

Tekelec 1200 Integrated Application Platform

Hardware Manual

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Chapter 1

Introduction

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This chapter contains general information about manual organization, scope, and audience, related documentation, how to locate customer documentation on the Customer Support site, how to get technical assistance, and RMA requirements.

Overview

The Tekelec 1200 integrated application platform (T1200 platform) is a complete solution consisting of hardware, operating system, and middleware. The T1200 platform has a modular hardware architecture and allows hardware co-mingling to consolidate product configurations of multiple product families to one common cabinet. Tekelec platform software provides alarm management and configuration of each hardware component.

Scope and Audience

This manual provides a platform overview and detailed descriptions of the T1200 application cabinet and its hardware components.

The T1200 cabinet is typically pre-cabled and custom-configured at Tekelec prior to shipment. Hardware component configuration is performed through the product application. Instructions can be found in the administrator section of the respective online-help system, which is provided with the product application on the same or a separate DVD.

This manual is intended for customers who require an understanding of the purpose and functions of the T1200 platform and hardware components.

Manual Organization

This Hardware Manual is organized into the following chapters:

- *Introduction* contains general information about manual organization, scope, and audience, related documentation, how to locate customer documentation on the Customer Support site, how to get technical assistance, and RMA requirements.
- *Safety and Pre-Installation Requirements* provides safety and electromagnetic compatibility and typical site requirements.
- *Systems Overview* describes the T1200 platform, the physical division of the T1200 frame into zones, and the purpose of each T1200 platform hardware component.
- *Hardware Description* provides detailed descriptions of the T1200 platform hardware components.

Related Publications

This document has the following related publications, which can be found either on the same documentation disc, on the application documentation disc, or on the Customer Support site:

- Platform Alarm Manual
- T1200 Platform Installation Manual
- T1200 Platform Maintenance Manual

Documentation Availability, Packaging, and Updates

Tekelec provides documentation with each system and in accordance with contractual agreements. For General Availability (GA) releases, Tekelec publishes a complete EAGLE 5 ISS documentation set. For Limited Availability (LA) releases, Tekelec may publish a documentation subset tailored to specific feature content or hardware requirements. Documentation Bulletins announce a new or updated release.

The Tekelec EAGLE 5 ISS documentation set is released on an optical disc. This format allows for easy searches through all parts of the documentation set.

The electronic file of each manual is also available from the [Tekelec Customer Support](#) site. This site allows for 24-hour access to the most up-to-date documentation, including the latest versions of Feature Notices.

Printed documentation is available for GA releases on request only and with a lead time of six weeks. The printed documentation set includes pocket guides for commands and alarms. Pocket guides may also be ordered separately. Exceptions to printed documentation are:

- Hardware or Installation manuals are printed without the linked attachments found in the electronic version of the manuals.
- The Release Notice is available only on the Customer Support site.

Note: Customers may print a reasonable number of each manual for their own use.

Documentation is updated when significant changes are made that affect system operation. Updates resulting from Severity 1 and 2 PRs are made to existing manuals. Other changes are included in the documentation for the next scheduled release. Updates are made by re-issuing an electronic file to the customer support site. Customers with printed documentation should contact their Sales Representative for an addendum. Occasionally, changes are communicated first with a Documentation Bulletin to provide customers with an advanced notice of the issue until officially released in the documentation. Documentation Bulletins are posted on the Customer Support site and can be viewed per product and release.

Locate Product Documentation on the Customer Support Site

Access to Tekelec's Customer Support site is restricted to current Tekelec customers only. This section describes how to log into the Tekelec Customer Support site and locate a document. Viewing the document requires Adobe Acrobat Reader, which can be downloaded at www.adobe.com.

1. Log into the [Tekelec Customer Support](#) site.

Note: If you have not registered for this new site, click the **Register Here** link. Have your customer number available. The response time for registration requests is 24 to 48 hours.

2. Click the **Product Support** tab.
3. Use the Search field to locate a document by its part number, release number, document name, or document type. The Search field accepts both full and partial entries.
4. Click a subject folder to browse through a list of related files.
5. To download a file to your location, right-click the file name and select **Save Target As**.

Customer Care Center

The Tekelec Customer Care Center is your initial point of contact for all product support needs. A representative takes your call or email, creates a Customer Service Request (CSR) and directs your requests to the Tekelec Technical Assistance Center (TAC). Each CSR includes an individual tracking number. Together with TAC Engineers, the representative will help you resolve your request.

The Customer Care Center is available 24 hours a day, 7 days a week, 365 days a year, and is linked to TAC Engineers around the globe.

Tekelec TAC Engineers are available to provide solutions to your technical questions and issues 7 days a week, 24 hours a day. After a CSR is issued, the TAC Engineer determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, normal support procedures apply. A primary Technical Engineer is assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

Tekelec Technical Assistance Centers are located around the globe in the following locations:

Tekelec - Global

Email (All Regions): support@tekelec.com

- **USA and Canada**

Phone:

1-888-FOR-TKLC or 1-888-367-8552 (toll-free, within continental USA and Canada)

1-919-460-2150 (outside continental USA and Canada)

TAC Regional Support Office Hours:

8:00 a.m. through 5:00 p.m. (GMT minus 5 hours), Monday through Friday, excluding holidays

- **Central and Latin America (CALA)**

Phone:

USA access code +1-800-658-5454, then 1-888-FOR-TKLC or 1-888-367-8552 (toll-free)

TAC Regional Support Office Hours (except Brazil):

10:00 a.m. through 7:00 p.m. (GMT minus 6 hours), Monday through Friday, excluding holidays

- **Argentina**

Phone:

0-800-555-5246 (toll-free)

- **Brazil**

Phone:

0-800-891-4341 (toll-free)

TAC Regional Support Office Hours:

8:30 a.m. through 6:30 p.m. (GMT minus 3 hours), Monday through Friday, excluding holidays

- **Chile**

Phone:

1230-020-555-5468

• **Columbia**Phone:

01-800-912-0537

• **Dominican Republic**Phone:

1-888-367-8552

• **Mexico**Phone:

001-888-367-8552

• **Peru**Phone:

0800-53-087

• **Puerto Rico**Phone:

1-888-367-8552 (1-888-FOR-TKLC)

• **Venezuela**Phone:

0800-176-6497

• **Europe, Middle East, and Africa**Regional Office Hours:

8:30 a.m. through 5:00 p.m. (GMT), Monday through Friday, excluding holidays

• **Signaling**Phone:

+44 1784 467 804 (within UK)

• **Software Solutions**Phone:

+33 3 89 33 54 00

• **Asia**• **India**Phone:

+91 124 436 8552 or +91 124 436 8553

TAC Regional Support Office Hours:

10:00 a.m. through 7:00 p.m. (GMT plus 5 1/2 hours), Monday through Saturday, excluding holidays

- **Singapore**

Phone:

+65 6796 2288

TAC Regional Support Office Hours:

9:00 a.m. through 6:00 p.m. (GMT plus 8 hours), Monday through Friday, excluding holidays

Emergency Response

In the event of a critical service situation, emergency response is offered by the Tekelec Customer Care Center 24 hours a day, 7 days a week. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with an EAGLE 5 ISS that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical problems affect service and/or system operation resulting in:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with the Tekelec Customer Care Center.

Chapter 2

Safety and Pre-Installation Requirements

Topics:

- *Safety and Electromagnetic Compatibility.....13*
- *Generic Site Requirements.....13*

This chapter provides safety and electromagnetic compatibility and typical site requirements.

Safety and Electromagnetic Compatibility

GR-1089-CORE Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment, Telcordia Technologies. NEBS Level 3.

GR-63-CORE NEBS Requirements: Physical Protection, Telcordia Technologies Generic Requirements, NEBS Level 3.

UL 60950-1 Information Technology Equipment - Safety - Part 1: General Requirements, Agency Listing

IEC 60950-1 Information Technology Equipment - Safety - Part 1: General Requirements

Safety Directive 2006/95/EC EN 60950-1, Information Technology Equipment - Safety - Part 1: General Requirements

CSA C22.2 No. 60950-1 Information Technology Equipment - Safety - Part 1: General Requirements for Canada

EMC Directive 2004/108/EC Compliance with EU Harmonized Standards EN 55022, I.T.E. Radio disturbance characteristics Limits and Methods of Measurement. Compliance with EN 55024, I.T.E. Immunity characteristics Limits and Methods of Measurement

Generic Site Requirements

The following specifications are standard telephony industry requirements for equipment installation.

