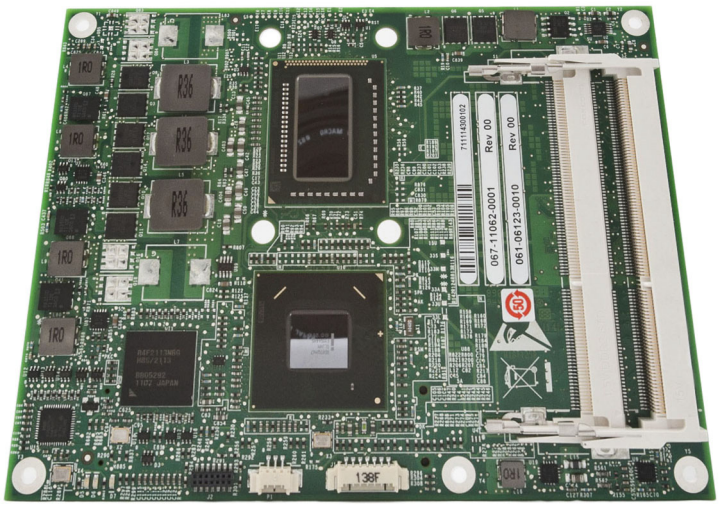
Quick Start Guide

radisys

COM EXPRESS®

CEQM67



This guide describes how to install, configure, and operate a Radisys® CEQM67 COM Express R2.0 Type 6 module, CEQM67-AHS active heatsink, and CR300 R2.0 Type 6 ATX carrier board.

Before starting, unpack the components on a grounded work surface and check to make sure you have everything you need. Contact your sales representative if any components are missing or damaged.

Handling precautions

WARNING! Handle the COM Express module and carrier board with care. Failure to employ adequate anti-static measures can cause partial or complete device failure, performance degradation, or reduced operating life.

The product contains static-sensitive components and should be handled with care. Failure to employ adequate anti-static measures can cause irreparable damage to components. Visit www.radisys.com/esd for ESD protection instructions.

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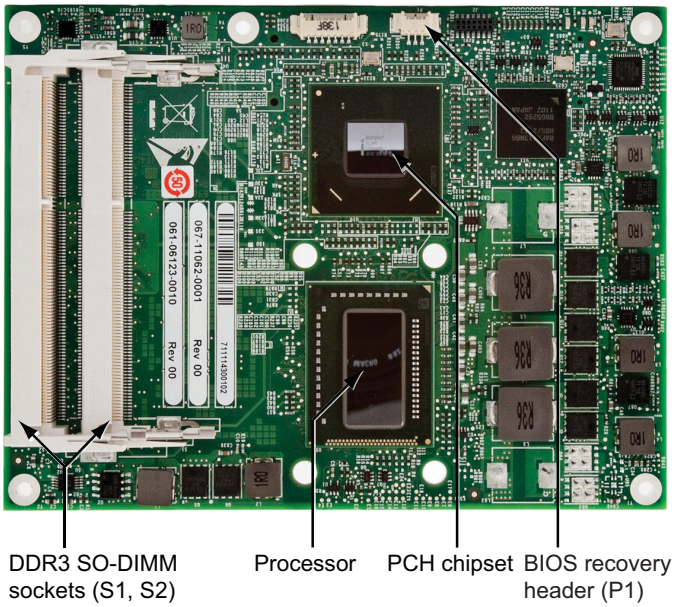
Quick start summary

These are the steps to install and operate your module. Refer to subsequent sections in this manual for details.

1. Check the pinout selection.
2. Install the system memory.
3. Assemble the module, heatsink, and carrier board.
4. Attach cables from the carrier board's front panel I/O header to the front panel interfaces—power button, HDD LED, etc.
5. Attach peripheral devices to the carrier board:
   - Video display
   - Storage disk drive
   - USB keyboard and mouse
   - Power supply
   - Ethernet (optional)
6. Power on the system.
7. Install the operating system and drivers.

