

>> Kontron Configuration Guide <<



CG2200 Carrier Grade Server

Document Revision 1.1

Revision History

Revision	Date	Comments
1.0	8/16/2012	Final draft
1.1	12/11/2013	Adding new E5-2600 v2 processors family
1.1a	07/01/2014	Adding Kontron PN for E5-2600 v2 processors family

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I. Introduction

Product Description:

The CG2200 Carrier Grade Server is the 6th generation of Kontron's 2U Carrier Grade Server products. The CG2200 supports the Intel's 8-core Intel® Xeon® E5-2600 series processors, coupling high performance with power efficiency to provide improved performance-per-watt over previous-generation rack-mount servers.

The CG2200 is a NEBS-3 and ETSI compliant product which is suited for a host of applications in the telecom Central Office and industrial environment. The server is targeted to OSS (Operations System and Support), Billing, Provisioning, Softswitch, Media Server, Wireless and Unified Messaging, Call Center and many other applications. It can also support manufacturing, industrial, oil & gas, utility and even military applications where a rugged, highly reliable server is required for harsh environments such as dust, high altitude, fire hazard, earthquake propensity, and high ambient temperatures.

To add to the many recognized benefits of Kontron's Carrier Grade Server family, the CG2200 introduces several new important features such as support of PCI-E Gen3, Power Management Bus, DDR3 memory, hot-swap/redundant fans, SD flash storage, and increased memory capacity.

More detailed product information on the CG2200 is available on Kontron's website at:

<http://us.kontron.com/products/systems+and+platforms/communication+rackmount+servers/carrier+grade+servers/cg2200.html>

Purpose of this Document:

This document serves as an ordering reference guide, providing details on what parts are available from Kontron for the CG2200 Carrier Grade Server and its associated accessories and spares. Included are the necessary order codes and other important configuration information related to the ordering of the product.

Supported third-party components are not covered by this document, and may be found in the Tested Hardware and Operating System List (THOL) for this product.

General Flow for Configuring a CG2200 System



Step	Implication	Reference info
A. Select Base System	AC or DC base System	
B. Select Redundant power supply	Redundant or non-redundant	Non-redundant as shipped
C. Select Number and Type of CPUs	<ul style="list-style-type: none"> • Determines number of PCI-e slots available • Determines number of DIMM slots available • Impacts Performance 	Technical Product Specification
D. Heatsink	<ul style="list-style-type: none"> • 	
E. Select PCI Risers	Determines number of slots & PCI bus width	
F. Select RAID	Software or Hardware RAID	<ul style="list-style-type: none"> • S/W RAID 0/1/10 included • H/W RAID refer to THOL for approved adapters + CG2200-RAIDCBLKIT
G. Select Hard Drives		THOL
H. Select Memory	Sized for the application	<ul style="list-style-type: none"> • Refer to Tested Memory List for list of validated DIMMs • Refer to Installation & Maintenance Guide for installation instructions
I. Select Remote Management	<ul style="list-style-type: none"> • Full or Lite version • Dedicated server management NIC port 	
J. Select system mounting	Rack mount kits	Appendix A
K. Repair Items	List of spare items used for repair	Section III.

II. Ordering CG2200 Systems

This section includes important information regarding how to order CG2200 systems. Please be familiar with each of these areas before placing an order.

A. Select CG2200 Base System

The **CG2200 Base System SKUs** are listed in the table below:

Product Code	Description	Min. Order Qty.
CG2200A-00 	CG2200 Carrier Grade Server Base Model 0 with AC Power Supply	1
CG2200D-00 	CG2200 Carrier Grade Server Base Model 0 with DC Power Supply	1

The CG2200 system SKUs are ordered using the Product Code as the order number. The CG2200 is offered as either an AC or DC version—as indicated by the 7th digit of the product code (“A” for AC or “D” for DC).

The above SKUs are “Base Model 0” SKUs—meaning they do not include processors, heat sinks, memory, hard drives, power cord, operating system, or plug-in adapters. Those components should be ordered separately as Accessories from Kontron or from third party vendors listed in the Tested Hardware and Operating System List (THOL).

See the **CG2200 Base Model 0 Configuration** table below for a list of components included in each base model 0 SKU. Notice that there are a number of optional accessory items which must be ordered separately.