Building Requirements

The building requirements for this system are standard telephony industry requirements for equipment installation.

The building must provide a clear, uncluttered route between the loading/receiving dock and the planned system location. In order to move the equipment to the proper location, recommended hall clearance is at least 4.5 feet (1.4 meters) wide by 8.5 feet (2.6 meters) tall.

Four foot, (1.2 meter) side aisles should be used to allow maneuvering frames into place and provide ample work space around the equipment.

The room selected for system installation should be large enough so the system frames can be at least 2.5 feet (76 cm) from the walls for front and rear access and at least 12 inches (31 cm) for side access.

Earthquake Resistance

All Tekelec system configurations are designed to assure that the system remains operational during and after an earthquake, even when the system is located on the upper floors of a zone 4 central office.

Elevation

Operating: 60 m below sea level at ambient temperature of 30° C to +4000 m above sea level at ambient temperature of 40° C.

Fire Protection

Local fire protection codes must be satisfied in the equipment room where the system is to be located.

Floor Loading

It is recommended the floor or raised sub-flooring have a distributed load capacity of no less than 100 pounds per square foot (453 kg/m²). The floor loading is determined by using the following equation:
Total equipment weight/floor area = distributed floor capacity.

HVAC Requirements

To maintain the required temperature range, Heating, Ventilation, and Air Conditioning (HVAC) equipment should have the capacity to compensate for the site engineering recommendations.

The required HVAC capacity to compensate for a miscellaneous frame varies depending on the customer previously installed equipment. To calculate needed HVAC capacity, determine the wattage of the installed equipment and use the following formula: watts x 3.413 = BTUs/hr.

Lighting

Adequate lighting should be provided in the room where the equipment is to be located. Lighting fixtures must be far enough from the equipment and cables to prevent heat damage and to allow safe access to equipment and cables.

Relative Humidity

- Operating: 5% to 85% non-condensing (maximum absolute humidity of 0.024 kg of water per kg of dry air)
- Short Term Operating: 5% to 90% non-condensing (maximum absolute humidity of 0.024 kg of water per kg of dry air)

Space Requirements

This system equipment is housed in 7 foot high (44U), 24 inch wide, floor supported, upright frame with top and side panels as well as door.

The number of frames required for an installation is described in the Initial Sales Order for that site. The number of frames is determined by the space required by the module population of the system.

When planning the installation, be sure to take into account spare module storage, modems, terminals, printers, cross connect panels, and all other items that might require space in a system.

Temperature Variation

Typical environmental conditions are temperature and humidity controlled. With loss of environmental control, the equipment covered in this manual complies with these conditions:

- Operating: 5° C to 40° C (41° F to 104° F)
- Exceptional Operating Limit: -5° C to 50° C (23° F to 122° F) (no more than 96 hours duration at extremes and at elevations less than 1800m)

- Storage: Tested to meet the storage and transportation requirements in Telcordia GR-63-CORE, ETSI EN 300 019-2-2, T2.3-

Chapter 3

Systems Overview

Topics:

- *Tekelec 1200 Integrated Application Platform ..17*
- *T1200 Application Cabinet.....19*
- *Power Distribution Panel (PDP).....21*
- *Modem Router.....21*
- *Application Switch.....22*
- *Content Switch.....22*
- *Ethernet Switch.....22*
- *Tekelec 1200 Application Server.....23*

This chapter describes the T1200 platform, the physical deviation of the T1200 frame into zones, and the purpose of each T1200 platform hardware component.

Tekelec 1200 Integrated Application Platform

Overview

The T1200 platform is a complete solution consisting of hardware, operating system, and middleware as applicable depending on the application running on the T1200 application server. The T1200 platform has a modular hardware architecture and allows hardware co-mingling to consolidate product configurations of multiple product families to one common cabinet. Tekelec platform software provides alarm management and configuration of each hardware component.

The T1200 platform uses an application cabinet with these components:

- Power Distribution Panel (PDP)
- Modem Router
- Application Switch
- Content Switch
- Ethernet Switch
- Tekelec 1200 Application Server (T1200 AS)

T1200 platform software components may include:

- TPD (Tekelec Platform Distribution) operating system.

TPD is a standard Linux-based operating system packaged and distributed by Tekelec. TPD provides value-added features for managing installations and upgrades, diagnostics, integration of 3rd party software (open and closed source), build tools, and server management tools.

- AppWorks

AppWorks is Tekelec's management framework for managing next generation distributed networks. AppWorks comprises of a distributed architecture with OAMP-NE, System OAM and Message Processors (MPs) (signaling elements). It encompasses a graphical user interface (GUI), database, OAM framework, and COMCOL modules.

Hardware co-mingling allows multiple applications that are hosted on separate server clusters to reside in a common cabinet. Each application is hosted on its own set of servers, just as if it would be placed in separate cabinets. Currently, there is no management element spanning the applications.

A future implementation will add application co-mingling, which will allow multiple applications to be hosted on a single set of servers and have a common management element spanning the applications. For example, a TekCore T5100 shelf, and the associated network OAM&P (NO) server pair could be deployed within a single cabinet.

Consolidating product configurations to a common frame design allows Tekelec to provide solutions that span multiple product families deployed in a most efficient manner.

About Zones

The T1200 application cabinet supports hardware co-mingling by dividing the cabinet space into zones.

- The Power Zone (7U) supports power distribution panels (PDPs)
- The Network Zone (10U) supports Ethernet switches and front-to-rear cable plenum when T5100 application shelves are included.

- Application Zone 1 (6U) supports an application hosted on up to 6 T1200 application servers.
- Application Zone 2 (6U) supports an independent application hosted on up to 6 T1200 application servers, or expansion of a Zone 1 application to a total of 12 T1200 application servers.
- Application Zone 3 (12U) supports an independent application hosted on T5100, up to 6 T1200s, an expansion of a Zone 2 application to a total of 12 T1200 application servers, or an expansion of a Zone 1 application to a total of 18 T1200 application servers.

Note: Applications can span multiple physical zones. An application starting physical zone 1 may also occupy physical zone 2 and possibly zone 3, depending on the number of servers the application requires.

Figure 1: Zones of the T1200 DC Application Cabinet

U	Zone (Co-mingled frame)	Components that can be loaded in each zone
1	Power (7U)	1 PDP(1+1 Aca breaker)
2		2
3		3
4		4 IU Filter Panel
5		5 PDP(1+1 Aca breaker)
6		6
7		7
8	Network (10U)	1 Cable Management
9		2 Application Switch
10		3 Corenet Switch
11		4 Ethernet Switch
12		5
13		6
14		7
15		8
16		9
17		10
18	Zone 1 (6U)	1
19		2
20		3 T1200 AS
21		4
22		5
23		6
24	Zone 2 (6U)	1
25		2
26		3 T1200 AS
27		4
28		5
29		6
30	Zone 3 (12U)	1
31		2
32		3 T1200 AS
33		4
34		5
35		6 T5100 Shelf (13U)
36		7
37		8
38		9
39		10
40		11
41		12
42	Raised floor cable entry (1U)	1 Modern (optional)
43		2 Modern (optional)
44		3 Cable Management

All equipment in the network and application zones are loaded and numbered from top to bottom.

Each of the top two T1200 application servers in each application zone configures one of the two Ethernet switches associated with that application without manual command input.

The three application zones allow for product simplification to the greatest extent possible. No equipment has to be moved to support a field extension of a second application into the application cabinet. Each application is independent of both the interaction of servers and the networking design.

Figure 2: T1200 DC Frame: Component Organization

- Modem Router
- Application Switch
- Content Switch
- Ethernet Switch
- Tekelec 1200 Application Server (T1200 AS)

Figure 3: Tekelec T1200 Application Cabinet shows a T1200 application cabinet with components.

