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RS232S13/17 Rugged Server User Guide



"The most trusted provider of computer architecture for operational, deployable, and high reliability applications."

CRYSTAL GROUP INC.

ISO 9001:2008 &
AS9100C:2009 CERTIFIED QMS
DOC-00155 REV. E

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We Thank You!

From all of us at Crystal Group Inc., **THANK YOU** for your purchase of the RS232S13/17 Rugged Server. Our customers are the lifeline that keeps Crystal going. That is why it is extremely important to us that our customers are 100% satisfied with their product choice.

Crystal products are designed to provide superior performance and reliability in the harshest environments. Our company is ISO 9001:2008 and AS9100C:2009 certified QMS to show that we are dedicated to providing high quality products to our customers.

We are confident that this server will meet or exceed your expectations for what a rugged industrial/military computer server should accomplish. If you have any questions or concerns, please contact us at one of the options listed in the Contact Information section on page 6.

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Safety

Any service should be performed by qualified service personnel. Carefully follow all advisories and instructions in this manual to avoid causing any bodily injury or damage to the unit. This product does not contain any user serviceable parts.

ADVISORIES

Three types of advisories are used throughout this manual to emphasize important information or to warn of potential hazards to the user or equipment. These advisories each have a specific icon that will stand for one of the following: Note, Warning, or Caution. An example of each is shown below:



NOTE

A note indicates important information that helps make better use of the equipment.



WARNING

A warning indicates a potential for property damage, personal injury, or death.



CAUTION

Caution indicates potential damage to hardware or loss of data if instructions are not followed.

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HANDLING PRECAUTIONS



This product has components that may be damaged by electrostatic discharge (ESD).

Electrostatic Discharge (ESD)

To protect the equipment from electrostatic discharge, observe the following precautions when handling or storing the equipment or its components:

1. Always use a grounded wrist strap at the workstation or ground frequently by touching the metal chassis of the system before handling any components. The chassis must be connected to an earth ground.
2. Use antistatic padding on all work surfaces.
3. Avoid static-inducing carpet areas.
4. Keep the electronic components in its static shield bag until ready to perform installation or after removing it from the server.
5. Always handle the memory or expansion cards by the edges.
6. Do not touch the input/output connector pins.

BATTERY DISPOSAL

The following applies to any battery that might be on any board installed in the equipment:



Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

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A Contact Information

Crystal's highly trained technical support personnel are dedicated to the service and support of Crystal's customers. Our technical personnel are acutely aware that downtime experienced by a customer is a mission critical event. They excel at providing timely and effective responses to any technical issues encountered in the field. Please contact us with any questions or concerns by using one of the options below:

Customer Service Hours of Operation:
8:00 AM - 5:00 PM Monday through Friday Central Standard Time.

Technical Support Assistance Availability:
7/24/365- 7 days a week; 24 hours a day; 365 days a year.

After hours messaging service is available with a less than 30-minutes response time.

Within the United States: **800-378-1636**

International Number: **1+319-378-1636**

Email Address: support@crystalrugged.com

Request a Form Under Tech Support:
http://www.crystalrugged.com

For Up-to-the-minute Crystal Products Information visit our website at:
http://www.crystalrugged.com

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B Product Information

OVERVIEW

The Crystal RS232S13/17 is a compact two rack unit (R/U) server in a 3.5" (2U) high by 18″ wide by 13″ or 17″ depth chassis that can be rack mounted or used as a stand-alone unit. The RS232S13/17 consists of an aluminum chassis/enclosure, a power supply, and an ATX form-factor motherboard.

IDENTIFYING THE SERVER TYPE

Table 1

RS232S13/17				
RS	**2**	**3**	**2**	**S13 or S17**
Rugged Server	2U Rack Units	# of expansion slots in chassis	# of drive bays	Depth of chassis, in inches

The number and types of expansion slots available is motherboard dependent.

SPECIFICATIONS

Mechanical

Height	3.5″
Width	17.75″
Depth	13″ or 17″
Weight	20-32 lbs.

Electromagnetic Interference (EMI)

Optional 461E Kit: CE102—Conducted Emissions—10 kHz-10 MHz and RE102—Radiated Emissions—10 kHz-18 MHz

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Expansion Slots

The Crystal RS232S13/17 has: One PCIe 2.0 x16 (x8 signals) slot, one PCIe 2.0 x8 slot, and one PCI slot; full-ht, ¾ length. The types of slots are motherboard-dependent.