Component Description	AC Model 0 Configuration	DC Model 0 Configuration
Chassis (sheet metal, top cover, PCI cages, air duct, interconnection cables, misc. parts)	1 included	
Baseboard S2600CO4 (Copper Pass), power distribution board, system boards, fans, interconnect cables	Included	
AC power supply (650W)	1 included	-
DC power supply (650 W)	-	1 included
Power Distribution Board	1 included	
Filler Panel in 2 nd power supply bay	1 included	
Bezel (unpainted)	1 included	
RDIMM/UDIMM memory slots (memory not included)	16 included	
Bays for hot-swap 2.5" Hard Disk Drives and drive carriers	6 included	
Rear Panel GbE NIC (Cu) ports (via Server Board)	4 included	
Power Cable	Purchase separately ¹	
SAS SW RAID 5 Key	Purchase separately from Intel	
Hardware RAID cable kit	Optional Accessories ²	
HW RAID Adapter, optional battery backup	Purchase separately ⁴	
SW RAID 0/1/10	Included	
Remote Management Module 4	Optional Accessory ²	
CG2200 Right side Dual slot PCI-e x8 Gen 3 passive riser	Optional Accessory ²	
CG2200 Right side Single slot PCI-e x16 passive riser	Optional Accessory ²	
CG2200 Right side Dual slot PCI-X active riser	Optional Accessory ²	
CG2200 Left side Single slot PCI-e X16 passive riser	Optional Accessory ²	
CG2200 Left side Dual slot PCI-e x8 passive riser	Optional Accessory ²	
Rack Mount Kits	Optional Accessory ³	
SD Flash Module	Included	
Kontron Deployment Assistant on SD Flash media	Included	
Rail Enabling Kit (enables AXXBASRAIL13 and AXXHERAIL2)	Optional Accessory ³	
Processor (refer to "Details on Ordering Processors")	Purchase separately ⁴	
Heatsink	Accessory or purchase separately	
RDIMM/UDIMM Memory	Purchase separately ⁴	
Hard Disk Drives (SAS or SATA SSD)	Purchase separately ⁴	
eUSB Flash Drive	Purchase separately ⁴	
SATA Disk on Module (SATA DOM)	Purchase separately ⁴	

¹Refer to AC power cord accessory in this section

²Refer to "Production Spares/Accessories List" in section III




³Refer to "Rack Mounting Options" in the Appendix

⁴Should be purchased separately (parts not listed in this document)

B. Select the Redundant Power supply

The CG2200 System accommodates a 2nd power supply which enables redundancy. Order the 2nd power supply to agree with either AC or DC base system. Order AC power cords to agree with the number of power supplies in the final system. Example (One CG2200A-00 base system + the 2nd power supply require 2 AC Power Cords.

Because DC power input cabling is usually custom, no DC power cord is offered. The CG2200D-00 does contain a DC input terminal block for terminating DC input power.

Product Code	Description	Products Supported	Included in Base Model (Y/N)	Min. Order Qty
CG2200-ACPSU 	AC Power Supply	CG2200	Y (one in AC SKU)	1
CG2200-DCPSU 	DC Power Supply Includes input power connector	CG2200	Y (one in DC SKU)	1
1-340000-0 	AC Power Cord Should be ordered by North America customers. International customers should procure their specific power cords directly.	All CRMS servers	N	1

Power cords are not included with the Mod 0 system. For AC Power cords, order the above North American power cable using the provided product code. This power cable is RoHS-compliant.

C. Select Number and Type of CPUs

The CG2200 is designed to support the following processor SKUs from the Intel® Xeon® processor E5-2600 series. The Base Model 0 CG2200 includes Zero CPUs. Customer must separately purchase CPU 1 and 2.

Intel® Xeon® Processors Supported by the CG2200:

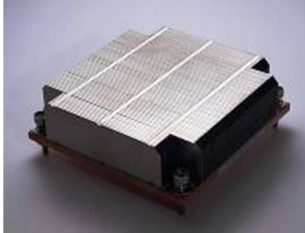
Processor Number	Cores	Speed	TDP	Memory Speed Support	Kontron P/N	Intel P/N (tray)
E5-2658	8 cores	2.1 GHz	95W	DDR3-1600	K00871-001	CM8062101042805
E5-2648L	8 cores	1.8 GHz	70W	DDR3-1600	K00872-001	CM8062100854905
E5-2620	6 cores	2.0 GHz	95W	DDR3-1333	K00873-001	CM8062101048401
E5-2658v2	10 cores	2.4 GHz	95 W	DDR3-1866	1055-8170	CM8063501293200
E5-2648Lv2	10 cores	1.9 GHz	70 W	DDR3-1866	1055-8174	CM8063501293506
E5-2628Lv2	8 cores	1.9 GHz	70 W	DDR3-1600	1055-8176	CM8063501522202
E5-2618Lv2	6 cores	2.0 GHz	50 W	DDR3-1333	1055-8178	CM8063501521302

Notes:

- The above processors are on Intel's long life roadmap and are recommended with the CG2200 for highest performance and long availability and support.
- The E5-2620 has a limited range Thermal Design Point, however with the robust thermal management of the CG2200 this CPU passed NEBS testing.
- These processors are orderable from Kontron or Intel using the indicated part numbers.
- Use of the above processors requires the purchase of a passive heatsink. See its order code below.

