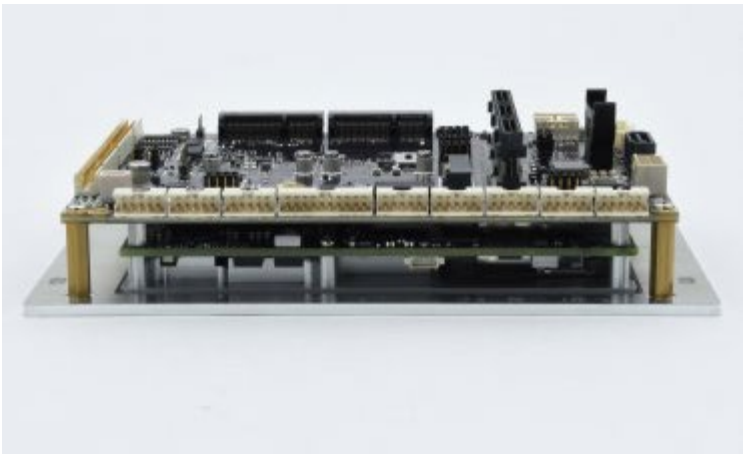
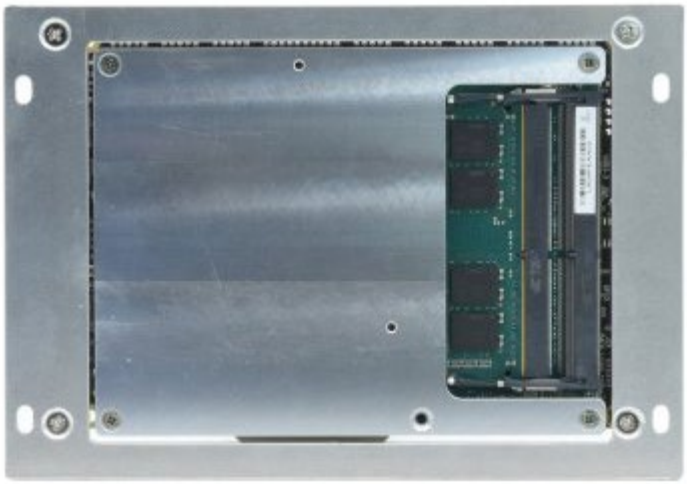
JASPER Rugged COM Express Type 6 Carrier Board and SBC with Rich I/O and Expansion

Jasper SBC assembly with integrated mounting plate

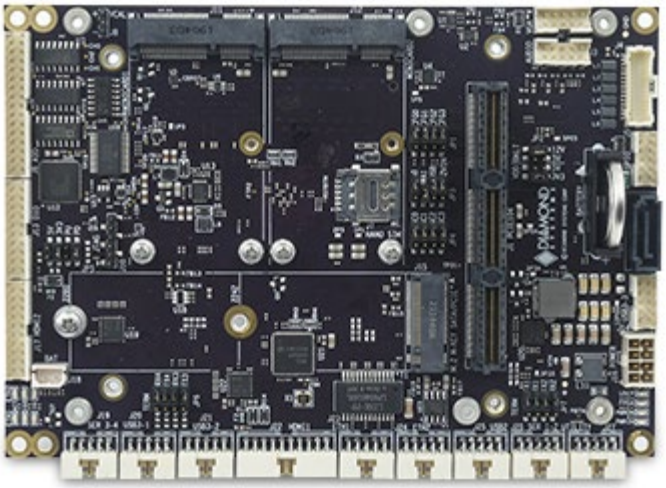


FEATURES

- Supports COM Express Type 6 Basic & Compact modules
- Available as complete solution with Intel 11th Gen Core i7 COM / up to 64GB RAM
- Rugged design: latching connectors, thicker PCB, wide temperature, conduction cooling
- 2 Gigabit Ethernet, 2 USB 2.0, 3 USB3.1
- 4 RS-232/422/485 ports, HDA Audio
- 2 HDMI, dual-channel 24-bit LVDS Display
- Dual PCIe MiniCard sockets with PCIe, SATA, and USB support
- M.2 (NVME/SATA) and SATA connectors for mass storage
- M.2 E key socket for networking modules
- Data acquisition with 16 A/D, 4 D/A, 16 GPIO
- PCIe/104 expansion with PCIe x1 and x16 links
- 12V or 18-36VDC Input
- -40C to +85C operating temperature (depending on installed COM)
- Dimensions: 5.75”W x 4.00”H / 146/102mm (3.5 inch form factor)



