Honeywell

Honeywell Process Solutions

T310 Honeywell Server

Planning, Installation, and Service Guide

EP-DPCX21
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Honeywell

Notices and Trademarks

Honeywell International

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About This Document

This document contains planning, installation and service information for the T310 Honeywell server. The instructions and service information contained in this guide addresses the server, and assumes that associated network communication equipment is pre-installed by the Honeywell factory or has manuals dedicated to its installation and service. This server is not a standard Dell model and you cannot order it independently from Dell.

Release Information

Document Name	Document ID	Release Number	Part No
T310 Honeywell Server Planning, Installation, and Service Guide- pisg-310	EP-DPCX21	Release Independent	51154553-904

Revision Notes

The following table lists the details of revisions of this document.

Revision	Revision Date	Revision Notes
A	10/2010	-
B	08/02/2011	ECO P310057
C	05/02/2012	Updated for MZ-PCSV11 and MZ-PCSV12
D	05/02/2013	Updated for memory configuration

References

The following list identifies all documents that may be sources of reference for material discussed in this publication.

Document Title	Doc ID

Document Title	Doc ID
TPS Users	
TPS System Site Planning	SW02-550 or later
TPS System Implementation Guide for Windows 2003/XP	TP08X
TPS System Planning Guide for Windows 2003/XP	TP10X
TPS System Administration Guide for Windows XP/2003	TP06X
Experion PKS Users	
Experion PKS Overview	EP-DCSX32 or later
Experion PKS Software Installation and Upgrade Guide	EP-DCXX12 or later
Server and Client Planning Guide	EP-DSX132 or later
Server and Client Configuration Guide (for Experion PKS)	EP-DSXX22 or later
Experion PKS Operators Guide	EP-DSXX42 or later
FTE Users	
Fault Tolerant Ethernet Installation and Service Guide	FE05

Symbol Definitions

The following table lists those symbols used in this document to denote certain conditions.

Symbol	Definition
	**ATTENTION:** Identifies information that requires special consideration.
	**TIP:** Identifies advice or hints for the user, often in terms of performing a task.
	**REFERENCE -EXTERNAL:** Identifies an additional source of information outside of the bookset.
	**REFERENCE - INTERNAL:** Identifies an additional source of information within the bookset.

Symbol	Definition
CAUTION	Indicates a situation which, if not avoided, may result in equipment or work (data) on the system being damaged or lost, or may result in the inability to properly operate the process.
	**CAUTION**: Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. **CAUTION** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	**WARNING**: Indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death. **WARNING** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	**WARNING, Risk of electrical shock**: Potential shock hazard where HAZARDOUS LIVE voltages greater than 100v/270v, 50Hz/60Hz AC may be accessible.
	**ESD HAZARD:** Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices.
	**Protective Earth (PE) terminal**: Provided for connection of the protective earth (green or green/yellow) supply system conductor.
	**Functional earth terminal**: Used for non-safety purposes such as noise immunity improvement. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national local electrical code requirements.
	**Earth Ground**: **Functional earth connection.** NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.

Symbol	Definition
	**Chassis Ground**: Identifies a connection to the chassis or frame of the equipment shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.

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1. Planning

1.1 Overview

About T310 Honeywell server

Server platforms sold by Honeywell are engineered for the process control mission of Experion and TPS systems, to provide consistent and robust performance. Through an extensive qualification process, Honeywell defines specific peripheral devices, slot locations, and BIOS settings for the best performance and reliability, sometimes even adding cooling fans for longer service. The computer manufacturer builds the platforms according to Honeywell specifications.

Honeywell engineering has tested the T310 Honeywell server with other Honeywell hardware and software and has qualified its use for specific configurations as identified in the Software Change Notice (SCN). This server is not a standard Dell model and cannot be ordered independently from Dell. The Technical Assistance Center (TAC) is trained to support Honeywell platforms. Use of any other server, including a similar Dell model, is considered a project special and its TAC support is limited according to the services policy.

This release of the server is based upon SATA hard drive and dual power supply design for MZ-PCSV11; and 3x500 GB SATA, 7.2K Revolutions per minute (RPM) non hot swap hard disk drive and two redundant Switched-Mode Power Supply (SMPS) design for MZ-PCSV12. This server provides computer-based functionality for the Experion system and the TPS system. For TPS systems and certain Experion systems configured with Fault Tolerant Ethernet (FTE), the server has an LCNP4E card installed, which allows connection to the TotalPlant Process Network (TPN) coax through the LCN Media Access Unit (MAU). Additionally, the server connects to the Ethernet or FTE using the on board NIC interface or an optional dual NIC card.

MZ-PCSV12 supports Experion R4xx.x and further releases only. It does not support TPN nodes.

Software requirements

- The server runs on Windows Server 2003 Service Pack 2 operating system and the latest version of Application Processing Platform (APP Node) or Experion Server (ESVT, SIM, ACE, SCE, and EHG) It supports Experion software releases R3xx.x or TPS releases TPS R40x, TPS R41x and TPS R42x. This software requirement is applicable only for MZ-PCSV11.
- Windows Server 2008 non Hyper-V media for Experion software releases R400.x.
- Windows Server 2008 R2 64-bit media for Experion software releases R410.x

ATTENTION

For Experion R4xx users, from April 2013 onwards T310 (MZ-PCSV11 and MZ-PCSV12) server is offered only for ACE-T and Experion APP nodes, which require AM-Ride through feature support.

BIOS configuration

All server platforms must have BIOS version 1.11.0 [1.1.52] or 1.11.0 or later.

1.2 Server model description

This user's guide applies to the Honeywell server platform identified in the following table.

Table 1-1 Honeywell server details

Model Number	Description	Part Number
MZ-PCSV11	T310 Honeywell server (Tower Unit)	51154553-100
MZ-PCSV12	T310 Honeywell server (Tower Unit) RAID5 and redundant power supply	-
EP-COA2K3	Windows Server 2003 (COA) for Experion Software Releases R3xx.x, and TPS releases TPS R40x, TPS R41x and TPS R42x.	-
EP-COA2K8	Windows Server 2008 (COA) for Experion Software Releases R400.x	-
EP-COAR28	Windows Server 2008 R2 COA for Experion Software Releases R400.x	-

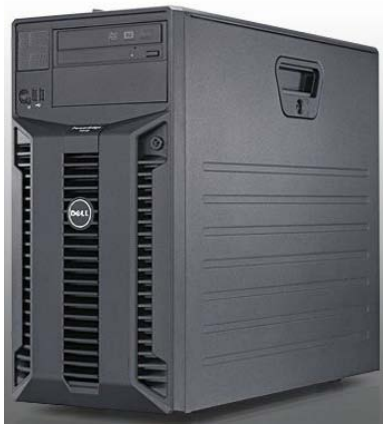


Figure 1-1 T310 Honeywell server tower unit

Equipment configuration

The server platform is used for TPS and Experion nodes, which cannot be mounted in the Icon Series console, Classic, or Z/EZ console; hence, this document does not include instructions for these types of installations.

Electronics module

The electronics module for MZ-PVCS11 and MZ-PVCS12 are as follows:

- Electronics assemblies for MZ-PCSV11 server platform CPU: Intel Xeon 2.4Ghz (Intel X3430) with 160GB 3.5-inch 7.2K RPM SATA II hard drive non hot plug and 2GB (2x1GB) DDR3 advanced ECC memory, 120/240 VAC.
  From April 2013, the T310 Honeywell server tower unit is shipped with CPU: Intel Xeon 2.4 GHz (Intel X3430) With 500GB 3.5-inch 7.2K RPM SATA II Hard Drive Non Hot plug and 4GB (2x2GB) DDR3 advanced ECC Low Voltage memory, 120/240 VAC.

- Electronics assemblies for MZ-PCSV12 server platform CPU: Intel Xeon 2.4 GHz (Intel X3430) with 3 x 500GB 3.5-inch 7.2K RPM SATA II hard drive non hot plug in RAID 5 configuration and 2GB (2x2GB) DDR3 advanced ECC memory, 2x120/240 VAC with redundant SMPS.

The peripheral electronics assemblies are based upon the Peripheral Component Interconnect Express (PCIE) bus or USB 2.0.

Storage and media devices

The standard SDRAM memory for these platforms is 4 GB (4 x 2GB Single Ranked (1R) UDIMM DDR3 Advanced ECC), which is expandable up to 8.0 GB. The memory devices must be from the same memory supplier.

The standard mass storage for this platform has 500GB 3.5-inch 7.2K RPM SATA II hard drive non-hot pluggable. All mass storage devices are connected through SAS and SATA. The SATA DVD RW drives are connected through the SATA connector on the motherboard.

Honeywell logo

The T310 Honeywell server is supplied with one Honeywell logo with the part number 51153722-100.

Features

The following is a list of the common features of this platform.

- Dell motherboard with Single Intel® Xeon® X3430, 2.4Ghz, 8M Cache, Turbo, HT, 1333MHz Max Memory 4.8GT/s QPI
- Cache
  - L2: 1MB
  - L3: 8MB
- Rear Ports
  - One serial
  - One Video
  - Four USB V2.0
  - Two RJ45
  - One ID push button with blue/amber LED
- Optional external VFlash card
  - One optional
  - Flash memory card slot with iDRAC6
  - Enterprise
  - Optional RJ-45 MEA connector

- Front Ports
  - Two USB 2.0
  - ID push button with blue/amber LED
  - One system power on/off button
- Two Integrated NIC (10/100/1000 MB per/sec)
- Bus Type: Five PCIE G2 slots
  - Two x8 slot
  - One x4 slot
  - Two x1 slot
- Dual power supply (400W) with Y cable for MZ-PCSV11
- Dual redundant power supply (400W) for MZ-PCSV12
- One 110 Volt / 230Volts Power Cords
- 2x1GB 1R UDIMM DDR3 1333MHz Adv. ECC
- SATA DVD-RW Drive
- 500GB 3.5-inch 7.2K RPM SATA II hard drive non hot pluggable for MZ-PCSV11
- 3x500GB 3.5 inch 7.2K RPM SATA II hard drive non hot plug in RAID 5 configuration for MZ-PCSV12
- Integrated Matrox G200 with 8MB of Cache
- USB compatible Windows Keyboard
- USB Optical Mouse

Slots configuration

The following is a list of options that can be configured in your platform.

Model No	Description
TP- LCNP04	LCN Interface card PCIE LCNP4E
NE- NICSS1	Card Single NIC PCIE Server
NE- NICS02	NIC Card PCIE dual port STP
NE-NICS03	Dual NIC Card PCIE,GB , ET Chipset

Note: You can use only one interface card from NE-NICSS1,NE-NICS02 & NE-NICS03 at a time.

Optional features

The following is a list of the additional options that can be configured in your platform.

- Single NIC
- Broadcom dual NIC
- LCNP4E
- Memory upgrade to 8 GB
- Universal ControlNet Interface

Power cords

The tables in this section list the AC power cords for tower configuration.

1. For MZ-PCSV11: The AC power cords configuration for MZ-PCSV11 servers is as follows.

Part Description	Part Number
AC power cord, 110 V	Use Dell power cord supplied with server
AC power cord, 220 V	(2) 5130557-100

The following table lists the Honeywell AC power cords (factory installed) for cabinet rack mount configuration.

