

>> Kontron Configuration Guide <<



Kontron Carrier Grade Server TIGH2U

Document Revision 1.9

December 2010

Revision History

Revision	Date	Comments
1.0	12/18/2007	Production version
1.1	2/29/2008	Updated for launch with new web links and format changes
1.2	3/28/2008	Updated to reflect added support for Xeon L5410 processor; updates to accessories/spares section; misc. format/structure changes.
1.3	4/7/2008	Updated Processor section, regarding heatsinks.
1.4	8/29/2008	Updated to reflect addition of basic rail kit support.
1.5	1/31/2009	Added EPSD rails section to Appendix A; updated processor section with latest steppings; updated RAID BBU spare to Li-Ion version ;updated SSD spare information; added note to spares list that IO Module is not NEBS-compliant; replaced Intel references with Kontron references.
1.6	5/13/2009	Removed MM# references from Kontron products. Noted discontinuance of AXXBASICRAIL and AXXHERAIL.
1.7	6/29/2009	Removed MM# references from Intel-sourced SKUs. All SKUs are now orderable directly from Kontron.
1.8	11/10/2009	Replaced AXXMINIDIMM with AXXMINIDIMM512 due to EOL of previous part.
1.9	12/20/2010	Added NSCSASBKPLNSW spare.

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I. Introduction

Product Description:

The Carrier Grade Server TIGH2U is the 4th generation of the 2U x 20"D Telecom and Industrial Grade Rack Server. The TIGH2U supports the 45nm Quad-Core Intel[®] Xeon[®] processor 5400 Series with 12M L2 cache, coupling high performance with power efficiency to provide improved performance-per-watt over previous-generation rack-mount servers.

The TIGH2U is a NEBS-3 and ETSI certified 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, 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.

More product information is available at the following website:

<http://us.kontron.com/products/systems+and+platforms/communication+rackmount+servers/carrier+grade+servers/carrier+grade+server+tigh2u.html>

Purpose of this Document:

This document provides details on what parts are available for ordering of the Carrier Grade Server TIGH2U production systems and 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.

II. Ordering TIGH2U System SKUs

The **TIGH2U System SKUs** that can be ordered are listed below:

Product Code	Description	Min. Order Qty.
TLHA0201W	Carrier Grade Server TIGH2U Base Model 0 with AC Power Supply .	1
TLHD0201W	Carrier Grade Server TIGH2U Base Model 0 with DC Power Supply .	1

See the **TIGH2U Base Model 0 Configuration** table further down in this section for a list of components included in each base model 0 SKU.

The TIGH2U system SKUs are ordered using the Product Code as the order number. Production SKUs are offered as either an AC or a DC version. The Product Identification code or PID of all SKUs contains the letter “A” for AC or “D” for DC as the 4th digit of the PID.

All Production SKUs are base model 0 SKUs, (no processor, heatsink, memory, hard drive, power cord, operating system, or plug-in adapters are provided). Those components must be ordered separately as Accessories from Kontron or from third party vendors listed in the Tested Hardware and Operating System List (THOL).

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

Product Code	Comments
1-340000-0	This AC power cable can be ordered by North America (NA) customers. International customers should procure their specific power cords directly.

Note: Ensure that customers have the appropriate technical support and contact before placing the first order.

TIGH2U Base Model 0 Configuration

All Production SKUs are base model 0 SKUs (no CPU, heatsink, memory, hard drive or plug-in adapters are provided). Those components must be ordered separately as Accessories from Kontron or from third party vendors listed in the Tested Hardware and Operating System List (THOL).

The table below lists which components are included in the base model 0 SKUs and which ones must be ordered separately or as optional accessories.

