

**SABRECOM-CE1 Rugged Integrated Computer
+ Managed Ethernet Switch with Removable Storage**



FEATURES

Rugged x86 computer +
managed Ethernet switch ideal
for harsh environment and
mobile applications

Compute Subsystem:

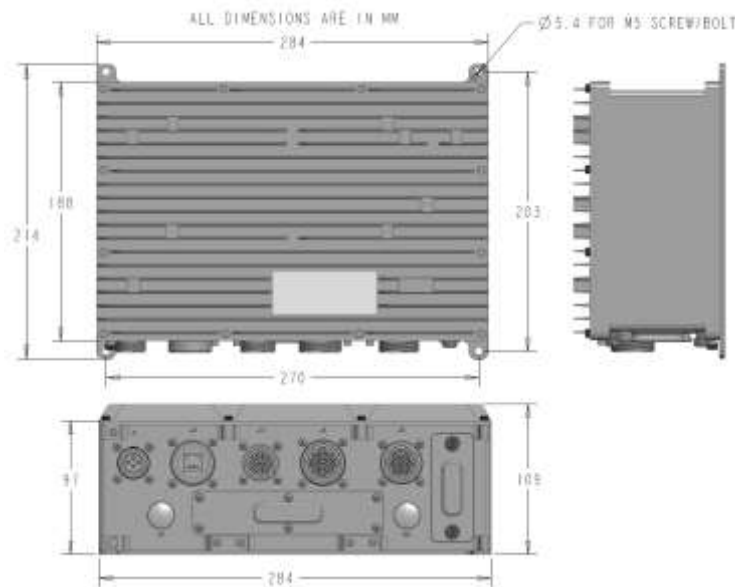
- ✦ Intel 11th / 13th gen Core i7
and Xeon processors
- ✦ 32-64GB RAM with ECC
option
- ✦ 128GB-2TB removable solid
state flashdisk
- ✦ Choice of Linux or Windows
10 / 11 64-bit OS

Standard system I/O includes:

- ✦ 1 1Gbps Ethernet from
processor circuit
- ✦ 4 USB 2.0
- ✦ 4 RS-232/422/485
- ✦ 8 GPIO 3.3V
- ✦ HD Audio, Reset, Power
Button, I2C
- ✦ 1 HDMI type A on service
panel
- ✦ 1 UB 3.0 / 2.0 on service
panel
- ✦ Replaceable BR2032 RTC
battery on service panel



Removable drive shown installed in internal cradle



Integrated managed Ethernet switch features:

- ✦ 11 1Gb copper ports
- ✦ 1 or 2 10Gb copper or fiber ports
- ✦ Integrated IStAX Layer 3 management software

Easy I/O expansion with up to 2 PCIe minicards

Choice of MIL-STD-461 filter or isolated power supply with MIL-STD-461/704/1275 filtering

Rugged enclosure with IP67 rating

MIL-DTL-38999 style I/O connectors for extreme ruggedness

Designed to meet MIL-STD-810H shock and vibration requirements

Internal electronics qualified to MIL-STD-202H shock and vibration requirements

10-60VDC input range with MIL power supply option

-40 to +75C operating temperature

Dimensions: 11.2 x 8.6 x 4.3 in. / 284 x 218 x 109 mm W x D x H

SabreCom-C1 offers rugged high-performance, computing and Ethernet switching in a single enclosure with enhanced features, including customizable I/O expansion and removable solid state storage.

Compute Subsystem

The system architecture supports long-term product availability and performance scalability by use of COM Express CPU modules. Processor options include Intel Core i7 and Xeon 11th and 13th generation families, and mass storage capacity is up to 2TB. Choose from Windows 10, Windows 11, and Linux OS.

The use of COM Express modules enables performance scalability, earlier access to the latest processors, well as lifecycle extension and protection from obsolescence. If the selected processor reaches end of life, a new COM with a different processor can be easily substituted with no mechanical change and usually very minimal reconfiguration of the OS drivers. A range of COMs and processors are already validated and available as ordering options. Customer requests for specific processors or COM vendors can also be accommodated with a nominal NRE charge for validation testing and OS support.