Part Description	Part Number
AC power cord, 120 V	51107941-115
AC power cord, 240 V	51107941-115

2. For MZ-PCSV11: The AC power cords configuration for MZ-PCSV11 servers is as follows.

Part Description	Part Number
AC power cord, 110 V	Use Dell power cord supplied with server
AC power cord, 220 V	(2) 5130557-100

The following table lists the Honeywell AC power cords (factory installed) for cabinet rack mount configuration.

Part Description	Part Number
AC power cord, 2x 120 V	51107941-115
AC power cord, 2x 240 V	51107941-115

1.3 Server information

Honeywell documentation

The following table lists other Honeywell publications that may be useful when installing or operating the T310 Honeywell server platform.

Table 1-2 Honeywell publications

Publication	Contains information on…
FE05: *Fault Tolerant Ethernet Installation and Service Guide*	Installing and using the FTE.

Dell documentation

The following table lists Dell publications and other useful sources of information for installing, operating, and servicing the Honeywell server.

Table 1-3 Dell publications

Publication	Contains information on…	Is available with…
Information Update	Last minute updates about technical changes to your computer or advanced technical-reference material for experienced users or technicians.	The computer package
Dell™ PowerEdge™ Product Information Guide	Warranty Safety	The computer package For more information, refer to www.dell.com
Getting Started With Your System	Unpacking and connecting the cables.	The computer package
Quick Installation Guide	Installing and configuring the server operating system.	The computer package Product Documentation CD
Dell™ PowerEdge™ T310 Systems Hardware	Removing and replacing the parts.	Product Documentation CD

Publication	Contains information on…	Is available with…
Owner's Manual	Technical specifications. Configuring the system. Troubleshooting.	For more information, refer to www.dell.com
Windows Installation Instructions and Important Information	Initialization the Windows operating system.	The computer package For more information, refer to www.dell.com
Dell™ Systems – Raid Controller Initialization	Initializing the RAID controller.	The computer package
Dell™ Systems – Upgrading Raid Firmware	Upgrading the RAID firmware.	The computer package
Dell™ PowerEdge™ T310 Systems Hardware Owner's Manual	Diagnosing problems. Using status indicators for troubleshooting.	Product Documentation CD For more information, refer to www.dell.com

1.4 TPN slot requirements

For detailed slot configuration, see Table 4-2.

TPN node setup

Slot No	Description	Option
1	PCIEx8	Free Slot
2	PCIE-X 16, x8 routing	LCNP4e
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEx1	Free Slot
5	PCIEx1	Free Slot

1.5 FTE slot requirements

Default configurations for FTE

- Broadcom on-board NICs are enabled without PXE.
- If you are using only FTE slot, then use on-board NICs.
- If you are using FTE and EHG, then use single NIC PCIE server for EHG and Broadcom onboard.

Optional configuration rules for FTE

- Broadcom on-board NICs are disabled.
- If you are using only FTE slot, then use NIC Card PCIE dual port STP.
- If you are using FTE and EHG, PCIE NIC Card PCIE dual port STP for FTE, then enable one Broadcom on-board.
- If you are using NIC, then use the BIOS settings.

FTE Supervisory (Default)

For MZ-PCSV11

Slot No	Description	Option
1	PCIEX 8	Free Slot
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

For MZ-PCSV12

Slot No	Description	Option
1	PCIEX 8	PERC 6/I controller
2	PCIE-X 16, x8 routing	Free Slot

Slot No	Description	Option
3	PCIE-X 8, x4 routing	Dual Port NIC
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

FTE Supervisory (Optional)

For MZ-PCSV11

Slot No	Description	Option
1	PCIEX 8	Dual port NIC
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

For MZ-PCSV12

Slot No	Description	Option
1	PCIEX 8	PERC 6/I controller
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Dual port NIC
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

FTE Co-Joined through Dual NIC (Default)

For MZ-PCSV11

Slot No	Description	Option
1	PCIEX 8	Single Port NIC

2	PCIE-X 16, x8 routing	LCNP4E
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

FTE Co-Joined through Dual NIC (Optional)

For MZ-PCSV11

Slot No	Description	Option
1	PCIEX 8	Dual Port NIC
2	PCIE-X 16, x8 routing	LCNP4E
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

FTE Co-Joined through Single NIC for EHG (Default)

For MZ-PCSV11

Slot No	Description	Option
1	PCIEX 8	Single Port NIC
2	PCIE-X 16, x8 routing	LCNP4E
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

FTE Co-Joined through On-board NIC for EHG (Optional)

For MZ-PCSV11

Slot No	Description	Option
1	PCIEX 8	Dual Port NIC
2	PCIE-X 16, x8 routing	LCNP4E
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

1.6 General Ethernet slot requirements

The general Ethernet must be used on the first/second on-board NICs. For more details on slot configuration, refer to Table 4-3.

For MZ-PCSV11

Option 1 – Single NIC (One on-board NIC enabled)

Slot No	Description	Option
1	PCIEX 8	Free Slot
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

Option 2 – Dual NICs (Two on-board NICs enabled)

Slot No	Description	Option
1	PCIEX 8	Free Slot
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Free Slot

4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

Option 3 – 3 NICs (Single NIC with two On-board NICs)

Slot No	Description	Option
1	PCIEX 8	Single NIC
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

Option 4 – 4 NICs (Dual NIC with two On-board NICs)

Slot No	Description	Option
1	PCIEX 8	Dual NIC
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

For MZ-PCSV12

Option 1 – Single NIC (One on-board NIC enabled)

Slot No	Description	Option
1	PCIEX 8	PERC 6/I controller
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

Option 2 – Dual NICs (Two on-board NICs enabled)

Slot No	Description	Option
1	PCIEX 8	PERC 6/I controller
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Free Slot
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

Option 3 – 3 NICs (Single NIC with two On-board NICs)

Slot No	Description	Option
1	PCIEX 8	PERC 6/I controller
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Single NIC
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

Option 4 – 4 NICs (Dual NIC with two On-board NICs)

Slot No	Description	Option
1	PCIEX 8	PERC 6/I controller
2	PCIE-X 16, x8 routing	Free Slot
3	PCIE-X 8, x4 routing	Single NIC
4	PCIEX 1	Free Slot
5	PCIEX 1	Free Slot

1.7 Honeywell server options

Device options

In addition to the standard configuration for the server, your platform can be configured with additional options based on the model number you order. The following table lists optional items for T310 Honeywell server.

Model No	Description
TP-LCNP04-100	LCNP4E
NE-NICSS1-100	Single NIC
NE-NICS02 -100	Dual NIC
MZ-PCEM13	2 GB(2x1GB) 1333 MHz. 1R advannced. ECC DDR3 UDIMM)
MZ-PCEM14	2 GB(1x2GB) 1R 1333 MHz. ECC DDR3 low voltage UDIMM

Memory option configuration

The standard memory capacity is 2 GB. The system memory can be increased to 4 GB, MZ PCEM12. Memory devices must be from the same memory supplier.

However, the systems from May 2012 are shipped with 4GB (2x2GB) UDIMM as a standard memory configuration.

Table 1-4 shows the placement of memory devices for the memory capacity options. The table is so organized that the DIMM sockets are in the same order as they are located on the motherboard.

Table 1-4 Memory configuration

Slot no	Description	2 GB Memory (standard)	4 GB Memory
1	A1	1GB, 1333 MHz, 1R Adv ECC DDR3 UDIMM	1GB 1333 MHz. 1R Adv. ECC DDR3 UDIMM
3	A2	-	1GB 1333 MHz. 1R Adv. ECC DDR3 UDIMM
5	A3	Not available for use	Not available for use
2	B1	1GB, 1333 MHz, 1R Adv ECC DDR3 UDIMM	1GB, 1333 MHz, 1R Adv ECC DDR3 UDIMM
4	B2	-	1GB, 1333 MHz, 1R Adv ECC DDR3 UDIMM
6	B3	Not available for use	Not available for use
Total		**2GB**	**4GB**

The following table lists the 4GB memory configuration.

Slot no	Description	4 GB Memory (standard)	4 GB Memory
1	A1	2GB, 1333 MHz, 1R Adv ECC DDR3 UDIMM	2GB 1333 MHz. 1R Adv. ECC DDR3 UDIMM
3	A2	-	2GB 1333 MHz. 1R Adv. ECC DDR3 UDIMM
5	A3	Not available for use	Not available for use
2	B1	2GB, 1333 MHz, 1R Adv ECC DDR3 UDIMM	2GB, 1333 MHz, 1R Adv ECC DDR3 UDIMM
4	B2	-	2GB, 1333 MHz, 1R Adv ECC DDR3 UDIMM
6	B3	Not available for use	Not available for use
Total		**4GB**	**8GB**

The following table lists the standard and optional memory configuration for model 51154292-300 and 51154292-400 shipped from May 2012 onwards.

DIMM Socket	4 GB Memory
A1	Not available for use
A4	Not available for use
A2	2GB
A5	--
A3	2GB
A6	--
Total	**4GB**

1.8 Other options

Honeywell offers a cabinet mounted 8-port KVM switch/control console (model number TP-KVMCB1 for switch with PS/2 interface and model number TP-KVMCB2 for switch

with USB interface) to provide a human interface (booting and maintenance activities) to cabinet mounted servers. Either option comes pre-installed from the Honeywell factory.

1.9 Specifications

Environmental Operating specifications for tower unit

The following tables list environmental limitations for a tower unit.

Table 1-5 Operating environmental specifications

Description	Tower (Cannot be racked)
Temperature	10º to 35º C (50º -95º F)
Relative Humidity	20 to 80%, non-condensing
Max Vibration	0.26 Gms at 5-500Hz for 15 min
Max Shock	One Shock pulse in the positive z axis
Altitude	0 to 3048 m (0 to 10,000 ft)

ATTENTION

For altitudes above 2950 feet (899.16 meters), the maximum operating temperature is derated 1°F/550 ft. (that is 1°F /167.64 meters that is - 17.22°c/167.64 meters)

Environmental storage specifications for tower unit

Table 1-6 Storage environmental specifications

Description	Tower (Cannot be racked)
Temperature	-40º to 65º C (-40º to 149º F)
Relative Humidity	5 to 95%, non-condensing
Max Vibration	1.54 Gms at 10-250Hz for 15 min.
Max Shock	Six consecutively executed shock pulses in the positive and negative x, y and z-axes (one pulse on each side of the system) of 71G for up to 2ms.
Altitude	0 to 10,605 m (-50 to 35,000 ft)

Environmental specifications for a cabinet

The following table lists operating environmental limitations for a cabinet.

Table 1-7 Operating environmental specifications for a cabinet

Description	Cabinets
Ambient room temperature	10° to 35°C (50° to 95°F)
Humidity	20 to 80% RH, non-condensing
Operating vibration	0.012” P-P display to 12.7 Hz, then 0.1g to 150 Hz; 60 min per axis, all 3 axes
Site induced shock	6g, 10 msec half-sine, 1 positive, 1 negative

Electronic assembly specifications

The following tables list electronic assembly specifications for MZ-PCSV11 and MZ-PCSV12.