Component Description	AC Mod 0 Configuration	DC Mod 0 Configuration
AC power supply (600 W)	1 included	-
DC power supply (600 W)	-	1 included
Filler Panel in 2 nd power supply bay	1 included	
Chassis (sheet metal, top cover, PCI carrier)	1 included	
Bezel (grey)	1 included	
Server Board T5000PAL	1 included	
PCI Riser FH-FL (two PCI-Express and one PCI-X slots)	1 included	
PCI Riser LP (two PCI-Express slots)	1 included	
FB-DIMM slots (memory not included)	8 included	
Trays for hot-swap 2.5" SAS Hard Disk Drives	6 included	
Filler Panel in optical device bay	1 included	
Rear Panel GbE NIC (Cu) ports (via Server Board)	2 included	
Server Deployment Toolkit (CD)	1 included	
Quick Start Guide	1 included	
Power Cable	Purchase separately ¹	
SW RAID 0/1/10	Supported	
HW RAID 5	Optional Accessory ²	
Mounting kit for Z-U130 Solid State Drives	Optional Accessory ²	
Remote Management Module 2	Optional Accessory ²	
PCI-X FH-FL Riser (3 PCI-X slots)	Optional Accessories ²	
Ethernet I/O Module (dual Gigabit rear ports)	Optional Accessory ²	
SAS I/O Expansion Module (x4 external rear port)	Optional Accessory ²	
Rack Mount Kits	Optional Accessory ³	
Rail Enabling Kit (to enable AXXBASRAIL13, AXXHERAIL2, AXXBASICRAIL, and AXXHERAIL kits)	Optional Accessory ⁴	
Processor (refer to "Details on Ordering Processors")	Purchase separately ⁴	
Heatsink (copper required)	Accessory or purchase separately	
Memory	Purchase separately ⁴	
Hard Disk Drive	Purchase separately ⁴	
Optical Drive	Purchase separately ⁴	

¹Refer to AC power cord accessory in this section

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

³Refer to "Rack Mounting Options" in the Appendix

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

Notes on the TIGH2U Model 0 Configuration and Options:

▪ PCI Risers

- The base configuration comes standard with two PCI Risers supporting up to five PCI slots. These include:
 - One low-profile riser supporting two PCI-Express (PCIe) slots
 - One full-height, full-length riser supporting three slots: two PCIe x4 and one PCI-X.
- Additional full-height, full-length risers (below) are supported and available as accessories (*refer to “Production Spares/Accessories List” in section III*).
 - PCI-X (active): three independent PCI-X, each with maximum 133 MHz
 - PCI-X (passive): two PCI-X with maximum 100 MHz and one PCI-X (66 MHz) all on a shared PCI bus

▪ HW RAID

- While SW RAID 0/1/10 is supported on the base configuration, HW RAID 5 support can be enabled via a set of optional accessories (*refer to “Production Spares/Accessories List” in section III*).
- Components required are **NSCRAID01W** (NSC2U RAID5 Kit – includes the I-Button (license), battery cable) and the **AXXMINIDIMM512** (512 MB Mini DIMM registered DDR-2 for RAID cache).
- An additional option is the **AXXRSBBU3** (Intel® RAID Smart Battery Backup module provides up to 72 hours of cache memory retention when used with AXXMINIDIMM512). The cable to connect the battery is included in the NSCRAID01W kit.
 - Note: The AXXRSBBU3 is now a Li-Ion (Lithium-ion) version that replaces the previous Ni-Mh version. A firmware update is required to enable the Li-Ion version and is posted in the Downloads/Software section of the TIGH2U product page on the Kontron website.

▪ Solid State Drives

- The **Embedded USB (EUSB) Flash Drive** from Smart Modular Technologies is supported in the system:
 - Available from SMART Modular Technologies or Kontron
 - Multiple drive capacities supported. Refer to the ‘Tested Hardware and Operating System List’ (THOL) for details on supported SKUs.
 - A special mounting kit, **TMWSSDRIVE01W**, is required in order to mount the drive inside the chassis (*refer to “Production Spares/Accessories List” in section III*).
 - Product information is available at:
<http://www.smartmodular.com/product/product.cfm?productID=65>
 - Replaces the former Intel® Z-U130 Value Solid State Drive

- **IO Option Modules**
 - These modules, available as optional accessories, attach to the system board via a proprietary connector, and provide additional IO through the rear bulkhead.
 - The **AXXGBIOMO** option module provides two Gigabit Ethernet NICs.
 - The **AXXSASIOMOD** option module provides one x4 external SAS port.
 - Note: Using the AXXGBIOMOD on the TIGH2U may result in non-compliance of NEBS GR-63 short term operating conditions.
 - *For ordering details, refer to “Production Spares/Accessories List” in section III.*

- **Air Filters** are not provided with the TIGH2U base system. If air filters are required by customer, then customer must purchase them separately.

