

INFRASTRUCTURE REQUIREMENTS

Respond to each item below:

- 1) IITS telecommunications infrastructure must meet DOC Telecommunication Distribution Standards (TDIS) <http://www.doc.wa.gov/about/business/capital-planning/resources.htm#links>. Note that Leviton SCS may be installed as an approved substitute to SystiMax Solution in the TDIS. No other substitution will be allowed. Acknowledge Vendor's acceptance of this requirement.

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

Securus acknowledges and accepts this requirement.

- 2) Incarcerant phone systems will not use the Administration Backbone or Horizontal Cabling Plant. Acknowledge Vendor's acceptance of this requirement.

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

Securus acknowledges and accepts this requirement.

Securus' phone system will not use the Administration Backbone or Horizontal Cabling Plant.

- 3) All wireless devices and access points must be 5GHz and the access points must be weather proof and also rated to be installed indoors. Describe how Vendor will meet this requirement.

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

Our currently installed WAPs support 2.4Ghz and 5ghz. The current JPay tablets at WA DOC operate on 2.4 Ghz. The new JP6 tablets operate on 2.4Ghz and 5GHz.

- 4) Vendor must conduct and provide a pre and post wireless site survey to validate coverage of the 5GHz band and must ensure complete wireless coverage of incarcerated living quarters except for those areas that are purposely restricted from coverage. Describe how Vendor will meet this requirement.

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

The current wireless network at WA DOC, which Securus recently upgraded, contains Ruckus Zoneflex R600 Wireless Access Points (WAPs). They can be set to 2.4GHz or 5GHz coverage. Currently they are set to 2.4 GHz because the current JPay tablets at WA DOC

operate on 2.4 Ghz. The new JP6 tablets operate on 5GHz. When we start providing JP6 tablets, we will conduct and provide a pre and post wireless site survey using AirMagnet Software to validate coverage of the 5GHz band and will ensure complete wireless coverage of incarcerated living quarters, except for those areas that are purposely restricted from coverage.

- 5) **All wireless access points must be protected from tampering. Describe how Vendor will meet this requirement.**

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

The Ruckus Zoneflex R600 WAPs are commercial grade and installed 25' in the air, which makes them virtually inaccessible for tampering. Typically, portable cranes are need to install and access them. Even in the extremely unlikely event an incarcerated is able to reach a WAP, the worst that would happen is the WAP might be disabled, as opposed to being usable for some illicit purpose. In the event we detect an inoperable WAP, we will dispatch a technician to repair or replace it.

- 6) **The system must be separate from the State Government Network (SGN). Acknowledge Vendor's acceptance of this requirement.**

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

Securus acknowledges and accepts this requirement.

- 7) **The wireless placement plan must first receive the approval of the facility's superintendent or designee and must honor the coverage boundaries required by the facilities. Acknowledge Vendor's acceptance of this requirement.**

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

Securus acknowledges and accepts this requirement.

- 8) **What speed of wireless service will Vendor provide and how will it be provided?**

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS 3-.

The wireless speed will be 54 Mbps.

- 9) **All construction/installation work to be carried out at a facility must first receive the approval of the Superintendent of the facility, must be properly permitted, and must be performed using industry standards. Acknowledge Vendor's acceptance of this requirement.**

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

Securus acknowledges and accepts this requirement.

- 10) **Vendor must provide redundancy for service critical hardware/infrastructure to reduce outages or downtime. Describe how Vendor will meet this requirement.**

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

Redundancy is a key component of the NextGen Secure Communications Platform™ (NextGen SCP™). While operating on a single platform, Securus' NextGen SCP runs on duplicate environments in separate data centers in Atlanta, Georgia, and Dallas, Texas. Each component has N+1 redundancy, meaning that a failure of any one component does not result in downtime because there is a backup available to resume its function. In addition to the inherent redundancy of NextGen SCP, Securus has also designed redundancy into all support systems, either through N+ 1 configuration, database clusters, virtual machines, load balancing, or other failover methods. All network transport has redundant network equipment and routing to allow traffic to reroute in the event of a failure.

The NextGen SCP platforms in Dallas and Atlanta were designed and built to the same specifications. This standardization allows re-homing of systems from their primary data center to an alternate data center in the event of a failure.

All circuits coming into Securus data centers use multiple diverse carriers, including the interconnections between data centers. In the event of a failure, traffic will reroute across a redundant circuit or path. In addition, Securus uses multiple carriers for incarcerated calls from the NextGen SCP platform. Calls to family and friends will immediately reroute upon failure of any carrier.

Securus uses multiple methods of storage to minimize the risk of data loss. All critical systems and data are backed up at regularly scheduled intervals and stored offsite for retrieval, if needed. In addition to offsite storage, Securus replicates voice clips, call recordings, and validation data between the data centers.

Securus uses industry-leading vendors for all platform and network hardware, including Dell, Cisco, Oracle, EMC, Big IP, and Intel. In addition to the redundancy designed into the platform and network, Securus also maintains a spare parts inventory onsite at each of our data centers to expedite repair of a failed component. Securus also maintains premium-

level support contracts with each vendor that define stringent service level agreements in case of a failure.

11) What will be the specifications of the infrastructure (servers, etc.)?

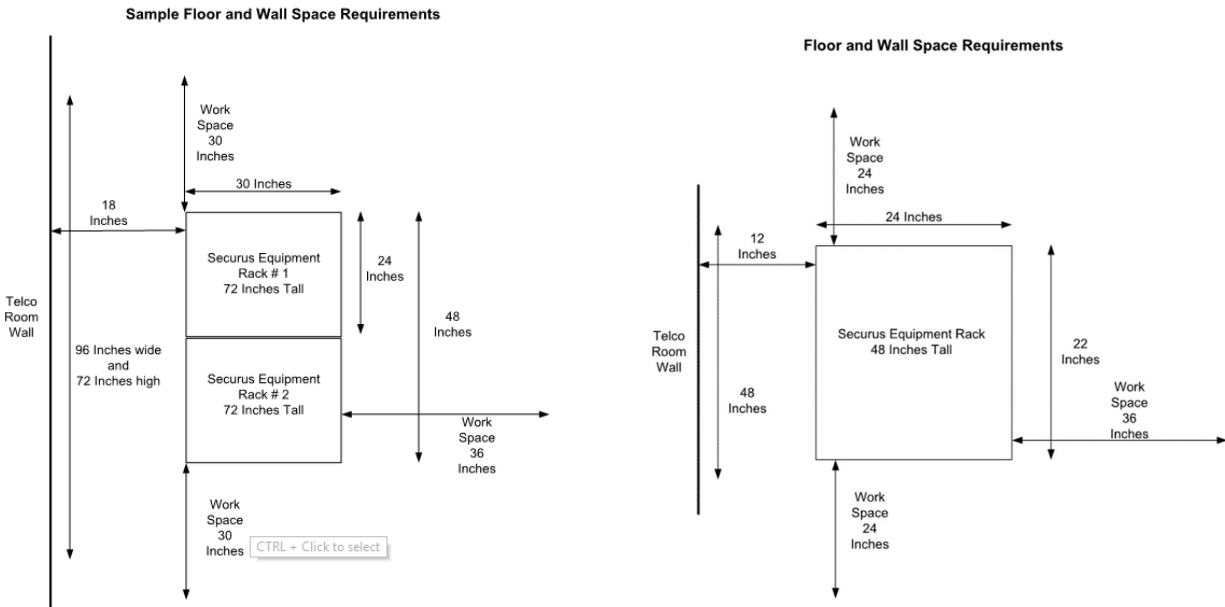
Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

The onsite hardware that will be used for our infrastructure will include the following. Please see Exhibit A – Hardware Tech Specs for full technical specifications:

Item	Make/Model
Routers	Adtran Netvanta 3140
Servers	NSD2, TCS 036-01664-001,
Switches	Adtran, Netvanta 1534 Adtran, Dual Mounting Tray Adtran, Netvanta 1534P
Wireless Access Points	Ruckus Zoneflex R600
UPS	Eaton 3S750
Surge Protectors	Panamax Tower Max 4KSU Tripp Lite, DNET1, Type RJ45 Protector, ITW Linx, CAT 6 64488 V-Line, Shelf, #SB-745S1919 SFB

Depending on the space configuration at each WA DOC facility, Securus has multiple rack options to house the components of our system.



12) What is Vendor’s plan to keep infrastructure current?

Vendor’s response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

Securus provides highly reliable service from initial system design and installation through ongoing maintenance and support. Our plan to keep infrastructure current includes integrated remote programming, diagnostics, downloading, and troubleshooting capabilities combined with the service of our account management and field service teams.

Securus continuously monitors all data centers, infrastructure components, platform systems, and incarcerant telephone systems (ITS) using the SolarWinds® suite of network performance monitors. The SolarWinds performance monitors are highly configurable to provide real-time monitoring, event notification, alert history, and statistical information. An alarm condition creates immediate visual alerts and email notifications.

Remote Programming, Diagnostics, and Troubleshooting

The Securus Network Operations Center (NOC) monitors all Securus systems and our network. The Securus Network Operations Center (NOC) provides 24x7x365 monitoring for all Securus systems, network, back-office systems, and data centers. The NOC proactively monitors these systems to ensure performance is optimal and uninterrupted. In addition to system and network-level monitoring, the NOC also monitors real-time video surveillance and environmental alerts for our data centers. Securus maintains a fully redundant backup NOC at a separate physical location, should services be disrupted at the primary location.