Jasper SBC bottom view showing mounting plate (outer) and COM heat spreader (inner)



Jasper carrier board with data acquisition and PCIe/104 expansion

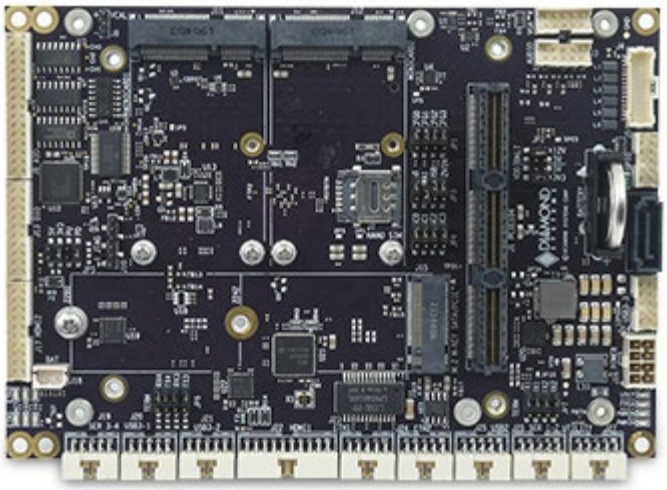
Jasper is a COM Express carrier board and SBC for Type 6 Basic (125x95mm) and Compact (95x95mm) modules. It is designed for applications that require ruggedness, a high level of I/O, or extended product lifetime. Notable features of Jasper include:

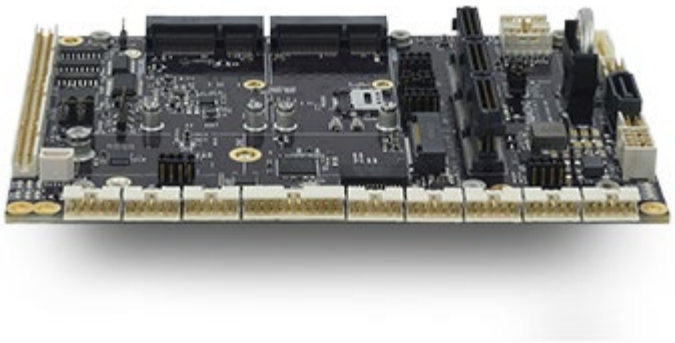
- Rugged mechanical design with thicker PCB and latching connectors
- Wide temperature operation – up to -40 to +85C (depending on the installed COM)
- Built-in 16-bit data acquisition circuit with autocalibration
- Dual minicard sockets with PCIe and USB interfaces
- Dual M.2 sockets for flash memory and network connectivity
- PCIe/104 expansion socket supporting x16 and x1 links

Jasper is available as a carrier board alone, for user integration with a COM of your choice, or as a ready to run "single-board computer" with an 11th generation Intel Xeon processor COM installed. Both Windows and Linux OS support are standard, while other OS support is available upon request.

Flexible Design to Fit Any Application

The most popular I/O on Jasper is provided on a single row of connectors along the front edge of the PCB. This arrangement supports dual connection modes. First Jasper can be used with traditional cables, with each cable providing a positive locking feature for increased shock and vibration resistance. Secondly the single row of connectors makes it easy to design and build I/O connector boards that match the end application's exact requirements. For example a connector board with commercial connectors (RJ-45, USB type A, etc.) or MIL-DTL-38999 rugged circuit connectors can be plugged directly into the Jasper I/O connectors to create a "cable-free" solution. Such a connector board can dramatically reduce assembly time and cost for the end system.





Rugged design

Jasper was designed from the ground up with a comprehensive set of features to meet the challenges of rugged environments and applications:

- The 50% thicker PCB increases rigidity and improves reliability of fine pitch and high-ball-count BGA solder joints
- Almost all I/O connectors are positive latching (not friction lock) for increased ruggedness
- A bottom-side heat spreader provides more efficient cooling than a traditional heat sink.
- All components are rated and/or tested to ensure reliable -40 to +85 o C operation

Thermal Dissipation

Jasper supports installation of the COM and its heat spreader on the bottom side of the carrier. This enables more efficient mounting and heat dissipation, since the COM's heat is directly coupled to the enclosure body instead of relying on a top-side heat sink to dissipate heat into the air inside. Jasper's mounting plate surrounds the COM heat spreader to provide mounting stability for the entire board assembly.