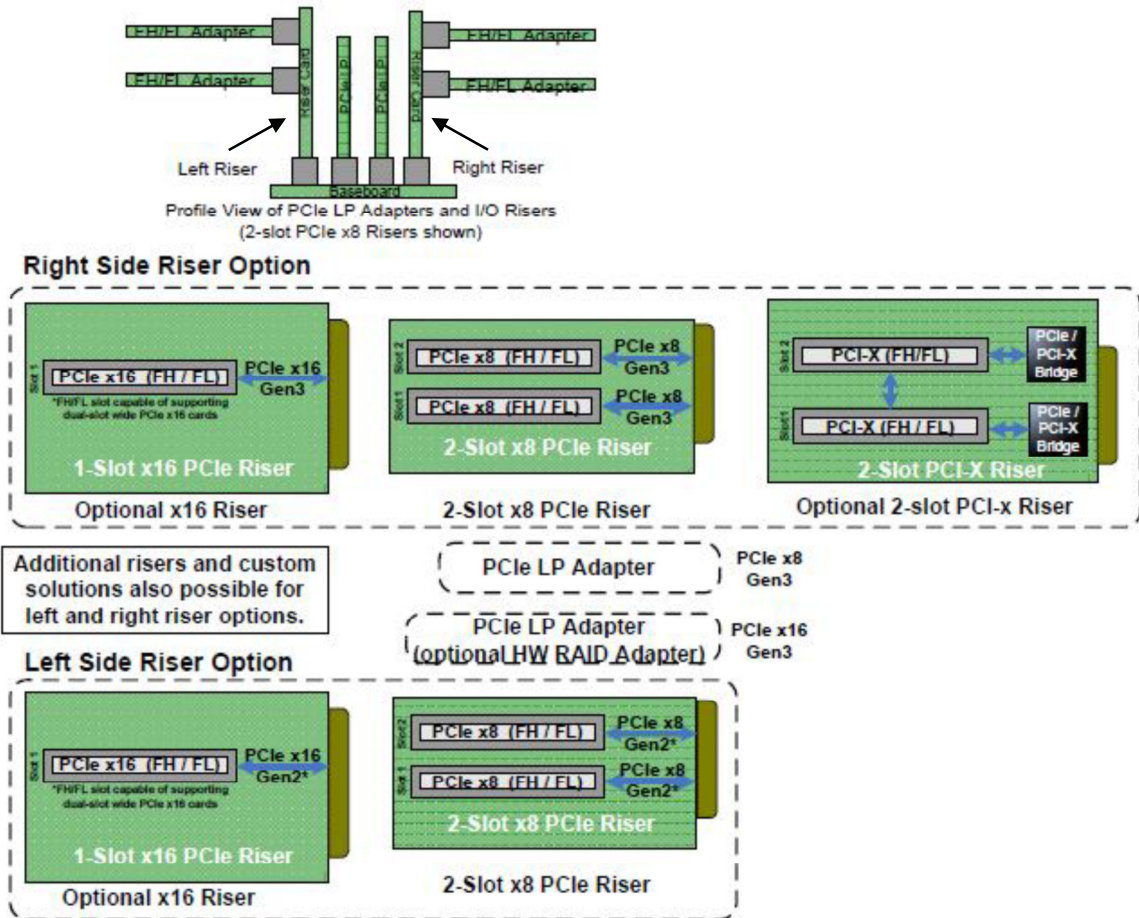
D. Heat Sink

Please order the number of heatsinks to agree with the number of CPUs in the system.
Use the order code below.

Product Code	Description	Products Supported	Included in Base Model (Y/N)	Min. Order Qty
BXSTS200P 	Heatsink (passive) Contents: 25.5mm Tall Passive Heatsink (copper base with aluminum fins)	CG2200	N	4






E. Select Risers

This diagram shows the PCI riser physical arrangement. The CG2200 Model 0 comes with ZERO risers, but can support the addition of 2 risers, a right-side and a left-side riser.



Notice in the diagram above that the two Low Profile PCI-e slots are available only when both CPU 1 and CPU 2 are populated. PCI risers are NOT included in the Model 0 base system.

Additional Full-height full-length PCI slots are made available by purchase of risers. Customers have these choices of PCI risers below. (Also listed in "Production Spares/Accessories List" in section III):

	Product Order Code	Description	MOQ
Choose One for Right side	No Right side riser		
	CG2200-RISER2SX8R 	CG2200 Right side Dual slot PCI-e x8 Gen 3 passive riser	1
	CG2200-RISER1SX16R 	CG2200 Right side Single slot PCI-e x16 Gen 3 passive riser	1
	CG2200-RISER2SPCIX 	CG2200 Right side Dual slot PCI-X active riser	1
Choose One for Left Side	No Left side riser		
	CG2200-RISER1SX16L 	CG2200 Left side Single slot PCI-e X16 Gen 2/Gen3 passive riser	1
	CG2200-RISER2SX8L 	CG2200 Left side Dual slot PCI-e x8 Gen2/Gen 3 passive riser	1


Zero of the above risers are included in the Base Model 0 server.

F. Select RAID

As shipped with the CG2200 Model 0 systems, there is software RAID 0/1/10 supported for all of the 6 SAS hard drives or SATA SSD's. If the customer desires additional level of S/W RAID, these are the choices available.

	Included in CG2200 Base Model 0 System?	Additional item to order
Software RAID 0/1/10	Yes, RKSAS8 included	None
Software RAID 5	No	Intel RKSAS8R5
Hardware RAID 5	No	LSI SAS9240-8i
		Intel RS2VB080

When Hardware RAID is desired, you will need to order the following cable kit:



Product Code	Description	Included in Base Model (Y/N)	Included in Base Model (Y/N)	Min. Order Qty
CG2200-RAIDCBLKIT 	CG2200 RAID Cable kit <ul style="list-style-type: none"> Provides cables to support both the LSI and Intel hardware RAID controllers (optional accessories) 	CG2200	N	1

G. Select Hard Drives

As shipped with the CG2200 Model 0 systems, there is hard drive support for up to 6 SAS hard drives or SATA SSD's. SATA rotating hard drives are not recommended for use in this system. See the Tested Hardware and Operating System List (THOL) for complete listing of HDD's that have been validated to work in this system. The THOL is a customer-driven document. If a certain HDD is required please arrange for its testing with Kontron.

