# 19-inch 1U Rack-Mount Chassis

## *User Guide*

**UG095 (v1.0.1) December 10, 2006**

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## Revision History

The following table shows the revision history for this document.

| Date | Version | Revision |
|---|---|---|
| 08/07/06 | 1.0 | Initial Xilinx release. |
| 12/10/06 | 1.0.1 | Minor typographical edits. Resampled all figure photographs. |


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# About This Guide

This user guide provides instructions to assemble the Xilinx 19-inch 1U rack-mount chassis with a Xilinx ML310 or ML410 embedded development platform.

## Additional Resources

To find additional documentation, see the Xilinx website at:

http://www.xilinx.com/literature.

To search the Answer Database of silicon, software, and IP questions and answers, or to create a technical support WebCase, see the Xilinx website at:

http://www.xilinx.com/support.

## Conventions

This document uses the following conventions. An example illustrates each convention.

### Typographical

The following typographical conventions are used in this document:

| Convention | Meaning or Use | Example |
|---|---|---|
| `Courier font` | Messages, prompts, and program files that the system displays | `speed grade: - 100` |
| **`Courier bold`** | Literal commands that you enter in a syntactical statement | **`ngdbuild`** *design_name* |
| **Helvetica bold** | Commands that you select from a menu | **File → Open** |
| | Keyboard shortcuts | **Ctrl+C** |


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| Convention | Meaning or Use | Example |
|---|---|---|
| Italic font | Variables in a syntax statement for which you must supply values | **ngdbuild** *design_name* |
| | References to other manuals | See the *Development System Reference Guide* for more information. |
| | Emphasis in text | If a wire is drawn so that it overlaps the pin of a symbol, the two nets are *not* connected. |
| Square brackets [ ] | An optional entry or parameter. However, in bus specifications, such as **bus[7:0]**, they are required. | **ngdbuild** [*option_name*] *design_name* |
| Braces { } | A list of items from which you must choose one or more | **lowpwr** ={**on**\|**off**} |
| Vertical bar \| | Separates items in a list of choices | **lowpwr** ={**on**\|**off**} |
| Vertical ellipsis<br>.<br>.<br>. | Repetitive material that has been omitted | IOB #1: Name = QOUT'<br>IOB #2: Name = CLKIN'<br>.<br>.<br>. |
| Horizontal ellipsis ... | Repetitive material that has been omitted | **allow block** *block_name loc1 loc2 ... locn;* |

## Online Document

The following conventions are used in this document:

| Convention | Meaning or Use | Example |
|---|---|---|
| Blue text | Cross-reference link to a location in the current document | See the section "Additional Resources" for details.<br>Refer to "Title Formats" in Chapter 1 for details. |
| Red text | Cross-reference link to a location in another document | See Figure 2-5 in the *Virtex-II Platform FPGA User Guide.* |
| Blue, underlined text | Hyperlink to a website (URL) | Go to http://www.xilinx.com for the latest speed files. |


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# 19-inch 1U Rack-Mount Chassis

## Overview

The ML310/ML410 embedded platform (the *board*) gives designers the ability to test and debug Virtex™-II Pro/Virtex-4 designs. To make the board more accessible and usable by a group of designers, a rack-mount installation can be used to allow network access to the board. This method enables multiple designers, rather than just one desktop, to access the board.

The Xilinx 19-inch 1U rack-mount chassis is intended to be installed into a 4-post network rack for remote use. This user guide provides instructions to assemble the Xilinx 19-inch 1U rack-mount chassis with a Xilinx ML310 or ML410 embedded development platform. A personality module can be added, and either an LCD (included with ML310/ML410 board), a CD-ROM, or a hard disk can be added to the ML310/ML410 board within the chassis (these optional additions are not included in this package, but instructions are given for their installation). The ML310/ML410 ATX back panel of the chassis allows for many types of other peripheral connections that meet most needs. The system power supply and necessary power cables are included in the chassis.