Our NOC is located at our headquarters in the Dallas, Texas, metro area. The NOC is staffed by Securus employees who are network experts certified in the systems and software used to monitor all system functions and equipment, as well as the associated network. The NOC can contact the Technical Support Center (TSC) if it determines that another level of technical support is needed to address an issue. The NOC maintains failure reports, service history, and other diagnostic information, which are available to the DOC when requested.

SolarWinds® Typical Monitored Application Elements

The screenshot displays three main sections of the SolarWinds monitoring interface:

- Application Details:** Shows management options (Edit Application Monitor, Unmanage, Poll Now) and real-time monitoring tools (Real-Time Process Explorer, Service Control Manager, Real-Time Event Log Viewer). It lists the application name as "Windows Server 2003-2008 (RPC) on ..." and shows both application and server status as "Up". A table lists various components and their statuses.
- Application Availability:** A bar chart titled "Windows Server 2003-2008 (RPC)" for Dec 5 2017, 12:00 am - Dec 5 2017, 5:00 pm. The chart shows 100% availability (green bars) throughout the period. A legend indicates status levels: Other (blue), Up (green), Unknown (grey), Warning (yellow), and Critical (red).
- Processes and Services:** A table showing resource usage for several services.

COMPONENT NAME	COMPONENT TYPE	COMPONENT STATUS
Distributed Transaction Coordinator	Windows Service Monitor	Up
Network Connections	Windows Service Monitor	Up
Number of Processes	WMI Monitor	Up
DHCP Service Monitor	Windows Service Monitor	Up
Total Available Memory (MBytes)	Performance Counter Monitor	Up
Page File Usage	Performance Counter Monitor	Up
Disk Queue Length	Performance Counter Monitor	Up
Number of Threads	Performance Counter Monitor	Up
File read bytes per second	Performance Counter Monitor	Up
File write bytes per second	Performance Counter Monitor	Up
Remote Registry Service	Windows Service Monitor	Up

COMPONENT NAME	PROCESS NAME (ID)	CPU LOAD	MEMORY USED			IOPS
			PHYSICAL	VIRTUAL		
DHCP Service Monitor	DHCP (792)	0	0.25	0.11		19.89 / Sec
Distributed Transaction Coordinator	MSDTC (17380)	0	0.08	0.01		0.00 / Sec
Network Connections	Netman (1196)	0	0.12	0.02		0.00 / Sec

Premise Equipment and Polling

The Securus Technical Support team provides 24x7x365 monitoring of all facility-based equipment and directly supports facility installations via telephone and email. Technical Support monitors connectivity for all installations and all installed equipment including Integrated Access Devices (IADs), Visitation Phone Monitoring (VPM) units, switches, and Uninterrupted Power Supply (UPS) systems. The systems are polled every two minutes to ensure proper operation, and their vital operating statistics sent every 10 minutes. Upon receiving an alert indicating network failure, Securus will open a trouble ticket with the appropriate circuit provider. In the case of a premise-based equipment failure, a Securus Field Technician is dispatched to the facility for on-site repair.

SolarWinds® Facility Monitoring Example



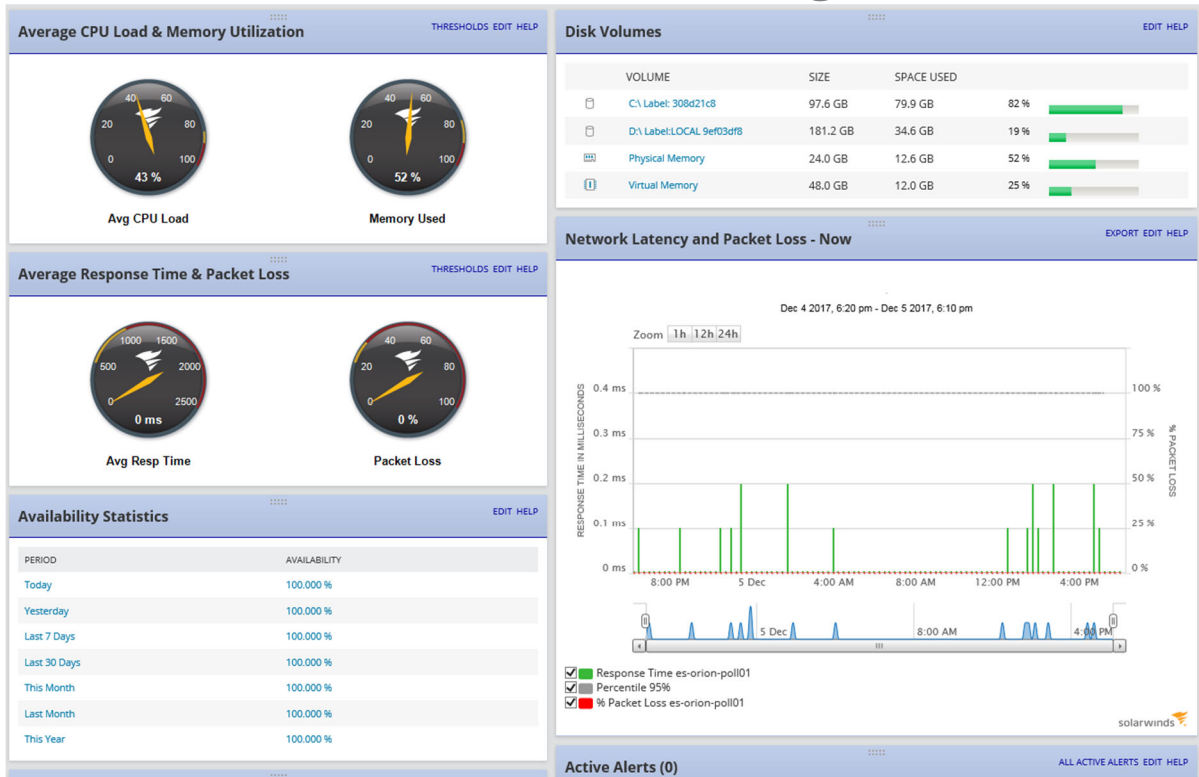
Bandwidth & Network Latency Monitoring Example

In addition to real-time monitoring and alerting, Securus Technical Support also leverages the SolarWinds® network performance monitor to gather and evaluate historical data for network alerts, bandwidth usage, packet loss, and hardware performance. The detailed level of monitoring available via our network performance monitor allows the Technical Support group to take proactive steps to prevent or mitigate facility outages and to ensure the correct resources are engaged if dispatch is necessary.

Infrastructure Inspections

System Administrators make scheduled inspections of all systems and routinely perform preventive maintenance and software enhancements as directed by a Production Change Control steering group. Additionally, change control practices have been reviewed and are compliant with Sarbanes-Oxley.

Additional NOC-Monitoring View



Premium Network Monitoring Capabilities

Securus proactively identifies potential system and network abnormalities through SolarWinds® suite of network performance monitors. This software allows Securus personnel to monitor all hardware, software and system metrics continuously.

Through network monitoring Securus can:

- **Proactively repair systems to prevent outages.** Many times corrections are made before a facility is aware of a problem. This means less downtime and increased system reliability for the facility.
- **Alert remote or on-site engineers of system threshold inconsistencies or alarms.** The NOC communicates with engineers through e-mail, short message service (SMS), or directly through a wireless phone to address the issue.
- **Receive real-time alerts when the system detects an error.** Monitoring identifies if network elements exceeded established thresholds and alerts Securus personnel of possible carrier network issues.
- **Ensure sufficient resources are in place.** The Securus capacity engineering team reviews call traffic volume reports and storage requirements throughout all systems to ensure sufficient network capacity.

- **Centrally monitor calling traffic to determine increases or decreases in the number of telephones.** With County agreement, the service and operations team will install additional telephones when required.

Account Management

The Securus Account Management group is a dedicated single point of contact service team that proactively manages the day-to-day needs of facilities to ensure the best possible experience from all our products, services, and support. In addition to Natasha Samuels, WA DOC's current Account Manager for JPay services, WA DOC will be assigned an account manager for Securus ITS, VVS, and associated services, who will be responsible for product training, monitoring system and product usage, proactive account support, account reviews, and reactive account support in order to ensure quality of service.

Quarterly Performance Reviews

Securus has assigned a dedicated account management team, which includes not only the sales and support staff, but also the DOC's assigned Account Manager who will monitor the ongoing service and maintenance request and will conduct regularly scheduled site visits to ensure that you are receiving the highest level of customer service. In addition to these site visits, Securus offers quarterly Operational Reviews in which your Account Manager will meet with the WA DOC staff and discuss operational performance, successes, and opportunities for improvement. Securus uses the information from these meetings to improve our service delivery platform. This approach allows Securus to consistently perform at Net Promoter Scores that are among the highest recorded by any business in any industry.

- 13) Cabling currently installed in several facilities is CAT 3, but it's expected that service needs will require CAT 6 or higher cabling. Describe how Vendor will meet this requirement.**

Vendor's response:

SECURUS HAS READ, UNDERSTANDS, AND WILL COMPLY WITH THIS REQUIREMENT.

If required, we will install CAT6 or higher cabling.

The telephony interface between the housing area and our NextGen Secure Communications Platform calling services is a standard 48-volt DC tip and ring connection. The copper connectivity requirement preferred is CAT 5E, although this type of connection is also compatible to lower-signal integrity cabling, such as CAT 3.