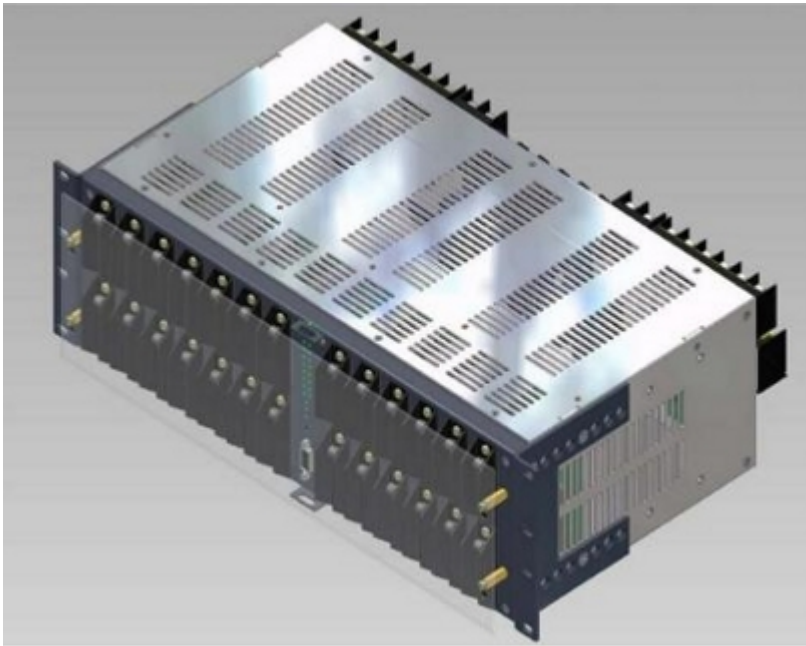
Figure 3: Tekelec T1200 Application Cabinet



Power Distribution Panel (PDP)

The Power Distribution Panel (PDP) monitors primary and secondary power sources on a continuous basis. The PDP of the T1200 platform is a pluggable circuit breaker panel that distributes DC power to load-side equipment. The panel accommodates up to 26 IMG-style pluggable breakers, which can be installed or removed in the field as required. Alarm circuitry is provided to indicate and extend alarm conditions when faults occur.

Figure 4: Power Distribution Panel (rear)



Modem Router

The Modem Router offers secure, wire-speed delivery of concurrent data, voice, and video services. The modular design of the router provides maximum flexibility for evolving needs. The router incorporates data, security, and voice services in a single system for fast, scalable delivery of crucial business applications.

Figure 5: Modem Router



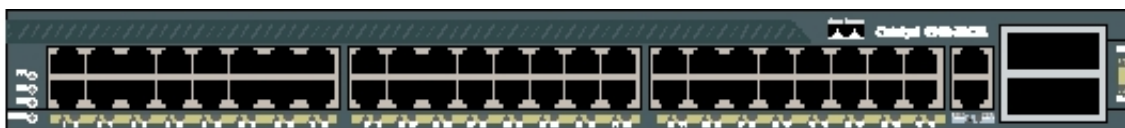
Application Switch

The Application Switch is a wire-speed, low-latency, Layer 2 to 4, 1-rack-unit (1U), fixed-configuration switch for rack-optimized server switching. It has exceptional performance and reliability for low-density, multilayer aggregation of high-performance servers and workstations.

High performance and scalability of intelligent network services is made possible with dedicated specialized resources known as ternary content addressable memory (TCAM). Ample TCAM resources (64,000 entries) enable high feature capacity, providing wire-speed routing and switching performance with concurrent provisioning of services such as quality of service (QoS) and security and helping ensure scalability for today's network requirements with ample room for future growth.

The Application Switch has 48 ports of wire-speed 10/100/1000BASE-T with four alternative wired 1 ports that can accommodate optional 1000BASE-X Small Form-Factor Pluggable (SFP) optics.

Figure 6: Application Switch (front view)

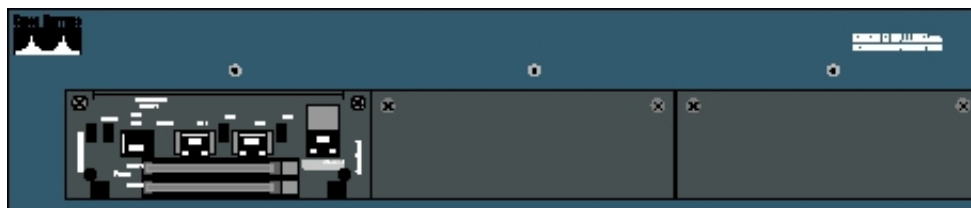


Content Switch

The Content Switch improves application and site availability and transaction integrity by using Adaptive Session Redundancy (ASR), an industry standard in stateful failover.

The Content Switch delivers flexibility for customizing combinations of ports, performance, and services. The switch scales secured application transaction performance through support of an integrated, high-capacity Secure Sockets Layer (SSL) module. Off-loading SSL onto the network improves the overall performance of the web and application server enabling better application performance.

Figure 7: Content Switch (front view)



Ethernet Switch

The Ethernet Switch is a compact high-performance switch made for demanding networks that require multi-layer service capabilities at wire speed. A high-density architecture enables the Ethernet switch

to utilize a large variety of interfaces to transparently switch Layer 2, 3, and 4 network traffic over copper, at 10, 100 or 1000 Mbps speeds and over fiber at 1000 Mbps speed. Figure 3-8 shows the front view of the switch.

Figure 8: Ethernet Switch (front view)



Tekelec 1200 Application Server

The T1200 application server is an off-the-shelf 1U server to host Tekelec central office applications at a significant performance improvement.

The T1200 application server has high availability. Advanced server management and alarming ensures maximum uptime. Redundant hot-swap power and cooling reduce Mean-Time-To-Repair (MTTR) and increase Mean-Time-Between-Failures (MTBF).

Figure 9: Tekelec 1200 Application Server (rear view) - DC



Hardware Description

Topics:

- *Overview.....25*
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- *Tekelec 1200 Application Server.....40*

This chapter provides detailed descriptions of the T1200 platform hardware components.

Overview

This chapter provides detailed descriptions of T1200 platform components. This chapter is designed to aid personnel in configuration, planning, and replacing components in the systems.

Tekelec 1200 Application Cabinet

Description

Each Tekelec 1200 (T1200) cabinet consists of a standard 23-inch wide, 44U high cabinet with top and side panels as well as door. The rails are set for standard 19" rack mount equipment. The cabinet provides adequate air flow as well as front and rear access for cabling and FRU replacement. The T1200 application cabinet can be configured for AC or DC applications. This manual describes the DC applications.

The T1200 frame is earthquake zone 4 compliant. It is heavy duty and fully welded. The steel frame has seismic reinforced corners and adjustable, heavy duty rack-mount angles. The seismic base uses a Telcordia-compliant floor bolt down pattern.

The T1200 cabinet contains these components:

- Power Distribution Panel (PDP)
- Modem Router
- Application Switch
- Content Switch
- Ethernet Switch
- Tekelec 1200 Application Server (T1200 AS)

Figure 10: Tekelec T1200 Application Cabinet



Cabinet-level Support

The T1200 application cabinet supports power, networking, applications, and cabling.

Power Zone

The power zone supports one or two power distribution panels with the correct breaker configuration. The PDP is located in the power zone.

All servers within a given zone are powered from a common PDP. A second PDP is required anytime 14 or more pieces of T1200 platform co-mingled hardware items are specified. A 1U filler panel is required (reserved) above second 3U PDP for thermal management.

Networking Zone

The networking zone supports Ethernet switches, content switches, and application switches.

Each T1200-based application requires two 24-port Ethernet switches. Each switch provides full layer-2 or 3 Gigabit Ethernet connectivity to each T1200 application server and full layer-3 connectivity over the uplinks.

Note: Applications utilizing higher density server configurations will require additional switches.

Content switches operate in a redundant manner. The Content Switch improves application and site availability and transaction integrity by using Adaptive Session Redundancy (ASR), an industry standard in stateful failover.

Note: The Content Switch is used only by the Tekelec Mobile Messaging application.