### Inventory List

#### Package Contents

Parts included in this package (Figure 1, page 9 and Figure 2, page 10):

- 1 19-inch 1U rack-mount chassis (remove the top lid to see all other accessories)
- Inside, installed:
  - 1 250W ATX power supply
  - 2 cooling fans
  - 1 drive cage with blank front panel
  - 1 personality module front panel
- Inside, uninstalled:
  - 1 power cord
  - 1 ribbon cable
  - 1 ML410 ATX back panel
  - 1 LCD front panel


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- 1 ejector lever kit for personality module
  - 2 levers
  - 2 clips
  - 2 screws with washers
  - 2 bushings
- 7 cable ties

### Required Parts (not included):

- Xilinx ML310 or ML410 embedded development platform (Figure 3, page 10)

### Optional Parts (not included):

The optional components (shown in Figure 4, page 10) are:

- Personality module
- LCD with ribbon cable (included with ML310/ML410 platform)
- Hard disk and associated screws and cables
- CD-ROM and associated screws and cables

### Required Tools (not included):

- Small and medium Phillips head screwdriver
- Needle-nose pliers (small for adjusting jumpers)


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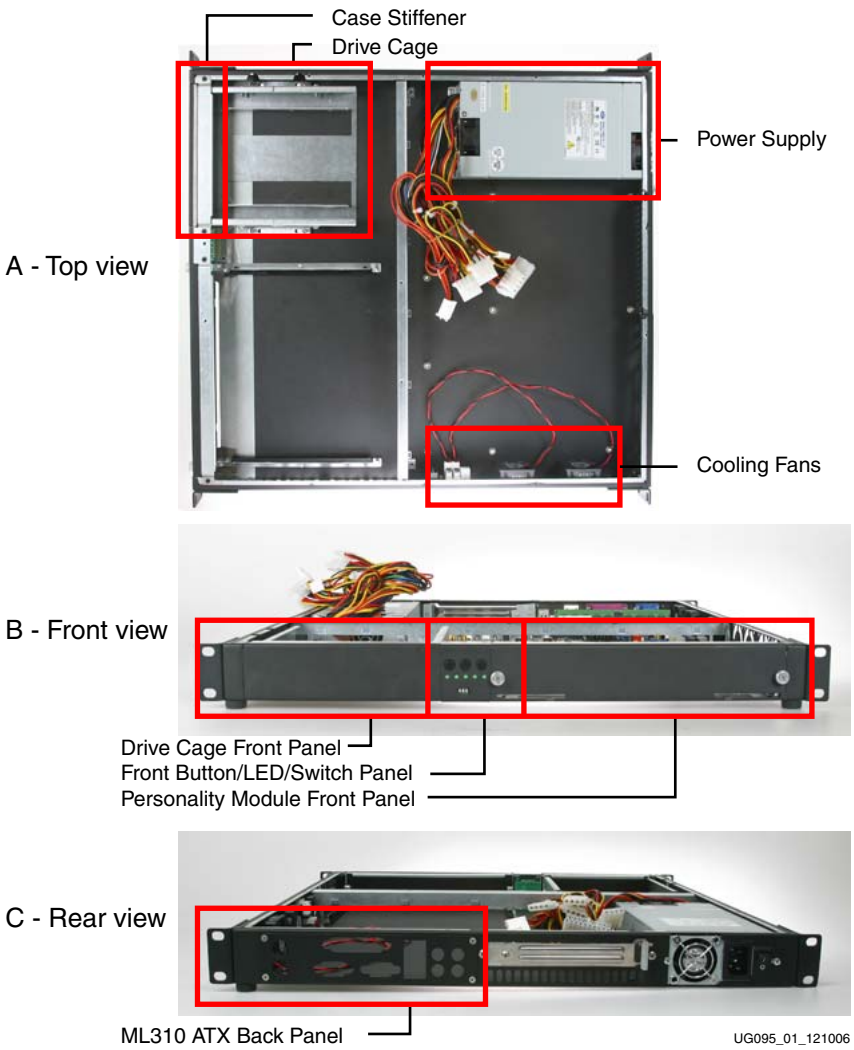