EXHIBIT A – HARDWARE TECH SPECS

NetVanta

3140

Fixed Port Secure Access Ethernet Router



Benefits

- 100 Mbps router with three Gigabit Ethernet interfaces
- Provides capability for Ethernet redundancy
- USB interface for integrated 3G/4G backup
- Voice Quality Monitoring (VQM) and Mean Opinion Score (MOS) prediction
- Utilizes standard-based routing protocols utilized by the widely deployed NetVanta Series
- Compatible with industry leading softswitches and call agents
- Dynamic bandwidth allocation affords more efficient utilization
- Stateful inspection firewall for network security
- Quality of Service (QoS) for delay and jitter sensitive traffic like VoIP
- Supports 802.1q Virtual LAN (VLAN) Trunking
- Optional IPSec Virtual Private Network (VPN) for secure corporate connectivity across the Internet
- Command Line Interface (CLI) mimics industry de facto standard
- Network Address Translation (NAT) for IP address concealment
- Wi-Fi@ Access Controller for centralized management of NetVanta Wireless Access Points (WAPs)
- Feature-rich ADTRAN® Operating System (AOS)
- Available in desk top or rack mountable version
- Industry-leading, North American five-year warranty
- Optional full featured eSBC for robust network security and voice interoperability

Overview

The NetVanta 3140 is a fixed-port, high-performance Ethernet router supporting converged access and high-quality voice services. It provides three routed, auto-sensing Gigabit Ethernet interfaces. This product is ideal for carrier-bundled service offerings, and enterprise class Internet access for secure, high-speed corporate connectivity. The NetVanta 3140 is available as either a desktop, or rack mountable platform.

Flexibility and Redundancy

The NetVanta 3140 is ideal for multiple applications where Ethernet redundancy is needed given the three Gigabit ports that can be either LAN or WAN facing. This can be achieved with two Ethernet delivered access services providing immediate failover to the active link anytime a link down event occurs. In addition, the NetVanta 3140 features USB interface that can be used for 3G/4G backup.

Many deployments still feature separate voice and data networks, and the NetVanta 3140 is a perfect fit for these as well with a single WAN link, the other two Gigabit interfaces can accomplish this.

Standards Protocols

The versatile hardware platform of the NetVanta 3140 is further complemented with the AOS. The AOS allows for the support of static and default routes, demand and policy based routing, and allows for fast, accurate network convergence using

routing protocols such as BGP, OSPF, RIP and PIM Sparse Mode for multicast routing. Multihoming is also available to provide redundant or backup WAN links to multiple ISPs, guaranteeing a wide-area connection.

Hierarchical QoS

QoS is also supported for delay-sensitive traffic like VoIP or video. To prioritize mission-critical traffic and control network congestion, the NetVanta 3140 uses Low Latency Queuing, Weighted Fair Queuing (WFQ), Class-based WFQ, and DiffServ marking to establish the priority of IP packets routed over the WAN.

VoIP Ready

In combination with the QoS features, a specialized SIP ALG allows SIP traffic to traverse NAT-enabled firewalls. For enterprise networks, this interoperability allows IP PBXs, phones, and other SIP-based devices to set up, tear down, and pass voice and call control messages seamlessly through the integral NAT-enabled firewall.

The NetVanta 3140 also deploys VQM to capture MOS, jitter, delay, and packet loss statistics necessary to troubleshoot VoIP calls over the WAN. This powerful, yet graphically intuitive, diagnostic tool allows for quick isolation of network issues to ensure superior call quality.



NETVANTA 3140

Enterprise Session Border Control (eSBC)

The NetVanta 3140 can provide optional eSBC functionality delivering a truly converged application platform at the customer premises. This feature is becoming mandatory in today's service deployment to normalize, secure and troubleshoot the SIP to SIP communication between a carrier network and the customers SIP compliant equipment.

Security

The AOS provides a powerful, high-performance stateful inspection firewall. The firewall can identify and protect against common Denial of Service (DoS) attacks like TCP syn flooding, IP spoofing, ICMP redirect, ping-of-death, and IP reassembly problems.

In addition, the AOS is capable of providing an inherent URL-filtering package without the use of an external server. URL filtering is another level of security that allows system administrators to restrict Internet access by permitting or denying specific URLs. This URL filtering feature also includes the ability to produce top website reports of the most frequently requested websites, allowing system administrators to modify the URL filter lists.

The NetVanta 3140 also adds the support for IPsec compliant VPN. The NetVanta 3140 supports encryption algorithms like DES, 3DES, and AES. With this upgrade, the NetVanta 3140 is fully compatible with other IPsec VPN equipped NetVanta products.

Management

The NetVanta 3140 Series can be remotely managed by ADTRAN's n-Command® MSP platform. ADTRAN n-Command platforms offer the ability to discover devices, make mass configuration changes or firmware upgrades, backup/restore configuration, and generate inventory reports for asset management. The ADTRAN n-Command MSP also offers VoIP VQM and reporting, as well as an industry-leading, easy-to-use, Graphical User Interface (GUI). NetVanta 3140 is available in rack mountable, and desktop versions; and are backed by an industry-leading warranty.

Administration

The AOS offers an intuitive Web-based GUI that provides step-by-step configuration wizards, management capability, and the ability to upload firmware updates. In addition, it has a standard CLI that mimics the widely adopted, industry de facto standard. The sequence of commands required to configure similar devices is almost identical, eliminating training costs typically associated with learning a new operating system or obtaining costly industry certifications. The CLI also allows for configuration scripts to be used, saved, and downloaded as a quick-and-easy recovery mechanism.

Product Specifications

Physical Interfaces

- Ethernet
- Full Duplex
- Auto-negotiation
- RJ-45
- USB 2.0
- One Port
- Console Port
- Three Gigabit Ethernet Interfaces (WAN/LAN Support)
- Supports 802.1q VLAN Trunking
- EIA-232 Providing Local Management and Configuration (via a DB-9 Female Connector)

Diagnostic LEDs

- Stat (Power)
- Gig 1, Gig 2, Gig 3 (Ethernet)
- USB

Protocols

- EBGp/IBGP
- RIP (v1 and V2)
- PIM Sparse Mode
- IGMP V2
- GRE
- PPP Dial Backup
- PAP and CHAP
- Multi-VRF CE
- VRRP
- Policy-based Routing
- OSPF
- PPPoE
- Multilink PPPoE
- Demand Routing
- RFC 1483
- Multihoming
- Layer 3 Backup
- TWAMP

Fixed Port Secure Access Ethernet Router

Quality of Service (QoS)

- Low Latency and Weighted Fair Queuing (WFQ)
- Class-Based WFQ
- DiffServ Packet Marking and Recognition
- Traffic Monitoring (NetFlow 9)

Voice Quality Monitoring (VQM)

- Mean Opinion Score (MOS) Prediction
- Jitter, Delay and Packet Loss
- Past and Active Calls

Traffic and Network Quality Monitoring

- ICMP and TWAMP Probes and Tracks
- One-Way Delay
- Round-Trip Loss and Delay
- Inter-Packet Delay Variance
- Traffic Flow Collection and Analysis
- Packet Capture

Administration

- Familiar Command Line Interface (CLI)
- Web-Based GUI
- n-Command Support
- SNMP V2 and V3
- SYSLOG Logging
- Email Alerts (SMTP)
- Policy Statistics
- TCL Scripting
- Login Privilege Levels
- Telnet, Craft/Console Port, SSH, Ping, Trace Route and NTP

DHCP

- Client, Server and Relay

Firewall

- Stateful Inspection Firewall
- Denial of Service (DOS) Protection
- Access Control Lists
- Application Level Gateways
- Packet Filtering

Network Address Translation

- Basic NAT (1:1), NAT (Many:1) and 1:1 Port Translation
- NAT-compatible SIP ALG

NAT Traversal and Remote Survivability

- B2BUA
- SIP Registrar for IP Phones
- SIP Proxy with Survivability
- Transparent/Stateful/Outbound

Content Filtering

- Inherent URL Filtering
- Top Website Reports
- Integration with Websense

Secure Management

- Multi-level Access Control
- TACACS+
- RADIUS AAA
- SSH CLI and SSL GUI
- Port Authentication (802.1x)

VPN (Optional)

- IPsec Tunnel Mode: 500 Tunnels
- Encryption: DES, 3DES and AES
- Authentication Mechanisms: XAUTH, Digital Certificates, Pre-shared Keys and Secure ID

Environment

- Operating Temperature: 32° to 122° F (0° to 50° C)
- Storage Temperature: -40° to 158° F (-20° to 70° C)
- Relative Humidity: Up to 95%, Non-condensing

Physical and Power

NetVanta 3140

- Self Standing, Desktop Plastic Enclosure
- Dimensions: 1.63 in. x 9 in. x 6.38 in. (H x W x D), (4.14 cm x 22.86 cm x 16.21 cm)
- Weight: 1 lbs. (.45 kg)
- Power: DC (12 VDC, 1.0 A)

NetVanta 3140 RM

- 1U Metal Rackmount
- Dimensions: 1.72 in. x 8.4 in. x 8 in. (H x W x D), (4.36 cm x 21.3 cm x 20.3 cm)
- Weight: 3 lbs. (1.4 kg)
- Power: AC (Auto-ranging, 100 to 250 VAC, 50/60 Hz, 0.4 A Maximum)

