide range of test & simulation equipment.





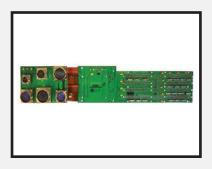


Rigid Flex Design

Elma Bustronic provides custom design and manufacturing solutions for rigid-flex backplanes. There are several special considerations for flex designs, including:

- Mechanical design ensure flex is not strained or damaged. Careful that the flex does not bend sharply. The layers can bow and distort the reference plane.
- Routing impedance changes from flex to rigid, etc. Consider signal integrity issues.
- Conformal coating process proper coverlay for the polyimide material and masking for coating of the rigid part of the board.
- Layer analysis optimize number of flex layers for maximum performance.





OpenVPX/VPX Backplanes









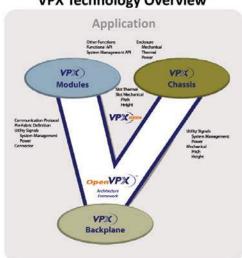
OpenVPX presents many design challenges and experienced teams like Elma Bustronic's are best suited to take them on. With 864 pins per slot carrying up to 192 differential pairs, there is an incredible amount of I/O to route through the backplane. Additionally, OpenVPX presently defines high-speed differential channels with bandwidths up to 6.25 Gbaud/s per lane. OpenVPX establishes specific requirements for slot, module and backplane profiles that standardize features and ensure system interoperability.

By preserving the VMEbus 6U mechanical form factor and through mapping of the current VMEbus signals to the MultiGig connectors, the OpenVPX technology brings several features to reality while maintaining ability to inter-operate with existing VME technology boards. VPX provides vastly increased high-speed serial I/O support for such needs as digital video, mass storage interconnects and FPGA interconnects. VPX also supports distributed switching that eliminates the need for dedicated switch card slots and allows for VITA 42 mezzanine sites with high speed I/O.

Elma Bustronic is the leader in VITA 46/65 VPX and OpenVPX products. Our experts developed the industry's first VPX backplane and proposed the first VME pinouts to the VITA 46 subcommittee. Since then, Elma has developed various VPX and OpenVPX configurations with and without legacy VME64x slots. VPX presents design challenges with higher layer-count backplanes, and more demanding power and cooling requirements. We tackle these problems with signal integrity analysis, thermal simulation and testing.

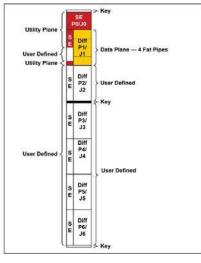
OpenVPX Background

OpenVPX is an effort by a joint group of companies to provide definitions for system interoperability. VPX is a highly flexible architecture, allowing a wide range of configurations and topology options. OpenVPX provides an easier way to ensure interoperability between VPX systems. The VPX Modules and Slots across the backplanes have been given definitions so that similar Modules will work within certain Slot configurations. The backplane Configurations have been defined to show the collection of Slot profiles it entails, including information on the data rate, routing topology, and fabric used. Now, the integrator can determine that a daughter card Module from "X" company can be used in the same backplane slot as "Y" company's, when both Module Profiles specify the same Slot Profile.





To explain OpenVPX, we'll use a 6U 5-slot Mesh OpenVPX backplane as an example. The diagram below shows the payload slot profile. It provides more information for the data plane section (in yellow), which in this case defines 4 fat pipe lanes. Also, the utility planes are clearly identified in red. Although this backplane does not have a control plane, if it had one, we'd also see this in the payload slot profile, along with the type of signal (thin pipes are commonly used for the control plane).



SLT6-PER-4F-10.3.1

The Slot Profile that is referenced in the two diagrams provide us some details on the card plugging into the slot. Going from the Slot profile number SLT6 says it's a 6U Slot profile (a 6U board), the PER says it's a Peripheral Slot, 4F means it has 4 fat pipes and the 10.3.1 is where you can find details on this slot profile in the VITA 65 specification. For OpenVPX, Fat Pipes have 4 links (4 Tx pairs + 4 Rx pairs), Thin Pipes have 2 links, and Ultra Thin pipes have one link. The wider channels like Fat Pipes are typically used in the data plane, while the control plane will often have the thin pipe or ultra thin-pipe signals. Slot types are comprised of Peripheral slots, Payload slots, Switch slots, or Bridge slots.

The Backplane Profile of the backplane also provides us more information. For example, this 6U 5-slot's profile is BKP6-DIS05-11.2.16-1. The BKP6 tells us it's a 6U backplane profile. DIS05 means it's a distributed (like a mesh or ring) architecture and has 5 slots. The 11.2.16 is the section of the specification where you can find details on this backplane profile. The "-1" tells us the Data rate is 3.125 Gbps (-2 means 5 Gbps and -3 means 6.250 Gbps)

The Backplane Profile Chart below shows the profile name, the pitch, the corresponding slot profile for the backplane, the control plane data rate (if applicable) and the data rate of the backplane.

Profile name	Mechanical		Slot Profiles and Section	Channel Gbaud Rate	
	Pitch (in)	RTM Conn	Payload	Control Plane	Data Plane
BKP6-DIS05- 11.2.16-1	1.0	VITA 46.10	SLT6-PER-4F -10.3.1	1.25	3.125
BKP6-DIS05- 11.2.16-2	1.0	VITA 46.10	SLT6-PER-4F -10.3.1	125	5.0
BKP6-DIS05- 11.2.16-3	1.0	VITA 46.10	SLT6-PER-4F -10.3.1	125	6.25

Backplane Profile Chart

The slot type (like DISO5) section of the profile name is an important part of the description. The main fabric topologies are CEN for Centralized, DIS for Distributed, and HYB for Hybrid. "Centralized" means it has a centralized switch slot and the routing could be similar to a Star topology. The DIS and CEN configurations typically have Payload and Switch slot types. The HYB defines a Backplane Profile that typically will include a Bridge slot (such as, SLT6-BRG-4F1V2T-10.5-1). The Bridge slot is designed to accept an OpenVPX format front card that will serve as the interface to slots supporting slots utilizing a different connector system to support other Eurocard embedded architectures such as VME, CompactPCI™, or even CompactPCI Express™. Although only 6U BRG Slot Profiles and 6U HYB Backplane Profiles are currently defined within ANSI-VITA 65. 3U HYB Backplane Profiles and 3U BRG Slot Profiles are possible.

VPX/OpenVPX Products Overview

OpenVPX Backplanes

Height	Slots	Topology	Description	Profile	Corresponding Slot Profiles	Part Numbers
3U	3	Centralized	3U VITA 65, 3-slot, centralized switch, channel Gbaud rate up to 6.25	BKP3-CEN03-15.2.9-3	SLT3-PAY- 2F-14.2.7 SLT3-PER-1F-14.3.2	10VX3031X6-1X11R 10VX3031X6-1X10R
3U	5	Distributed	3U VITA 65, 5-slot with VITA 67 RF connectors on 3-slots, channel Gbaud rate up to 3.125	BKP3-DIS05-15.3.2-1	SLT3-SWH-4F-14.4.4 SLT3-PAY-4F4R-14.6.2	10VX305DX1-1X11R 10VX305DX1-1X10R
3U	6	Distributed	3U VITA 65, 6-slot VPX twisted ring with Ethernet control plane, channel Gbaud rate up to 6.25	BKP3-DIS06-15.2.14-3	SLT3-PAY-2F2T-14.2.5 SLT3-SWH-16T-14.4.6	10VX306SX6-1X11R 10VX306SX6-1X10R
3U	6	Distributed	3U VITA 65, 6-slot VPX twisted ring, channel Gbaud rate up to 6.25	BKP3-DIS06-15.2.7-3	SLT3-PAY-2F2T-14.2.5 SLT3-SWH-16T-14.4.6	10VX306AX6-1X11R 10VX306AX6-1X10R
3U	6	Centralized	VPX central switch with expansion plane, channel Gbaud rate up to 3.125	BKP3-CEN06-15.2.2-1	SLT3-PAY-1F2F2U-14.2.2 SLT3-SWH-6F6U-14.4.1	10VX306UX1-1X11R 10VX306UX1-1X10R
3U	6	Centralized	VPX central switch, payload in Slot 1 connected to slot 2, channel Gbaud rate up to 6.25	BKP3-CEN06-15.2.12-3	SLT3-PAY-2F-14.2.7 SLT3-SWH-4F-14.4.4 SLT3-PER-1F-14.3.2	10VX306JX6-1X11R 10VX306JX6-1X10R
3U	9	Distributed	3U VITA 65, 9-slot VPX central switch with and without expansion plane, channel Gbaud rate up to 6.25	BKP3-CEN09-15.2.17-3	SLT3-PAY-3F2U-14.2.13 SLT3-PAY-1F2U-14.2.12 SLT3-PAY-1F2F2U-14.2.2 SLT3-SWH-6F8U-14.4.9	10VX309KX6-1X11R 10VX309KX6-1X10R 10VX309KY6-1X11R 10VX309KY6-1X10R
6U	5	Distributed	6U VITA 65, 5-slot mesh, 4 lane fat pipe, channel Gbaud rate up to 6.25	BKP6-DIS05-11.2.16-3	SLT6-PER-4F-10.3.1	10VX605MX6-1X01R 10VX605MX6-1X00R
6U	5	Centralized	6U VITA 65, 5-slot, centralized switch, channel Gbaud rate up to 3.125	BKP6-CEN05-11.2.5-1	SLT6-PAY-4F1Q2U2T-10.2.1 SLT6-SWH-16U20F-10.4.2	10VX605FX1-1X01R 10VX605FX1-1X00R
6U	6	Distributed	6U VITA 65, 6-slot mesh with switch, channel Gbaud rate up to 6.25	BKP6-DIS06-11.2.10-3	SLT6-PAY-4F2T-10.2.2 SLT6-SWH-4F24T-10.4.4	10VX606BX6-1X01R 10VX606BX6-1X00R
6U	7	Hybrid	6U VITA 65, 7-slot (5 VPX + 2 legacy VME64x)	BKP6-HYB07-11.2.20-1	SLT6-BRG-4F1V2T-10.5.1 SLT6-PAY-4F2T-10.2.2 SLT6-SWH-4F24T-10.4.4	10VX607EX1-1201R 10VX607EX1-1200R
6U	9	Centralized	VPX central switch, channel Gbaud rate up to 3.125	BKP6-CEN09-11.2.13-1	SLT6-PAY-8F-10.2.3 SLT6-PER-2F-10.3.2	10VX609VX1-1X01R 10VX609VX1-1X00R
6U	10	Centralized	VPX Dual Star central switches with expansion and control planes, channel Gbaud rate up to 6.25	BKP6-CEN10-11.2.6-3	SLT6-PAY-4F1Q2U2T-10.2.1 SLT6-SWH-16U20F-10.4.2	10VX610WX6-1X01R 10VX610WX6-1X00R
6U	16	Centralized	VPX Dual Star central switches with expansion and control planes, channel Gbaud rate up to 6.25	BKP6-CEN16-11.2.2-3	SLT6-PAY-4F1Q2U2T-10.2.1 SLT6-SWH-20U19F-10.4.1	10VX616GX6-1X01R 10VX616GX6-1X00R
6U	17	Hybrid	6U VITA 65, 17-slot (14 VPX + 3 legacy VME64x)	BKP6-HYB17-11.2.11-1	SLT6-BRG-4F1V2T- 10.5.1 SLT6-PAY-4F2T-10.2.2 SLT6-SWH-4F24T-10.4.4	10VX617NX1-1321R 10VX617NX1-1320R

OpenVPX Accessories Overview

VPX Backplanes

Height	Slots	Topology	Description	Part Number
3U	1	n/a	3U VPX, 1-slot power and ground	101VPX301P-1X31R
3U	5	n/a	3U VPX, 5-slot power and ground	101VPX305P-1X31R
3U	6	n/a	3U VPX, 6-slot power and ground	101VPX306P-1X31R
7U	1	n/a	7U VPX, 1-slot power and ground	101VPX701P-1X40R
7U	1	n/a	7U VPX, 1-slot power and ground w/VITA 67 RF	1900002558-0000
7U	4	n/a	7U VPX, 4-slot power and ground	101VPX704P-1X40R*

* Consult factory for ordering details

Accessories



3U VPX Test Extender: 119EXT3024-07XX



6U VPX Load Board, Conduction-Cooled: 1940000376-0000R



6U VPX Test Extender: 119EXT6024-05XX



6U VPX Load Board, Convection-Cooled: 1940000355-0000R



3U VPX Load Board, Conduction-Cooled: 1940000446-0000R



6U VPX RTM: 1940000352-0000R



3U VPX Load Board, Convection-Cooled: 1940000345-0000R



SerDes Test Device, 16 channel w/ 2 VPX cables: 1940000511-0000

OpenVPX Backplanes - 3U, 3-Slot



Features

- Compliant to ANSI/VITA 65-2010
- Compliant to the latest VITA 46 Specifications
- High-speed MultiGig connector
- Uses the rugged 3U-160 Eurocard form factor
- Centralized single star topology with one fat pipe to each slot
- Provides built in ESD ground protection in every slot

Mechanical Specifications

Height	Slots	Pitch
3U	3	1″
	0.7	

Multi-Gig RT-2 7-row connectors

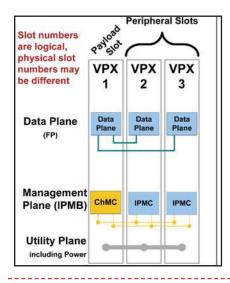
Board Specifications

Layers	2 oz. Copper Power & Ground	PCB FR-4 or Equivalent	PCB Thickness
14	Yes	Yes	.213″

The 3U, 3-slot OpenVPX backplane features one fat pipe routed to each slot in a single star topology. This leaves a wealth of User Defined pins in the P1 and P2 sections of the backplane.

See Signal Assignments and Backplane Profiles on page 25 and 34.

Backplane Topology



Height	Slots	Description	Profile Number	Order Number
3U	3	3U VITA 65, VPX central switch, up to 6.25 Gbaud channel data rate	BKP3-CEN03-15.2.9-3	10VX303QX6-1X11R
3U	3	3U VITA 65, VPX central switch, up to 6.25 Gbaud channel data rate, no RTM connectors	BKP3-CEN03-15.2.9-3	10VX303QX6-1X10R

OpenVPX Backplanes - 3U, 5-Slot



Features

- Compliant to ANSI/VITA 65-2010
- Compliant to the latest VITA 46 Specifications
- A 4-cavity RF connector installed in 3 slots of the lower half of the standard J2 connector. This corresponds to rows 9-16 of slots 3, 4 and 5
- High-speed MultiGig connector
- Uses the rugged 3U-160 Eurocard form factor
- Mesh routing topology with all four fat pipes connected across all slots
- Provides built in ESD ground protection in every slot

Mechanical Specifications

Height	Slots	Pitch		
3U	5	1.0″		
Multi Gia PT 2 7 row connectors				

Multi-Gig RT-2 7-row connectors

Board Specifications

Layers	2 oz. Copper Power & Ground	PCB FR-4 or Equivalent	PCB Thickness
14	Yes	Yes	.213″

The 3U, 5-slot OpenVPX backplane has 3 slots for VITA 67 RF connectors, which are passthrough only. Otherwise, the design incorporates a distributed mesh topology.

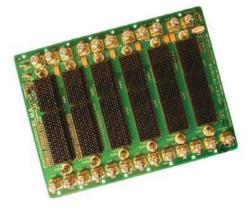
See Signal Assignments and Backplane Profiles on page 25 and 34.

Backplane Topology

	Payload slot				
Slot numbers are logical, physical slot numbers may be different	VPX 1	VPX 2	VPX 3	VPX 4	VPX 5
Expansion Plane VITA 67 (RF)			Esp	Esp	Exp
Data Plane (FP)		ŗ	E		
Management Plane (IPMB)	-	-	FWC	-	CANC
Utility Plane Includes Power				-	

Height	Slots	Description	Profile Number	Order Number
3U	5	Mesh with 3 VITA 67 RF connector interfaces	BKP3-DIS05-15.3.2-1	10VX305DX1-1X11R
3U	5	Mesh with 3 VITA 67 RF connector interfaces, no RTM connectors	BKP3-DIS05-15.3.2-1	10VX305DX1-1X10R

OpenVPX Backplanes - 3U, 6-Slot



Features

- Compliant to ANSI/VITA 65-2010
- Compliant to the latest VITA 46 Specifications
- High-speed MultiGig connector
- Uses the rugged 3U-160 Eurocard form factor
- Channels A and B are arranged as 2 fat pipes (x4) channels configured as a twisted ring extending from slots 1 to 5
- Provides built in ESD ground protection in every slot
- Versions with or without GigE Control Plane
- Version with slot 6 not connected to other slots for use with RTM

Mechanical Specifications

Height	Slots	Pitch
3U	6	1.0″

Multi-Gig RT-2 7-row connectors

Board Specifications

Layers	2 oz. Copper Power & Ground	PCB FR-4 or Equivalent	PCB Thickness
22 SX, AX & JX version 16 UX version	Yes	Yes	.212" SX, AX & JX version .173" UX version

Utilizing a twisted-ring topology versus a mesh topology allows for more I/O pins and ability to use mezzanines like XMC. A full mesh topology over 3U VPX would simply take up the vast majority of available pins. In the Elma Bustronic 3U VPX backplane (twisted ring versions), slot 6 has configurable thin pipe links for distributed Gigabit Ethernet to slot 1 through slot 5 and two fat pipes for rear I/O. In slots 1-5 any or all of the P1 thin pipes (x2 channels) assigned to the control channel star can be reconfigured as rear I/O by removing zero ohm SMT shunts. In slots 1-5 all P2 differential pairs are available on the rear side for I/O. In the "AX" part number version, slot 6 is not connected to the other slots, allowing undefined pins for an RTM slot. The only defined pins to the RTM are the 2x thin pipes for the control plane.

The VPX Gigabit Ethernet Control Plane adds a GigE switch, providing a separate star or dual star network for out-ofband communication. This can be particularly important for system management, software and firmware upgrades, and initiating new processes on specific boards.

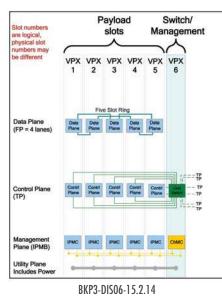
The Elma Bustronic design solution offers 3.125 to 6.250Gbauds/performance in in one PCB. This design provides maximum performance while saving you money. The central switch version of our 3U, 6-slot OpenVPX backplane features a fat pipe expansion plane, a fat pipe Star topology data plane, and an ultra thin pipe for the control plane. It is designed using Nelco-13SI PCB material.

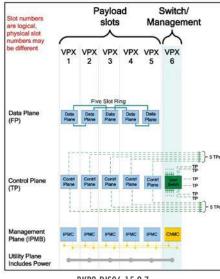
See Signal Assignments and Backplane Profiles on page 26-27 and 34-35.

Height	Slots	Description	Profile Number	Order Number
3U	6	VPX twisted ring with configurable Ethernet Control Plane, channel Gbaud rate up to 6.25	BKP3-DIS06-15.2.14-3	10VX306SX6-1X11R
3U	6	VPX twisted ring with configurable Ethernet Control Plane, channel Gbaud rate up to 6.25, no RTM connectors	BKP3-DIS06-15.2.14-3	10VX306SX6-1X10R
3U	6	VPX twisted ring, channel Gbaud rate up to 6.25	BKP3-DIS06-15.2.7-3	10VX306AX6-1X11R
3U	6	VPX twisted ring, channel Gbaud rate up to 6.25, no RTM connectors	BKP3-DIS06-15.2.7-3	10VX306AX6-1X10R
3U	6	VPX central switch with expansion plane	BKP3-CEN06-15.2.2-1	10VX306UX1-1X11R
3U	6	VPX central switch with expansion plane, no RTM connectors	BKP3-CEN06-15.2.2-1	10VX306UX1-1X10R
3U	6	VPX central switch, payload in Slot 1 connected to slot 2, channel Gbaud rate up to 6.25	BKP3-CEN06-15.2.12-3	10VX306JX6-1X11R
3U	6	VPX central switch, payload in Slot 1 connected to slot 2, channel Gbaud rate up to 6.25, no RTM connectors	BKP3-CEN06-15.2.12-3	10VX306JX6-1X10R

OpenVPX Backplanes - 3U, 6-Slot

Backplane Topology

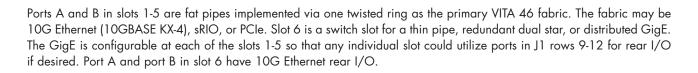


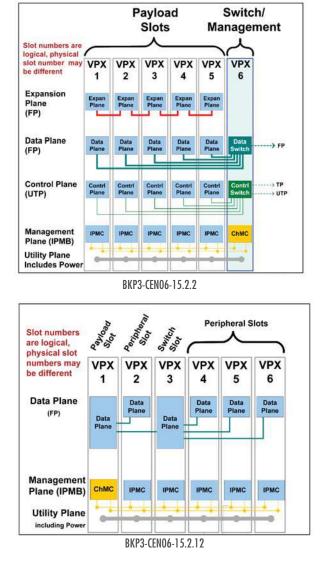




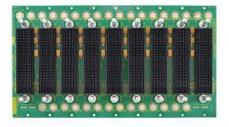
Port Mapping

		1 VPX Peyload	2 VPX Payload	3 VPX Peyload	4 VPX Peytoed	5 VPX Payload	UPX Switch	
	A 1			-		-	PortA	Fat Pi
	B						Port B	Fat Pi
	B S				-		Port 1 Port 2	
	0 1:		-				ePot 4	
T	A 1			Passan Passan	-		#Port 6	19 X 5
	8 5			1			Port I	(blpes
	c ,				1	1	Port 10	this
	D 13			-		-	Port 12	U.





OpenVPX Backplanes - 3U, 9-Slot



Features

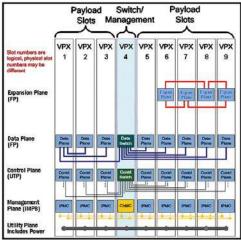
- Version with expansion plane compliant to VITA 65 specification. Version without expansion plane is VITA 65 compatible.
- Uses the rugged 3U-160 Eurocard form factor
- High-speed MultiGig connector
- Version with expansion plane in slots 5-8
- Provides built in ESD ground protection in every slot

Mechanical Sp	pecifications	Board Specificati	ons		
Height	Slots	Lavers	2 oz. Copper Power &	PCB FR-4 or	PCB
3U	9	24,013	Ground	Equivalent	Thickness
Multi-Gig RT-2 7-	row connectors	16 KX version 18 KY version	Yes	Yes	.213″

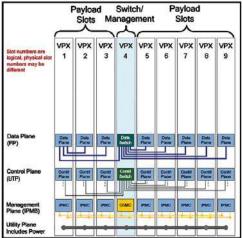
Elma Bustronic offers two versions of the BKP3-CEN09-15.2.17-n backplane: one with an expansion control plane and one without. Designed to VITA 65 design principles, the 9-slot OpenVPX backplane features a centralized routing topology. The switch slot is connected to slots 1, 5, 6, 7, 8, and 9. Slots 1-3 are also connected on the data plane. The version with the expansion plane have those signals going across slots 6-9. Contiguous groups of slots can have their maskable reset pin joined via jumpers within a provided backplane header.

See Signal Assignments and Backplane Profiles on page 27 and 35.





3U, 9-Slot without Expansion Plane Backplane Topology



Height	Slots	Description	Profile Number	Order Number
3U	9	VPX central switch with expansion plane, channel Gbaud rate up to 6.25	BKP3-CEN09-15.2-17-3	10VX309KX6-1X11R
3U	9	VPX central switch with expansion plane, channel Gbaud rate up to 6.25, no RTM connectors	BKP3-CEN09-15.2-17-3	10VX309KX6-1X10R
3U	9	VPX central switch without expansion plane, channel Gbaud rate up to 6.25	BKP3-CEN09-15.2-17-3	10VX309KY6-1X11R
3U	9	VPX central switch without expansion plane, no RTM connectors, channel Gbaud rate up to 6.25	BKP3-CEN09-15.2-17-3	10VX309KY6-1X10R

OpenVPX Backplanes - 6U, 5 and 6-Slot



5 & 6-Slot Mesh Backplane Features

- Compliant to ANSI/VITA 65-2010
- Compliant to the latest VITA 46 Specifications
- High-speed Multi-gig connector
- Rugged Eurocard form factor in 6U height
- Provides built in ESD ground protection in every slot
- Signal integrity analysis report available upon request
- Distributed and centralized topology versions available

Mechanical Specifications

Height	Slots	Pitch	
6U	5, 6	1.0″	
Multi Cia PT 2 7 row connectors			

Multi-Gig RT-2 7-row connectors

Board Specifications

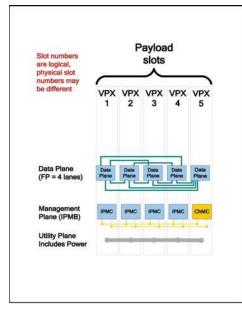
Slots	Layers	2 oz. Copper Power & Ground	PCB FR-4 or Equivalent	PCB Thickness
5	18	Yes	Yes	.212″
6	16	Yes	Yes	.212″

Elma Bustronic's 6U OpenVPX backplanes come in centralized and distributed topologies. The centralized version features a double fat pipe expansion plane and a dual star routing topology for the data plane. The distributed topologies offer 3.125 to 6.250 Gbauds/performance in one PCB. This design provides maximum performance while saving you money.

See Signal Assignments and Backplane Profiles on page 28-29 and 35-36.

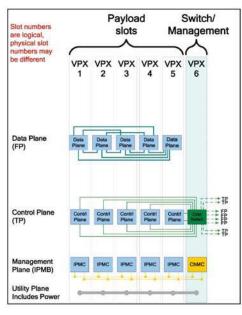
Height	Slots	Description	Profile Number	Order Number
6U	5	VPX central switch, channel Gbaud rate up to 3.125	BKP6-CEN05-11.2.5-1	10VX605FX1-1X01R
6U	5	VPX central switch, channel Gbaud rate up to 3.125, no RTM connectors	BKP6-CEN05-11.2.5-1	10VX605FX1-1X00R
6U	5	VPX mesh, 4 lane fat pipe, up to 6.25 Gbps per channel	BKP6-DIS05-11.2.16-3	10VX605MX6-1X01R
6U	5	VPX mesh, 4 lane fat pipe up to 6.25 Gbps per channel, no RTM connectors	BKP6-DIS05-11.2.16-3	10VX605MX6-1X00R
6U	6	VPX mesh data plane with switched control plane, up to 6.25 Gbaud channel data rate	BKP6-DIS06-11.2.10-3	10VX606BX6-1X01R
6U	6	VPX mesh data plane with switched control plane, up to 6.25 Gbaud channel data rate, no RTM connectors	BKP6-DIS06-11.2.10-3	10VX606BX6-1X00R

6U, 5-Slot Backplane Topology



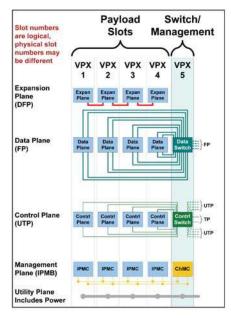
BKP6-DIS05-11.2.16

6U, 6-Slot Backplane Topology



BKP6-DIS06-11.2.10

6U, 5-Slot Backplane Topology



BKP6-CEN05-11.2.5

OpenVPX Backplanes - 6U, 9-Slot



Features

- Compliant to ANSI/VITA 65-2010
- Compliant to the latest VITA 46 Specifications
- High-speed Multi-gig connector
- Rugged Eurocard form factor in 6U height
- Provides built in ESD ground protection in every slot
- Signal integrity analysis report available upon request

Photo of 5-slot version shown

Mechanical Specifications

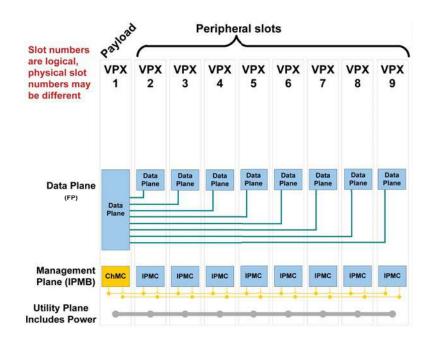
Height	Slots	Pitch
6U	9	1.0″
Multi-Gig R1	-2 7-row co	nnectors

Board Specifications

Slots	Layers	2 oz. Copper Power & Ground	PCB FR-4 or Equivalent	PCB Thickness
9	TBD	Yes	Yes	TBD

The Elma Bustronic BKP6-CEN09-11.2.13-1 6U OpenVPX backplane comes in a Star central slot topology with fat pipes routed to each slot.

See Signal Assignments and Backplane Profiles on page 30 and 36.



Height	Slots	Description	Profile Number	Order Number
6U	9	VPX central switch, channel Gbaud rate up to 3.125	BKP6-CEN09-11.2.13-1	10VX609VX1-1X01R
6U	9	VPX central switch, channel Gbaud rate up to 3.125, no RTM connectors	BKP6-CEN09-11.2.13-1	10VX609VX1-1X00R

OpenVPX Backplanes - 6U, 10-Slot



Photo of 5-slot version shown

Mechanical Specifications

Features

- Compliant to ANSI/VITA 65-2010
- Compliant to the latest VITA 46 Specifications
- Dual Star routing topology
- High-speed Multi-gig connector
- Rugged Eurocard form factor in 6U height
- Provides built in ESD ground protection in every slot
- Signal integrity analysis report available upon request

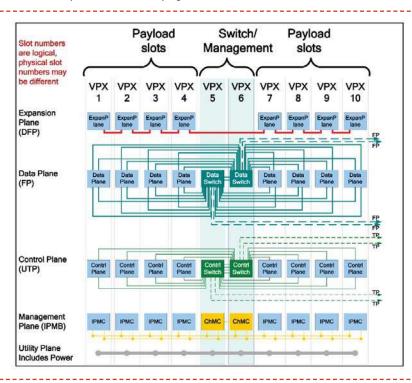
Board Specifications

Height 6U	Slots 10	Layers	2 oz. Copper Power & Ground	PCB FR-4 or Equivalent	F Thio
Nulti-Gig RT-2 7	row connectors	TBD	Yes	Yes	TE

The Elma Bustronic BKP6-CEN10-11.2.6-3 6U OpenVPX backplane comes in a Dual Star centralized routing topology with two switch slots with fat pipes to each slots. The control plane is also a Dual Star topology with ultra thin pipes to each slots. The expansion plane is a direct connection of all of the payload slots in a double fat pipe topology. The data plane has fat pipes available and the control plane has thin pipes that can be assessed from an RTM or via cables.

The backplane offers 3.125 to 6.250 Gbauds/performance in one PCB. This design provides maximum performance while saving you money.

See Signal Assignments and Backplane Profiles on page 31 and 36.



Height	Slots	Description	Profile Number	Order Number
6U	10	VPX Dual Star central switches with expansion and control planes, channel Gbaud rate up to 6.25	BKP6-CEN10-11.2.6-3	10VX610WX6-1X11R
6U	10	VPX Dual Star central switches with expansion and control planes, channel Gbaud rate up to 6.25, no RTM connectors	BKP6-CEN10-11.2.6-3	10VX610WX6-1X10R

OpenVPX Backplanes - 6U, 16-Slot



Features

- Compliant to ANSI/VITA 65-2010
- Compliant to the latest VITA 46 Specifications
- High-speed Multi-gig connector
- Rugged Eurocard form factor in 6U height
- Provides built in ESD ground protection in every slot
- Signal integrity analysis report available upon request

Photo of 5-slot version shown

Mechanical Specifications

Height	Slots	Pitch
6U	16	1.0″
Multi-Gig RT	-2 7-row co	nnectors

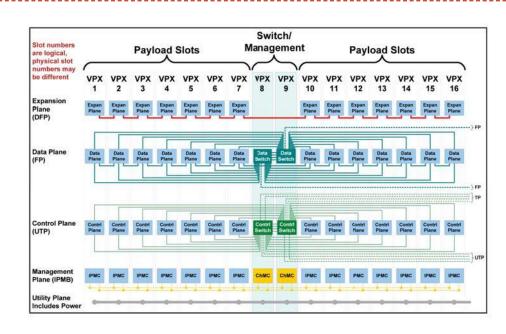
Board Specifications

Slots	Layers	2 oz. Copper Power & Ground	PCB FR-4 or Equivalent	PCB Thickness
16	28	Yes	Yes	.213″

The Elma Bustronic BKP6-CEN16-11.2.2-3 6U OpenVPX backplane comes in a Dual Star centralized routing topology with two switch slots with fat pipes to each slots. The control plane is also a Dual Star topology with ultra thin pipes to each slots. The expansion plane is a direct connection of all of the payload slots in a double fat pipe topology. The data plane has fat pipes available and the control plane has thin pipes and ultra thin pipes that can be assessed from an RTM or via cables.

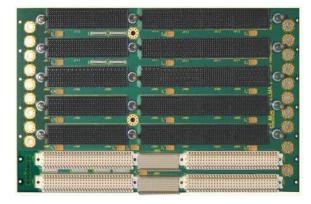
The backplane offers 3.125 to 6.250 Gbauds/performance in one PCB. This design provides maximum performance while saving you money.