Generation	Type	Processor	PassMark* (approx.)	Max RAM
11 - Tiger Lake	Core i7	1185GRE	7,800	32GB
13 - Raptor Lake	Core i7	1365URE	10,900	64GB
13 - Raptor Lake	Core i7	1370PRE	20,300	64GB
13 – Raptor Lake	Core i5	120U	14,900	64GB
11 - Tiger Lake	Xeon	11865MRE	19,600	64GB / ECC 32GB

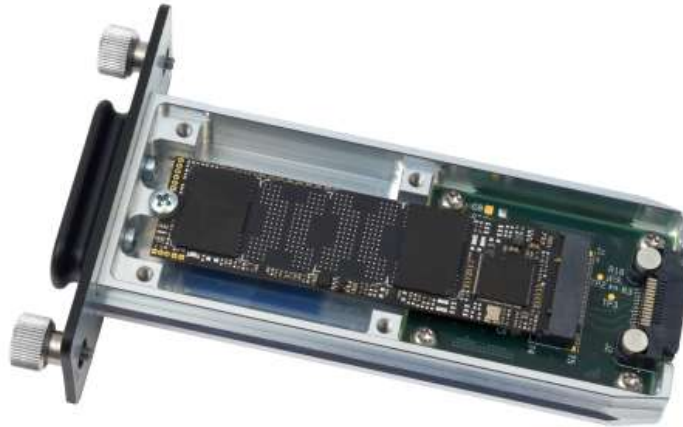
Integrated Managed Ethernet Switch

Ethernet switching consists of a 14-port Layer 3 managed gigabit Ethernet switch with 11 1GbE copper ports and 1 or 2 10Gb ports available on the front panel. The 12th 1Gb port connects the switch to one of the two 1Gb Ethernet ports on the embedded computer. The 10GbE ports are available with various options: A single copper port can be brought out on an RJFTV style rugged connector with an RJ-45 jack contained within a 38999-style shell. Alternatively an M12 X-coded connector can be used for 2 10Gb copper ports, or 2 single-mode / multimode fiber ports can be provided with an XBeam connector. The switch is managed with built-in Layer 3 routing/switching software accessible via any Ethernet port or a dedicated serial port. For more details please see the Ethernet Switch tab on this page.



◆ Removable Solid State Storage

A rugged removable drive system features quick extraction and swapping of solid state hard drives. The removable tray houses a M.2 2280 SATA / NVME module with capacity up to 2TB (default is SATA). Note: This flash drive is not hot-swappable.



◆ Front Panel Convenience Features

A front panel cover plate can be removed to reveal access to an HDMI type A connector, a USB 3.0/2.0 port with Type A connector, and a replaceable BR2032 RTC backup battery.



◆ Power Options

Two input power options are available for SabreCom systems:

- MIL-STD-461 compliant filter module this option offers a lower system price for applications that have less stringent power requirements. It can support both a fixed 12VDC and a variable 18-24VDC input range.
- Rugged MIL isolated power supply this option features MIL-STD-461, -704, -1275, and DO160 compliance. This option supports a 10-60VDC input range. Maximum total system power dissipation is 80W, which is sufficient for any combination of processor and I/O included in the system. More information on this power supply is available [here](#).

SabreCom-CE1 is designed to meet stringent requirements of MIL-STD-810H and IP67. See a test report of similar products [here](#).

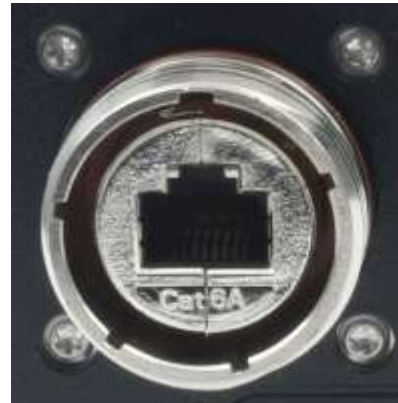
Ethernet Switch Subsystem

Ethernet switching consists of a 12-port Layer 3 managed gigabit Ethernet switch with 11 1GbE copper ports and 1 10Gb port available on the front panel. A 13th 1Gb port connects the switch to one of the two 1Gb Ethernet ports on the embedded computer. The 10GbE copper port is brought out on an RJFTV style rugged connector with an RJ-45 jack contained within a 38999-style shell. Alternatively an M12 X-coded connector can be used for a 10Gb copper port, or a 38999 shell with termini can be provided for a 10Gb fiber port.