*Figure 1:* **Chassis with Installed Components**


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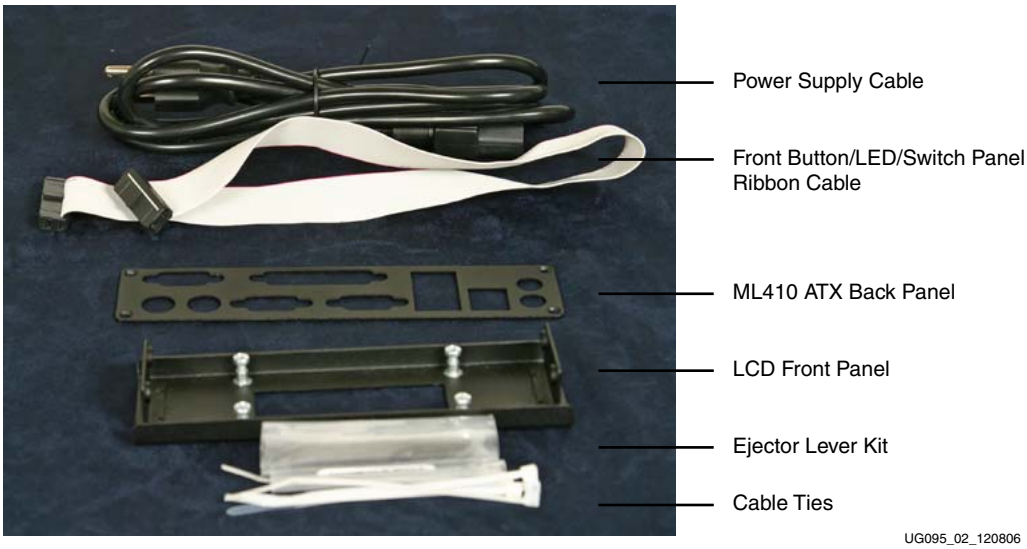


*Figure 2:* **Parts Included: Uninstalled**

*Figure 3:* **Required Parts: ML310 or ML410 Boards**

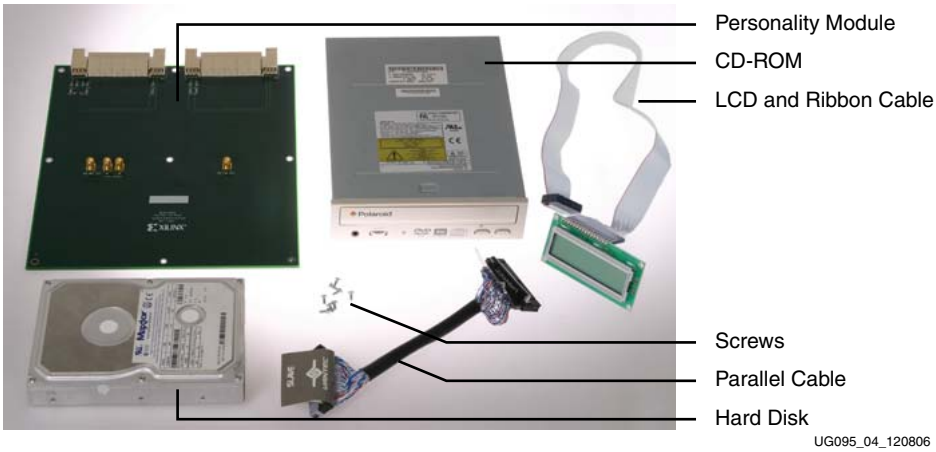


*Figure 4:* **Optional Components**


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# Assembly Instructions

The completed assembly shown in Figure 5 contains the following optional parts:

- Personality module
- LCD

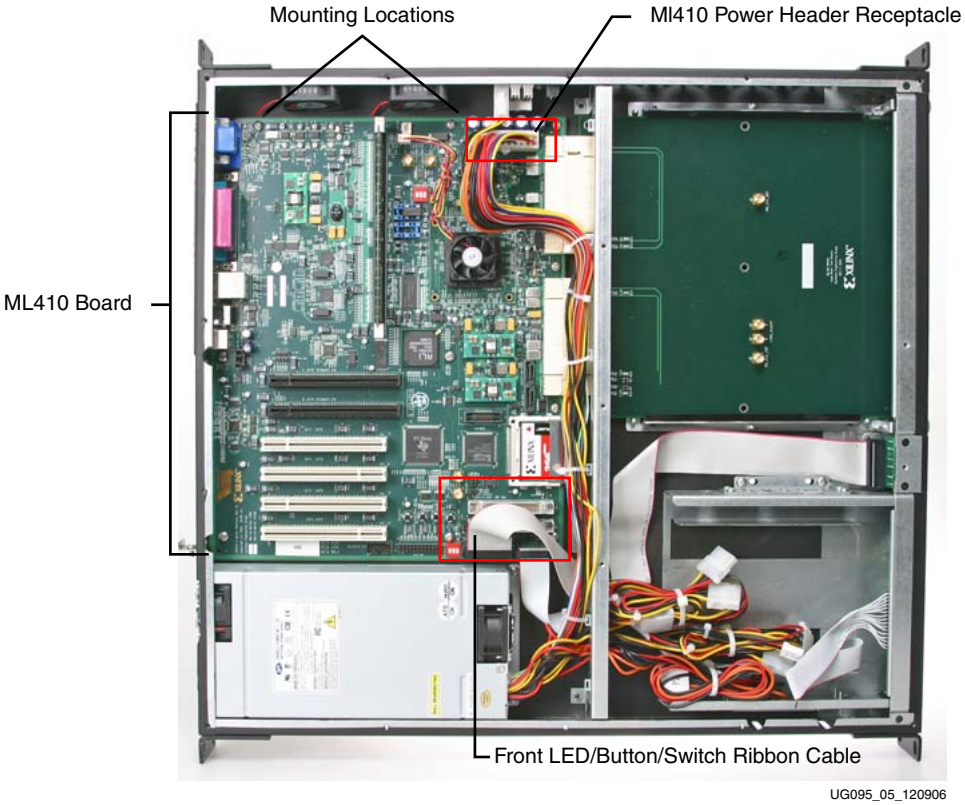


*Figure 5:* **Completed Assembly**

1. Remove the top case lid by removing the 17 screws that hold it down to the case. Figure 6 shows a side view of the top lid.

*Figure 6:* **Removing the Top Lid**


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2. Install the appropriate ATX back panel for your board in the location shown in Figure 7. If using a ML310 board, the correct back panel is already installed; if using a ML410 board, switch the ML310 ATX back panel with the ML410 ATX back panel included in the package (Figure 7).

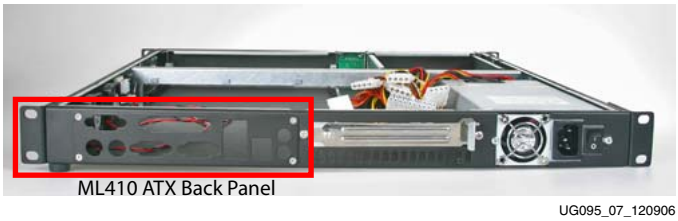


*Figure 7:* **ML410 ATX Back Panel Installed**

3. Install the ML310/ML410 board into the chassis as shown in Figure 5, page 11 with the provided screws.

   ***Caution!*** Be careful not to damage the board while installing it.

   Make sure that the cables for the two installed fans remain underneath the board and that they are not damaged by the board or the screws.

4. Install the ribbon cable (the orientation of the cable is shown in Figure 5, page 11):
   a. Attach one end of the ribbon cable (included in the package) to J23 on the ML310/ML410 board
   b. Connect the other end of the ribbon cable to the front of the chassis behind the front button/LED/switch panel.
5. Configure power-on:
   a. At J19 on the ML410 board, switch the jumper to the two pins closest to the power supply (Figure 8, page 13). This changes the power-on operation of the system. With the jumper in its default position (the jumper in the two pins furthest from the power supply), when the power supply is given power, the system turns on. With the jumper changed, the system power is controlled by the front button/LED/switch panel by way of the ribbon cable connected in the previous step (Step 4).

      ***Note:*** This does not apply to the ML310 board (the ML310 board does not have this jumper; when the ribbon cable from the previous step is connected, the power for the ML310 board is automatically controlled by the front button/LED/switch panel.

   b. Set all the SW3 switches to the *off* position on the ML310/ML410 board. The switches on the front button/LED/switch panel will be used instead by way of the ribbon cable connected in Step 4 (Figure 8, page 13).


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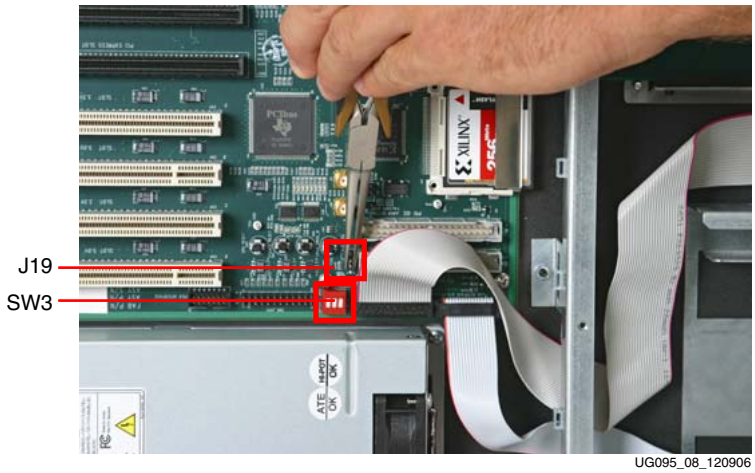