External Bays

Option 1 (standard)	Two removable SATA or SAS 2.5″ or 3.5″ hard drive bays
Option 2	Four 2.5″ SATA or SAS HDDs
Option 3	One CD/DVD (R/W) or Blu-ray ™ and two removable SATA or SAS 2.5″ or one 3.5″ HDD

Cooling

Seven thermostatically controlled fans (plus two power supply fans, supply dependent)

Mounting Options

Option 1 (standard)	Mounted on delrin glides
Option 2	Fixed mount, front and rear
Option 3	Jonathan rails

Power Supply Options

Option 1 (standard)	The RS232S13/17 is available with a 400 or 460 Watt full range ATX power supply with the following specifications: Input Voltage: 120 to 240 VAC w/PFC full range Frequency: 50-400Hz. Efficiency: 80% typical
Option 2	The RS232S13/17 is available with a 425 Watt DC ATX power supply with the following specifications: Input Voltage: 18-36VDC. Efficiency: 80% typical

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System Board

Option 1	X8DTL-3F, LGA1366 Xeon, ATX, 2LAN1000, VGA, 2 PCI 3.3V, 3 PCI-E X8, 1 PCI-E X16, IPMI, IPKVM, SATARAIDX6, SASRAIDX8
Option 2	X8DAL-3, LGA1366 Xeon, ATX, 2LAN1000, Audio, 2 PCI 5V, 1 PCI-E X4, 1 PCI-E X4 (IN X16 SLOT), 1 PCI-E X16, SATARAIDX6, SAS RAIDX8
Option 3	X9DRL-IF, LGA2011 Xeon, ATX, 2LAN1000, VGA, 1 PCI 3.3V, 4 PCI-E X8, 1 PCI-E X1, IPMI, IPKVM, SATARAIDX8, SATA3X2
Option 4	X9SAE-V, LGA1155, Xeon & i3/5/7, ATX, 2LAN1000, VGA, 2XHDMI, AUDIO, 1 PCI, 2 PCI-E X1, 1 PCI-E X4, 1 PCI-E X8, 2 PCI-E X16, SATAX4, SATA3X2

Military Standards

For a complete list of Military Standards visit the Crystal Group website at:
http://www.crystalrugged.com

Commercial Standards

Commercial standards are based on the National Electric Code (NFPA70- National Fire Protection Association). Please visit the following link to learn more about the National Electric Code standards:

http://www.nfpa.org

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Installing the Product

GROUNDING

- AC Version- to ensure a good earth ground, the RS232S13/17 should be used with a UL listed three-conductor power cord connected to a three-conductor grounded power source.
- DC Version- input installations- use only approved copper connectors.

Reliable Grounding- reliable grounding of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips). Please see Figure 3 for ground stud location.

RACK MOUNTING PRECAUTIONS

To prevent bodily injury when mounting or servicing this unit in a rack, special precautions must be taken to ensure that the system remains stable. The following guidelines are provided to ensure personal safety:

- If using an equipment rack, make sure to securely bolt the rack frame to the floor or vehicle.
- Elevated Operating Ambient Temperature- if installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack contents may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environmentally compatible rack with the manufacturer's maximum rated ambient temperature.
- Reduced Air Flow- installation of the equipment in a rack should be such that the air flow is not restricted.
- Mechanical Loading- mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading.
- Circuit Overloading- consideration should be given to how the equipment will be connected to a supply circuit and the effect that the loading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of the equipment ratings should be used when addressing this concern.
- All electrical wiring should be in accordance with the National Electric Code, or prevailing Military Standards.

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INSTALLING THE RS232S13/17 WITH CRYSTAL SLIDES IN AN EQUIPMENT RACK

To install RS232S13/17 with crystal slides in an equipment rack, complete the steps and see Figure **1** below:

1. Line up two holes on the front mounting ears at the desired level on the front of the equipment rack, and attach to the rack using (2) 10-32 x .75″ rack screws provided.

   It may not be possible to line up all holes. If more than three holes do not line up on each side, please contact Technical Support.