See Signal Assignments and Backplane Profiles on page 32 and 37.



Height	Slots	Description	Profile Number	Order Number
6U	16	VPX Dual Star central switches with expansion and control planes, channel Gbaud rate up to 6.25	BKP6-CEN16-11.2.2-3	10VX616GX6-1X01R
6U	16	VPX Dual Star central switches with expansion and control planes, channel Gbaud rate up to 6.25, no RTM connectors	BKP6-CEN16-11.2.2-3	10VX616GX6-1X00R

OpenVPX Backplanes - 6U Hybrid



FEATURES

- Compliant to ANSI/VITA 65-2010
- Compliant to the latest VITA 46 Specifications
- Offers a highly flexible interconnect scheme that can support either differential or single ended connection
- Hybrid VPX backplane with legacy VME64x slots
- Rugged Eurocard form factor in 6U height
- Provides built in ESD ground protection in every slot

Mechanical Specifications

Height	Slots	Pitch
6U	7 slots (5 VPX, 2 VME64x)	1.0″
6U	17 slots (14 VPX, 3 VME64x)	1.0″

Multi-Gig RT-2 7-row connectors

Board Specifications

Slots	Layers	2 oz. Copper Power & Ground	PCB FR-4 or Equivalent	PCB Thickness
7	16	Yes	Yes	.213″
17	18	Yes	Yes	.213″

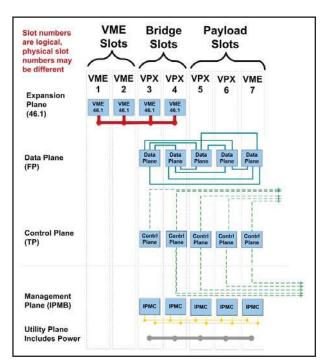
OpenVPX can be compatible with legacy systems in "hybrid" backplanes. The VMEbus signals can go across the MultiGig high-speed connectors to the legacy VME/64x slots.

The 7 slot (5 VPX slots + 2 legacy VME64x slots) has a slot pitch of 0.8" in slots 1 -2 and 1.0" for the 5 VPX slots 3-7. Slots 3-4 have VME bussing on the J2 connector per VITA 46.1 and slots 3-7 have a full mesh implemented on the J1 connector. VPX slots 3-7 conform to IEEE 1101.10 and VITA 46.0, 46.3 and 46.10 as well as 46.1 where specified to be fully meshed with four fabric channels – one channel from each slot to each of the other four slots. The flexible design offers a combination of VME/64x only, VPX w/VME bussed slots, meshed VPX slots, and VPX-only slots.

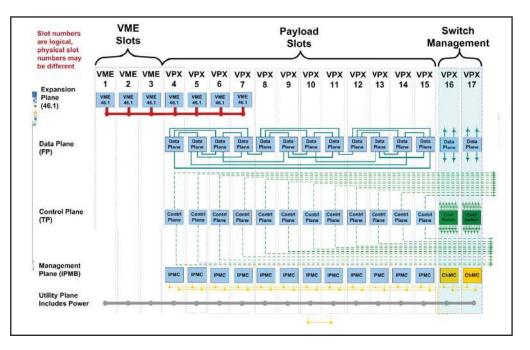
See Signal Assignments and Backplane Profiles on page 30 (7-slot), 33 (17-slot) and 36 (7-slot), 37 (17-slot).

Height	Slots	Description	Profile Number	Order Number
6U	7	5 VPX mesh slots with 2 legacy VME64x	BKP6-HYB07-11.2.20-1	10VX607EX1-1201R
6U	7	5 VPX mesh slots with 2 legacy VME64x, no RTM connectors	ВКР6-НҮВ07-11.2.20-1	10VX607EX1-1200R
6U	17	17 slots (14 VPX + 3 legacy VME64x) of 4 slots and 2 end VPX slots are configurable 3 VPX mesh clusters	BKP6-HYB17-11.2.11-1	10VX617NX1-1301R
6U	17	17 slots (14 VPX + 3 legacy VME64x) of 4 slots and 2 end VPX slots are configurable 3 VPX mesh clusters, no RTM connectors	BKP6-HYB17-11.2.11-1	10VX617NX1-1300R

6U, 7-Slot Backplane Topology



6U, 17-Slot Backplane Topology



VITA Based Backplanes

OpenVPX Backplanes Part Number Configurations

Order Information

1 o v x 🖸 🖸 🗖 🗖 🗖 🗖 🗖 🗖 🗖 🗖 🗖 🗖

Product Type

OVX = OpenVPX compatible

🔲 Height

3 = 3U 6 = 6U 7 = 7U

Slots

02-20

Slots

MX = BKP6-DIS05-11.2.16 SX = BKP3-DISO6-15.2.14DX = BKP3-DIS05-15.3.1NX = BKP6-HYB17-11.2.11 AX = BKP3-DISO6-15.2.7BX = BKP6-DISO6-11.2.10EX = BKP6-HYB07-11.2.20KX = BKP3-CEN09-15.2-17 KY = BKP3-CEN09-15.2-17 QX = BKP3-CEN03-15.2.9 FX = BKP6-CEN05-11.2.5 UX = BKP3-CEN06-15.2.2 GX = BKP6-CEN16-11.2.2JX = BKP3-DIS06-15.2.12VX = BKP6-CEN09-11.2.13 WX = BKP6-CEN10-11.2.6

🔲 Data Rate

- 1 = Data plane 3.125 Gbaud
- 2 = Data plane 5.0 Gbaud
- 3 = Data plane 6.25 Gbaud
- 4 = Data plane 10 Gbaud 5 = Not used, for future use
- 6 = Data plane up to 6.25 Gbaud (same cost-effective PCB used for
 - 3.125 to 6.25 versions)

Power Interface

1 = 8/32 threaded stud

🔲 Hybrid

- 1 = 1 VME64X slot
- 2 = 2 VME64X slot
- 3 = 3 VME64X slot
- 4 = 4 VME64X slot
- 5 = 5 VME64X slot
- 6 = 6 VME64X slot X = not applicable

🔲 Voltage

- 0 = 5V, 12V (6U ONLY) AND -12V AUX, +12V AUX, 3.3V AUX
- 1 = 3.3V, 5V, 12V (3U ONLY) AND -12V AUX, +12V AUX, 3.3V AUX
- 2 = 3U/6U power

Rear I/O

- 0 = No rear I/O connectors
- 1 = As required by VITA 65, refer to RTM connector configuration

RoHS

- R = RoHS compliant
- S = RoHS 5/6 compliant
- (Blank) = not RoHS compliant

3U, 3-Slot Signal Assignments

JO Signal Assignments

_	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row #
1	Val	Wat	Vat	Vat	No Pad	Vi2	VN2	942	Vs2
2	Val	Vat	Vat	Vol.	No Pad	Viz	VN3	VSP	Visit
5	Vid	95	Vel	V43	No Pad	890	W0	993	Vit2
4	90	5502	SMS	640	-52V_Aux	GND	SYSHESET	NVMIO	OND
5	910	GAP	GMP	Q1D	3.3V_Aux	GND	SMI	SMI	010
4	CHO	GA3"	CAP	Q1D	+12V_Aux	GND	GAP	GAB*	SHD
7	ток	GND.	GND	TDO	TOI	GHQ	GND	TMS	TIST'
	010	REF.CLK	REF_CLK+	010	GND	ALTR. CLK.	AUT CLKA	GhD	OND

J1 Peripheral Signal Assignments

Plug-		Row G	Row F		OW E	Row D	Row C		ow B	Row A
Modul				Even	Odd		_	Even	Odd	-
Bplan	e J1	Row i	Row h	Row g	Row f	Row e	Row d	Row c	Row b	Row a
1	24	GDiscrete1	GND	GND-JI	DP01-T0-	DP01-T0+	GND	GND-J1	DP01-R0-	DP01-R0+
2	Plano rt 1	GND.	DP01-T1-	DP01-T1+	GND-/H	GND	DP01-R1-	DP01-R1+	GND-JH	GND
3	Port Port	P1-VBAT	GND	GND-J1	DP01-T2-	DP01-T2+	GND	OND-J1	DP01-R2-	DP01-R2+
4	•	GND	DP01-T3-	DP01-T3+	GND-/1	GND	DP01-R3-	DP01-R3+	GNOLH	GND
5		SYS_CON"	GND	CAND-JH	UD	UD	GND	DND-J9	UD	UD
6		GND	UD	UD	GND-21	GND	UD	UD	GND-J1	GND
7		Reserved	GND	GND-J1	UD	UD	GND	GND-J1	UD	UD
8		GND	UD	UD	GND-J1	GND	UD	UD	GND-J1	GND
9		UD	GND	GND-J1	UD	UD	GND	GND-J1	UD	UD
10	Sefine	GND	UD	UD	GND-/1	GND	UD	UD	GND-J1	GND
11	Jaer de	UD	GND	GND-J1	UD	UD	GND	GND-J1	uo	UD
12	3	GND	UD	UD	GND-/1	GND	UD	UD	GND-J1	GND
13		UD	GND	GND-J1	UD	UD	GND	GND-J#	UD	UD
14		GND	UD	UD	GND-/1	GND	UD	UD	GND-J1	GND
15		Maskable Reset*	GND	GND-H	UD	UD	GND	GND-J1	UD	UD
16		GND	UD	UD	GND-/1	GND	UD	UD	GND-JH	GND

3U, 5-Slot Signal Assignments

JO Signal Assignments

_	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row #
а.	Val	Vet	Vat	Vat	No Pad	Via C	Vi2	942	Vs2
2	Val.	Vat	Vat	991	No Pad	V92	Via City	VSP	VeJ
3	Ve3	915	Vet	Val	tto Pad	890	wa .	343	NH3
4	00	5502	SMG	GND	-529_Aux	OND	SYSHESET	NVMIO	OND
5	910	GAP	GMP	010	1.3V_Aux	GND	SMI	SMI	010
8	OND	GAY	CAP	010	+12V_Aux	OND	GA1*	GAN	SHD
7	TOK	GND	GND	TDO	TDI	GHD	OND	TMS	TIST:
	CHE	REF.CLK	REF CLK+	040	GND	ALTR. CLK	AUX CLKA	GND	OND

J1 Payload Signal Assignments

Plug-l Modu		Row G	Row F	Ri Even	Odd	Row D	Row C	R Even	Cdd	Row A
Bplan	e J1	Rowi	Row h	Rowg	Row f	Rowe	Row d	Rowe	Rowb	Row
1		GDiscrete1	GND	560-11	DP01-T0-	0P01-T0+	CND	GNOW	DP01-R0-	0001-00
2	1:	GND	DPOS-T1-	DP01-T1+	5960-39	OND	DP01-R1-	DP01-R1+	-GMD-JP	GND
3	Port Port	PT-VEAT	GND	DWD-UT	DP01-T3-	DP01-T2+	OND	ONDA/T	DP01-R2-	DP01-R2
4	•	SN0	DP01-T3-	OP01-T3+	DINELUS	GND	DP01-R3-	DP01-R3+	ONELUT	GND
5		SAR CON.	GND	040-01	DP02-T0-	DP02-T0+	GND	GNELVE	CP02-R0-	DP02-R0
8	30	GND	DP02-T1-	DP02-T1+	Chibut	GND	DP02-R1+	DP02-R1+	CNENT	GND
7	Port	Reserved	GND	040-01	DP02-T2-	DP02-12+	GND	610-21	DP02-R2-	DP02-R2
8	0	GND	DP02-T3-	0P02-T3+	06047	GND	OP03-R3-	EP02-R3+	ONENT	GND
9		UD	GND	\$40-21	UD	UD	GND	650-37	UD	UD
10		0N0	UD	UD	360.01	GND	UD	UD .	GND-JT	GND
11	1.20	uo	GND	940.01	up	UD	GND	610.21	UD	UD
12	14	GND .	UD	UD	DND JF	GND	UD	up	GNO J1	GND
13		UD	GND	946-J1	UD	UD	GND	6580.27	UD	UD
14	3	GND	UD	UD	540.07	GND	UD	UD .	-6NO.//	GND
15	t i	Maskable Reset	GND	\$40.0	up.	UD	GND	040-31	UD	UD
16		GND	UD	UD	040-35	GND	UD	UD	CNELY	GND

11	Siana	Assin	Inments

Plug-l		Row G	Row f		DW E	Row D	Row C		ow 0	Row
Modu	e P1			Even	Odd	_		Even	Odd	
Bolan	a J1	Row i	Row h	Rowg	Row 1	Rown	Row d	Rowc	Rowb	Row a
1		GDIscrete1	GND	SHO-V	DF01-T0-	0P01-T0+	GND	010-11	OPD1-R0-	DP01-RD
2	1:	GND	DP01-T1-	DP01-T1+	GND-37	GND	DP01-R1-	0P01-R1+	BND-H	GND
3	22	PT-VBAT	GND	CHO-M	DEN1-12-	0901-724	QND	940-11	DP01-R2-	0991482
4	•	GND	DP01-T2-	DP01-T3+	6ND-11	GND	DP01-R3-	0P01-R34	DAD-JY	GND
5		SYS_CON*	GND	TLONG I	DP02-10-	DP02-10+	GND	940.0	DP02-R9-	CP02-R0
6	34	GND	OP02-T1-	DP02-T1+	GND-J1	GND	DP02-R1-	0P02-R1+	910-31	GND
7	1	Reserved	GND	OHD-J1	DF02-72-	DP02-T2+	GND	015-11	DP02-R2-	DP02-R2-
8	•	6%0	DP92-73-	0P02-T3+	GND-07	GND	DP02-R3-	0P02-R3+	DMD-21	GND
9		UD	GND	SHOUL	DP03.TD.	DP03.T0+	GND.	dati.u	0P03.90	DP03.RD
10	12	690	OP\$9-11+	0903-11+	GND-JI7	SND	DF93-RT-	OP03HR1+	BAID-21	9ND
11	Port Port	UD	GND	CHENNE	DF03-72-	DP03-T2+	GND.	CND-st	DP03-R2-	DP03-82
12	•	0/10	OP65-T3-	DP03-T3+	GipD_st	OND	DP03-R3-	0P03-R3+	1940-21	CN0
13	1.0	VO	GND	SHOVY	DP0H-TD-	0P04-T0+	GND	910-11	DPD4-RD-	DP04-RD
14	-	GND	DP04-71-	DP04-T1+	GND-JH	GND	DPOLR1-	OP04-R1+	DABLH	GND
16	Port P	Mashabie Reset*	GND	HOME	DP04-T2-	DP64.T2+	GND	GMELIN	0P04.R2	CPOL R2
16		GND	DP04-T3-	DP04-T3+	GND-J?	GND	DP64-R3-	0P04R3+	\$40.7	GND

J2/P2 Signal Assignments* (Slots 1-2)

Plug		Mod -P6		Row G	Row F	Re	W E Odd	Row D	Rew C	Even	low B	Row A
Back	plan	te J2	-,16	Rowi	Row h	Row g	Rowf	Row e	Row d	Row c	Rowb	Row a
1		200	1	SEwafer1	040	040-17	LINI-TD-	LN0-TD+	GND	GMD-17	LNR-RD-	LN0-RD+
2			0.0	GND	LNI-TD-	UNI-TD+	840.7	GND	LIN-RD-	LNH-RD+	BMENJIT	GND
3		-	ukin.	SEwater.)	GND	010-17	UIZ-TD.	LN2-TD+	GND	31-348	UD RD.	LNQ.RD+
4		110	1	(IND	LHO-TD-	LN0-10+	GND-JZ	GND	LND-RD-	LNG-RD+	sheva.	GND
5	5	-		SEwafer5	GND	040-12	LN4-TD-	LN4 TD+	GND	GHD-12	UN4-RD	UNA-RD+
6		1	100	GND	LNS-TD-	LNS-TD+	9×0-0	GND	LIS-RD-	LNS-RD+	BMD-27	GND
1	5		a kin	SEwafer7	- SND -	000-0	LH6-TD.	LN6-TD+	GAD	6MD-42	UH-RD	LNERD+
8	10			GND	LNT-TD-	LNT-TD+	GMEN./2	GND	LNP-ND-	LNT-SID+	BAE\./2	GND
.9	1	51	land to	SEwater9	910	010-32	LNS-TD-	LNB.TD+	GND	040-20	LINARD	UNILRD+
10	X			GND .	LNO-TD-	LNS-TD+	540.4	GND	LNB-RD-	LN9-RD+	8ND-12	GND
8	1	4	1	SEwaler11	GND	990-17	LINIS-TD-	LNIO-TD+	GAD	BMD-J2	LNID-RD-	LINIO-RD
12		at a	×.	GND	UNIT-TD.	LN11-TD+	GND-JI	GND	LIN1 SD.	LN11-RD+	GAE-J2	GND
13		and a	5	SEwafer13	GND .	990-12	LN12-TD-	LN12-TD+	GND	(140-12	LN12-RD-	LNH2-RD-
14		1	11	GND	LNH3-TD-	UNIS-TD+	GND-JJ	6N0	LIND RD.	UND-RD+	040-11	GND
15			1	SEwater15	GND	010-17	LN14-TD-	LNI4-TD+	GND	GMD-22	LNN4-RD-	1/814-810
16			1	GND.	UNIS-TD-	UNIS-TD+	and-ut	GND	UHERD.	LNHS-RD+	0x0-d	SND

* Any signal pins pass through the rear

J2/P2 Signal Assignments (Slots 3-5)

Plug inModule P2-P6		Row G	Row F	Ro	W E Odd	Row D	Row C	Even	Row B	Row A
Backpla	ne J2-J6	Rowi	Row h	Row g	Rowf	Row e	Row d	Rowe	Row b	Row :
1	10	SEwaters	GND	GMD-12	LNIS-TD-	LNO-TD+	GND	910-12	LN0-RD-	LNO-RD+
2	13.6	GND	LINI-TD-	LN1-TD-	GND-JL	GND	LIII-RD-	LN1-RD+	6/10-12	GND
3	In In	SEwater3	GND	GMD-J2	LH2-TD-	LII2-TD+	GND	6NC-,12	LN2-RD-	LIN2-RD+
4	lo:10 kx	GND	LUIS-TD-	LND-TD+	010-77	GND	LHO-RD-	LND-RD+	0/ID-/7	GND
5	tein te	SEwater5	GND	GWD-JQ	LN4-TD-	LNA-TD+	GND	940-12	LN4-RD-	LINA RD+
6	T L	GND	LHS-TD-	LN5-TD+	GND-JI	GND	LNS-RD-	LN5-RD+	8/10-12	GND
7	Late	SEwater?	GND	BMD-J2	LN6-TD-	LNR-TD+	GND	GND-22	LN8-RD-	LNH-RD+
8	1	GND	LN7-TD-	LN7-TD+	GND-J2	GND	LN7-RD-	LN7-80+	GND-J2	GND

3U, 6-Slot Signal Assignments (BKP3-DIS06-15-2.14, BKP3-DIS06-15.2.7)

JO Signal Assignments

	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
\mathbf{x}	Val	Vet	Vat	Vat	No Pad	Vi2	VA2	W12	Vs2
2	Val.	Vat	Vat	991	No Past	VN2	VN2	VS2	VeJ
3	Ve3	915	Vet	Val	No Pad	890	W0	343	No.
4	00	5502	SM3	GND	-52V_Aux	OND	SYSHESET	NVMIO	OND
5	910	GAP	GMP	010	3.3V_Aux	GHD	SMI	SMI	GND
	OND	GAY	CAP	010	+129_Aux	GND	GA1*	GAP	SHD
7	TOK	GND	GND	TDO	TOI	GHD	OND	TMS	TRST!
	010	BEF CLK	REF CLK+	GND	GND	ALC: CON.	AUT CLK.	GND	OND

J1 Switch Signal Assignments

Plug- Mode	in Ar P1	Row G	Row F	R) Even	Odd Odd	Rew D	Row C	R	W 8 Odd	Row
Bachel		- Real	17 March	Area	Burt	Contrast 100	Butt	Bees		Res a
1		ODiscrete1	GND	ENEN/F	CP01-T0-	CP01-TE+	OND.	940-1	CP01.85-	GPUL RO
2	18:	GND	CP91.T1-	CPD1.T1+	040-31	0N0	CPOLAT.	CPUL R1+	680-21	GND
3	12	PLYBAT	OND	SNOUT	CP91-T2-	CP01-T2+	GND	UND-J1	C#01-#2-	CPS1-RD
4	8	GND	CP91-T3-	CPD1.f3+	040-21	040	CPOLAD.	CPU1.82+	010-11	GND
5	,	SYS_CON	GND	END-UT	CPO2-TO-	CP02-78+	GND	940-21	CPOJ AS-	CPS2-HD
	10	OND .	CP02.11-	CP02.T1+	DADUR.	GND .	CP02.81	CP02-R1+	040-/1	GND
.7	125	Reserved	GND	IND-H	CP01-T2-	CP10-T2+	UND.	040-21	CP02.82-	CP92-H2
8	3	GAD .	CPO2-TS-	CP02-13+	010-01	OND.	CP02-83-	CP02-83+	040.4	OND.
		ψD	GND	END-J1	CPurget- TD-	CPMMR1- TD+	GND	(DD)	CPutyd1- RD-	CPuter1 RD+
10	8.6	OND	CPurpED- TD-	CPublic TD+	840.3	040	CPunyez-	CPutp03- RD+	00.0	OND.
11	2.0	VO	GND	END./I	CPurpit3- TD-	CPstp83- TD+	OND.	UNDUY -	CPutp85-	CPutpil5 TD=
12	122	GND	CPutpd4 TD-	CPutpot- TD+	OAG-JH	GND	CPutpd4	CPutpol- RD+	ONS-IT	580
13	15	90	GND	END-/1	CPurpl8- TD	CPutp85- TD+	OND	1LOND-1	CPutpl8- TD-	CPutp05 TD+
14	0	GND	CPurp06- TD-	CPUID08- TD+	0.00	GND	CPyly06- RD	CPstp84- RD+	010-7	GND
15		Mahmable Reset*	GND	IRD-J1	CPuryon. 10-	CPutp07- TD+	GND	- INDUH	CPulpET-	CPutyo? TO+
16		040	CPusp06-	CPutude- TD+	100.7	040	CPulyde-	CPuty08- RD+	GND-VT	GND

J2/P2 Switch Signal Assignments (Slot 6)

Plug-in		Row G	Row F		ow E	Row D	Row C		ow B	Row A
Module	P2	LO CARLES	and the second	Even	Odd	1.000	- second	Even	Odd	11000
activation of	2	Revis.	Ren 1	Barry	A DECEMBER OF	Reya	Res II	New Y	Pine to	. Barn a
1		uo	GND	540-77	CPurplet- TD-	CPuques- TD+	IGNO -	UND-JP	CPutp01- MD	CPUI/de RD+
2		GND	CPuturto- TD-	CPulp10- TD+	SMD-JI	GND	CPUALSS- ND-	CPutp16- IED+	GND-IF	GND
3	1	UD .	GND	2963-62	CPUIp11- TD-	CPstp11- TD+	OND	SNI-JE	Chuyth-	CPutett- RD+
	1	(2HD	CPN(#13- 10-	CPutp13- TD+	11-040	OND	CPutp12- RD-	CPuqu12- RD+	040-2	GND
5	- 8	vo	GND	040.07	CPulp13- TD-	CPutp13- TD+	GND	940-9	CPutp13- RD-	CPutp13 RD+
4	. [GND	CPutute- TD-	CPutp14- TD+	ULCAR	GND	CPutp14- RD-	CPutp14- RD+	040-7	OHD
7	1.1	UD .	GND	010-17	CPutp15- TD-	CPutp15- TD+	GND	0.040	CPublis. RD	CPublis RD+
	2	GND	CPutpts- TD-	CPutp14- 10+	(LIAG)	GND	CPutpita- ND-	CPulp18- RO+	GAD./7	GND
	2	00	GND	\$965.22	CPMp17- TD-	CPutp17- TD+	GND	RND-J2	Chulutz- RD-	CPulp17- RD+
10	1	OND	CPutp18- 10-	CPutp18- TD+	100-17	GND	CPMpN8- RD-	CPutp18- ND+	940-jr	040
11	ំា	up	GND	\$1.640	CPUp18- TD-	CPulp19- TD+	Q4D	UND.0	Chuly (S- 30)	CPulp15- RD+
12		OND	CPurp20- TD	CPusp30- TD+	(INCUT	GND	CPutp28- RD-	CPurp26 ND+	040-3	GND
13		UD	GND	sub-st	CPulp25- TD-	CPutp21- TD+	GND	UND-JT	CPuts21- HD-	CPUADES-
14	1	GNC	CPugal- TD-	CPutp22- TD+	tL049	GND	CPv4p22- RD-	CPyrip13- RD+	ako.it	040
15		up	GND	PND-12	CPurp23- TO-	CPutp23- TD+	GND	BND-JP	CPulp23- RD-	CPutp35 RD+
10		GND.	CPuts24- 7D-	CPutp34- 10+	0.000	GND	CPutp24- ND-	CPulp34- RD+	0.000	OND

3U, 6-Slot Signal Assignments (BKP3-CEN06-15.2.12)

JO Signal Assignments

_	Row I	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	Val	Wet	Vat	Vat	No Pad	Via I	Va2	V12	Vs2
2	Val	Vat	Vat	Vst.	No Pad	VN2	Via .	W4	Vel
5	Ve2	945	Vet	Ve2	No Past	890	Vi3	993	Ve3
¢.	90	5902	SMG	GND	-12V_Aux	OND	SYSNESET	NVMID	OND
5	910	GAP-	GM	GND	3.3V_Aux	GHD	SMI	SMI	OND
	CHO-	GAY	GAP	010	+12V_Aux	040	GA1*	GAP	SHD
,	TOK	GND	GND	TDO	TDI	GHD	OND	TMS	TRST!
	010	REF.CLK	REF_CLK+	040	GND	ALTR. CLK	AUX CLKA	GND	GND

J1/P1 Switch Signal Assignments

Flag- Modu		Row G	Row F	R	odd 0	Row D	Row C	Even	ow B Cost	Row A
Bplan	a J1	Rowi	Rowh	Rows	Rowf	Rowa	Rowd	Rowe	Rewb	Row a
1		GDistrated	GND	685-7	CP91-TB-	0P01-T0+	040	(1046	EP01-R0-	OPO1-RD-
2	1:	GNO	DP81-11-	DP01-T1+	1005-21	00	EP121-81-	DP01-R1+	inth-IT	GND
3	122	PEVBAT	CN0	640-/Y	OP01-72	DP01.72+	DND .	6265-21	EP01.82-	DPC1.82-
4	a	GND.	CPO1-T1-	DP01.73+	GNDG/	(MD)	EP01-83-	DP01.R3+	10004	- GND
5		BYS CON"	GND	EAD.A	DP92-78-	DP03.T0+	GND	CREW	EP02-86-	DP02.RD
	10	GND .	0002-11	DP03-T1+	GND-UT	GND	CP12-R1-	DP03-R1+	010-11	OND
	35	Reserved	GND	pip,a	OP92-72-	CP03-T2+	GND	UNDU!	EP03.82.	DP02-82-
	•	(DND)	DP02-E3-	CIP02-T3+	GALLAT	OND.	CPS3-R3-	EP03.83+	INNT	CND
9		UD	GND	CND //	0990.78	EP03-T0+	GND	1,000	EPGS.RG.	CPCC.NO-
15	12	GND	DING-TH-	DP03-T1+	R.GAU	GND	EP13-85-	DPULAT-	1 DAD-IT	GND
. 11	22	UD	GND	910.0	0993.13	DP13-T2+	540	010-11	EP03-R2	EP03.82
12	-	0ND	0993 83	DP03-T3+	SND J1	SND	CPS3-H3	DP03-R3+	119974	OND
13	14	UD .	9N0	665-7	0794-78-	EP04T0+	040	040,31	CP04.05-	DP04-70-
14	1.	GND	DP04-TH-	DP64-T1+	040-21	UND:	CPS4-R1-	DP04-R1+	0454/1	OND.
15	d Ind	Meshable Reset*	GND	SHO-17	OPM-T3-	DP04-73+	GND	CHERCIE	EP04-R3-	DP04-32-
15	1	GND	CP04.T3.	DP64-T3+	940-71	GND	CP04.83-	DPG4/R3+	DAD-JT	OND

All J2/P2 slots = User Defined

J1 Payload Signal Assignments

	g-in duie			Row G	Row F	Ro	WE OM	Row D	Row C	Ro Even	OM B	Row A
	-			Real	Rent	Even.	Real	Real	Acres 4	Reg c	Ares	Ares
	-			GDiscrete T	GND	(240,1	OP01-TD6-	DP01-700+	GND	(NOV)	DP91-RD8	DPOL MDD
3	ž		27.546	GND	OP01-TD1-	DPOL-TD1+	CHEN.IT	040	DP01-RD1-	OPEL ADI.	GMD-y1	CND
3	2		2	PLYBAT	OND	SHOUP	CP01-T02-	OP01-T02+	GND	SNOUT	DP01-402	DPOS ADD
	2		3	OND	DP01-TD3-	DP01-105+	dND.Jt	040	0P01-800-	0401 HDD+	phose i	GND
	2	×		SYS_CONT	GND	6ND-3	OP63-TD8-	DP92-100+	GND	040-0	DP02-808-	OPE2-RDB
	ł,	2	ŝ.	GND	DP03-TD1-	DP02-TD1+	data-je	540	0P02-801-	DP02-RD1+	GND-J1	GND
Ť	ł.		ě.	Reserved	GND	UND-IT	0993-103-	0902-302+	GND	16.040	DP03-RD2-	DP03-803
	2		2	CND	6P03-T03-	DP82-TD3+	IL GMB	640	DP02-RD5-	DP02-HD3+	(LOND)	CND
٠		-		UD	OND	GMDUP	UD	UD	GND	0001	UD UD	00
10	13	1		OND	UD	UD	1,040	DAD.	UQ .	90	(nD ₁ /	6ND
11		4		UD	GND	GND-/T	uo	UD	OND	SN5-J1	LO .	UB
92		3		GND	50	UD	040,01	-940	00	UD.	040-01	GND
15				00	OND	SHO-W	CPIERS-	CPu02-08+	0ND	IND-34	CPyd3.0A	CPU/02-
14		\$		GND	CPtp82- DO-	CP903-	GADUN	540	CPW03-DC-	CPigd2- DC+	010-24	GND
18	No.	ì		Matestie Reset	OND	CHD-H	CP1/01- CR	CPUOLOB-	9ND	аноля	CPUELDA.	CPUES. DA+
18		0		GND	CPIpit-	CPtp01- DD+	oid in	940	CPWIS-DC-	CPtpdt- DC+	SHO-H	GND

J2/P2 Signal Assignments* (Slots 1-5)

Plugin	Moc	iule S	Row G	Row F	Re	We'E	Row D	Row C	Even	ow B	Row A
Backpl	ine J	2-36	Rowi	Row h	Row g	Rowf	Row e	Row d	Row c	Row b	Row a
1	1	5	SEwafer1	010	045-17	LNO-TD-	LN0-TD+	GND	GMD-J2	LNA-RD-	LN0-RD+
2		0.0	GND.	LNI-TD-	LNI-TD+	340.7	GND	LNIS-RD-	LNI-RD+	6MEN.27	GND
3		in the	SEwater3	GID	040-12	UIQ-TD-	LNQ-TD+	GND .	046-37	UI2.60-	LNQ-RD+
4	10	1	(IND	LHO-TD-	LNI-TD+	CLOND-ST	010	110-80-	LN3-RD+	SNE-J2	GND
5	1	-	SEwafer5	GND	040-17	LN4-TD-	LN4-TD+	GND	GHD-32	UN4 RD	LNH-RD+
6	1	16	GND	LNS-TD-	LNS-TD+	D-GR	GND	LIS-ID-	LNS-RD+	840-17	GND
7 8		3	SEwafer7	SND	000-0	LNG-TD-	LN6-TD+	GND	040-44	UILED	LNE-RD+
8		2	GND	LN7-TD-	LNF-TD+	0424.27	GND	LNP-RD-	UN7-SID+	8465.0	GND
9		10	SEwafer9	GND .	04/0-12	LNIS-TD-	LNB-TD+	GND	040-07	LIN-RD	UNB-RD+
10		1	0ND	1348-710-	LN9-TD+	th-Gell	0ND	110-60-	LN9-RD+	UND-J2	CHO
15	-	1	SEwater11	GND	980-17	LN10-TD-	LNIG-TD+	GAD	BMD-22	LNID-RD-	LINIO-RD+
12	÷.	1	(AND	UNIT-TD	LN11-TD+	GND-JT	GND	LIN11-RD	LN11-RD+	640-10	GND
53	10	8	SEwater13	040	940-0	LN12-TD-	LWI2-TD+	GND	(145-17	LN12-RD-	UNIZ-RD+
14		10	GND	LNH3-TD-	LAHS-TD+	0AD-21	GND	UND-RD.	LINES-RD+	010-11	GND
15		1	SEwater15	GND	010-17	LN14-TD-	LN14-TD+	GND	GMD-22	LNI14-RD-	1.N14-RD+
16		1	GND	UNIS-TD-	UNHS-TD+	DAD-JI	GND	CHIS-RD-	LNHS-RD+	040.0	GND