Application Zones

The application zones support 48-port application switches operating in a redundant manner. Each switch provides full layer-2 or 3 Gigabit Ethernet connectivity to each T1200 application server and to the uplinks.

If a T5100 shelf is included, the networking zone needs to also include the requisite console server and cable plenum.

The application zones support a maximum of 18 T1200 application servers per cabinet. As a co-mingled cabinet, it supports a maximum of one T5100 application shelf in Zone 3.

Each of the top two T1200 application servers in each application configures one of the two Ethernet switches associated with that application without manual command input.

All traffic passing through the Ethernet switches between the customer network and the T1200 application servers are routed at layer 3 to isolate the internal LAN within the application cabinet from the customer LAN.

Cabling

The application cabinet provides cable management for the densest supported configuration and accommodates cabling in overhead trays and under raised floors. The application cabinet provides separate cable management and identification per application zone.

Remote Access

The Application Cabinet supports redundant remote access to each T1200 application server that maintains independence for each application. Redundant access means that no single point of failure can prevent remote access to any given server. Independence for each application requires that access to a T1200 application server within a given application zone will not require any involvement of components (T1200 application servers or switches) associated with a different application. The remote access solution consists of a co-mingled T1200 and a pair of modem routers.

Serviceability

Service Network Support for VPN

The application cabinet provides service network support for VPN using ports on the Ethernet switch pair associated with each application. For this support, the cabinet contains:

- An Ethernet connection to the RMM port on each T1200 AS

- A single, non-redundant connection from the topmost Ethernet switch in the cabinet to the customer VPN network.
- Logical VLAN isolation of the service network from the signaling and management traffic.

Service Network Support for Remote Management

The application cabinet supports access to the following features over the Service Network.

1. Remote console access
2. Ability to reconfigure the BIOS
3. Ability to reboot the T1200
4. Ability to power cycle the T1200

Modem Access Support

An optional redundant modem solution provides utilizing a device with a V.90 modem, connected to the VPN network connection via an Ethernet connection of up to 100 Mbits/sec, and supporting RMM functionality.

T1200 Frame Specifications

Table 1: T1200 Frame Specifications summarizes the technical specifications for the T1200 frame and maximum cabinet dimensions.

Table 1: T1200 Frame Specifications

General Attributes	
Prepared for GND earthline connections	Welded construction
Standards	
External dimensions to DIN 41 488 and based on DIN 41 494 part 7, protection IP 55 to DIN 40 050	
Usable Height and Weight	
Height	77 inches (1,955 mm) or 44U
Width	19-inch (482.6 mm)
Overall Cabinet	
Height	84 inches (2,133.6 mm)
Width	23.6 inches (600 mm)
Depth	23.6 inches (600 mm)

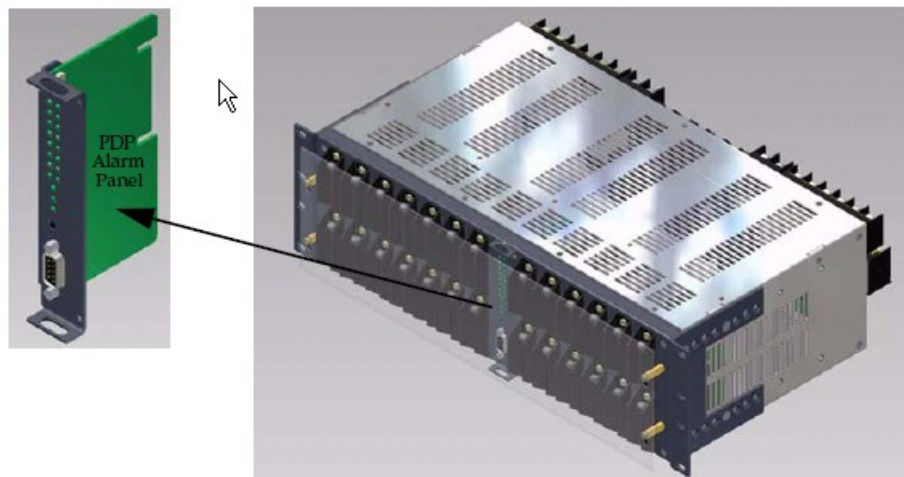
Weight	385 pounds (174.63 kg) empty
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Power Distribution Panel

PDP Overview

The Power Distribution Panel (PDP) monitors primary and secondary power sources on a continuous basis. The PDP of the T1200 platform is a pluggable circuit breaker panel that distributes DC power to load-side equipment. The panel accommodates up to 26 IMG-style pluggable breakers, which can be installed or removed in the field as required. Alarm circuitry is provided to indicate and extend alarm conditions when faults occur.

Figure 11: Power Distribution Panel (PDP)



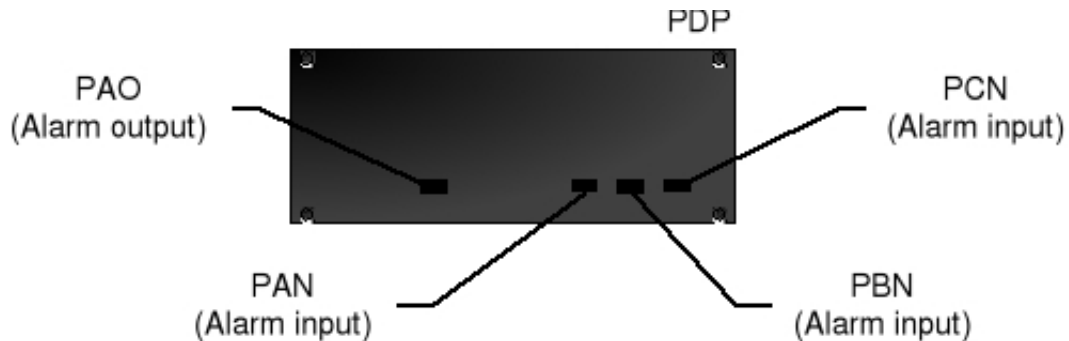
PDP Features

The PDP has the following features:

- Aluminum chassis, brushed and clear anodized with a painted front panel. Breaker guards are brushed and black anodized to maximize heat transfer from the breaker to the surrounding air.
- Panel mounts in a 19-inch (482.6 mm) or 23-inch (584.2 mm) rack and is 5.25 inches (133.35 mm) high.
- Accepts up to 26 pluggable IMG-style breakers; 13 breakers for the A side and 13 breakers for the B side for redundancy.
- Two-hole lugs for inputs and high-current Molex® connectors for outputs.
- Capable of continuous input current of 44 amps on 12 individual input power feeds, plus 22 amps on 2 auxiliary input power feeds.
- Input wiring for the panel is connected to high current stud input blocks on the rear of the panel. Inputs are made via 2-hole compression lugs that accept up to #2 AWG cable.
- Input power status and alarm LEDs provided on the unit's face plate. See PDP alarm panel in [Figure 11: Power Distribution Panel \(PDP\)](#).
- Alarm input and output connectors are provided on the rear of the PDP panel.

- Advanced alarm circuitry with Minor, Major and Critical alarm inputs, System Management Presence logic, and Form-C changeover contacts for Minor, Major, Critical, Breaker, and Power Alarms.

Figure 12: PDP Alarm Connectors (rear)



PDP Specifications

[Table 2: Power Distribution Panel Specifications](#) summarizes the technical specifications for the Power Distribution Panel.

Table 2: Power Distribution Panel Specifications

Voltage	-40 to -57 VDC
Bus Configuration	13 breakers/bus, 2 bus
Current Breaker	30 Amps Maximum
Current Bus	286 Amps/bus (x2)
Output Panel	26 IMG Breakers
Input Connectors	Two 1/4 inch studs on 5/8 inch centers with locknuts Maximum Torque: 36 in-lbs
Output Connectors	Molex® Minifit-Sr Plugs on panel
Alarm Connectors	DB9 Female Inputs (x3) DB15 Female Output (x1)
Alarm Relay Current	500 mA max

Dimensions	5.25 inches H, 19 inches W, 12 inches D
Rack Mounting	19-inch (482.6 mm) or 23-inch (584.2 mm) wide rack 2 inches/1.75 inches hole spacing Flush, 0.5 inches recessed, 1.0 inches (25.4 mm) recessed and 1.5 inches (38.1 mm) recessed offsets
Weight	Approx. 25 pounds (11.34 kg)
Material	Aluminum
Color	Grey (Front), Clear Anodized

Modem Router

The Modem Router offers secure, wire-speed delivery of concurrent data, voice, and video services. The modular design of the router provides maximum flexibility for evolving needs. The router incorporates data, security, and voice services in a single system for fast, scalable delivery of crucial business applications. The router offers features such as hardware-based VPN encryption acceleration, intrusion-protection and firewall functions. The router offers a wide variety of network modules and interfaces, voice digital signal processor (DSP) slots, high-density interfaces for a wide range of connectivity requirements, and sufficient performance and slot density for future network expansion and advanced applications.

