



Raptor Rugged System Configuration & Ordering Guide

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Raptor rugged embedded systems are configurable to meet the needs of your particular application. Many aspects of the system are configurable and are specified at the time of order. Raptor systems are ordered using the nomenclature RS-P-M-F-O-D-IA-IB-S where the configurable system attributes are defined as follows:

- P = single board computer model
- M = system memory size
- F = mass storage
- O = bootable operating system
- D = on-board data acquisition
- IA = optional add-on I/O Group A
- IB = optional add-on I/O Group B
- S = case size and cooling method



The following sections describe these configuration options in more detail.

When requesting a quote for a Raptor rugged system, please complete and return the **Raptor System Configuration & Quote Request Form** found on pages 8, 9 & 10 of this Guide.

If your needs dictate a fully custom Raptor system, please email your complete system requirements to sales@diamondsystems.com and/or contact your Diamond Systems' Business Development Manager. Raptor system customization options can be found on page 6.

Application Systems

Raptor rugged embedded computer systems are designed around Diamond's [Vega single-board computer](#) (SBC), a rugged EMX SBC featuring a range of COM Express CPU modules. Standard memory capacity is a 4GB DDR3 SO-DIMM, expandable up to 16GB. An on-board flashdisk provides a bootable operating system and storage for your application and data.

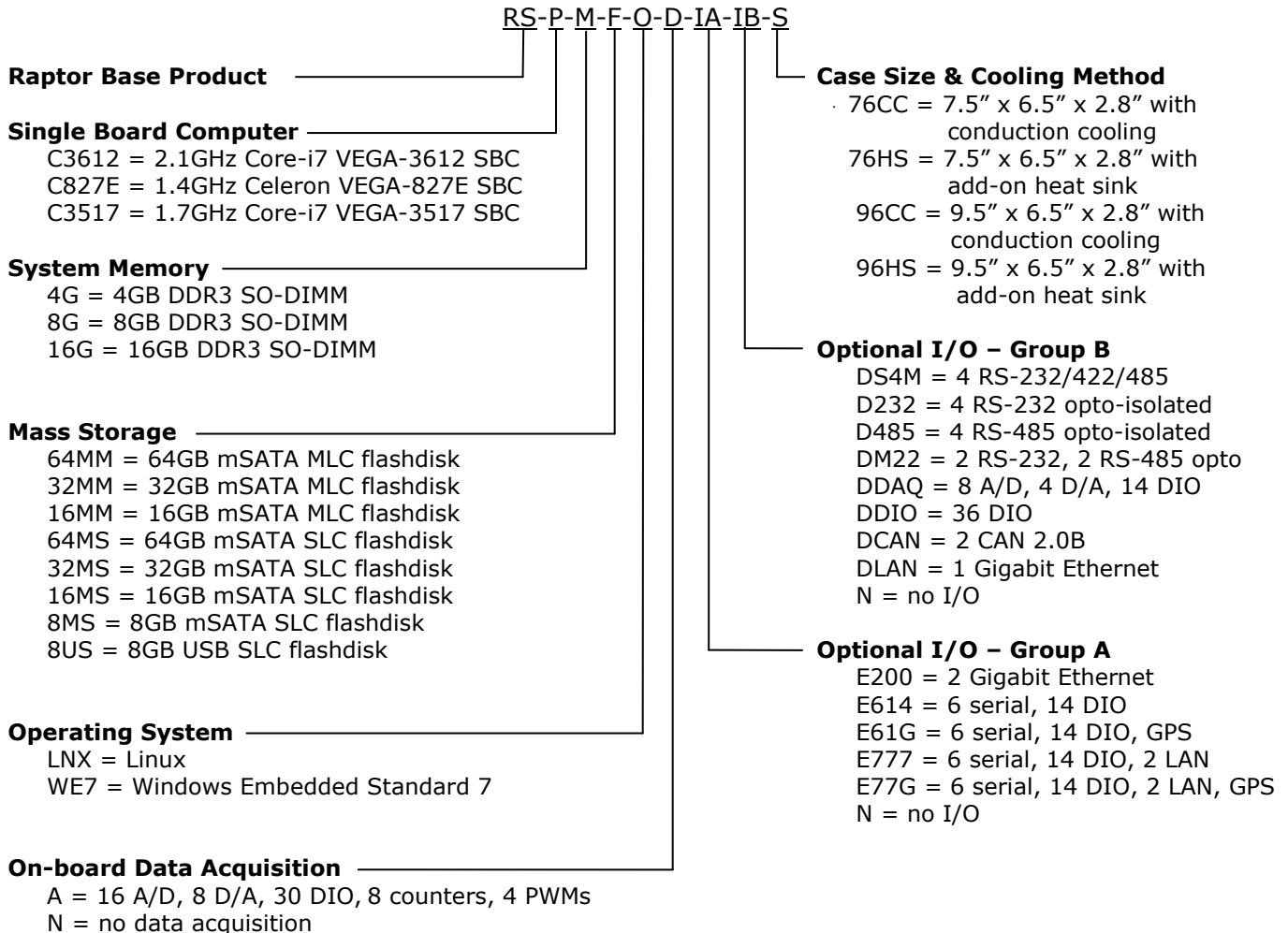
A full suite of I/O provides flexibility for most applications, while the EMX stackable I/O expansion connector and PCIe MiniCard socket on the SBC enable installation of expansion I/O boards for add-on analog, digital, serial, Ethernet, CAN, or other I/O. The standard system configuration includes MIL D38999 connectors for all power and I/O. Custom cable configurations, enclosure modifications, and coatings are also available, see the Enclosures section.