*Figure 8:* **Configuring Power On**

6. Install power for the fans:
   a. For 12V fans (shipped with the chassis), connect the square header of the 12V wire to the Fan PCB located by the two pre-installed fans (see Figure 9).

      ***Note:*** If 5V or 5V and 12V is desired, plug a power cable to the header of the Fan PCB on the right instead of connecting the 12V wire.

   b. To use 12V for the fans, move jumpers to the left.
   c. To use 5V for the fans, move the jumpers to the right (see Figure 9).

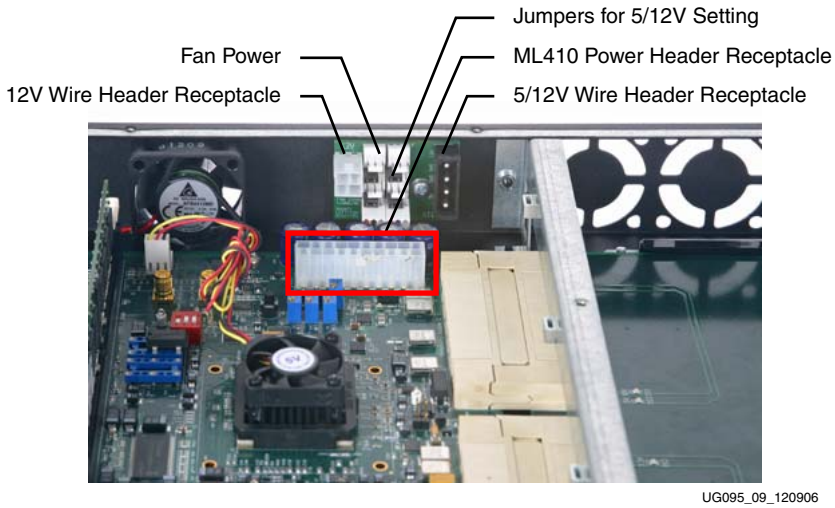


*Figure 9:* **Fan PCB (Close-up)**

7. Install the Fan PCB

   Connect the ML310/ML410 power cable (the cable with the largest header) to the ML310/ML410 board via J18 (see Figure 5, page 11 andFigure 9). Use cable ties to fasten this group of wires and the group of wires from the previous step to the small mounting metal holes on the center support beam of the chassis. If a hard disk or


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CD-ROM is installed, connect one of the power wires to the device. Cable tie the remaining power supply wires and tuck them away as shown in Figure 5, page 11.

8. Make sure that there are no wires running over the center support beam of the chassis.
9. Connect the power plug from the chassis to a power source.
10. Verify the system can be turned on from the front button/LED/switch panel by pressing the left button (see "Front Button/LED/Switch Panel Operation," page 21).
11. Complete the assembly by screwing on the top cover of the case.

# Installing Optional Accessories

This section provides optional assembly instructions. "Installing a Personality Module" can be completed and/or choose one of either"Installing an LCD", "Installing a Hard Disk", or "Installing a CD-ROM".

More fans (instructions not given) can be added to cool the personality module. The power for additional fans is connected to the Fan PCB (Refer to Figure 9, page 13).

## Installing a Personality Module

1. Open the ejector lever kit (included in this package) and insert the bushings into the two corner screw holes of the personality module (see Figure 10).

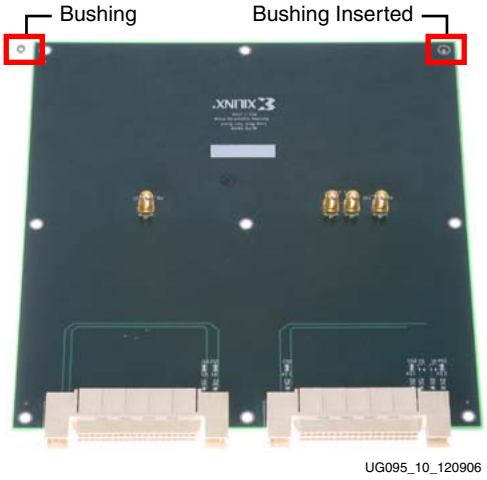


*Figure 10:* **Inserting the Bushings**

2. Remove the personality module front panel (refer to Figure 1, page 9).


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3. Attach one of the two metal clips to the personality module front panel (see Figure 11 and Figure 12).