Table 1-8 Typical operating power requirements for MZ-PCSV11 and MZ-PCSV12

For MZ-PCSV11

Description	Requirement

Description	Requirement
DC POWER	N/A
AC Voltage	120 (90-132) Vrms 240 (180-260) Vrms
AC Current	0.474A 0.298 Arms
AC Power	57 Watts 72 Watts

For MZ-PCSV12

Description	Requirement
DC POWER	N/A
AC Voltage	120 (90-132) Vrms 240 (180-260) Vrms
AC Current	0.78A 0.44 Arms
AC Power	90 Watts 91 Watts

Table 1-9 Maximum operating power requirements for MZ-PCSV11 and MZ-PCSV12

For MZ-PCSV11

Description	Requirement
DC POWER	N/A
AC Voltage	120 (90-132) Vrms 240 (180-260) Vrms
AC Current	1.06 Arms 0.57 Arms
AC Power	128 Watts 127 Watts

For MZ-PCSV12

Description	Requirement
DC POWER	N/A
AC Voltage	120 (90-132) Vrms 240 (180-260) Vrms
AC Current	1.32 Arms 0.69 Arms
AC Power	155 Watts 150 Watts

Table 1-10 Electronic assembly weight and dimensions

Description	Requirement
Height	44.10cm (17.40 in feet)
Width	27.40cm (10.80 in feet)
Depth	62.10cm (24.40") (including PSU with bezel)
Weight	35 kg (77 lbs)

Hard disk drive specifications

The T310 Honeywell server platform has four hard disk drive bays. It uses one 160 GB 3.5-inch 7.2K RPM SATA II non-hot plug hard drive. There is no option to add additional hard drives. Disk drives in this server platform must be of the same size and speed.

Table 1-11 160 GB Hard disk drive power requirements

Description	Requirement
DC 5 volt Power (typ)	2.25 Watts
DC 12 volt Power (typ)	5Watts +10%, -8%
Other DC Power	9.5 Watts Max 8.75 Watts idle
AC Power	N/A

Table 1-12 160 GB Hard disk drive weight and dimensions

Description	Requirement
Height	25 mm
Width	101.6 mm
Depth	147.0 mm
Weight	0.60 kg

Removable media specifications

The T310 Honeywell server platform can be configured with one removable media drive; this drive is SATA DVD-RW drive. The SATA DVD-RW drive is connected to SATA 0 ports on the motherboard.

Table 1-13 Removable media operating power requirements

Description	Requirements
DC 5 volt Power	13 Watts

Mouse

The USB mouse is the standard cursor control device and is included with the T310 Honeywell server platforms.

Keyboard

A USB standard keyboard is included with the T310 Honeywell server platforms.

Honeywell offers a cabinet mounted 8-port KVM switch/control console (model number TP-KVMCB1 for switch with PS/2 interface and model number TP-KVMCB2 for switch with USB interface) to a provide human interface (booting and maintenance activities) to cabinet mounted servers. Either option comes pre-installed from the Honeywell factory.

Monitor

The T310 Honeywell server platforms supports industrial standard video format (typically 1024X768 at a refresh rate of 75Hz) with a multisync monitor and can be only configured with a single screen option. In this configuration, the monitor is connected to the AGP video controller card.

ATTENTION

Touch screen option is not available in the T310 Honeywell server platforms.

Video cable

The video cable must support DDC. If either a monitor or video cable that does not support DDC is connected, the display generator selects the default resolution that precludes communication with the system software and stops startup. A quick check to determine if a cable is DDC compatible is to check if the pins 5, 9, and 12 of the HD 15 connector are wired. The supplied cable, part number 51196742-200 is DDC compatible.

The server platform supports industrial standard video formats, typically 1280X1024, at a refresh rate of 75Hz or 1024X768 at a refresh rate of 75Hz.

System specifications

Table 1-14 System specifications

Microprocessor	
Microprocessor	Intel® Xeon® X3430, 2.4Ghz, 8M Cache, Turbo, HT, 1333MHz Max Memory 4.8GT/s QPI (or better)
Cache(L1/L2)	1MB/8MB

Chipset	Intel® 3420 Chipset
Expansion Slots	
Bus Type	5 PCIe G2 slots: o Two x8 slot, (one with x16 connector) o One x4 slot (with x8 connector) o Two x1 slots
Memory	
Architecture	800-Mhz, 1066MHz or 1333MHz DDR3 registered or unbuffered Error Correcting code (ECC) DIMMs.
DIMM sockets	Six , 240-Pin
DIMM capacities	1 GB or 2 GB
Minimum RAM	2 GB or 4 GB
Maximum RAM	4 GB or 8 GB
Optical Disk Drive	
DVD	Internal SATA DVD + / - RW Drive
Video	
Video Type	Matrox G200eW w/ 8MB memory
Network interface	
Network	Broadcom 5716 dual-port Gigabit Ethernet 2 without TOE enabled.
Power supply unit	
Wattage	Single Cabled power supply (375W) for MZ-PCSV11 Dual redundant power supply (400W) for MZ-PCSV12
Environmental	
Temperature	

Operating	+10° to +35° C (50° to 95° F) with a maximum temperature gradation of 10° per hour. Note: for Altitudes above 2950 feet (899.16 meters), the maximum operating temperature is derated 1°F/550ft.
Storage	-40° to +65°C (-40° to 149° F) with maximum temperature gradation of 20°C per hour.
Relative Humidity	
Operating	20% to 80% (non-condensing) with a maximum humidity gradation of 10% per hour.
Storage	20% to 85% (non-condensing)
Physical – Form Factor	
Height	44cm (17.30") (with feet)
Width	21.8cm (8.6") (with feet)
Depth	52.10cm (20.5") (includes PSU with bezel)
Weight (Maximum Config)	23.5 kg (51.8 lb)
Drive Bays	
Internal	Four 3.5” SATA drives
External	5.4” Optical disk drive
Maximum Vibration	
Operating	0.26 Gms at 5-500Hz for 15 min.
Storage	1.54 Gms at 10-250Hz for 15 min.
Shock	
Operating	One shock pulse in the positive z-axis (One pulse on each side of the system) of 31G for 2.6ms in the operational orientation.
Storage	Six consecutively executed shock pulses in the positive and negative x, y and z-axes (One pulse on each side of the system) of 71G for up to 2ms.

Altitude	
Operating	0 to 3048 m (0 to 10,000 ft) Note: For altitudes above 2950 feet (899.16 meters), the maximum operating temperature is derated 1°F/550 ft. (that is 1°F /167.64 meters that is 17.22°c/167.64 meters).
Storage	0 to 10,605 m (-50 to 35,000 ft)
Airborne Contaminant Level	
Class	G2 or Lower as defined by ISA-S71.04-1985
External Peripherals	
Keyboard	Windows compliant USB equivalent or better
Mouse	USB equivalent or better
Drives	
Hard Drive	160GB 3.5-inch 7.2K RPM SATA II hard drive non hot plug for MZ-PCSV11 3 x 500GB 3.5-inch 7.2K RPM SATA II non hot pluggable hard disk drive in RAID 5 configuration for MZ-PCSV12
External Ports	
Serial	9-Pin, DTE, 16550 compatible
LAN	2 x RJ-45
SCSI External	None
USB	Total: 8 , USB 2.0 compliant 4 in the back, 2 in the front, 2 internal (Integrated onboard)
Video	15 Pin VGA
Management	
Power Related	Monitoring of voltage, fan, processor and other thermal conditions
Memory	Track ECC error reporting

TIP

Refer to the workstation user's guide for additional technical specifications and the vendor documentation for specifications on the peripheral devices.

1.10 Industrial regulatory compliance

Overview

The compliance specifications in this section apply to cabinet installations.

WARNING

Honeywell does not claim Safety Compliance or Electromagnetic Compatibility (EMC) Compliance for system equipment configurations that is not described in this guide as standard system configurations. Any equipment configuration other than that described in this publication decertifies the Safety and EMC compliance of this product.

Electromagnetic Compatibility (EMC)

Table 1-15 EMC specifications

European Community	
Emissions:	IEC 61326, 1997 (Industrial Locations, CISPR 11, Class A)
Immunity:	IEC 61326, 1997 (Industrial Locations)

ATTENTION

The following formula is a proximity guideline, for use of Portable Transceivers (walkie-talkies) in the frequency range of 80MHz to 1GHz.

D > 0.30$\star\sqrt{}$ **{P}** (D must be greater than 0.30 multiplied by the square root of P)
D = Distance from equipment, in meters.
P = Power Output of the Portable Transceivers (walkie-talkies), in Watts.

Examples:
P = 10 Watts, D > 0.949 meters
P = 5 Watts, D > 0.671 meters
P = 1 Watt, D > 0.300 meters

ATTENTION

Electrical cables, which are routed external to the equipment, must be fully shielded cables (360 degree metallic shielding), to comply with the above EMC standards.

Safety compliance

Table 1-16 Safety compliance

Product Safety Compliance
CSA C22.2 No. 1010.1-92 (R1999) & 1010.1B-97 (R2001) Am. 2
IEC 31010-1, 2001, 2nd edition

ATTENTION

Within the above referenced standards is a “Normative Reference” section citing additional standards, which may apply as suited and required for product compliance.

1.11 Light industrial regulatory compliance

Overview

The compliance specifications in this section apply to installations other than cabinets.

WARNING

Honeywell does not claim Safety Compliance or Electromagnetic Compatibility (EMC) Compliance for system equipment configurations that have not been described in this guide as standard system configurations. Any equipment configuration other than that described in this publication decertifies the Safety and EMC compliance of this product.

Electromagnetic Compatibility (EMC)

Table 1-17 Electromagnetic compatibility specifications

European Community	
Emissions:	IEC 61326, 1997 (Basic Requirements, CISPR11, Class A)
Immunity:	IEC 61326, 1997 (Basic Requirements)

ATTENTION

The following formula is a proximity guideline, for use of Portable Transceivers (walkie-talkies) in the frequency range of 80MHz to 1GHz

D > √ {P} (D must be greater than the square root of P)
D = Distance from equipment, in meters.
P = Power Output of the Portable Transceivers (walkie-talkies), in Watts.

Examples:
P = 10 Watts, D > 3.162 meters
P = 5 Watts, D > 2.236 meters
P = 1 Watt, D > 1.000 meters

ATTENTION

Electrical cables, which are routed external to the equipment, must be fully shielded cables (360 degree metallic shielding), to comply with the above EMC standards.

Safety compliance

Table 1-18 Safety compliance

Product Safety Compliance:
CSA C22.2 No. 1010.1-92 (R1999) & 1010.1B-97 (R2001) Am. 2
IEC 31010-1, 2001, 2nd edition

ATTENTION

Within the above referenced standards is a “Normative Reference” section citing additional standards, which may apply as suited and required for product compliance.

2. Installation

2.1 Introduction

This section describes the procedures for installing and cabling the server as a tower unit in a 1-meter deep Honeywell cabinet, model number MP-C1MCB1.