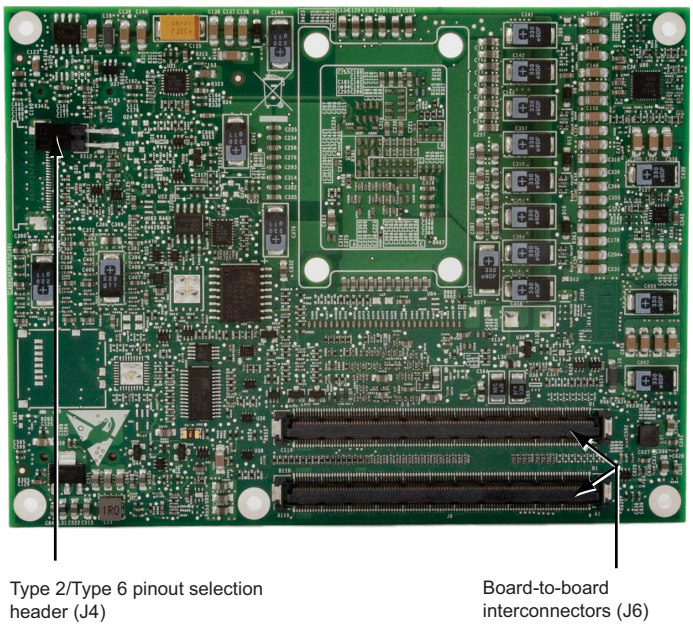


Check the pinout selection

The CEQM67 COM Express modules provide a pinout selection header (J4) for either R2.0 Type 6 or R1.0/R2.0 Type 2 pinouts. By default, the board-to-board interconnectors conform to R2.0 Type 6 pinout definitions.

Remove the jumper from J4 to select R1.0/R2.0 Type 2 module pinouts for use with a Type 2 carrier board. The board-to-board interconnector will no longer support R2.0 Type 6 pinouts for features such as PCI and IDE interfaces.

Note: If the COM Express module supports fewer ports than the total available on the carrier board, the ports with lower fill orders will be used when you connect external devices.



Install the memory modules

The two SO-DIMM sockets each accept DDR3-1066 and DDR3-1333 SDRAM in 1GB, 2GB, 4GB, and 8GB sizes. At least one DDR3 SDRAM must be installed in either socket to operate the system.

Prepare your heatsink parts

The active heatsink is designed to prevent overheating and subsequent damage to the processor and key components. In order to install the CEQM67-AHS active heatsink, you need to disassemble the heatsink parts first. Refer to Figure 1 as a guide to steps 1 through 3.

Important: Do not throw any parts away, as they will all be needed again in the final assembly.

1. Remove the fan from the heatsink body.
2. Loosen the CPU spring screws until the backer plate underneath falls off. Do not attempt to remove the CPU spring screws completely, since they are secured to the heatsink body with E-rings.
3. Remove the five heatsink screws and washers.
4. Remove the five carrier screws, washers, and nuts.
5. Remove all plastic covers on the thermal interface material (TIM) pads. Figure 2 on page 4 shows the Thermal interface Material (TIM) on the bottom of the heatsink.