H. Select Remote Management Module Option

There are 2 choices for remote management of the CG2200. This is an optional accessory.

Product Code	Description	Products Supported	Included in Base Model (Y/N)	Min. Order Qty
AXXRMM4 	Intel® Remote Management Module 4 kit Contents: module, mounting brackets, long and short cables	CG2200	N	1
AXXRMM4LITE 	Intel® Remote Management Module 4 Lite kit Contents: module, mounting brackets, long and short cables	CG2200	N	1

I. Select System Mounting

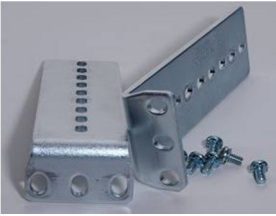
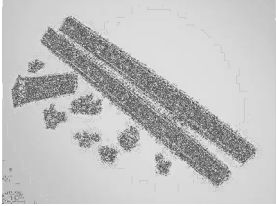

There are many choices for mounting of the CG2200 within rack enclosures. Depending on the application, the following rack mount kits are available. Please see Appendix A for details.

Rack mounting kits for 2-post or 4-post, 19-inch or 23-inch racks are offered for this product. These include TMLCMOUNT21, TMLPMOUNT41, TMLPMOUNT51, TMLPMOUNT52, and TMLPSLIDE01. The Rail Enabling Kit (TMLREK01) is not required for these rack mount kits.

- *Please refer to Appendix A to determine the correct options to suit your needs. For ordering details, refer to “Production Spares/Accessories List” in section III.*

If AXXBASRAIL13 or AXXHERAIL2 (from Intel) will be used, then a Rail Enabling Kit (TMLREK01) must be purchased from Kontron to enable support of these Intel rail kits.

Rack Mount Kits *(refer to Appendix A for additional details)*

Product Code	Description	Included in Base Model (Y/N)	Min. Order Qty
TMLCMOUNT21 	Rack Mount Kit TMLCMOUNT21 Used for mounting servers on a 19-inch wide, 2-post rack	N	10
TMLPMOUNT41 	Rack Mount Kit TMLPMOUNT41 Used for mounting servers on 19-inch wide, 2-post or 4-post racks	N	10
TMLPMOUNT51 	Rack Mount Kit TMLPMOUNT51 Used for mounting servers on 19-inch wide, 2-post or 4-post racks	N	1

<p>TMLPMOUNT52</p> 	<p>Rack Mount Kit TMLPMOUNT52</p> <p>Used for mounting servers on 23-inch wide, 2-post or 4-post racks</p>		N	1
<p>TMLPSLIDE01</p> 	<p>Universal Front Mounting Brackets</p> <p>Accessory kit designed for use in conjunction with slide rails. Each kit contains two Universal Front Mounting Brackets that secure the server to the front of the rack.</p>		N	10
<p>AXXBASRAIL13</p> 	<p>Basic Slide Rail Kit</p> <p><i>NOTE: Does not support Cable Management Arm.</i> <i>NOTE: Requires TMLREK01 to attach to CG2200 chassis</i></p> <p><i>(orderable from Intel only –MM# 899080)</i></p>		N	1
<p>AXXHERAIL2</p> 	<p>Full extending Slide Rail Kit</p> <p><i>NOTE: Requires TMLREK01 to attach to CG2200 chassis</i></p> <p><i>(orderable from Intel only – MM# 901082)</i></p>		N	1
<p>AXXRACKARM2</p> 	<p>Cable Management Arm</p> <p><i>NOTE: To be used with AXXHERAIL2 only</i></p> <p><i>(orderable from Intel only – MM# 901084)</i></p>		N	1
<p>TMLREK01</p>	<p>Rail Enabling Kit</p> <p><i>Enables AXXBASRAIL13 and AXXHERAIL2 on CG2200</i></p>	<p>Each kit includes:</p> <ul style="list-style-type: none"> • rackmount ears (2) • rackmount shoulder screws (4) • screws (2) 	N	10 <i>(order in multiples of 10)</i>

J. Additional Notes on the CG2200 Configuration & Options

Please review the following important notes regarding certain accessories and configuration options for the CG2200.

▪ Flash Drives


- Two front accessible SD memory slots are provided. These SD memory are bootable, and may be used for software update or logging purposes.
- Generic SD-Flash devices may be sourced from a wide variety of vendors.
- An internal SATA DOM socket is provided. Refer to THOL (Tested Hardware and O/S List) for ordering choices.
- An internal optional eUSB Drive is supported.

III. Ordering CG2200 Serviceable Items


The table below lists all of the Serviceable Spares items that may be ordered for the CG2200 system. Generally these are items that could potentially fail or need replacement over the life of the product. These items are made available so that customers might stock their service depots and repair centers. Please read the following notes regarding this parts list.

- **3rd Party Accessories:** For a listing of compatible 3rd party accessories, please refer to the Tested Hardware and Operating System List (THOL) document.