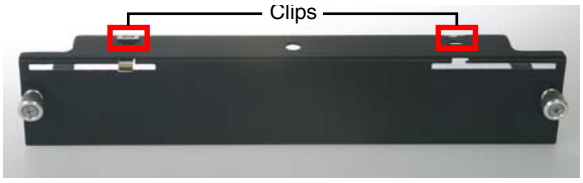


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*Figure 11:* **Inserting the Clips (Upside-Down, Front View)**

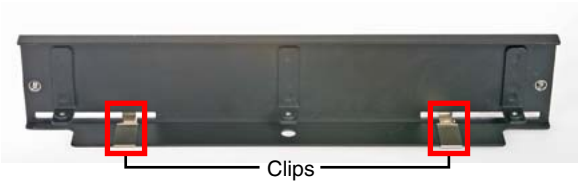


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*Figure 12:* **Inserting the Clips (Rear View)**

4. Set the two levers in the slots on both sides as shown in Figure 13, then use the screws provided in the ejector lever kit to fasten the levers (inserting the screws from the bottom of the panel). Make sure that the personality module is in between the levers and the screw mounts of the panel as shown in Figure 14 and Figure 15, page 16.

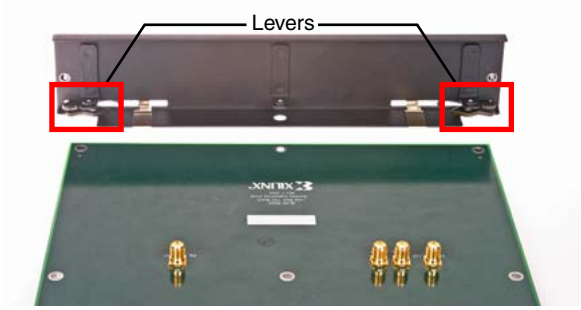


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*Figure 13:* **Inserting the Levers (Rear View)**

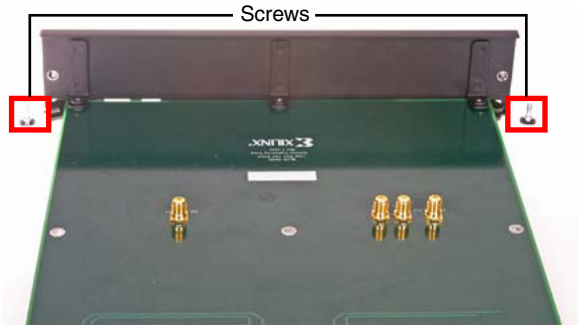


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*Figure 14:* **Inserting the Screws (Rear View)**


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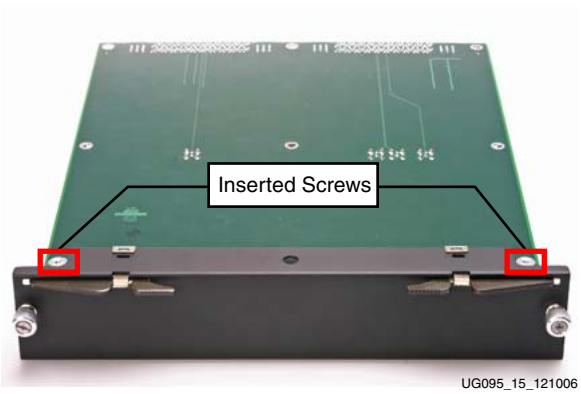


*Figure 15:* **Inserting the Screws (Upside-Down Front View)**

5. Push the personality module inside through the opening, making sure it slides in through the mounting guide. Make sure the levers are open (shown closed in Figure 16) before pushing in and guide the levers to attach to each side of the opening. After the levers are latched to the chassis and are shut, turn the screw knobs tight (see Figure 16 and Figure 17).