Figure 1. CEQM67-AHS heatsink diagram

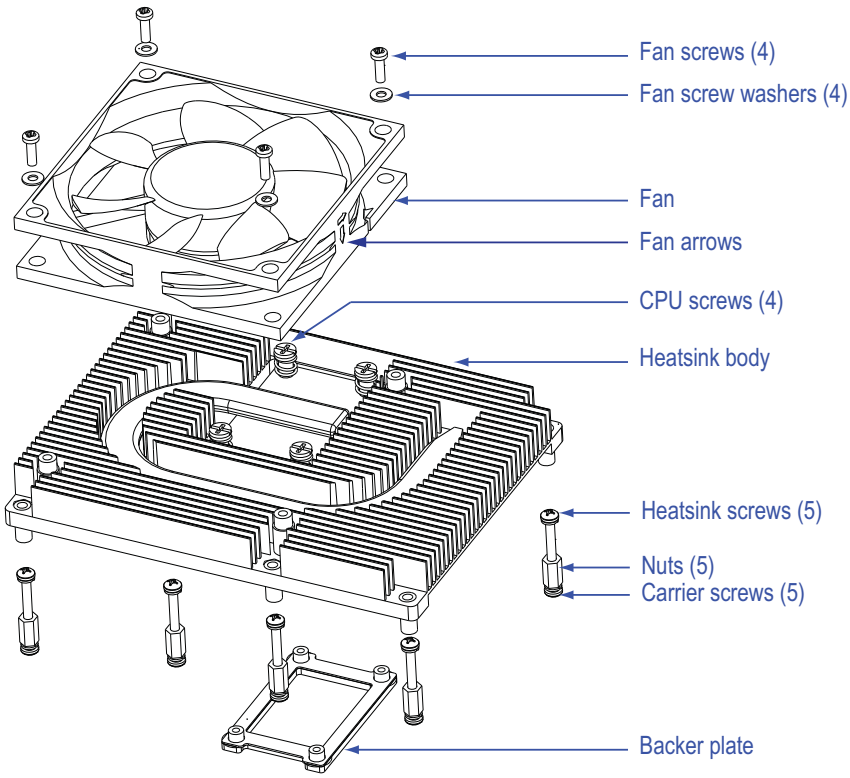


Figure 2. CEQM67-AHS bottom view (TIM)