* Any signal pins pass through the rear

J1/P1 Payload Signal Assignments

Piapi	PI	Row G	Ros I	R Even	Date Case	Row D	Row C	B. Even	L OM	Row A
Bolan		Provi i	Real	Row o	Bow /	Rowe	See.d.	Rowe	Row h	Rows
1		Otherstert.	ling	(00-2	DP95-TB	CP21.T2+	OND .	detty of	DPDT-HD	DPO1-AD-
2	1-	Caro	0791-01	0191-111	86.0	040	001.81	CP01.81+	6N0./T	000
3	12	PENIAT	040	600.41	0761.72	DP01.32-	OND	(Mb.r.	OPD. RD.	0991-82
4	2	GAD	DP91-73	OF91.73+	100-0	GND	CP01-83-	EP01-83+	440,11	OND
5		SYE CON"	GND	680-24	DF82-10-	OP12-10+	OND	6865.7	DPC2-HD-	C#102-RD
8	1.	GND	DP92-75-	CIP02-T1+	-660-71	OND	E#92-R1-	EP62-R1+	(ADL)	CND
. 7	38	Reserved	GND	CADIN.	DP02.72	CP03-72+	GND	CNEN/F	DPC2.R2-	0903-83
8	ō	GMD	OP02-35	0992-73+	6101.0	GND	CP02-85-	CP02-R3+	UADUT -	GND
3	5 8	uo	GND	645.0	UD	00	UND	ONEL/V	up	10
10	6 8	SND.	00	00	645.7	OND	66	uc	1,040,11	GND
11		UD	.0ND	(Mage	UD.	00	OND	(mbut	UD .	uo
12	1.	CND .	100	VO	660-JT	OND	LD:	UD .	(ADJT	CND
13		UD	CND	0301-1	uo	100	CND	ORENT	ND .	uo
14	3	GND	UD .	UD OV	4ND-41	GND	UC	UD .	6765/1	CND
15		Manhairie Bunat	ISND	6ND-V	UD	UD	GND	CHENY.	UE	UC
15	1	GMD	00	100	\$200 JT	GND	10	UD	-aMD-JT	CPAD

J1/P1 Peripheral Signal Assignments

Picg-		Rew G	Row F	R Even	DW E Odd	Row D	Row C	R	ow B I Odd	Row #
Rolar	# J1	Row i	Row h	Rowg	Rowl	Rowe	Rowd	Rowc	Row b	Row a
1		GDiscretet	GND	350.7	DPS9-TO-	OP01-T0+	OND	545.79	DP01-R8	000140
2	1.	OND	EPOLTI-	DPGs 11+	1904	OND.	CPO1.R1-	OPD1.811	WID-IT.	GND
3	12	PSNBAT	CND ·	UNUT	000172-	0901.724	GND .	2950-0	DP01-RD	000180
	1	GND	CP01-75	OP01-T3+	DNAD-UT.	GND	DP01-RS-	DP05-ND+	GND-UT	GND
	1.5	\$15_CON	GND	090-07	UD	90	GND	240-0	up.	40
. 6		GND	LC	90	PiQui	GND	UD .	UD	PHONE !!	OND.
1	1. 1	Reserved	GHD.	04947	UD .	up	GND	CMD-17	UD	00
	83	OND.	LD	UD.	Destri	GHD.	uo	UD	6ND-07	GND
		UD	GND	098535	UD .	10	GND	OND-IT	UD	10
10		(IND	10	UD .	Peul	GND	60	00	(DAD-)-1	(IND
11	1	UD	GNO	pic.r	UD .	UD.	GND .	940-11	UD.	UD.
12	6	GND	UD	ud	1040.01	OND	Up	UD .	940.4	UND
13	1 3	UD	OND	1LOHO	UD.	u0	GND	046.0	up	40
14	1 3	GND.	50	10	345.4	: QND	10	UD	GMD-JI	GND
15	6 (Baskatis Recot	GHD .	0964/1	UD .	uo	CND	CHE-UT	up	00
16	8 0	OND	VP	10	240-1	ON0	00	00	6ND-/1	010

3U, 6-Slot Signal Assignments (BKP3-CEN06-15.2.2)

JO Signal Assignments

	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	Vat	Wet	Vat	Vat	No Pad	Via C	Vi2	942	Vs2
į.	Vat	Vat	Vat	Vst	No Pad	VN2	Via City	VSP	Val
5	Val	965	Vel	Ve3	No Pad	890	wa .	343	Vid .
1	90	5502	SMO	GND	-529_Aux	OND	SYSHESET	NVMIO	OND
ç.	910	GAP	GMP	010	1.3V_Aux	GND.	SMI	SMI	010
	CHO	GAY	CAP	010	+12V_Aux	GND	GA1*	GAN	SHD
r	ток	GND	GND	TDO	TDI	GHD	OND	TMS	TIST-
7	CHD .	BEF.CLK	REF CLK+	GND	GND	ALLE CLK	AUX CLK.	GND	OND

J1/P1 Switch Signal Assignments

Plug-l Modu		Row G	Row F.	R: Even	WE Odd	RowD	Row C	Ro Even	WB Ood	Row A
Bolan	a J1	Rowi	Row h	Rowg	Rowf	Row e	Row d	Row c	Row b	Rowa
. 30	1	ODiscrete1	0ND	540-11	OPOS-TDO-	0P01-TD0+	GND	SHOUT	EP01-800-	DPOL-ROO-
4	12	QND	DP01-101-	0928-701+	140.01	tinti	DPU1 MD1-	CP01-R01+	. shout	OND
3	22	PLVEAT	0N0	960/1	DPSS-TD2.	0791-102+	OND.	010./1	DP21-ND2-	DPS1-RDQ1
4	° (c)	GND	0/01-103-	DP05-103+	340.0	OND	DPOT-RDS-	EP01-M03+	340-21	OND
	1	SYR CON"	(CNC)	(MA)UT	0P52-100-	0703-100+	040	19965,71	OPE2-HOD	DPES-ROD-
6	10	GND .	0992-701-	0403-TD1+	Debut	GND	DPI2 RD1-	0992.801+	UNDUT.	OND
7	35	Reperved	040	- owner	DPE2-TD2-	0P02-T02+	GND	046476	DP12-R03-	OP15-R03+
	•	(PAD)	DR82-705-	DP03-TD3+	090-07	GND	DPUL PD3-	DP02-R03+	ONNT	QND.
	200	10	940	pip/r	DP03-TD0-	0993-700+	640	phone 1	DPS3-MD6-	OPEN-NDG-
10	12	GND	DP08-TD1-	0P93-T01+	904	GND	DPS3-RD1-	OPULAD1+	avevi	OND
11	22	u0	9N0	540,17	DP03-TD0-	0913-102+	GND	BNDU T	OPES ROS.	DPIS-RDD-
12		QND	0403-103	DP03-100+	190./*	GND.	DP03-RD3-	DP03.400+	1000	OND
13	0.00	10	040	540.47	DP04-T00-	0P04-T00+	OND	040,01	DP54-RD6-	DP14-R00-
14	1.	GND	0794-101-	OPIA TOTA	960,7	OND	0004-801-	EP04-R01+	SMD/T	OND
15	12	Maskabbs'	GND	ONDUT	DPD4-TDD-	0904-700+	GHD -	UNDER	DP54-802-	CPOL ROO-
16	10	GND	0904-700-	DPS4-TD3+	240.0	OND	0P94.803-	EP01-800+	040-07	GND

User Defined Pins for Thin Pipe - P2 & J2

3U, 9-Slot Signal Assignments

JO Signal Assignments

_	Row I	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	Val	Set	Vat	Vat	No Pad	Via Via	Va2	Viz.	V12
2	Val.	Vat	Vat	V91	No Pad	VNZ	Via .	1942	Vel
3	Ve3	915	Vet	Val	No Pad	890	wa .	343	No.
4	00	5502	SMG	GND	-12V_Aux	OND	SYSHESET	NVMIO	OND
5	310	GAP	GMP	010	3.3V_Aux	GND.	SMI	SMI	OND
	OND	GAY	CAP	010	+12V_Aux	GND	GA1*	GAN	340
7	TOK	GND	GND	TDO	TDI	GHD	OND	TMS	TIST:
	010	REF_CLR.	REF_CLK+	OND .	GND	ALTR. CLK	AUX_CLK+	GND	GND

J1/P1 Signal Assignments for Slots 2, 3 & 5

Plug-in module I	PI	Row G	Row F	Ro	WE Dott	Row D	Row C	Ro	w fi L Ost	Row A
Bolaras .		Scw1	Rowh	Sow o	Rowf	Rowro	Bowd	Rowc	Rowb	Row a
1 2	-	(CENscretar)	OND	HAD-IT	DP01-100-	DP01-100+	OND	indut.	OP01-806-	EP01-RD0
2 4	4.0	GND	DP01-101-	0991-101+	- JARNJT	0nci	EPGI ADI-	OPES HD1+	AND A	OND
3 2	4	PLANAT	GND	IM-5-J1	0/01-102-	0404-702+	GND.	OND,IT	0P91-802-	EP01 /02
4 8	1	CND	DP21-T03-	0701-103+	GND-1	010	DPOL/RDS-	DPDS.HDD+	UNDAIT.	GND
4	1948	SYS_CON*	GND	DAD-VA	LID	05	GND .	CADAY	90	50
•		GND	UD	UD.	GREWT	1240	sio.	UD .	EMP-JT	GND
7		Resorved	GND	1940-J1	UD .	09	GNE	CHECH	uo.	SD .
1	- Š	6N3	48	90	SND JT	670	UD .	UE	1ND-71	CND.
1	1	-90	GND	345-0	UD	UD	GND	GND-37	VO .	10
	1	GND	100	UD .	dedut	0ND	UD	UD	inthur	GND.
11	5	10	040	HAD-H S	10	UD	010	OWERS .	00	00
12		040	100	UD .	GNENT -	010	uo	UD.	inp.y	GND
13		00	GND	6462-J1	UD .	09	CND	UNDAY	UD	UD
14	3	GND	100	UD.	CADVA	940	un .	UD	UNDUT	GND
15	1	Monikable Read	GND	340-11	CPutpRD- TD-	CPutp02- TD+	940	010-1	CPurplet- RD-	CPutpS8- ND+
14	1	GND	CPurp01- TD-	CPutulit-	GAIDUT	GND	CPutp15- RD-	CPutp01- RD+	1,085	OND

J1/P1 Signal Assignments for Slots 6-9

Plug-	in de P1		Row G	Row F	Ro		Row D	Row C	Ro	WB Cold	Row A
Optar	e J1		Rowl	Row h	Here	Row!	Rows	Row d	Rows	How b	Row a
1		-	GDecretert	GND	UMENT .	OPIN-TOR-	0P01-7094	GND	CM(5/IT	OPet-RD6-	DPS1-RDS
2	11:	21.44	GNO	OPER-TDR-	0P01-T01+	GND-H	GND	DPOS RD1-	0901-801+	6365-74	GND
j,	192	ia.	PS-VBAT	GND	0.00-0	CPO1-TD2-	0P01-7024	GND	CNONT	DPU1-AD2	0201-803
4	1°	2	DND	DP21-TD3-	EP01.703+	GND-21	IRNO	0401-803-	0P01-8E0+	100.0	1110
4	÷.	-	BYB CON'	GND.	640-IT	EP09-TD-	EPOD-TD+	040	640-37	EP06-80-	EPIG-RD-
4	5		UNC	EPO1-TD-	6791-TD+	440.0	0ND	EPO1-RD-	EP01-RD+	807	0N0
7	5	N.	Reserved	(0ND)	GARLIT .	area to	EPSETD+	OND	ansur	EPOZ RD	EPE2-RD+
8	8	3	(242)	EP43.TD.	EP93-TD+	6ND-VI	GND	ENDAD.	EPS3-RD+	END-74	GND
	1		40	GND	0155-1	EPO6-TD-	CP04-TD+	GND	0105/7	EPON RD-	CPS4-RD4
52	11	2	950	EPes-TD-	EPSS-TEH	GND-IT.	(INC)	EPIS-RD-	EPSS-RD+	650 A	GND
11	3	2	ub.	OND	640.7	8P06-10-	EPOS-TD+	OND	010-0	EPOS-RD-	BPOS-ROH
\$2	ł.	2	(DND)	8797-TD-	£/97-70+	6ND.N	0MD	EP67-83-	EP97-80+	80.4	UND
13		1	10	OND	VL042	SID OU	90	OND	090./7	UD.	UD
- 14	3	8	UND .	110	10	GMD_H	SIND	00	90	UNT-H	GND
15	2	1	Maskable Reself	OND	denur .	CPutp62- TD-	CPulp03- TOH	OND	anour	CPutoR3- RD-	CPutp82- RD+
58	S.	2	(INC)	CPurp01- 10-	CPurgios-	680-11	ENO.	CPugot-	CPutp01-	SNEL-IT	GND

J1/P1 Payload Signal Assignments

Mudu			Row G	RowF	Even	Odd	Row D	RowC	Even	0dd	Row A
Dplan	a J1		Rowi	Rowh	Row g	Rowf	Row a	Row d	Rowc	Row b	Rowa
1	23	-	ODiscrate1	OND :	TLONG	DP01-FD6-	DP01-TD0+	OND	invis.tt	OPET-ROB-	0901-8004
2	10	2	OND	EP01-T01-	EPOI-TOI+	(IMD-U)	GND	DPDS-RD1-	DPG1-RD1+	680-14	040
з	Posts P	1243	PLVEAT	CND .	0704/1	DP01-T03-	DPSI-TE2+	GND	PRNT.	DPet-RDS-	0P01-802
4	9	a.	GND	CP05-T02-	CP01-TD0+	END/	GND	DPUS PEDS-	DPDS-RDS+	6321.7	SND
8	÷.	-	SYS_COMP	GND	CMONT	EPOB-TD-	EP06-TD+	GND	LINE-AT	EPOB.RD-	EPOD-RD+
6	÷	ä	(IND	EP91-TD-	8791-70+	GND-/7	010	EP91-80-	£791.85-	END //	GND
T	4	8	Reserved	GND	GMD-J1	EP12-10	8P02-104	GND	000.0	EP12.80	1992-80+
8	8	3	OND .	EP80-70-	EP93-T0+	UADJI.	GND	(PESRO-	£P93.80-	6425.24	ISND.
9	2	-	10	040	OMEAUS	EPO4-TD-	E#96-TD+	GND	(ND-/I	EPOI-RD-	EP64-RD+
10	2	1	GND	EPed-TD-	EPIS-TD+	GRONT	GND	DNS-R3-	EP9540+	ENCH/#	1040
11	ŝ.	1242	UD .	GND	CAD'S	EPOS-TD-	EP06-10+	GND	178(D-X	EPOS-RD.	EPOL-RD+
12	2	2	. (NO	EPW?-TD-	EPST-TD+	END-IT	SND	OPUT-RD.	EPST-RD-	610-11	1910
13	1	1	10	GREE	040JT	UD.	UD	GND	11,016	UD	100
14	- 81		UND	UD	UD UD	UND J1	GND	UD	UD	610-/1	GND
15	I		Maskable Reset	OND	GNDUT	Churpeta- TG-	CPutp02- TD+	OND	396.0	Chipe)-	EPulpit)- RO+
18	Gentral		GND	CPutpds-	CPurpet-	650.0	SND	CPulj01-	CPulliot-	665.//	- SND

J2/P2 Switch Signal Assignments

Piug-l Modu		Row G	Row F	Ro Futto	i Odd	Row D	Row C	Even	WB Odd	Row A
Itelan		Ree (Rowth	Read	Bowl	Rows	Row d	Rowc	Row b.	Real
1		UD	OND	GMD-21-	OF95-TD6-	0/105-700+	DND	96.0	CP16-RX-	CIPOS-RDD
2	20	CND	CPUS-TD1-	0905.7014	602-0	GND .	OP95-RD1-	0705-801+	140,0	GND
3	and a	up .	OND .	640-21	OP05-702-	OP46-102+	GND .	UND-17	CPOS ROD	EP05-802
4	6	GND	DP06-103	0406-1034	685-12	GND	DMM RDS	0405-800+	0M5,07	CND
5		ND	OND	045-8	0991-709	0991-708+	END .	947.07	0501-806-	£501-500
6	1:	GND	Dises-TD1-	0001-701+	616-12	GND:	0501-RD1-	D101-RD1+	040.2	CND .
7	22	up	8ND	640-2	0801/122	0601-102+	040	\$40.0	E521-802-	0501-8004
8	4	GND .	0941-703-	D601-TE34	00.0	0ND	D001403-	D806-RD3+	SLOND	GND
8	5	up	10ND	640-3	Clueydn:	CSuper.	0100	910./2	CSurgot:	Chargett.
10		OND	CPUID46- TD-	CPUID46.	1025-0	GND	GPulp40- RD	CPublis- RD+	UMDLU	CND
11	1:	UD	GND	GND.42	C744064-	CPUIDH-	UND.	940.8	CPurplet	CPurplet #D=
12	-	OND	CPutpel-	CPUERD-	N/21.22	GND	CPstpitol-	CPMp03-	-defa.d	OND
13	8.	UD	(OND	645-12	CP-4400-	CPyejd2-	483	590-0	CPUNCE-	CPUINCO-
14		GND	CPutp01- TD-	CPU601- TO+	840.4	GND.	CPsilp01- RD	CPulp01- BDH	gilding .	CR4D
10		UD	080	640.2	90	VD.	GND	210.0	UD	UD.
15	8	OND	UD	10	ako.d	640	UD-	05	040.0	GND .

J1/P1 Signal Assignments for Slot 1

Phug mod			1	Row G	Rea F	Ro Even	Der	RowD	RowC	Ro Even	o B	Ros A
Rpia	-	J١		Revi	flow h	Rowg	Row f	Row e	Row #	How.c	Rowb	Rowa
1	÷			ODisc Infelt	OND	GND./I	1991.108-	DP01-TD0+	GNET	GMD-/1	CPH1-NDD-	DP01-8D0-
2	5	ł.	12	OND	EP11-101-	CP01-E01+	980.JX	UND	DPHI-RD1-	DP81-801+	(SND) JI	040
3	2		10	PLYBAT	GND	END.U	DP01-502	OPEN-TOD+	OND	685.0	CPEL-NDD-	DP01-800-
4	4		1	940	EP01-TD8-	CIP01-T00+	MID.IX	GAD	DP#1-820-	CP61-R03+	(INT) AL	OND
5		1	-	BTR.COM	(DAD)	6924)t	OPez-TOB-	OPES TORM	CND	64524	OPEJ-HDE-	0993-800
6	4		H	000	EP02-701-	DP62-T01+	URDUK.	CND	DPELADE.	CPU2.801+	(SAENJ)	(245)
7	H		2	Reserved	GND	630-0	DP45-703-	OP41-702+	CHD .	610-11	EPED-ADD-	0401-908
			3	- 1960	EP03-T08-	CP40-700+	003	GND	0P60-803-	CP45-R08+	GNDUI	040
				40	GAD	END-UT	UD.	00	GND	645-/1	60	UD.
10				ono	40	up .	010-71	CHD	up .	UD .	ideo Ja	OND
55		10		U0	040	(IND JC	uo	.00	OND	640.0	up .	10
12		-		OND	uc	60	646.0	8ND	upi	UD UD	XING XI	OND
15		5		10	0ND	(SND-J1	UC	-00	CHD .	680-1	UD UD	UD .
54				GND	SD.	up	60.03	DND	uici i	UD .	SNDU.9	OND .
15	0.00	-		Manuality Record	640	UNELLI	OPusido- TD-	0Puty403- 10+	cvici -	GADVI	CPUINE RD	CPUIDER-
16		31	2	SND	CPUtpl1-	CPUIp01- TD4	CRD-J1	(IND	CPutpet-	CPstp01- RD+	steur	GND

J1/P1 Signal Assignments for Slot 4

Phag-4 Modul		Row G	Row F	80 Even	Uest	Row D	Ros C	Ro Even	Dea	Row A
Bplan	+ J1	Bowl	Rowth	Rowg	Rew 1	Rowe	Rowd	Rowie	Row b	Row a
1	1	GEREPHER	ONCI	210.11	DIPON TOO-	0001-1004	GND	2HCut	EXP01-IRDG-	EPOI-HOD
5	1:	0ND	OPO1-TO1-	UP05-701+	Swidu at	Unio .	OPCI RD1-	DPS1-RD1+	SND.JI	0ND
3.	Post.	PLUBAT	ÓND	dealb.um	0701-102-	0P01-000+	6ND	(MOJ1	CP01-R02-	EPOS ROD
	9	DND	01101-103-	DP18-700+	district.	GND	001400-	DP21-RD3+	IIM5.H	OND
3		SYS_COM	GND	0000	0952-100	0912 708+	GND	040007	CHO2-RDS-	EPez Ros
6	12	GND	DP02-TD1-	OP02-T01+	040415	CHO	OPER ADI-	DPI2-RD1+	1965/7	.GND
7	35	Reserved	CHO.	INNT	0PS2.702-	0902-700-	GND .	2964/1	CP03-R03-	EP03.803
8	•	9N0	0003-003-	OP03-TD0+	04645	GND	CPC2.RD3-	0P22-R02+	OND-UT	GND
9		UP.	(2ND)	0.0001	DIPES TOO-	DP03-100+	GND .	arovi	CPS1.800-	EPIG-RDG
10	10	1940	0703-7011	0P03.701+	SHOUT	1000	0703-801-	DRIS ROTH	340.0	OND
15	22	UD	GND	360,0	DP03-102-	CH103-100+	010	1LONE	CHP03-IRE70-	0913-000
12	0	SND	0403-103-	0913-105+	SHO/IT	040	DPES HES-	DPI3-MD3+	540.7	OND
13		UD:	QND	340.41	0P04.100	0104-7004	040	-BMDJ1	DP04-900-	DPD4-RDD
14	1.	GND	0/904-701-	0764-T01+	deput	GND	0P04-PD1-	0P54-RD1+	UMA,H	GND
15	βž	Mathatie Resat	GND	DANT	DP04-702-	0804-702+	GND .	DAVI	DPOL ROD-	CP04-RD3
16	~	5N0	0804-703-	DPSe-TDS+	040-01	UND	OPS4-RD3-	DPS4-RD3+	390,0	OND.

J2/P2 Signal Assignments for Slot 4

Plug-l Modu		Row G	Row F	Ro Even	065	Row D	RowC	Even	B Osd	Row A
Balan	+ 32	Rowi	Rowh	Row-g	Rowt	Rowa	Row 6	Rowe	Rowb	Row a
1		UD.	OND	(HCL/)	DP05-TDS-	0795-1004	OND	380.07	DPSS-RDS-	00105-18200
2	14	040	0705-701-	0906 101+	660.ct	010	DPG8.RD1.	OPDS-RD1+	840.0	(IND
3	142	UD.	010	04047	OP08-T02-	DP05-102+	CND	-(MIN/2	DP05-R02-	CPUS-ROJ
4	0	(DND)	0405-703-	0905-100+	SHAND	CND	CP05.800-	DPOS-HOD+	0MD-0/	CND
5		u0	0/0	343-0	0605-TD0-	DSH-TDH+	OND	380./7	0501-805-	0501-HD0
4	12:	GND	DSSE-TD1-	0501-701+	01010	GND	D501-RD1-	DSD1-RD1+	25652	GND
7	12	u0	GND	840.02	0505-102-	0975-100-	OND .	04020	0501-802-	0501-902
	•	(240)	D805-702-	0801-100+	040.02	-586	D001-MD0-	D606-MD0+	240-72	OND.
		uo.	0ND	DML-0	CSurgidi. TD-	CSurp01- TD+	OND -	260,0	CSuppli-	Courpet- RD+
10	1	GND	CPutellis. TD-	CPutpd6- TD+	consute.	GND	KD-	CPutp08. RD+	08542	GND
11	19	UD	(NO	BNG-JT	CPulget	Cruppl. TD+	640	(\$40.0	RD-	CPUIJOL RD-
12	12:	GND	CPutp03- TD-	CPulp63- TD+	init	010	CPSepilit- RD	CPUNPES- RD+	0447	GND
13	11	u0-	GND	340-12	CPurgi03	CPuepd2- TD+	GND	340.0	CPuge2	CPutpd3: RD+
14	3-	OND	CPutpl01. TD-	CPurgds. TD+	990.07	OND	CPupits-	CPutpitt- RD+	1945.12	GND
15	1	uo	OND	SNLC	Cputp01-	Cpurpét- TD+	OND	38613	Coulpet-	Cpsep07- HD+
-16	1	040	CPMp06- TD-	CPurple-	010-02	: GND	CPuspie-	CPutp06- RD4	2567-12	GND .

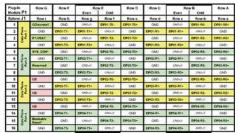
6U, 5-Slot Signal Assignments

JO Signal Assignments

_	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row #
а.	Val	Wet	Vat	Vat	No Pad	Via .	Va2	942	Vs2
2	Vat	Vat	Vat	Vol	No Pat	Viz	VN2	W4	VeJ
5	¥43	915	Vel	Val	No Pad	840	wa .	943	Vis3
4	00	5M2	SMG	GND	-12V_Aux	OND	SYSHESET	NVMIO	OND
5	910	GAP*	GMP	010	3.3V_Aux	CHD.	SMI	SMI	010
8	OND	GAY	CAP	010	+129_Aux	OND	GAN .	GAN	SHD
7	TOK	GND	GND	TDO	TOI	GHQ	OND	TMS	TIST-
	010	RF.C.K.	REF_CLK+	OND .	GND	ALTR. CLK.	AUX_CUK+	GND	OND

J2-J6 Signal Assignments = User Defined

J]	/P1	Signal	Assignments
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6U, 5-Slot Payload Signal Assignments (BKP6-CEN05-11.2.5)

JO Signal Assignments

_	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	Val	Vet	Vat	Vat	No Pad	Via C	Vi2	942	Vs2
2	Val	Vat	Vat	Vot:	No Pad	VN2	Via City	VSP	VeJ
5	Via J	905	Vet	Va3	No Pad	890	wa .	343	Vid .
í.	90	5502	SM3	GND	-529_Aux	OND	SYSHESET	NVMID	OND
5	310	GAP	GMP	GHD .	1.3V_Aux	GND.	SMI	SMI	GND
	OND	GAY	CAP	010	+12V_Aux	GND	GA1*	GAN	310
,	TOK	GND	GND	TDO	TDI	GND	0ND	TMS	TIST:
	CHD .	BEF CLR.	REF CLK+	040	GND	ALLE CLK	AUX CLK.	GND	OND

J2/P2 Signal Assignments

Plug Modi		2		Row G	Row F	R	ow E	Row D	Row C	R	Odd	Row A
Back	plan	a J2	2	Rowi	Rowh	Rowg	Rowf	Row e	Row d	Rowc	Row b	Rowa
1			lo	UD	GND	GND-J2	EP00-T-	EP00-T+	GND	GN0-J2	EP00-R-	EPOD-N+
2			10	GND	EP01-T-	EP01-T+	0ND-J2	GND	EP01-R-	EP01-R+	GND-22	GND
3		8	cien	UD	GND	GND-J7	EP02-T-	EP02-T+	GND	GND-12	EP02-R-	EP02-R+
4		65°.21 Bu	*	GND	EP03-T-	EP03-T+	GND-JU	GND	EP03-R-	EP03-R+	0ND-J2	GND
5	8	Cali		UD	GND	0ND-J7	EP04-T-	EP04-T+	GND	040-32	EP04-R-	EP04-R+
6	2	-	6	GND	EP06-T-	EPOS-T+	GND./2	GND	EP05-R-	EPOS-R+	GND-J2	GND
7	10:51		1	UD	GND	GND-J2	EP06-T-	EP06-T+	GND	6ND-JZ	EP06-R-	EPOS.R+
8	11 a		1	GND	EP07-T-	EP07-T+	GND-J2	GND	EP07-R-	EP07-R+	0ND-12	GND
9	-	1	18	UD	GND	GND-J2	EPOS.T.	EPOB-T+	GND	GND-J7	EPts.R.	EP08-R+
10	X		111	GND	EPOD-T-	EPOP-T+	GND-JS	GND	EPOS.R.	EPOS-R+	GNG-J#	GND
11	î î	18-5	-	UD	GND	GND-J2	EP10-T-	EP10-T+	GND	010-32	EP10-R-	EP10-R+
12		118	1 MA	GND	EP11-T-	EP11-T+	GND-J2	GND	EP11-R-	EP11-R+	GND-J2	GND
13	6	using	12	UD	GND	GND-12	EP12-T-	EP12-T+	GND	GND-J2	EP12-R-	EP12-R+
14	0	-	118	GND	EP13-T-	EP13-T+	DV-040	GND	EP13-R-	EP13-R+	OND-J2	GND
15			ning	UD	GND	SND-J2	EP14.T.	EP14.Te	GND	GND-J2	EP14-R-	EP14.R+
16	2		X	GND	EP15-T-	EP15-T+	6ND-12	OND	EP15-R-	EP15-R+	0ND-/2	OND

J3, J5-J6 Signal Assignments = User Defined

J1/P1 Signal Assignments

Plugi Mode	in Ie P1	Row G	Row F	Eves	Ow E	Row D	Row C	R	W B Odd	Now A
Bolan	a J1	Rowi	Rowh	Rowg	Rowf	Rowe	Row d	Rowe	Row b	Rowa
		GDiscusio1	OND	(INDUT	DP01-TO-	CP01-20+	GND	680.0	DP01-R0-	DPg1.88+
2	11:	OND .	DPD1.T1-	DP01-T1+	NUM:	OND	OPOL-RL.	DP01-81+	n.can	GND
3	11	PI-VBAT	OND	OME-LE	D#91-T2-	CP01-72+	OND	005/1	CPIET-R2-	0701-82+
4	° .	OND	DP01-T3-	CP01-T3+	UNEN.T	CND	OPET-RS-	DP01-83+	GAEN/T-	DND
1	100	SVS_CON"	640	ONDAS	DPC3.TO.	CP03.30+	GND	(JAC)-(I	CIP02-80-	0742-86+
	12	GND	DP03-71-	CP03-T1+	CMD-JV	GND	DPD-R1-	0102-81+	GNDUT	GND
7	32	Reserved	GND	OND-UT	CPES-T2-	EP02-73+	GND	UND-/#	DP95-R2-	DP92-#2+
	•	OND	DPG-T3-	EP63.13+	END./Y	SND	DPD3.R3-	DP03-R3+	650.r	GND
		VD.	OND	1LONG:	DP67-T0-	6993-70+	940	680.4	CP93-68-	0143-08+
10	12	040	OP93-11-	CP03-75+	040.4	GND	DP93-R1-	DP93-83+	GND-71	GND
11	1	10	OND	OND,0	DPD3-T2-	EP01-72+	OND.	100.0	OP03-R2-	0P83-R2+
12	1°	0.0	EPRO-13-	DPG3-T3+	6ADJT	OND	OPED RD-	DP63.82+	CAED.JT	OND
13	2.05	LID .	CND	ONENT	CP04-10-	EP04-70+	CAD	640.07	DP04-HD	DP04-88+
11	1.	GND	DP04-71-	CP06-71+	CREN/V	GND	DP04-R1-	DP04-R1+	GAEN/T	GND
15	ALC: N	Baskable Rear	646	anour	DPS4-T2-	EP06 73+	GND	und-un	DP96-R2	DF94-83+
18	<u> </u>	OND.	0P94-73-	0994-734	1040.0	CMD	DPS4-R3-	0704-53+	GNDUT	OND

J4/P4 Signal Assignments

Plag		Row Q	Row F		e Oot	Row D	Row C	Ro		Row A
Mod		-	-	Evan		-		Even	Odd	
Bpiar	+ J4	Row	Rowh	Rowg	Rowf	Row a	Row d	Rowe	Rowb	Rowa
1		90	GND	- ENCLUA	UD .	UD .	GND -	(003).34		00
2		GND	30	up	EACLIN	GNO	10	UD	CNEXUF	CHD .
3		00	GND	(IND-SH	UC .	UD .	940	0657	10	up
4	2	GND	UK)	UD	TAC-H	GHD	uc	ub	(200-22	GND
5		WD .	OND	PIC-H	10	UB	GND	uic.u	10	UD.
6	1	GND	00	UD	640-H	. GND	10	UD	GND JH	OND
7	5	UD.	GRO	INC.rel	UC	ND .	0.00	645.0	10	UD DU
8		GND	30	UB	and the	UND	80	UD	GND-JR	OND
9		90	GNO-	- DAD vit	40	UD	GND	elevit.	00	UD
10		OND	WD	UD	1640.14	082	10	UD.	640.24	OND
11	-	00	GND	END of	CPulpida Tr	CPulpit2.1+	0ND	IN NO	CP-44-02 IL	CPulpit2 R
12	2	GND	Chuyes to:	CPulp01-1+	540.ir	GND .	CPulpE1 R	CPulpitAl+	i6M0.JK	CMO .
13		WD.	ONO .	PNC-H	CP(00.08-)	CPU02-DR+	GN0	100.01	CPENGA-	CPHIO2-DA
14	20	GND	CP1948-00-	CPUS2-CO+	BND.VF	18ND	CPUICE OC.	CPupit-DC+	GND-24	GND
15		UD .	GND	IN GHE	CPtych DB-	CPW71-DR+	UND	SING-JA	CPN01GA-	CPMOT CA
15	8	OND	CPtyles CO-	CP101-00-	M0.H	640	CPyl100-	CPy01-DC+	ditro al	GND