2. Line up two holes on the rear mounting ears at the desired level on the rear of the equipment rack, and attach to the rack using (2) 10-32 x .50″ rack screws provided.

3. Lock slide in place using screws.

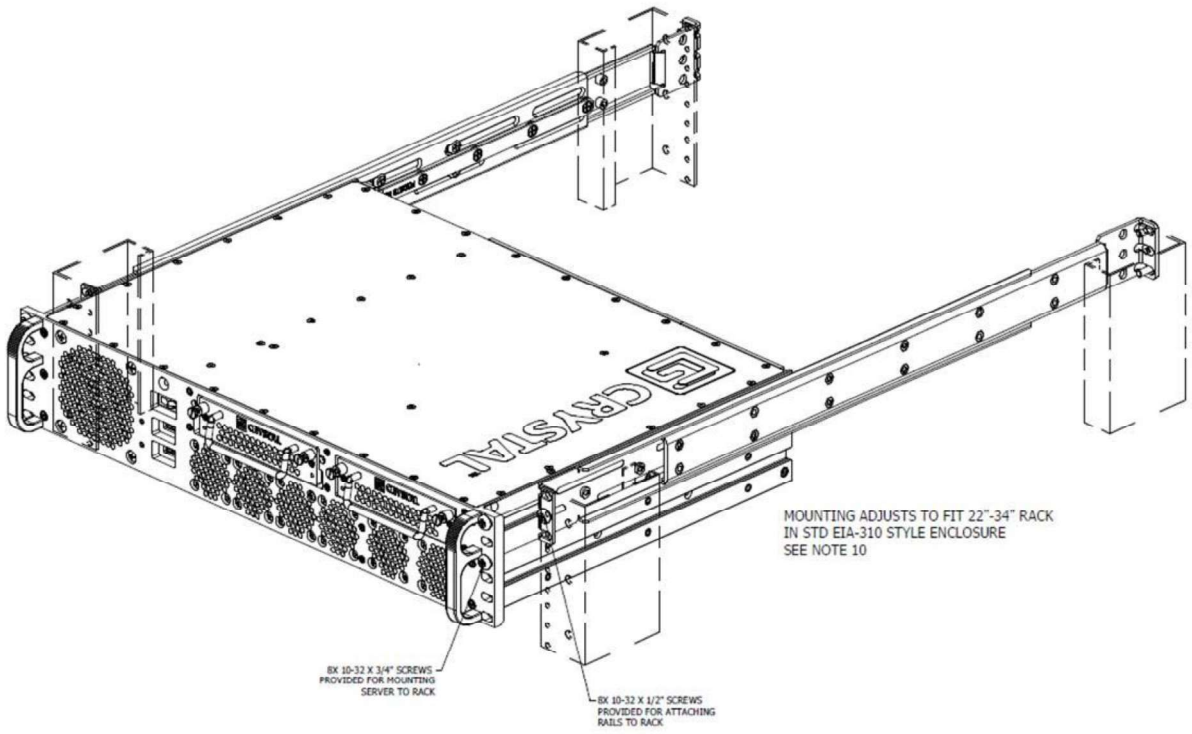


Figure 1. RS232S13/17 with Crystal Slides

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D Operating the Product

If the RS232S13/17 is part of a rack configuration, refer to the rack user's guide for more information on connecting to a power source.

CONNECTING TO A POWER SOURCE

Please see Section C- Installing the Product for more information.

POWERING THE SERVER ON

After securely attaching the power connection, press the Power On/Off switch which will be located on either the front or the back of the chassis depending on the specific configuration. A blue LED will illuminate when power is applied (see Figure **2** for location of power switch and more information about the RS232S13/17 chassis).

E Maintaining the Product

Only qualified service personnel should attempt to open the (product) chassis. There are not any user serviceable parts inside.

To protect the equipment from Electrostatic Damage (ESD), follow the proper precautions at all times when handling the unit and its components. Please see Electrostatic Discharge section on Page 5.

DRIVER UPDATES

Contact Technical Support at one of the options listed on page 6.

CHASSIS ACCESS

Removing the Cover

1. Make sure the RS232S-13/17 is powered off and the unit is disconnected from the power source.
2. Remove the screws connecting the top cover to the chassis using a Phillips screw driver.
3. Lift the cover to expose the interior of the chassis.