Agency Approvals

- FCC Part 15 Class A
- CE Mark
- UL & Canadian UL
- RoHS
- C-Tick for Australia and New Zealand

Ordering Options

Hardware Options	Part No.
Multi-Service Edge Switch	
NetVanta 3140 Desktop	1700340F1
NetVanta 3140	1700341F1
NetVanta 3140 Desktop with VPN and VOM	4700340F2
NetVanta 3140 with VPN and VOM	4700341F2
VPN and VOM Software Upgrade	1950340F2
19 in. Rackmount Brackets*	1700511F1
19 in. Dual Mounting Tray*	1700508F1
Wall Mount*	1200884G1
Dual Wall Mount*	1700512F1
NetVanta 3140 with SBC, 5 Calls	4700341F2#5
NetVanta 3140 with SBC, 10 Calls	4700341F2#10
NetVanta 3140 with SBC, 25 Calls	4700341F2#25
NetVanta 3140 with SBC, 50 Calls	4700341F2#50
NetVanta 3140 with SBC, 100 Calls	4700341F2#100
NetVanta 3140 with SBC, 300 Calls	4700341F2#300
Software Options	
NetVanta 3140 SBC Upgrade, 5 Calls	1963SBCF5
NetVanta 3140 SBC Upgrade, 10 Calls	1963SBCF10
NetVanta 3140 SBC Upgrade, 25 Calls	1963SBCF25
NetVanta 3140 SBC Upgrade, 50 Calls	1963SBCF50
NetVanta 3140 SBC Upgrade, 100 Calls	1963SBCF100
NetVanta 3140 SBC Upgrade, 300 Calls	1963SBCF300

* Accessories apply to NetVanta 3140 (non-desktop version) only



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61700340F1-8E

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ADTRAN
Certified
Supplier



TL9000
TIA-909

NetVanta 1534

Layer 3 Lite Gigabit Ethernet Switch



Product Features

- 28-port multi-layer Gigabit Ethernet switch
- 24-Gigabit Ethernet ports and four SFP optical ports
- Two standard 1 Gbps SFP ports and two enhanced 2.5 Gbps SFP ports
- Non-blocking, up to 62 Gbps switching capacity
- Line rate Layer 2 and Layer 3 Lite capabilities
- 16 static routes
- 802.1Q VLANs, Private VLANs and VLAN assignment via 802.1x
- VoIP Setup Wizard
- Advanced QoS with support for 802.1p and DiffServ prioritization with four queues per egress port
- Automate actions with Port Scheduler and TCL scripting
- VoIP ready with LLDP/LLDP-MED and voice VLANs
- Business-class security with RADIUS, TACACS+, 802.1x and port security
- Optimized for iSCSI Storage Area Networks (SANs) solutions
- Wi-Fi® access controller for centralized management of NetVanta Wireless Access Points (WAPs)
- Cable and SFP diagnostics provides easy to use troubleshooting tools for copper and fiber cable
- Familiar CLI and Web GUI
- Limited lifetime warranty
- Next business day advance replacement

NetVanta® 1534 is a managed, 28-port, Layer 3 Lite, Gigabit Ethernet switch designed as an access layer or network backbone switch for Small to Medium-sized Enterprises (SMEs). With the combination of the advanced multi-layer switching fabric, high-bandwidth capabilities, and enhanced Quality of Service (QoS) features, the NetVanta 1534 is ideal in Gigabit-to-the-desktop deployments, and converged voice and data networks.

Hardware

The NetVanta 1534 rackmountable switch provides 28 Gigabit Ethernet ports, consisting of 24 fixed 10/100/1000Base-T Ethernet ports, two 1.0 Gbps Small Form-factor Pluggable (SFP) ports, and two 2.5 Gbps enhanced SFP ports located on the back. Together the four SFP ports can provide up to 14 Gbps of bandwidth between interconnected NetVanta 1534 switches. "Half-rack" in size, you can scale to 48 Gigabit Ethernet ports and eight SFP optical ports utilizing two NetVanta 1534 switches side-by-side in a single 19-inch rack space.

Multi-layer Switching

The NetVanta 1534 supports advanced multi-layer (Layer 2 and Layer 3 Lite) switching with up to 16 static routes allowing it to easily scale from SMBs to enterprise-size networks.

VoIP Ready

The NetVanta 1534 is VoIP-ready with the ability to automatically configure IP phones using LLDP-MED, and the ability to separate voice traffic onto voice VLANs, to simplify the deployment of VoIP. In addition, the switch includes a VoIP Setup Wizard (available via a Web-based Graphical User Interface (GUI) or Command Line Interface (CLI)), which automates the complete VoIP setup process reducing deployment time and eliminating errors. An on-demand VoIP report provides a printable summary of the switch VoIP configuration, as well as providing alerts and recommendations to improve performance. All NetVanta switches support QoS to prioritize VoIP traffic, 802.1p and DiffServ Class of Service (CoS).

Security

The NetVanta 1534 offers a variety of data security features including DoS protection, MAC-based port security, multilevel user passwords, Secure Shell (SSH) and Secure Socket Layer (SSL) for encrypted user login, and Access Authentication and Authorization (AAA) for authentication with RADIUS and TACACS+. With features such as 802.1x and port security, administrators can assure that only authorized users are allowed access to the network.

The ADTRAN® Operating System (AOS) also features desktop auditing using DHCP in conjunction with Microsoft Network Access Protection (NAP) protocol to monitor the health of client computers. The two protocols work together to ensure that systems connected to the network are using appropriate corporate policies, such as firewall settings, antivirus settings and other client health information.

Port Scheduler

NetVanta 1534 allows ports to be enable or disabled based on time of day. This ability to schedule available ports allows for added security and can provide less power consumption during off hours saving on utility cost.

iSCSI Optimized

All ADTRAN NetVanta Gigabit Ethernet switches are optimized for iSCSI SANs deployments. Network administrators can take advantage of features such as Jumbo frame support (up to 13K), separation of iSCSI network traffic utilizing VLANs, and 802.3x flow control to seamlessly integrate ADTRAN switches with iSCSI SANs devices.

Administration

AOS offers both a CLI and an intuitive Web-based GUI with step-by-step configuration wizards. For automating setup and configuration, NetVanta 1534 supports Auto-Config which provides the ability to automatically obtain the switch configuration via DHCP.

AOS also offers network forensics to aid in troubleshooting network problems by allowing network administrators to easily locate devices on the network by MAC or IP address.





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617028601-4E July
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NetVanta 1534

Layer 3 Lite Gigabit Ethernet Switch

Product Specifications

Physical Interface

- Ethernet Ports
 - 24 – 10/100/1000Base-T
 - 2 – Standard 1 Gbps SFP ports
 - 2 – Enhanced 1.0/2.5 Gbps SFP Ports
 - Auto rate/duplex/MDI/MDI-X

- Console Port
 - DB-9, RS-232

Switching Performance

- Non-blocking Layer 2/3 Switching

Maximum Forwarding Bandwidth

- 62 Gbps

Layer 2 Support

- 802.1D Spanning Tree
- 802.1w Rapid STP
- 802.3ad Link Aggregation
- 8,000 MAC Addresses
- Jumbo Frames (9K)
- IGMP Snooping
- 802.3x Flow Control

Layer 3 Support

- 16 Static Routes
- 8 Layer 3 Interfaces
- UDP Relay
- 232 ARP Entries
- IPv6 Management

Diagnostics

- Port Mirroring
- LLDP (802.1AB)
- LLDP-MED
- Cable Diagnostics
- SFP Diagnostics
- Troubleshooting Page

Front Panel Status LEDs

- Power Status
- LAN: link, activity

Port Statistics

- Number of TX/RX Frames, Collisions, Errors

Quality of Service

- 802.1p and DiffServ
- Four output queues per egress port
- Weighted Round Robin (WRR)
- Strict Priority Scheduling

VLAN

- Port-based VLANs
- 802.1Q tagged trunked VLANs
- Voice VLANs
- Private VLAN Edge
- Dynamic 802.1x assigned VLANs
- Support for up to 255 active VLANs

Storm Control

- Broadcast, Unicast, and Multicast

Administration

- CLI (Console/Telnet/SSH)
- SNMP v3
- Web-based GUI (HTTP/SSL)
- SYSLOG
- n-Command[®] support
- Email Alerts
- RADIUS
- TACACS+
- TCL Scripting
- Auto Config
- Port Scheduler
- DHCP Network Forensics

Security

- Port authentication (802.1x)
- Port Security
- DoS Protection
- Hardware ACLs
- Microsoft Desktop Auditing

Wi-Fi Controller

- Controls up to 24 NetVanta WAPs

Environment

- Operating Temperature: 32° to 122° F (0° to 50° C)
- Storage Temperature: -4° to 158° F (-20° to 70° C)
- Relative Humidity: Up to 95%, non-condensing

Physical

- Chassis: 1U, 19 in. Rackmountable Metal Enclosure (Rackmount Brackets Included)
- Dimensions: 1.72 in. x 8 in. x 11 in. (4.4 cm x 20.3 cm x 27.9 cm) (H x W x D)
- Weight: 4 lbs. (2.72 kg.)
- AC Power: 100–250 VAC, 50/60 Hz
- Power: 30 Watts, 1 A Max