6U, 5-Slot Switch Signal Assignments (BKP6-CEN05-11.2.5)

J1/P1 Signal Assignments

Plugi		Row G	Row F	Ro	wE	Row D	Row C	Ro	*0	Row A
Modu	ie P1			Even	Qdd	o	- vrianen	Even	Odd	1
Dplan	e J1	Rowi	Row h	Row g	Bow f	Row a	Row d	Row c	Row b	Row a
1	1	GOiscrete1	GAD	GND-//	CSupp1.T-	CSug01.7+	GN0	665.0	Clupbin.	Claight Re
2	82	GAD	CSutp02-T-	CSubleT>	645-7	GND	CSulp82-R-	CSulp92-R+	INCOM	GND
3	184	PSVEAT	CAD .	SND-JI	CSU083-Y-	CSup03-7+	GND	RL-DAB	Clubble.	Clinip82-R
4	35	GAD	Clived T.	CSulphi T+	GAD-UT	GND	CELAPSE #	CRubpol H+	SHELVY	545
5		515,008	GAO	GADUA	CPutjøs.F.	Chapol-Te	- QNQ	1983-04	CNOHA.	CPuljos R
		GND	CPutueb-T-	CPutpet-T-	\$ND-/*	GND	CPusses-R-	CPupot-A-	Sinci-vr	GND
7		Resolved	GND	640-7	CP-4243-7-	Chuyez T+	080	96.9	CROBER	CPutpits #
8	é.	GAD	GPutp64-T-	CPutj04.T+	IND.IT	GND	Chap64-IL	Chulpol-liv	1992-11	0ND
9	1.2	UD	GND	- 680-/1	CPutplet-T-	CPutp05.T+	GN0 .	6ND-P	CPutrol 6	CPutgd5.R
10	1	CND	CPUIDE-T-	CPutpot-T+	SND./I	640	CPutplet-R-	CPutpot-R+	Singly #	040
11	2.2	UEI	GND	CALLA	CPutpet.T-	CPutpet-T+	GNO	DAR-VI	CPupita.	Chaplet a
12	122	GND	CPutal4.T.	CPutpleTe	DiD.//	GND	CPutyde.R.	Chaude Re	Bidd JA	(CND)
13	1	VC	GND	940-7	CPutp05-T-	CPUIDED.T+	UND .	isko n	CPublish.	CPutos A
14	°	GND	CPulptS-T-	CPuturst-T+	and /r	GND	CPuterto.A.	CPWW10-R+	8x2./1	OND -
15		Maskalde Resof	GND	8875.0	CPMpH1-E-	01-01-1+	010	040,0	Chemit	CINETSR
15		GND	CPutp12-To	CPutp12-Te	DOUT	GND	CPulp12-8	CPN052-R+	DNR/	12ND

J3/P3-J4/P4 Signal Assignments

Philip		Row G	Rew F		ow F	Row D	Row C		DAN BI	Row J
Modu	te P3			Even	Odd			Evan	Odd	
Uplan	He J3	Rowi	Rowh	Rowg	Row 1	Row e	Row d	Row 6	Row b	Row a
1	69	UD .	GND	0.00.0	DP12.T0.	EP12.T0+	CND	10C-0	OP12-R0-	0012.89
z	1 2 2	CINCI	DP12-T1+	DP12-TI+	CN5kJ	GND	DP12-R1-	DP12-R1+	GRC-US	GND
3	22	UD	GND	GMD-28	DP12-T2-	DP12-T2+	GND	GND-14	OP12-R2-	DP12-R2
4	The Party	GNS	DP12-T3-	DP12-T3+	440.3	GMD	DP12-R3-	DP12-R3+	SND-/2	GNB
5	65	UD	GND	010.01	0P11-T0-	DP11-T0+	GND	640.45	OP11-RD-	DP11-80
6	25	GND	DP11-T1-	DP11-T1+	649.5	GND	CP11-R1-	DP11-81+	6.948	GND
7	44	UD	OND	GNEL78	DP11-T2-	DP11-T2+	OND	650-//	DP11-R2-	0P11-R2
8	5.8	GN0	DP11-T2-	DP11-T3+	980-0	GND	DP11-83-	DP11-834	6VCV8	GND
9	10	UD	CND	QNEL/J	DP10-T0-	DP10-T0+	GND	050-07	DP10-R0-	DP18-R0
10	200	GND	DP10-T1-	DP10-T1+	CND-J	GND	DPID-Rt.	DP10-81+	CND-v3	GND
11	125	UD	GND	0305-0	OP10-T2-	DP10-T2+	GND	050-78	DP16-R2-	DP10-R3
12	Det	GND	0010-73-	DP10-T3+	640-2	GND	DP10-83-	DP10-83+	610.0	GND
13	-	UD	GND	050.0	DP09-16-	EPOS-TO+	GND	650.0	OP09-RD	DP09 R0
14	12	GND	D/909-T1-	DP05-T1+	04041	GND	DP00-R1-	DP03-R1+	6LOVD	OND
15	41	UD	GND	649.3	DP09-T2-	DP09-12+	GND	6NC-//	DPOP R2	DP09-62
16	33	0N0	OP09-T3-	CF09-T3+	GNO.0	CND	0006-03-	DP05-R1+	000-0	OND

6U, 6-Slot Signal Assignments (BKP6-DIS06-11.2.10)

JO Signal Assignments

_	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	Val	Vet	Vat	Vat	No Pad	Via Via	Va2	942	Vs2
2	Val	Vat	Vat	V91	No Pad	VNZ	Via .	VS2	Ve3
3	Va3	965	Vet	Val	No Pad	890	W2	943	No.
4	90	5502	SM3	GND	-529_Aux	OND	SYSHESET	INVINIO	OND
5	910	GAP	GMP	010	1.3V_Aux	GND.	SMI	SMI	GND
	CHO	GAY	CAP	010	+12V_Aux	GND	GA1*	GA8*	310
7	TOK	GND	GND	TDO.	TDI	GND	GND	TMS	TRST'
	CHD .	BEF.CLK	REF_CLK+	040	GND	ALLE CLK	AUX CLK.	GhD	OND

J1/P1 Signal Assignments for Switch Slot 6

Plug-I Modul		Row G	Row F	R	Odd	Row D	Row C	B: Even	W B Odd	Row A
Bplan	e J1	Row i	Row h	Row g	Rowf	Row o	Row d	Row c	Row b	Row a
1		GDiscrete1	GND	040-01	CP01-10-	CP01-TO+	GND	540-21	CF01-R0-	CP01-RD
2	2.	OND	CP01-T1-	CP01-T1+	. SM0-J1	CND.	CP01-R1-	CP01-R1+	6ND-//	GND
3	Post	P1-VBAT	CND .	SNOUT	CP01-12-	CP01-12+	CND	090-0	CP01-R2-	CP01-R24
4	å	CND	CP01-73-	CP01-75+	CHONE	CND	CP01-R3-	CP01-R3+	GNEV/5	GND
5	2	SYS_CON	GND	GND-UT	GP02-TD-	CP02-T0+	OND .	040-01	CP02-R0.	CP02-RD-
6	6.	OND	CP02-T1-	CP02-T1+	chout	040	CP02-R1-	GP02-R1+	GND-/1	GND
7	Pos	Reserved	GNO	SHO-VI	GP92-T2-	CP02-72+	GND	DHD /I	GP02-R2-	GP02-82
8	8	ONO	CP02-T3-	GP02-75+	040-11	OND	GP02-R3-	GP02-R3+	4ND-17	GND
9		UD	GND	SND-/1	GP03-T0-	CP03-T0+	0N0	GN0./1	GP03-R0.	CP03-80
10	20	OND	CP03-T1-	GP03-T1+	10ADUT	OND	CP03-R1-	CP03-R11	6ND-71	GND
11	Port	UD	GNO	SM0-JT	GP03-T2-	CP03-T2+	(240)	6N0-71	GP03-R2-	GP03-82
12	ů	GND	CP03-T3-	CP03-T3+	DAU-UT	OND	CP02-R3-	CP03-R34	GND-JN	GND
13		UD	GND	\$465.71	CP54-T0-	CP54-T5+	CND	(Discl.y)	CP04-R0-	CP04-R04
14	12	GND	CP04-T1-	CP54-T1+	CNO-UT	GND.	CPOI-R1-	CP04-R1+	6ND-/1	GND
15	Port	Maskable Reset	GNO	SINDUT	CP04-T2-	CP04-12+	GND	940.21	CPOH-RZ-	CPO4-RZ
16	ð	OND	CP04-T3-	CP04-73+	SADUR	OND	CP04-R3-	CP04-R3+	GND-/1	GND

J3/P3 Signal Assignments for Switch Slot 6

Plug-In Module P3	Row G	Row F	Ro	w E I Odd	Row D	Row C	Ro	w B Odd	Row A
Bplane J3	Rowi	Rowh	Rowg	Rowf	Row e	Row d	Rowc	Row b	Row a
1	UD	GND	GND-/3	CP1p09-DB-	CPtp03-D8+	GND	010-0	CPtp09-DA-	CPtp08-DA
2	GND	CPIDOR-DD-	CP1209-00+	GND-JS	GND	CPtp09-DC-	CPtp09-DC+	GND-J3	GND
3	UD	GND	GND-J3	CPtp10-DB-	CPtp10-DB+	GND	01010	CPtp10-DA-	CPtp10-DA
4	GND	CPtp10-DD-	CP1p10-00+	GND-29	GND	CPtp10-DC-	CPtp10-DC+	GND-J0	GND
5 g	UD	GND	GND-/7	CPtp11-DB-	CPtp11-DB+	GND	GMD-J3	CPtp11-DA-	CPtp11.DA
6	GND	CPtp11-DD-	CPtp11-DD+	GND-J3	GND	CPtp11-DC-	CPtp11-DC+	GND-JD	GND
7 8	UD	OND	GND-J3	CPtp12-DB-	CPtp12-08+	GND	\$40.0	CPtp12-DA-	CPtp12-DA
8 diff	GND	CPtp12-DD-	CPtp12-DD+	GND-JJ	GND	CPtp12-DC-	CPtp12-DC+	GND-J3	GND
9 5	UD	GND	GND-J3	CPtp13-DB-	CPtp13-D8+	GND	ano.a	CPtp13-DA-	CPtp13-DA
10 2	GND.	CPtp13-DD	CPtp13-DO+	GND-JB	GND	CPtp13-DC-	CPtp13-DC+	GND-J3	GND
11 04000	UD	GND	ChOrd	CPtp14-DB-	CPtp14-08+	GND	SND-JJ	CPtp14-DA-	CPtp14-DA
12 8	GND	CPtp14-DD-	CPtp14-DD+	GND-22	GND	CPtp14-DC-	CPtp14-DC+	GND-J3	GND
13	UD	GND	GND-/7	CPtp15-DB-	CPtp15-DB+	GND	GMD-J3	CPtp16-DA-	CPtp15-DA
14	GND	CPtp15-DD-	CPtp15-DO+	GND-J9	GND	CPtp15-DC-	CP1p15-DC+	GND-J3	GND
15	UD	GND	GND-JO	CPIp16-DB-	CPtp16-DB+	GND	SND-J3	CPtp18-DA-	CPtp15-DA
16	GND	CPtp16-DD-	CPtp16-DD+	GND-JJ	GND .	CPtp18-DC-	CPtp16-DC+	GND-JJ	GND

J2-J6 slots 1-5 and J5, J6 Signal Assignments = User Defined

J2/P2 Signal Assignments

Plug-		Row G	Row F	R	owE	Row D	Rew C		sw B	Row
Modu	le P2			Even	Odd			Cren	Odd	
Oplar	e J2	Rowi	Row h	Rowg	Rowt	Row e	Row d	Rows	Row b	Row
1	4	ND.	GND	005.01	DP18-T0-	0916-10+	GND	897.0	DP18 RP	DP16-00
. 2	12	GND	DPHETS.	.0P16.T1+	(5125-27	0ND	0016.81	OP16-R1+	645.0	.5ND
3	Port Port	UD	GND	SINC-10	OP16-12-	OP16-T24	GND	GNG-/2	DP16-R2-	OP16-R2
	å	GND	DP18-73-	OP16-73+	GIGAD	GND	DP16-R3-	DP16-R3+	CINE-LIZ	GND
5		UD.	GND	6ND-12	DP15.TO.	OPIE-TD+	GND	CND-18	DPIS.Ro.	DP18-RO
6	12	GND	DP15-T1-	DP15-T1+	940.42	GND	DP15-R1-	0P15-R1+	UND-UT	-9ND
7	42	UD	GND	842-73	DP15-T2	OP15-12+	GND	610-12	DP16-R2	OP15-R2
8	8	GND	DP15-T3-	DP15-T3+	GNC .0	OND	DP15-R5-	01715-83+	GND.4	GND
9		UD	UND	inn at	DP14-T0-	DP14-TD4	GND	\$40- <i>it</i>	DP14-RD-	D#14-80
.10	22	GND	0914-11-	DP14/T14	TLOWN	GND	OP14-R1	0P14.81+	IND.0	-680
11	Port La Pile	UD	OND	645.0	0P14-T2-	OP14-T2+	GND	GRAN!	OP14-R2-	DP14-R2
12	a	GND	DP14-T3-	0914-134	6ND-02	GND	DPM-RG-	DP14-R3+	BAELU	GND.
13		UD	OND	4465-42	DP13.70.	OP13-T0+	GND	400-10	DP13-R0-	0913-80
14	-	GND	DP42.TH.	0P13-T1+	00.0	GND	OP13.R1.	0P13-R1+	GND-10	GND
15	Per P	UD	GND	UNCS/d	DP13-72-	0915-72+	GND	946-12	DPI3-R2-	DP13-R2
16	ð	GND	0012-12-	DP13-T3r	640.0	GND	DPIS-RS-	0713-813+	GND-0	GNG

J5/P5-J6/P6 Signal Assignments

Plug- Modu	in te P4	Row G	Row F	R	ow E	Row D	Row C	R	w B	Row A
Bplan	10 J4	Row i	Row h	Kow g	Row 1	Rown	Row d	Rowc	Now b	Row a
1	2.	UD	GND	SHO N	DP08-T0	DP08-10+	GND	BIO.H	DP08-R0	DF08-R04
2	a to	GND	DP08-T1-	OPOR-T1+	NL OHD	GND	OP98-R1-	DP08-R1+	SND.H	GND
3	25	UD	GND	540.M	DPOR T2	0008-12+	GND	842.0	DP08-R2	DPOL R2
4	33	GND	DP08-T3-	DP08-T3+	660.4	GND	0998.81	DP08.83+	ISND.H	GND
\$	22	up	GND	distilut .	DP07-T0-	DP07-T0+	GND	6421.14	0P07.R0	DP07-R0+
6	22	GND	DP07-T1-	DP07-71+	DNAM	GND	DP07-R1-	DP07-R1+	SNEW	GNO
7	1	UD	GND:	CRONH	DP07-T2-	OP07-T2+	GND.	GINCLUM	DP37-R2-	DP07-R2+
8	20	GND	DP07-73-	DPET-TO+	DIVENUE	GND	DP97-83-	DP07-R3+	SND-HF	GND
9		UD	GND	SND-JH :	DP06-T0-	DP06-T0+	OND	SND-M	OP06-R0-	DPOS-R04
10	12	GND	DP06-T1-	0P06-T1+	940.44	GND	DPMI-R1-	DP06-R1+	SND-M	GND
11	a a	UD	GND	SHD.N	DP08-T2-	0005-12+	GND	IND J4	DP06-R2	DP06 R2+
12	100	GND	DF08-T3-	DP06-73+	SNOUN	GND	DP08-R3	DP08-R3+	840.8	GND
13	20	UD	GND	GND-J4	DPSS-TS-	DP05-T0+	GND	610-31	DP05-R0	DPOS-RD+
14	25	CND	DP05-T1-	OPES-T1+	SHOW	GND	DP05-R1-	DP05-R1+	1000-24	GND
15	12	UD.	GND	0405-04	DP05-T2-	DP05-72+	GND	ONCI JH	OP05-R2	DP05-R24
16	1 2 3	GND	DPOS-T3-	DP08-T3+	Citation	GND	OP95.R1	DPDS.R3+	END.H	GND

J1/P1 Signal Assignments

Plug-l Nodu		Row G	Row F	R Even	Ow E	Row D	Row C	Even	Own B	Row A
Bylan	e J1	Rew I	Rowh	Row g	Rowf	Rowe	Row d	Rowe	Rewb	Row a
1	1	GDacretet	OND	04541	EP01-T0-	OP11-10+	OND	4M0-41	EP01-80-	DP01-R0+
2	1:	CHID	OPOSTI-	DP01-21+	iono-H	OND	DP01-R1-	CP01-R1+	ONDUT	OND
3	12	PI-VBAT	(IND	05029	0P01-T2-	OP21-T2+	CND	UNINT.	EPOI-R2-	DPEI-82+
4	•	CND	CP01/13-	CP01-33+	CREAR!	040	DPD1-RD-	CP01-R3+	CHENN I	au
0	12181	SVS.CON	040	CAENT	EP03.TO-	CP02.70-	GND	CND-/7	EP02-80-	DP00-R0+
6	1.	GAD	OPCS/T1-	CP02-71+	CHOUL	GND	CP02.R1-	CPOLAT.	CAND	GND
7	32	Reserved	040	dAD-J1	EP02/13-	EP12.72-	GND	dND-ct	EP13-R3-	CP03.82+
8	٩	CND	DP02-T3-	CP02-13+	OND ₄ 3	OND	DP02-R3-	OP12-82+	ULON()	GND
	8.8	LC.	GND	UMDUT .	DP85-78-	EPIS TE-	CND	010.07	EP65.85-	CPCS-RE-
10	12	CND	DP03-71-	CPID-TI+	(MEN)	CND	EPES-Rt-	OPES-R1+	016471	CAD
11	1	10	GND	CMONT	DP05-T2-	EP05-T2+	GND	CND-IT	EPOS-R2-	DPG3-R2+
12	•	GND	DP03-73-	CP05-T2+	CAD-H	GND	EP03-R5-	CP55.83+	040-JT	GND
13		60	GND	QND-71	EPOLTO.	EP04.70-	GND.	TL QAD	EPOLRO.	DPG4.RD+
14	1.	OND	DP04-T1-	CP14.11+	010-21	OND	EP04-R1-	DP06.81+	940-21	GND
15	12	Maskable Roset	040	(ANDLH	6P04-T2-	0P54-T2+	OND	dMANY	EP04-R2-	DP64-R2+
16		CND.	CPS4-T2-	CP04.13+	CHENE	680	CPO4-RD-	CP04.83+	CADAR	OND:

J2/P2 Signal Assignments for Switch Slot 6

Plug-In	Row G	Row F		WE	Row D	Row C		wB	Row A
Module I			Even	Odd			Even	Odd	
Bplane .	2 Row i	Row h	Rowg	Row f	Rowe	Row d	Row c	Row b	Row a
1	UD	GND	GND J2	CPtp01-DB-	CP1p01-DB+	GND	IRND J2	CPtp01-DA-	CPtp01-DA
2	GND	CPtp01-DD-	CPtp01-00+	GND-J2	GND	CPtp01-DC-	CPtp01-DC+	GNO-17	GND
3	UD	GND	SIAD-J2	CPtp02-DB-	CPtp02-DB+	OND	SND-J2	CPtp02-DA-	CPtp02-DA
4	GND	CPtp02-00-	CPtp02-DD+	040-2	GND	CPtp02-DC-	CPtp02-DC+	GND-12	GND
5	UD	GND	GND-J2	CP1p03-DB-	CP1p03-D8+	GND	GND-J2	CPtp03-DA-	CPtp03-DA
	GND	CPtp83-00-	CPtp03-DD+	GNO-JZ	GND	CPtp03-DC-	CPtp03-DC+	GND-J2	GND
7	UD	GND	SND JZ	CPtp04-DB-	CP1p04-DB+	GND	GMD-JZ	CPtp04-DA-	CPtp04-DA
8	GND	CPtp64-0D-	CPtp04-DD+	040.2	GND	CPtp04-DC-	CPtp04-DC+	6ND-J2	GND
	UD	GND	GND-/2	CPIp05-DB-	CP1p05-08+	GND	GND-J2	CPIp05-DA-	CPtp05-DA
10	GND	CPtp05-00+	CPtp05-DD+	GND-J2	GND	CPIp05-DC-	CPtp05-DC+	SI-CMD	GND
11	UD	GND	0ND-J2	CPIp06-DB-	CPtp08-DB+	GND	GND-J2	CPtp05-DA-	CPtp08-DA
12	GND.	CPtp06-00-	CPtp06-DD+	640.2	GND	CPtp06-DC-	CPtp05-DC+	6ND-2	GND
13	UD	GND	GND-/2	CPtp07-DB-	CP1p07-08+	GND	GMD-J2	CPtp07-DA-	CPtp07-DA
14	GND	CPtp97-00+	CPtp07-DD+	GND-/2	GND	CPtp07-DC-	CPtp07-DC+	GND-17	GND
15	UD	GND	GND-Q	CPtp08-DB-	CPtp08-DB+	GND	GND-J2	CPtp08-DA-	CPtp08-DA
16	GND	CPtp08-DD-	CPtp08-DD+	GND-JP	GND	CPtp08-DC-	CPtp08-DC+	0ND-JD	GND

J4/P4 Signal Assignments for Switch Slot 6

Piug-In Module		Row G	Row F	Ro Even	w E Odd	Row D	Row C	Ro Even	w B Odd	Row A
Bplane	J4	Rowi	Row h	Rowg	Row f	Row e	Row d	Row c	Row b	Row a
1		UD	GND	GND-J4	CPtp17-08-	CPtp17-D8+	GND	GND-JH	CPtp17-DA-	CPtp17-DA
2		GND	CPtp17-DD-	CPtp17-DD+	GND-J3	GND	CPtp17-DC-	CPtp17-DC+	GND-J4	GND
3		UD	GND	OND-J4	CPtp18-DB-	CPtp18-DB+	GND	GND-J4	CPtp18-DA-	CPtp18-DA
4		GND	CPtp18-DD-	CPtp18-0D+	OND-24	GND	CPtp18-DC-	CPtp18-DC+	OND-J4	GND
5	2	UD	GND	GND-JH	CPtp19-DB-	CPtp19-DB+	GND	ISND-J2	CPtp19-DA-	CPtp19-DA
6	- 44	GND	CPtp18-DD-	CP1p19-00+	GND-JH	GND	CPtp19-DC-	CPtp19-DC+	0ND-34	GND
7	1	UD	GND	GND-JH	CPtp20-DB-	CPtp20-DB+	GND	GND-JH	CPtp20-DA-	CPtp20-DA
8	in Pi	GND	CPtp20-DD-	CPtp20-DD+	GND-J4	GND	CPtp20-DC-	CPtp28-DC+	6MD-24	GND
9	e.	UD	GND	GND-J4	CPtp21-DB-	CPtp21-08+	GND	GND-JH	CPtp21-DA-	CPtp21-DA
10	Plan	GND	CPtp21-DD-	CPtp21-0D+	GND-J4	GND	CPtp21-DC-	CPtp21-DC+	GND-JH	GND
11	Control	UD	GND	GNO-24	CPtp22-DB-	CPtp22-08+	GND	GND-34	CPtp22-DA-	CPtp22-DA
12	Col	GND	CPtp22-DD-	CPtp22-DD+	0ND-J4	GND	CPtp22-DC-	CPtp22-DC+	0ND-34	GND
13		UD	GND	GND-JH	CPtp23-08-	CPtp23-DB+	GND	GND-JH	CPtp23-DA-	CPtp23-DA
14		GND	CPtp23-00-	CPtp23-00+	UND-JH	GND	CPtp23-DC-	CPtp23-OC+	GND-24	GND
15		UD	GND	H-CKD	CPtp24-DB-	CPtp24-DB+	GND	GND-JH	CPtp24-DA-	CPtp24-DA
16		GND	CPtp24-0D-	CP1p24-00+	GND-J4	GND	CPtp24-DC-	CPtp24-DC+	GND- J4	GND

6U, 7-Slot Signal Assignments

JO Signal Assignments

	Row A	Row B	Row C	Row D	RowE	Row F	Row G	Row H	Row
1	Var	142	VIIZ	V62		Vat	Val	Val	Vat
2	Vicz	WE	WZ	Vi2		1001	Viri	MAT	Vot
3	Ves	Ved	Vid	Vii)		Ved	Ved	Vio	VeD
4	GND	NVMRD	SYSRESET	GND	12V Aux	GND	SN3	580	GND
5	GND	SMI	SHO	GND	3.3V_Aux	GND	GA4*	GAP	GND
6	GND	EN0'	GAP	GND	+12V_Am	GND	GA2 ⁴	GAD	GND
7	TRST	TMS	GND	GND	TDI	TDO	GND	GND	TCK
8	GND	GND	AUX_CLK+	AUX_CLK-	GND	GND	REF_CLK+	REF_CLK	GND

J2/P2 Signal Assignments for Slots 3&4

	Row I	Rox H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	GND	DG8	ACFAL*	GND	8851*	GND	SYSFAR.	D00	GND
2	OND.	009	BG26V*	GND	BCLR*	OND	6/R0*	021	GND
3	GBID	D10	BOZOUT	GND	BOON*	GND	881*	002	GND
4	GND	D11	BG3N*	GND	BOSOUT	GND	8R2*	. 003	GND
5	GND	D12	BG3OUT	GND	DG1IN*	GND	58.11	004	GND
6	GND	D13	857081	GND	8/210UT	GND	AMO.	D05	GND
7	GND	D14	LWORD*	GND	SYSCEK	GND	AMT	D06	GND
8	GND	D15	A345	GND	DS1*	GND	AM2	D07	GND
9	GND	A22	A23	GND	0.50*	GND	AM3	AMA	GND
10	GND	A20	A21	GND	WRITE*	GNO	IRQ7+	. AQ7	GND
11	GND	ASD	A19	GND	DTACK*	GND	INQ61	A06	GND
12	GND	A18	A17	GND	45%	GND	1805*	A05	GND
13	GND	A14	Ald	GND	IACK*	GRO	IRQ4*	A04	GND
14	GND	A12	A12	GND	ACK8P	GND	IRQ3*	403	GND
15	GND	A10	A55	GND	ACKOUT!	GND	IRQ2*	A02	OND
16	GND	408	409	GND	RETRO	GND	18401*	401	GND

J1/P1 Payload Signal Assignments for Slots 3-7

Plug-		Row G	Row F	Ro	w E I Odd	Row D	Row C	Ro	w B Odd	Row A
	10 J4	Rowi	Bow h	Rowg	Row f	Rowe	Row d	Rowc	Rowb	Row a
1		UD	GND	GND-J4	UD	UD	GND	GND-JN	UD	UD
2		GND.	UD	UD	GND-JK	GND	UD	UD	GND-J4	GND
3	8	UD	GND	GND-J4	UD	UD	GND	GND-JN	UD	UD
4		GND	UD	UD	GND-JH	GND	UD	UD	GND-JN	GND
5	7	UD	GND	GND-JH	UD	UD	GND	GND-J4	UD	UD
6	Define	GND	UD	UD	GND-J#	GND	UD	UD	GND-J4	GND
7	User D	UD	GND	ICND JN	UD /	UD	GND	GND-J4	UD	UD
8	5	GND.	UD	UD	OND JK	GND	UD	UD	GND-M	GND
9		UD	GND	GND-JH	UD	UD	GND	GND-JN	UD	UD
10		GND	UD	UD	GNDUK	GND	UD	UD	UND-J4	GND
11	6	UD	GND	GND-JH	UD	UD	GND	GND-JH	UD	UD
12	2	GND	UD	UD	GND-JH	GND	UD	UD	UND-J4	GND
13		UD	GND	GND-J4	CPtp02-DB-	CPtp02-DB+	GND	GND-14	CPtp02-DA-	CPtp02-DA
14	The second	GND	CPtp02-DD-	CPtp02-00+	GND-JH	GND	CPtp02-DC-	CPtp02-DC+	SND-JH	GND
15	2 T	UD	GND	GNDUH	CPtp01-DB-	CPtp01-DB+	GND	GNDUH	CPtp01-DA-	CPtp01-DA
16	S	GND	CPtp01-DD-	CPtp01-DD+	GNC-JH	GND	CPtp01-DC-	CPtp01-DC+	GND-J4	GND

J3-J6 on slots 3 and 4 and J2-J6 on slots 5-7 = User Defined

6U, 9-Slot Signal Assignments

JO Signal Assignments

	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	Val	Vet	Vat	Vat	No Pad	Via C	Vi2	942	Vs2
2	Val	Vat	Vat	VH	No Pad	V92	Via City	VSP	VeJ
5	We3	905	Vel	Val	No Pad	890	wa .	343	Vid .
4	90	5302	SMCS	GND	-529_Aux	OND	SYSHESET	NVMIO	OND
5	910	GAP	GMP	G10	1.3V_Aux	GHD.	SMI	SMI	OND
4	CHO	GAY	CAP	010	+12V_Aux	OND	GA1*	GAN	310
7	TOK	GND	GND	TDO	TDI	GHD	OND	TMS	TRST!
	(20)	DEP CLA	BEE CLK.	GND	GND	ALC: CON.	AUT CLN.	GND	OND

J1/P1 Payload Slot Signal Assignments

Plug & Modul		Row G	Rowf	Even	Ose C	Row D	Row C	R: Erm	Odds	Row A
Bplan	e J1	Rowi	Rown	Row g	Row I	Row e	Row d	Row c	Row b	Row a
1		ODMINIST	0140	\$40.0	DP01-T0-	SPRI-TRM	CAND -	lind-yr	DPI1 RB	0991-88
1	1:	OND	DP05-T1-	0761-TT+	2007.01	UND	OF95-R8-	0191-011	END-/1	ISNO.
3	32	PLVBAT.	SND	9ND./F	DP01-T2-	DP01-T2+	GND	GND_FT	DP01-82	OP01-82
4	•	OND -	OPTS.TD.	0925.33+	1040-04	GND	DP01-83-	DP01-R34	600.01	- 040
		STS,CON	010	340.01	010210	DP02-T0+	GAO	1665,21	OP92-RD-	0102-80
	10	GND .	DP02-T1+	DP02-71+	390-/1	GND	C#92-H1-	DP02-81+	640-7	CND.
7	32	Reserved	040	04041	DP02.72-	DP02-T2+	GND :	1,049	DP92-R2-	0192-82
	đ	OND	UP12-17-	0/92-13+	1.540	UND	0192-63-	0092-83+	640./1	GND
1	100	UD	.040	942.0	DP03-16-	DP03-T04	GND	EMELIA.	0993-88	0993-09
10	10	GND	OP03-TH-	0003-71*	395.4	GND	DP93-84-	0793-81+	(997)1	GND
11	32	ub	010	UNDUP	000372	DP03-T2+	(DAD)	8425,21	0140-82	0993-82
12	•	GND :	0913-13-	DP03-73*	040-01	GND	CH95-H3-	DF03-83+	(AD-7	010
12		90	GND	(INCUT	DPS4.TO-	DP04-75+	GND -	URDU!	DPSt-RB-	0954.80
34	1.	GND	DP04.71+	0754-11+	Dist.	GND	DP94.Rt.	OPSLAT-	DAD-M	640
15	32	Naskalle Beset	040	anaut.	OP04-12-	DF64-T2+	GND	0.040	DPH-R2-	0/94.83
16	-	040	OP04-TS-	0006-13+	0.000	6ND	0194-83	0794-854	100.01	010

J2/P2 Payload Slot Signal Assignments

Plug- Mode	in de P2	Row G	Row F	Ro	W E Odd	Row D	Row C	Ro	W B Odd	Row A
Bpla	ne J2	Rowi	Row h	Row g	Rowf	Rowe	Row d	Rowc	Row b	Row a
1	in a state	UD	GND	-GND-12	DPSS-TB-	OPOS-TO+	GND	GND-J2	DP05-R0-	DP05-R0+
2	12	GND	DP05-T1-	DP05-T1+	GND-J2	GND	DP05-R1-	DP05-R1+	GND-J2	GND
3	Data Plan Port 5	UD	GND	GND-J2	DP05-T2-	DP05-T2+	GND	GND-J2	DP05-R2-	DP05-R2+
4	•	GND	DP06-T3-	DP05-T3+	GND-J2	GND	DP05-R3-	DP05-R3+	GND-JJ	GND
5		UD	GND	GND-22	DP08-T0-	DPOS-TO+	GND	DND-J2	DP06-R0-	DPDS-R0
6	12	GND	DP06-T1-	DP06-T1+	GND-J2	GND	DP06-R1-	DP06-R1+	GND-J2	GND
7	Data Plan Port 6	UD	GND	GND-JZ	DP06-T2-	OP05-T2+	GND	GND-J#	DP06-R2-	DP05-R2+
8	9	GND	DP06-T3-	DP06-T3+	GND-J2	GND	DP05-R3-	DP05-R3+	GND-J2	GND
9		UD	GND	GND-J2	DP07-T0-	DP07-T0+	GND	GND-J2	DP07-R0-	DP07-R0+
10	Same	GND	DP07-T1-	DP07-T1+	GND-J2	GND	DP07-R1-	DP07-R1+	GND-J2	GND
11	Port Port	UD	GND	040-0	DP07-T2-	DP07-T2+	GND	010-07	DP07-R2-	DP07-R24
12	•	GND	DP07-T3-	DP07-T3+	OND JZ	GND	DP07-R3-	DP07-R3+	OND-J2	GND
13	2	UD	GND	960-72	DP08-T0-	DP08-T0+	GND	GND-12	DP08-R0-	DP08-R0+
14	1 tene	GND	DPS8-T1-	OP08-T1+	GND-32	GND	DP08-R1-	DP05-R1+	GND-J7	GND
15	Data Plane Port 8	UD	GND	GND-JZ	DP08-T2-	DP08-T2+	GND	6ND-J2	DP08-R2-	DP08-R2+
16	•	GND	DP08-T3-	DP08-T3+	GND-J2	GND	DP08-R3-	DP08-R3+	GND-J7	GND