Hard Drive Carriers:

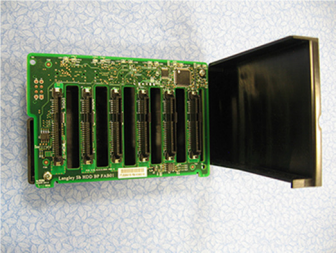

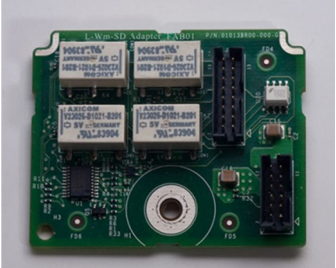
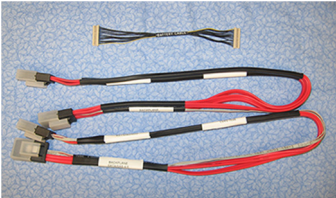

Product Code	Description	Included in Base Model (Y/N)	Included in Base Model (Y/N)	Min. Order Qty
NSNSASHDDCARQ 	SAS HDD Carrier <ul style="list-style-type: none"> • Contents: Carrier, black plastic filler, screws (4) 	CG2200, CG2100, NSN2U	Y <i>(six included)</i>	12 <i>(order in multiples of 12)</i>

Bezels:

Product Code	Description	Products Supported	Included in Base Model (Y/N)	Min. Order Qty
CG2100-BEZEL01 	CG2100 Bezel (Unpainted) This part is reused from prior CG2100 product.	CG2200, CG2100	Y <i>(one bezel)</i>	12 <i>(order in multiples of 12)</i>

Other Service Items:

Product Code	Description	Products Supported	Included in Base Model (Y/N)	Min. Order Qty
S2600CO 	Intel Server Board S2600CO4 (Available from Intel)	CG2200	Y	1
NSNLEDSWITCHBDQ  <p>Front and Back views</p>	LED / Switch Board	CG2200, CG2100, NSN2U	Y	1
CG2200-PWRDISBD 	Power Distribution Board	CG2200	Y	1
CG2200-FPIOBD 	Front Panel IO board	CG2200	Y	1
CG2200-FANSET 	Fan Assembly (6 fans) Contents: 6 x 80m assembly fans. Includes plastic parts (finger guard).	CG2200	Y	1

<p>CG2200-INTCBLKIT</p>	<p>CG2200 System Interconnect Cable Kit</p> <p>Contents: LED/Switch board signal cable, 80mm fan cable. SD flash cable, alarms cable, TAM cable, serial port cable</p>	<p>CG2200</p>	<p>Y</p>	<p>1</p>
<p>CG2200-SASBKPLN</p> 	<p>CG2200 SAS Backplane</p>	<p>CG2200</p>	<p>Y</p>	<p>1</p>
<p>CG2200-FANBD</p> 	<p>CG2200 Fan Controller Board</p>	<p>CG2200</p>	<p>Y</p>	<p>1</p>
<p>CG2200-TAMMODULE</p> 	<p>CG2200 TAM Module</p>	<p>CG2200</p>	<p>Y</p>	<p>1</p>
<p>CG2200-RAIDCBLKIT</p> 	<p>CG2200 RAID Cable kit</p> <ul style="list-style-type: none"> Provides cables to support both the LSI and Intel hardware RAID controllers (optional accessories) 	<p>CG2200</p>	<p>N</p>	<p>1</p>
<p>CG2200-CHASSISKIT</p> 	<p>CG2200 Chassis Parts kit</p> <ul style="list-style-type: none"> Various items that often get lost Replacement screws, ties, and other loose items. 	<p>CG2200</p>	<p>N</p>	<p>1</p>

Appendix A. Rack Mounting Options for 1U and 2U Communications Rack Mount Servers

Rack mounting kits for 2-post or 4-post, 19-inch or 23-inch racks are offered for this product. For ordering details, refer to “Production Spares/Accessories List” in section III. Please refer to the tables below for the correct options to suit your needs.

Although these mounts have been designed for industry standard racks, please consult with your Field Application or Sales Engineer before selecting racks for these servers. Compatible rack mounting kits can also be obtained from 3rd party suppliers.

All rack mount kits listed are suitable for 1U and 2U Communications Rack Mount Servers. Installation instructions are included in each kit.

2-post Rack Mounting Kit Options							
Applicable kits:	Rack width		Post depth		Rack fastener hole spacing		
	19 inch	23 inch	3 inch	5 inch	EIA-Wide	EIA-Universal	ETSI
TMLCMOUNT21	√		√	√	√	√	
TMLPMOUNT41	√		√	√		√	
TMLPMOUNT51	√		√	√	√	√	
TMLPMOUNT52		√	√	√	√	√	√