Please refer to the [Raptor-Vega Rugged System datasheet](#) for complete information on the features offered in the standard configurations.

Step-by-Step Configuration Instructions

1. Select the base Raptor single board computer
2. Select a memory upgrade option if desired
3. Select a flashdisk type and size
4. Select an operating system to be pre-loaded on the flash disk
5. Select the on-board data acquisition circuitry if desired
6. Select up to two I/O modules, one from Group A and one from Group B
7. Select the case size and cooling method
8. Specify any customization requirements
9. Complete the Raptor System Configuration & Quote Form on pages 8-10 and submit it to Diamond Systems

Part Number Description



P: Single Board Computer Options

Several single board computer options exist that allow you to select the right balance of power and performance for your application. One of the following options must be ordered.

P: SBC Options	Description
C3612	Vega SBC with 2.1GHz Intel Core i7-3612QE CPU
C827E	Vega SBC with 1.4GHz Intel Celeron 827E CPU
C3517	Vega SBC with 1.7GHz Intel Core i7-3517UE CPU

M: System Memory Options

The memory capacity of the Raptor SBC ranges from 4GB to 16GB of DDR3 SO-DIMM. One of the following options must be ordered.

M: Memory Options	Description
4G	4GB DDR3 SO-DIMM
8G	8GB DDR3 SO-DIMM
16G	16GB DDR3 SO-DIMM (available only with C3612 SBC option)

F: Mass Storage Options

Raptor application systems include an on-board flash disk pre-loaded with a bootable operating system and Diamond's Universal Driver 7.00 software (configuration dependent) pre-loaded. One of the following options must be ordered.

F: Mass Storage Options	Description
64MM	64GB mSATA MLC flashdisk *
32MM	32GB mSATA MLC flashdisk *
16MM	16GB mSATA MLC flashdisk *
64MS	64GB mSATA SLC flashdisk *
32MS	32GB mSATA SLC flashdisk *
16MS	16GB mSATA SLC flashdisk *
8MS	8GB mSATA SLC flashdisk *
8US	8GB USB flashdisk

* Selecting an mSATA flashdisk prevents the addition of all Group B I/O expansion modules

O: Operating System Options

Select the operating system to be installed on the flashdisk module. One of the following options must be ordered.

O: OS Options	Description
LNX	Linux
WE7	Windows Embedded Standard 7

D: On-board Data Acquisition Options

An on-board data acquisition circuit can be added to the base Raptor SBC. The functionality of the on-board data acquisition is summarized in the table below. More details can be found at the [Vega SBC webpage](#). One of the following options must be ordered.