Agency Approvals

- FCC Part 15 Class A, UL 1950/CSA, CE Mark, C-tick, RoHS

Ordering Information

Equipment	Part No.
Net Vanta 1534	1702590G1
Net Vanta 1000BaseSX SFP Transceiver	1200480E1
Net Vanta 1000BaseLX SFP Transceiver	1200481E1
Net Vanta 2.5 Gbps Multimode SFP Transceiver	1200482G1
Net Vanta 2.5 Gbps Singlemode SFP Transceiver	1200483G1
Net Vanta 1 Meter SFP Interconnect Cable	1200484G1
Net Vanta 3 Meter SFP Interconnect Cable	1200484G3
Dual Mounting Tray	1700508F1
Wall Mount Brackets	1700507F1

NetVanta 1534P

Layer 3 Lite Gigabit Ethernet Switch



Product Features

- 28-port multi-layer Gigabit Ethernet switch
- 24-Gigabit Ethernet ports and four SFP optical ports
- Two standard 1 Gbps SFP ports and two enhanced 2.5 Gbps SFP ports
- 802.3af (PoE), 802.3at (PoE+) and Legacy PoE
- Non-blocking, up to 62 Gbps switching capacity
- Line rate Layer 2 and Layer 3 Lite capabilities
- DHCP network forensics
- 802.1Q VLANs, Private VLANs and VLAN assignment via 802.1x
- VoIP Setup Wizard
- Advanced QoS with support for 802.1p and DiffServ prioritization with four queues per egress port
- Automate actions with Port Scheduler and TCL scripting
- VoIP ready with LLDP/LLDP-MED and voice VLANs
- Business-class security with RADIUS, TACACS+, 802.1x and port security
- Optimized for iSCSI Storage Area Networks (SANs) solutions
- Wi-Fi® access controller for centralized management of NetVanta Wireless Access Points (WAPs)
- Cable and SFP diagnostics provides easy to use troubleshooting tools for copper and fiber cable
- Familiar CLI and Web GUI
- Limited lifetime warranty
- Next business day advance replacement

The NetVanta® 1534P is a managed, 28-port PoE, Layer 3 Lite, Gigabit Ethernet switch designed for fast, secure, cost-effective Local Area Network (LAN) switching. This scalable, full-featured business-class switch is perfect for higher-bandwidth Voice over IP (VoIP) applications needing PoE to power IP Phones, as well as Gigabit-to-the-desktop deployments. Experience the ease of management with an easy-to-use Web-based Graphical User Interface (GUI) and familiar Command Line Interface (CLI).

Hardware

The NetVanta 1534P rackmount switch provides 28 Gigabit Ethernet ports, consisting of 24 fixed 10/100/1000Base-T Ethernet ports, two 1.0 Gbps Small Form-factor Pluggable (SFP) ports, and two 2.5 Gbps enhanced SFP ports. Together the four SFP ports can provide up to 14 Gbps of bandwidth between interconnected NetVanta 1534P switches.

Multi-layer Switching

The NetVanta 1534P supports advanced multi-layer (Layer 2 and Layer 3 Lite) switching with up to 16 static routes allowing it to easily scale from SMBs to enterprise-size networks.

VoIP Ready

The NetVanta 1534P is VoIP-ready with the ability to automatically configure IP phones using LLDP-MED, and the ability to separate voice traffic onto voice VLANs, to simplify the deployment of VoIP. In addition, the switch includes a VoIP Setup Wizard (available via a Web-based Graphical User Interface (GUI) or Command Line Interface (CLI)), which automates the complete VoIP setup process reducing deployment time and eliminating errors. An on-demand VoIP report provides a printable summary of the switch VoIP configuration, as well as providing alerts and recommendations to improve performance. All NetVanta switches support QoS to prioritize VoIP traffic, 802.1p and DiffServ Class of Service (CoS).

PoE

The NetVanta 1534P provides up to 370 watts of 802.3af (PoE), 802.3at (PoE+) and Legacy PoE for powering IP phones, wireless access points (WAPs), and other devices requiring LAN power.

Supplemental PoE Power

When deployed with the NetVanta 1131 RPS/EPS unit, the NetVanta 1534P supports power redundancy

as well as enhanced PoE. The NetVanta 1131's EPS output provides up to 370 watts of backup PoE for redundancy, and can also provide up to 370 watts of additional PoE, effectively doubling the available PoE budget (up to 740 watts).

Security

The NetVanta 1534P offers a variety of data security features including DoS protection, MAC-based port security, multilevel user passwords, Secure Shell (SSH) and Secure Socket Layer (SSL) for encrypted user login, and Access Authentication and Authorization (AAA) for authentication with RADIUS and TACACS+. With features such as 802.1x and port security, administrators can assure that only authorized users are allowed access to the network.

The ADTRAN® Operating System (AOS) also features desktop auditing using DHCP in conjunction with Microsoft Network Access Protection (NAP) protocol to monitor the health of client computers. The two protocols work together to ensure that systems connected to the network are using appropriate corporate policies, such as firewall settings, antivirus settings and other client health information.

Port Scheduler

NetVanta 1534P allows ports to be enable or disabled based on time of day. This ability to schedule available ports allows for added security and can provide less power consumption during off hours saving on utility cost.

iSCSI Optimized

All ADTRAN NetVanta Gigabit Ethernet switches are optimized for iSCSI SANs deployments. Network administrators can take advantage of features such as Jumbo frame support (up to 13K), separation of iSCSI network traffic utilizing VLANs, and 802.3x flow control to seamlessly integrate ADTRAN switches with iSCSI SANs devices.

Administration

AOS offers both a CLI and an intuitive Web-based GUI with step-by-step configuration wizards. For automating setup and configuration, NetVanta 1534P supports Auto-Config which provides the ability to automatically obtain the switch configuration via DHCP.

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NetVanta 1534P

Layer 3 Lite Gigabit Ethernet Switch

Product Specifications

Physical Interface

- Ethernet Ports
 - 24 – 10/100/1000Base-T
 - 2 – Standard 1 Gbps SFP ports
 - 2 – Enhanced 1.0/2.5 Gbps SFP Ports
 - Auto rate/duplex/MDI/MDI-X

Console Port

- DB-9, RS-232

Switching Performance

- Non-blocking Layer 2/3 Switching

Maximum Forwarding Bandwidth

- 62 Gbps

Layer 2 Support

- 802.1D Spanning Tree
- 802.3ad Link Aggregation
- Jumbo Frames (13K)
- 802.3x Flow Control
- 802.1w Rapid STP
- 8,000 MAC Addresses
- IGMP Snooping

Layer 3 Support

- 16 Static Routes
- UDP Relay
- IPv6 Management
- 8 Layer 3 Interfaces
- 232 ARP Entries

Diagnostics

- Port Mirroring
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Front Panel Status LEDs

- Power Status
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- 802.1p and DiffServ
- Four output queues per egress port
- Weighted Round Robin (WRR)
- Strict Priority Scheduling

VLAN

- Port-based VLANs
- 802.1Q tagged trunked VLANs
- Voice VLANs
- Private VLAN Edge
- Dynamic 802.1x assigned VLANs
- Support for up to 255 active VLANs

Storm Control

- Broadcast, Unicast, and Multicast

PoE

- 802.3af (PoE) and 802.3at (PoE+) and Legacy PoE
- 370 Watts (Total)
- Extended PoE Budget up to 740W (when connected to the NetVanta 1131)

Administration

- CLI (Console/Telnet/SSH)
- Web-based GUI (HTTP/SSL)
- n-Command[®] support
- RADIUS
- TCL Scripting
- Port Scheduler
- SNMP v3
- SYSLOG
- Email Alerts
- TACACS+
- Auto Config
- DHCP Network Forensics

Security

- Port authentication (802.1x)
- DoS Protection
- Microsoft Desktop Auditing
- Port Security
- Hardware ACLs

Wi-Fi Controller

- Controls up to 24 NetVanta WAPs

Environment

- Operating Temperature: 32° to 122° F (0° to 45° C)
- Storage Temperature: -4° to 158° F (-20° to 70° C)
- Relative Humidity: Up to 95%, non-condensing

Physical

- Chassis: 1U, 19 in. Rackmountable Metal Enclosure (Rackmount Brackets Included)
- Dimensions: 1.72 in. x 17.2 in. x 10 in. (4.4 cm x 43.7 cm x 25.4 cm) (H x W x D)
- Weight: 9.5 lbs. (4.3 kg.)
- AC Power: 110–230 VAC, 50/60 Hz
- Power: 500 Watts, 4.9 A Max

Agency Approvals

- FCC Part 15 Class A, UL 1950/CSA, RoHS

Ordering Information

Equipment	Part No.
Net Vanta 1534P	1702591G2
Net Vanta 1000BaseSX SFP Transceiver	1200480E1
Net Vanta 1000BaseLX SFP Transceiver	1200481E1
Net Vanta 2.5 Gbps Multimode SFP Transceiver	1200482G1
Net Vanta 2.5 Gbps Singlemode SFP Transceiver	1200483G1
Net Vanta 1 Meter SFP Interconnect Cable	1200484G1
Net Vanta 3 Meter SFP Interconnect Cable	1200484G3
Net Vanta 1131 (RPS/EPS)	1700530F1
Net Vanta 1131 RPS Cable	1700532F1
Net Vanta 1131 EPS Cable	1700533F1