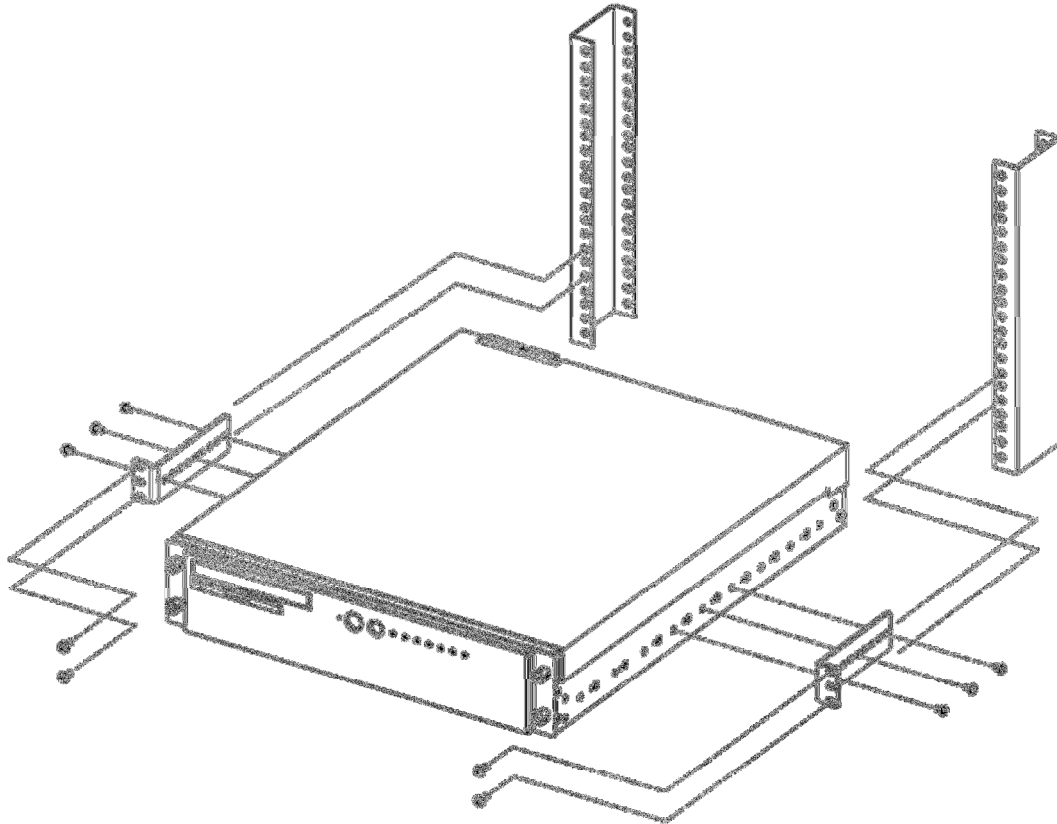
4-post Rack Mounting Kit Options							
Applicable kits:	Rack width		Front-post to rear-post distance		Rack fastener hole spacing		
	19 inch	23 inch	Min (inches)	Max (inches)	EIA-Wide	EIA-Universal	ETSI
TMLPMOUNT41	√		20	24		√	
TMLPMOUNT51	√		20	24	√	√	
TMLPMOUNT52		√	20	24	√	√	√
TMLPSLIDE01 [†]	√		22.5	28 or 34 ^{††}		√	

[†]The **TMLPSLIDE01** kit contains server securing brackets.

^{††}**34-inch** span requires the optional Accuride "Long Bracket" kit.

TMLCMOUNT21

The TMLCMOUNT21 kit mounts Communication Rack Mount Servers to a 2-post, central office type, 19-inch wide rack. This kit consists of L-shaped brackets that fasten to the sides of the server and to the rack.



TMLCMOUNT21

TMLPMOUNT41, TMLPMOUNT51 and TMLPMOUNT52

TMLPMOUNT41/51/52 series mounts Communication Rack Mount Servers to 2-post or 4-post racks.

TMLPMOUNT41 and TMLPMOUNT51 are used for mounting servers on 19-inch wide racks. These racks are considered standard EIA (universal hole spacing) racks.