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CHASSIS VIEWS:

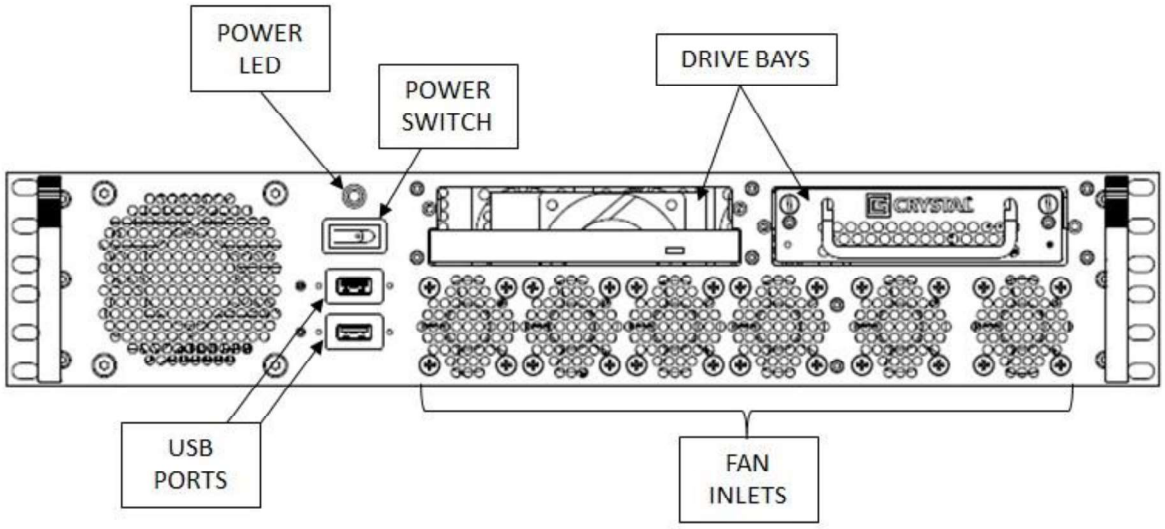


Figure 2. Front View RS232S13/17

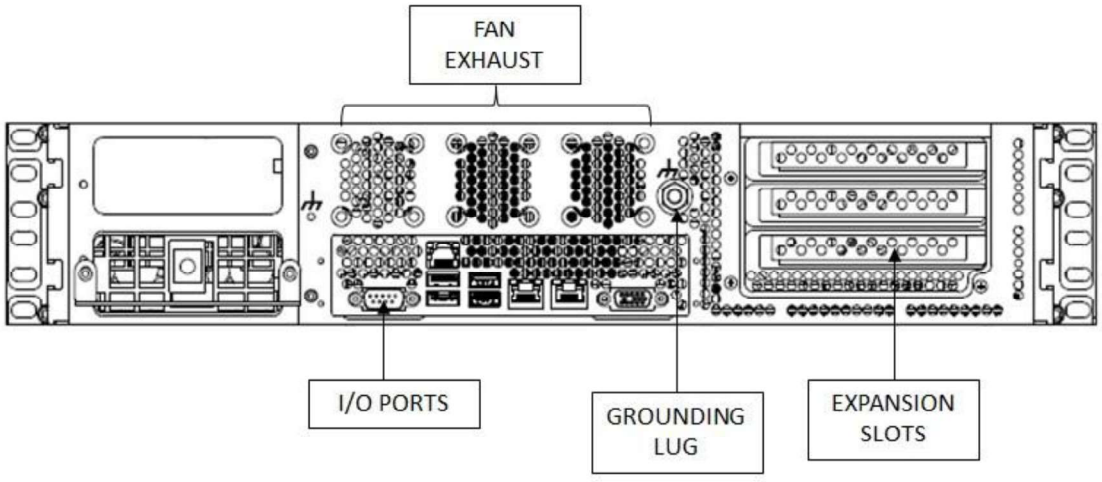
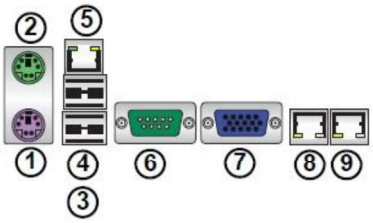