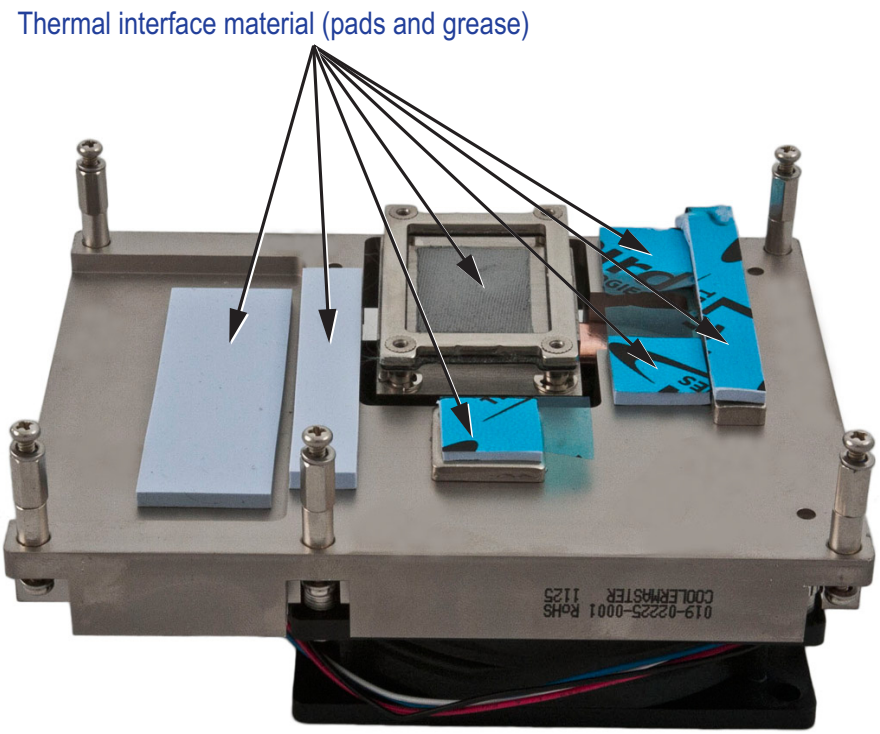
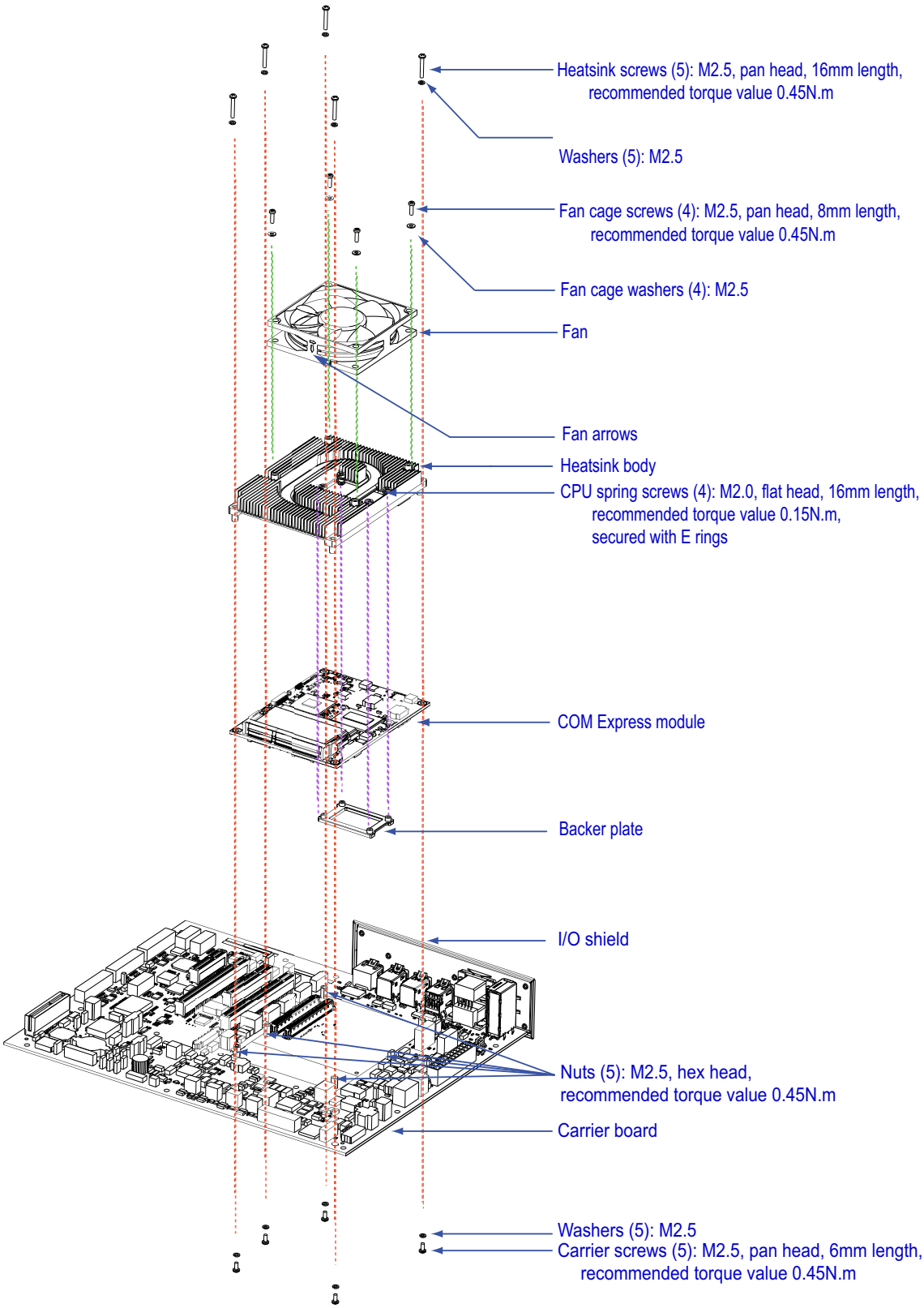


Figure 3. Assemble the heatsink, module, and carrier board



Assemble the module, heatsink, and carrier board

Refer to the Figure 3 on page 5 as a guide to these steps.

1. Place the top side of the heatsink body (the side with fins) on a grounded work area.
2. Place the top side of the COM Express module onto the heatsink body. The four CPU screws on the heatsink body should penetrate through the four holes around the CPU.

   Check the thermal interface material (TIM) pads and grease on the heatsink to make sure they line up with the corresponding components on the heatsink.
3. Attach the backer plate underneath the COM Express module by lining up the backer plate with the four screws that protrude through the module.
4. Tighten the CPU spring screws from the top side of the heatsink body to ensure the CPU will contact the heatsink evenly. The recommended torque value is 0.15N·m.
5. Attach the fan to the heatsink body, making sure the down arrow points to the heatsink. Tighten the four fan screws and washers to a torque value of 0.45N·m.