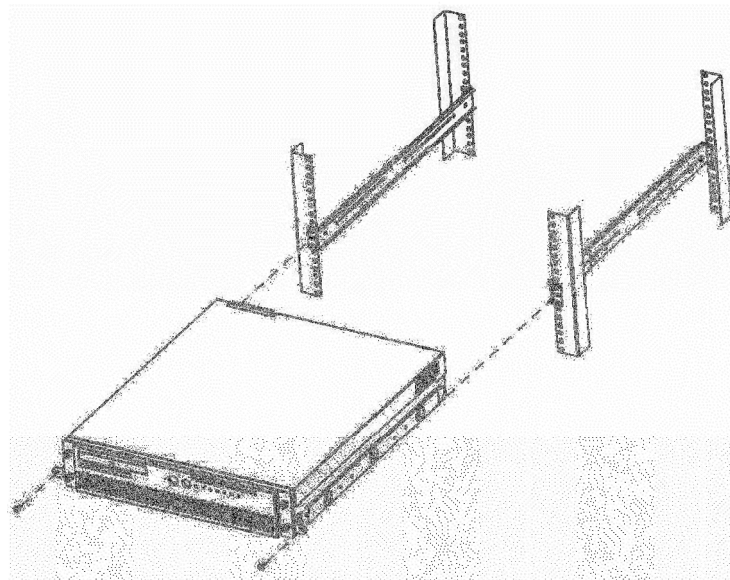
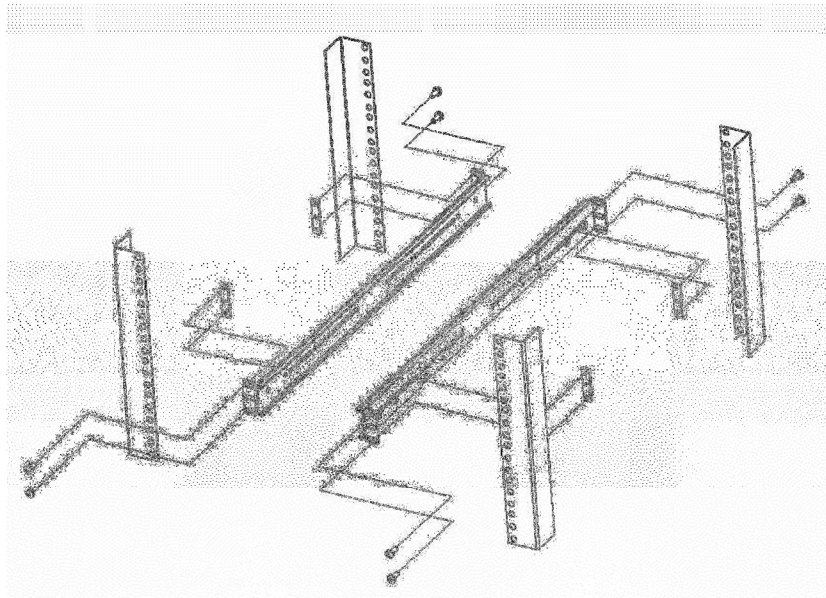
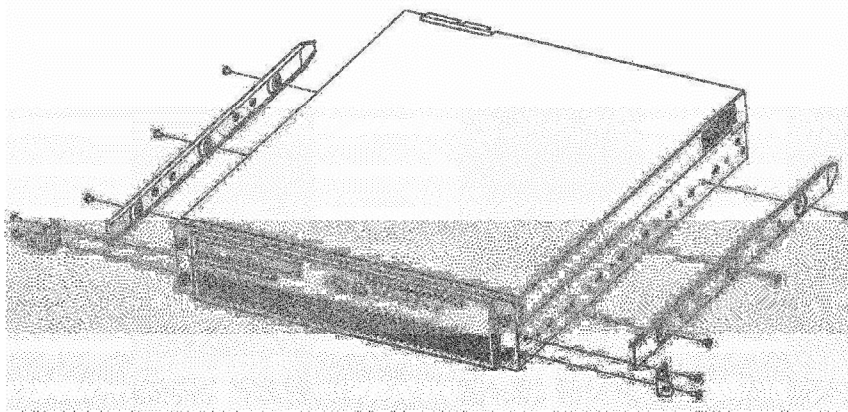
TMLPMOUNT52 is used for mounting servers on 23-inch wide racks. These racks could be standard EIA (universal or wide hole spacing) or ETSI (European) racks.

TMLPMOUNT41/51/52 series are designed with a slide-in rail-type system. Although the mounts are designed as rails, they are not sliding rails. This means the servers can be slid into the racks for installation purpose, but the rails are not designed to support a mounted server during service.

TMLPMOUNT4x/5x Feature Comparison						
	Slide pull-out locking feature	Slide interface material	4-post rack hole spacing	2U-tall nut bar	2-post chassis securing screw location	"HP Mulan rack interference"
TMLPMOUNT41	No ¹	Plastic strips ²	EIA-Universal	Not included	Side access ⁶	Interference
TMLPMOUNT51	Yes	Xylan coating ³	EIA-Wide or EIA-Universal ⁴	Included ⁵	Front access	No Interference
TMLPMOUNT52	Yes	Xylan coating ³	EIA-Wide, EIA-Universal or ETSI	Included ⁵	Front access	N/A

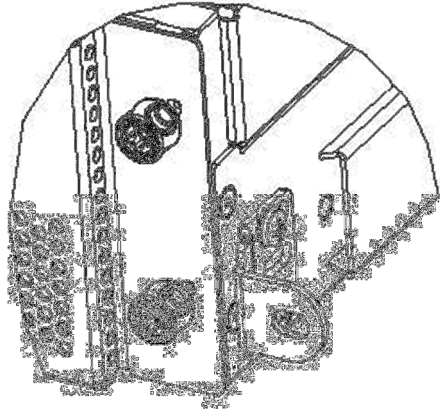
Notes:

1. Extra care must be exercised with TMLPMOUNT41 to securely hold the server with one's hands when sliding it out of the rack; otherwise, the server could fall to the ground as it is being removed.
2. Plastic strips on TMLPMOUNT41 have peeled off in some customer installations. The result of this is that the parts are usable, but the server could have somewhat of a "scrape-in feel" rather than "slide in". Also, the rails will fit sloppier, so the side-located chassis securing screws could be difficult to align in 2-post installations. Replacement material is available from the plastic strip manufacturer.
3. Xylan is a tough, low-friction coating similar to Teflon.
4. EIA-Wide spacing doesn't have the interstitial hole that is present in EIA-Universal. TMLPMOUNT51 contains an adapter bracket to overcome this EIA-Wide issue.
5. This component (2U Nut Bar) enables installation of a rail kit into a 1U rack slot when there is already equipment installed both above and below that open slot.
6. The sides of the server must be accessible when using TMLPMOUNT41 in 2-post racks.