D: DAQ Options	Description
A	16 16-bit analog inputs 8 16-bit analog outputs 30 digital I/O lines 8 32-bit counter/timers 4 24-bit pulse width modulators 8-channel waveform generator
N	No data acquisition

IA: Group A I/O Options

I/O expansion modules can be added to the Raptor application system. Up to one module from Group A and one module from Group B can be added to the Raptor-Vega system. One of the following options must be ordered.

IA: Group A I/O Options	Standard Product #	Description
E200	EMX-ESG200	2 Gigabit Ethernet ports
E614	EMX-ESG614	4 RS-232/422/485 serial ports 2 RS-232 serial ports 14 digital I/O lines
E61G	EMX-ESG614-GPS	4 RS-232/422/485 serial ports 2 RS-232 serial ports 14 digital I/O lines Trimble Condor C2626 GPS module
E777	EMX-ESG777	2 Gigabit Ethernet ports 4 RS-232/422/485 serial ports 2 RS-232 serial ports 14 digital I/O lines
E77G	EMX-ESG777-GPS	2 Gigabit Ethernet ports 4 RS-232/422/485 serial ports 2 RS-232 serial ports 14 digital I/O lines Trimble Condor C2626 GPS module
N		No I/O

IB: Group B I/O Options

I/O expansion modules can be added to the Raptor application system. Up to one module from Group A and one module from Group B can be added to the Raptor-Vega system. One of the following options must be ordered.

IB: Group B I/O Options	Standard Product #	Description
DS4M	DS-MPE-SER4M *	4 high speed RS-232/422/485 serial ports
D232	DS-MPE-OPT4232 *	4 high speed opto-isolated RS-232 serial ports
D485	DS-MPE-OPT4485 *	4 high speed opto-isolated RS-485 serial ports
DM22	DS-MPE-OPT4M22 *	2 high speed opto-isolated RS-232 serial ports 2 high speed opto-isolated RS-485 serial ports
DDAQ	DS-MPE-DAQ0804 *	8 16-bit analog inputs 4 16-bit analog outputs 14 digital I/O lines
DDIO	DS-MPE-GPIO *	36 buffered digital I/O lines
DCAN	DS-MPE-CAN2L *	2 CAN 2.0B ports
DLAN	DS-MPE-GE210 *	1 Gigabit Ethernet port
N		No I/O

* Selecting an I/O module from Group B prevents the use of all mSATA flashdisk modules

S: Case Size & Cooling Method Options

The available case sizes for Raptor systems are as follows, not including the mounting flanges. Each case size is available with either conduction cooling for mounting on a bulkhead or to a chassis, or an add-on heat sink for convection cooling. Raptor systems come with MIL D38999 connectors and an anodized finish standard. One of the following options must be ordered.

S: Case Size Options	Description
76CC	7.5" x 6.5" x 2.8" (l x w x h) with conduction cooling
76HS	7.5" x 6.5" x 2.8" (l x w x h) with add-on heat sink
96CC	9.5" x 6.5" x 2.8" (l x w x h) with conduction cooling (required if I/O from IA or IB is selected)
96HS	9.5" x 6.5" x 2.8" (l x w x h) with add-on heat sink (required if I/O from IA or IB is selected)

Custom Raptor Systems

Customized Raptor embedded systems can be designed to perfectly match the requirements of your application. Customization options can include any of the following. Please [contact Diamond Systems](#) to request a custom Raptor quote and describe which items you would like configured into your Raptor system.

Customization Possibilities
Alternate Diamond Systems' SBC, which may generate a different set of memory, flashdisk and I/O options
Integrated mass storage options – add a 2.5" SSD SATA drive up of to 1TB to the system
Alternate bootable operating system
Enclosure options including (see below): Case size and finish Connectors and protective caps Heat sinks
Custom exterior mating cables

Custom Enclosure Options

The following enclosure options are available for any Raptor rugged system.

Case Sizes and Finishes

The case sizes for the standard Raptor systems are as follows, not including the mounting flanges. Custom case sizes can be designed to meet your specifications.