The **CM2** option provides two 10GbE copper ports on M12 connectors.



The **CR1** option provides one 10GbE copper port on an RJFTV ruggedized RJ-45 jack.



The **FX2** option provides 2 single-mode or multimode fiber 10Gb ports on a rugged XBeam connector. (Click image for larger view.)



The **FT2** option supports two single-mode or multimode 10Gb ports on termini in a 38999 shell.



The Ethernet switch includes embedded management software offering a rich set of Layer 3 routing and Layer 2 switching features. Below is a short list of some of the more popular features. A complete list is available at this link:

www.diamondsystems.com/umpages/ethsw

VLAN

MSTP

RSTP

Link aggregation

IGMP snooping

Port mirroring

Software- and hardware-based IPv4/IPv6 L3 static routing

QoS

Storm control

Port and Queue policers

Port-based single and multiple 802.1x

RADIUS accounting

JSON-RPC

IPv4/IPv6 ping and traceroute

Port speed/duplex mode/flow control

802.1Qbb priority-based flow control

Jumbo frame support

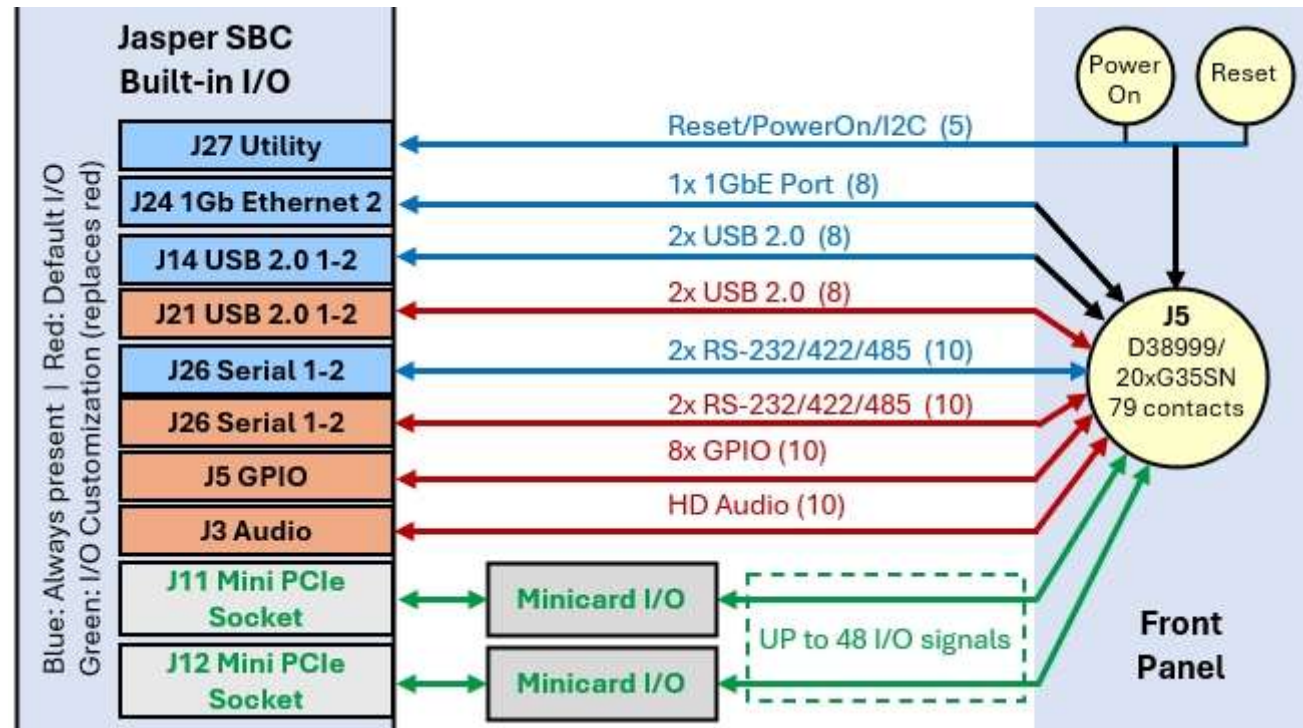
Link monitoring

Port statistics



I/O Expansion

I/O expansion is achieved via 2 PCIe / USB minicard sockets on the carrier board. I/O is brought out to the front panel on a D38999 style connector J5, combined with other system I/O. The standard connector is E size with 55 contacts, of which 31 are occupied, leaving 24 available for I/O expansion. Optional larger sizes are F with 35 available contacts and G with 48 available contacts. If less than 11 1GbE copper Ethernet ports are required in the application, additional contacts on the Ethernet connectors J3 and J4 can also be repurposed for I/O expansion.