I/O Expansion

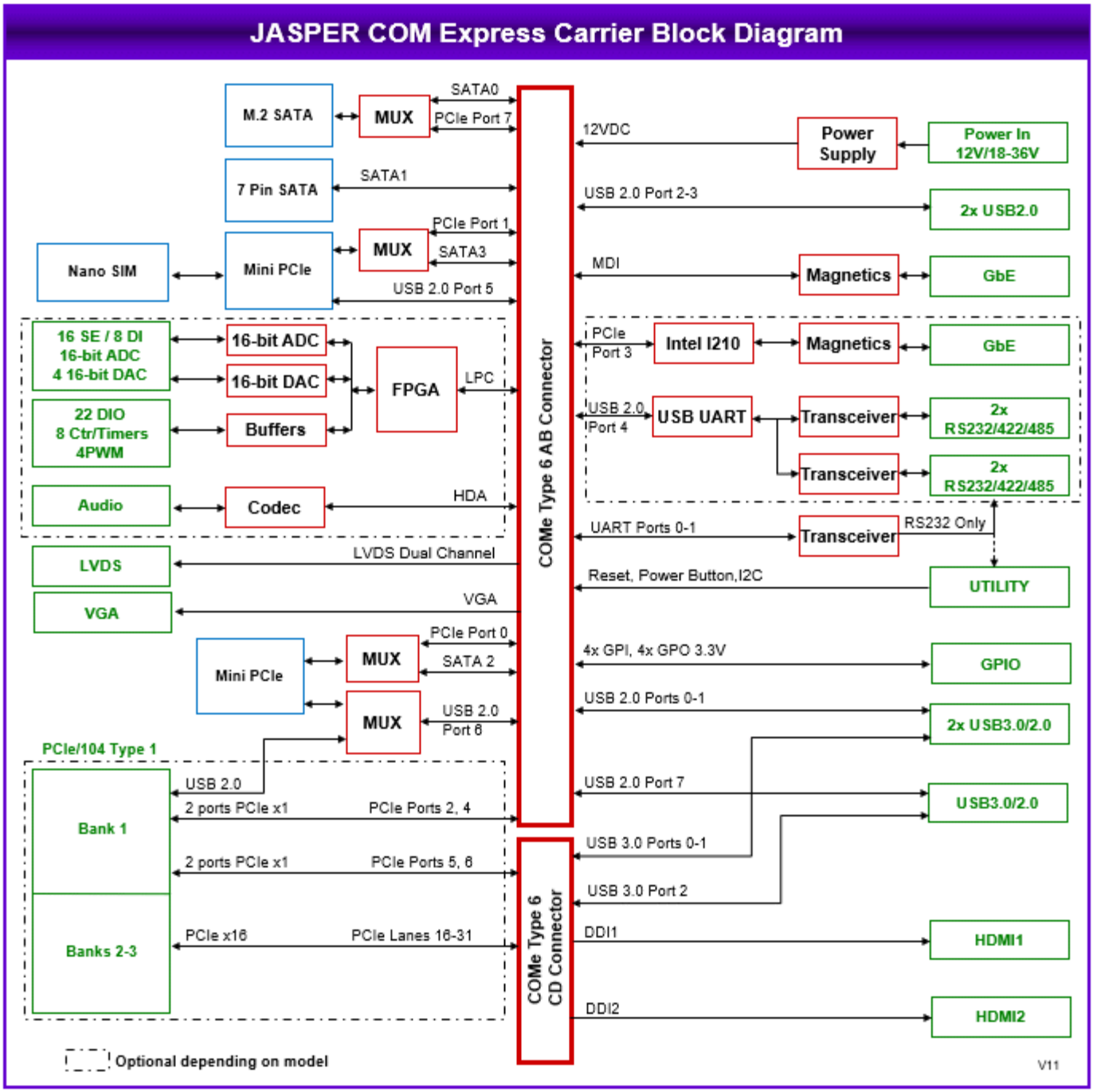
Jasper includes dual PCIe minicard sockets with both PCIe and USB interfaces, supporting a wide range of I/O and communications/networking modules from Diamond as well as third party vendors. It includes an M.2 E key socket for installation of wifi and other networking modules. The PCIe/104 socket enables use with PCIe/104 Type 1 I/O modules using x1, x4, x8, and x16 PCIe links (depending on the capability of the installed COM) as well as PCIe/104 OneBank modules using the x1 lanes on the first connector bank.