Raptor Model	Standard Case Size (L x W x H)
Base models	7.5" x 6.5" x 2.8"
Models with I/O modules from groups IA or IB	9.5" x 6.5" x 2.8"

Unless otherwise specified, Raptor systems come with a black anodized finish. Other finishes can be accommodated to meet your needs. Please contact Diamond Systems for a quote on any custom enclosure size or finish. Any custom case size or finish must be specified on the purchase order.

Standalone Raptor Enclosures

Raptor enclosures may be purchased separately, either with the standard connector holes or as a blank chassis with no holes. Use the following product numbers to order the standard enclosure with holes. Contact Diamond Systems for a quote on blank enclosures with no holes or custom enclosure sizes.

Raptor Case Product Number	Standard Case Size (L x W x H)
RS-CH76	7.5" x 6.5" x 2.8"
RS-CH96	9.5" x 6.5" x 2.8"
RS-CH116	11.0" x 6.5" x 2.8"

Connectors and Protective Caps

Raptor systems come standard with MIL-DTL-38999 Series III TV K-finish passivated stainless steel, service rating M, connectors. Other connector types are also available; please contact us with your requirements.

The connectors on standard Raptor systems come with removable plastic protective caps. Captive metal protective caps can be ordered for any or all connectors.



Cap Option	Order This Product ...
Captive screw-on metal caps	CAPTIVE-CAP and specify which connectors on the system should have the captive cap

Please contact Diamond Systems for a quote on any other custom connector or protective cap.

Heat Sinks

Raptor systems come with a heat sink on the top of the case designed to facilitate efficient removal of heat from the case. Custom versions of the heat sink can be created to meet your specific requirements. Please contact Diamond Systems for a quote on a custom heat sink.

Cables

Diamond Systems offers a set of lab-grade cables for each Raptor system. We can design custom cables to meet your exact requirements for connector type, pinout, finish and keying. Please contact Diamond Systems for a quote.

Raptor System Configuration & Quote Request Form

Option	Description	Check
P	SBC Options (must select one)	
C3612	Vega SBC with 2.1GHz Intel Core i7-3612QE CPU	<input type="checkbox"/>
C827E	Vega SBC with 1.4GHz Intel Celeron 827E CPU	<input type="checkbox"/>
C3517	Vega SBC with 1.7GHz Intel Core i7-3517UE CPU	<input type="checkbox"/>
M	System Memory Options (must select one)	
4G	4GB DDR3 SO-DIMM	<input type="checkbox"/>
8G	8GB DDR3 SO-DIMM	<input type="checkbox"/>
16G	16GB DDR3 SO-DIMM (for SBC option C3612 only)	<input type="checkbox"/>
F	Mass Storage Option (must select one)	
64MM	64GB mSATA MLC flashdisk *	<input type="checkbox"/>
32MM	32GB mSATA MLC flashdisk *	<input type="checkbox"/>
16MM	16GB mSATA MLC flashdisk *	<input type="checkbox"/>
64MS	64GB mSATA SLC flashdisk *	<input type="checkbox"/>
32MS	32GB mSATA SLC flashdisk *	<input type="checkbox"/>
16MS	16GB mSATA SLC flashdisk *	<input type="checkbox"/>
8MS	8GB mSATA SLC flashdisk *	<input type="checkbox"/>
8US	8GB USB flashdisk	<input type="checkbox"/>
O	Operating System Option (must select one)	
LNX	Linux	<input type="checkbox"/>
WE7	Windows Embedded 7	<input type="checkbox"/>
D	On-board DAQ Option (must select one)	
A	16 16-bit A/D; 8 16-bit D/A; 30 DIO; 8 32-bit counter/timers; 4 24-bit PWMs; 8-channel waveform generator	<input type="checkbox"/>
N	no data acquisition	<input type="checkbox"/>
IA	Group A I/O Option (must select one)	
E200	2 Gigabit Ethernet ports	<input type="checkbox"/>
E614	4 RS-232/422/485 serial ports 2 RS-232 serial ports 14 digital I/O lines	<input type="checkbox"/>
E61G	4 RS-232/422/485 serial ports 2 RS-232 serial ports 14 digital I/O lines Trimble Condor C2626 GPS module	<input type="checkbox"/>
E777	2 Gigabit Ethernet ports 4 RS-232/422/485 serial ports 2 RS-232 serial ports 14 digital I/O lines	<input type="checkbox"/>
E77G	2 Gigabit Ethernet ports 4 RS-232/422/485 serial ports 2 RS-232 serial ports 14 digital I/O lines Trimble Condor C2626 GPS module	<input type="checkbox"/>
N	no I/O	<input type="checkbox"/>

* May order only one of these mSATA flashdisks **or** one of the Group B I/O modules, cannot order both.