Figure 3. Rear View RS232S13/17

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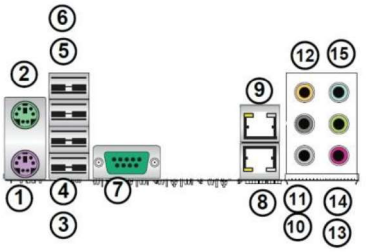
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INPUT/OUTPUT (I/O) PORTS:



X8DTL-3F

NUMBER	FUNCTION
1	Keyboard (Purple)
2	PS/2 Mouse (Green)
3	Back Panel USB Port 0
4	Back Panel USB Port 1
5	Dedicated LAN (X8DTL-3F/iF only)
6	COM Port 1 (Turquoise)
7	VGA (Blue)
8	Gigabit LAN 1
9	Gigabit LAN 2

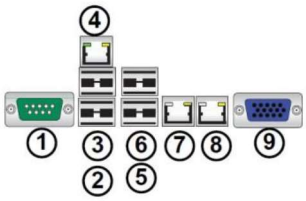


X8DAL-3

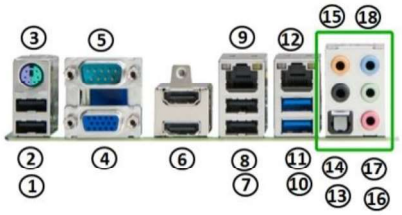
NUMBER	FUNCTION
1	Keyboard (Purple)
2	PS/2 Mouse (Green)
3	Back Panel USB Port 0
4	Back Panel USB Port 1
5	Back Panel USB Port 2
6	Back Panel USB Port 3
7	COM Port 1 (Turquoise)
8	LAN Port 1
9	LAN Port 2
10	Side_Surround (Grey)
11	Back_Surround (Black)
12	CEN/LFE (Orange)
13	Microphone-In (Pink)
14	Front (Green)
15	Line-In (Blue)

Figure 4. I/O Ports

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X9DRL-IF



X9SAE-V

NUMBER	FUNCTION
1	COM Port 1 (Turquoise)
2	Back Panel USB Port 6
3	Back Panel USB Port 7
4	IPMI_Dedicated LAN
5	Back Panel USB Port 8
6	Back Panel USB Port 9
7	Gigabit LAN 1
8	Gigabit LAN 2
9	Back Panel VGA (Blue)

NUMBER	FUNCTION
1	USB 2.0 Port 9
2	USB 2.0 Port 8
3	Keyboard/Mouse
4	VGA Port
5	Serial Port (COM1)
6	HDMI1/HDMI2 Ports
7	USB 2.0 Port 13
8	USB 2.0 Port 10
9	Gb LAN Port 1
10	USB 2.0 Port 3**
11	USB 2.0 Port 2*
12	Gb LAN Port 2
13	SPDIF Out
14	Surround Out
15	Center/LFE Out
16	Mic In
17	Line Out
18	Line In

Figure 4. I/O Ports (cont'd)

The product received will have one of the four I/O ports shown above.

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EXPANSION/RISER CARD REMOVAL AND REPLACEMENT

Installing a plug-in expansion card requires an appropriate riser card. Contact a Crystal Sales Representative or Technical Support if the system does not include a riser card.

Removing and Replacing the Plug-in Expansion/Riser Card

Disconnect power source to prevent injury.
Installing a plug-in expansion/riser card requires opening the (product) cover; removing the card cage; inserting the card into the motherboard; replacing the card cage; and disconnecting and reconnecting the appropriate connectors.

Do not force the card. Forcing the card may result in equipment damage. If it does not slide into place, check the alignment and try again.

(Remove if 1U Product) Depending on the product configuration, the expansion card slot may be vertical or horizontal. If horizontal the riser card will be used to 'brace' the expansion card and connect to the motherboard.

Please reference Figure **5** on the next page.

Steps:

1. Turn the unit OFF and disconnect the unit from the power source.
2. Remove the chassis cover (see Removing the Cover).
3. The card cage is retained by three screws, two from the rear of the unit and one at the end of the retention bar. Locate and loosen the screws. Carefully slide card cage forward and lift from chassis.
4. Remove the corresponding expansion slot filler bracket if installed or remove card.
5. Align the expansion card with the appropriate slot and press the expansion card in firmly. Set the plug-in cards into the riser card and attach using the pan head screws supplied with the filler plate.
6. With the expansion card in place within the slot, install the screw and tighten to hold the card in place.
7. Re-attach card cage assembly to chassis with the three screws.