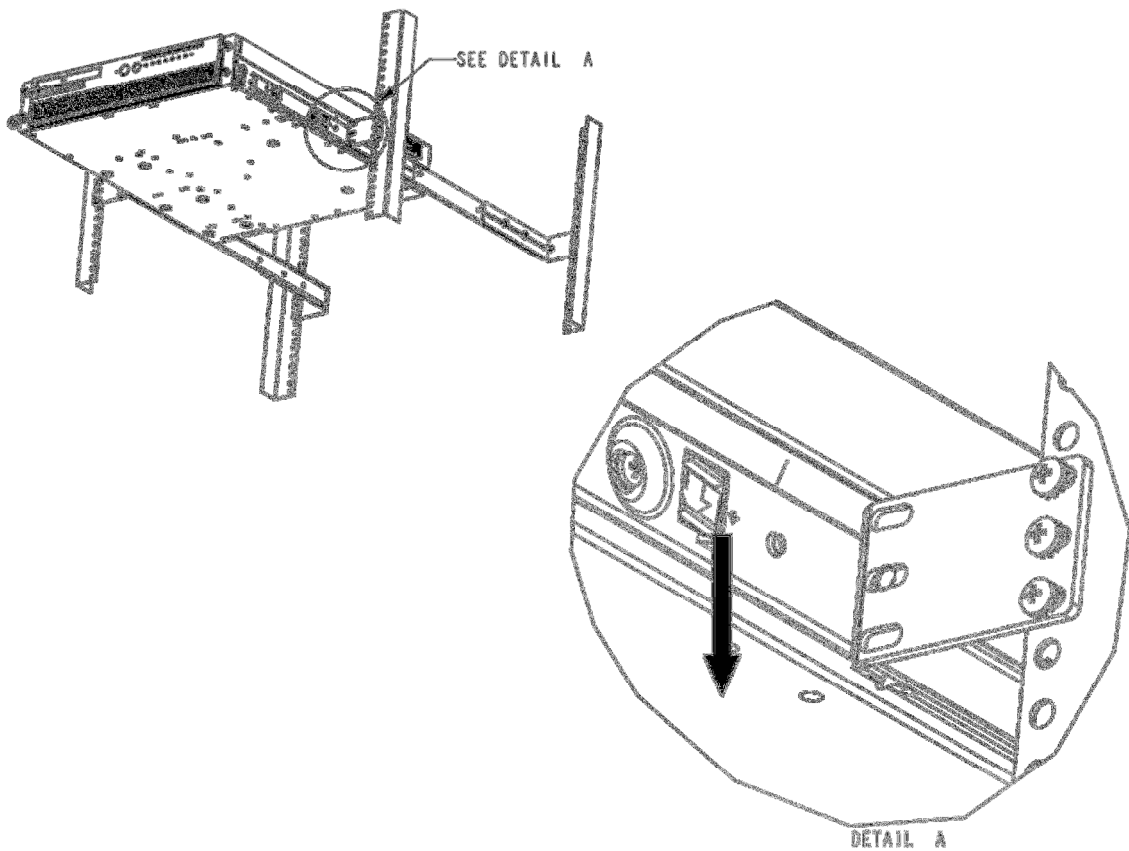


The diagrams above summarize the components and “slide-in rail-type” system of the TMLPMOUNT41. It can be adapted for a 2-post or 4-post installation.

The main difference between the TMLPMOUNT41 and TMLPMOUNT51/52 series is that the TMLPMOUNT41 series uses a screw to lock the server in place using the Universal Mounting Bracket, whilst the TMLPMOUNT51/52 series has an additional Slide Pull-Out Locking feature.



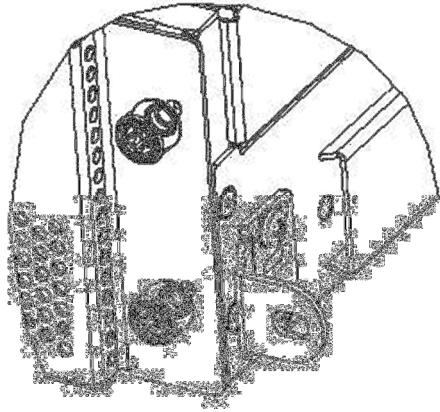
Universal Front Mounting Bracket on the TMLPMOUNT41



Slide Pull-Out Locking feature on the TMLPMOUNT51/52

TMLPSLIDE01

The TMLPSLIDE01 is an accessory kit designed for use in conjunction with slide rails to produce a rack mounted serviceable server. The TMLPSLIDE01 kit contains two Universal Front Mounting Brackets that secure the server to the front of the rack. The sliding rails and optional mounting brackets required to mount the server must be purchased through the channel. For example, the Accuride 22-inch Model 305A-LR slide rails are designed to mount a server for "in-rack service." This example would also use an Accuride mounting bracket kit and the TMLPSLIDE01.



Universal Front Mounting Bracket with securing tab

Note: Using slide rails could result in non-compliance with Seismic Zone 4 requirements of NEBS-3 certification.