Installation tasks

The following table lists the platform installation tasks.

Table 2-1 Platform installation tasks

✓	Task
	Understanding the Power and grounding requirements. Also, refer to the section 4 *System Grounding* in the *TPN System Installation (SW20-600) guide.*
	Installing the server and connecting the cables.
	Starting the server

Before you begin

Ensure that you perform the following tasks.

- Cabinet is properly grounded.
- Unpack the platform from the box and verify the parts.
- Place the server on a secure surface near the cabinet to mount.
- Ensure that you have the necessary cables ready.

2.2 Power and grounding requirements

Grounding for computer based nodes

The ground connection is made through the third wire in the AC power cord.

Grounding cabinets

Refer to the *TPN System Installation Manual, SW20-600, Section 4, "System Grounding"* for information on grounding furniture, including the following:

- Ground wiring overview
- Grounding LCN cabinets and stations
- Cabinet Logic ground
- Grounding LCN cables

AC power warning

53895

	**WARNING** The power supply circuit is connected to AC power when the power cable is connected.

	**ATTENTION** It is strongly recommended that you connect the power cord to a clean power source with backup such as an Uninterruptible Power Source (UPS).

2.3 Cabinet spacing requirements

Server arrangements

Due to physical constraints, only one T310 Honeywell server can be mounted on a 1-meter deep Rittal MP-C1MCB1 cabinet from Honeywell. The server must be mounted on rack space interval 11U through 15U, counting from the bottom of the cabinet and moving up.

Thermal test results verified that the Honeywell 1-meter deep cabinet provides adequate AC power and acceptable operating intake air temperatures for up to three T310 rack mount servers. Therefore, on a special project bases, a trained service technician can mount up to two additional servers. The mounting instructions for the additional servers are not in this document. These servers must be mounted on the first 15U of vertical rack space.

The room ambient temperature must be between 10º and 30º C (50º to 86º F).

Unused cabinet spaces

ATTENTION

To ensure proper computer cooling and airflow through the cabinet, all unused rack mount locations must have a blank front panel and air duct baffle installed.

These are available in four height options. Table 2-2 shows the four height options, and the corresponding part and tab numbers.

Table 2-2 Air duct baffle and blank front panel height options

Height Option	Part	Part Number	Tab Number
1U	Blank front panel	51201248	-100
	Air duct baffle	51303521	-100
2U	Blank front panel	51201248	-200
	Air duct baffle	51303521	-200
3U	Blank front panel	51201248	-300
	Air duct baffle	51303521	-300
4U	Blank front panel	51201248	-400
	Air duct baffle	51303521	-400

2.4 Installing the server and connecting the cables

Overview

This section describes the procedures for installing and cabling the server as a tower unit or in a 1-meter deep Honeywell cabinet. This procedure assumes a new 1-meter deep equipment cabinet, Honeywell model number MP-C1MCB1, was shipped from the Honeywell factory with Versa Rail slides pre-assembled.

Honeywell server back panel connections

Figure 2-1 shows the back panel of the server and identifies the connectors for all devices.

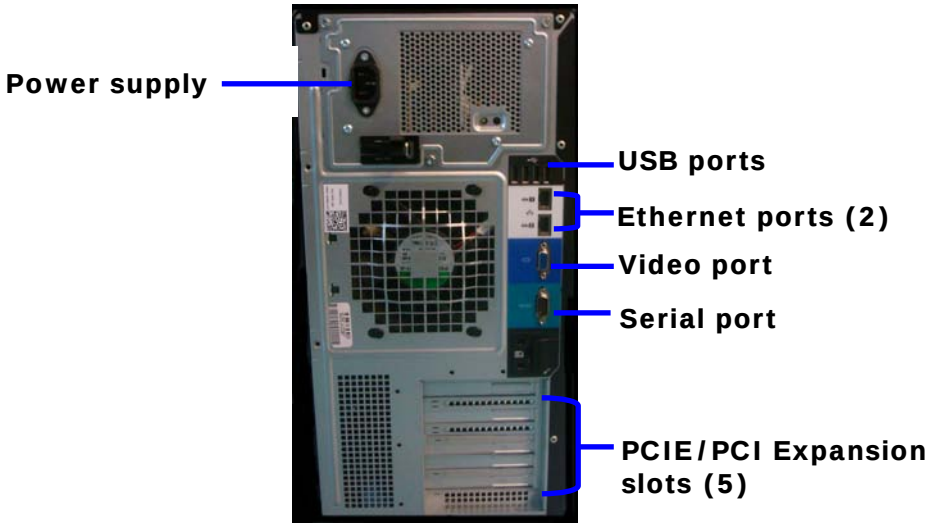


Figure 2-1 Back panel of T310 Honeywell Server

Install the server

Perform the following steps to install the server.

Step	Action
1	Connect the power cords and all cables to the back panel of the server.
2	Fully extend the right and left Versa Rail slides (pre-installed at the Honeywell factory) in the cabinet.
3	Lower the server into the J-shaped slots on each slide, starting with the slot closest to the cabinet.
4	Gently push the server toward the cabinet until the retaining clips snap into place.
	ATTENTION The Versa Rail kit includes a cable management arm (installed in the Honeywell factory) that mounts to the rear of the Versa Rail. AC power cords and KVM cables are pre-routed through the cable management arm. For more information on installing the Versa Rail, refer to *Rack Installation Guide* shipped with the cabinet.
5	Slide the server directly into the cabinet and engage the captivated retaining screws in the front flange of the Versa Rails.
6	After both retaining screws are engaged in the threaded inserts, tighten them until the server rack mount flanges contact the front mounting rails of the cabinet.
7	If you are using the 8-port KVM, switch/control console for your human interface (pre-installed in the Honeywell factory), connect the KVM cable mouse and keyboard connections to the USB connectors on the rear of the server. The KVM cable has separate USB connections for the mouse and keyboard or they can be combined into one USB connector through USB to PS/2 adapter (included with the KVM cable).

Connect the cables

Perform the following steps to connect the power cords and cables to the back panel of the server.

Step	Action
1	Connect the video cable and network interface cables.
	WARNING AC power cords from all computing nodes mounted on a given cabinet must be distributed across the two power entries as equally as possible. Failure to do so may result in tripping the circuit breakers.
2	Connect the Honeywell AC power cords.
	ATTENTION Ensure that the power cords are connected to separate power entries. For more information on power cord, refer to Power cords.
3	o If you are not using Fault Tolerant Ethernet (FTE), connect the Ethernet cable to the on-board RJ-45 connector. o If you are using an Intel® Dual NIC card for FTE, connect the FTE cable to the NIC card in the expansion slot. o If you are using the on-board NICs for FTE, connect the FTE cable to the on-board RJ-45 connector.
4	Tighten the cables, and verify that all cables have proper strain relief.
	TIP Refer to the section Installing air duct baffles and the blank front cover, if necessary.
	ATTENTION Any unused rack mount space must have an air duct baffle and blank front panel installed.

2.5 Installing air duct baffles and the blank front cover

The following section describes the steps to install the air duct baffle and the blank front cover in the cabinet. This is available in four height options; refer to Table 2-2 for details about height options. Installing the parts ensures that the airflow within the cabinet allows proper cooling of the computing nodes.

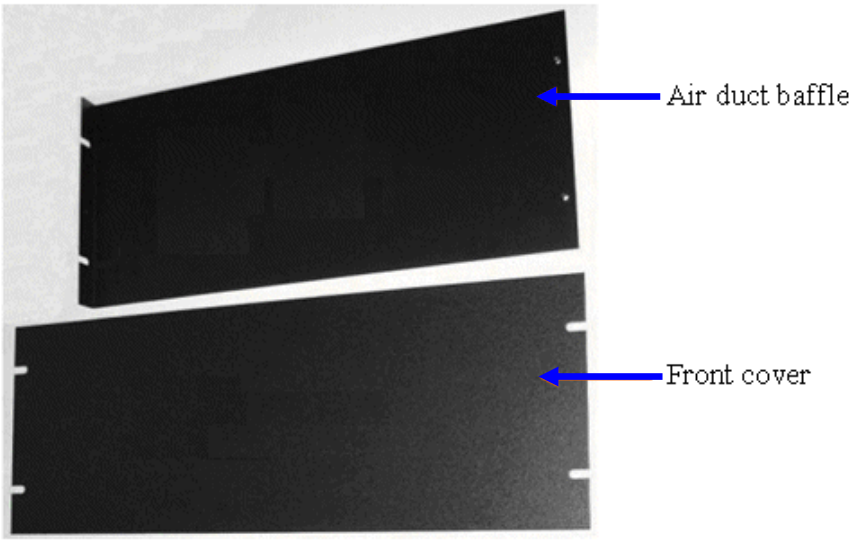
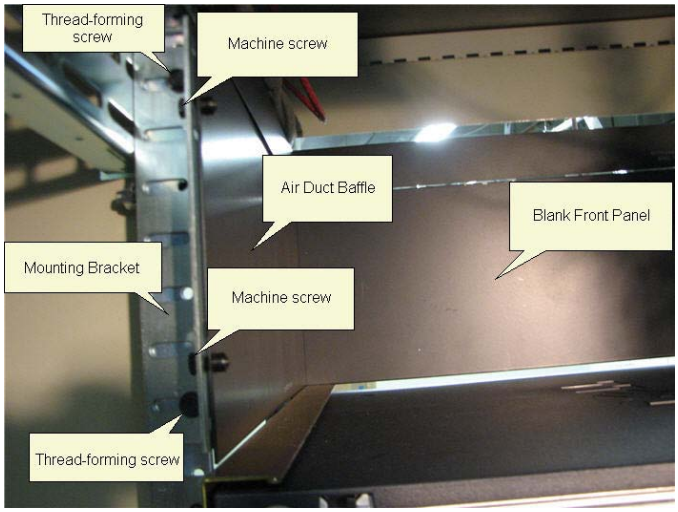
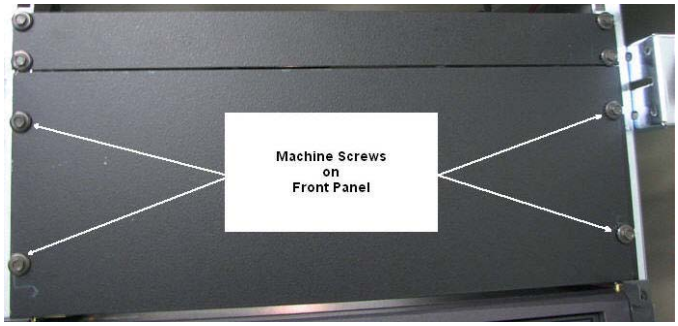


Figure 2-2 Install Air duct baffle and Front cover

Perform the following steps to install the air duct baffle and the front cover in the cabinet.

Step	Action
1	Place the air duct baffle inside the cabinet with the bent tab resting along the front of the right cabinet rail. 
2	Place the blank front panel across the front of the cabinet rails. 
3	Attach the blank front panel to the air duct baffle and right cabinet rail using two machine screws and two external tooth washers threaded into the two clip nuts.
4	Tighten the screws.
5	Attach the other side of the blank front panel to the left cabinet rail using two machine screws and two external tooth washers threaded into the two clip nuts and tighten the screws.