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8. Attach appropriate connectors.
9. Replace chassis cover.

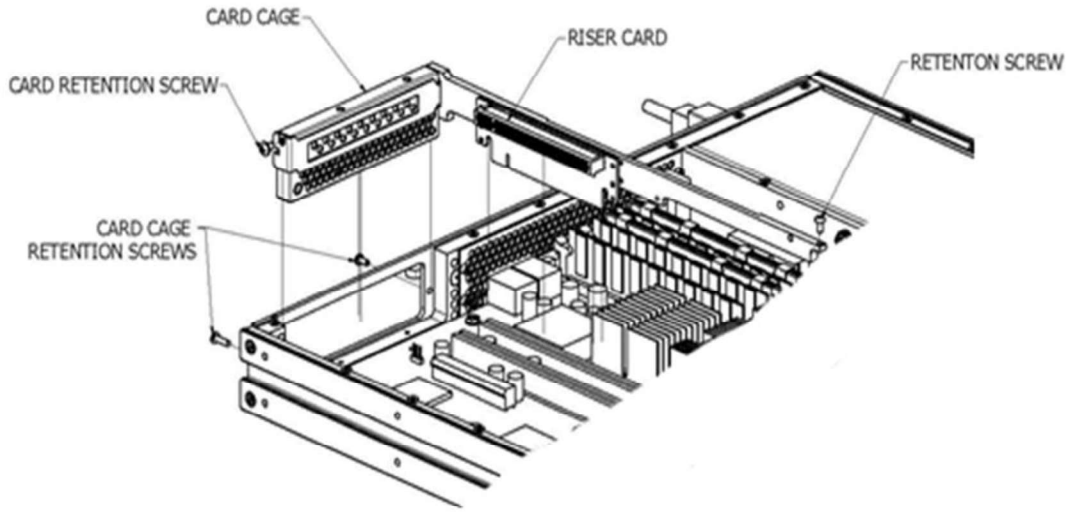


Figure 5. Expansion/Riser Card Installation

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HARD DRIVE REMOVAL AND REPLACEMENT

Removing and Replacing the Carrier/Hard Drive Assembly

The procedure below may be different depending on the explicit drive contained in the product.

Steps:

1. Power the system down (unless a drive controller supporting hot-swap has been installed- contact Technical Support with any questions).
2. Unscrew both thumbscrews on the face of the carrier to be removed (please see circled area in Figure **6** below). If thumbscrews are too tight, use a flathead screwdriver to loosen.
3. Grasp the handle and pull the carrier/drive assembly straight out of the face of the system.
4. Remove the drive by removing the four Phillips head screws from bottom of the carrier sled.
5. Install replacement drive into carrier and secure with the four Phillips head screws (a thread-lock solution is recommended).
6. Re-install carrier/drive assembly into the system.
7. Tighten thumbscrews to secure the drive.
8. Reapply power to the server, rebuilding any RAID arrays as necessary.



Figure 6. Drive Removal and Replacement

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MEMORY REMOVAL AND REPLACEMENT

Removing and Replacing the Memory

Contact Crystal Technical Support before performing a memory upgrade. Use only Crystal- approved memory for upgrades.

Do not force the DIMM. Forcing the DIMM may result in equipment damage. Check the alignment and keying before installing.

For population order see the motherboard manual received or contact Technical Support.

Steps:

1. Open up chassis cover (see Removing the Cover in the Chassis Access section on page 15).
2. If removal is required, locate the memory card area and open both DIMM release levers by placing one finger on each lever and pushing outward. See Figure **7** on next page.
3. The DIMM will lightly pop out of the slot. Remove the old DIMM.
4. Check the orientation or key when adding new DIMM.
5. Press the DIMM into its slot evenly on both ends until it clicks into place. The DIMM release levers will snap into place.
6. The DIMM is properly seated when the release levers have fully engaged.