- **Rack Mounting Options**
 - Rack mounting kits for 2-post or 4-post, 19-inch or 23-inch racks are offered by Kontron 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, AXXHERAIL2, AXXBASICRAIL, or AXXHERAIL from Intel will be used, then a Rail Enabling Kit (TMLREK01) must be purchased from Kontron to enable support of these rails.
 - *For ordering details, refer to “Production Spares/Accessories List” in section III.*

Details on Ordering of Processors:

The TIGH2U supports the Quad-Core Intel® Xeon® processor 5400 Series. These should only be ordered as Tray processors (see note below).

Quad-Core Intel® Xeon® Processors Supported by TIGH2U:

Processor Number	Cores	Speed	TDP	FSB	Kontron P/N	Intel P/N	Intel MM#
E5440	Quad	2.83 GHz	80W	1333 MHz	K00008-001	AT80574KJ073N	898592
L5410	Quad	2.33 GHz	50W	1333 MHz	K00029-001	AT80574JJ053N	898603

Notes:

- Both of the above processors are on Intel's long life roadmap and are recommended with the TIGH2U for highest performance and long availability and support.
- These processors are orderable from Kontron or Intel using the indicated part numbers.
- Heatsinks
 - Only Tray processors are recommended with this product. The processor thermal solution for this server must include the use of a copper heat sink (e.g. see NSCSNKCLP01 in the Spares/Accessories list below). There are no clips needed for this heat sink, since the heat sink includes captive screws.
 - The boxed processors previously listed in the "supported" table have been removed since these now include an aluminum heat sink which does not provide sufficient heat dissipation to meet NEBS thermal requirements. For this reason, **Kontron does not recommend the use of Boxed processors with this product.**

III. Ordering TIGH2U Spares/Accessories

Below are the Spares parts and Accessories that may be ordered with the TIGH2U system. Please read the following notes regarding this parts list.

- **Spares:** Any of these items may be ordered as 'Spares' for replacement purposes.
- **Accessories:** Some of these items are not included in the TIGH2U Mod0 base model, but may be ordered as 'Accessories' to upgrade the base model with additional features.
- **3rd Party Accessories:** For a listing of compatible 3rd party accessories, please refer to the Tested Hardware and Operating System List (THOL) document.

Product Code	Description	Contents	Included in Base Model (Y/N)	Min. Order Qty
TLIACPSU003	TIGI2U AC Power Supply	AC power supply	Y (one in AC SKU)	1
TLIDCPSU003	TIGI2U DC Power Supply	DC power supply, input power connector	Y (one in DC SKU)	1
NSCSNKCLP01	NSC2U CPU Heatsink	Heatsink (copper)	N	1
TLHBEZELU004W	TIGH2U Bezel (Unpainted), 12-pack	Unpainted Bezel, packaged in cartons of 12	Y	12 (order in multiples of 12)
HW RAID				
NSCRAID01W	NSC2U RAID5 Kit	I-Button (license), battery cable (battery or mini-DIMM not included)	N	1
AXXRSBBU3	Intel® RAID Smart Battery Backup module: for use with Intel® Integrated Server RAID (requires NSCRAID01W plus mini DIMM), provides up to 72 hours of cache memory retention when used with AXXMINDIMM512. Li-Ion (Lithium-ion) version Note: requires firmware update (posted on product web page on Kontron site)	Battery backup kit	N	5 (order in multiples of 5)
AXXMINDIMM512	512 MB Mini DIMM registered DDR-2 for RAID cache. Note: enabling RAID capability also requires Intel RAID Activation Key– NSCRAID01W	Mini-DIMM	N	5 (order in multiples of 5)
Remote Management				
AXXRMM2	Intel® Remote Management Module 2 (RMM2) - Single Pack	RMM2 with GCM (single-pack)	N	1
AXXRMM2BULK	Intel® Remote Management Module 2 (RMM2) – 10-Pack	RMM2 with GCM (10-pack)	N	10 specify '1' for each 10-pack

TIGH2U Spares/Accessories List (continued)

