



The Specifications Corner:

New Power for CompactPCI Systems

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CompactPCI systems are well suited for a wide variety of computing applications. As the popularity and features of CompactPCI grow, so does the demand for the power to drive these systems. This increasing demand for power is due to the availability of more computing capability in a given space. Also, reductions in the voltages that are required to drive modern electronic devices have caused a shift in the power mix. These factors will continue to contribute to the need for higher density power supplies into the future. This is particularly true when the system design calls for power supplies to be placed into the subrack, which serves to displace system features.

Higher power density is only one of the challenges that power supply manufacturers face. Many features add to the complexity of power supply design such as:

- Hot swap capability
- Communication with the host system
- Redundancy
- Regulation of bus voltages
- Cooling considerations

In addition reduced price, greater availability, and time-tested quality are important to CompactPCI power supply users. Although individual manufacturers shoulder much of the responsibility for price, availability, and quality, power supply standardization can aid in this effort.

A previous revision of the CompactPCI core specification, PICMG 2.0 R 2.1, offered a first attempt at standardized in-rack power supplies. A DIN M style connector served as the power interface. Contact assignments were provided along with mechanical placement of 3U power supplies within the subrack. Supplies that conformed to the core specification criteria were limited to 150-200 watts, primarily due to limitations of the DIN M connector, which only provided for 12 amperes at 3.3V.

Manufacturers have utilized a variety of connectors to overcome the limitations of the DIN M connector. When different manufacturers used the same connector types, the location of the power interface on the backplane often varied. This lack of uniformity caused confusion and incompatibility in the marketplace, and the need for change was apparent. In April of 1998, the PICMG 2.11 Power Interface Specification Subcommittee was charged with the task of developing a new specification. The goal of the subcommittee was to develop a power supply specification that would provide for the power needs and feature requirements of today's systems, while allowing for a growth path into the future.

On October 1, 1999, the PCI Industrial Computer Manufacturers Group (PICMG) adopted the PICMG 2.11 R1.0 Power Interface Specification. This specification details in-rack power supplies for CompactPCI applications and includes the following features:

- Standardized form factor and connector interface, which details placement of power supplies within the subrack along with the location of the power interface

- Multi-voltage output of up to 600 watts with a single connector (see the PICMG 2.11 Power Connector in Figure 1)

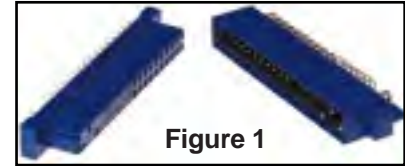


Figure 1

- Standardized electrical interface (see Figure 2)
- AC or DC power input
- Keying for input and output power configurations
- Regulation of Bus voltages to ensure compliance with CompactPCI requirements
- Hot swap capability
- Communication with the host system
- 3U and 6U options
- Compliance to common international safety requirements

In addition, the PICMG 2.11 specification provides some guidance for common performance requirements that may be

PICMG 2.11 Power Connector Contact Assignments

Pin # ⁽¹⁾	Staging # ⁽²⁾	Signal Name	Description
1-4	M	V1	V1 Output
5-12	M	RTN	V1 and V2 Return
13-18	M	V2	V2 Output
19	M	RTN	V3 Return
20	M	V3	V3 Output
21	M	V4	V4 Output
22	M	RTN	Signal Return
23	M	RESERVED	Reserved
24	M	RTN	V4 Return
25	M	GA0	Geographic Address Bit 0
26	M	RESERVED	Reserved
27	S	EN#	Enable
28	M	GA1	Geographic Address Bit 1
29	M	V1ADJ	V1 Adjust
30	M	V1 SENSE	V1 Remote Sense
31	M	GA2	Geographic Address Bit 2
32	M	V2ADJ	V2 Adjust
33	M	V2 SENSE	V2 Remote Sense
34	M	S RTN	Sense Return
35	M	V1 SHARE	V1 Current Share
36	M	V3 SENSE	V3 Remote Sense
37	M	IPMB_SCL ¹	Reserved for System Management Bus
38	M	DEG#	Degrade Signal
39	M	INH#	Inhibit
40	M	IPMB_SDA ²	Reserved for System Management Bus
41	M	V2 SHARE	V2 Current Share
42	M	FAL#	Fail Signal
43	M	IPMB_PWR ³	Reserved for System Management Bus
44	M	V3 SHARE	V3 Current Share
45	L	CGND	Chassis Ground (safety ground)
46	M	ACN/+DC IN	AC Input - Neutral; +DC Input
47	M	ACL/-DC IN	AC Input - Line; -DC Input

(1) Pin numbers illustrated are of the female backplane connector

(2) L = Long length pins (First Mate, Last Break), M = medium length pins, S = Short length pins (Last Mate, First Break)

(3) These signals are to be defined by PICMG 2.9 Secondary System Management Bus

Figure 2

applicable in certain situations, e.g. when NEBS requirements are a consideration in telecommunication applications. Other requirements can be easily included as the need arises.

Although the PICMG 2.11 specification creates certain mechanical and electrical parameters for pluggable power supplies, the innovation of individual manufacturers is preserved. The specification allows for independent design regarding:

- Power factor correction
- Filtering
- Current sharing
- Cooling characteristics

This will encourage solutions for a wide variety of general system requirements at the best performance-to-cost ratios for a specific system.

For one and a half years, a consortium of talented individuals representing over twenty CompactPCI manufacturers labored to develop the PICMG 2.11 specification. The PICMG2.11 R1.0 Power Interface Specification is offered to support the expansion of CompactPCI worldwide by delivering the power needed today and into the future.

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To obtain more information about the activities of PICMG's 2.11 Power Interface Subcommittee or if you would like a copy of the latest Specification, contact the PICMG administrative office at:

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