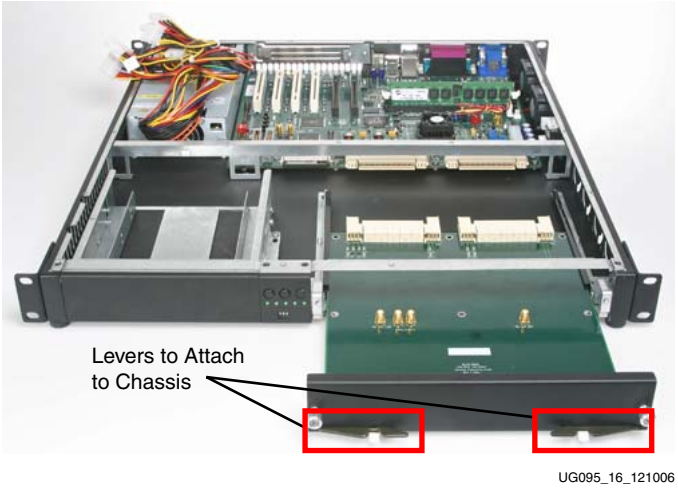


*Figure 16:* **Inserting the Personality Module (View 1)**

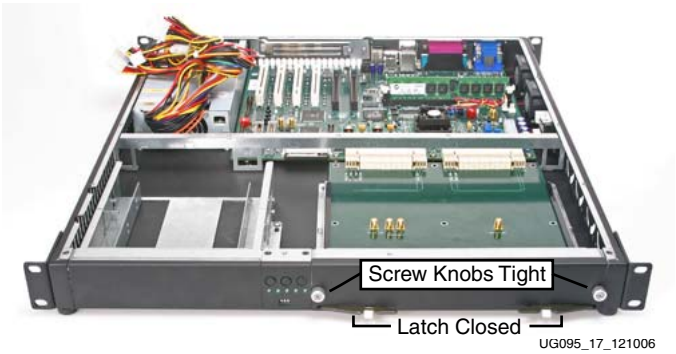


*Figure 17:* **Inserting the Personality Module (View 2)**


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## Installing an LCD

1. Attach the LCD to the LCD front panel by first removing the screws on the LCD panel, then place the LCD in the LCD front panel and fasten (Figure 18 and Figure 19).

*Figure 18:* **Preparing the LCD Front Panel**

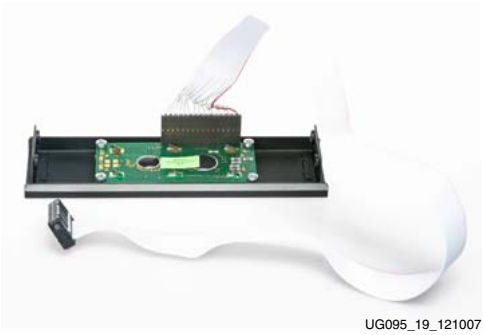


*Figure 19:* **Mounting the LCD**

2. Remove the drive cage from the chassis by first removing the case stiffener and then the four screws that hold down the cage (refer to Figure 1, page 9).
3. Remove the blank front panel from the cage and replace it with the LCD front panel (Figure 20 and Figure 21, page 18).

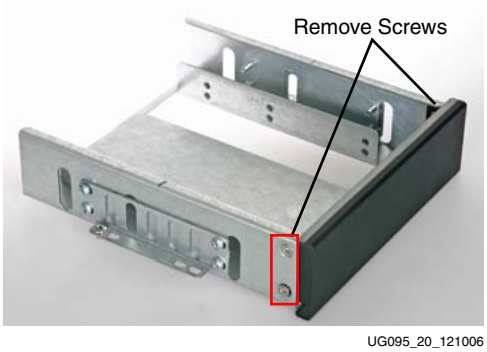


*Figure 20:* **Removing the Blank the Front Panel Frame**


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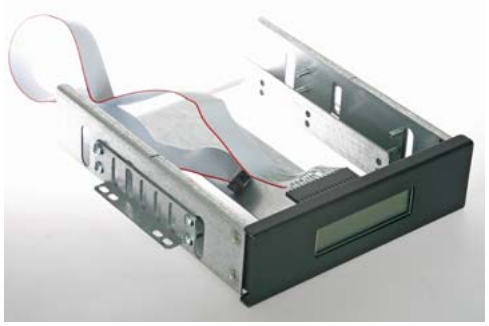

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*Figure 21:* **Installing the LCD Front Panel**

4. Reinstall the drive cage and the case stiffener.
5. Make sure the LCD ribbon cable is attached to the LCD and attach the other end to the header J13 on the ML310/ML410 board with the orientation shown in Figure 22.

