



## PacketAssure™ iQ1000

### Intelligent Quality of Service for Tactical IP Networks

- Predictable application performance through reliable bandwidth management
- Rapid QoS policy changes as missions change
- Reduced IP training requirements from ease of use features such as configuration wizards and policy templates
- Migrate to Unified Capabilities with serial-to-IP interfaces, DSCP marking and DSCP gateway features
- Lower cost of ownership from rugged module design that consolidates assets and trims spares inventory
- Transport combat services such as sensor data and fire missions across C4 networks and leased line facilities

All Services of the US Department of Defense are working toward establishing Unified Capabilities with Real Time Services. Creating predictable, flexible, converged networks is challenging. New, high priority applications and users are emerging on both secure and non-secure networks. IP traffic management requirements and policies are outstripping the capacity of deployed IP network routers, the skill level of technical staff and budgeted procurement dollars. Network architects must choose solutions that accommodate legacy platforms and support future network and interoperability requirements.

The PacketAssure™ iQ1000 Service Delivery Manager, designed and manufactured by Ultra Electronics DNE Technologies, provides comprehensive Quality of Service (QoS) for all communications traffic in a high performance switching system, assuring that application delivery meets mission objectives. Customizable traffic classification, marking and other QoS mechanisms enable prioritization of critical user traffic. This simplifies the creation, operation and administration

of a Unified Capabilities infrastructure that can offer and guarantee delivery of high priority services when needed. With the PacketAssure iQ1000, decision makers can be certain that key information is being delivered on time.

Designed for reliability in harsh tactical domains, PacketAssure iQ1000 hardware surpasses standard COTS equipment in all aspects of environmental resilience and system availability in the field. With an assortment of field-upgradeable, hot-swap interface option modules, the PacketAssure iQ1000 enables migration from legacy networks to unified communications architectures at the network planners' pace, transitioning existing assets only as required.

The PacketAssure iQ1000 is uniquely designed to operate over constrained communications facilities (packet, serial data transport, and T1/E1 networks) used by tactical military services and other government agencies.



Comprehensive IP-based traffic management functionality provides coarse- and fine-grained control of service prioritization on a per-flow basis. An extensive list of traffic classifiers at Layers 1-4, coupled with a host of prioritization policies and eight customizable service queues, provide complete traffic management flexibility, from latency-sensitive voice and video to best-effort data. Sophisticated admission control, queuing and congestion management assures key personnel access to scarce network resources, when and where they need it.

The PacketAssure iQ1000 breaks new ground in user management with its iQ Manager Web User Interface. Featuring Web 2.0-based format, iQ Manager provides an intuitive presentation to the iQ1000 feature set, along with extensive customization capabilities. Network planners and designers can “tune” the graphical workflow to meet specific operator skill sets and mission requirements. A traditional Command Line Interface provides a user alternative to ensure broad compliance with diverse DoD requirements. In-band and out-of-band management connections, accessible

locally and remotely, provide secure communication paths that are physically and logically separate from user traffic.

Embedded Information Assurance controls ease certification and accreditation processes, and allow operators to safely manage information-related risks. Login services, bandwidth management, data plane confidentiality, system integrity and Denial of Service mechanisms are built into every PacketAssure iQ1000, structured in accordance with IA implementation instructions set forth in DoDI 8500-2 and related documents. FIPS 140-2 Validation and the Defense Information Systems Agency (DISA) Joint Interoperability Test Command (JITC) testing and certification ensure smooth and secure integration in DoD networks providing Unified Capabilities.

Overall, the PacketAssure iQ1000 Service Delivery Managers provides a robust, economical and powerful alternative that unifies communications traffic and guarantees prioritized service delivery to meet exacting mission objectives.

<b>Specifications</b>	
Quality of Service	Eight Classes of Service (CoS) per port. Packet assignment to CoS using IEEE 802.1p, DSCP/TOS or fine-grained packet classification. DoD/UCR DSCP support  Min/max shaping per Class of Service or per port. Three drop precedence colors.  Per-port, per CoS drop profiles. Ingress packet triggers for back pressure. Strict Priority (SP), Weighted Deficit Round Robin (WDRR), Color-aware Random Early Detection (RED)
QoS Modes	IEEE 802.1p, DoD/UCR-DSCP, Fine-Grained (custom)
Classification Criteria (fine-grained mode)	Ingress interface, egress interface, VLAN ID, P-Bit value, source MAC address, destination MAC address, EtherType value, IP version (v4 and/or v6), transport protocol, DSCP value, source subnet, destination subnet, source port range, destination port range
Maximum Number of Classifications	1024
Policy Actions	Monitor flow, set alarm threshold, mirror to additional interface, drop flow, direct to assigned interface, assign to CoS queue, assign DSCP value, assign meter mode, assign CIR/CBS/PIR/EBS, police traffic
Maximum Number of Policies	1024
Service Classes (Queues)	Control, Circuit Emulation, Voice, Video, Streaming, Interactive, File Transfer, Best Effort
DSCP	Per port, per flow DSCP remarking. DSCP remarking based on Classification Criteria match
<b>Software Features</b>	
Packet Sizes Supported (Link Layer)	64 - 1522 bytes
Layer 2 Switching	Supports learning up to 16K MAC addresses. Also supports static entries. Line rate switching for all supported packet sizes. Independent VLAN learning. VLAN flooding for broadcast and DLF packets. Hardware-based address learning. Hardware and software-based aging. Per port limiting of MAC learning