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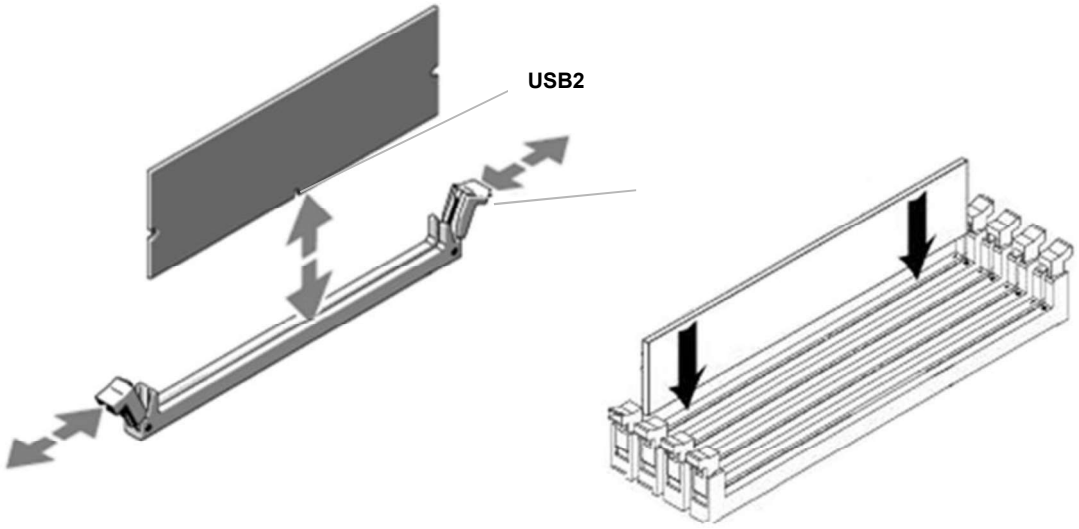


Figure 7. Installing DIMM

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F Troubleshooting

CONTACT TECHNICAL SUPPORT

If any problems arise when using the product, please contact Technical Support at one of the options listed on page 6. Before calling, please have the following information available to help expedite assistance:

1. Unit serial number
2. Brief description of the problem
3. Brief explanation of the steps already taken to isolate and resolve the problem

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Available Warranty

CRYSTAL GROUP LIMITED WARRANTY

Seller warrants to the Buyer that the products manufactured by it will be free from defects in material and workmanship under normal use and service for the time period specified herein. Seller's sole obligation under this warranty shall be the repair or replacement of any part or parts which prove to be defective under normal use and service within five (5) years from the date of delivery to the Buyer. To receive the benefits of this warranty, the Buyer must return said allegedly defective part or parts to Seller's facility in Hiawatha, Iowa, or other location specified by Seller, within the time period set forth above. A warranty extension contract is available if purchased, potentially extending the coverage to ten (10) years. Terms and Conditions of the extension period are dictated in a separate agreement. Customer bears the risk of loss or damage of equipment in transit from Buyer to Seller. The Buyer shall also pay the costs of shipping and handling for any service other than Standard Ground or Air Transportation from Seller's factory to Buyer's specified destination. Correction by Seller of the defects in the manner provided above shall constitute a fulfillment of all liabilities of Seller with respect to this warranty. Buyer shall pay all costs of removal of any part or parts and reinstallation thereof. Seller's sole liability under this warranty shall be either
(a) to repair or to replace, at Seller's option, the defective component in accordance with the above procedure, or (b) if Seller reasonably determines that it is unable to resolve the defect by repair or replacement, to refund the purchase price upon return of the defective item. The warranty period for repaired or replaced components shall be the remainder of the original warranty period for the repaired or replaced item. Specifically excluded from this warranty are any products not provided by Seller. Seller will however provide the labor to remove, install, and test excluded products at Seller's facility (or a facility authorized by Seller) to the extent that the Buyer agrees to purchase replacement parts or to the extent that an applicable warranty replacement is available from the OEM of the part. Under no circumstances will this warranty apply to any software products or preventative maintenance service.

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The following information is for FCC compliance of Class A devices: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

The following information is for FCC compliance of Class B devices: The equipment described in this manual generates and may radiate radio-frequency energy. If it is not installed in accordance with Crystal's installation instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in part 15 of the FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

Modifying the equipment without Crystal's written authorization may result in the equipment no longer complying with FCC requirements for Class A or Class B digital devices. In that event, the right to use the equipment may be limited by FCC regulations, and correction of any interference to radio or television communications may be required at the owner's expense.