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*Figure 22:* **Installing the Drive Cage with LCD**

***Note:*** A personality module (optional) is shown installed in this figure.



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## Installing a Hard Disk

1. Remove the drive cage from the chassis by first removing the case stiffener and then the four screws that hold down the cage (refer to Figure 1, page 9).
2. Install the hard disk in the drive cage using the screws that came with the hard disk (Figure 23).

*Figure 23:* **Mounting the Hard Disk**

3. Reinstall the drive cage and the case stiffener and attach the hard disk parallel cable from the hard disk to the primary or secondary IDE, J16 or J15, respectively on the ML310/ML410 board (Figure 24).

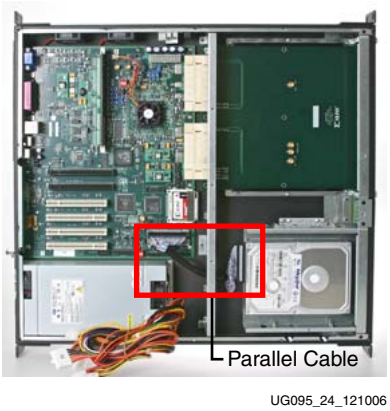


*Figure 24:* **Installing the Drive Cage with Hard Disk**

***Note:*** A personality module (optional) is shown installed in this figure.


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## Installing a CD-ROM

1. Remove the drive cage from the chassis by first removing the case stiffener and then the four screws that hold down the cage (see Figure 1, page 9).
2. Remove the mounting brackets on each side and attach to the sides of the CD-ROM using the screws provided with the CD-ROM (Figure 25 and Figure 26).

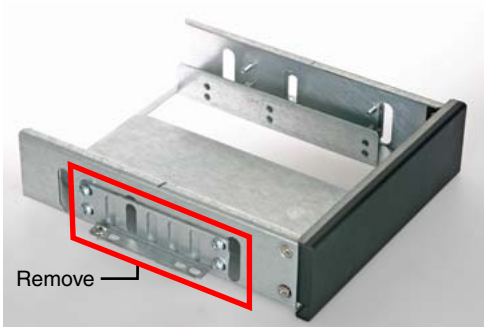


*Figure 25:* **Removing the Mounting Brackets**

*Figure 26:* **Installing the Mounting Brackets to the CD-ROM**

3. Return this assembly to the chassis, leaving out the drive cage and the case stiffener. Attach the CD-ROM parallel cable from the hard disk to the primary or secondary IDE, J16 or J15, respectively on the ML310/ML410 board (Figure 27, page 21).


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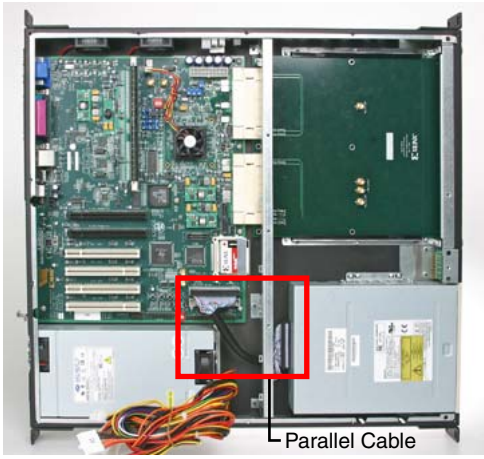


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*Figure 27:* **Installing the Drive Cage with CD-ROM**

***Note:*** A personality module (optional) is shown installed in this figure.

# Front Button/LED/Switch Panel Operation

Refer to Figure 1, page 9 for the position of the components in this section.

## Buttons

- Left button: Turn system power ON/OFF
- Middle button: SYSACE reset
- Right button: CPU reset

## LED 1-5 from the left:

- LED 1: System power ON/OFF
- LED 2: System ACE™ controller status
- LED 3: IDE signal
- LED 4: User 1
- LED 5: User 2

## Switches:

- To be used instead of SW3 on the ML410 board

# Chassis Installation

This product is intended to be installed in either a network closet or in a network rack.

1. Install the assembled case in a network rack.
2. Connect power, Ethernet, and any other connectors necessary (for example, serial/USB).
3. Connect to the board using a remote login.


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