Cable Kit

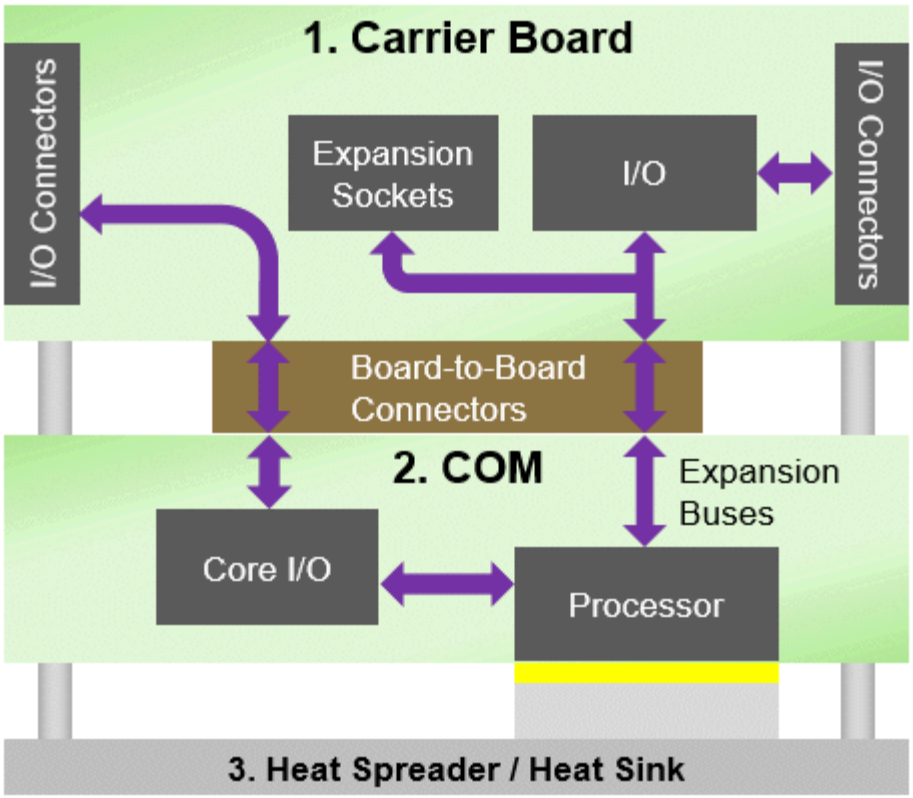
The Jasper cable kit includes cables for all I/O and features on the board. All cables except for SATA have positive latching feature for resistance to shock and vibration.

CK-JSP-01 includes the following cables:

No.	Qty	Cable	Description	Drawing
1	1	6980512	Power input cable, discrete wires	Show
2	1	6980524	External battery cable, discrete wires	Show
3	2	6980601	Dual serial port cable, 2x DB9 male	Show
4	1	6980602	Dual USB 2.0 cable, 2x USB 2.0 type A	Show
5	3	6980603	Dual USB 3.0 type A, latching	Show
6	2	6980604	Ethernet cable, RJ-45 socket	Show
7	2	6980605	HDMI Cable	Show
8	1	6980608	Audio cable, 3x 3.5mm jacks	Show
9	2	6980609	FCI latching 2x5 2mm to IC 2x5 2mm, 12"	Show
10	1	6980612	Analog I/O, latching 2x15 2mm to DB37F panel mount	Show
11	1	6980611	Digital I/O, latching 2x10 2mm to DB37F panel mount	Show
12	1	6981084	VGA, 2x5 2mm latching to DD15F	Show
13	1	6989101	SATA Cable, 7-Pin Data, Straight to Right Angle, 500mm	Show