In the diagram, blue features are present in all configurations. Red features are included in the default configuration and in varying quantities in other configurations as well as custom configurations. The two minicard sockets are not populated by default and are available for custom I/O expansion.

Choose from a range of I/O options from Diamond Systems as well as 3rd parties, including:

- Analog I/O with 16-bit A/D & D/A resolution and autocalibration
- Digital I/O with 3.3V / 5V logic levels, including counter/timers and PWMs
- Serial ports with RS-232/422/485 capability including optional opto-isolation
- 1GbE / 2.5GbE Ethernet
- CAN
- USB 2.0 / 3.0
- MIL-STD-1553
- ARINC-429
- and others

Several predefined I/O expansion configurations are available with no NRE charge and reduced leadtime. The table below lists the available options. The table below shows the available ordering codes and feature combinations. All serial ports are RS-232/422/485 capable and are preconfigured in pairs during system assembly time.

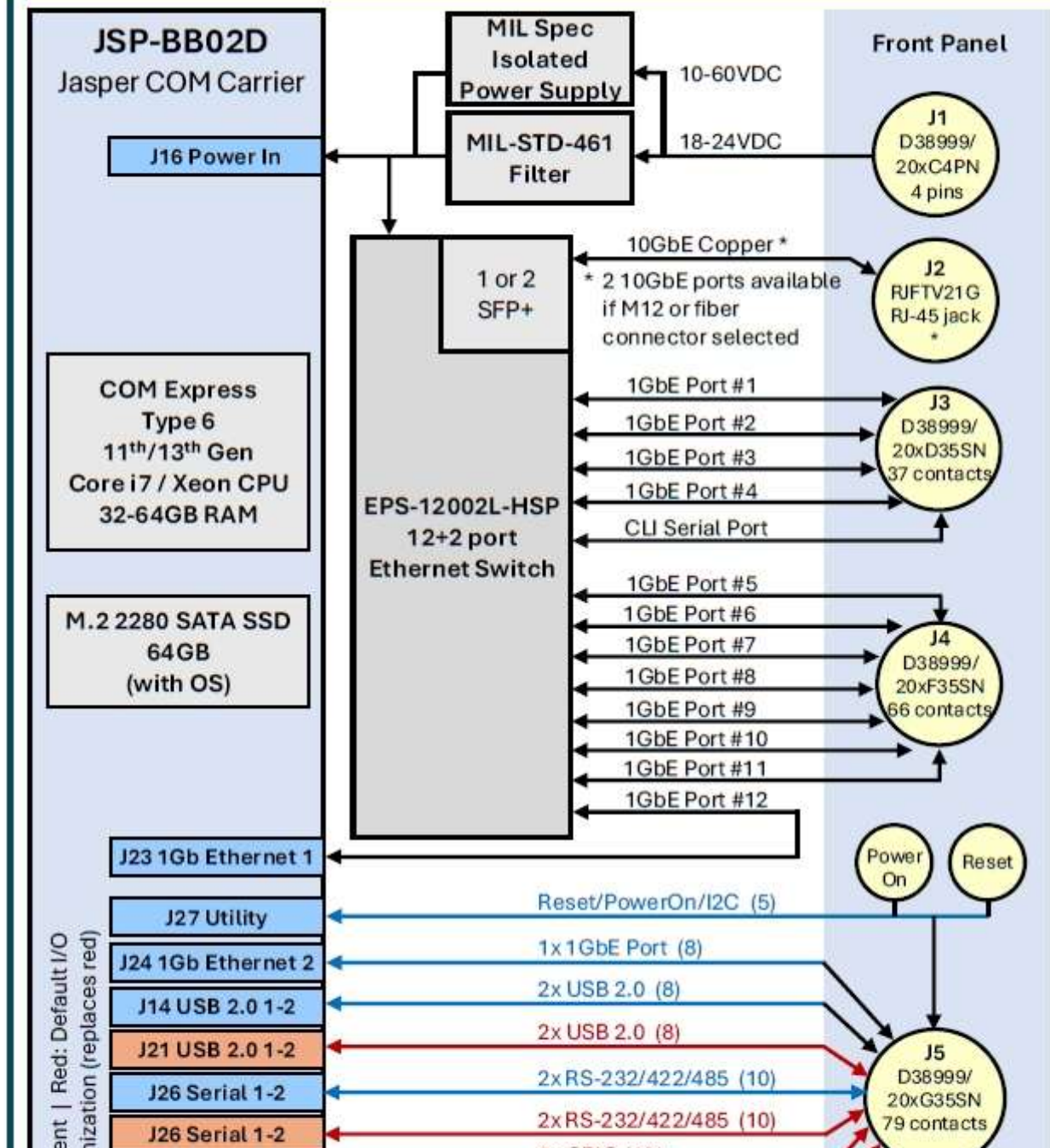
Order Code	1Gb Eth	USB 2.0	Serial	GPIO 3.3V	Utility	A/D 16-bit	D/A 16-bit	CAN	Audio	Mini Card
00	1	4	4	8	Yes				Yes	
01	1	2	2	22	Yes	16	4			
02	1	4	4	8	Yes			4		
XX	1	2	2		Yes					1-2