Product Code	Description	Contents	Included in Base Model (Y/N)	Min. Order Qty
PCI Risers and I/O Options				
ASR2500FHR	SR2500 (2U) Full Height PCI-Express riser (two PCI-Express slots, one PCI-X slot)	Riser	Y	1
ADRACTRIS	SR2500 (2U) Full Height PCI-X "active" high performance riser card (three PCI-X slots)	Riser	N	1
ADRPCIXRIS	SR2500 (2U) Full Height PCI-X "passive" riser card (three PCI-X slots)	Riser	N	1
FSR2500LPR	Two-slot Low Profile PCI-Express riser	Riser	Y	1
AXXGBIOMOD	Dual Gigabit Ethernet I/O Module <i>Note: Not NEBS-compliant—see note for IO Modules in Section II</i>	Dual Gigabit rear ports	N	1
AXXSASIOMOD	Four-port external SAS I/O Expansion Module	x4 external rear port	N	1
Solid State Drive Support				
TMWVSSDRIVE01W	Mounting kit for Z-U130 Solid State Drives <i>Interface support for:</i> <ul style="list-style-type: none"> • SMART Z-U130 eUSB Drive • Intel® Z-U130 Value Solid State Drive (legacy) <i>(drives purchased separately)</i>	Interposer board, cable, mounting screws (<i>flash drive not included</i>)	N	1
Spares				
TLHBEZEL004W	TIGH2U Bezel, painted	Bezel, painted (gray)	Y	1
TLHTAM004W	TIGH2U Telco Alarms Module with LED pipe	Module, LED pipe	Y	1
NSCSASBSBDW	NSC2U T5000PAL Server board	Board	Y	1
NSCSASBKPLNSW	NSC2U SAS Backplane <i>(Supports SATA optical drives only)</i>	Backplane, cabling, instructions	N	1
NSCSASBKPLNW	NSC2U SAS Backplane <i>(Supports PATA optical drives only)</i>	Backplane	Y	1
NSCBRIDGEBDW	NSC2U Bridge board	Board, insulator	Y	1
TLHFPIOBD04W	TIGH2U Front Panel I/O Board	Board	Y	1

TIGH2U Spares/Accessories List (continued)

Product Code	Description	Contents	Included in Base Model (Y/N)	Min. Order Qty
Spares				
TLHSICBL004W	TIGH2U System Interconnect Cable Kit	Flex cable (SAS interface, front panel signals), front panel power cable, serial port cable, CD-ROM cable, alarm cable, TAM module cable	Y	1
TLHFANSETW	TIGH2U Fan Assembly (set of 4)	80mm CPU fans (2), 40mm PCI fans (2), plastic fasteners (8)	Y	1
NSCPWRDISBDW	NSC2U Power Distribution Board	Power distribution board, with integrated wire harness	Y	1
NSCDVDENGTABW	NSC2U DVD Drive Engagement Tab	Blue plastic engagement bracket & black plastic locking clip, screws	Y	1
FXX25HDDCAR	TIGW1U SAS HDD carrier	Carrier, black plastic filler, screws (4)	Y	10 <i>(order in multiples of 10)</i>
Rack Mount Kits (refer to Appendix A for additional details)				
TMLCMOUNT21	Server Spare TMLPMOUNT21		N	10
TMLPMOUNT41	Server Spare TMLPMOUNT41		N	10
TMLPMOUNT51	Server Spare TMLPMOUNT51		N	1
TMLPMOUNT52	Server Spare TMLPMOUNT52		N	1
TMLPSLIDE01	Server Spare TMLPSLIDE01		N	10
AXXBASRAIL13 <i>(orderable from Intel only – MM# 899080)</i>	Basic Slide Rail Kit <i>(replaces AXXBASICRAIL)</i> <i>NOTE: Does not support Cable Management Arm.</i> <i>NOTE: Requires TMLREK01 to attach to TIGH2U chassis</i>		N	1
AXXHERAIL2 <i>(orderable from Intel only – MM# 901082)</i>	Fully extending Slide Rail Kit <i>(replaces AXXHERAIL)</i> <i>NOTE: Requires TMLREK01 to attach to TIGH2U chassis</i>		N	1
AXXRACKARM2 <i>(orderable from Intel only – MM# 901084)</i>	Cable Management Arm <i>NOTE: To be used with AXXHERAIL2 only</i>		N	1
AXXBASICRAIL <i>(discontinued by Intel)</i>	Basic Slide Rail Kit. <i>NOTE: Requires TMLREK01 to attach to TIGH2U chassis</i>		N	1
AXXHERAIL <i>(discontinued by Intel)</i>	Tool-less, full extension sliding rail kit. <i>NOTE: Requires TMLREK01 to attach to TIGH2U chassis</i>		N	1
TMLREK01	Rail Enabling Kit <i>Enables AXXBASRAIL13, AXXHERAIL2, AXXBASICRAIL, and AXXHERAIL kits</i>	Rackmount ears (2), rackmount shoulder screws (4), screws (2) per kit	N	10 <i>(order in multiples of 10)</i>