   Notes:

   - There are two arrows on the side of the fan. The right arrow shows the direction of the fan rotation. The down arrow shows the direction in which the fan is attached to the heatsink body.

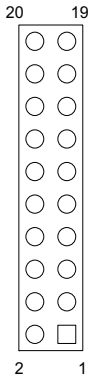
     WARNING! If the fan is not installed properly as directed by the arrow on the fan, the heatsink will not cool the system adequately. See Figure 1 on page 3 for the direction of the fan arrow.
   - You can skip this step if you are installing a passive cooling solution (heatsink without fan), but refer to the *Product Manual* for important information on airflow requirements.
6. Tighten the five nuts onto the carrier board using five pairs of carrier screws and washers (recommended torque: 0.45N·m). The screws and washers go underneath the carrier board and the nuts on top.

   Note: Radisys offers two types of standoffs applicable to 8mm-high or 5mm-high board-to-board interconnectors on the carrier board.
7. Place the module and heatsink assembly onto the carrier board, lining up the board-to-board interconnectors on the module and carrier board. Press the module firmly into place on the carrier board. When the interconnectors are fully seated, the five nuts on top of the carrier board should be touching the module.

   WARNING! To avoid damaging any components, make sure that the module is firmly seated in the carrier board's interconnectors before proceeding to the next step.
8. Tighten the module and heatsink assembly onto the carrier board using five pairs of heatsink screws and washers (recommended torque: 0.45N·m).
9. Attach the heatsink's 4-pin fan power connector to the processor fan header on the carrier board.

Connect the front I/O panel switches and indicators

If you are using a CR300 carrier board, the power button switch, reset switch, hard disk LED, and PC speaker are located on the 2x10-pin front I/O panel. See the table below for pinout definitions.



Configuration	Pin numbers	Description
Hard disk LED	1 & 3	Pin 1: HDD LED anode (to VCC), 5V power for hard disk LED Pin 3: HDD LED cathode (from HD_ACT#), hard disk read/write activity LED
Front panel reset switch	5 & 7	Pin 5: Ground for Pin 7, true ground Pin 7: Reset system input
Front panel power button switch	6 & 8	Pin 6: Power button input Pin 8: Ground for Pin 6, via a 100Ω resistor
Front panel speaker	10 & 12/16	Pin 10: 5V power for speaker Pin 12: PC speaker Pin 16: PC speaker

Connect peripheral devices

Install at least the minimum number of devices to make the system functional—video, storage, USB keyboard/mouse, and power supply. Refer to the carrier board manual for connector locations.

Device type	Module features		Available interfaces on CR300
	Interface	Feature details	
Video[a]	PEG (x1)	• Gen2 (5 GT/s) PCI Express frequency • Low Swing and Full Swing operating modes • Configurable options via soft strapping: one x16, two x8, and one x8 plus two x4 interfaces	One PEG slot (J11)
	VGA (x1)	• 24-bit RAMDAC color depth • Up to 2048x1536 @ 60Hz resolution	One DE-15 VGA connector (J18)
	LVDS (x1)	• Single-channel or dual-channel • 18-bit and 24-bit color depths • Up to 1920x1200 @ 75Hz resolution • PWM backlight control	• One LVDS connector (J13) • One LVDS backlight control connector (P18)
Audio	HDA (x1)	Up to four CODECs of different types	Audio jacks (J1) for microphone in, line in, and line out
	PC speaker (x1)	PC speaker signals for diagnostic beeps	Front I/O speaker pins (P53)
Storage	SATA (x4)	• Support for hard disk drives, solid state drives, and CD-ROM/DVD-ROM drives • Data transfer rates up to 6.0Gbps • IDE, AHCI, and RAID (0, 1, 5, and 10) modes	Four SATA ports (P8, P9, P12, P13)