COM-based architecture for long life and scalability



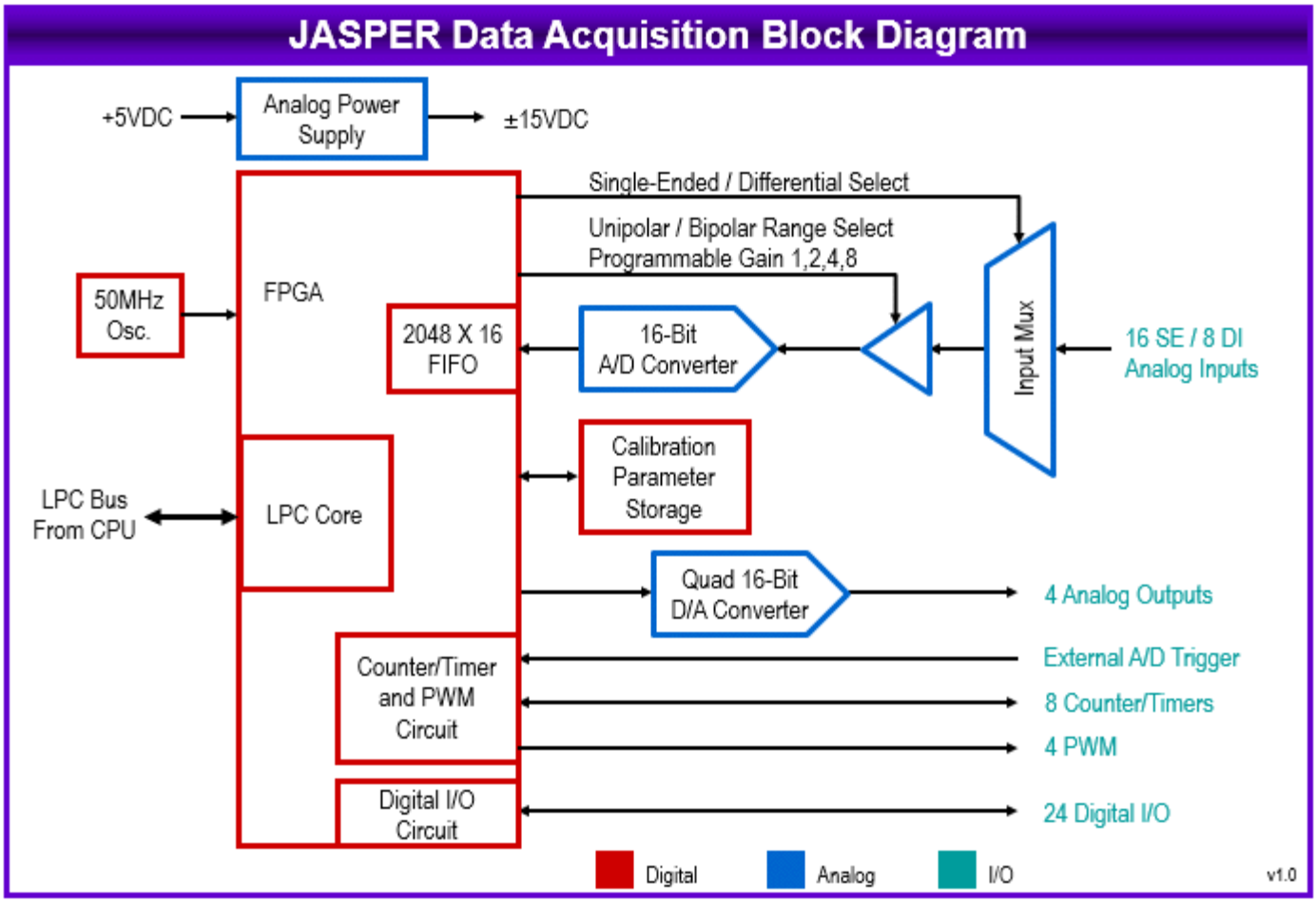
A COM-based SBC is a 2-board solution consisting of a Computer-on-Module (COM) that contains the processor and core I/O mounted on a carrier board that provides additional I/O and user connections. The carrier board brings out the I/O from the COM and provides additional I/O derived from the expansion buses provided by the COM, such as PCIE, LPC, SATA, and USB. This 2-board architecture provides significant advantages over traditional single-board computers.

A true SBC with a soldered-on processor provides a compact and economical solution for embedded computing. However it also carries inherent risk compared to a COM-based design: The lifetime and features of the SBC are tied to the processor. Since no two SBCs are truly alike, if the processor reaches end of life or is otherwise unavailable, a redesign effort is required that can be painful as you try to match your existing system requirements to available replacement boards. A COM-based SBC solves this problem by allowing easy replacement of the COM with another one in the exact same size with the exact same features. COMs maintain much more similarity from product to product than SBCs, so replacing a COM is far less likely to present complications than replacing the entire SBC. This enables COM-based products to enjoy much longer lifetimes than traditional SBC designs, with far lower lifecycle extension efforts.

A COM-based solution is also ideal during periods of supply chain uncertainty. If one vendor's COM is unavailable, it is much easier to select a substitute COM than to replace the entire SBC.

A COM-based design also supports the ability to upgrade the system performance much more easily by simply swapping one COM for another. The rest of the system remains the same as before.