Layer 2 Multicast	Supports 1024 Layer 2 multicast groups. Line rate switching for all supported packet sizes
VLAN	Supports 4090 VLANs per system, MAC-based VLANs, protocol-based VLANs, IP subnet-based VLANs, IEEE 802.1p, IEEE 802.1Q. Independent VLAN learning (IVL). VLAN-based packet ingress filtering for IEEE 802.1Q VLAN security
Spanning Tree	Supports IEEE 802.1D-2004
Protocols Supported	IP Stack: Ethernet, VLAN, STP/RSTP, L2 Multicast, MAC Bridging, IPv4, IPv6, TCP/UDP, RTP, RTCP, NTP, SFTP, unstructured CES, EoPDH
Information Assurance	SSH, TLS 1.0, PacketAssure Managed Data. All ports Admin Down as Factory Default. Per port blocking. Per MAC address blocking. IA Controls per DoDI 8500.2
<b>Hardware Features</b>	All PacketAssure iQ hardware is designed for operational superiority over traditional COTS designs, using industrial-grade components, robust VHDM connectors and all-metal rigid chassis construction
Maximum Data Transfer	18 Gbps, non-blocking
Maximum Interface Option Interfaces	Up to 18 @ 1Gbps each
Field Replaceable Modules	Packet Switching Module, Interface Option Modules, System Interface Module, Power Supply Units, Fan Array, Air Filter
Hot-Swappable Modules	All Interface Option Modules, System Interface Module, Fan Array, Air Filter
Mounting	19" EIA rack mountable or tabletop. Mounts to flange depths 18" – 24" using included four-corner brackets. Brackets support fore/aft mounting
Dimensions	17.5" (445mm) W x 15.0" (381mm) D x 1.75" (45mm) H
Weight	13.5 lbs. (6.1Kg ) fully loaded
<b>Electrical</b>	
AC	90-130/180-264 VAC, 2.0/1.0 A, 47-63 Hz, auto-ranging
Power Dissipation	62 – 177 W, configuration dependent
Environmental	FCC Part 15 Class B, EN55022:2006, EN66000-3-2, EN61000-3-3 MIL-STD-810, Method 516.5, Procedure VI, Bench Handling Shock MIL-STD-810, Method 514.5, Procedure I, General Vibration MIL-STD-810, Method 514.5, Procedure II, Loose Cargo Vibration MIL-STD-810, Method 516.5, Procedure I, Functional Shock MIL-STD-810, Method 510.4, Procedure I, Blowing Dust MIL-STD-810, Method 510.4, Procedure III, Settling Dust
Operating Temperature	-20°C to +60°C fan-cooled, per MIL-STD-810, Method 501.4, Procedure II
Storage Temperature	-30°C to +75°C, per MIL-STD-810, Method 501.4, Procedure I
Humidity	Up to 95% RH over a 20°C to +60°C range, non-condensing per MIL-STD-810, Method 507.4
Operating Altitude	0 - 15,000 feet (4,600 m), per MIL-STD-810, Method 500.4, Procedure II
Storage Altitude	0 - 40,000 feet (12,192 m), per MIL-STD-810, Method 500.4, Procedure I
System Timing	Recoverable via Serial Interface Option Module or station timing interface. Station timing interface accepts RS-422 (Balanced), Bi-Polar/Zero-Cross and Single-Ended TTL signal. Up to three timing sources may be configured, in addition to internal oscillator (Stratum 3E) and holdover. Automatic switchover and switchback between timing sources

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<b>Management</b>	
Local Management/ Control Ports Supported	One serial RJ-45, user-configurable 9600 bps – 115200 bps One 10/100 Ethernet RJ-45
Management Interfaces	iQ Manager Web User Interface; Command Line Interface, SNMPv3
Management Framework	Fault, Configuration, Administration, Performance and Security Management. All management connections secured via SSH or TLS. In-band & Out-of-band, local & remote connectivity. All connectivity methods and user privileges under admin control
<b>Interface Option Modules (IOMs)</b>	All Interface Option Modules can be installed in any position in the PacketAssure iQ1000
<b>Ethernet IOM</b>	Six ports per module
Operating Modes	10BASE-T, 100BASE-T, 100BASE-TX, 100BASE-FX, 1000BASE-X per IEEE 802.3; Auto-Negotiate and Auto MDI/MDIX (copper)
Operating rates	10/100/1000Mbps
Physical Ports	Four shielded RJ-45 female connectors, plus two Small Form factor Pluggable (SFP) receptacles for optional copper/fiber connections
<b>Serial IOM</b>	Four ports per module
Operating Modes	Unstructured CES (DCE) mode, Framed Ethernet (Transport) mode, user-selectable per individual port; with Adaptive Transport, Auto CoS (ATAC)
Operating Rates	All rates listed in bits per second
CES (DCE) Mode	600, 2400, 4800, 9600, 16K, 19.2K, 32K, 38.4K, 64K, 128K, 256K, 288K, 384K, 512K, 576K, 768K, 1.024M, 1.536M, 2.048M, 3.072M, 4.096M, 4.608M, 5.120M, 6.144M, 8.192M, 10.240M, 12.288M, 16.384M, 18.432M, 20.000M, 22.000M; symmetric/asymmetric
Transport (DTE) Mode	64K, 128K, 256K, 288K, 384K, 512K, 576K, 768K, 1.024M, 1.536M, 2.048M, 3.072M, 4.096M, 4.608M, 5.120M, 6.144M, 8.192M, 10.240M, 12.288M, 16.384M, 18.432M, 20.000M, 22.000M; symmetric/asymmetric
Physical Ports	TIA/EIA-530-A
<b>T1/E1 IOM</b>	Four ports per module
Operation Modes	T1 (ANSI T1.102) for DS1; E1 (ITU G.703)
Operating rates	T1: 1.544Mbps or E1: 2.048Mbps
Physical Ports	USOC RJ-48C
Certifications	FIPS 140-2, Level 2 (pending) DISA JITC UC Testing & Certification (pending)



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