ZoneFlex R600

Dual-Band 802.11ac 3X3:3 Smart Wi-Fi Access Points



DATA SHEET



BENEFITS

EXTENDED RANGE REQUIRES FEWER APs

Adaptive antenna technology delivers up to 2x increase in Wi-Fi signal coverage minimizing the number of APs required to service any area

SLEEK, LOW PROFILE ENCLOSURE FOR EASE-OF-DEPLOYMENT

Aesthetically-pleasing design and a range of mounting options

CHANNEL SELECTION OPTIMIZES THROUGHPUT

ChannelFly dynamic channel management, based on throughput measurements, not just interference, chooses the best channel to give users the highest possible throughput

SUPER SIMPLE CONFIGURATION AND MANAGEMENT

The industry's simplest configuration and management through a Web-based wizard

FLEXIBLE DEPLOYMENT OPTIONS

Standalone or controller-based migration

ADAPTIVE POLARIZATION DIVERSITY (PD-MRC)

Dual-polarized antennas that are dynamically selected provide better reception for hard to hear clients and more consistent performance as clients constantly change orientation

HASSLE FREE MIGRATION TO HIGHER SPEED WI-FI

Support for standard 802.3af power over Ethernet allows enterprises to use existing PoE switches without costly upgrades

802.11AC HIGH PERFORMANCE MID-RANGE 3X3:3 SMART WI-FI ACCESS POINTS WITH ADAPTIVE ANTENNA TECHNOLOGY

The Ruckus ZoneFlex R600 delivers high-performance and reliable 802.11ac wireless networking at a competitive price point for medium density venues such as in K-12 or Higher ED.

The ZoneFlex R600 combines patented adaptive antenna technology and automatic interference mitigation to deliver consistent, predictable performance at extended ranges with up to an additional 6dB of BeamFlex gain on top of the physical antenna gain and up to 15dB of interference mitigation.

The R600 is ideal for wireless networks servicing mobile devices with dual-polarized antennas that adapt in real time to maximize performance for the mobile enterprise.

Performance is further enhanced as the ZoneFlex R600 integrates Ruckus' patented BeamFlex, a software-controlled, high gain adaptive antenna technology. The ZoneFlex R600 automatically selects channels for highest throughput potential using Ruckus ChannelFly dynamic channel management, adapting to environmental changes.

A sleek and low-profile design, the ZoneFlex R600 was purpose-built for small-medium enterprises requiring reliable high speed client connectivity. It is ideal for a variety of medium density enterprise and hotspot environments including SMB's such as independent hotels, local retailers and non-franchise restaurants.

PATENTED BEAMFLEX™ TECHNOLOGY EXTENDS SIGNAL RANGE, IMPROVES STABILITY OF CLIENT CONNECTIONS

All ZoneFlex R600 Wi-Fi access points integrate a software-controlled smart antenna with PD-MRC (polarization diversity) that delivers up to an additional 6dB of BeamFlex gain and 15dB of interference mitigation. This is especially beneficial to enhance the performance of mobile devices which are constantly in motion and changing orientation.

ADVANCED WLAN APPLICATIONS

Each ZoneFlex R600 supports a wide range of value-added applications such as guest networking, Dynamic PSK, hotspot authentication, wireless intrusion detection and many more. In a controller-less configuration, the ZoneFlex R600 works with a wide range of authentication servers including Microsoft's Active Directory, and AAA/RADIUS.

FLEXIBLE DEPLOYMENT OPTIONS

Ruckus is custom-designed to help small business owners grow their business, deliver an excellent customer experience and manage costs while supporting Wi-Fi and a variety of mobile devices with minimal IT staff.

COMPLETE LOCAL AND REMOTE MANAGEMENT

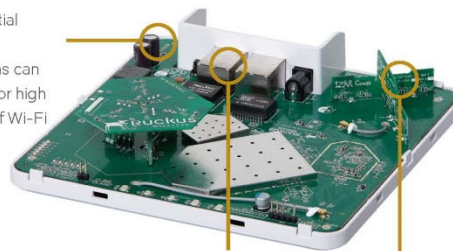
Each ZoneFlex R600 can be managed as a standalone AP through a Web-based GUI, using SNMP or through the Ruckus SCI or FlexMaster. Local management can also be performed using Ruckus' Smart WLAN controllers. FlexMaster is a LINUX-based software platform that uses industry standard protocols to perform bulk configuration, fault detection, monitoring and a wide range of trouble-shooting capabilities over a wire area connection. The controllers enable local management and control of APs, adding value-added services such as transmit power control and guest networking.



FEATURES

- Dual-band concurrent (2.4GHz/5GHz)
- Adaptive antenna technology and advanced RF management
- Up to an additional 6dB BeamFlex gain / 15dB interference mitigation / 3dBi physical antenna gain
- Automatic interference mitigation, optimized for high-density environments
- Integrated smart antenna technology
- Standard 802.3af Power over Ethernet (PoE)
- DHCP services
- IP multicast video streaming support
- Advanced QoS packet classification and automatic priority for latency-sensitive traffic
- Dynamic, per user rate-limiting for hotspot WLANs
- WPA-PSK (AES), 802.1X support for RADIUS and Active Directory
- BYOD, Zero-IT and Dynamic PSK
- Admission control/load balancing
- Band steering and airtime fairness support
- Rich and customizable guest access services
- Application recognition and control
- Bonjour gateway
- SecureHotspot
- Band balancing
- SmartMesh
- SPoT location services

Many potential antenna combinations can be chosen for high availability of Wi-Fi



Two 10/100/1000 Mbps ports: one with PoE

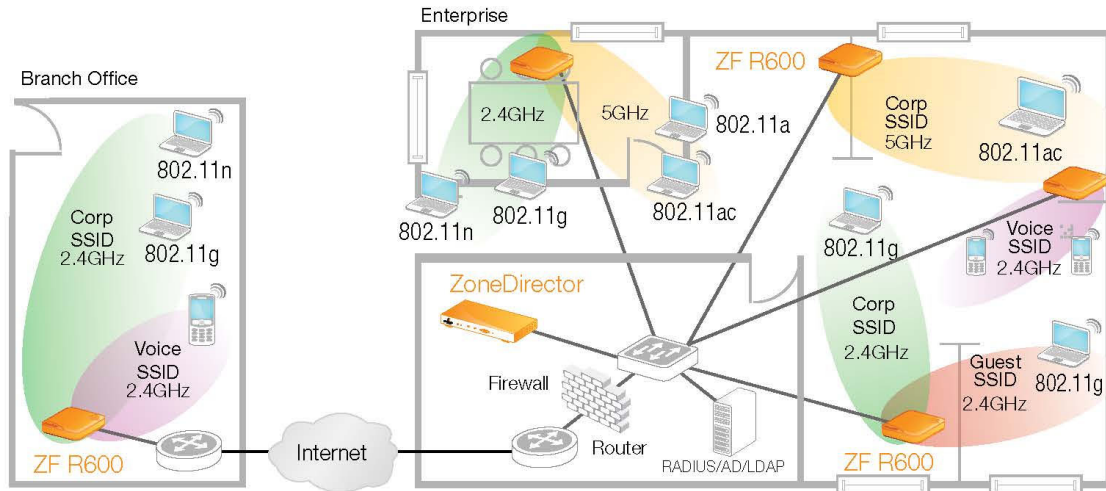
High-gain directional antenna elements not only delivers signal gain but also interference mitigation for range extension, reliability and high data rates

ZoneFlex R600

Dual-Band 802.11ac 3X3:3 Smart Wi-Fi Access Points

DATA SHEET

The ZoneFlex R600 integrates with your existing network infrastructure, delivering best-in-class 802.11ac performance and reliability at a competitive price -- making it the ideal wireless solution for mid-range enterprise and branch office applications.

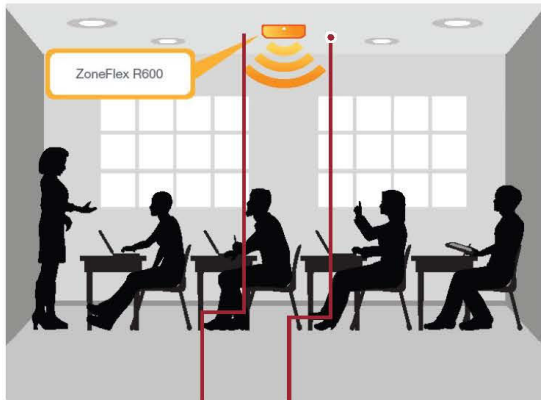


DEPLOYMENTS FOR CLASSROOMS AND LIBRARIES

The ZoneFlex R600 is ideal for deployment in education common areas providing high quality wireless access in high density locations

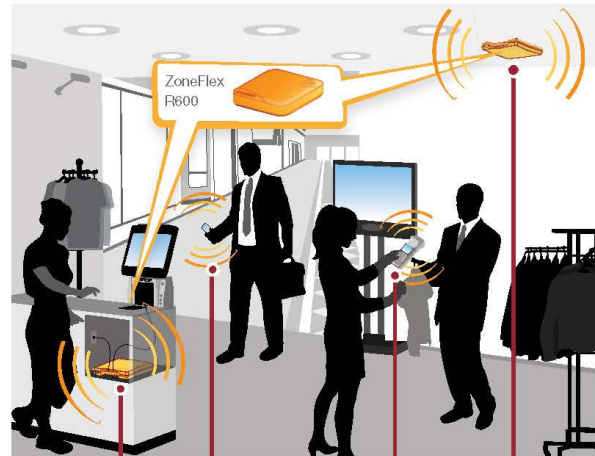
DEPLOYMENT FOR RETAIL/BRANCH OFFICES

The ZoneFlex R600 is ideal for deployment in retail stores to provide inconspicuous wireless connection to high quality video, wireless IP phones and data access for handheld PoS barcode scanners



Dual-band (2.4/5GHz) support allows for concurrent Internet and IP-based video services

Sleek, elegant design easily concealed



Wired ports to connect devices such as cash registers, printers, etc.