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		●	●	●	●	●	●

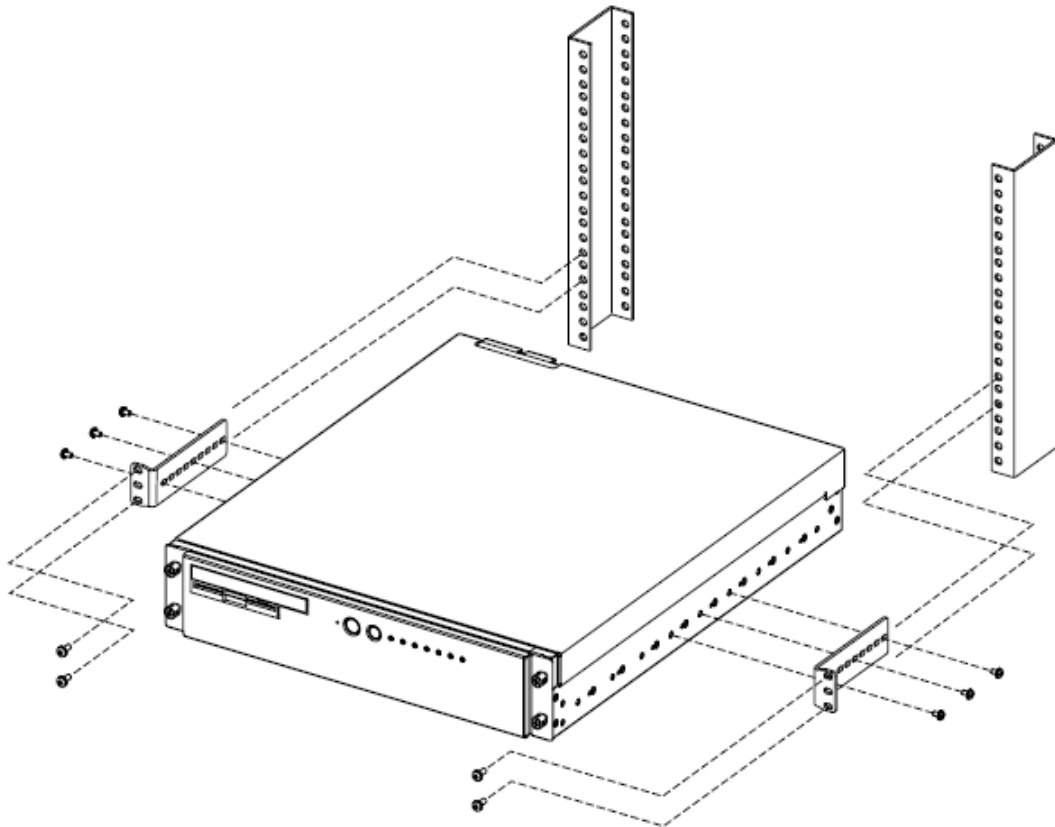
4-post Rack Mounting Kit Options							
Applicable kits:	Rack width		Front-post to rear-post distance		Rack fastener hole spacing		
	19 inch	23 inch	Min (inches)	Max (inches)	EIA-Wide	EIA-Universal	ETSI
TMLPMOUNT41	●		20	24		●	
TMLPMOUNT51	●		20	24	●	●	
TMLPMOUNT52		●	20	24	●	●	●
TMLPSLIDE01 [†]	●		22.5	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" wide rack. This kit consists of simple L-shaped brackets; which 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" wide racks. These racks are considered standard EIA (universal hole spacing) racks.