Ordering Guide continues on next page.

Option	Description	Check
IB	Group B I/O Option (must select one)	
DS4M	4 high speed RS-232/422/485 serial ports *	<input type="checkbox"/>
D232	4 high speed opto-isolated RS-232 serial ports *	<input type="checkbox"/>
D485	4 high speed opto-isolated RS-485 serial ports *	<input type="checkbox"/>
DM22	2 RS-232 & 2 RS-485 high speed opto-isolated serial ports *	<input type="checkbox"/>
DDAQ	8 16-bit analog inputs; 4 16-bit analog outputs; 14 DIO *	<input type="checkbox"/>
DDIO	36 buffered digital I/O lines *	<input type="checkbox"/>
DCAN	2 CAN 2.0B ports *	<input type="checkbox"/>
DLAN	1 Gigabit Ethernet port *	<input type="checkbox"/>
N	no I/O	<input type="checkbox"/>
S	Case Size Option (must select one)	
76CC	7.5" x 6.5" x 2.8" (l x w x h) with conduction cooling	<input type="checkbox"/>
76HS	7.5" x 6.5" x 2.8" (l x w x h) with add-on heat sink	<input type="checkbox"/>
96CC	9.5" x 6.5" x 2.8" (l x w x h) with conduction cooling (required if IA or IB I/O is selected)	<input type="checkbox"/>
96HS	9.5" x 6.5" x 2.8" (l x w x h) with add-on heat sink (required if IA or IB I/O is selected)	<input type="checkbox"/>

* May order only one of these mSATA flashdisks **or** one of these I/O modules, cannot order both.

Quantity Requested

Contact Information	
Name	<input type="text"/>
Company	<input type="text"/>
Address	<input type="text"/>
Telephone #	<input type="text"/>
Fax #	<input type="text"/>
Email address	<input type="text"/>

Please email Raptor System Configuration and Quote Request Form to salesorders@diamondsystems.com or fax to (650) 618-2520.

Custom Raptor Systems

Customized Raptor embedded application systems can be designed to perfectly match the requirements of your application. Customization options can include the following. Please [contact Diamond Systems](#) to request a custom Raptor quote and provide a detailed description of which items you would like configured into your custom Raptor system. Below are just a few of the many possibilities.

Raptor Enclosure Options		
Cap Covers	Description (may select one of the below)	Check
CAPTIVE-CAP	Captive screw-on metal caps	<input type="checkbox"/>

Raptor Standalone Enclosures		
Enclosures	Description (may select one of the below)	Check
RS-CH76	7.5" x 6.5" x 2.8" enclosure	<input type="checkbox"/>
RS-CH96	9.5" x 6.5" x 2.8" enclosure	<input type="checkbox"/>
RS-CH116	11.0" x 6.5" x 2.8" enclosure	<input type="checkbox"/>

Custom Requirements	
I have custom requirements for: (check all that apply)	Check
Alternate SBC - specify:	<input type="checkbox"/>
Operating System support – specify:	<input type="checkbox"/>
Mass storage options – specify size of 2.5" SATA drive:	<input type="checkbox"/>
Enclosure size – specify:	<input type="checkbox"/>
Enclosure finish – specify:	<input type="checkbox"/>
Connector type, pin out, finish and keying – specify:	<input type="checkbox"/>
Protective cap – specify:	<input type="checkbox"/>
Custom enclosure heat sink – specify:	<input type="checkbox"/>
Custom external mating cables – specify:	<input type="checkbox"/>

Quantity Requested

Contact Information	
Name	<input type="text"/>
Company	<input type="text"/>
Address	<input type="text"/>
Telephone #	<input type="text"/>
Fax #	<input type="text"/>
Email address	<input type="text"/>

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