Figure 13: Modem Router (front view - as mounted?)

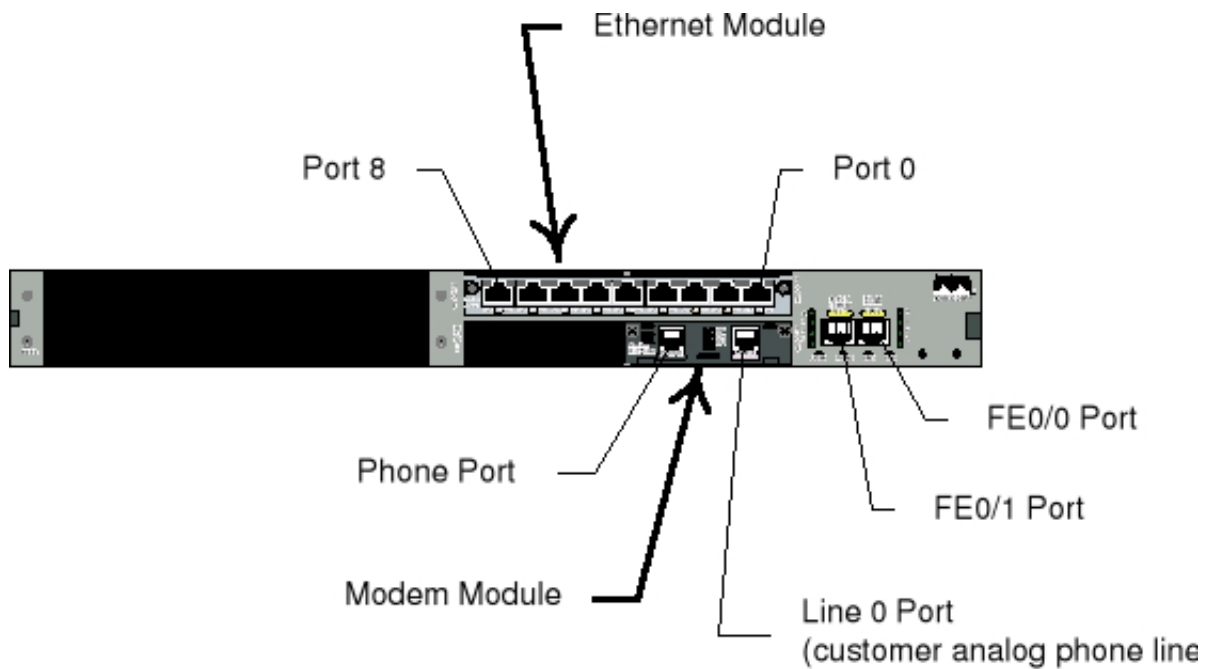
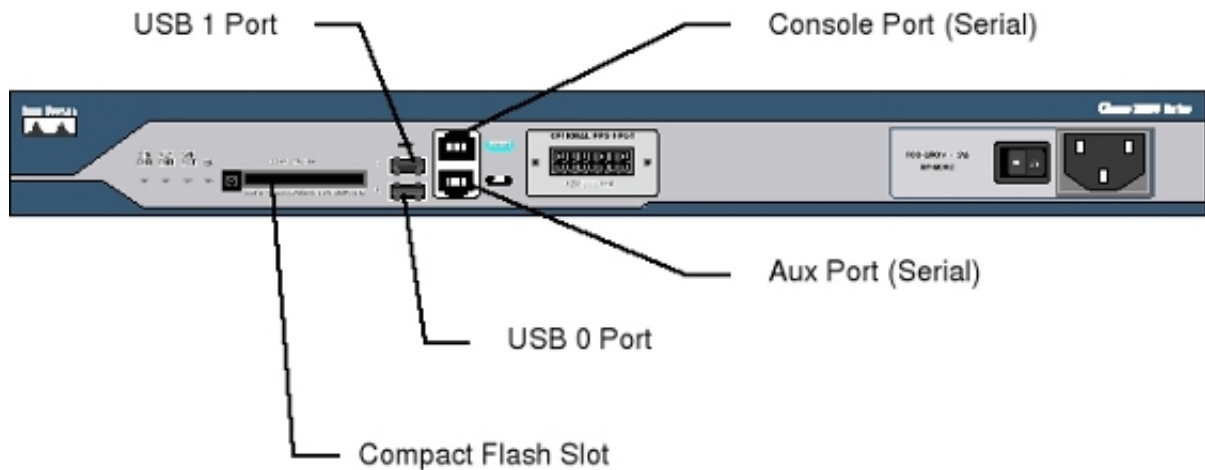


Figure 14: Modem Router (rear view - as mounted?)



Modem Router features include:

- Two built-In interfaces 100BASE-T Fast Ethernet (FE) Ports (RJ-45)
- Two Universal Serial Bus Ports
- One Console Port (RJ-45)
- One Auxiliary Port (RJ-45)
- Interchangeable Modules:
 - One Network Module (NM) or one Network Module Enhanced (NME)
 - High Speed Wan Interface Cards: 4 single wide or 2 double side
 - Two Advanced Integration Modules (AIM)
 - Two Packet Voice Data Modules (PVDM)

- Maximum memory—768 MB2
- Three fans that operate at a slower speed to conserve power and reduce fan noise at ambient temperatures below 32° C. They operate at high speed in ambient temperatures above 32° C.
- An internal real-time clock with battery backup provides the system software with time of day on system power up.

For additional Modem Router specifications, refer to [Table 3: Modem Router Specifications](#).

Table 3: Modem Router Specifications

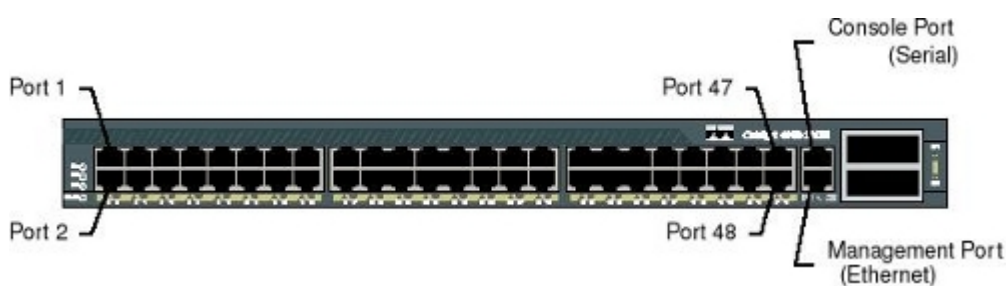
DRAM	Default 256 MB Max 768 MB
Compact Flash	Default 64 MB Max 256 MB
Fixed USB 1.1 Ports	2
Interface Card Slots	4 slots. Each slot can support HWIC, WIC, VIC or VWIC type modules
Network Module Slot	1 slot supports NM and NME type modules
Integrated Hardware-Based Encryption	Yes
Console Port (up to 115.2 Kbps)	1
Auxiliary Port (up to 115.2 Kbps)	1
Rack Mounting	Yes, 19 and 22 inch options
RPS	External Only- connector for RPS provided by default
Recommended RPS Unit	Cisco RPS-2300 Redundant Power System
Dimensions	1.75 x 17.25 x 16.4 in. 44.5 x 438.2 x 416.6 mm
Rack Height	1U

Application Switch

The Application Switch is a wire-speed, low-latency, Layer 2 to 4, 1-rack-unit (1U), fixed-configuration switch for rack-optimized server switching. It has exceptional performance and reliability for low-density, multilayer aggregation of high-performance servers and workstations. High performance and scalability of intelligent network services is made possible with dedicated specialized resources known as ternary content addressable memory (TCAM). Ample TCAM resources (64,000 entries) enable high feature capacity, providing wire-speed routing and switching performance with concurrent provisioning of services such as quality of service (QoS) and security and helping ensure scalability for today's network requirements with ample room for future growth.