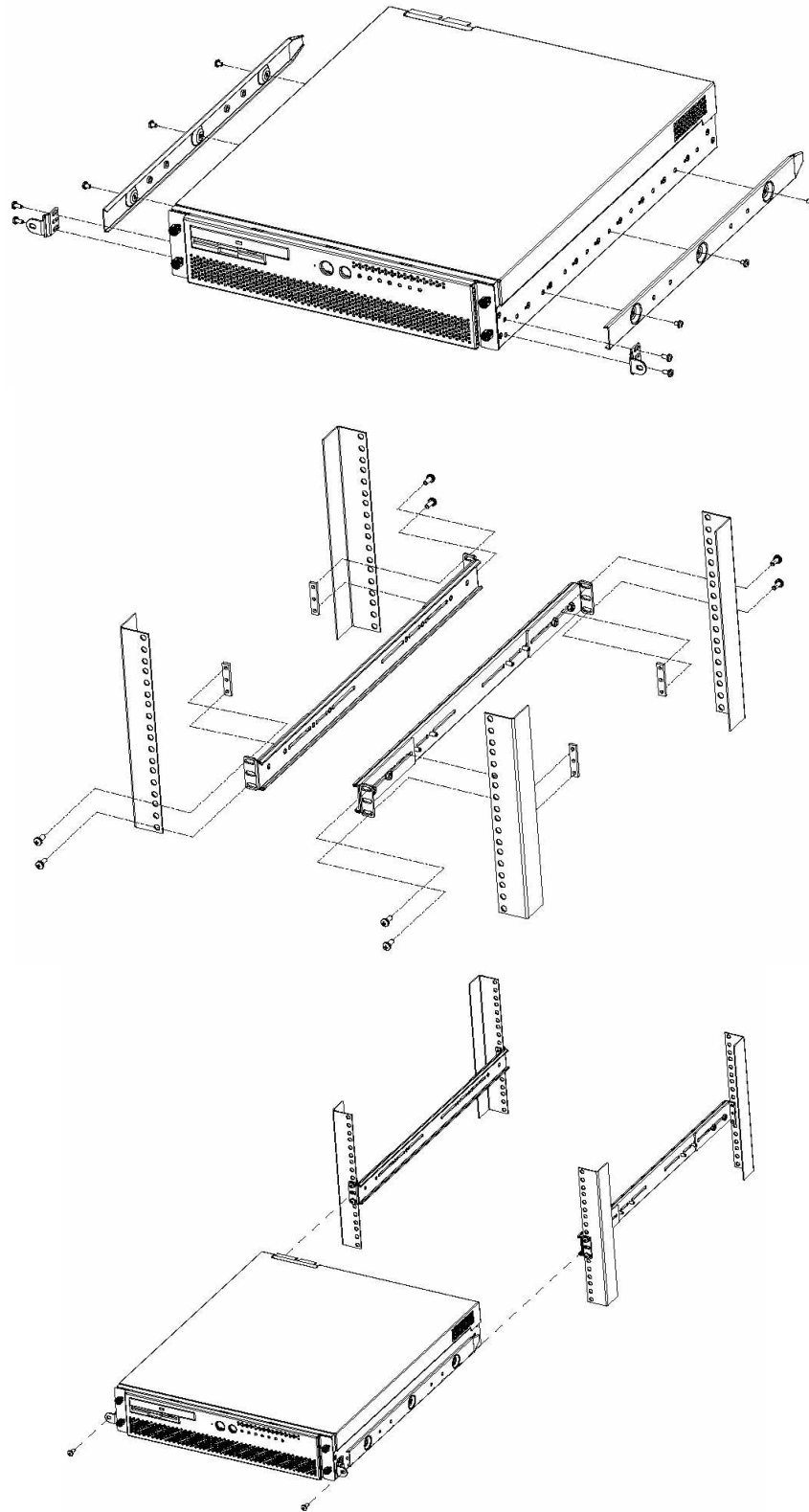
TMLPMOUNT52 is used for mounting servers on 23" wide racks. These racks could be standard EIA (universal or wide hole spacing) or ETSI (European) racks.

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

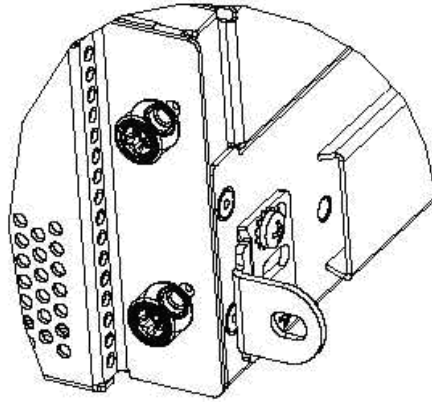
Notes:

1. Extra care must be exercised with TMLPMOUNT41 to securely hold the server with one's hands when sliding it out of the rack, else the server may fall to the ground as its being removed.
2. Plastic strips on TMLPMOUNT41 have peeled off in some customer installations. Consequence: The parts are usable, but the server may have somewhat of a "scrape-in feel" rather than "slide in". Also, the rails will fit sloppier, so the side-located chassis securing screws may 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.