Step	Action
6	Attach the rear-mounting bracket to the rear cabinet rail using two thread forming screws and two external tooth washers.
7	Tighten the screws.
8	Attach the air duct baffle to the rear-mounting bracket using two machine screws and two external tooth washers threaded into the two self-clinching nuts.
9	Tighten the screws.

2.6 Starting the server

Before you begin

ATTENTION

Cabinet mounted servers that do not have a KVM switch/console require the connection of the USB mouse and keyboard (supplied with the server) for starting the server.

Turn on the power

Perform the following steps to turn on the power.

Step	Action
1	Press the power button on the front panel of the T310 Honeywell server.
2	Wait for the power light to become solid green.
3	If the power light does not become solid green, refer to the *Troubleshooting* section in the *Dell™ PowerEdge™ T310 Systems Hardware Owner's Manual.*

Start the TDC Emulator Services

If you are using a TPS node with the LCNP4E board installed, start the TDC Emulator service. Perform the following steps to start the service.

Step	Action
1	Choose **Start > Run**. The **Run** dialog box appears.
2	In the **Open** box, type *services.msc*
3	Right-click *TDC Emulator service* and click **start**.

Check the LCNP4E status

Perform the following steps to verify if the LCNP4E passed self-test.

Step	Action
1	Choose **Start > Programs > Honeywell TPS > LCNP Status**.
2	Verify that the LCNP status indicates **Passed Self Test** and the circle is green.
3	Verify that **TPN Address** appears in the **LEDs** field of the LCNP Status display, after the board, 0 is configured. You must reset the LCNP after configuration.

REFERENCE

Refer to the LCNP Status section in the *LCNP Status User's Guide* for more information.

3. Operation

3.1 Overview

Front view of server

The following figure shows the front view of the server.

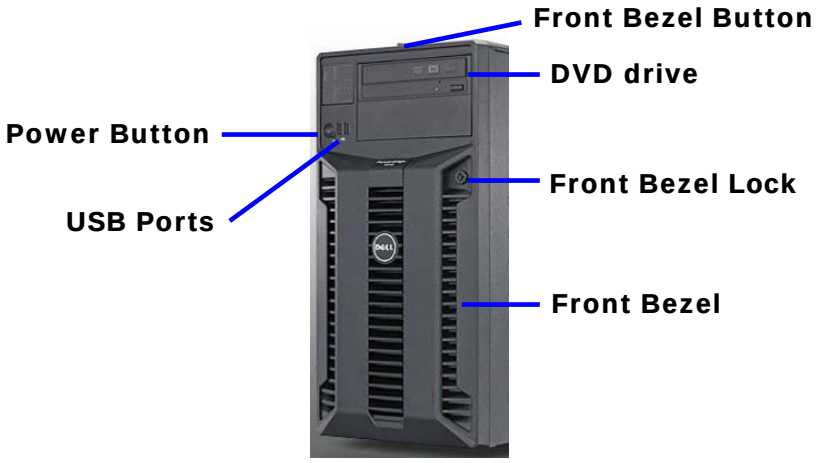


Figure 3-1 Front view of T310 Honeywell server

Additional references

The following table lists the Dell publications that contain operation and servicing information.

Table 3-1 Dell Publications for operation and servicing

Publication	Contains information on	Is available with…
Information Update	Last minute updates about technical changes to your computer or advanced technical-reference material for experienced users or technicians.	The computer package

Publication	Contains information on	Is available with…
Dell™ PowerEdge™ T310 Product Information Guide	Warranty and safety.	The computer package For more information refer to www.dell.com
Dell™ PowerEdge™ T310 Systems Hardware Owner's Manual	Removing and replacing the parts. Technical specifications. Configuring the system. Troubleshooting	Product Documentation CD The computer package For more information refer to www.dell.com
Rack Installation Instructions — Sliding Rails	Installing the system in a server rack or a cabinet.	The computer package For more information refer to www.dell.com
Windows Installation Instructions and Important Information	Initializing the Windows operating system.	The computer package For more information refer to www.dell.com

3.2 Network connections

Overview

The server platform must be connected to an LCN network and/or an Ethernet network. The Broadcom dual embedded GB NICs are enabled without PXE in the system BIOS. For FTE configurations using the Broadcom dual NIC card for connectivity, the BIOS must be disabled.

Ethernet network

Two Ethernet 10/100/1000 embedded Base T connections are standard on the server platform. Most TPS/Experion FTE systems use the on-board NICs. If you are using FTE, you must install the FTE cables according to the specific instructions in the *FTE Installation and Service Guide*. Some Experion configurations using the on-board NICs may also use a dual NIC card.

LCN network

The connection to the LCN is made through a Local Control Network Processor (LCNP4E) card. This card is a Honeywell card that allows the TPS Operator Station to emulate Universal Stations. This card provides the communication path for the server to other LCN modules. The LCNP4E consists of an LCNP4E card, a MAU cable, and the LCN MAU (Media Access Unit). The LCNP4E card is a half-length PCIE card that consumes PCIex16. The LCNP4E, MAU, and MAU cable are required to connect to the LCN Network.

The LCN node address must meet the customer requirements. If the LCN address is not known, the node address must be set to zero. Setting the address to zero allows the node to connect to the LCN without the risk of an address conflict with some other node. This is consistent with the current LCN standard procedure.

The server platform uses a digital system clock. When the server platform is added to an existing system that contains node running analog clocks, that system must have at least two KxLCN boards for analog/digital conversion.

ATTENTION

The LCNP4E (model number TP-LCNP04-100) is required.

LCN cables

The two cables and T-connectors (and terminators, if applicable) must be located underneath (the future location) of the unit, with an additional loop, 1 meter in length (with a T-connector). This loop can be routed into the rear of the platform where the connection is made to the LCN MAU. The cable between the LCNP4E board and the LCN MAU is 2 meters in length.

Cabinet mounted server

The two LCN cables and with T-connectors (and terminators, if applicable) are routed vertically inside the left rear corner of the cabinet (when viewed from the rear door) near the vertical cable duct where the connection is made to the LCN MAU. The cable between the LCNP4E board and the LCN MAU is two meters in length.

Refer to *LCN System Installation, Subsection 3.6* for the rules and techniques of installing an LCN cable system.

LCN connections

The LCN cable A and B connections are made through a single cable from the LCNP4E board to the LCN Media Access Unit (MAU) contained in a metal housing.

MAU connection

Connect the MAU to both cable A and B coax T-connector as displayed in the following figure.

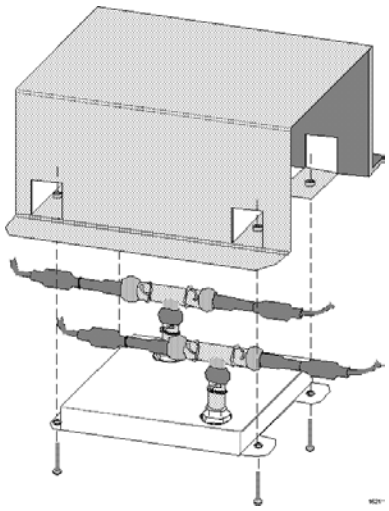


Figure 3-2 LCN MAU to LCN Cable T-Connections

ControlNet Network

A ControlNet Network is a single coaxial trunk cable broken up into segments interconnected by links. Node Connections to the network are created through a Tap and drop cable. Repeaters are used to link segments together and for changes in media from coax to fiber optic. All points on the network must have either an interface card or a terminator. Terminators are comprised of termination resistors, which are used to mark the beginning and end of a trunk segment and Tap Dummy Load(TDL), which terminate a drop cable when no node is present. The model number for the ControlNet Universal Interface is TC-PCIC02-100.

.	**REFERENCE -EXTERNAL:** Controlnet Network interface must be connected to T310 Honeywell Server using Magma PCIe to PCI converter box. For more information on how to connect, refer to the *Magma PCI Expansion Chassis Installation Instructions (PE4DR-HNWL)* supplied with the Magma hardware kit.

4. Servicing

4.1 Servicing T310 Honeywell server

Before you begin

Ensure that you read the following instructions before servicing the server platform.

	**ESD HAZARD** Shut down the server.
	**SHOCK HAZARD** o To avoid electrical shock, ensure that you unplug the computer from the electrical outlet. o Disconnect the power cords and cables from the back panel.
	**CAUTION** Before you begin any of the procedures in this section, follow the safety instructions in the *Dell System Information Guide*.
	**ATTENTION** o Remove the server from the cabinet or tower unit and place on a secure surface. o After removing the cover, ensure that you do not disconnect the cables from the system board.

Remove the Front bezel

A lock on the bezel restricts access to the hard drives. To remove or install any of these drives, you must first remove the front bezel.

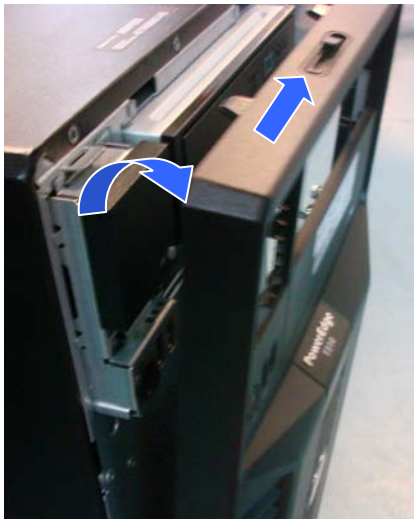


Figure 4-1 Remove the front bezel of T310 Honeywell server

Perform the following steps to remove the front bezel.

Step	Action
1	Push the top lever in the direction of the arrow until it releases the bezel from the top of the chassis.
2	Pull the bezel away from the chassis, removing the bezel tabs from the slots.

Removing the Side cover

A lock on the side cover bezel restricts access to the mother board. To remove or install the components on the mother board; you must first remove the side cover.

Figure 4-2 Remove the side cover of T310 Honeywell server

Perform the following steps to remove the side cover.

Step	Action
1	Turn the lock on the cover release latch, counterclockwise to unlock position.
2	Press the release latch, and rotate the latch end of the cover away from the system.
3	Lift the cover away from the system.

4.2 Servicing the LCNP4E

LCNP4E board description

The LCNP4E board has 256 MB of onboard memory.