Jasper is a member of Diamond's 2-in-1 series of SBCs with integrated data acquisition. For applications requiring precision analog I/O, a 2-in-1 SBC is an ideal choice because it reduces the number of boards in the system, resulting in a system that is smaller, lighter, lower cost, and easier to assemble and maintain. The features of the Jasper DAQ circuit surpass those found on most other embedded SBCs in both variety and quality, providing a comprehensive, professional quality subsystem backed with top of the line software support. "A" models include the full DAQ circuit with both analog and digital I/O features, while "D" models include only the digital I/O features. (The DAQ circuit on Jasper is identical to the one found on our **Saturn** SBC.)



The A/D circuit includes 16 single-ended / 8 differential analog input channels with programmable input ranges and a maximum aggregate sampling rate of 250KHz. A built-in programmable counter/timer supports accurate high-speed sampling with precise timing. The 2048-sample FIFO with programmable threshold ensures error-free sampling and enables you to tune the performance of the circuit to minimize interrupt processing overhead.

The D/A circuit consists of 4 16-bit D/A voltage outputs with independently programmable output ranges including 0-10V, +/-10V, 0-5V, and +/-5V. A 2048-sample waveform buffer is included to support arbitrary waveform generator functions on up to 4 channels simultaneously.

The digital I/O circuit consists of GPIO, counter/timers, and pulse-width modulators. The GPIO circuit provides 22 buffered digital I/O lines, consisting of one 8-bit port and 14 1-bit ports. Each port is individually programmable for input or output. The 1-bit direction controllable ports provide better matching of input and output quantities to each application. Jumper configuration enables selection of 5V/3.3V logic levels and pull-up or pull-down resistors on the digital I/O lines.

The 8 32-bit programmable counter/timers feature both up and down counting with clocking selectable from an external digital signal or the on-board 50MHz clock. Counters can be used for generating programmable output frequencies with programmable output pulse widths, counting external events, generating interrupts to the host processor at a programmable rate, and driving A/D sampling at precise frequencies with perfect timing between samples.

The circuit further includes 4 24-bit programmable pulse width modulators also driven by the on-board 50MHz clock. These feature programmable rate, duty cycle, and polarity, with real-time rate and duty cycle update capability.

Software Support

The data acquisition circuit on Jasper is supported by Diamond Systems' **Universal Driver software**. This software provides unmatched power and flexibility for embedded data acquisition programming with PC/104 and small form factor I/O boards. It provides flexible C-language programming support for Windows and Linux to control all data acquisition features on Jasper, as well as Diamond's MiniCard data acquisition modules that can be used with Jasper.

A powerful and convenient graphical control panel provides instant, easy access to all data acquisition features on the board. It can be used for proof of concept, testing, and even system debugging.

Visit our **Universal Driver software** page to learn more.

Models and Accessories

Jasper		
available models:		
JSP-BB01D	Jasper COM Carrier, low cost model, 18-36VDC In	Min Order Qty
JSP-BB02D	Jasper COM Carrier, PCIe/104 expansion, Digital I/O, 18-36VDC In	Coming Soon
JSP-BB03A	Jasper COM Carrier, PCIe/104 and Data Acquisition, 18-36VDC In	Coming Soon
6882210	Mounting Plate for Jasper Carrier	Coming Soon
JSP-1185G7E-64G-02D	Jasper SBC with Intel 11th Gen Core i7, 64GB RAM, DIO, 18-36VDC In	Coming Soon
JSP-1185G7E-64G-03A	Jasper SBC with Intel 11th Gen Core i7, 64GB RAM, DAQ, 18-36VDC In	Coming Soon
DK-JSP-1185G7E-LNX64	Jasper Development Kit: Jasper 11th Gen Core i7 SBC with DIO, 64GB RAM, Linux 64-bit OS	Coming Soon
DK-JSP-1185G7E-W1064	Jasper Development Kit: Jasper 11th Gen Core i7 SBC with DIO, 64GB RAM, Windows 10 64-bit OS	Coming Soon
SDK-JSP-1185G7E-LNX64	Linux 64-bit Software Development Kit for Jasper SBC with 11th Gen Core i7	Coming Soon
SDK-JSP-1185G7E-W1064	Windows 10 64-bit Software Development Kit for Jasper SBC with 11th Gen Core i7	Coming Soon

Please login or signup for an online quote request.

Cables and accessories	
available models:	
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6980512	Power input cable, discrete wires
6980524	External battery cable, discrete wires
6980601	Dual serial port cable, 2x DB9 male
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6980603	Dual USB 3.0 type A, latching
6980604	Ethernet cable, RJ-45 socket
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6980612	Analog I/O, latching 2x15 2mm to DB37F panel mount
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