The Application Switch has 48 ports of wire-speed 10/100/1000BASE-T with four alternative wired 1 ports that can accommodate optional 1000BASE-X Small Form-Factor Pluggable (SFP) optics.

Figure 15: Application Switch (front view)



Application Switch features include:

- Wire-Speed performance for 10/100/1000 connectivity with low latency for data-intensive applications using a 96-Gbps switching fabric with a forwarding rate of 72 million packets per second (mpps) in hardware for Layer 2 to 4 traffic.
- Power supply redundancy for nonstop operation. Reliability for critical applications is provided with 1+1 redundant hot-swappable internal AC or DC power supplies. The 1+1 power supply design provides A-to-B failover when power supplies are connected to different circuits. AC and DC power supplies can be mixed in the same unit for maximum deployment flexibility.
- Hot-swappable fan tray with four redundant fans for additional serviceability and availability.
- Comprehensive management through a single, dedicated 10/100 console port and a single, dedicated 10/100 management port for offline disaster recovery.
- Remote in-band management via the Simple Network Management Protocol (SNMP), Telnet client, Bootstrap Protocol (BOOTP), and Trivial File Transfer Protocol (TFTP). Support for local or remote out-of-band management is delivered through a terminal or modem attached to the console interface. The management port enables the switch to reload a new image from a TFTP server within seconds.
- Application networks using the application switch can be provisioned rapidly through the automated requirements-based deployment model.

For additional application switch specifications, refer to [Table 4: Application Switch Specifications](#).

Table 4: Application Switch Specifications

Switching Capacity	96 Gbps
--------------------	---------

Throughput	72 mpps
IPv6 Support	In Software
Height	1U
Max 10/100/1000 ports	48
Max 10 Gigabit Ethernet ports	0
Max Gigabit Ethernet ports	4
Uplink Optic Type	4 small form-factor pluggable (SFP) optics
Shared Buffer	16MB
CPU	266 MHz
SDRAM	256 MB
Active VLANs	2048
Multicast Entries	28,000 (Layer 3) 16,000 (Layer 2)
Per-VLAN Spanning Tree (PVST) and VLAN IDs	4096
Spanning Tree Protocol Instances	1500
Switched Virtual Interfaces (SVIs)	2000
Security and QoS Hardware Entries	32,000
MAC Addresses	32,000
Switched Port Analyzer (SPAN)	2 ingress 4 egress
Power Supply Spec	300W DC
Input Current	8A@ -48 to -60V
Output Current	25A@ 12 VDC

Weight	2.0 kg
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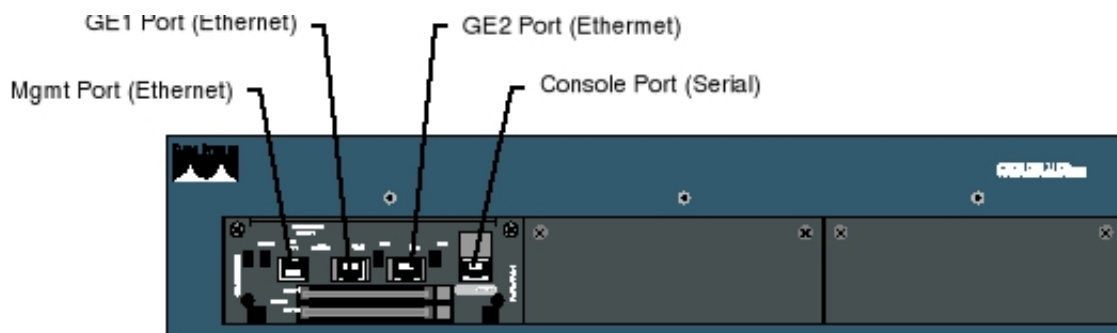
Content Switch

The content switch improves application and site availability and transaction integrity by using Adaptive Session Redundancy (ASR), an industry standard in stateful failover.

The content switch delivers flexibility for customizing combinations of ports, performance, and services. The switch scales secured application transaction performance through support of an integrated, high-capacity Secure Sockets Layer (SSL) module. Off-loading SSL onto the network improves the overall performance of the web and application server enabling better application performance.

It also provides an integrated high-capacity web application (Hypertext Transfer Protocol, HTTP) compression module. Web application (HTTP) compression improves application response time by 20 to 50%, off-load the compression from the server, which reduces server workload, and decreases the traffic traversing wide area networks (WANs), which reduces bandwidth requirements and improves overall application response times; improving productivity.

Figure 16: Content Switch (front view)



Content Switch features include:

- One SCM slot
- 2 rack units
- Two slots for additional modules
- Integrated switch fabric module
- Full URL parsing
- HTTP (1.0, 1.1)
- Sticky cookie insertion
- All TCP services, UDP, and SSL
- HTTP Compression GZIP and deflate file formats
- Content policy ACLs on all HTTP headers
- VLAN 802.1Q
- Management: SSH Protocol, SNMP, SSL browser-based interface, embedded GUI
- Integrated global load balancing with HTTP and DNS-based redirection
- Routing Information Protocol (RIP) versions 1 and 2, Open Shortest Path First (OSPF)

- Server/node operating system compatibility: Any TCP/IP OS, including Windows XP, Windows 2000, Windows NT, Windows 98, Windows 95, all UNIX platforms, Linux, and Mac OS
- Fixed configuration with 8 10/100 Ethernet and 1 GE (GBIC) port
- Aggregate switch throughput: 6 Gbps

Table 5: Content Switch Specifications summarizes the technical specifications for the Content Switch.

Table 5: Content Switch Specifications

Module Slots	3
Base Configuration	Switch control module with 2 GE (GBIC) ports
Max GE Ports	6
Max 10/100 Ethernet Ports	32
SSL Termination	Yes
2-Port GE I/O module	Max of 2
16-port 10/100 Ethernet I/O	Max of 2
8-Port 10/100 Ethernet I/O	Max of 2
SSL and Compression Modules	Max of 2
Session Accelerator Modules	Max of 2
Redundancy Features	Active-active Layer 5 ASR VIP redundancy
Bandwidth Aggregate	20 Gbps
Storage Options	1GB-MB flash memory disk
Power	Integrated DC
SCM Slot	1
Rack Units	2
Slots for additional modules	2
Switch Fabric Module	Integrated

Aggregate switch throughput	20 Gbps
Height	3.5 in (8.9mm) (2U)
Width	17.0 in (43.2mm)
Depth	12.5 in (31.8 mm)

Ethernet Switch

The Ethernet switch is a compact high performance switch made for demanding networks that require multi-layer service capabilities at wire speed. A high-density architecture enables the Ethernet switch to utilize a large variety of interfaces to transparently switch Layer 2, 3 and 4 network traffic over copper, at 10, 100 or 1000 Mbps speeds and over fiber at 1000 Mbps speed. [Figure 17: Ethernet Switch \(front view\)](#) shows the front view of the switch.

Figure 17: Ethernet Switch (front view)



Ethernet Switch features include:

- Wire speed Layer 2 switching and Layer 3 routing
- Link aggregation (801.3ad)
- IEEE 802.1q VLAN
- IEEE 802.1d Spanning Tree Algorithm
- IEEE 802.3x Flow Control and Backpressure
- Bandwidth reservation
- Differentiated Services
- IEEE 802.1p based Quality of Service with 8 priority queues
- MAC resolution
- CRC checks
- TTL updates
- Front panel LED indicators
- RMON MIB support (4 groups) provides extensive analysis performance
- Monitoring and diagnostic capabilities via Port Mirroring

[Table 6: Ethernet Switch](#) summarizes the technical specifications for the Ethernet Switch.