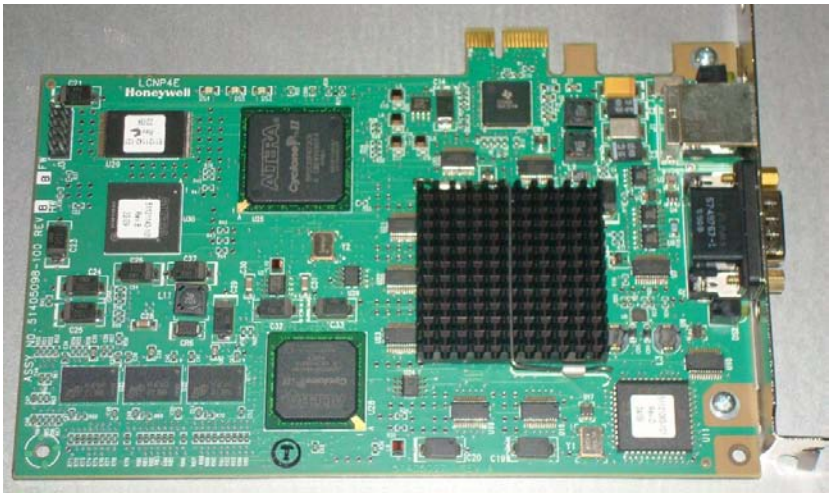
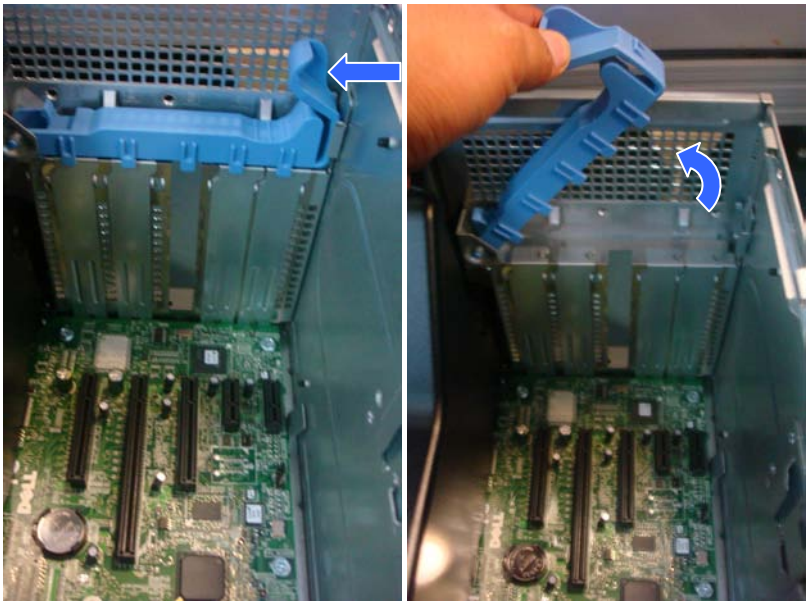


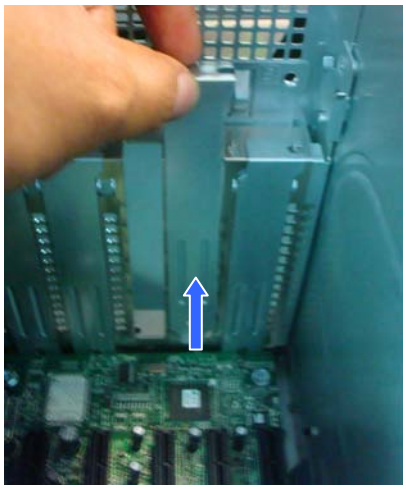
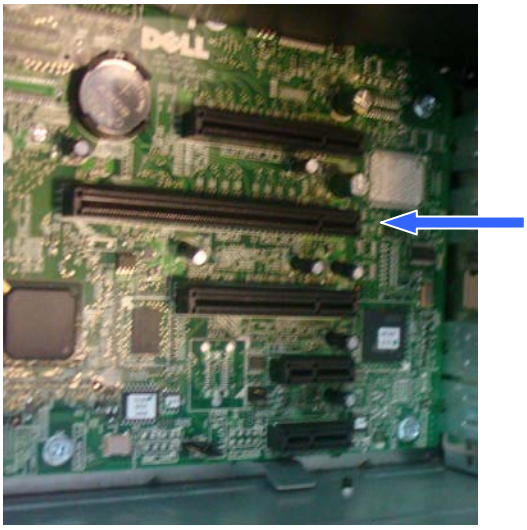
Figure 4-3 LCNP4E board

Replace the LCNP4E board

The LCNP4E board is located in the PCIE slot 2. Perform the following steps to replace the LCNP4E card. See also *Dell™ PowerEdge™ T310 Systems Hardware Owner's Manual.*

	**ESD HAZARD** The LCNP4E board is an electro statically sensitive device. Use a grounding strap and grounded work surfaces and equipment when handling this component. Store and transport the parts only in electro statically safe containers.

Step	Action
1	Disconnect the LCN MAU cable from the LCNP4E board.
2	Remove the side cover.
3	Open the blue plastic expansion card retainer located at the top. 
4	Remove the metal filler bracket, if not removed before.

	
5	Wear a grounded ESD wrist strap, grasp the existing LCNP4E card at the corners, and gently remove it from PCIE slot 2.
6	Insert the replacement LCNP4E card firmly into PCIE slot 2, until the card is fully seated. 
7	Align the LCNP4E card edge with the card edge guide.

8	Install the screw that secures the assembly card bracket to the expansion slot cage. (The top of this screw may be on the underside of the bracket.)
9	Close the blue expansion card retainer.
10	Replace the cover and bezel.
11	Reconnect the LCN MAU cable to the LCNP4E card.
	 **ATTENTION** Do not route cables over or behind the cards. Cables routed over the cards can prevent the system cover from closing properly or cause damage the equipment.
12	Close the cover and bezel.
13	Replace the server in the cabinet.
14	Connect the power cords and cables to the back panel of the server.
15	Connect the LCN MAU cable.
16	Press the Power On/Off button on the server, to turn on the power.

4.3 Servicing the hard disk drives and power supply

Overview

The server from Honeywell is configured with five 160 GB SAS hard drives for RAID-5 configuration and the fifth hard drive is a hot spare. The configuration also contains redundant power supplies. Both the hard disk drives and power supplies are hot swappable and must be of same capacity and speed. You must replace only one power supply and/or hard disk drive at a time in a system that is turned on. Refer to the Dell documentation for detailed instructions on swapping the power supply and hard disk drive.

References

The following table lists the specific Dell publications and relevant sections for troubleshooting and servicing the hard disk drives and power supplies.

Table 4-1 Dell publications for hard disk drives and power supplies

Publication	Contains information on…
Dell™ PowerEdge™ T310 Systems Hardware Owner's Manual	System Overview Basic Troubleshooting Indicators, Codes, and Messages Removing and Installing Parts Jumpers and Connectors Using the System Setup Program Finding Software Solutions Running the System Diagnostics Troubleshooting Your System Installing System Options Installing Drives Getting Help Jumpers, Switches, and Connectors I/O Ports and Connectors Abbreviations and Acronyms

4.4 Servicing Honeywell options

Overview

CAUTION

Do not damage the EMI gasket fingers when removing/installing boards.

ESD HAZARD

Use the grounding strap and grounded work surfaces and equipment when handling any electro statically sensitive components such as the video cards, NIC adapter cards, and SCSI controller cards. Store and transport parts only in electro statically safe containers.

Slot requirements for TPN node setup

The following table identifies the MZ-PCSV11 specific slots for the Honeywell options for a TPN node configuration.

MZ-PCSV12 does not support TPN nodes.

Table 4-2 Slot requirements for TPN node configuration

Slot No	Description	Option
1	PCIex8	Free Slot
2	PCIE-X 16, x8 routing	LCNP4e
3	PCIE-X 8, x4 routing	Free Slot
4	PCIex1	Free Slot
5	PCIex1	Free Slot

Slot requirements for general Ethernet and FTE node setup

The following table identifies the specific slots for each of the Honeywell options for general Ethernet and FTE node configurations.

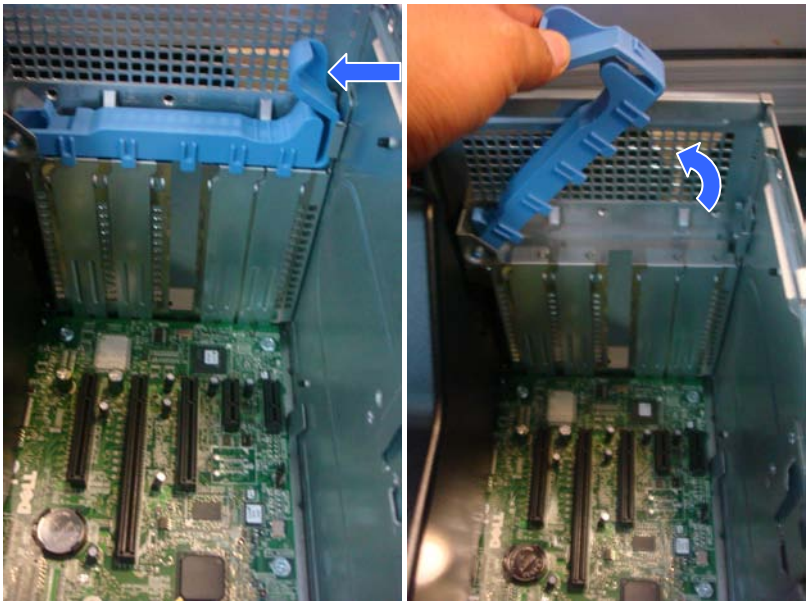
Table 4-3 Slot requirements for general Ethernet and FTE node configurations

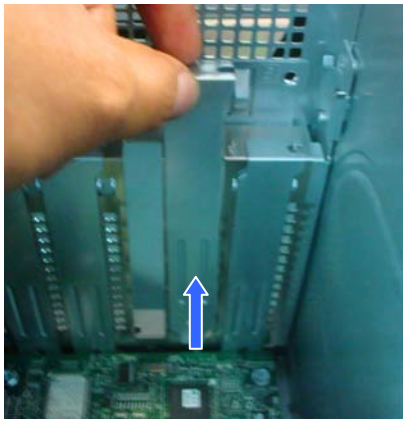
Configuration	PCIEx8	PCIEx16	PCIEx8	PCIEx1	PCIEx1
FTE Supervisory (Default)	Free Slot	Free Slot	Free Slot	Free Slot	Free Slot
FTE Supervisory (Optional)	Dual NIC	Free Slot	Free Slot	Free Slot	Free Slot
3 NICs, FTE co-joined through Dual NIC (Default)	Free Slot	LCNP4E	Free Slot	Free Slot	Free Slot
3 NICs, FTE co-joined through Dual NIC (Optional)	Dual NIC	LCNP4E	Free Slot	Free Slot	Free Slot
3 NICs, FTE co-joined through single NIC for EHG (Default)	Single NIC	LCNP4E	Free Slot	Free Slot	Free Slot
3 NICs, FTE co-joined through on-board single NIC for EHG (Optional)	Dual NIC	LCNP4E	Free Slot	Free Slot	Free Slot
1 NIC, Standard Ethernet through one on-board NIC	Free Slot	Free Slot	Free Slot	Free Slot	Free Slot
2 NICs, Standard Ethernet through two on-board NICs	Free Slot	Free Slot	Free Slot	Free Slot	Free Slot
3 NICs, Standard Ethernet through two on-board NICs plus single NIC	Single NIC	Free Slot	Free Slot	Free Slot	Free Slot
4 NICs, Standard Ethernet through two on-board NICs plus dual NIC	Dual NIC	Free Slot	Free Slot	Free Slot	Free Slot

Replace the cards in expansion slots

Perform the following steps to replace the expansion cards in the PCIE slots. See also *Dell™ PowerEdge™ T310 Systems Hardware Owner's Manual.*

	**ESD HAZARD** Expansion cards are electro statically sensitive device. Use a grounding strap and grounded work surfaces and equipment when handling these components. Store and transport parts only in electro statically safe containers.