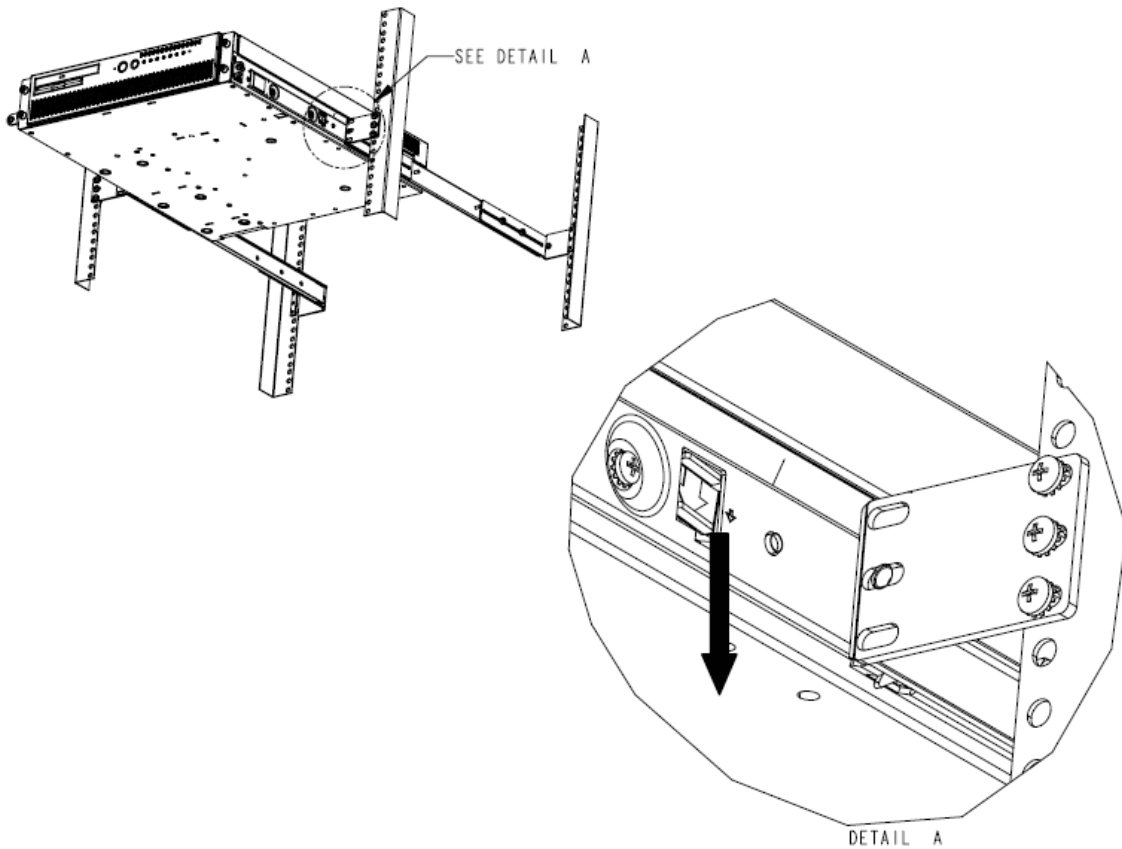


The diagrams above summarize the components and “slide-in rail-type” system of the TMLPMOUNT41. It can be adapted for a 2-post or 4-post installation.

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



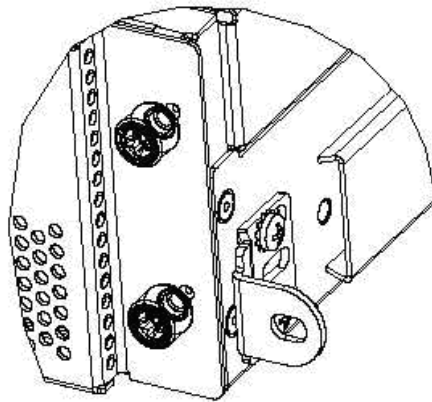
The Universal Front Mounting Bracket on the TMLPMOUNT41



The 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 may result in non-compliance with Seismic Zone 4 requirements of NEBS-3 certification.