Multiple SSIDs for differentiated user services (e.g. guest Wi-Fi, point of sale, voice)

Reliable Wi-Fi connectivity for point of sale devices

5GHz band and smart antenna system ideal for 802.11ac clients

ZoneFlex R600

Dual-Band 802.11ac 3X3:3 Smart Wi-Fi Access Points

DATA SHEET

PHYSICAL CHARACTERISTICS	
Power	<ul style="list-style-type: none"> DC Input 12VDC/10A Power over Ethernet 802.3af
Physical Size	15.8 cm x 15.8 cm x 4 cm (6.2 in x 6.2 in x 1.57 in)
Weight	364 g (0.8 lb.)
Data Ports	<ul style="list-style-type: none"> 2 auto MDX, auto-sensing 10/100/1000 Mbps, RJ-45, PoE port (on one port)
Lock Options	<ul style="list-style-type: none"> Hidden latching mechanism Kensington Lock Hole T-bar Torx Bracket (902-0108-0000) Torx screw & padlock (sold separately)
Environmental Conditions	<ul style="list-style-type: none"> Operating Temperature: 0°C - 40°C Operating Humidity: 10% - 95% non-condensing
Power Draw	<ul style="list-style-type: none"> Idle: 4W Typical: 6.2W Peak: 11.2W

PERFORMANCE AND CAPACITY	
Concurrent Stations	Up to 512 clients per AP
Simultaneous Voip Clients	Up to 30 clients per AP

RF	
ANTENNA	<ul style="list-style-type: none"> Adaptive antenna that provides up to 512 unique antenna patterns per radio Full omnidirectional polarization diversity
PHYSICAL ANTENNA GAIN	Up to 3dBi
BEAMFLEX* SINR TX GAIN	Up to 6dB
BEAMFLEX* SINR RX GAIN	3-5dB (PD-MRC)
INTERFERENCE MITIGATION	Up to 15dB
MINIMUM RX SENSITIVITY	Up to -101dBm

* BeamFlex gains are statistical system level effects translated to enhanced SINR based on observations over time in real-world conditions with multiple APs and many clients

MANAGEMENT	
Deployment Options	<ul style="list-style-type: none"> Standalone (individually managed) Managed by ZoneDirector (3.81 & Above) Managed by SmartZone (3.0 & above) Managed by FlexMaster Managed by SmartCell™ Gateway 200 (2.5 & above)
Configuration	<ul style="list-style-type: none"> Web User Interface (HTTP/S) CLI (Telnet/SSH), SNMPv1, 2, 3 TR-069 vis FlexMaster
Auto Ap Software Updates	FTP or TFTP, remote auto available

WI-FI	
Standards	<ul style="list-style-type: none"> IEEE 802.11a/b/g/n/ac 2.4GHz and 5GHz
Supported Data Rates	<ul style="list-style-type: none"> 802.11n/ac: 6.5Mbps - 260Mbps (20MHz) 13.5Mbps - 600Mbps (40MHz) 29.3Mbps - 1300Mbps (80MHz) 802.11a: 54, 48, 36, 24, 18, 12, 9 and 6Mbps 802.11b: 11, 5.5, 2 and 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9 and 6Mbps
Radio Chains	3 x 3
Spatial Streams	3
RF POWER OUTPUT (Aggregate)	<ul style="list-style-type: none"> 28 dBm for 2.4GHz† 27 dBm for 5GHz†
Channelization	20MHz, 40MHz, 80MHz
Operating Channels	<ul style="list-style-type: none"> US/Canada: 1-11, Europe (ETSI X30): 1-13, Japan X41: 1-13 5 GHz channels: Country dependent
Frequency Band	<ul style="list-style-type: none"> IEEE 802.11 b/g/n: 2.4 - 2.484GHz IEEE 802.11a/ac: 5.15 - 5.25GHz, 5.25 - 5.35GHz, 5.47 - 5.725 GHz, 5.725 - 5.85GHz
Power Save	Supported
Wireless Security	<ul style="list-style-type: none"> WPA-PSK, WPA-TKIP, WPA2 AES, 802.1i Authentication via 802.1X with the ZoneDirector, local authentication database, support of RADIUS, and ActiveDirectory
Certifications**	<ul style="list-style-type: none"> US, Europe, Argentina, Australia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Egypt, Hong Kong, India, Indonesia, Israel, Japan, Korea, Malaysia, Mauritius, Mexico, New Zealand, Pakistan, Peru, Philippines, Russia, Saudi Arabia, Singapore, South Africa, Taiwan, Thailand & UAE WEEE/RoHS compliance EN-60601-1-2 (Medical) Wi-Fi Alliance EN50121-1 Railway EMC EN50121-4 Railway Immunity IEC 61373 Railway Shock & Vibration UL 2043 plenum rated 5GHz UNII-1 (2014)

† Maximum power varies by country
 ** For current certification status please see price list

PRODUCT ORDERING INFORMATION

MODEL	DESCRIPTION
ZoneFlex R600 Smart Wi-Fi 802.11ac Access Point	
901-R600-XX00	Concurrent dual band 802.11ac Access Point, no power adapter
Optional Accessories	
902-0108-0000	Spare, Accessory Mounting Bracket
902-0173-XXYY	Power Adapter, AC/DC wall plug 100-240Vac 50/60Hz
902-0162-XXYY	PoE injector (sold in quantities of 10 or 100)

PLEASE NOTE: When ordering ZoneFlex Indoor APs, you must specify the destination region by indicating -US, -WW, or -Z2 instead of XX. When ordering PoE injectors or power supplies, you must specify the destination region by indicating -US, -EU, -AU, -BR, -CN, -IN, -JP, -KR, -SA, -UK, or -UN instead of -XX.

For access points, -Z2 applies to the following countries: Algeria, Egypt, Israel, Morocco, Tunisia, and Vietnam

Warranty: Sold with a limited lifetime warranty.
 For details see <http://support.ruckuswireless.com/warranty>

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 17-01-A

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ruckuswireless.com





The Eaton 3S — Sleek. Savvy. Sophisticated.

The sleek, new Eaton® 3S delivers high efficiency and energy-saving battery backup and surge protection for your premium home and office equipment — ready to go right out of the box.

Eaton 3S features and benefits:

Ease-of-use: The plug-and-play functionality of the 3S allows you to start backing up your equipment the moment you take the unit out of the box. Gain automatic integration with Windows, Mac and Linux with a simple connection to a USB port.

EcoControl: The 3S manages your energy efficiency for you with EcoControl Master/Control outlets. When the item using the Master outlet (e.g., your computer) is idle or shut down, then items using the Control outlets (e.g., printer, scanner, fax) are automatically powered down — rewarding you with up to 30% in energy savings over a typical battery backup.

Modem design: The sleek design of the 3S allows you to display it alongside your high-tech equipment for a sophisticated look. This unit can also be wall- or desk-mounted for additional space savings.

Premium protection: The high-efficiency design of the Eaton 3S provides premium power protection for up to 10 devices, including those using data lines.

Intelligent Power Protector

By combining Eaton's Intelligent Power® Protector software with the 3S, you can monitor and manage all of the power devices on your network. You can even enable graceful shutdown of computers during an extended power outage.

To learn more, please visit:

www.eaton.com/intelligentpower

Services and support

Eaton provides product support 24 hours a day, 7 days a week. From battery replacement to full service plans, Eaton is one of the top service models in the industry.

Three-year warranty

The 3S warranty covers both the UPS and the batteries for three years. No other manufacturer in the industry offers as comprehensive a warranty.

Battery runtime

The 3S provides up to 45 minutes of battery backup. For a detailed interactive battery runtime chart, please visit www.eaton.com/3S — then view the individual technical specifications pages for details of each unit.



The compact, versatile 3S fits under a desk or mounts on the wall.