Step	Action
1	Disconnect the cables from the expansion card.
2	Remove the side cover.
3	Open the blue plastic expansion card retainer located at the top. 
4	Remove the metal filler, if not removed before.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td></td><td>  </td></tr>
<tr><td>5</td><td>Wear a grounded ESD wrist strap, grasp the existing LCNP4E card at the corners, and gently remove it from PCIE slot.</td></tr>
<tr><td>6</td><td>o If you are replacing an expansion card, align the expansion card edge with the card edge guide and insert the expansion firmly into the slot until the card is fully seated.
o If you are removing an expansion card permanently, install a metal filler bracket over the empty expansion slot opening.
o If you are installing a new expansion card, remove the metal filler bracket. Align the expansion card edge with the card edge guide and insert the expansion firmly into the slot unit the card is fully seated.
  ATTENTION
Keep this bracket in case you need to remove the expansion card later. Filler brackets must be installed over empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.</td></tr>
<tr><td>7</td><td>Close the expansion card retainer.</td></tr>
</table>

Step	Action
8	Connect expansion card cable to the expansion card.
	ATTENTION Do not route cables over or behind the cards. Cables routed over the cards can prevent the system cover from closing properly or cause damage the equipment.
9	Close the cover and bezel.
10	Replace the server in the cabinet.
11	Connect the power cords and cables to the back panel of the server.
12	Press the Power On/Off button on the server, to turn on the power.

Add additional memory

The standard memory capacity is 2 GB. The system memory can be increased to 4 GB, MZ PCEM12. Memory devices must be from the same memory supplier.

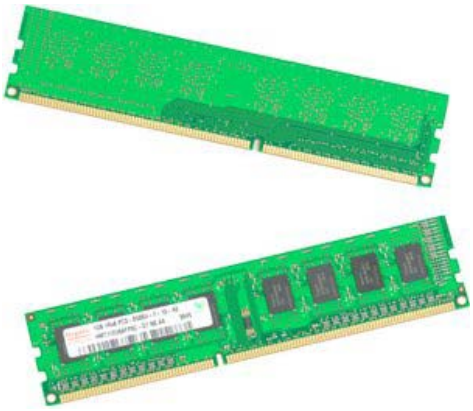


Figure 4-4 Memory cards

Refer to the Table 1-4 Memory configuration for the placement of memory devices for the memory capacity options.

ATTENTION

When adding additional memory, you might get a warning message stating that memory is not optimal, due to the interleaf memory socket design. You can ignore this message.

Perform the following steps to upgrade the memory. See also *Dell™ PowerEdge™ T310 Systems Hardware Owner's Manual.*

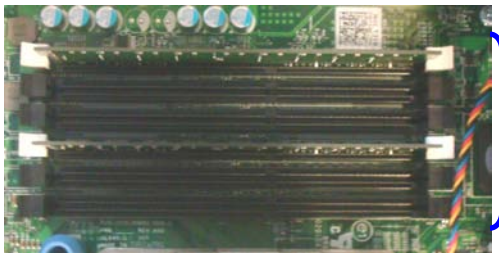
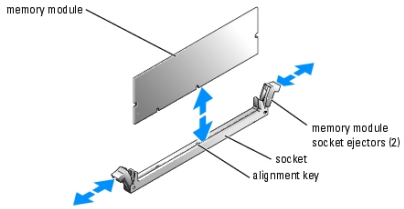
ESD HAZARD

Memory is electro statically sensitive. Use a grounding strap and grounded work surfaces and equipment while handling these components. Store and transport parts only in electro statically safe containers.

Step	Action
1	Remove the side cover.
2	Lift the cooling shroud in the direction of the arrow. 

CAUTION

The DIMMs are hot to the touch for some time after the system has been powered down. Allow time for the DIMMs to cool before handling them. Handle the DIMMs by the edges and avoid touching DIMM components.

Step	Action
3	The DIMM slots are now exposed. Refer to Table 1-4 Memory configuration for DIMM socket configuration.  DIMM sockets
4	Wear a grounded ESD wrist strap and press the socket ejectors on the memory module socket down, to allow the memory module to be inserted into the socket.
5	Insert the memory module. 
6	Align the memory module's edge connector with the alignment key on the memory module socket, and insert the memory module into the socket. **ATTENTION** The memory module socket has an alignment key that allows you to install the memory module in the socket only in one way.
7	Press down the memory module with your thumbs and pull up on the socket ejectors with your index fingers to lock the memory module into the socket. When the memory module is properly seated in the socket, the socket ejectors on the memory module socket align with the socket ejectors on the other sockets that have memory modules installed.
8	Close the shroud and on the chassis and ensure that release handle closes securely.
9	Close the side cover.

Step	Action
10	Replace the server in the cabinet.
11	Connect the power cords and cables to the back panel of the server.
12	Press the Power On/Off button on the server, to turn on the power.

4.5 Verifying the BIOS settings

Purpose

All Honeywell systems must have the Honeywell recommended BIOS version. Honeywell configures specific BIOS settings in the factory for each of the server platform configurations. BIOS settings for the server are listed in the Table 4-4 and Table 4-5 list the specific BIOS settings for FTE and non-FTE configurations using a Broadcom dual NIC card for connectivity.

Table 4-4 BIOS settings (default)

Configuration	BIOS setting		
	NIC Card PCIE dual port STP	**Broadcom Dual onboard NIC**	**Card single NIC PCIE Server**
FTE only	none	Use both NICs	none
FTE with EHG	none	Use both NICs	install
No FTE, but 1 or 2 Ethernet ports	none	Use 1 or 2 NICs (Enable both the NICs through BIOS settings.)	none
No FTE, but 3 Ethernet ports	none	Use both NICs (Enable both the NICs through BIOS settings.)	install
No FTE, but 4 Ethernet ports	install	Use both NICs (Enable both NICs through BIOS settings.)	none

Table 4-5 BIOS settings (optional)

Configuration	BIOS setting		
	NIC Card PCIE dual port STP	**Broadcom Dual onboard NIC**	**Card single NIC PCIE Server**
FTE only	install	Disable (through BIOS settings.)	none
FTE with EHG	install	Use 1 NIC (Enable both the NICs through BIOS Settings.)	none
No FTE, but 1 or 2 Ethernet ports	none	Enable two NIC (through BIOS settings.)	none
No FTE, but 3 Ethernet ports	none	Enable two NIC (through BIOS settings.)	install
No FTE, but 4 Ethernet ports	install	Enable two NIC (through BIOS settings.)	none

Enter the BIOS

Perform the following to access BIOS and view the settings for MZ-PCSV11 and MZ-PCSV12.

	**ATTENTION** Do not perform this procedure unless you are familiar with BIOS.

Step	Action
1	Turn on the server.
2	Press **F2** on the keyboard to enter the BIOS Setup.
3	Check the BIOS version is as follows: • For MZ-PCSV11 it must be 1.11.0 [1.1.52] or 1.11.0 • For MZ-PCSV12 it must be 1.11.0 [1.1.52] or later.

BIOS setting for MZ-PCSV11

The following tables lists the BIOS settings configured in the factory for the MZ-PCSV11 server platform.

System Date and Time

Item	Value
System Time	(As appropriate)
System Date	(As Appropriate)

Memory information

Item	Value
System Memory Size	2GB
System Memory Type	ECC DDR3
System Memory Speed	1333 MHz
Video Memory	8 MB
System Memory Testing	Enabled

CPU information

Item	Value
64-bit	Yes
Core Speed	2.40 GHz or later
Bus Speed	4.80GT/S
Virtualization Technology	Disabled
Execute Disable	Enabled
Number of cores per processor	All
Turbo Mode	Enabled
C-State	Enabled
Processor 1 Family-Model-Stepping	06-1E-5 or later
Intel® Xeon® CPU E5560	2.40 GHZ or later
Level 2 Cache	4x256 KB
Level 3 Cache	8MB
Number of Cores	4

SATA settings

Item	Value
Embedded SATA	ATA Mode
Port A	Auto
Model	HDD Model No
Drive Type	Hard Drive
Capacity	500 GB
Port B	Off
Port C	Off
Port D	Off
Port E	Auto
Port F	Off
Model	DVD R/w Model No
Drive Type	Optical Drive
Capacity	N/A

Boot settings

Item	Value
Boot Mode	BIOS
Boot Sequence	
SATA Optical drive	Enabled
Hard drive C: (Embedded SATA Port A)	Enabled
Boot Sequence Retry	Disabled

Integrated devices

Item	Value
User Accessible USB Ports	All Ports ON
Internal USB Port	On
Internal SD Card Port	Off
Embedded NIC 1 and NIC 2	Enabled
Embedded GB NIC 1	Enabled
MAC Address	Xxxxxxxxxxx
Embedded GB NIC 2	Enabled
MAC Address	Xxxxxxxxxxx
OS Watchdog Timer	Disabled
Embedded Video Controller	Enabled

PCI IRQ assignment

Item	Value
Embedded Video	IRQ 6
Embedded NIC 1	IRQ 15
Embedded NIC 2	IRQ 5
Embedded South Bridge Device 16	IRQ 14
Embedded USB EHCI Controller 2	IRQ 14
Embedded USB UHCI Controller 1	IRQ 14
Embedded Video	IRQ 10
Embedded SATA1	IRQ 11
Embedded SATA2	IRQ 10

Serial communication

Item	Value
Serial Communication	On without Console Redirection
Serial port address	Serial Device 1 = COM1
	Serial Device 2 = COM2
External Serial Connector	Serial Device 1
Fail-Safe Baud Rate	115200
Remote Terminal Type	VT100/VT220
Redirection After Boot	Enabled

Power management

Item	Value
Power Management	OS Control
CPU Power Performance Management	OS DBPM
Fan Power and Performance Management	Minimum Power
Memory Power and Performance Management	Maximum Performance

System security

Item	Value
System Password	Not Enabled
Setup Password	Not Enabled
Password Status	Unlocked
Power Button	Enabled
TPM Security	Off

Item	Value
TPM Activation	No Change
TPM Clear	No
NMI Button	Disabled
AC Power Recovery	Off
AC Power Recovery Delay	Intermediate
User Defined Delay	Enter
Keyboard NumLock	On
Report Keyboard Errors	Report
F1/F2 Prompt on Error	Enabled

BIOS setting for MZ-PCSV12

The following tables lists the BIOS settings configured in the factory for the MZ-PCSV12 server platform.