Table 6: Ethernet Switch

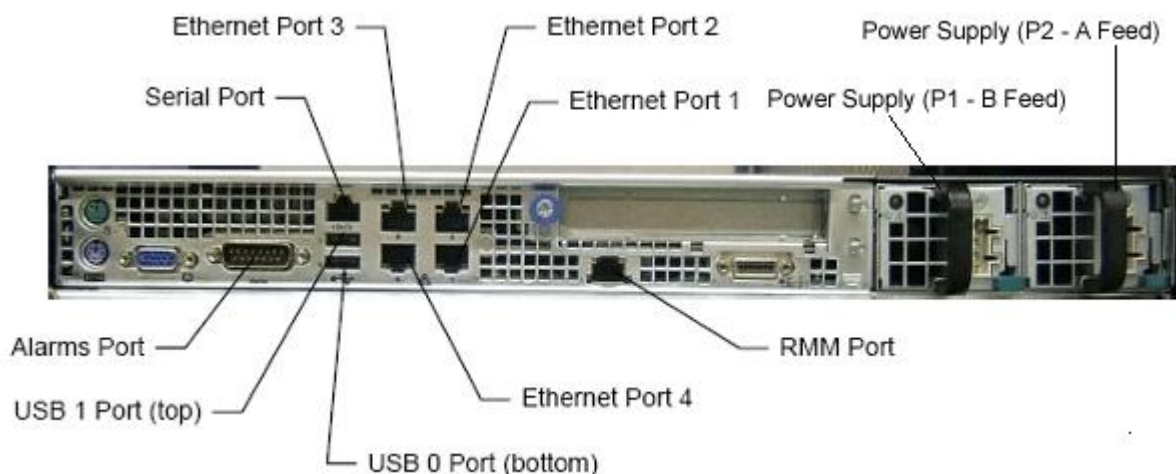
Ports	20 10/100/1000BaseT/Tx ports 4 Dual (1/100/1000BaseT and SFP) autosense ports
Power Supply	Dual-feed -48VDC Power Supply BiNOS-Multi-Layer SW enabled
Physical Dimensions	
19" x 1U' Rack Mountable	
Width	442mm (17.4 in)
Height	43.9 mm (1.73 in)
Depth	304 mm (12.0 in)
Weight	4.6 kg (10.2 lbs)
Shipping Weight	5.5kg (12.2lbs)
Physical/Environmental	
Environment	Indoor application only
Management Features	
Inband	Integrated SNMP agent JAVA Applet, TelNet and SSH
MIBs	MIB II Bridge MIB Private MIB RMON MIB (groups 1,2,3,9)
Console Port	For initial configuration via dedicated RJ-45 connector EIA 232 protocol VT-100 compatible

Traps / Alarms	SNMP traps to NMS
Outband Ethernet Port	For software update via dedicated RJ-45 connector
Software	Via TFTP

Tekelec 1200 Application Server

The Tekelec 1200 application server is an off-the-shelf server to host Tekelec central office applications at a significant performance improvement. The T1200 application server has high availability. Advanced server management and alarming ensures maximum uptime. Redundant hot-swap power and cooling reduce Mean-Time-To-Repair (MTTR) and increase Mean-Time-Between-Failures (MTBF)

Figure 18: Tekelec 1200 Application Server - DC - Rear View



The T1200 application server is a 1U rack-mount server containing:

- two CPU sockets populated with a quadcore processor
- 6 DIMM slots with a maximum of 24 GB
- two identical, redundant, hot-swappable power supplies
- four 1 Gigabit Ethernet ports on the base board
- Ethernet-based Remote Management Module (RMM)
- one expansion slot for PCI Express adapter.
- up to three USB ports
- either two redundant 2.5" SAS hard drives with a capacity of 146 GB or greater or two redundant 2.5" 300 GB SAS hard drives
- one optional third hard drive

Note: In the 3-hard-drive configuration, loaded with the TPD operating system and a software RAID 1 configuration, the total capacity provides 220 GB of usable disk space.

- DVD Read/Write optical drive used for loading software and backing-up application data

Figure 19: T1200 Application Server - Front Panel shows the T1200 application server front panel with alarm and status LEDs as well as power and reset buttons.

Figure 19: T1200 Application Server - Front Panel

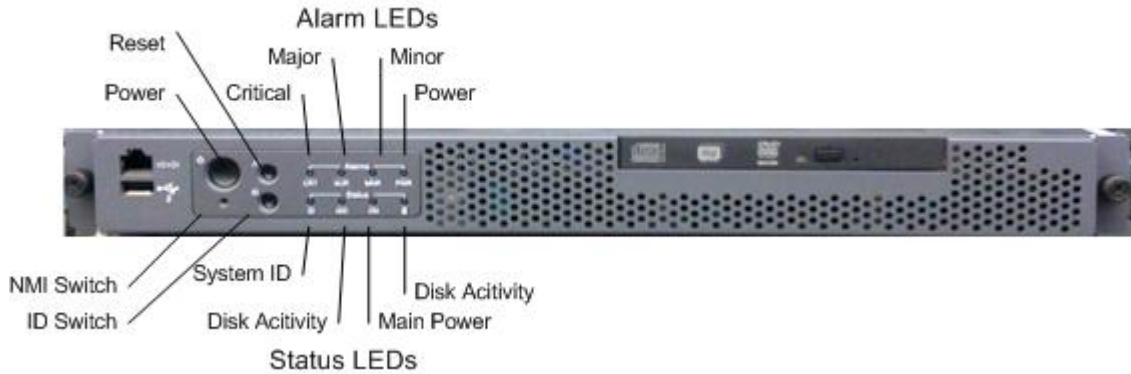


Table 7: T1200 Application Server Dimensions provides T1200 application server dimensions

Table 7: T1200 Application Server Dimensions

Height	1.70 inches (43.2mm)
Width	16.93 inches (430.0mm)
Depth	20.0 inches (508mm)
Front clearance	2.0 inches (76mm)
Side clearance	1.0 inch (25mm)
Rear clearance	3.6 inches (92mm)

Table 8: SFP I/O Processor Subsystem summarizes the I/O processor subsystem located on the SAS front panel (SFP) board of the T1200 application server.

Table 8: SFP I/O Processor Subsystem

I/O Processor SubsystemI	Intel® 80333 I/O controller device: acts as PCI Express to PCI-X bridge provides hardware RAID functionality to support RAID 5
PCI-X to PCI Express Bridge	Controller acts as PCI-X to PCI Express Bridge.

RAID Controller	Controller adds hardware RAID capabilities to the SFP board when an optional Intel® RAID Activation Key is installed.
Intel® 80333 I/O Processor	The 500 MHz core controls two 133 MHz, 64-bit PCI-X buses, a x8 PCI Express bus, a ROM bus, and a DDR2 400 MHz SDRAM bus. Provides two UARTs, I2C bus, and GPIOs.
Flash Memory	32 megabit, contains executable code for I/O controller when in hardware RAID (RAID 5) mode.
NVRAM	256 kilobits of accessible static RAM, stores controller's configuration information and disk drive RAID configuration information.
PCI-X Buses	The PCI-X bus interface is 64 bits wide and runs at 133 MHz. Only one PCI-X bus (Bus A) is used. The LSI1068 is the only device on the controller's PCI-X bus.
PCI Express Bus	The PCI Express bus interfaces the controller to the system via the SFP flex connector. The PCI Express bus is an x8 configuration.
SAS Interface	The SFP's LSI1068 internal SAS interface consists of seven, 3 Gbps links. Three of the SAS ports are routed directly to internal 2.5-inch SAS drive connectors. Four ports are routed to the system baseboard's repeater for re-formation to the baseboard external SAS connector. (The eighth SAS interface on the LSI1068 is unused on the SFP.) All supported hardware and software RAID modes are available on the SAS interface.
Flash Memory	A 16 Mbit flash memory contains the 1068's executable code. The LSI1068 boots from the flash when the Carrier Grade Server TIGW1U SFP card is operating in normal SAS mode.
I2C	The LSI1068's I2C bus allows the system's BMC to communicate with the LSI1068. This ISTW I2C bus is provided via the SFP VSC410 enclosure management controller.