J3, J5-J6 Payload Signal Assignments = User Defined

J1/P1 Switch Slot Signal Assignments

Plug-I Modul		Row G	Row F	Even	Odd	Row D	Row C	Even	Odd	Row A
Bplan	o J1	Row i	Row h	Rowg	Row f	Row e	Row d	Row c	Row b	Rowa
1		GDiscrete1	GND	OND-JT	DP01-T0-	DP01-T0+	GND	diND-J1	OP01-R0-	DP01-R0
2	1:	GND	DP01-T1-	DP01-T1+	GND-JT	GND	DP01-R1-	0P01-R1+	QND-JT	GND
3	Por	P1-VBAT	GND	GND-JP	DP01-72-	DP01-T2+	GND.	END-JP	OP01-R2-	DP01-92
4	•	GND	DP01-T3-	DP01-T3+	GND-JY	GND	OP01-R3-	DP01-R3+	0ND-J1	GND
5	121	SYS_CON"	GND	OND-J1	DP02-T0-	DP02-T0+	GND	OND-J1	DP02-R0-	DP02-R0
6	1 me	GND	DP02-T1-	DP02-T1+	GND-JT	GND	DP02-R1-	DP02-R1+	GND-J1	GND
7	Place Port 2	Reserved	GND	GND-J1	DP02-T2-	DP02-T2+	GND	GND-J7	OP02-R2-	DP02-R2
8	0	GND	DP02-T3-	DP02-T3+	GND-JT	GND	DP02-R3-	DP02-R3+	0ND-J1	GND
9	192 - T	UD	GND	GND-JT	UD	VD	GND	GND-JT	UD	UD
10		GND	UD	UD	GND-JT	GND	UD	UD	GND-J1	GND
11		UD	GND	GND-JT	UD	UD	GND	GND-JT	UD	UD
12	Defined	GND	UD	UD /	GND-JT	GND	UD	UD	GND-JT	GND
13		UD	GND	GND-J1	UD	UD	GND	GND-J1	UD	UD
14	User	GND	UD	UD	GND-JF	GND	UD	UD	GND-J1	GND
15		Maskable Reset*	GND	GNDUF	UD	UD	GND	GND-J7	UD	UD
16		GND	UD	UD	GND-JF	GND	UD	UD	GND-J1	GND

J4/P4 Payload Slot Signal Assignments

Mod P		Row G	Row F	R Even	Ow E	Row D	Row C	R Even	I CAN	Row
Bolan	o .J4	Rowl	Rowh	Row-p	Row 1	Row a	Row d	Row c	Row 5	Row
1	1	UÚ.	OND.	630-H	UD .	ND	OND -	1007.01	UD	UD.
2		CND	UD	UD	0.425.74	GND	UD	UD	012-14	GND
3		UD DJ	GND	650-R	UD	UD	GND	040-24	UD	un
4		GND	UD	UD	-040-24	UND.	UD:	UD	90.00	GND
8	1	UD	GND	N.G/B	UD	10	OND .	392.4	UD	UD
6	1	GND	UD	UD	INC-31	GND	UD	UD	1005.34	GND
7	5	UD.	GND	650,4	UD.	UD	GND	0967,4	10D	UD
		GND	UD	UD	640-24	UND.	UD	UD	N-CMD	GND
3		up	CND.	64D-14	UD .	UD	GND .	BAD-JA	UD	UD
10	5 3	GND	UD	UD	5ND-/4	GND	UD	UD	992-7	GND
11	6	UD.	GND	GND-JA	MISYD	FIND	CINCI	Prove.	F(5)(0	PISINO
12	2	GND	REVO	RISVO	66.3	GND	RSVD	RSVD	4,000	GND
13		UD .	GND	KMD-X	UB	UD	GNO	316//	UB	UD.
14	N.	OND .	UD	00	650 JI	UND.	UD.	UD.	610.4	GND
15	-	UD	GND	645.4	UD	LID	OND	545.4	UD	UD
16	5	GND	UD .	UD	00-2	GND	UD	00	0.00-14	GHD

VITA Based Backplanes

6U, 10-Slot Signal Assignments

JO Signal Assignments

	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	Val	Vet	Vat	Vat	No Pad	Vi2	Va2	We2	Vs2
į.	Val	Vat	Vat	Vol	No Pad	VN2	VH2	VSP	VeJ
5	Via J	905	Vet	Val	No Pad	890	W0	943	Vid .
4	90	5502	SM3	GND	-529_Aux	OND	SYSHESET	NVNIO	OND
5	310	GAP	GMP	GND	1.3V_Aux	GHD	SMI	SMI	GND
4	OND	GAY	CAP	010	+12V_Aux	GND	GAN .	GA8*	310
7	TOK	GND	GND	TDO	TDI	GHD	OND	TMS	TRST!
	CHD	REF.CLK	REF_CLK+	GND	GND	AITE CLK.	AUX CLKA	GhD .	GND

J2/P2 Payload Slot Signal Assignments

Plug- Modu		2		Row G	Row F	Ri Even	Odd	Row D	Row C	R	ow B Odd	Row A
Back	plan	e J2	-	Row i	Row h	Rowg	Row f	Row e	Row d	Rowc	Row b	Row a
1			10	UD	GND	GND-J2	EPOD-T-	EP00-T+	GND	GND-J2	EPOD-R-	EPOD-R+
2			0 [3:	GND	EP01-T-	EP01-T+	GND-22	GND	EP01-R-	EP01-R+	GND-J7	GND
3			-un	UD	GND	GND-Q	EP02-T-	EP02-T+	GND	GND-JQ	EP02-R.	EP02-R+
4		0.71 0		GND	EP03-T-	EP03-T+	UND-/2	GND	EP03-R-	EP03-R+	DND-J7	GND
5		Buisn	-	UD	GND	6ND-27	EP04-T-	EP04-T+	GND	0ND-J2	EP04-R-	EP04-R+
6		*	6	GND	EP06-T-	EPOS-T+	GND:42	GND	EP05-R-	EPOS-R+	GND-J2	GND
7	103		-	UD	GND	GND-17	EP06-T-	EP06-T+	GND	GND-JP	EPOS-R-	EPOS-R+
8	Ę.		*	GND	EP07-T-	EP07-T+	OND-J2	GND	EP07-R-	EP07-R+	SLOND	GND
9	1		18	UD	GND	GND-J2	EPG8-T-	EPOB-T+	GND	GND-J2	EPOB-R-	EPOS-R+
10	2		E	GND	EP09-7-	EP09-T+	GND-/2	GND	EP09-R-	EPOS-R+	GND-JJ	GND
11		5	in in	UD	GND	GND-12	EP10-T-	EP10-T+	GND	GND-J2	EP10-R-	EPID-R+
12		using[15:8]	**	GND	EP11-7-	EP11-T+	GND-J2	GND	EP11.R.	EP11-R+	GND-D	GNO
13		-	121	UD	GND	0ND-/2	EP12-T-	EP12-T+	GND	GND-J2	EP12-R-	EP12-R+
14			0[18:1	GND	EP12-T-	EP13-T+	GND-/2	GND	EP13-R-	EP13-R+	SY-GKB	GND
15			aing	UD	GND	GND-JZ	EP14-T-	EP14-Te	GND	GND-J2	EP14-R-	EP14.R+
18			-	GND	EP18-T-	EP15-T+	6ND-J2	GND	EP15-R-	EP15-R+	0.00.07	GND

J3, J5-J6 Payload Signal Assignments = User Defined

J1/P1 Switch Slot Signal Assignments

Plug- Modu		Row G	Row F	Ro	w E I Odd	Row D	Row C	Ro	w B Cdd	Row A
	-	<u> </u>	<u> </u>			<u> </u>				
Bplan	ie J1	Row I	Row h	Rowg	Row f	Row e	Row d	Rowc	Row b	Row a
1	NS-	ODiscrete1	GND	GND-J1	CSutp01-T-	CSutp01-T+	OND	040-71	CSutp01-R-	CSutp01-R
2	že.	GND	CSutp02-T-	CSutp02-T+	GND-J7	GND	CSutp02-R-	CSutp02-R+	GND-27	GND
3	24	P1-VBAT	GND	GND-JT	CSurp03-T-	CSutp03-T+	GND	040-/1	CSutp03-R-	CSut03-R
4	CPlan	GND	CSutp04-T-	CSutp04-T+	GND-/1	GND	CSutp04-R-	CSutp64-R+	GND-21	GND
5		SYS_CON*	GND	GND-VI	CPutp01-T-	CPutp01-T+	GND	DAD-H	CPutp01-R-	CPutp01-R
6		GND	CPutp02-T-	CPutp02-T+	GND-71	GND	CPutp02-R-	CPutp02-R+	GYD-J1	GND
7	- di	Reserved	GND	and the	CPutp03-T-	CPutp03-T+	GND	ako-n	CPutp03-R-	CPutp03-R
8	ŝ	OND	CPutp04-T-	CPutp04-T+	GND-71	GND	CPutp04-R-	CPutp04-R+	OND-UT	GND
9	2	UD	GND	GND-/1	CPutp05-T-	CPstp05-T+	GND	GND-J1	CPutp05-R-	CPutp05-R
10	-12	GND	CPutp06-T-	CPutp06-T+	GND-J1	GND	CPutp06-R-	CPutp06-R+	ISAD-J1	GND
11	Ports 1	UD	GND	GND-21	CPutp07-T-	CPutp07-T+	GND	GND-J1	CPutp07-R-	CPutp07-R
12		OND	CPutp08-T-	CPutp08-T+	GND-J1	GND	CPutp08-R+	CPutp08-R+	OND-J1	GND
13	Control	UD	GND	GND-JT	CPutp09-T-	CPutp09-T+	GND	GND-J1	CPutp09-R-	CPutp09-R
14	0	GND	CPutp10-T-	CPutp10-T+	GND-J1	GND	CPutp10-R-	CPutp10-R+	GNDUH	GND
15		Maskable Reset	GND	GND-J1	CPutp11-T-	CPutp11-T+	GND	GND-J1	CPutp11-R-	CPutp11-R
16		GND	CPutp12-T-	CPutp12-T+	GND-J7	GND	CPutp12-R-	CPutp12-R+	GND-/1	GND

J3/P3 Switch Slot Signal Assignments

Plug	j-In Iule F	2		Row G	Row F	R) Even	ow E Odd	Row D	Row C	Re Even	W B Odd	Row A
Bac	kplan	e J2		Row i	Row h	Row g	Row f	Rowe	Row d	Rowc	Row b	Row a
1			10	UD	GND	0AD-17	EP00-T-	EP00-T+	OND	GND-J2	EPOD-R-	EPOD-R+
2			0 12	GND	EP01-T-	EP01-T+	GND-22	GND	EP01-R-	EP01-R+	OND-J7	GND
3		5	- initial	UD	GND	GND-/2	EP02-T-	EP02-T+	GND	GND-J2	EP02-R-	EP02-R+
4		11 0	X	GND	EP03-T-	EP03-T+	GND-/2	GND	EP03-R-	EP03-R+	0ND-J2	ON0
5		1		UD	GND	6ND-77	EP04-T-	EP04-T+	GND	UND-J2	EP04-R-	EP04-R+
6			6	GND	EPOS-T-	EP06-T+	GND:42	GND	EP05-R-	EP05-R+	GND-J2	GND
7	10		-	UD	GND	GND-17	EP06-T-	EP06-T+	GND	GND-J2	EPOS-R-	EPOS-R+
8	0.116		*	GND	EP07-T-	EP07-T+	040-12	GND	EP07-R-	EP07-R+	ST-CND	GND
9	-		18	UD.	GND	GND-J2	EPO8-T-	EPO8-T+	OND	GNC-J2	EPOL-R-	EPOB-R+
10	XIE		111	GND	EP09-T-	EP09-T+	GND-/2	GND	EP09-R-	EP09-R+	GND-J3	GND
11		5	in in	UD	GND	GND-17	EP10-T-	EP10-T+	GND	GND-J2	EP10-R-	EP10-R+
12		a[15	N.	GND	EP11-T-	EP11-T+	GND-J2	GND	EP11-R	EP11-R+	GND-D	GND
13		e8 using	123	UD	GND	0ND-/2	EP12-T-	EP12-T+	GND.	GND-J2	EP12-R-	EP12-R+
14		88	0[18:1	GND	EP13-T-	EP13-T+	GND-/2	GND	EP13-R-	EP12-R+	SY-CING	GND
15			aing	UD	GND	GND-JZ	EP14-T-	EP14-T+	GND	GND-J2	EP14-R.	EP14.8+
18			T.	GND	EP18-T-	EP15-T+	6ND-12	GND	EP15-R-	EP15-R+	GND-J2	GND

J5/P5 Switch Slot Signal Assignments

Plug-l Modu		Row G	Row F	R	ow E	Row D	Row C	Ro	W B	Row A
Bplan	o J5	Rowi	Row h	Row g	Row f	Row e	Row d	Row c	Row b	Row a
1	Pay-	UD	GND	OND-JS	DP04-T0-	DP04-T0+	GND	0ND-J8	DP04-R0-	DP04-R0+
2	32	GND	DP04-T1-	DP04-T1+	GND-J8	GND	DP04-R1-	DP04-R1+	GND-/8	GND
3	20	UD	GND	DAD-JS	DP04-T2-	DP04-T2+	GND	GNDUS	DP04-R2-	DP64-82+
4	Data	GND	DP04-T3-	DP04-T3+	GNDUS	GND	DP04-R3-	DP04-R3+	UND-J8	GND
5	\$2	UD	GND	BJ-CMO	DP03-T0-	DP03-T0+	GND	GND-JS	DP02-R0-	DP03-R0+
6	Por	GND	DP03-T1-	DP03-T1+	640-/5	GND	DP03-R1-	0P03-R1+	BLOND)	OND
7	1 Pu	UD	GND	GND-JS	DP03-T2-	DP03-T2+	GND	GND-JB	DP03-R2-	DP03-R2+
8	Tour Sea	GND	DP03-T3-	DP03-T3+	GND-JS	GND	DP03-R3-	DP03-R3+	GND-JS	GND
9	Pay-	UD	GND	0ND-J8	DP92-T0-	DP02-T0+	GSD	GND-JS	OP02-R0-	DP02-R0+
10	20.	GND	DP02-T1-	DP02-T1+	GND-5	GND	DP02-R1-	DP02-R1+	GNDUS	GND
11	d FP	UD	GND	GND-J5	DP02-T2-	DP02-T2+	GND	GND-JS	DP02-R2-	DP02-R2+
12	Data	GND	DP02-T3-	0P02-T3+	GND-J5	GND	DP02-R3-	DP02-R3+	GND-JE	GND
13	10	UD	GND	GND-JS	OP01-TO-	DP01-T0+	GND	GND-JS	DP01-R0-	DP01-R0+
14	20	GND	DP01-T1-	DP01-71+	GND-J5	GND	DP01-R1-	DP01-R1+	GND-JS	OND
15	d Pla	UD	GND	OND-J5	OP01-T2-	DP01-T2+	GND	040-38	DP01-R2-	DP01-R2+
16	10 m	GND	DP01-T3-	DP01-T3+	SIND-JB.	GND	DP01-83-	0P01-R3+	640-28	GND

J1/P1 Payload Slot Signal Assignments

Plugi		Row G	Row F		ow E	Row D	Row C		aw II	Row A
Mode	Ar P1			Even	Odd			Even	046	
Biplan	w J1	Row i	Row h	Rowg	Rowf	Spa q	Roow B	Row c	Row b	Row a
1		GDiscrete1	GND	GND-UT	DP01-TO-	EP11-70-	OND .	6ND-v1	DPet-Re-	DPat-Re-
2	11:	GND .	DP95-T1-	DP95-T1+	GND-JT	OND	EP01-R1-	DP91-RT+	6400-01	GND
3	152	PS-VBAT	OND	GND V	DP91-12-	EP01-T2+	GND	90.1	DV91-R2-	01101-1121
4	1.0	OND .	DP91-T3-	DP05-73+	040.7	OND	DP01-83-	DF61-83+	640.0	GND
5		\$15_CON*	OND	6875.71	EP02-T0-	C#12-10+	OND	005.0	01403-88-	DF02-50-
	He.	CND	OP12-T1-	DP02-T1+	UND-/Y	CND	DP02-R1-	DP02-R1+	650.2	GAD
7	32	Reserved	CND	5,495	EP42-12-	EP02-72+	CND.	680-41	DP62-R2-	DP03-82*
	1°	GND	DP03.73-	D#65-T3+	CND-27	CAS	CP03.83-	DP40-R3+	GNENIT	GRD
9	25.00	UD	GND .	CREW	DPGD-TE-	CP03.75+	GND	END-UT	DING-NE-	DP41-84-
10	12	GND	DPO-TI-	EP63-T1-	640-VI	GND	EPOD-R1-	DP90-R1+	610-51	GND
11	122	UD	(UND)	UND-U	DP0312-	EP10.12+	GND	00.7	DP03.82	DP05-R2+
12		GND	EP53-T3-	EP05-13+	1140.0	OND	EPS3-R3-	(0F63-83+	440.0	OND
13		UD .	OND	destruct	EP04-10-	EP54 10+	GAD.	IL COST	DP04-ND-	DP94-68+
14	1.	ONO.	DP04-T1-	OP04-T1+	1000,07	OND	DP04-RS-	DP04-81+	685.3	GND
15	135	Nackalaw Result	GND	CREACE	DP04-T2-	CP04-T2+	GND	SNOVE	DP64-R2-	DPM-RJ+
15	1	GND	DPG4.TS.	CPCs.T2+	GMD-JT	CND	CPG4.85	0104-83+	dation .	GAD

J4/P4 Payload Slot Signal Assignments

Mod		Row G	Row F	Ro Even	Odd	Row D	Row C	Even	Cdd	Row A
Bplan	te J4	Rowl	Row h	Rowg	Rowf	Rowe	Row d	Row c	Row b	Row a
1	1	UD	CND	UNDAR .	UD	UD	OND	OVD-M	UD	UD
2		090	U0	u0	GND-V4	GND	UD	uo	GMD-VI	GND
3		UD .	OND	44,083	UD	UD	OND	CMD-24	up	un
4	2	0%0	U0	UD.	(50.4	GND	UD.	10	048-34	GND
5	Nel 1	UD	OND	GMD-J#	UD.	UD.	OND	640-34	UD	UD
6	120	GNO	99	UD	440.4	GND	UD.	00	6000.33	GND
7	3	UD.	OND	650.4	UD	UD	GND	640.4	UD	UD
8	1	GND	UD UD	UQ.	N. C28	SND	U0	VO	\$10.4	GND
9	1	UD .	GND	050-04	uo	UD	GND	CINCI-JY	UD	UD .
10	1	GND	UD .	U0	CND.JI	GND	100	UD.	640.34	GND
.11	ŧ	UD	GND	GND J/	CPalg02.T-	CPutp02.7+	GND	NL CIAD	CPutp02.R-	CPutp02.R
12		GND	CPMp01/T-	CPutpO1-T+	N-ONE	GND	SPUIPITIE-	CPutp01-R+	6(VD_M	GND
13	2	UD.	GND	010-11	CPaps2-DB-	CP6033-08-	GND	OMD-38	CPIp00-DA-	CP8p32-DA-
14	20	12940	CPHO2.DD	CP\$p02-DD+	010.01	GND	CP\$602.0C-	CP102.0C+	SND-JH	GND
18	100	UD	GND	ULD JI	CPM01-DB.	CPIp01 DIH+	GND	GND.JP	CPIp01-DA	CPUPI DA
16	ΰ.	GNO	CPapel-CO-	CPapet-DD+	632.4	GND	CPID01-DC-	CP101-0C+	040.14	GND

J2/P2 Switch Slot Signal Assignments

Plog-l	In In P2	Row G	RowF	R. Even	ow #	Row D	Row C	R:	l osu	Row A
					and the second second second	-	-	_	-	
Bplais	+ J2	Rowi	Rewh	Howg	Row f	Rowe	Row d	Rowe	Rowb	Row a
1	5.	UD	OND	6865-2	EPIS-TE-	OP16-T0+	CAD	685.4	DP16-80	OP16-RS-
- 2	12	GND	0916-21-	OPIS-TH	0M2-0	CND	DP16-R1-	DP16-R5+	- (\$40-0"	GND
3	12	ub-	OND	686-4	CPILT3	0P16-T2+	GND	68048	DP16-R2-	0016-82
4	8	GNO	DPI6-T3-	DP16-T2+	04043	GND	CPISAS.	CPIE-RS+	UNDUE	GND
5		UD	CAD	KND4Z	CP15-70-	CP18-T0+	640	CAD-2	OPIGRA	0P15-80-
4	Ì٤.	040	0P15-T1-	DPIS-TI+	040.dt	GND	CPIS.RI-	DPIE.RS+	5,0,0	GND
7	52	UD	GND	690,2	CP10.13	DP15-72+	GND	640.0	OP15-R3	OPIS#3
	8	OND	0P15-53-	DP15.T3+	849.4	GND	DP15-R3-	DP15-R3+	INC-IT	GNO
\$		UD	GAD	400.2	2214-10-	CP14-T0+	GND	(20).2	0914-88	DP14.85
10	15	(SND	DP14-11-	DP14-T1+	105.0	CND	CPSA-R5-	DP14.81+	1445-12	GND
11	12	UD.	OND	680-31	0914-12	OP14-12+	CNQ	000-2	DP14-R2	0014-82
12	4	GND	0P14-T3-	DP14-T2+	045-2	CND	CF14-R3-	DP14-RS+	IAD-JZ	GND
13		UD	CND	GND-R	CP13.70-	C#13.T0+	GND	0,4240	DP13.86	OP13-80-
14	12	0140	091275	DP13-T1+	CMENT	GND	CPIS.RL	DP15.85+	14047	GND
15	52	UD	GND	040-3	EP13.72-	OP13-T2+	GAD	040.0	0013-82	0013-83
16	6	(2NC)	DP13.73-	OP12-T3+	6N0-2	GND	DP12-R3-	OPIL-RIA .	140.0	GND

J4/P4 Switch Slot Signal Assignments

Plug-i Modul	n le P4	Row G	Row F	R	Dev E	Row D	Row C	R	B B	Row A
Bplan	n J4	Rowi	Row h	Rowg	Rowf	Rew e	Row d	Rows	Row b	Rowa
1	20	UD	GND	CHOUN	CIPCS-TO-	DP05-T0+	GND	CRCv4	0705-80-	OPOS-RO-
2	Port	GND	DPOB-T1+	DPD8-T1+	CHOUR	GND	DP95-R1-	DP06-R1+	GNDUH	GNU
3	APP -	UD	GND	SHOLY	DPES-T3-	DP08-T2+	CINE1	END-A	DPOS.R2	DPOB RD
4	10 Det	GND	DP08-12-	DP08-T2+	340.04	UND	DPDB-RD	DP26-82*	- BAD H	GND
5	-	UD	GND	HOH!	DP07-10-	DP27-12+	END	810.4	OPOT-RD-	0P07-80
6	12	GND.	DP07-11-	0007-11+	0990.44	GND	DP07-R1-	0997481+	MATUR	GND
7	-	UD	GND.	SIAD-34	DP07-T2-	0/07-124	CND	000.44	DP97-R2-	DP07-R2
8	33	GNO	DP07-T3-	OP07-T3+	040.04	CND	0P97-R3-	0P07-R34	640-14	GND
9	it.	UD	GND	Q4Q-Q4	DP06-T0-	0406-70+	GNO	GRENH.	DP06-R0-	DP06-R0
10	22	GND	0F06-T1-	DP06-T1+	0165-34	GND	DPM-Rt.	DP06-R1+	DAD-UK	GND
11	and a la	UD.	GND	SM0.04	DP06-T2-	0946-72+	CND	680.H	DPOS-R2-	DP06-R2
12	Deta	(IND	DP94-T3-	0P05-T2+	and ar	GND	DP96-R3-	DP06-834	GIC-14	GND
13	40	UD	OND.	040.44	0P06-T0-	DP05-T0+	0ND	010.14	DPOS-RO-	DP05-R0
14	100	OND	DP05-71-	DP05-T1+	040.4	GND	DP95-R1-	DP05-R1+	610.4	OND
15	10.0	UD	GND	RIGHE	OPDS-T2-	OP06-T2+	GND	BAC.H	DPUS R2	DPOS R2
16	82	GND	OPOS-T3-	DP05-T3+	GND.M	GND	DP98.83	DPOS.R3+	GAD.A	GND

J6/P6 Switch Slot Signal Assignments

Plug-l Modu	n le P6	Row G	Row F	Even	Odd	Row D	Row C	Even	0dd	Row A
Bplan	6 J6	Rowi	Rowh	Rowg	Rowt	Rowe	Rowd	Row c	Row b	Row a
1	3-	UD	CMD	1750.10	D604-T6-	D504-T0+	GND	B.040	0864.RB	D854 R0+
ź	Pon	GND	D104-11-	D804-T1+	0493,9	SND	D304-R1-	DS04-R1+	SAD-36	GND
3	10	UD	CIND	ONEX.2	US04-12-	0504-12+	OND	050-00	DS04-R2-	D304-82+
4	Duria	GND	0584-13-	D584-T34	CRELIN	GND	1504-R3-	0584-R3+	540-16	GND
5	12	UD	GND	GRENT	D\$03-T0-	D503-T0+	CND	\$750-ye	0603-R0-	0603-80+
6	12	GND	D\$83-T1+	DS03-T1+	CREME	GND	0503-R1-	0503-R1+	SING-10	GND
7	22	UD	GND	610-8	D503-T2-	D\$03-72+	GND	GHD-JE	0803-R2-	0803-R2+
-8	Det.	GND	D803-T3-	D803-T3+	040-8	OND	D803-R3-	0503-R3+	BL 040	GN0
9	Irthur.	UD	GND	and up	DS12-TD-	D502-T0+	GND	840.JE	0802-R0-	0802-R0+
10	22	GND	D502.T1-	DS02.T1+	040.8	GND	D\$62.81	0502-R1+	SLOAR	GND
11	100	up	GND.	840.4	D502.T2	DS02.72+	GND	040.4	D\$02.R2	D802-R24
12	Data 1	GND	D502-T3-	D502-T3+	9,040	GND	C502-R3-	CS02-R3+	545-36	GND
13	10	UD.	GND	0.4542	CEO1-TD-	D501-T0+	GND	0100-08	0801-R0-	D891-R01
14	Par	GND	D501-T1-	D501-T1+	CRENT	GND	0581-R1+	0501-R1+	040-06	GND
15	28	UD	GND	CREAR	DS01-T2-	0501-T2+	GND	CRU-VR	0901-R2-	D301-82+
16	34	GND	D\$01-T2-	D501.73+	CREAM	GND	D501-R3-	DS01-R3+	040.4	GND

6U, 16-Slot Signal Assignments

JO Signal Assignments

_	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	Val	Vet	Vat	Vat	No Pad	Via .	VA2	942	Vs2
2	Val	Vat	Vat	Vst	No Pad	VV2	VN2	VSP	VeJ
5	Via J	905	Vet	Ve3	No Pad	890	W0	343	Vid .
4	90	5502	SM3	GND	-529_Aux	OND	SYSHESET	NVMID	OND
5	310	GAP	GMP	010	1.3V_Aux	CHD	SMI	SMI	GND
8	OND	GAY	CAP	010	+12V_Aux	OND	GA1*	GAN	310
7	TOK	GND	GND	TDO	TDI	GHQ	GND	TMS	TIST.
	CHD	REF.CLK	REF_CLK+	GND	GND	ALLE CLK.	AUT CLK.	GND	OND

J4/P4 Payload Slot Signal Assignments

Plug Mod		Row G	Rowf	Ro Even	Г 064	Row D	Row C	Ro Even	Cold	Row A
	e J4	Rowl	Rowh	Row g	Row f.	Rowe	Rowd	Rowc	Row b	Rowa
1	1	uo.	CND	6855,0	90	00	OND	(INDUK)	60	ND
2		GND	UQ	ub du	UNDAR	GND	50	uo	ENDAUR	CND
3	E 9	UD .	GND	6ND-JH	UD	UD.	GND	CND-UH	UD.	ub.
4		GND	UD .	60	BADUR.	040	10	UD	UND-21	GND
8	1	90	GND .	exo.u	40	UD.	OND	640-2	U0 .	UD.
.6	1	GND	up	00	(3ND -41	GND	10	UD	and the	OND
7	5	U0	OHD	6.06	40	UD	GND	ako Je	10	UD
		GND	00	40	(SND)#	GND	40	UD	ALCHO.	OND
9		UO	CND	CRO-H	uð	05	GND	CND-JY	LO	00
10	1	GND	UB .	UD	GND-JI	GND	uo .	up	-END-JH	GNB
11	ŧ	00	GND	610.4	CPutp02-T-	CPutp02-T+	GND	610.4	CPutp024-	CPutyd2.80
12	2	9ND	CPutp01-T-	Chapter.	ISND-14	GND	CPMp01-8-	CPMp01-R+	END.4	OND
13	1	uo .	GND	ELCH2	C790528-	CPU02-08+	OND	GAD-+*	CPERIOR-	CPERICA.
14	20	QND	CP\$02-00-	CP602-004	GND-JH	GND	CPERSOC.	CP8282-0C+	GND-JH	GND
15	15	UD	OND	H GRO	CPIposes.	C7605-08+	GND	GND JA	CPEOLON.	CPERT-GA.
16	3	GND	CP001-00-	CPUH-DD+	UCM71.14	GND	CP601-DC-	GPIp01-0C+	CMPL.U	OND

J1/P1 Switch Slot Signal Assignments

Plug-l Modu		Row G	Row F	Ro Even	w E I Odd	Row D	Row C	Ro	w B Odd	Row A
Bolan	_	Rowi	Row h	Row a	Rowf	Rowe	Row d	Rowc	Row b	Row a
1	Nº.	GDiscrete1	GND	GNDUT	CSutp01-T-	CSutp01-T+	GND	GND-Jt	CSutp01-R-	CSutp01-R
2	1.0	GND	CSutp02-T-	CSutp02-T+	GND-J/I	GND	CSutp02-R-	CSutp02-R+	GND-J1	GND
3	Port	P1-VBAT	GND	GND-JT	CButp83-T-	CSutp03-T+	GND	GND-J1	CSutp03-R-	CSutp03-R
4	105	GND	CSutp04-T-	CSutp04-T+	OND-J1	GND	CSutp04-R-	CSutp04-R+	GND-J1	GND
5		SYS_CON'	GND	GND-J1	CPutp01-T-	CPutp01-T+	GND	GND-J1	CPutp01-R-	CPutp01-R
6		GND	CPutp02-T-	CPutp02-T+	GND-J1	GND.	CPutp02-R-	CPutp02-R+	GND-J1	GND
7		Reserved	GND	GND-J7	CPutp03-T-	CPutp03-T+	GND	GND-J1	CPutp03-R	CPutp03-R
8	É	GND	CPutp04-T-	CPutp04-T+	OND-J1	GND	CPutp04-R-	CPutp04-R+	010-01	GND
9	1	UD	GND	GND-J1	CPutp05-T-	CPutp05-T+	GND	GND-J1	CPutp05-R-	CPutp05-R
10	-12	GND	CPutp06-T-	CPutp06-T+	GND-J1	GND	CPutp06-R-	CPutp06-R+	ISNO-J1	GND
11	Ports 1	UD	GND	GND-JT	CPutp07-T-	CPutp07-T+	GND	GNDJF	CPutp07-R-	CPutp07-R
12	Plan	GND	CPulp68-T-	CPutplos-T+	GND-J1	GND	CPutp08-R-	CPutp08-R+	GND-JT	GND
13	Contra	UD	GND	GND-JT	CPutpt9-T-	CPutp09-T+	GND .	SND-71	CPutp08-R-	CPutp05-R
14	0	GND	CPutp10-T-	CPutp10-T+	GND-J1	GND	CPutp10-R-	CPutp10-R+	GND-J1	GND
15		Maskable Reset*	GND	GND-JT	CPutp11-T-	CPutp11-T+	GND	GND-J1	CPutp11-R-	CPutp11-R
16		GND	CPutp12-T-	CPutp12-T+	GND-JH	GND	CPutp12-R-	CPutp12-R+	(INO-J)	GND