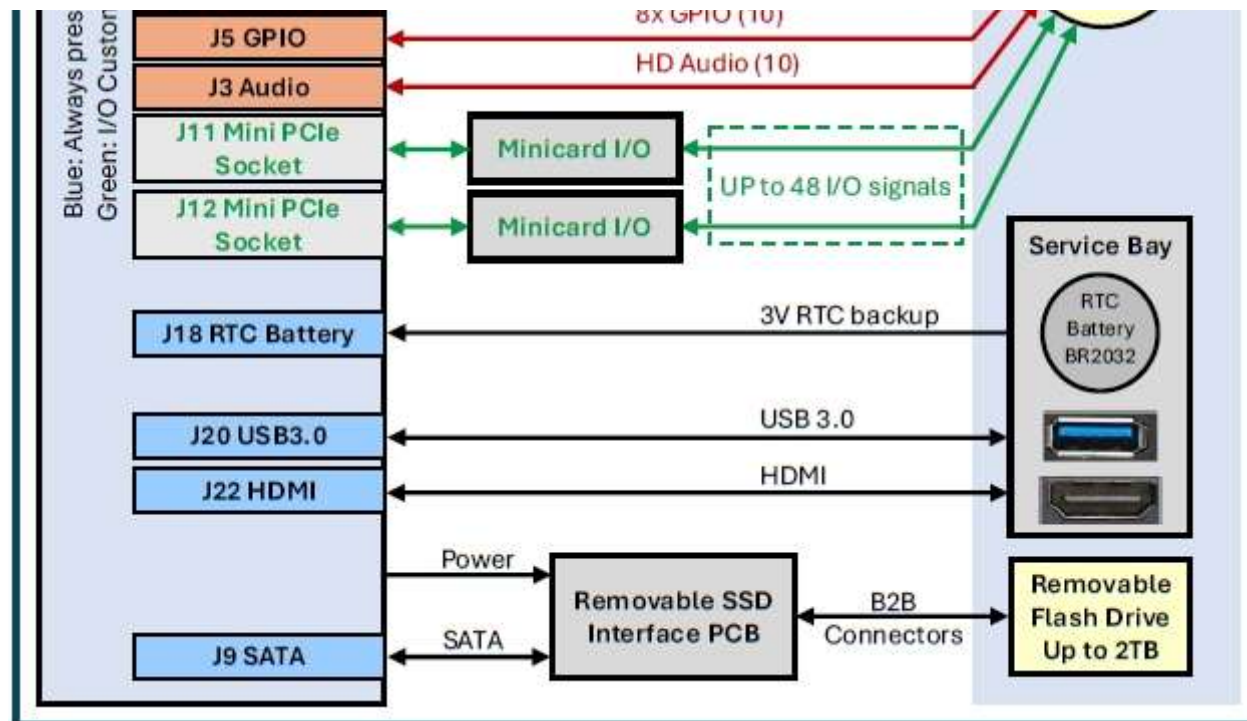
Standard D38999 G size I/O connector supporting up to 79 I/O contacts