System Date and Time

Item	Value
System Time	(As appropriate)
System Date	(As Appropriate)

Memory information

Item	Value
System Memory Size	4GB
System Memory Type	ECC DDR3
System Memory Speed	1333 MHz
Video Memory	8 MB
System Memory Testing	Enabled

CPU information

Item	Value
64-bit	Yes
Core Speed	2.40 GHz or later
Bus Speed	4.80GT/S
Virtualization Technology	Disabled
Execute Disable	Enabled
Number of cores per processor	All
Turbo Mode	Enabled
C-State	Enabled
Processor 1 Family-Model-Stepping	06-1E-5 or later
Intel® Xeon® CPU E5560	2.40 GHZ or later
Level 2 Cache	4x256 KB
Level 3 Cache	8MB
Number of Cores	4

SATA settings

Item	Value
Embedded SATA	ATA Mode
Port A	Off
Model	NA
Drive Type	NA
Capacity	NA
Port B	Off
Port C	Off

Item	Value
Port D	Off
Port E	Auto
Port F	Off
Model	DVD R/W Model No
Drive Type	Optical Drive
Capacity	N/A

Boot settings

Item	Value
Boot Mode	BIOS
Boot Sequence	
SATA Optical drive Hard drive C: (Slot1 PERC 6/i Adapter bus 03 dev)	Enabled Enabled
Boot Sequence Retry	Disabled

Integrated devices

Item	Value
User Accessible USB Ports	All Ports ON
Internal USB Port	On
Internal SD Card Port	Off
Embedded NIC 1 and NIC 2	Enabled
Embedded GB NIC 1 MAC Address	Enabled Xxxxxxxxxxx
Embedded GB NIC 2	Enabled

Item	Value
MAC Address	Xxxxxxxxxxxx
OS Watchdog Timer	Disabled
Embedded Video Controller	Enabled

PCI IRQ assignment

Item	Value
Embedded Video	IRQ 6
Embedded NIC 1	IRQ 15
Embedded NIC 2	IRQ 5
Slot1 Dell Inc. RAID	IRQ 15
Embedded South Bridge Device 16	IRQ 14
Embedded USB EHCI Controller 2	IRQ 14
Embedded USB UHCI Controller 1	IRQ 14
Embedded Video	IRQ 10
Embedded SATA1	IRQ 11
Embedded SATA2	IRQ 10

Serial communication

Item	Value
Serial Communication	On without Console Redirection
Serial port address	Serial Device 1 = COM1
	Serial Device 2 = COM2
External Serial Connector	Serial Device 1
Fail-Safe Baud Rate	115200
Remote Terminal Type	VT100/VT220
Redirection After Boot	Enabled

Power management

Item	Value
Power Management	OS Control
CPU Power Performance Management	OS DBPM
Fan Power and Performance Management	Minimum Power
Memory Power and Performance Management	Maximum Performance

System security

Item	Value
System Password	Not Enabled
Setup Password	Not Enabled
Password Status	Unlocked
Power Button	Enabled
TPM Security	Off

Item	Value
TPM Activation	No Change
TPM Status	Disabled
TPM Clear	No
Power Button	Enabled
NMI Button	Disabled
AC Power Recovery	Off
AC Power Recovery Delay	Intermediate
User Defined Delay	Enter
Keyboard NumLock	On
Report Keyboard Errors	Report
F1/F2 Prompt on Error	Enabled

Exit the BIOS

Perform the following steps to exit the BIOS settings.

Step	Action
1	Press the **ESC** key on the keyboard. A message appears asking you to save the settings.
2	Select **Save Changes and Exit**.
3	Press the **ENTER** key to restart the server.

4.6 Spare parts

The following table lists the Optimal Replaceable Units (ORUs) for the server.

Table 4-6 Spare parts for T310 Honeywell server

Item	Spare /Add-in Part Description tab 900	Part No.
Processor	Intel® Xeon® X3430, 2.4Ghz, 8M Cache,	51154553-901

Item	Spare /Add-in Part Description tab 900	Part No.
	Turbo, HT, 1333MHz Max Memory 4.8T/s QPI or higher	
RAM	2GB(2x1GB) 1R 1333 MHz ECC DDR 3 UDIMM	51154553-903
Mouse	USB Optical Mouse	51154292-902
Keyboard	USB Standard Windows Keyboard	51154292-903
DVD±RW	ASSY, DVD+/- RW,	51154292-906
Manuals	Reference & Installation Guide Diagnostics & Troubleshooting Guide	51154553-902
Software	Windows 2003 Server Standard Service Pack 2 for Experion R3xx and TPS R4xx.x Windows Server 2008 non HyperV media,32-bit for Experion R400.x Windows Server 2008 non HyperV media, 64-bit for Experion R410.x	

5. Notices

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5.1 Documentation feedback

You can find the most up-to-date documents on the Honeywell Process Solutions support website at:

http://www.honeywellprocess.com/support

If you have comments about Honeywell Process Solutions documentation, send your feedback to:

hpsdocs@honeywell.com

Use this email address to provide feedback, or to report errors and omissions in the documentation. For immediate help with a technical problem, contact your local Honeywell Process Solutions Customer Contact Center (CCC) or Honeywell Technical Assistance Center (TAC) listed in the “Support and other contacts” section of this document.

5.2 How to report a security vulnerability

For the purpose of submission, a security vulnerability is defined as a software defect or weakness that can be exploited to reduce the operational or security capabilities of the software.

Honeywell investigates all reports of security vulnerabilities affecting Honeywell products and services.

To report a potential security vulnerability against any Honeywell product, please follow the instructions at:

https://honeywell.com/pages/vulnerabilityreporting.aspx

Submit the requested information to Honeywell using one of the following methods:

- Send an email to security@honeywell.com.

or

- Contact your local Honeywell Process Solutions Customer Contact Center (CCC) or Honeywell Technical Assistance Center (TAC) listed in the "Support and other contacts" section of this document.

5.3 Support and other contacts

For support, contact your local Honeywell Process Solutions Customer Contact Center (CCC).

North America

Country	Phone	Facsimile	Email
Canada and United States	800-822-7673	973-455-5000	asksscc@honeywell.com

Northern Europe

Country	Local Time Business Hours	Phone	Facsimile	Email

Denmark	07:00 – 18:00	80–252165	+45 6980 2349	hpscustomersupport@honeywell.com
Finland	08:00 – 19:00	0800–9–15938	+358 (0)9 2319 4396	hpscustomersupport@honeywell.com
Ireland	06:00 – 17:00	1800939488	+353 (0)1 686 4905	hpscustomersupport@honeywell.com
Netherlands	07:00 – 18:00	0800 020 3498	+31 (0)20 524 1609	hpscustomersupport@honeywell.com
Norway	07:00 – 18:00	800–11478	47–852–287–16	hpscustomersupport@honeywell.com
Sweden	07:00 – 18:00	0200883167	+46 (0)8 509 097 84	hpscustomersupport@honeywell.com
United Kingdom	06:00 – 17:00	08002797226	+44 (0)20 3031 1064	hpscustomersupport@honeywell.com

Southern Europe

Country	Local Time Business Hours	Phone	Facsimile	Email
Belgium	07:00 – 18:00	080048580	+32 (0)2 791 96 02	hpscustomersupport@honeywell.com
France	07:00 – 18:00	0805100041	+33 (0)1 72 74 33 44	hpscustomersupport@honeywell.com
Luxembourg	07:00 – 18:00	8002–8524	+352 24611292	hpscustomersupport@honeywell.com
Spain	07:00 – 18:00	800099804	+34 91 791 56 25	hpscustomersupport@honeywell.com
Portugal	06:00 – 17:00	800–8–55994	+34 91 791 56 25	hpscustomersupport@honeywell.com

Eastern Europe

Country	Local Time Business Hours	Phone	Facsimile	Email
Bulgaria	08:00 – 19:00	700 20771	+359 (0)2 489 7384	hpscustomersupport@honeywell.com
Croatia	07:00 – 18:00	0800 80 6392	+420 227 204 957	hpscustomersupport@honeywell.com
Czech Republic	07:00 – 18:00	800 142 784	+420 227 204 957	hpscustomersupport@honeywell.com
Hungary	07:00 – 18:00	06 800 20 699	+36 (06) 1 577 7371	hpscustomersupport@honeywell.com
Poland	07:00 – 18:00	00 800 121 50 46	+48 22 485 35 10	hpscustomersupport@honeywell.com
Romania	08:00 – 19:00	0 800 800 178	+40 (0)31 710 7590	hpscustomersupport@honeywell.com
Russia Federation	09:00 – 20:00	8.10.80 02-412 50 11	+7 495 796 98 94	hpscustomersupport@honeywell.com
Slovakia	07:00 – 18:00	0800 002 340	+421 (0)2 3301 0376	hpscustomersupport@honeywell.com

Central Europe

Country	Local Time Business Hours	Phone	Facsimile	Email
Austria	07:00 – 18:00	0800 006438	+43 (0)1 253 6722 4904	hpscustomersupport@honeywell.com
Germany	07:00 – 18:00	0800 7239098	+49 (0)30 6908 8463	hpscustomersupport@honeywell.com
Greece	08:00 – 19:00	00800 12	+30 21 1 268	hpscustomersupport@hon

		9493	6973	eywell.com
Israel	08:00 – 19:00	1 809 407 309	+972 (0)2 591 6148	hpscustomersupport@honeywell.com
Italy	07:00 – 18:00	8000 35205	+39 06 96681356	hpscustomersupport@honeywell.com
Switzerland	07:00 – 18:00	00 080 035	+41 (0)31 560 41 60	hpscustomersupport@honeywell.com

Middle East and South Africa

Country	Local Time Business Hours	Phone	Email
Bahrain	08:00 – 19:00	8008 1343	hpscustomersupport@honeywell.com
Oman	08:00 – 19:00	8007 7595	hpscustomersupport@honeywell.com
Qatar	08:00 – 19:00	800 5460	hpscustomersupport@honeywell.com
Saudi Arabia	08:00 – 19:00	800 844 5309	hpscustomersupport@honeywell.com
South Africa	07:00 – 18:00	0800 983 634	hpscustomersupport@honeywell.com
Turkey	08:00 – 19:00	00800 448823587	hpscustomersupport@honeywell.com
United Arab Emirates	09:00 – 20:00	8000 444 0300	hpscustomersupport@honeywell.com

Other regions

Region	Phone	Facsimile	Email
Pacific	1300-364-822 (toll free within Australia) +61-8-9362-9559 (outside Australia)	+61-8-9362-9564	GTAC@honeywell.com

India	+91-20-6603-2718 / 19 1800-233-5051	+91-20-6603-9800	Global-TAC-India@honeywell.com
Korea	+82-80-782-2255 (toll free within Korea)	+82-2-792-9015	Global-TAC-Korea@honeywell.com
People's Republic of China	+86-21-2219-6888 800-820-0237 400-820-0386		Global-TAC-China@honeywell.com
Singapore	+65-6823-2215	+65-6445-3033	GTAC-SEA@honeywell.com
Japan		+81-3-6730-7228	Global-TACJapanJA25@honeywell.com

World Wide Web

Honeywell Process Solutions support website:

http://www.honeywellprocess.com/support

Elsewhere

Contact your nearest Honeywell office.

5.4 Training classes

Honeywell holds technical training classes on Experion PKS. These classes are taught by experts in the field of process control systems. For more information about these classes, contact your Honeywell representative, or see http://www.automationcollege.com.

Honeywell

Honeywell International
Process Solutions
1860 W Rose Garden Lane
Phoenix, AZ 85027