J3/P3 Switch Slot Signal Assignments

Plug-	lo.	Row G	Row F	R	ow E	Row D	Row C	R	w B	Row A
	le P3			Even	Odd			Even	Odd	
Bplan	e J3	Rowi	Row h	Row g	Row f	Row e	Row d	Row c	Row b	Row a
1	12	UD	GND	GND-J3	DP12-T0-	OP12-T0+	GND	GAID-US	DP12-R0-	OP12-80-
2	Port	GND	DP12-T1-	DP12-T1+	6ND-J2	GND	DP12-R1-	DP12-R1+	(INICI-JI)	GND
3	2e	UD	GND	GND-J0	DP12-T2-	DP12-T2+	GND	GND-J3	DP12-R2-	DP12-R2
4	Dute	GND	DP12-T3-	DP12-T3+	GND-J1	GND	DP12-R3-	0P12-83+	GND-J3	GND
5	승부	UD	GND	000-0	DP11-TD-	DP11-T0+	GND	CL-GND	DP11-R0-	DP11-R0-
8	Port	GND	DP11-T1-	DP11-T1+	GND-J2	GND	DP11-R1-	DP11-R1+	GND-J3	GND
7	22	UD	GND	GADUS	DP11-T2-	DP11-T2+	GND	GND-J3	DP11-R2-	DP11-R2
8	No.	GND	DP11-T3-	DP11-T3+	6AD-J2	GND	DP11-R3-	DP11-R3+	CAD-J3	GND
9	10	UD	GND	040-03	DP10-T0-	DP10-T0+	GND	0.401-32	DP10-R0-	DP10-R0
10	d and	GND	DP10-T1-	DP10-T1+	GND-/7	GND	DP10-R1-	DP10-R1+	GMD-JD	GND
11	26	UD	GND	GND-J3	DP10-T2-	DP10-T2+	GND	GND-J3	DP10-R2-	DP10-R2
12	Deta	GND	DP10-T3-	DP10-T3+	GND-J3	GND	DP10-R3-	DP10-R3+	GND-/3	GND
13	-	UD	GND	GND-/0	DP09-T0-	DP09-T0+	GND:	GND-/3	DP09-R0-	0909-80
14	Port	GND	DP09-T1-	DP09-T1+	GND-J3	GND	DP09-R1-	DP09-R1+	GND-J3	GND
15	20	UD	GND	GND-J3	DP09-T2-	DP09-T2+	GND	GND-J3	DP09-R2-	DP09-82
16	10 mt	GND	DP09-T3-	DP09-T3+	GND-J7	GND	DP09-R3-	DP09-R3+	GND-/3	GND

J5/P5 Switch Slot Signal Assignments

Plug- Modu		Row G	Row F	R	ow E	Row D	Row C	R	ow B	Row A
Bolan	e J5	Row i	Row h	Rowg	Rowf	Row e	Row d	Row c	Row b	Row a
1	14	UD	GNÓ	OND-JS	DP04-T0-	DP04-T0+	GND	0.40-79	DP04-R0-	DP04-R0+
2	4 10	GND	DP04-T1-	DP04-T1+	GND-/5	GND	DP04-R1-	OP04-R1+	GND-28	GND
3	Plan	UD	GND	GND-JS	DP04-12-	DP04-T2+	GND	GND-JS	DP04-R2-	DP64-R2
4	Oata	GND	DP04-T3-	DP04-T3+	GND-JB	GND	DP04-R3-	DP04-R3+	OND-US	GND
5	80	UD	GND.	GNDUB	DP03-T0-	DP03-T0+	GND	GAD-JS	DP03-R0-	DP03-R0
6	Por	GND	DP03-T1-	DP03-T1+	BLOND.	GND	DP03-R1-	DP03-R1+	GND-J5	GND
7	44	UD	GND	SND-18	DP03-T2-	OP03-T2+	GND	DND-JS	DP03-R2-	DP03-R2+
8	N S	GND	DP03-T3-	DP03-T3+	GND-/5	GND	DP03-R3-	DP63-R3+	GND-J9	GND
9	2n	UD	GND	GMD-J8	DPR2-TO-	DP02-T0+	OND	GND-/5	DP02-R0-	DP22-R04
10	Port P	GND	DP02-T1-	DP02-T1+	GND-18	GND	DP02-R1-	DP02-R1+	civitium	GND
11	d a b	UD	GND	GND-JS	DP02-T2-	DP02-T2+	GND	GNDUS	DP02-R2-	DP02-R2
12	Den	GND	DP02-T3-	DP02-T3+	GND-JS	GND	DP02-R3-	DP02-R3+	GND-18	GND
13	\$2	UD	GND	GND-J5	DP01-TO-	DP01-T0+	GND	040-15	DP01-R0-	DP01-R0-
14	204	GND	DP01-T1-	DP01-T1+	GNDUS	GND	DP01-R1-	DP01-R1+	SND-J8	GND
15	d Pla	UD	GND	GNDVS	DP01-T2-	DP01-T2+	GND	GND-JS	DP01-R2-	DP01-R24
15	20	GND	DP01-T3-	DP01-T3+	GND-J8	GND	DP01-R3-	DP01-R3+	GND-JB	GND

J1/P1 Payload Slot Signal Assignments



J2, J3, J5-J6 Payload Signal Assignments = User Defined

J2/P2 Switch Slot Signal Assignments

Plug		Row C	RowF		wž	Row D	Row C		w B	Row A
	te P2		1 1	Even	Cdd	-	1 2	Even	Odd	
Splat	e .J2	Row I	Row b	Rowg	Rowf	Rowe	Row d	Row c	Row b	Row a
4	22	ND	040	04040	CPuta13-T-	CPv4p13-T+	GND	645-3	CPutp1246-	CPutp13-R
2	10	040	OPUIp14T-	CPuta14.T+	10161-37	END .	CPutp14.8-	CPutp54-RIX	1940-12	040
3	15	UD.	OND.	650-3	CPUMIST.	CPuty85.T+	GND .	ONCIAL	COMPSER	Chaptan
4	84	GND	CP24147-	OPutp16-T+	196-4	GND	CPutp16-R-	CPutp 15-8+	LING-UP	GND
5	22	UD	(MD)	69642	CP15-TG-	DP15-75*	GNS	bAG-JZ	OPIS-RE	0P16#0+
	22	OND	CP15-T1-	DP15-T1+	UND-2	GND	OPIE-RS-	OPIERI+	04040	GND.
7	11	UD	0ND	640-3	DP15-T2-	DP15-T24	0102	045-3	DP15-F2	OP15-82+
	11	OND	CP15-13-	DP15-13+	640.0	IIN0	OPIS-RD-	0P15-83+	MC-F.	GND
	62	1/0	OND.	0.040	DP14.76-	DP14-TD4	GND	64C-3	DI14.88	DP14-BD+
10	12	OND	DP1411-	DP14T1+	689,27	EN0	DP14-R5	0P14.81+	105.0	GND
11	12	UD /	CND	0404.0	DP14.T3-	10P14-72*	GND	1005-0	OP14.82	OPIARO
12	82	GND	OF14-T2-	DP14-T2+	0405-02	GND.	OP14-RG	0014-834	0560	GND
13	50	LID	OND .	GND-JJ	EP13-76-	DP15-T94	GND	046-38	0113.85	0713-80+
14	1	GND	C#15-T1-	DP13.TI+	00.0	GNO	OF13.41.	OPI3.81+	DAD-VE	GND
15	52	UD.	GND	640-0	DP13-T2-	OP13-T2+	GND	Bu-Cerif	0913-83	0913-82+
16	31	GNU	CP13.T3-	DP13-T3+	010-2	LIN2	DP13.43	OPI3#3+	100-08	UND

J4/P4 Switch Slot Signal Assignments

Flug- Modu	n le P4	Rew Q	Row F	R	1	Row D	RowC	R	ĩ	Row A
Epiar	e J4	Rowi	Row h	Rowg	Row !	Rows	Rowd	Row c	Row b	Row a
1	80	UD	GND	GNDUR	DP98-79-	DP98-T9+	GND	SND-H	DPGE-RD-	DP08.80+
2	22	OND	OP98-71-	0099-71+	N-GKD	GND	DPRE-MI-	0196-R1+	- DADyri	GND
3	24	uo	OND	IND H	DF95.72-	DF98-72+	GND	BAD-JA	DP06.83	DP56-R2+
4	11	10ND	DP08-13-	DP08-134	IN CHE	OND	OP98-RD-	0108.834	NO.4	000
5	2-	00	GND	GND M	DP07-39-	0997-78*	OND	SAD JA	0997-88-	0907-80+
5	11	ISND .	DP67-75-	DP07-T1+	1655-14	GND	D/107-811	0P02-R1+	ISARL/A	OND
7	22	UD -	GND	650-34	0/97-72-	DP97-T2+	GND	665.0	0/97-82-	0P97-R2+
8	23	GND	EPST-TS	DP07-534	(WD-)H	GND	DP07-85	0P07-854	IND, M	040
. 9	22	00	GND	SIND IN	0796-79-	0196-191	GND	SHEW	DPS6.89	DPOL NOT
10	92	GND	EP05-T1-	0466-111+	CIND-UK	GND	OPHAN.	0456-R1+	DACHUR	040
11	24	UD	GND	GND-14	DP06-T2-	OPIK-T2+	-GND	GNDUH	DP06-R2	0706-82+
12	83	GND	OPHI-TS-	OPHE-T24	- 6ND-14	GND	DPH-R3-	0P06-R3+	240.4	GND
13	- 1	00	GND	END A	0105-78	DP95-78+	GND	642.4	DP95-RB-	DP05-810+
14	52	IGND	DPMS-T1-	DP05-T1+	RND.M	GND	0P95-81-	0P05-R1+	THE A	6ND
15	65	90.	010	rist: in	DF05-12	0/05-22+	GND.	IND.H	OPOS-RZ.	0108-82+
18	83	0ND	DP05-13-	DF05-T34	int at	BND	0705-63-	DIPOS-RG#	BADuat	0/10

J6/P6 Switch Slot Signal Assignments

Mug- Modu	in is P6	Row G	Row F	B	Didd	Row D	Row C	Even	Dea	Rew A
Opter	e .36	Rowi	Row h	Rowg	Row f	Rowa	Row d	Rowic	Rowb	How a
1	14	10	GND	UAD-JR	0594-10	0104-78+	GAD	00.04	D604.90	0804 80+
2	1 2 2	GND :	D504-T1-	DBM-T1+	6.000	GND	0886-81	D584-R1+	DAD/W	(CMC)
3	22	UD	GND .	KADUR.	D994-T2-	0004-12+	GND	000.6	0804-82-	0006-82+
4	18	ÓND.	E504-73-	COR.TS-	0.04	GND	COM-A3-	0804-83+	5N2-#	GND
6.	1.	UD	GND	640-18	01943-TB-	D003-70+	(END)	510.0	D003-80-	9805 AU-
	32	GND	E003 T1	D103-11+	440.4	OND	D983 /11	D803.R1+	8,046	(IND)
7	25	UD	GND	IND.8	O993-T2-	0003.12+	640	8,049	0803-84	0823-82
	10	OND	6100-73-	0983-13+	B-060	dnD	0563-63-	0563-R3+	INC.IE.	010
9	24	te	GND	8, CM5	0582-18	0582-794	040	680.8	0602-80	0552-80
10	132	OND:	0580-75-	0582.71+	CND-10	GND	0582-84	D862-81+	0ND-J#	010
11	24	UD	GND	GALLAR	OS82-T2-	0002-72+	640	LINU-JA	0602-R2-	0502-82-
12	34	GND:	0592-73-	0592-73+	600.8	GND	0592-83-	0502-83+	0.02-38	GND
13	1-	UD	GND	8,000	D991-T9-	D001-784	GND	90.4	0001-80-	0001-80-
14	12	(INE)	C001-T1-	0881-111	SID-A	GND	DBH1-R1-	DS81-M1+	0.04	190
15	12	UD	GND	640.8	D501-T2	0601-721	GND	6.00	0801-82-	0801.82
16	125	GND.	C001.73	0501-73+	600.8	GND	C601-R5	D881.85+	845.4	0.00

6U, 17-Slot Signal Assignments

JO Signal Assignments

_	Rowl	Row H	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	Val	Vet	Vat	Vat	No Pad	Via C	Va2	V12	Vs2
2	Val	Vat	Vat	991	No Past	VN2	VN2	1952	VeJ
5	V43	915	Vet	Val	No Pad	890	W2	943	Visit
4	00	5502	SMG	GND	-12V_Aux	OND	SYSHESET	NVMIO	OND
5	910	GAP	GMP	010	3.3V_Aux	GHD.	SMI	SMI	OND
8	OND	GAY	CAP	010	+129_Aux	GND	GA1*	GA8*	SHD
7	TOK	GND	GND	TDO	TOI	GHD	OND	TMS	TRST!
	010	BEF.CLK	REF_CLK+	040	GND	ALTR. CLK	AUT CLKA	GhD .	OND

J2/P2 - J6/P6 Signal Assignments**

Plug inModule P2-P6				Row G	Row F	Row E		Row D	Rew C	Even Odd		Row A
Back	Backplane J2-J6					Row g	Rowf	Row e	Row d	Row c	Rowb	Row a
1			g [5:4]	SEwafer1	040	040-17	LING-TD-	LN0-TD+	GND	6MD-J2	LNR-RD-	LN6-RD+
2				GND	LNI-TD-	LN1-TD+	340.2	GND	LIN-SD-	UNI-RD+	6M25/27	GND
3		-	visio	SEwater.)	GID	010-12	UIG-TD.	LN2-TD+	GND	016-12	U0.60-	LN2-RD+
4		110	1	(JND	LHO-TD-	LND-TD+	GND-J2	GND	LND-RD-	LN3-RD+	SND-12	GND
5		-	-	SEwafer5	GND	0HD-17	LN4-TD-	LN4-TD+	GND	GHD-32	UN4-RD	LN4-RD+
6		1	10	GND.	LNS-TD-	LNS-TD+	SHD-JT	GND	LIS-ND-	LNS-RD+	9KD-J7	GND
1	(11) of		a kin	SEwafer7	SND	000-0	LH6-TD-	LNG-TD+	GND	006-4	DISED	LNE-RD+
			2	GND	INT-TD-	LNT-TD+	0M21-22	GND	LHP AD-	UN7-SID+	846-2	GND
.9	1		Ū.	SEwafer9	GND	010-12	LHIS-TD-	LNB.TD+	GND	040-07	LIM-RD	UNI-RD+
10	E.		10	GND .	LN0-7D-	LND-TD+	th dec	GND	LINE-RD-	UND-RD+	UND-J2	GND
15	1	*	1	SEwater11	GND	990-12	LINIS-TD-	LINIO-TD+	GND	BMD-22	LINID-RD-	LING-RD-
12		i a	÷.	GND	UNIT-TD	LN11-TD+	SND-JT	GND	Lint.sp.	LN11-RD+	GAD-JD	GND
13		an in	5	SEwafer13	040	940-2	LN12-TD-	LNI2-TD+	GND	0.00.02	LN12-RD-	LNH2-RD+
14			10	GND	LNH3-TD-	LANS.TD+	0MD-25	GND	UN18D.	UN13-RD+	040-11	GND
15			1	SEwater15	GND	010-17	LN14-TD-	LN14-TD+	GND	GMD-22	LNN+RD-	LN14-RD+
16			E.	GND	UNIS-TD-	LNHS-TD+	340-37	GND	UHS-RD-	LNHS-RD+	040-17	GND

**Any signal pins pass through the rear

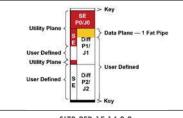
J1/P1 Signal Assignments Slots 4-15

Plug-in Module P1 Bplane J1		Row G Row i	Row F Row h	Row E		Row D	Row C	Row B		Row A
				Even Row g	Odd Row f	Rowe	Row d	Even Row c	Odd Row b	Row a
2	Port 1	0N0	0P01-T1-	0P01-T1+	040-11	OND	QP01-Rt-	OP01-RE+	GND J1	010
3		PT-VBAT	ONO	940-01	DP01-TZ-	OP01-T2+	OND	649-//L	DP01-82-	OP01-K2+
4		GND	OP01-T3-	DP01-T3+	BARTAN	GND	DP01-R3-	OP01-R3+	- 6MD-74	END
\$	214	SYS_CON"	GND	that yo	DP02-TD-	DP02.T0+	CND	riada in	DP02-R0.	0P02.80+
6	Date Plane	GND	DP02-T1-	DP02-T1+	ONL-27	GND	DP02-R1-	DP02-R1+	GND-97	GNO
7		Reserved	GN0	040-15	0P02-72-	0P02-T2+	GND	5ND-71	DP02-R2-	0P92-82+
н	•	GNG	DP02-T3-	0P02-T3+	DNDU)	GND	DP02-#3-	DP02-R3+	GNDVI	UND
9		up.	0N0	04047	0P63-T0-	DP03-T0+	ÓND	680-77	DP93.89.	0P03-80+
10	Port 3	GND	DP03-T1-	DP03-T1+	1940-01	GND	DP03-R1-	DP03-R1+	END //	UND
11		UD	GND	340.07	DP03-YZ-	D#03-T2+	GND	645.7	DP03-R2-	DP03-R24
12	9	GND	DP03-T3	DP03-T3+	040.0	GND	DP03-R3-	DP02-R3+	640-//	GND
13	800	UD	GNO	SNDUP	OPOL-TO-	DP04-T0+	GND	645.0	DP04.R0	0004-50+
14	Data Plane Port 4	GNO	OP04-T1-	DP04-T1+	090-/1	GND	DP04-R1-	OPM-R11	040-24	GND
15		Maskable Reset*	GND	DMD-07	0P54-72-	DP04-T2+	GND	6ND-/1	DPM-R2-	DP04-R2+
16		GND	DP04-T3-	DP04-T2+	946-27	GND	DP04-H3-	DP04-R3+	640.0	OND

*Slots 16 and 17 = User Defined

3U, 3-Slot Peripheral Profile

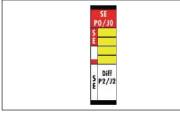
BKP3-CEN03-15.2.9



SLT3-PER-1F-14.3.2

3U, 5-Slot Switch Profile (Slots 1-2)

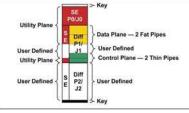
BKP3-DIS05-15.3.2



SLT3-SWH-4F-14.4.4

3U, 6-Slot Payload Profile

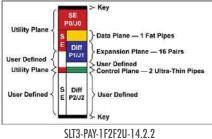
BKP3-DISO6-15.2.14, BKP3-DISO6-15.2.7



SLT3-PAY-2F2T-14.2.5

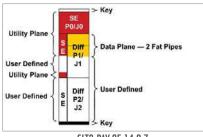
3U, 6-Slot Payload Profile

BKP3-CEN06-15.2.2



3U, 6-Slot Payload Profile

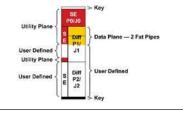
BKP3-CEN06-15.2.12



SLT3-PAY-2F-14.2.7

3U, 3-Slot Paylod Profile

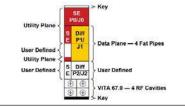
BKP3-CEN03-15.2.9



SLT3-PAY-2F-14.2.7

3U, 5-Slot Paylod Profile (Slots 3-5)

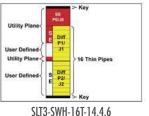
BKP3-DIS05-15.3.2



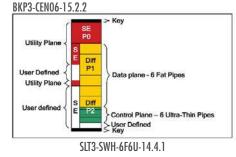
SLT3-PAY-4F4R-14.6.2

3U, 6-Slot Switch Profile

BKP3-DIS06-15.2.14, BKP3-DIS06-15.2.7

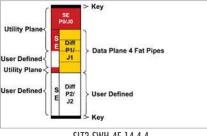


3U, 6-Slot Switch Profile



3U, 6-Slot Switch Profile

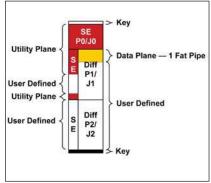
BKP3-CEN06-15.2.12



SLT3-SWH-4F-14.4.4

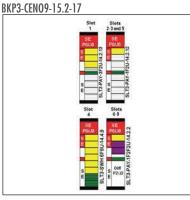
3U, 6-Slot Peripheral Profile

BKP3-CEN06-15.2.12



SLT3-PER-1F-14.3.2

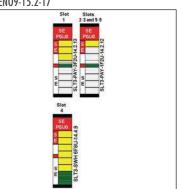
3U, 9-Slot Profiles



BKP3-CEN09-15.2-17-1 with switch in slot 4 with expansion plane

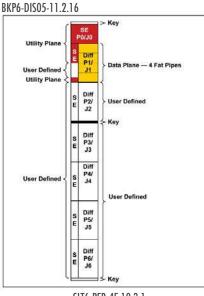
3U, 9-Slot Profiles

BKP3-CEN09-15.2-17



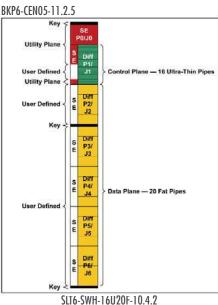
BKP3-CEN09-15.2-17-3 with switch in slot 4 without expansion plane

6U, 5-Slot Payload Profile

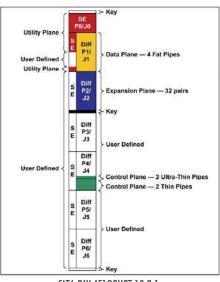


SLT6-PER-4F-10.3.1

6U, 5-Slot Switch Profile

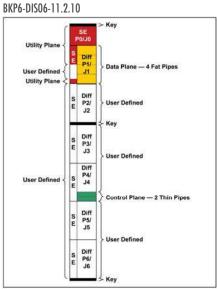


6U, 5-Slot Payload Profile BKP6-CEN05-11.2.5

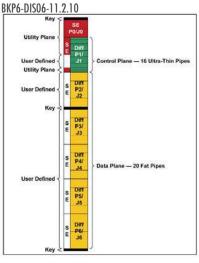


SLT6-PAY-4F1Q2U2T-10.2.1

6U, 6-Slot Payload Profile



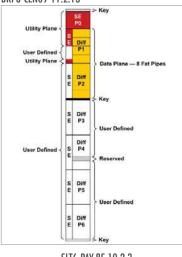
6U, 6-Slot Switch Profile



SLT6-SWH-4F24T-10.4.4

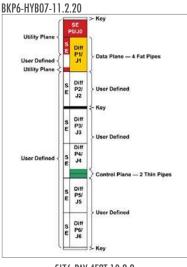
6U, 9-Slot Payload Profile

BKP6-CEN09-11.2.13



SLT6-PAY-8F-10.2.3

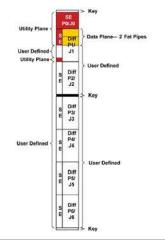
6U, 7-Slot Peripheral Profile



SLT6-PAY-4F2T-10.2.2

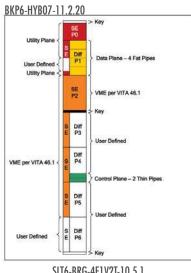
6U, 9-Slot Peripheral Profile BKP6-CEN09-11.2.13





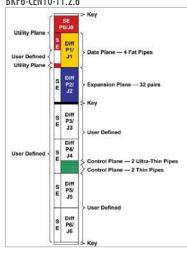
SLT6-PER-2F-10.3.2

6U, 7-Slot Bridge Profile



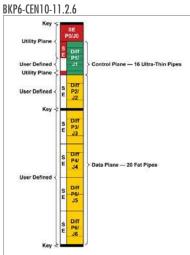
SLT6-BRG-4F1V2T-10.5.1

6U, 10-Slot Payload Profile BKP6-CEN10-11.2.6



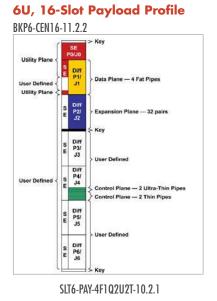
SLT6-PAY-4F1Q2U2T-10.2.1

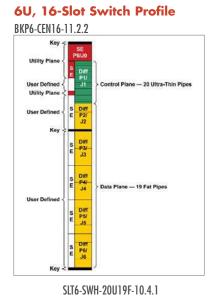
6U, 10-Slot Switch Profile



SLT6-SWH-16U20F-10.4.2

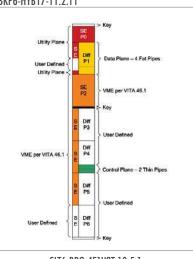
ITA Based Backplanes





6U, 17-Slot VME Profile

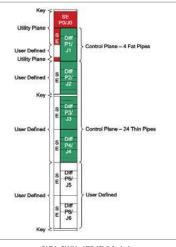
BKP6-HYB17-11.2.11



SLT6-BRG-4F1V2T-10.5.1

6U, 17-Slot Switch Profile

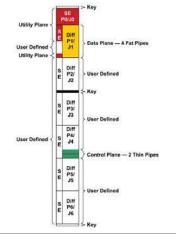
BKP6-HYB17-11.2.11



SLT6-SWH-4F24T-10.4.4

6U, 17-Slot Payload Profile

BKP6-HYB17-11.2.11



SLT6-PAY-4F2T-10.2.2

VPX Test Backplane



Version with SMA/SATA



Version without

SMA/SATA

Features

- For convenient testing of VPX/OpenVPX boards
- Designed to meet the latest VITA 46.0 and VITA 65 specifications
- Accepts either 3U or 6U VPX cards by use of the configuration jumpers on the rear of the backplane and a 3U shelf divider
- Wider slot pitch allows more space for attaching to probes SMA/SATA version has J1 "A" channel broken out to sixteen SMA connectors for each slot (32 total)
- SMA/SATA version has J1 "B", "C", and "D" channels are each broken out to four SATA II cable headers for a total of 12 headers per slot (24 total)
- Allows simultaneous access of J1 fabric signals with standard VPX RTM module for J2-J6 signals
- More than two VPX modules may be interconnected by using additional 2-slot test backplanes

Mechanical Specifications

Version	Height	Slots
for direct wafer to wafer MultiGig cable connection	6U	2
with SMA/SATA	6U	2

Multi-Gig RT-2 connectors

Board Specifications

Version	Slots	Layers	2 oz. Copper Power & Ground	PCB FR-4 or Equivalent	PCB Thickness
for direct wafer to wafer MultiGig cable connection	2	10	Yes	Yes	.213″
with SMA/SATA	2	8	Yes	Yes	.213″

The Elma Bustronic 2-slot test backplanes are unique tools that lets VPX card developers and system integrators test VPX boards. The device allows the user to power up test their J1 fabric connections as they would be interconnected in the target application. Signals can be passed from one slot to the next via high speed interconnecting cables or via signals introduced through the J1 fabric connector. The SMA/SATA version also allows access for these types of connections. Additional 2-slot Test Backplanes can be used in a larger chassis to interconnect the J1 primary fabric in any serial topology desired. Signals in any other connector position may be interconnected or accessed using optional MultiGig cable headers or typical commercial RTM modules. Note that rear cables and RTM connectors cannot be used at the same time in the same slot.

Unlike other access methods, such as rear VPX cables alone or special high speed RTM break out boards, the Elma Bustronic 2-slot Test backplane allows primary J1 fabric signals to be accessed/interconnected/injected without interfering with the use of an existing RTM module designed for J2-J6 IO connector signals. Custom backplanes are often required to interconnect the primary fabric signals between multiple VPX blades for a specific application. However, it is desirable to be able to connect two or more such blades with a test backplane before investing the time or expense of a custom VPX backplane.

Version	Height	Slots	Order Number
For direct wafer to wafer MultiGig cable connection	6U	2	1900002311-0000
With SMA/SATA	6U	2	1900002083-0000

VPX Power & Ground Backplanes



Features

- Compliant to latest VITA 46 specifications
- Power and ground only for VPX development purposes
- 3.3V, 5V, and 12V power
- Simple and low-cost development backplane
- PO-P6 pins are user-defined

Mechanical Specifications

meenanical specifications		
Height	Slots	
3U	1, 5, 6	
7U	1, 4	

Multi-Gig RT-2 connectors

Version	Layers	2 oz. Copper Power & Ground	PCB UL Recognized 94V-0	PCB FR-4 or Equivalent	PCB Thick
3U	10	Yes	Yes	Yes	.212″

Yes

Yes

The VPX power and ground development backplane is a simple and cost-effective development tool. All of the pins are user defined. Power for 3.3V, 5V and 12V are included. The rear connectors are all fully loaded.

Yes

Board Specifications

10

7U

Order Information

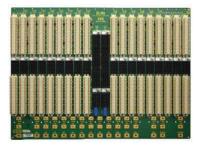
Height	Slots	Description	Order Number
3U	1	1-slot VPX power and ground	101VPX301P-1X31R
3U	5	5-slot VPX power and ground	101VPX305P-1X31R
3U	6	6-slot VPX power and ground	101VPX306P-1X31R
7U	1	1-slot VPX power and ground	101VPX701P-1X40R
7U	1	1-slot VPX power & ground w/VITA 67 RF	1900002558-0000
7U	4	4-slot VPX power and ground	101VPX704P-1X40R*

* Consult factory for ordering details

kness

.212′

VXS Backplanes



The VITA 41.0 specification for VXS was ratified by ANSI in 2006. VXS adds a high-speed connector over PO of a VME64x backplane for serial data traffic. Designers have the flexibility of plugging in standard VME64x cards for parallel bus only, integrate new payload and switch cards for parallel bus and switch fabric transport or switch fabric transport only. The VXS spec allows for four differential serial pairs per direction link over PO, and supports up to two such ports on each VMEbus card.

Backwards Compatibility

One important consideration for VME as it has evolved over the years is its backwards compatibility. From three row 16 bit, 40 Mbytes/sec to 32- bit (3U) and 64-bit (6U) (80 Mbytes/sec) to five row VME64x (160Mbytes/sec), VME has always had increased performance along with compatibility to previous specifications. VXS is no exception. The VXS design starts with a standard VME64x backplane design and implements a high speed fabric by replacing the existing P0 connector with the Multi-Gig 7 Row connector and adding hub slots fully populated with the new connector. However, the backplane is backwards compatible to VME64x/VME, allowing standard VME64x cards (without the P0 connector) to be used in the system.

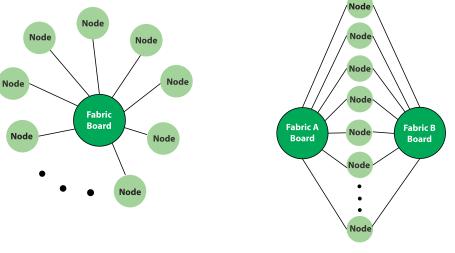
Backwards compatibility is a highly important issue. Here are some of the key reasons to maintain it:

- Preservation of investment in a technology
- Reuse of existing cards/components with ability to upgrade
- Working on a proven, tested platform
- Multiple vendors/choices of legacy platform
- Less risk of obsolescence as new compatible products are available in roadmap.

Signal Integrity

At higher clock speeds, the PCB requires cleaner signal transmission without compromising the stability of the system. Signal integrity issues such as reflections, cross talk, frequency dependent transmission line loss and dispersion can significantly lead to poorer system performance propagating through the interconnect.

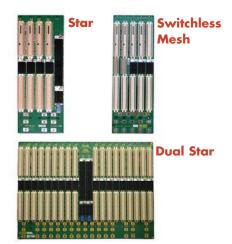
Depending on the configuration, routing a VXS backplane with superior performance can be challenging. In the higher slot sizes, the number and length of the traces can have an effect on the signal integrity. Particularly with larger backplane the number of traces and lack of physical space, it may require creative and intelligent routing schemes from an experienced designer.



Star - One Fabric

Dual Star - Two Fabric Slots

VXS Backplanes - Star, Dual Star, Switchless Mesh



Features

- Conforms to VITA 41.0-2006 VXS backplane specifications
- Versions compliant to VITA 41.6 for Ethernet Control Plane are available
- High speed MultiGig RT-2 connector over PO
- One hub slot, 4 payload slots (5-slot)
- One switch slot, 7 payload slots, and 2 legacy VME64x slots (10-slot)
- Plenty of power bugs for 3.3V, 5V, 12V and GND
- Compatible with VME64x standard line cards
- Single Star, Dual Star, Mesh, and Hybrid versions available
- Various configurations of payload slots, switch card slots, etc.