Device type	Module features		Available interfaces on CR300
	Interface	Feature details	
I/O	USB (x8)	• Support for hard disk drives, flash drives, floppy disk drives, and CD-ROM/DVD-ROM drives • High-speed, full-speed, and low-speed USB • USB 2.0 debug port on port 0 • Console redirection on port 0	Eight USB ports(J7, J16, J17)
	Serial port (x1)	• 16550-compatible • Support for console redirection	• Serial port connector 0 (J18) • Serial port connector 1 (P24)[b]
	Legacy I/O (via BIOS)	• RS-232 serial ports, PS/2 keyboard, and PS/2 mouse supported by the SMSC® 47N217, Nuvoton® WPCN383U, Winbond® W83627EHG/DHG-P, and/or SMSC SCH3116 LPC Super I/O chips • Console redirection on serial port	• 47N217: P11 for serial port 0 • WPCN383U: P7 for serial ports[0:1] • W83627EHG/DHG-P: P6 for serial ports [0:1] and PS/2 • SCH3116: P15 for serial ports [0:1] and PS/2, P23 for serial ports [2:3], P5 for serial ports [4:5]
Network	Gigabit Ethernet (x1)	• IEEE 802.3x-compliant • Integrated PHY for 10/100/1000 Mbps full-duplex and half-duplex operation • ACPI 3.0-compliant wake-up • PXE remote boot • Four programmable LEDs for link status, traffic, 100Mbps speed, and 1000Mbps speed	One Ethernet port (J6)
Power supply		• AC power supply, 12V (optionally with 5V standby) • DC power supply • Smart battery	• Two ATX power connectors, one 24-pin connector (P17)[c] and one 4-pin connector (J12) • DC-in power connector (J33) • Smart battery connector (P28)

[a] The COM Express module is also capable of supporting DisplayPort, HDMI, embedded DisplayPort, and SDVO via the PCH's digital display interfaces. The availability of these interfaces in a COM Express system depends on the carrier board design.

[b] The CEQM67 supports only one 16550-compatible serial port, so the secondary serial port (connector 1) is not usable by the system.

[c] A 20-pin power supply can also be used. No adapter is required: plug the 20-pin cable into the pin #1 end of the connector, leaving pins 21-24 on the other end exposed. Pin #1 is marked with an asterisk (*) on the PCB.

Configure the system BIOS

IMPORTANT: Before installing the operating system, make sure the boot device priority in the system BIOS is set appropriately.

After you complete the COM Express system assembly, connect the power supply and power on the system. To enter the system setup utility, press <F2> or <Delete> during system startup. The system BIOS is based on the AMI® Aptio™ UEFI (Unified Extensible Firmware Interface) developed by Intel and American Megatrends, Inc.

Use the up, down, left, and right arrow keys on your keyboard to navigate through BIOS items in a menu, and use <+> and <-> to switch options. Refer to the *System Setup Utility Specification* for details.

After you have completed BIOS configurations, navigate to the Save & Exit menu to save changes and reboot.

Note: By default, the system will boot from the SPI flash ROM on the module. It is possible to configure BIOS_DIS[0:1]# signals to boot the system from the SPI flash ROM on the carrier board. Typically a boot BIOS selection header is available on the carrier board to determine the boot BIOS.

Install the operating system and drivers

The system supports these operating systems:

- Microsoft® Windows XP® Professional with Service Pack 3 (32-bit and 64-bit)
- Microsoft Windows 7 (32-bit and 64-bit)
- Microsoft Windows XP Embedded Standard 2009
- Red Hat® Linux® Enterprise (32-bit and 64-bit)
- Fedora® Linux (32-bit and 64-bit)
- Wind River® VxWorks® 6.8

The operating system you select may require you to install device drivers. Visit www.radisys.com/downloads for device drivers and utilities.

1. Install the operating system using a bootable SATA or USB optical disk. Follow the instructions provided with the operating system.

   After installing the operating system, you may want to change the boot order in the BIOS so that the hard disk is checked first.

2. Download and install the required drivers from the Radisys Web site.