3S MODEL SELECTION GUIDE*

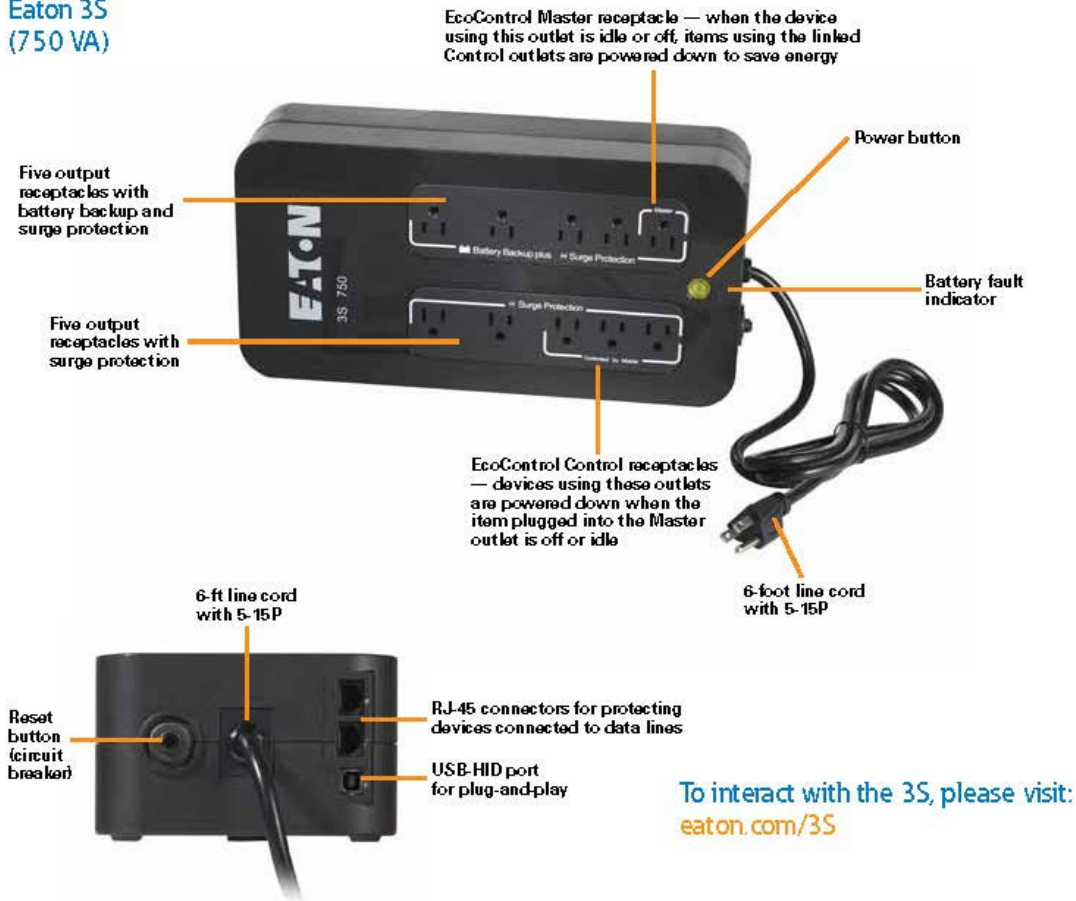
Catalog Number	Power rating (VA/Watts)	Input connection	Output receptacles***	Dimensions (H x W x D), in	Net weight, lb
120V, 50/60 Hz					
3S550	550/330	5-15P	(8) 5-15R	3.4 x 5.5 x 13.2	7.3
3S750**	750/450	5-15P	(10) 5-15R	3.4 x 6.7 x 13.2	9.7

* Due to continuous product improvement programs, all specifications are subject to change without notice. Please visit www.eaton.com/3S to view complete product specifications.

** This model has EcoControl energy savings capability. To enable EcoControl, download Eaton's Personal Solution-Pac software: www.eaton.com/psp.

*** On each unit, half of the receptacles provide battery backup and surge protection, half provide surge protection only.

**Eaton 3S
(750 VA)**



To interact with the 3S, please visit:
eaton.com/3S

Eaton Corporation
8609 Six Forks Road
Raleigh, NC 27615
United States
800.256.5794

Eaton.com/powerquality

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Printed in USA
3301 FCA
July 2011



The 3S is part of the UPSgrade program



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DataShield In-Line Surge Protector for Network and Phone Lines, 1-Line RJ45

MODEL NUMBER: DNET1



Protects network datalines on workstations, printers, hubs and other devices from blown NIC cards, garbled transmissions, lock-ups and hardware failures caused by surges, line noise, ESD, faulty wiring and lightning.

Description

Tripp Lite's DNET1 provides network Ethernet line surge suppression for 100Base-T, 10Base-T, Token Ring, AS400/Sys3x and RS422 applications. Surge suppression is handled with balanced arrays of high-speed avalanche diodes that divert excess energies created by electrostatic discharges, faulty wiring or lightning away from network interface connections. Tripp Lite network surge suppressors reduce blown NIC cards, garbled network transmissions, system lock-ups and hard equipment failure by safely shunting dataline surges to ground. Convenient RJ45 input and output connections with an included 5-inch Ethernet patch cable enables ideal protection for network workstations, printers and other internetworking devices with a network connection. For peace of mind, the DNET1 comes with a lifetime warranty and RoHS-compliant design.

Features

- DNET1 protects network workstations, printers and internetworking devices from surges present on 10/100Base-T, token ring, AS400/Sys3x or RS422 network lines
- Convenient RJ45 input and output connections make for simple installation (RJ45 input/output connections, pins 1-8, 7.5V clamping)
- 5 inch Ethernet patch cable enables ideal protection placed as close as possible to the point of use
- Surge suppression utilizing high speed avalanche diodes divert excess energies on the network to ground
- RoHS Compliance
- Lifetime Warranty

Highlights

- Network Ethernet line surge suppression for 100Base-T, 10Base-T, Token Ring, AS400/Sys3x and RS422 applications
- Ideal protection for NICs, terminals, hubs, printers, LAN equipment, and other internetworking devices
- Protects against the effects of electrostatic discharge, faulty wiring and lightning
- Reduces blown NIC cards, garbled network transmissions, system lock-ups and hard equipment failure
- 750A circuit breaker; 7.5V nominal clamping voltage
- RJ45 input and output connections with included patch cable

Package Includes

- DNET1 dataline protector
- 5-in. RJ45 patch cable
- Warranty information and instruction manual



Tripp Lite
1111 W. 35th Street
Chicago, IL 60609 USA
Telephone: 773.869.1234
www.tripplite.com

Specifications

OVERVIEW	
UPC Code	037332011435
OUTPUT	
Output Receptacles	(1) Network
Circuit Breaker (amps)	750
Right-Angle Outlets	No
INPUT	
Nominal Input Voltage(s) Supported	120V AC; 230V AC
Recommended Electrical Service	120V, 230V
Input Plug Type	RJ45
Input Cord Length (ft.)	0
Right-Angle Plug	No
Input Cord Length (m)	0.00
Integrated Cord Clip	No
USER INTERFACE, ALERTS & CONTROLS	
Diagnostic LED(s)	No
SURGE / NOISE SUPPRESSION	
AC Suppression Joule Rating	0
Clamping Voltage (RMS)	7.5
Auto Shut-Off	No
DATALINE SURGE SUPPRESSION	
Telephone/DSL Protection	Yes
Telephone/DSL Protection Details	1 line
Cable (Coax) Protection	No
Network (Ethernet) Protection	Yes
Additional Dataline Protection	1-8
PHYSICAL	
Anti-Microbial Protected	No
Color	Light Gray



Tripp Lite
1111 W. 35th Street
Chicago, IL 60609 USA
Telephone: 773.869.1234
www.tripplite.com

Integrated Keyhole Mounting Slots	No
Shipping Dimensions (hwd / cm)	15.24 x 7.62 x 5.08
Shipping Dimensions (hwd / in.)	6.00 x 3.00 x 2.00
Shipping Weight (kg)	0.11
Shipping Weight (lbs.)	0.23
WARRANTY	
Product Warranty Period (Worldwide)	Lifetime limited warranty

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CAT6-75-110 IN/RJ 45 OUT - SOLID-STATE BUILDING ENTRANCE PROTECTORS



Features:

- UL listed for Primary (497) and Isolated Loop (497B) applications
- Exceeds TIA/EIA Standards 568 and 758 for CAT6 performance
- Solid-state protection for fastest response
- Use between buildings in a campus environment as a building entrance protector or in hostile industrial applications as an isolated loop protector
- For use with CISCO POE systems
- Can be used in high power POE (POE+) applications
- **Expandable System Protection** - SurgeGate Modules can be attached to one another to expand system protection as your system grows
- **5 Year Product Warranty** - This surge protector shall be free of any defects in design, materials, or workmanship, or ITW Linx will repair or replace the defective product
- **\$50,000 Connected Equipment**



Questions on ordering? Call us at 1-800-278-5666

Visit us at: www.itwlinx.com



TECHNICAL SPECIFICATIONS

PRODUCT SPECIFICATIONS:

Agency Approval	UL Primary (497) and Isolated Loop (497B)
Grounding Requirements	See Technical Reference at www.itwlinx.com
Recommended Grounding Impedance	<0.5 Ohm
Width / Height / Depth / Weight	4.25" / 4.25" / 1.5" / 0.42 lbs
Product Warranty	5 Years
Connected Equipment Warranty	Up to \$50,000

SIGNAL LINE SURGE PROTECTION: (TELCO)

Signal Perfect Circuitry	Yes
Fused	Yes
Performance Rating	Cat6
Clamping Level	75V
Response Time	1-5 Nanoseconds
Capacitance	<5pF
Wires Protected	4-pairs
Termination Type	110 Punchdown In/RJ 45 Out

ORDERING INFORMATION

Part Number	Description
CAT6-75-110 In/RJ 45 Out	Protects high-performance 4-pair CAT6 Outside Plant Cables as well as CAT6 UTP cables for voice or ISDN low-voltage (digital, 75V) applications. Uses 110 punchdown In/RJ45 Out.



Questions about ordering? Please contact us at 1-800-336-5469
 Contact an authorized distributor for pricing
 Visit us at www.itwlinx.com