To determine whether the equipment is causing interference, turn off the equipment. If the interference stops, it was probably caused by the Crystal equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

• Turn the television or radio antenna until the interference stops.

• Move the equipment to one side or the other of the television or radio.

• Move the equipment farther away from the television or radio.

• Plug the equipment into an outlet that is on a different circuit from the television or radio (that is, making certain the equipment and the television or radio is on circuits controlled by different circuit breakers or fuses).

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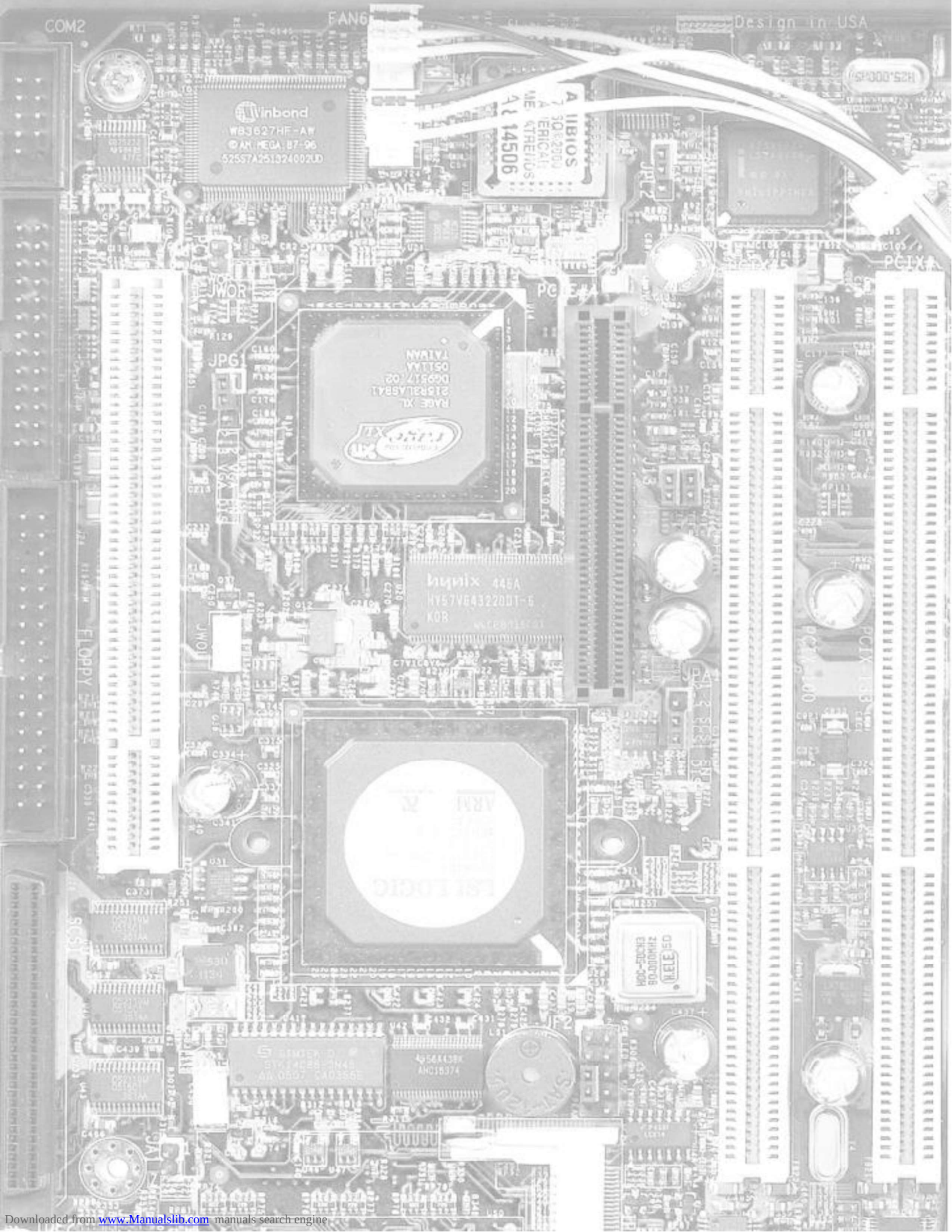
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