LSI1068 Heart Beat LED Indicator	The HB_LED_N signal from the LSI1068 drives an LED on the SFP board that indicates SAS controller health. A blinking green LED indicates the LSI1068 IOP (I/O processor) is up and running. This LED is specifically for debug purposes and is only viewable by removing the system top cover.
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Table 9: Programmable Logic Device summarizes functions of the SFP programmable logic device, which is used for board power/reset control, board interlock control, buzzer control, Intel® RAID Smart Battery control, and various miscellaneous signals.

Table 9: Programmable Logic Device

Power On/Reset	A state machine ensures the voltage sequencing and reset logic comes up as expected.
Buzzer Control	The PLD uses the PLD clock and the AUDIOTRIG signal to generate a 2.4 kHz signal to drive the server board buzzer.
Intel® RAID Smart Battery Control	The PLD uses the PLD clock to generate the Intel® RAID Smart Battery control signals BBE and IBBU_BBSTROBE. These signals notify the Smart Battery that critical data (dirty) is in the DIMM and that the Smart Battery will have to supply VBAT_RAID if power fails.
Telco Alarm LED Control	The PLD is responsible for selecting the correct color (Red or Yellow) for the Critical and Major dual alarm LEDs
System Drive Status LED Control	The PLD monitors hard drive presence, hard drive activity, and drive fault signals driven from the VSC410. It uses all of these pins to control the OR'ed internal drive status LED that indicates drive activity and drive faults.
Hardware RAID	The SFP provides hardware supported RAID 0/1/10/5. To activate the hardware RAID feature, an optional Intel® RAID Activation Key is available. This pre-programmed serial device contains a configuration code to unlock specific features to support the LSI Logic* MegaRAID solution.

DDR-2 Support	The Carrier Grade Server TIGW1U SFP has a single 244-pin DDR-2 mini-DIMM slot that can be used to add local memory for the I/O processor.
ROMB Battery Backup	The battery backup allows the contents of the ROMB DIMM to be preserved if power drops below specifications.

Glossary

A

AC	Alternating Current Application Context Authentication Center
ACL	Application Processor Code Loader
alarm	An indicator in the <code>rept-stat-gpl</code> and <code>rtrv-gpl</code> command outputs to show that the entry in these command outputs is in an alarm condition and further action may be necessary to relieve the alarm condition.
architecture	Used to conceptually describe the function, interaction, and connectivity of hardware, software, and/or system components within a network.
AS	Application Server A logical entity serving a specific Routing Key. An example of an Application Server is a virtual switch element handling all call processing for a unique range of PSTN trunks, identified by an SS7 DPC/OPC/CIC_range. Another example is a virtual database element, handling all HLR transactions for a particular SS7 DPC/OPC/SCCP_SSN combination. The AS contains a set of one or more unique Application Server Processes, of which one or more normally is actively processing traffic. Application Simulator

	A	
		Test tool that can simulate applications and/or SMSCs.
	B	
BIOS		Basic Input-Output System
BTU		British Thermal Unit
	C	
COMCOL		Communications Core Object Library
CPU		Central Processing Unit
CRC		Cyclic Redundancy Check A number derived from, and stored or transmitted with, a block of data in order to detect corruption. By recalculating the CRC and comparing it to the value originally transmitted, the receiver can detect some types of transmission errors.
	D	
DC		Direct Current
DNS		Domain Name Services
DVD		Digital Versatile Disk
	E	
EIA		Electronic Industries Association
	F	
failover		The capability to automatically switch to a redundant or backup server, system, or network when

F

the previously active server, system, or network fails or terminates abnormally. In certain instances, however, automatic failover may not be desirable, and human intervention may be required to initiate the failover manually.

FE Feature Engineer

FRU Field Replaceable Unit

A circuit board or part that can be quickly and easily removed and replaced by the user or by a technician without having to send the entire product or system to a repair facility.

G

GUI Graphical User Interface

The term given to that set of items and facilities which provide the user with a graphic means for manipulating screen data rather than being limited to character based commands.

H

hot-swappable The ability to remove and replace components of a machine (such as a computer) without turning the machine off. Also known as hot-plugging.

I

I/O Input/Output

IP Internet Protocol

I

IP specifies the format of packets, also called datagrams, and the addressing scheme. The network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer.

L

LED

Light Emitting Diode

An electrical device that glows a particular color when a specified voltage is applied to it.

M

MAC

Media Access Control Address

The unique serial number burned into the Ethernet adapter that identifies that network card from all others.

MIB

Management Information Database

middleware

A communications layer that allows applications to interact across hardware and network environments.

MP

Measurement Platform

Message Processor

The role of the Message Processor is to provide the application messaging protocol interfaces and processing. However, these servers also have OAM&P components. All Message Processors replicate from their Signaling OAM's

M

database and generate faults to a Fault Management System.

MTBF Mean Time Between Failures

MTTR Mean Time to Repair

N

NEBS Network Equipment Building Systems

NM Network Management

The execution of the set of functions required for controlling, planning, allocating, deploying, coordinating and monitoring the resources of a telecommunications network, including performing functions such as initial network planning, frequency allocation, predetermined traffic routing to support load balancing, cryptographic key distribution authorization, configuration management, fault management, security management, performance management, and accounting management. Note: Network management does not include user-terminal equipment.

O

OAM Operations, Administration, and Maintenance

The generic load program (application) that operates the Maintenance and Administration Subsystem which controls the operation of the EAGLE 5 ISS.

O

OAM&P

Operations – Monitoring the environment, detecting and determining faults, and alerting administrators.

Administration – Typically involves collecting performance statistics, accounting data for the purpose of billing, capacity planning, using usage data, and maintaining system reliability.

Maintenance – Provides such functions as upgrades, fixes, new feature enablement, backup and restore tasks, and monitoring media health (for example, diagnostics).

Provisioning – Setting up user accounts, devices, and services.

OS

Operations Systems

P

PCI

Peripheral Component Interface

Point Code International

Protocol Control Information

Peripheral Component Interconnect

PDP

Permissive Dialing Period

Power Distribution Panel

Monitors primary and secondary power sources on a continuous basis.

Q

QoS

Quality of Service

Control mechanisms that guarantee a certain level of performance to a data flow.

R

R

RIP Routing Information Protocol

S

SAS Serial-attached SCSI
The physical connection used among Controller Enclosures and Disk Enclosures.

SCM System Configuration Manager
System Configuration Matrix.

SNMP Simple Network Management Protocol.
An industry-wide standard protocol used for network management.
The SNMP agent maintains data variables that represent aspects of the network. These variables are called managed objects and are stored in a management information base (MIB). The SNMP protocol arranges managed objects into groups.

SSH Secure Shell
A protocol for secure remote login and other network services over an insecure network. SSH encrypts and authenticates all EAGLE 5 ISS IPUI and MCP traffic, incoming and outgoing (including passwords) to effectively eliminate eavesdropping, connection hijacking, and other network-level attacks.

SSL Secure Socket Layer

Switch A device that connects multiple network segments along the data

S

link layer (layer-2 and possibly layer-3).

T

TCP Transfer Control Protocol

Tekelec Platform Distribution See TPD.

TFTP Trivial File Transfer Protocol

TPD Tekelec Platform Distribution
TPD is a standard Linux-based operating system packaged and distributed by Tekelec. TPD provides value-added features for managing installations and upgrades, diagnostics, integration of 3rd party software (open and closed source), build tools, and server management tools.

U

U Rack Unit
In its strictest sense, a rack unit (U) is a unit of measure that describes the height of a component mounted in a standard 19-inch rack. One rack unit (1U) is 44.45 mm (1.75 in) high. In this example, a "standard 44U frame" refers to the amount of vertical space occupied by this 19 inch-wide frame, which is 77.0 (1.75 inches x 44) inches high.

UDP User Datagram Protocol

URL Uniform Resource Locator

USB Universal Serial Bus

V

VLAN

Virtual Local Area Network

A logically independent network. A VLAN consists of a network of computers that function as though they were connected to the same wire when in fact they may be physically connected to different segments of a LAN. VLANs are configured through software rather than hardware. Several VLANs can co-exist on a single physical switch.

W

WAN

Wide Area Network