Mechanical Specifications

Version	Slots	Height
Star	5, 8 and 10 slots, other sizes available	7U height (5-slot) , 6U height (8, 10-slot)
Dual Star	8, 12, 18, and 20 slots, other sizes available	6U (8, 18, 21-slot), 7U (12, 20-slot)
Switchless Mesh	5 slots, other sizes available	7U

160-pin, class II VME connectors Multi-Gig RT-2 connectors

Board Specifications

Version	Layers	2 oz. Copper Power & Ground	PCB UL Recognized 94V-0	PCB FR-4 or Equivalent	PCB Thickness
Star	12, 14-layers	Yes	Yes	Yes	PCB .159" thick (5-slot) PCB .182" thick (8-slot) PCB .145" thick (10-slot)
Dual Star	10-layer (8-slot), 12-layer (12-slot Nelco), 18-layer (18-slot Nelco, 20, Nelco)	Yes	Yes	Yes	PCB .147" thick (8-slot) PCB .160" thick (12- slot) PCB .198" thick (12-slot Nelco) PCB .157" thick (18, 20, 21-slot)
Switchless Mesh	10 layers	Yes	Yes	Yes	PCB .148" thick

Order Information

101VXS

Height

6 = 6U

7 = 70

- Topology
- S = Single Star
- D = Dual Star
- M = Switchless Mesh T = Single Star w/ VITA 41.6
- **Control Plane**
- M = Dual Star w/ VITA 41.6 **Control Plane**

Slots

02-14

Power Interface

- 0 = 10 pin power tap with 6/32 screw
- 1 = M4 threaded stud
- 2 = 10 pin power taps with busbar kit
- 9 = Custom
- X = Not applicable

J1 Connectors and Shrouds

- 0 = Not applicable
- 1 = Not applicable
- 2 = 160 pin 17mm with shrouds, all slots
- 3 = 160 pin 13mm with shrouds, all slots 4 = 160 pin 13mm without shrouds, all slots
- 5 = 160 pin 17mm without shrouds, all slots
- 6 = 160 pin 5mm without shrouds, all slots
- 7 = 160 pin 17mm slot 1, 5mm all slots
- X = Not applicable

J2 Connectors and Shrouds

- 0 = Not applicable
- 1 = Not applicable
- 2 = 160 pin 17mm with shrouds, all slots
- 3 = 160 pin 13mm with shrouds, all slots
- 4 = 160 pin 13mm without shrouds, all slots
- 5 = 160 pin 17mm without shrouds, all slots 6 = 160 pin 5mm without shrouds, all slots
- X = Not applicable

JO Connectors and Shrouds

0 = No JO connector

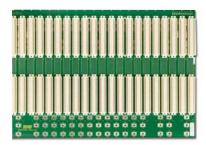
- $1 = J0 (9 \times 15 \text{ connector})$
- 2 = J0, RJ0, rear alignment pin and header

/ITA Based Backplanes

- (if VME64x slots present, JO and shrouds inst.)
- X = Not applicable

- **Common Order Number Suffixes For Power & Shrouds**
- -0621 -0621R
- If an R is present at the end of the order#, the backplane is **RoHS** compliant.

VME64X Backplanes



The Elma Bustronic VME64x backplane series is designed to fully comply with the ANSI/VITA VME extension standard. We provide all standard features required for VME64x compatibility, including 160-pin VME extension connectors in J1 and J2, all defined ground pins connected to a ground plane, routing and termination of all VME and VME64x bussed signal lines, geographic address pins, distribution of +5V, +3.3V, +/-12V, +/-V1, +/-V2, and VPC, all on a single monolithic printed circuit board with J1 and J2 included. Additional features include active, electronic IACK/BUSGRANT daisy chaining standard; onboard, inboard termination; distributed high frequency capacitors for each slot, distributed low frequency capacitors; five signal layers, five power and ground planes.

Elma Bustronic constructs the VME64x board in ten layers — five signal layers, five power and ground planes. We incorporate a full stripline design, generously distributed decoupling capacitors, inboard termination, and 2 oz. power and ground planes. We could use fewer layers, but we use this design to isolate each signal layer so our backplanes provide superior performance. Our VME64x backplanes are compliant to the VITA 1.7 Increased Current Specification.

Power Distribution

The Elma Bustronic 7U VME64x backplane families are designed with the power insertion area below the signal slots above the bottom-mounting rail so we can apply the maximum power potential to the backplane. We have inserted adequate numbers of power bugs in this area to accommodate more power than the 12 amps potential per slot. The 6U VME64X and VME320 backplanes have power bugs on top and below the slots. As an option, we offer 8/32" press-in powerstuds. +/- V1 and V2 are accommodated by a 12-pin friction lock header connector located at the top of the backplane and an 8-position utility connector for system functions, including Ground, +5V, ACFAIL, SYSFAIL, SYSRESET, +3.3V, +12V, and -12V.

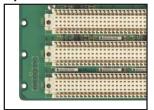




Signal Layout

The Elma Bustronic design conforms to ANSI/VITA 1.1-1997 (R2003). Onboard, inboard terminators are provided to reduce signal length and reduce possible signal reflections. A minimum stub length is utilized in routing and interconnecting to the terminators. IACK/BUSGRANT daisy chaining is accomplished utilizing surface mount components located between the J1 connectors. Elma Bustronic designs backplanes with the customer's system design in mind to ensure the highest performance, reliability, and value.

Optional - Busbar



Automatic Daisy Chaining

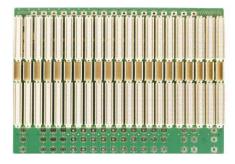
Automatic daisy chain in VME64x backplanes eliminates a major source of problems when configuring a VME64x system, while eliminating the need for access to the backplane. The VME64x backplane uses surface mount ICs for the daisy chaining. SMT is the latest in technology and offers the most space-saving and efficient processes. The VME320 backplanes have manual jumpering.

For more information see VME Reference Sheet at http://www.elmabustronic.com/CatalogInfo

Optional - Stiffeners



VME64x Backplanes - 6U, 7U



Features

- Meets or exceeds ANSI/VITA 1.1-1997 (R2003), VME extensions standard
- Exceeds ANSI/VITA 1-1994 (R2002) and IEEE 1014-1987 specifications
- 10-layer controlled impedance stripline design
- Active BUSGRANT, IACK daisy chain
- 7U versions have extra power bugs at bottom of backplane
- Superior power distribution
- Backplane stiffeners to provide durability, reliability
- Versions compliant to VITA 1.7 Increased Current Specification
- Optional conformal coating for rugged applications

Mechanical Specifications

· · · · · · · · · · · · · · · · · · ·		
Height	Slots	
6U*	5, 8, 12, 14, 15 & 21 (other sizes available)	
7U*	2-21	
Vibration: to DIN 41640 Part 15:10 Hz-500Hz 5 g rms, Impact (10 impacts per axis x. y. z) 100 g, 6 ms		

*160-pin, class II VME connectors

Board Specifications

Туре	Layers	2 oz. Copper Power & Ground	PCB UL Recognized 94V-0	PCB FR-4 or Equivalent	PCB Thickness
6U	10	Yes	Yes	Yes	.125″
7U	10	Yes	Yes	Yes	.125″

Electrical/Operating

Operating Temperature:
–40°C to +85°C
Storage Temperature:
–55°C to 85°C
Single Line Impedance:
55 Ohm +/- 10 %. Resistance
Basic Current Consumption:
1.5A Max. voltage drop for +5V and +3.3V< 40mV (at 9A/slot)

Order Information

101V64X 🔲 🔲 🔲 - 🛄 🛄 🛄

🔲 Form

M = Monolithic, J1/J2, 7U C = Monolithic, J1/J2, 6U

Slots

02-21 (7U) 05, 08, 12*, 14, 15 & 21* slots (6U, other sizes available)

Power Interface

- 0 = 10 pin power tap with 6/32 screw
- 1 = M4 threaded stud
- 2 = 10 pin power taps with busbar kit
- 8 = Not applicable
- 9 = Custom (-9XXX sequential Numbers)

J1 Connectors and Shrouds

- 0 = 96 pin, 13mm with shrouds first and last slots, all other slots 96 pin, 6mm connectors
- 1 = 96 pin, 17mm with shrouds first and last slots, all other slots 96 pin, 6mm connectors
- 2 = 160 pin, 17mm with shrouds, all slots
- 3 = 160 pin, 13mm with shrouds, all slots
- 4 = 160 pin, 13mm without shrouds, all slots
- 5 = 160 pin, 17mm without shrouds, all slots
- 6 = 160 pin, 5mm without shrouds, all slots

J2 Connectors and Shrouds

- 0 = 96 pin, 13mm with shrouds
- 1 = 96 pin, 17mm with shrouds
- 2 = 160 pin, 13mm with shrouds, all slots
- 3 = 160 pin, 13mm with shrouds, all slots
- 4 = 160 pin, 13mm without shrouds, all slots
- 5 = 160 pin, 17mm without shrouds, all slots 6 = 160 pin, 5mm without shrouds, all slots
- X = Not applicable

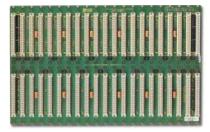
JO Connector and Shrouds

- 0 = No JO connector 1 = 95 pin (19 x 7 position 17mm with shrouds)
- X = Not applicable

Common Order Number Suffixes For Power & Shrouds

-0620	-0621
-1620	-0620R
-0621R	-1621

If an R is present at the end of the order#, the backplane is RoHS compliant.



All Elma Bustronic VME backplanes are designed to maximize performance, minimize noise, and to give the customer the most reliable, cost-effective product possible. To achieve this we use 8-layer construction, stripline design, decoupling capacitors at every slot, inboard terminators, heavy power and ground planes, transient analysis simulation programs, and years of experience designing, building, and using backplanes. Three 2 oz. copper ground layers are used to fully shield the backplane to minimize RFI/ EMI emission/susceptibility, to minimize crosstalk, and to maximize power

The outer ground layers serve to prevent signals or VCC from being exposed where they could be shorted or damaged. Two 2 oz. copper VCC layers are used to maximize power distribution and to act as virtual ground planes for the signals in order to minimize noise and crosstalk. The high frequency decoupling capacitors at every slot and distributed low frequency electrolytic capacitors throughout the board also help this effort. Measured results verify that Elma Bustronic backplanes are among the quietest in the industry.

Power Distribution

The versatile power distribution consists of power bugs at every other slot, an optional busbar may be installed directly across the power bugs without interfering with the mounting holes. In lieu of power bugs, studs may be installed. A 16-pin Molex connector is provided for power distribution and to provide control signal interfacing. High frequency decoupling capacitors are provided at every slot while low frequency decoupling is distributed throughout the PCB.

Signal Layout

Onboard and inboard terminators are provided to reduce signal length and reduce possible signal reflections. A minimum stub length is utilized in routing and interconnecting to the terminators. The bus grant jumpers are arranged between each slot and are centered for easy installation and removal. All bus grant jumpers are accessible from the front and rear. Elma Bustronic backplanes have been designed with the customers' system designs in mind in order to give the highest performance, reliability, and value in the industry.

Automatic Daisy Chaining

Automatic daisy chain eliminates a major source of problems when configuring a VME system, while eliminating the need for access to the backplane.

Mechanical Design

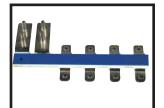
All mounting holes have adequate clearances for installation with metal hardware. All corners are rounded to allow installation into tight enclosures and prevent cables and wiring from snagging on the sharp corners. Power bugs and connectors are positioned to allow shrouds at each connector location for both J1 and J2. All slots and components are identified with easy to read silkscreen in yellow. A high quality soldermask is used to prevent chipping or scratches.

For more information see VME Reference Sheet at http://www.elmabustronic.com/CatalogInfo

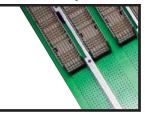
Power Bugs



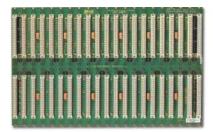
Busbar - Optional



Stiffener - Optional



VME Backplanes - J1+J2 Monolithic, J1, J2 Development



Features

- Exceeds ANSI/VITA 1-1994 (R2002) and IEEE 1014-1987 specification
- Computer simulations utilized for design optimization
- Onboard, inboard termination
- Outer ground layers for mechanical protection and EMI/RFI shielding
 - Optional BUSGRANT/IACK daisy chain connectors
- Optional high current busbar set
- Options for compliance to VITA 1.7 Increased **Current Specification**
- J2 Development backplanes with all J2 B row power and ground pins connected

Mechanical Specifications

Туре	Slots	Height
J1+J2 Monolithic	2-21	6U
J1, J2, J3	3-21	3U
J2, J3 Development	2-21	3U
J2, J3 Overlays	3-6	3U

Board Specifications

Туре	Layers	2 oz. Copper Power & Ground	PCB UL Recognized 94V-0	PCB FR-4 or Equivalent	PCB Thickness
J1+J2 Monolithic	8	Yes	Yes	Yes	.125″
J1, J2, J3	8	Yes	Yes	Yes	.125″
J2, J3 Development	2	Yes	Yes	Yes	.125″
J2, J3 Overlays	4	Yes	Yes	Yes	.125″

Electrical/Operating

Operating Temperature:
–40°C to +85°C
Storage Temperature:
–55°C to 85°C

Order Information

101VME

🔲 🗖 Form

M1 = Monolithic, 6U J1 = 3U, J1J2 = 3U, J2J3 = 3U, J3

Slots

02-21

Power Interface

- 0 = 10 pin power tap with 6/32 screw
- 1 = M4 threaded stud
- 2 = 10 pin power taps with busbar kit
- 8 = Not applicable
- 9 = Custom (-9XXX sequential Numbers)

J0 and J1 Connector Tail Length if Applicable

- 0 = 13mm first and last slots, 6mm all other slots
- 1 = 17mm first and last slots, 6mm all other slots
- 2 = 6mm all slots
- 3 = 13mm all slots 4 = 17mm all slots
- 5 = 13mm first and last slots, 6mm ADC all other slots 7 = 96 pin, 6mm earless DIN
- 9 = Not applicable
- C = 96 pin, 6mm with ADC

🔲 J2 and J3 Connector Tail Length if Applicable

- 0 = 96 pin, 13mm all slots
- 1 = 96 pin, 17mm all slots
- 2 = 96 pin, 6mm all slots
- X = Not applicable

Shrouds

- 0 = All slots shrouded where applicable
- 1 = No slots shrouded
- 2 = All J2 slots shrouded
- 5 = J2, first and last slots
- 6 = Locking shrouds where applicable
- 7 = Locking shrouds J2 only

Common Order Number Suffixes For Power & Shrouds for J1+J2 nolithic M

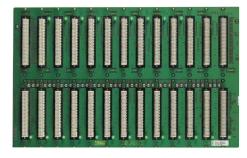
Mononthic		
-0000	-0221	-0500
-0000R	-0221R	-0500R

Common Order Number Suffixes For Power & Shrouds for J1, J2, J3

-0000	-0500	-0590
-0900	-0000R	-0500R
-0590R	-0900R	

If an R is present at the end of the order#, the backplane is RoHS compliant.

VXI Backplanes



Features

- Compliant with VXIbus spec. Rev. 1.4-1992
- 10-layer, controlled impedance stripline design
- Electronic BUSGRANT, IACK daisy chain
- Superior power distribution
- Matched propagation delays
- Virtually zero crosstalk

Mechanical Specifications

Size	Slots	Height	Pitch
C Size	5, 6, 8, 9 and 13	6U, 9U	1.2″
D Size	5, 6, 8, 9 and 13	6U, 9U	1.2″

Board Specifications

Layers	2 oz. Copper Power & Ground	PCB UL Recognized 94V-0	PCB FR-4 or Equivalent	PCB Thickness
10	Yes	Yes	Yes	.125″

Electrical/Operating

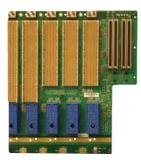
Conforms to:
Operating Temperature:
–40°C to +85°C
Storage Temperature:
–55°C to 85°C
Single Line Impedance:
55 Ohms +/- 10%
Max. Voltage Drop for +5V:
<40mV

The Elma Bustronic VXIbus backplane series are designed to fully comply with the VXIbus specifications, Rev. 1.4-5/92. Elma Bustronic has incorporated a feature set that is unique in the industry: a custom, laminated busbar, active or passive terminations, automatic active BUSGRANT and IACK jumpering, and optional AMP enhanced Eurocard connectors are offered, along with a 4-point chassis ground that can be modified by the user to isolate the chassis ground from the digital ground.

For more information see VME Reference Sheet at http://www.elmabustronic.com/CatalogInfo

Slots	Height in.	Height mm	Width in.	Width mm	Order Number
C/05	10.317	262.100	7.000	177.800	101VXIM105
C/06	10.317	262.100	8.200	208.300	101VXIM106
C/08	10.317	262.100	10.600	269.200	101VXIM108
C/09	10.317	262.100	11.800	299.700	101VXIM109
C/11	10.317	262.100	14.200	360.680	101VXIM111
C/13	10.317	262.100	16.600	421.600	101VXIM113
D/05	15.567	395.400	7.000	177.800	101VXIM205
D/08	15.567	395.400	10.600	269.200	101VXIM208
D/13	15.567	395.400	10.600	421.600	101VXIM213

AdvancedTCA Backplanes



AdvancedTCA was a major initiative from PICMG, with over 125 members participating. The 8U x 280mm cards and 1.2" pitch allow a wealth of processors and components to be used. The technology utilizes primarily Dual Star (two hubs slots with direct links to each of the node slots) and Mesh switched fabric topologies (each slot acts as a hub slot, with direct links to every other slots, vastly increasing the bandwidth). The architecture will be able to handle interfaces up to 40Gpbs (for Terabit backplane bandwidth), High Availability (99.999% uptime), and Quality of Service issues demanded by the telecom central office. The backplane allows for 48VDC input from an external source to be distributed to the individual slot cards.

The ATCA backplane is broken up into zones. Zone 1 contains the power connector. Zone 2 is made up of the signal connectors carrying the base interface, clocks, update channel interface and the fabric interface. The base interface uses an Ethernet Dual Star topology. Horizontally the connector columns have 5 differential pairs and vertically there are 10 rows. The ZD connector is specifically designed for high speed differential signaling, and is capable of speeds up to 5 Gbps. Zone 3 is for Rear Transition Modules.

ATCA boasts the following:

- High speeds scalable to 2.5Tb/sec.
- High Availability RAS (Reliability, Availability and Serviceability) functionality by virtue of Redundancy, Failover, Fault prediction and prevention
- Open standards
- Interoperable third party products contributing to a dynamic ecosystem
- Robust system management features
- Scalable and cost effective

ATCA Topologies

AdvancedTCA specification allows a variety of architectural implementations. The topologies of the specification are Dual Star, Dual Dual Star, and Mesh (including Replicated Mesh). All of these configurations can go up to 14 slots (in a 19" rack). The channel mapping allows a standard ATCA switch card to support any configuration. For instance, a Dual Star (redundant hub slots running the fabric) implementation could be implemented with cards at either end of the subrack, adjacent in slots one and two or in the middle of the backplane.

The topology of the ATCA backplane can greatly affect the overall system cost as the cards, backplane, etc, will be affected. Focusing on the backplane, a Mesh topology can demand significantly more layers than a Dual Star topology. With more point-to-point links, more layers need to be added to achieve the signal routing, which increase the cost of the backplane.

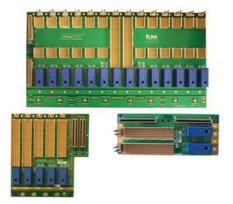
ATCA Routing

The routing of the 5-slot Mesh ATCA backplane is made up of 15 channels on each slot. Each channel has eight differential pairs and is designed as a XAUI link, which can run up to 10 Gbps (verified during signal integrity testing). Four channels from each slot create a full mesh, and using 12 channels a 3X Mesh can be implemented. Therefore, there are 3 XAUI connections between each of the slots. The 3 extra channels were routed between slots 1, 2, 3 and 4. In summary, there are a total of 4 channels connecting slots 1-4 and 3 channels connecting all 5 slots. See pinout diagram below for details. The 2-slot ATCA has direct point-to-point links between the two slots. See diagram below for details.

40G ATCA Efforts

The ATCA community has been moving to 10Gpbs per channel for 40G speeds. With Elma Bustronic's extensive prelayout and post-layout simulation studies, our backplanes have been fine tuned to achieve excellent performance. Our 40G ATCA backplanes are based on the design principles of IEEE 802.3-2008 and IEEE 802.3ba-2010 (10GBASE-KR and 10GBASE-KR4)

AdvancedTCA Backplanes - Dual Star and Mesh

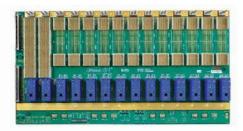


Dual Star and Mesh Features

- Compliant to PICMG 3.0 R2.0 specification
- Gigabyte/Terabyte per second bandwidth per shelf
- Connections to IPM Sentry shelf manager
- Controlled impedance stripline design
- Dual Star version has 2 Fabric slots, 12 node slots (other sizes available)
- Dual Star version has 2 shelf manager connectors in slot 0, allows full 14 slots
- Mesh versions fully connected
- 2-slot Mesh is point-to-point links, switchless

The Elma Bustronic 14-slot Dual Star AdvancedTCA (ATCA) backplanes are compliant to the PICMG 3.0 Rev.1.0 specification. The experts in high-speed differential pair routing, Elma Bustronic's ATCA backplanes have been simulated and characterized by our signal integrity lab to optimize performance.

The Elma Bustronic Mesh AdvancedTCA (ATCA) backplanes are compliant to the PICMG 3.0 Rev.1.0 specification. The experts in high-speed differential pair routing, Elma Bustronic's ATCA backplanes have been simulated and characterized by our signal integrity lab to optimize performance.



40G Features

- Compliant to PICMG 2.9 R1.0 specification
- Designed to meet 40Gbps (4 x 10G ports) data rates
- Based on design principles of IEEE 802.3ba-2010, 10GBASE-KR, and 40GBASE-KR4
- Nelco 4000 13-SI high grade laminate material
- Extensive pre-layout and post-layout simulation studies
- Backdrilled to minimize stub reflections
- Very low Insertion Loss Deviation (ILD)
- Dual shelf managers in slot 0, radial IPMB/I²C implementation
- Up to 400W/slot 48VDC distribution to each slot
- 18 layer stripline design
- Test reports available upon request

Elma Bustronic's 40G ATCA backplane was tested at AdvancedTCA Interoperability Workshops (AIW) with leading board vendors 40G switch and payload cards. The backplane performed superbly, without dropping any packets or other issues.

AdvancedTCA Backplanes - Dual Star and Mesh

Mechanical Specifications

Version	Height	Slots	Pitch
Dual Star	5U	14 (other sizes available)	1.2″
Mesh	5U, 7U	2, 5, 6, 14, and 16 slots	1.2″
40G	5U	14	1.2″

Board Specifications

Version	Layers	2 oz. Copper Power & Ground	PCB UL	PCB FR-4 or Equivalent	PCB Thickness
Dual Star	16	Yes	Yes	Yes	.132″
Mesh	10 layers (2-slot) 18 layers (5,14, 16 slot) 26 layers (6-slot)	Yes	Yes	Yes	.137" (2-slot) .151" (5-slot) .171" (6-slot) .136" (14-slot) .125" (16-slot)
40G	18	Yes	Yes	Nelco 4000 13-SI	.146″

Electrical/Operating

Conforms to:	
Operating Temperature:	
–40°C to +85°C	J
Storage Temperature:	
–55°C to 85°C	
Differential Impedance:	
100 Ohm +/- 10 %	ľ

Order Information

109 🗌 🗌 🔲 🔲 🔲 🗖 🗖 🗖 🗖

ППП Туре

ATCA = AdvancedTCA

🔲 Form

5 = 5U, Zones 1 & 2 7 = 7U

Slots

02-14

🔲 Topology

- 0 = Dual Star
- 1 = Dual-Dual Star
- 2 = Mesh 3 = Replicated Mesh

Standard Base Backplane Order#'s

Channels
Ciluineis

0 = Full channel

🔲 System Management

0 = Redundant shelf managers

🔲 Data Rate

0 = 3.125 Gbps 1 = 5 Gbps 2 = 6.25 Gbps 3 = 10 Gbps

4 = 25 Gbps

Slots	Fabric Slots	Node Slots	Description	Order Number (Base)
14	2	12	5U Dual Star standard	109ATCA514
14	2	12	5U Dual Star 40G	109ATCA510-0003R
2	all	all	5U Mesh	109ATCA502
5	all	all	5U Mesh	109ATCA505
6	all	all	5U Mesh	109ATCA506
14	all	all	7U Mesh	1900001778
16	all	all	7U Mesh	1900001495

MicroTCA Backplanes - Star, Dual Star, MicroSlim



Features

- Complies to MicroTCA.0 Specification Rev 1.0
- Slot to slot aggregate bandwidth of 5,000 Mbytes/sec
- Accepts both single and double modules
- Compression-mount standard
- Optimized via signal integrity studies, reports available upon request
- Other versions available in various configurations compact and mid size, cube and MicroSlim style
- MicroSlim version comes in horizontal mount orientation

Mechanical Specifications

Version	Height	Slots
Star**	3U	11 AMC, 1 MCH,1 JSM (J-TAG Switch Module) and 1 Power Module slot (all full size)
Dual Star**	3U	10 AMC, 2 MCH, 2 Power Module slot (all full size)
MicroSlim**	1U, 3U	6 AMC, 1 PM (Power Module), 1 MCH (MicroTCA Carrier Hub), 1 JSM (J-TAG Switch Module) and 2 CUs (Cooling Units)

**Compression-mount connectors standard

Board Specifications

Version	Layers	2 oz. Copper Power & Ground	PCB UL Recognized 94V-0	PCB FR-4 or Equivalent	PCB Thickness
Star	26	Yes	Yes	Yes	.195″
Dual Star	26	Yes	Yes	Yes	.195″
MicroSlim	20	Yes	Yes	Yes	1U, .167″ 3U, .195″

Electrical/Operating

Operating Temperature:
–40°C to +85°C
Operating Temperature:
–55°C to 85°C
Differential Impedance:
100 Ohm +/- 10 %

109

Order Information

🗌 🗌 🔲 Туре

MTCA = MicroTCA.0

🔲 Form

S = Single WidthM = Double Width

Slots

02-14

🔲 Topology

- 0 = Single Star (1 MCH)
- 1 = Replicated Single Star (1 MCH)
- 2 = Dual Star (2 MCH)
- 3 = Mesh (2 MCH)
- 9 = Custom

Power

- 1 = 1 Power Module Slot
- 2 = 2 Power Module Slots

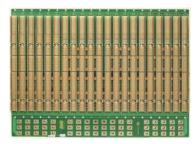
Connector Type

- 0 = Pressfit
- 1 = SMT
- 2 = Compression
- Spacing
- 0 = Full Size
- 1 = Compact
- 2 = Midsize

Standard Base Backplane Order#'s

Height	Slots	Description	Order Number
3U	14	12 AMC, 1 power, 1 MCH slots all in full size	109MTCAS14-0100R
3U	14	12 AMC, 2 power, 2 MCH slots, all in full size	109MTCAS14-2220R
1U	9	Passive: 6 AMC, 1 PM, 1 JSM, 1 MCH, and 2 CUs (Cooling Units)	1900001880-0000R
3U	24	Passive: 12 AMC, 4 HDD (w/SATA), 2 PM 2 MCH, 1 JSM, 3 spare slots and 2 CUs (Cooling Units)	1900001881-0000R
1U	24	Active: 6 AMC, 1 PSU connector, 1 MCH, and 2 CUs (Cooling Units)	109MTCAS07-0122

CompactPCI Backplanes



The Elma Bustronic CompactPCI backplane series conform to the PICMG basic specification 2.0 R3.0 and Hot Swap specification 2.1 R1.0. The H.110 CT versions also conform to PICMG H.110 Computer Telephony Specification 2.5 R1.0. We provide all standard features required for full compatibility, including all pin connections for bussed signal lines and all defined power and ground pins connected to their respective planes. User-defined VI/O is standard. 66Mhz versions are limited to 5 slots. 33Mhz versions are limited to 8 slots (without bridges).CompactPCI backplanes with slot counts beyond 8 have optional cPCI bridges (see cPCI Bridge section for details).

All Elma Bustronic backplanes are designed to maximize performance, minimize noise, and give the customer the most reliable, cost-effective products possible. We incorporate a full stripline design, generously distributed high and low frequency decoupling capacitors, 2 oz. power and ground planes to minimize noise. Our standard design with two 2 oz. copper ground planes fully shield the backplane, minimize EMI/RFI emissions susceptibility, minimize crosstalk, and maximize power distribution. There is also a full VI/O plane. Measured results verify that Elma Bustronic backplanes are among the quietest in the industry. We use stripline construction to assure the highest possible performance. By exclusively utilizing stripline construction, we eliminate a significant source of EMI/RFI radiation and give all signals similar characteristic impedances and minimal signal skew. All these items allow for significantly higher data transfer rates, since signal skew factors into the data transfer rate calculations four times.

For more information see cPCI Reference Sheet at http://www.elmabustronic.com/CatalogInfo

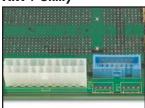
Power Distribution

The Elma Bustronic CPCI backplane family is designed with the power insertion area beside the signal slots, allowing for easy and efficient system integration. Adequate numbers of 6/32 nuts and an ATX connector have been inserted in this area to accommodate more power than the 28 amps required per slot. The ATX connector allows for an ATX power supply to be plugged in. The connector has 20 pins standard on our 6U CPCI backplane. The fastons have been added to allow additional power while taking a minimum of space. The blades are rated at 12A each. The Low Profie CPCI backplanes forego the power nuts for power studs between the slots. This method saves a slot width of space. The power bugs and taps are rated at 22A per connection.





ATX + Utility



Optional - Power Bugs



Optional - Power Studs



Signal Layout

The Elma Bustronic design conforms to the PICMG basic specification 2.0 R3.0 and basic Hot Swap specifications 2.0 R1.0. A minimum stub length is utilized in routing and interconnecting to the signal traces. Our design techniques avoid crosstalk and noise caused by inadequate ground and power. Every Elma Bustronic backplane is designed with the customer's system in mind—ensuring the highest performance, reliability, and value.

Jumpering

Jumpers can be installed to close a circuit. The backplane has labeled areas for jumper installation. The following applies to all of Elma Bustronic's CompactPCI and H.110 backplanes in 2-8 slot sizes. Configurations with 2-5 slots have an addition jumper consideration, the M66EN# jumper.

64-EN# Jumper

If the jumper is installed, 64-EN# P2-B5 (see Hot Swap specification, PICMG 2.1) is ground, and 64-bit boards will initialize for 64-bit operation. If the jumper is not installed, 64-EN# is open, and 64-bit boards will initialize for 32-bit operation.

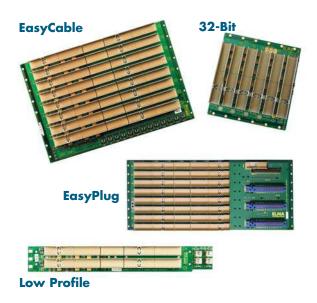
PS-ON# Jumper

If the jumper is installed, pin 14 PS-ON# on the ATX power connector is grounded. The ATX power supply will turn on immediately when plugged in. If the jumper is not installed, pin 14 PS-ON# on the ATX power connector is open. The ATX power supply will not turn on when plugged in. The PS-ON# jumper pins may be used to wire an on/off switch for the power supply.

2-5 Slot Backplanes Only: M66EN# Jumper

If the jumper is installed M66EN# P1-D21 is ground and the backplane operates in 33MHz mode. If the jumper is not installed M66EN# is bussed and the backplane operates in 66MHz mode.

cPCI Backplanes - Easy Cable, Easy Plug, Low Profile, 32-bit



Features

- Conforms to PICMG basic specification 2.0 R3.0
- PICMG Hot Swap specification 2.1 R1.0
- Controlled impedance stripline design
- Virtually zero crosstalk
- Logical slot #1 (system controller) is right justified (left justified optional)
- EasyCable version has power studs on side of backplane, allowing for easier cabling
- EasyPlug version has 47-pin power connectors in either vertical or horizontal configurations
- H.110 versions conform PICMG Hot Swap specification 2.1 R1.0 PICMG H.110 Computer Telephony specification 2.5 R1.0
- Low profile versions have power studs between slots to save space
- 32-bit versions offer more I/O pins than the 64-bit version, where those pins are defined

Mechanical Specifications

Version	Height & Slots
EasyCable	3U - 4, 6, 8 slots 6U - 3, 4, 5, 6, 8 slots
EasyPlug	3U - 8 slots 6U - 8, 14, 16 slots 9U - 2, 4, 6, 8 slots
Low Profile	3U - 3 slot 6U - 4, 6, 8 slots
32-Bit	3U - 3, 8 slots 6U - 6, 8 slots

For 16 and 21 slot version: separate bridgeable segments

Board Specifications

Version	Layers	2 oz. Copper Power & Ground	PCB UL Recognized 94V-0	PCB FR-4 or Equivalent	PCB Thickness
EasyCable	8, 12 for H.110	Yes	Yes	Yes	PCB .125" thick (.132" thick for H.110)
EasyPlug	8, 12 for H.110	Yes	Yes	Yes	PCB .125" thick (.132" thick for H.110)
Low Profile	10-layers, 8-layers (2-slot) PICMG 2.16 versions vary	Yes	Yes	Yes	PCB .134" thick, (.125") 2-slot, (.140") 3-slot, PICMG 2.16 versions vary
32-Bit	10	Yes	Yes	Yes	PCB .125″ thick (.128″ for 3U 3-slot)

Electrical/Operating

Operating Temperature:
–40°C to +85°C
Storage Temperature:
–55°C to 85°C
ZO Impedance (without connectors & daughter cards):
65 Ohm +/- 10%
Current Carrying Capacity (+3.3V/GND):
10A / slot

EasyCable Order Information

102CPCI

Form

3 = 3U 6 = 60

Slots

- 04 = 4 slots 66mhz capable 05 = 5 slots 66mhz capable 06 = 6 slots
- 08 = 8 slots

Power Interface

- 0 = Power taps with 6-32 screws
- 1 = Not applicable
- 2 = 6-32 nuts and fastons for +12V, -12V(This is the only power interface for 3U backplanes)
- 4 = 6/32 pressed nuts, ATX connector and utility connectors
- 5 = ATX connector only, PWR taps +3.3V, 5V, V10, GND
- 6 = Power taps, ATX connector and utility connectors
- 9 = Custom (9XXX sequential numbers)
- X = Not applicable

Connectors for P1, P2

- 0 = P1 short, P2 long
- 1 = P1 short, P2 short
- 2 = P1 short, No P2
- X = Not applicable 7 = 96 pin, 5mm without shrouds, all slots
- X = Not applicable

Connectors for P3, P4 & P5

- 0 = Not applicable
- 1 = Not applicable
- 2 = Not applicable
- 3 = Not applicable
- 4 = Not applicable
- 5 = P3 & P5 long type AB, P4 long type A
- X = Not applicable

Shrouds

- 0 = P2 only
- 1 = Not applicable
- 2 = Not applicable 3 = Not applicable
- 4 = Not applicable
- 5 = Not applicable 6 = Not applicable
- 7 = P2 if long tail, P4 type A ,
- P3 & P5 type AB
- X = Not applicable

Common Order Number Suffixes For

Power &	Shrouds
-4057	-4057R
-4157	-4157R
-40X0	-40X0R
-41XX	-41XXR

If an R is present at the end of the order#, the backplane is RoHS compliant.