SabreCom-CE1 System Architecture

Rev 3.2





Ordering Information

System Configuration and Ordering

The ordering guide below lists all the standard configuration options for SabreCom-CE1. Choose one option from each category to configure your system, then contact us to obtain a quote. Several predefined I/O configurations are available with quicker leadtime and no NRE charge. For custom I/O expansion, please contact our Sales team and we will work with you to define the expansion boards and internal / external cabling and provide a custom part number.

Ordering No.: **SCM-CE1-A-BCD-E-F-GH**

Select one option each from A-H below.
* denotes the most common option.

Rev 2.1

A Processor and RAM

* i7-1185GRE 32G	1185-32
i7-1365URE 32G	1365-32
i7-1365URE 64G	1365-64
i7-1370PRE 32G	1370-32
i7-1370PRE 64G	1370-64
i5-120U 32G	120U-32
i5-120U 64G	120U-64
i7-11865MRE 32G ECC	11865-32E
i7-11865MRE 64G	11865-64

B Jasper Baseboard

* JSP-BB02D without DAQ	D
JSP-BB03A with DAQ (G must be 01)	A

C Power Supply

* MIL isolated power, 10-60VDC	J
MIL-STD-461 filter, 12V or 18-34VDC	F
Direct input, 12V or 18-34VDC	X

D Flashdisk (Contains operating system)

* 1TB	1
2TB	2
512GB	5
128GB	8

H Connector Caps

* Plastic protective caps	(Blank)
Metal sealing caps	C

G I/O Expansion (Features are in addition to standard I/O)

* 2 USB 2.0, 2 RS-232/422/485, 8 GPIO, HD Audio	00
Data Acquisition (16 A/D, 4 D/A, 22GPIO)	01
2 USB 2.0, 2 RS-232/422/485, 8 GPIO, 4 CAN	02
Custom I/O (XX determined by Diamond Systems)	XX

All configurations include the following standard I/O in addition to features listed: 1 GbE, 2 USB 2.0, 2 RS-232/422/485, I2C, Pwr On, Reset

F 10Gb Ethernet Port Configuration

* 2x Copper on M12	CM2
1x Copper on RJ45	CR1
2x Fiber on XBeam	FX2
No 10Gbps	XXX

E Operating System (Options may depend on processor)

* Linux 64-bit	LNK
Windows 10 64-bit	W10
Windows 11 64-bit	W11

Example: **SCM-CE1-1185-32-DJ1-LNK-CM2-02C**

SabreCom-CE1 Rugged Computer + Ethernet Switch, 1185GRE CPU, 32GB RAM, MIL Isolated Power, 1TB SSD, Linux, 2x 10GbE Cu on M12, IO Option 2, Sealing Caps

Cable Kits

Diamond can provide lab-grade cable kits for system evaluation and testing. These cables generally consist of consumer-grade cables (HDMI, RJ-45, DB9, etc.) attached to the appropriate MIL-DTL-38999 mating connector to plug into the system front panel connectors. These are not ruggedized and not intended for use in the actual application environment. Predefined cables are available for the standard I/O connectors J1, J2, and J3. For custom I/O on J4, Diamond can design and quote a matching external cable of the same general style.

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