EasyPlug Order Information 103

ССС Туре

CPCI = CPCI Backplane, 64 Bit CTEL = H.110 compatible, 64 Bit CPCR, CTER = 64 Bit, system slot right CPCL = 64 Bit, system slot left CP3R, CT3R = 32 Bit, system slot right CP3L, CT3L = 32 Bit, system slot left

🗌 Form

Slots

01-21

Power Interface

- 0 = Power taps with 6-32 screws
- 1 = 3 Positronic connectors for 6U power supplies
- 2 = 6-32 nuts and fastons for $+12\dot{V}$, $-12V^*$
- 3 = 1 Positronic connector for 3U power supply
- 4 = 2 Positronic connectors for 3U power supplies
- 5 = 3 Positronic connectors for 6U power supplies

- 6 = 1 Positronic connector for 6U power supply
- 7 = 2 Positronic connectors for 6U power supplies*
- 8 = 4 Positronic connectors for 3U power supplies
- 9 = Custom (9XXX sequential numbers)
- X = Not applicable

Connectors for P1, P2

- 0 = P1 short, P2 long
- 1 = P1 short, P2 short
- 2 = P1 short, No P2
- X = Not applicable

Connectors for P3, P4 & P5

- 0 = Not applicable
- 1 = Not applicable
- 2 = Not applicable
- 3 = P3 long type AB, P4 tye A long all slots, P5
- long type AB for CTEL 4 = P3 long type AB, P4 short (slot 1 long), P5
- long type AB for CTEL
- 5 = P3 & P5 long type AB, P4 long type A
- X = Not applicable

Shrouds

- 0 = P2 only
- 1 = Not applicable
- 2 = Not applicable
- 3 = Not applicable
- 4 = Not applicable
- 5 = P2 if long tail, P4 type A all slots, P3 & P5 type AB for CTEL
- 6 = P2 if long tail, P4 slot 1 type A, P3 & P5 type AB for CTEL
- 7 = P2 if long tail, P4 type A , P3 & P5 type AB
- X = Not applicable

Common Order Number Suffixes For Power & Shrouds

·21XX	-21XXR
3157	-3157R
-1157	-1157R
7157	-7157R

If an R is present at the end of the order#, the backplane is RoHS compliant.

cPCI Backplanes - Low Profile, 32-Bit Order Information

Low Profile Order Information

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🗌 🗌 🔲 Туре

CPCI = CPCI Backplane, 64 Bit CTEL = H.110 compatible, 64 Bit CPCR, CTER = 64 Bit, system slot right CPCL = 64 Bit, system slot left CP3R, CT3R = 32 Bit, system slot right CP3L, CT3L = 32 Bit, system slot left

🔲 Form

3 = 3U6 = 6U7 = 7U

Slots

02-21

Power Interface

- 0 = Power taps on GND, +5V, +3.3V, faston blades for +/- 12V
- 1 = Studs
- 9 = Custom (9XXX sequential numbers)

32-Bit Order Information

X = Not applicable

Connectors for P1, P2

- 0 = P1 short, P2 long
- 1 = P1 short, P2 short
- 2 = P1 short, No P2
- X = Not applicable

Connectors for P3, P4 & P5

- 0 = Not applicable
- 1 = Not applicable
- 2 = Not applicable
- 3 = P3 long type AB, P4 short (slot 1 long), P5 long type AB for CTEL
- 4 = P3 long type AB, P4 long all slots, P5 long type AB for CTEL
- 5 = P3 & P5long type AB, P4 long type A
- X = Not applicable

Shrouds

- 0 = P2 only
- 1 = Not applicable
- 2 = Not applicable
- 3 = Not applicable
- 4 = Not applicable
- 5 = P2 if long tail, P4 type A all slots, P3 & P5 type AB for CTEL
- 6 = P2 if long tail, P4 slot 1 type A, P3 & P5 type AB for CTEL
- 7 = P2 if long tail, P4 type A , P3 & P5 type AB
- X = Not applicable

Common Order Number Suffixes For Power & Shrouds

-0136	-0157
-10X0	-1157
-11XX	-20X0
-0136R	-0157R
-10XOR	-1157R
-11XXR	-20X0F

If an R is present at the end of the order#, the backplane is RoHS compliant.

10 🗖 🗖 🗖 🗖 🗖 🗖 🗖 🗖 🗖 🗖 🗖

Version

2 = EasyCable 5 = Low Profile

🗌 🗌 🔲 Type

 $\begin{array}{l} \mbox{CP3R} = 32 \mbox{ Bit, System Slot Right} \\ \mbox{CP3L} = 32 \mbox{ Bit, System Slot Left} \end{array}$

🔲 Form

3 = 3U

6 = 6U

Slots

02-21

Power Interface

- 0 = Power taps on GND, +5V, +3.3V, faston blades for +/- 12V
- 1 = Studs
- 2 = Custom (9XXX sequential numbers)
- X = Not applicable

Connectors for P1, P2

- 0 = P1 short, P2 long
- 1 = P1 short, P2 short
- 2 = P1 short, No P2
- X = Not applicable

Connectors for P3, P4 & P5

- 0 = Not applicable
- 1 = Not applicable
- 2 = Not applicable
- 3 = P3 long type AB, P4 tye A long all slots, P5 long type AB for CTEL
- 4 = P3 long type AB, P4 short (slot 1 long), P5 long type AB for CTEL
- 5 = P3 & P5 long type AB, P4 long type A
- X = Not applicable

Shrouds

- 0 = P2 only
- 1 = Not applicable 2 = Not applicable
- 3 = Not applicable
- 4 = Not applicable
- 5 = P2 if long tail, P4 type A all slots, P3 & P5 type AB for CTEL
- 6 = P2 if long tail, P4 slot 1 type A, P3 & P5 type AB for CTEL
- 7 = P2 if long tail, P4 type A , P3 & P5 type AB
- X = Not applicable

-20X0

Common Order Number Suffixes For Power & Shrouds -10X0 -11XX

-10X0R

If an R is present at the end of the order#, the backplane is RoHS compliant.

cPCI Backplanes - Serial and Plus IO





Features Serial Backplane

- PICMG CPCI-S.0 R1.0 2011 CompactPCI Serial compliant Backplane
- 1 x CPCI S.O System Slot (CPU) and 8 x CPCI S.O Peripheral Slots
- High-speed connectors supporting up to Data Transfer rate up to 12Gbps are in all 9 Slots
- Designed to support Rear Transition Modules
- Single Star Topology for Serial Interfaces such as PCI Express, SATA, USB2 + USB3 are provided by the CPCI S.0 System Slot
- All 9 Slots are connected to each other through a Full Mesh Ethernet Topology
- Eurocard form factor in 3U height

Features Plus IO Backplane

- PICMG 2.30 CPCI PlusIO R1.0 2009 compliant backplane
- Hybrid function by having standard CPCI Standard Slots and CPCI – S.O Peripheral Slots
- High-speed connectors in the 4 x CPCI S.O Peripheral Slots, legacy cPCI in other 4 slots
- Eurocard form factor in 3U height
- Designed to support Rear Transition Modules
- System management interface on the backplane

Mechanical Specifications

Version	Height	Slots	PCB Thickness
Serial Backplane	3U	9	4.15mm
Plus IO Backplane	3U	4	4.3mm

Board Specifications

Version	Layers	Slot Pitch	PCB Material
Serial Backplane	TBD	0.8″	NELCO 4000-13
Plus IO Backplane	12	0.8″	FR-4 or equivalent

Version	Height	Slots	Width	Order Number
Serial Backplane	3U	9	197.12mm	1900002441-0000
Plus IO Backplane	3U	4	160.56mm	TBD

PICMG 2.16 Backplanes



Features

- Conforms to PICMG 2.16 R1.0 specification
- Conforms to PICMG basic specification 2.0 R3.0
- Moves data via switched Ethernet fabric (10/100/1000 Mbit/s)
- Hot-swappable fabric slots in various configurations
- Standard power studs
- Supports existing SBCs, Ethernet cards, and line cards
- 10-14 layer controlled impedance stripline design
- Versions with connections to IPM Sentry Shelf Manager

Mechanica	I Specificatio	ons			Electrical/Operating
	Height			Slots	Conforms to:
	6U		4, 6, 8, and 21	slot sizes standard	Operating Temperature:
Ethernet and cPCI compatible			–40°C to +85°C		
Board Spe	cifications				Storage Temperature:
Layers	2 oz. Copper Power & Ground	PCB UL Recognized 94V-0	PCB FR-4 or Equivalent	PCB Thickness	–55°C to 85°C
10-1/	Voc	Vas	Voc	132" 152"	

The performance of CompactPCI is vastly improved with the cPSB (PICMG 2.16) protocol. It provides the ideal solution for third-generation wireless, Internet protocol, voice over IP (VoIP), and other applications that require high processing power and data rates. CPSB increases system performance by moving data traffic off the shared bus, and onto an embedded switched Ethernet network fabric (10/100/1000 Mbit/s), accessed via the P3 connector.

The 4-slot, 6-slot, and (one of the) 8-slot backplanes have 1 fabric slot, with the rest of the slots as node slots with the CompactPCI bus. Elma Bustronic also offers an 8-slot version with 2 fabric slots, with the rest of the node slots with the CompactPCI bus and with or without the H.110 bus. All of Elma Bustronic's standard PICMG 2.16 backplanes offer one slot that is convertible to a system slot via a CPU Enable jumper. With the power studs and power blades dispersed throughout key locations in the backplanes, the overall widths are a true 4-slot, 6-slot, and 8-slot size. This allows the 4-slot, and 8-slot backplanes to fit within 2U, and 4U horizontal chassis respectively. Further, the use of 6/32 power studs gives the backplanes modularity, allowing power interface boards in various configurations to be mounted to the backplane. Elma Bustronic offers design services for various other configurations of PICMG 2.16. The backplanes have several 6/32 power studs for 3.3V, 5V, VI/O, and GND and fast-on blades for +/- 12V. Per the specification, the shelf geographical addressing is located in the P3 section of the backplane and is configurable. The DEG (derate/degrade) and FAIL headers can be run from the power supply to the CPU board for power supply monitoring. A PRST (power on reset pin) is also included. Some cPSB versions include a 20-pin header with pins for the Intelligent Platform Management Bus (IPMB) for shelf management.

Slots	Fabric Slots	Node Slots	Height in.	Width in.	Order Number
4	1	2 w/cPCI, 1 node/sys slot w/ cPCI	10.32	3.16	107PS11604
6	1	4 w/cPCI, 1 node/sys slot w/ cPCI	10.32	4.78	107PS11606
6	1	4 w/cPCI and H.110 bus, 1 node/sys slot w/ cPCI	10.32	4.78	108PS11606
8	1	6 w/cPCI, 1 node/sys slot w/ cPCI	10.32	6.38	107PS11608
8	2	5 w/cPCI, 1 node/sys slot w/ cPCI, IPM Sentry shelf mgmt. connector	10.32	6.38	107PS21608
8	2	5 w/cPCI and H.110, 1 node/sys slot w/cPCI	10.32	6.38	108PS21608
21	2	19 node slots, no PCI	10.32	16.78	107PS21621

Other Backplanes and Boards

CompactPCI Express

- Complies to PICMG EXP.0 R1.0 specification
- PCI Express over 3U CompactPCI form factor
- System slot-two ZD and one enriched 2mm HM, power connector
- Type 2-one ZD and the one enriched 2mm HM

- The Type 2 slots can be converted to hybrid cPCI/PCIe
- Controlled-Impedance stripline design
- RoHS compliant versions also available
- 4-slot version uses power nuts, 6-slot version uses M4 power bolts Order Number: 1900001476 (4-slot), 1900001737 (6-slot)

VITA 31.1

- 10/100/1000BASE-T Ethernet switched network on a VME64x backplane
- 2 redundant VITA 31.1 Fabric Slots, right side of backplane
- 6 VITA 31.1 Node Slots
- Increase bandwidth and reliability
- Switches 100% compatible to PICMG 2.16
- Standard VME64x / cPCI connectors
- Automatic active Daisy Chain
- Passive inboard termination (basic current consumption 1.5A)
- Power input: M3/M4 power bolts (M3/M4 cable lugs, washer and nuts enclosed)
- 10-layer construction
- ANSI/VITA 1.1-1997 VME64x Standard compliant
- According to VITA 1.7 Increased Current Level For 96 Pin & 160 Pin DIN/IEC Connector
- Order Number: 1900001484

Miscellaneous Backplanes & Boards

- Backplanes in ISA, PXI, PCI-X, PCI, ISA and more
- ISA available in 4, 6, 8, 12 and 14 slots
- Busbar Kits For VME, VXI, VME64x and custom applications. Can be cut to various sizes
- Daisy Chain Modules (Jumper Boards) Fills unused slots in the system and deflects airflow. Available in various chassis depths and heights.
- VME JO Connector Mounting Boards in 2-21 slots. Completely user definable
- Terminators VME J1 and J2 off-board terminators
- PXI, PCI-X Backplanes See custom versions on PXI and PCI-X pages on Elma Bustronic's Web site

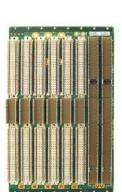
Rear Transition Module (RTM)

- For VXS, VME/64x, cPCI, ATCA, VPX and other architectures
- Elma Bustronic offers unique rear I/O and RTM solutions VXS and VPX
- Design and contract assembly services available
- Sizes in 3U x 80mm, 6U x 80mm, 8U x 80mm and more

Universal VPX RTM Breakout Board

- 6U x 80 mm RTM format
- Designed to meet VITA 46.10 for VPX RTM modules
- Supports 2 Level Maintenance per VITA 46.0 section 4.5
- 10-layer design
- Breakout for all signals possible depending upon connector configuration
- All the available RTM signals from connectors rJO-rJ6 are broken out to .010" x .010" grids of solder pads
- Front panel and injector/ejector optional, with all necessary holes provided
- Strain relief holes provided directly behind the front panel mounting location for clamping bar or wire-ties







Other Backplanes & Boards

Test Extender Boards - VME, VME64x, VPX, VXI, VXS



Features

- Designed to meet mechanical and electrical connection requirements of latest ANSI/VITA standards
- All J1 (and J2) connector pins can be individually switch isolated
- Test points for all 96 or 160 pins of J1 and J2
- Optional J0 connector available for VME64x
- Designed for use in 160mm and 220mm chassis
- Rugged card guide handles most legacy VME products

Mechanical Specifications

VME64x - 6U x 220mm VME - Can be assembled in any combination to make 3U, 6U, 9U, or 12U configurations VXI – 6U x 340mm All J1, J2 and J0 connectors are DIN, class II

Elma Bustronic test extender boards comply with the mechanical and signal connection requirements of the latest ANSI/ VITA standards. The extender boards are designed to bring a circuit card completely out of a card cage or enclosure so that it can be tested or debugged. This provides access to both sides of the test board. There are test points for all of the lines on each 96 pin (VME, VXI) or 160-pin (VME64x) connector. Each signal, power, and ground line can be individually isolated with the DIP switches. The extender boards accommodate use in 160mm and 220mm chassis. The rugged card guide handles securely hold the test board, ensuring a reliable connection. The +5U, ±12V, 3.3V, and GND pins for VME64x are tied to their respective planes.

ORDER INFORMATION

Board Specifications

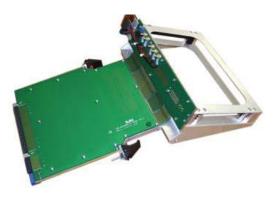
PCB UL recognized 94V-0 PCB FR-4 or equivalent

PCB .062"

VME, VXI - 8-layer stripline design

VME64x - 12-layer stripline design

Туре	Height	Length	Order Number
VME64x (no P0 connector)	6U	220mm	116EXT6122-012X
VME64x (with P0 connector)	6U	220mm	116EXT6122-0125
VME	3U	200mm	111EXT3122
VME	6U	200mm	111EXT6122
VME	9U	200mm	111EXT9122
VME	3U	400mm	111EXT3140
VME	6U	400mm	111EXT6140
VME	9U	400mm	111EXT9140
VXI	6U	340mm	113EXT6134-012X



Features - VXS, VPX

- Conforms to VITA 41.0 VXS or VITA 46 VPX backplane specifications
- Controlled impedance rigid-flex-rigid design
- Alignment keying headers provided for extender and plug-in card
- 100 Ohm differential pair routing
- J1 signals are single-ended signals and run point-to -point across the extender (VPX version)
- Mechanical frame supports 6U, 160mm plug-in card
- Signal rate: 3.125 Gb/sec
- Current monitor on +5V power (VXS version)
- Order Number:
- 118EXT6024-0XXX (Payload) 115EXT6024-0XXX (Switch) 119EXT6024-05XX (6U VPX) 119EXT3024-07XXR (3U VPX)

Mechanical Specifications

6U x 240mm

Board Specifications

10-layer stripline design PCB UL recognized 94-V0 PCB Material: FR4 rigid, polyimide flex PCB .080" thick Accessories

Test Extender Boards - cPCI, ATCA, uTCA



Shown with cPCI board inserted into the extender

Features - cPCI

- Designed to meet latest PICMG specification
- External ground planes for mechanical protection and EMI/RFI shielding
- IEEE 1101.10 compatible injector/ejector handles
- Test points for all lines on each 2mm HM connector in P1-P5 can be individually switch isolated
- Metal frame securely holds test board in place
- Order Number: 117EXT6116-0XXX

Mechanical Specifications

6U x 400mm

Elma Bustronic CompactPCI test extenders comply with the mechanical and signal connection requirements of PICMG 2.0 Rev. 3.0. The cPCI extender boards bring a circuit card completely out of a card cage or enclosure so that it can be tested or debugged. This provides access to both sides of the test board. There are test points for all of the lines on each 2mm HM connector in P1-P5. Each line in rows A-E of the 2mm HM connector can be individually isolated with the DIP switches. The cPCI extender board accommodates use in 6U x 400mm chassis. The secure metal frame firmly holds the extender board to the test board. It also has ejector/injector latches, allowing the extender board to lock into the chassis.

Additional features include high and low frequency decoupling capacitors, five signal layers and seven power and ground planes. Elma Bustronic test extenders are designed to maximize perfomance, minimize noise and give the customer the most accurate test results possible.



Features - ATCA

- Mechanical extension of boards outside the chassis for testing
- Metal frame securely holds test board in place
- Designed to meet mechanical and electrical connection requirement of PICMG Rev. 3.0
- External ground planes for mechanical protection and EMI/RFI shielding
- The injector/ejector handles provide a secure and reliable connection to the chassis
- Order Number: 114EXT8040-0XXX

Board Specifications

Board Specifications

PCB ÚL recognized 94-VO PCB FR-4 or equivalent PCB .062" thick

12-layer stripline design (cPCI)

10-layer stripline design PCB UL recognized 94-V0 PCB FR-4 or equivalent PCB .062" thick **Mechanical Specifications**

8U x 711.2mm

The AdvancedTCA extender board extends both the power and IPMB (Intelligent Platform Management Bus) signals. With a 10-layer stripline design, the extender is designed for the full populated fabric slot (5 ZD connectors, P20 thru P24) and the power connector J10. The Zone 3 section is served by a blind board assembled to Zone 1+2 through the frame. The flexible design of the Zone 3 area allows for customization with minimum costs, by simply changing the blind board the required configuration. The complete keying system, including the Zone 3 area is assembled.



Features - uTCA

• Complies with MicroTCA.0, AMC.1 R1.0, AMC.2 D0.96A

- Extends board outside of the card cage for easy test or de-bug
- Extends all fabric signals, 3 clock lines
- Virtually zero power consumption
- Metal frame securely holds test board in place
- Virtually zero power consumption
- Management and payload power can be individually switch isolated
- Order Number: 026-505

Rear Extender Boards - cPCI



Features

- Compliant to PICMG 2.0 Rev. 3.0 specifications
- 6U x 180mm form factor
- Extends rear I/O signal
- 12-layer controlled impedance stripline design
- Injector/ejector latches provide easy insertion and removal
- PCB FR-4 or equivalent, 0.125" thick

Order Information

Туре	Height	Length	Order Number
cPCI Rear	6U	180mm	117FFE6018-0XXX

Form Factor Extenders



Features

- Versions for VME, VME64x
- Allows boards of different depths to be used in the same depth card cage
- Outer ground planes for mechanical protection and EMI/RFI shielding
- Available in multiple sizes: 3U x 60mm, 6U x 60mm,
- 6U x 120mm, 6U x 180mm
- High performance stripline design

Туре	Height	Length	Order Number
VME	3U	60mm	111FFE3006-01XX
VME	6U	60mm	111FFE6006-012X
VME	6U	120mm	111FFE6012-012X
VME	6U	180mm	111FFE6018-012X
VME64x	6U	60mm	116FFE6006-012X
VME64x	6U	180mm	116FFE6018-012X
VME64x (w/ P0 connector)	6U	180mm	116FFE6018-0125

Load Boards - VME/VME64x, cPCI, AMC, VPX



Features

- Conforms to electrical and mechanical connections latest VME, VME64x, cPCI, AMC or VPX specifications
- Verifies chassis can meet power requirement and specifications
- Aids in locating hot spots in the chassis
- Visual GO-NO GO indicators for +5V, +3.3V, +12V, -12V VME primary test points +V1, +V2, -V1, -V2, ACFAIL, SYSRESET, SYSFAIL, and GROUND
- CPCI primary voltage test points are V I/O, PRST#, FAIL#, and GND
- Power supply loading can be controlled with front panel switches

Developed to enhance testing of VME, VME64x, cPCI, AMC and VPX systems the load boards aid the system designer in assuring adequate chassis cooling and verifying that the chassis is capable of meeting the power requirements of the system (or VITA, PICMG specs). Predominantly used by chassis manufacturers and system developers, the load board provides significant time and expense savings by assuring a system's operating specifications. The load board functions to test a system's cooling capabilities by first applying the load to the power supply for verification and finally creating the necessary heat to confirm chassis cooling. By locating hot spots in the chassis, a system designer can verify where to optimally redirect the airflow to prevent overheating. The load board increases productivity by quickly and accurately characterizing systems at low cost. In addition, the cPCI load board offers power supply loading that utilizes binary switches to impose a load ranging from 0 to 7 amps of the primary load. This feature is also used for thermal characterization.

The AdvancedMC[™] load board is dedicated for testing the cooling and power of MicroTCA systems. Single module/full size is standard with options for double modules and compact or mid sizes. The board is hot swap pluggable and has IPMI support. The load is configurable in to seven wattages: 0W, 20W, 30W, 40W, 50W, 60W and 70W. Six LEDs on the front panel indicate which power level is activated. If all LEDs are off, the power is 0W. Custom wattages and access management is available upon request.

<u>Switc</u>	h +5V	+3.3V	+12V	-12V	V I/O:+5V	V I/O:+3.3V
000	off	off	off	off	off	off
001	1 A	1 A	0.1 A	0.1 A	5.0 A	3.3 A
010	2 A	2 A	0.2 A	0.2 A	2.5 A	1.7 A
011	3 A	3 A	0.3 A	0.3 A	7.5 A	5.0 A
100	4 A	4 A	0.4 A	0.4 A	1.3 A	0.8 A
101	5 A	5 A	0.5 A	0.5 A	6.3 A	4.1 A
110	6 A	6 A	0.6 A	0.6 A	3.8 A	2.5 A
111	7 A	7 A	0.7 A	0.7 A	8.8 A	5.8 A

CPCI Test Point Chart

VME Test Point Chart

	IIGH			
Switch +5V	+3.3V	+12V	-12V	
<u>000 off</u>	off	off	off	
001 1 A	1 A	0.1 A	0.1 A	
010 2 A	2 A	0.2 A	0.2 A	
011 3 A	3 A	0.3 A	0.3 A	
100 4 A	4 A	0.4 A	0.4 A	
<u>101 5 A</u>	5 A	0.5 A	0.5 A	
110 6 A	6 A	0.6 A	0.6 A	
111 7 A	7 A	0.7 A	0.7 A	

Туре	Height	Length	Order Number			
AMC (uTCA)	3U	180mm	1940000264-0000			
cPCI	6U	160mm	1940000135-0000			
VME/VME64x	6U	160mm	1940000140-0000			
VPX	3U	160mm	1940000345-0000R			
VPX (convection-cooled)	6U	160mm	1940000355-0000R			
VPX (conduction-cooled)	6U	160mm	1940000376-0000R			

Accessories

Power Interface Boards



Features

- Designed to comply with power interface specification PICMG 2.11 Rev. 1.0
- Designed to comply with IEEE 1101.10 mechanical specification
- 3U and 6U, one or two pluggable 47-pin power connectors
- Interface to backplane via power bugs with 6/32 screws
- Header for voltage sense, current share (2 ps connector version) and IPMB interface compliant to system management specification PICMG 2.9 Rev. 1.0
- Power taps for +5V, 3.3V, GND and faston blades for +12V, -12V
- Utility (20-pin), aux/disk drive, and power switch connectors
- Geographical Addressing on the power supply connector is selectable

The Power Interface Boards are separate boards for the power section of the backplane. They are used to facilitate pluggable power supplies, headers, and utility connectors. Elma Bustronic's standard backplane lines utilize power taps and power studs, which are wired to the power supplies. With the PIBs, customers will be able to choose between Elma Bustronic's standard power interface and pluggable modules. The power boards come in standard 3U and 6U heights and contain one or two 47-pin Positronic hot-pluggable power supply connectors (Positronic PCIH47F9300A1-246.0), and a 20-pin header for voltage sense and IPMB interface (Thomas & Betts 609-2037 or equivalent). Two power taps are for +5V, two for 3.3V, and four for GND. There are also four Fast-on blades each for -12V and +12V (AMP 63650-1 or equivalent). (For the 1 ps connector version, reduce the number of power taps and faston blades listed above in half.) The PIB interfaces to the backplane via power bugs with 6/32 screws. The design also includes mounting holes, allowing the PIB to be securely fixed to the chassis.

Other features include an auxiliary/disk drive connector (TYCO 350424-1 or equivalent), and a power switch header (AMP/TYCO 640456-2 or equivalent). The sense lines help the power supply better regulate the power at the load end. The function header allows remote or local sense. For optimal power regulation, remote sense is recommended. The current share lines allow multiple power supplies to share current, either on one PIB (with two power supply connectors) or between multiple PIBs. The current share lines have to be connected if using more than one PIB. The Geographical Addressing is configurable through jumpers, with GAO, GA1, and GA2. (The 2 ps version has two sets of these jumpers.) The IPMB interface is compliant to system management specification PICMG 2.9 Rev. 1.0. The PIB is also designed to comply with the power interface specification PICMG 2.11 Rev. 1.0 and with the IEEE 1101.10 mechanical specification.

Height	Width	Power Supply Connectors	Order Number
3U	1.54″	single	106PIMB301-0000
3U(w/ AC pins)	1.54″	single	106PIMB301-9001
3U	3.13″	dual	106PIMB302-0000
3U(w/ AC pins)	3.13″	dual	106PIMB302-9001
6U	1.54″	single	106PIMB601-0000
6U(w/ AC pins)	1.54″	single	106PIMB601-9001
6U	1.54″	dual	106PIMB602-0000
6U(w/ AC pins)	1.54″	dual	106PIMB602-9001

Bridges and Monitors



Bridges - cPCI

- Low profile bridge enables the use of off-the-shelf rear transition modules
- Based on the Pericom P17C8154 PCI to PCI Bridge
- Compatible with the Intel 21154BE/AC/AE/BE and P21150 drivers
- Allows concurrent bus transfers on both PCI bus segments
- Accepts 32-bit or 64-bit, automatic detection of bus widths
- Accepts 33MHz or 66MHz bus frequencies
- Supports 3.3V or 5V input for bridge driver (onboard voltage regulator)
- Provides 7 clock signals for the secondary backplane
- Arbitration for 7 devices on the secondary backplane possible
- Version available for right or left-justified system slot

- System Configuration
- The buildes seems 1 date
- The bridge spans 4 slots
- System configurations with one bridge: 7 slot (primary) + 3-7 slot (secondary) backplane
- System configurations with one bridge: 7 slot (primary) + 7 slot (middle) +3-7 slot (tertiary) backplane. The configurations are for 33 MHz operation-fewer slots are supported with 66 MHz operation.

Order Information

Height (mm)	Width (mm)	Thickness (mm)	Order Number
95.13	74.81	1.8	1940000260-0000R (Left)
95.13	74.81	1.8	1940000260-0001R (Right)



System Monitor OnlinePro

- Up to 8 voltages
- Monitors up to 14 temperature sensors
- Monitor and control up to 12 fans
- Ethernet interface: TCP/IP HTTP, Telnet protocol supported
- RS232 interface
- User configurable I/O pins

The SysMon OnlinePro is a platform independent system monitor for monitoring internal system conditions including temperature, voltage, fan rotation or power supply. The system monitor uses a 16-bit microcontroller with integrated 12-bit A/D converter. It has also a built-in web page allowing the user to monitor the system operation from any place with Internet connectivity. For fans with PWM regulation only!

Height	Width	Order Number
3U	TBD	024-974
	 Monitors the s LED display be Over/Under v 	tor - VME, VXI tatus of +5V, +12V, -12V Remote oard with ribbon cable oltage display format (approx. 4.0" x 1.5") ce "FAIL" output

Height	Width	Order Number	
4.0 in	1.5 in	194000009	

VPX Cabling System



VPX Cabling System

- Direct connection alternative to RTM solutions for VPX
- Compatible with the latest VITA 46.0 specifications
- For use in deployed or development/test applications
- Pulls signals from slot to slot and/or chassis to chassis with virtually zero signal degradation
- Fully scalable & stackable to meet application needs
- Versions for either front or rear backplane plugging
- Plug directly into backplane to SMA or other contacts for signal test setups
- Resistant to shock and vibration
- Can be used for out-of-band communication

The VPX cabling system is the industry's first direct cabling system for the VPX architecture. Compliant to the latest VITA 46 and VITA 65 specifications, the cabling system can be used for I/O to bulkhead connectors, slot-to-slot connections, and out-of-band communication. The cabling solution can also be used for system development. The direct cabling system also has front-plug versions, which allow testing across the backplane or full interconnect path.

Order Information

Contact factory for order information.

SerDes Test Devices



SerDes Test Devices

- Multilane differential serial fabric test unit
- Flexible design allows signal analysis for various architectures (VPX, ATCA, VXS, etc.)
- Lab-on-board eliminates need for acquiring a whole rack of equipment
- Directly evaluate true Gbps serial link BER performance
- Test and characterize entire mutli-lane serial fabric (PCle, sRIO, GigE) with one device
- Achieve lowest cost of test and fastest time to market
- Can be used for testing both line cards and backplanes
- Test up to 16 channels at once, up to 6.4 Gbps
- Perform pre-emphasis tuning

The adoption of serial link technology in VPX and ATCA poses significant debug, characterization, and test challenges. The BTSD16 is an ultra low cost multi-lane Gbps serial test device that achieves unprecedented density and performance. With the BTSD16, you do not need to purchase equipment such as oscilloscopes, pattern generators, jitter analyzers, BERTs, clock generators, and analog function generators for higher speed testing. The device allows the user to characterize the PCle, Gig E, sRIO, XAUI, or SATA ports quickly and efficiently. Speeds to KX and KX-4 are currently covered by the module, with a roadmap to KR levels. The BTSD16 uses cabling in the VPX, ATCA or other architectures. The unit is connected to a VPX backplane using a 24" VPX cable (full fat pipe connection wafer to SMA contacts and SMA adapter).

Description	Channels	Order Number
BTSD16 Test Module with 2x VPX Cables (24", wafer to SMA & SMA adapter)	16	1940000511-0000
BTSD16 Test Module without cables	16	1940000508-0000
VPX Test Cables (1 set)	n/a	Contact Factory



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