INNOMEDIA

ESBC 9580-4B

DOCSIS 3.0 CABLE MODEM INTEGRATED ENTERPRISE SESSION BORDER CONTROLLER

HIGHLY INTEGRATED ESBC WITH A BUILT-IN T1/E1 PRI (or CAS) GATEWAY, IDEAL FOR MSOs OFFERING SIP TRUNKING AND HIGH-SPEED DATA SERVICES TO IP AS WELL AS TDM PBX CUSTOMERS

Key Benefits

A clear demarcation solution for cable operators to deliver SIP trunking, hosted voice, and broadband internet services to business customers with TDM PBX, IP-PBX and IP-Phones

Smart-DQoS™ for end-to-end QoS with or without PacketCable Multimedia
- Instant service quality improvement
- Minimum infrastructure investment
- Time to market

Multiple functions allowing MSOs to offer bundled services
- B2BUA and Registrar for SIP trunking
- SIP ALG for hosted voice service
- Transparent bridge port for high-speed data service

Highly integrated unit for easy installation and management
- Embedded DOCSIS 3.0 Cable Modem (eCM)
- Embedded Session Border Controller (eSBC)
- FXS ports
- T1/E1 PRI (or CAS) gateway
- Internal intelligent batteries

Combined IP and TDM solution
- Extending SIP trunking services to IP and TDM PBX customers
- Allowing enterprise customers easy transition from TDM to IP telephony

DOCSIS 3.0 Cable Modem module with 8x4 channel bonding and 24 UGS SIDs
- >300 Mbps downstream and 120 Mbps upstream high speed data service
- Up to 24 UGS service flows without MGPI

Flexible SIP normalization for scalable and rapid service deployment
- Header manipulation and flow adaptation eliminate user agent signaling variations
- Profile based IPPBX configuration for easy deployment
- SIPConnect compliant
- IMS compliant
- Special call handling and SIP Normalization for Emergency Calls
- Advanced media processing for DTMF and voice CODEC transcoding

Rich voice and network metrics for performance monitoring and quality analysis
- Voice metrics: R-Factors, MOS scores
- Network metrics: Network jitter, delay, packet loss
- CDR records
- Test agent for quality testing
- SNMP traps for quality alarms
- Battery status
- Data monitoring throughput tools

Business environment friendly
- PBX (Ground start/Loop start & OSI)
- FAX (T.38 and G.711 fallback)
- House wiring with foreign voltage detection
- Credit card reader transaction

Security
- TLS for signaling
- Stateful Inspection, IDS/IPS
- Access control

Designed for MSOs offering SIP trunking, hosted voice, and high-speed data services, InnoMedia's ESBC 9580-4B is a highly integrated and highly manageable Enterprise Session Border Controller (ESBC) that can be auto-provisioned and remotely managed. With InnoMedia's exclusive *Smart*-DQoS™ technology enabling device-initiated DQoS UGS service flow establishment, ESBC 9580-4B is ideally suitable for MSOs offering bundled services with end-to-end quality of service over HFC cable plants. Its B2BUA and SIP ALG capabilities enable wide deployment by MSOs addressing SIP-PBX interoperability for SIP Trunking as well as providing simple NAT Traversal for Hosted PBX Services, and its embedded DOCSIS 3.0 cable modem with 8x4 channel bonding and 24 UGS SIDs allows high speed data throughput and 24 simultaneous SIP sessions without requiring MGPI support. The built-in T1/E1 PRI (or CAS) gateway further extends MSOs SIP trunking service offering to traditional PBX customers who do not want to retrofit their existing TDM equipment, or are in transition from TDM to IP based telephony solutions.

Integrated with DOCSIS 3.0 embedded cable modem (eCM), embedded Session Border Controller (eSBC), the *Smart*-DQoS™ technology, a T1/E1 module, intelligent internal battery, and an interface for external UPS, InnoMedia ESBC 9580-4B offers 4 FXS ports, a SIP trunk path for enterprise IP-based UAs (IP-PBXs) or TDM-based PBXs, a SIP ALG path for Hosted IP-PBX or IP Centrex Services, and a bridge/pass-through path for high speed data.

The ESBC 9580-4B eCM is a DOCSIS 3.0 cable modem with 8x4 channel bonding and 24 UGS SIDs. It offers a maximum of over 300 Mbps of downstream throughput and 120 Mbps of upstream throughput. The 24 UGS SIDs make it possible to have 24 simultaneous UGS SIP trunk sessions or SIP ALG sessions without using the Multiple Grants per Interval (MGPI) scheme.

Smart-DQoS™ enables ESBC9580-4B to intelligently initiate and manage DQoS Unsolicited Grant Service (UGS) service flows based on user and SIP signaling events, while directing non-real time data traffic to DOCSIS Best Effort (BE) service flows. It instantly enables MSOs to offer bundled services with end-to-end QoS without having to wait for PacketCable Multimedia based network infrastructure enhancement.

The SIP trunk path provides SIP normalization, NAT traversal, topology hiding, and security for MSOs offering SIP trunking service to enterprise customers with diverse IPPBX and network configurations. It includes B2BUA for SIP normalization, a Registrar for User Agent (UA) registration, TLS block for secured signaling, and NAT traversal for proper SDP address translation. The UA (e.g., IPPBX) registers to and communicates with the ESBC which terminates UA traffic and re-initiates normalized SIP packets to communicate with the MSOs' network servers. Together with *Smart*-DQoS™, the MSO is able to offer QoS ensured SIP trunking service.

The SIP ALG path enables MSOs to offer Hosted PBX Services with NAT traversal, TLS security for signaling, and header manipulation. It allows SIP packets of registered UAs (e.g., IP Phones) to traverse through to communicate with the network servers. The UAs register to the designated network servers, and point to the ESBC as the default gateway. Together with *Smart*-DQoS™, the MSO is able to offer QoS ensured hosted voice/IP Centrex service.

The bridge path is a transparent pass-through port, allowing undisrupted high-speed data to go through. It is intended for MSOs to offer high-speed data services.

The T1/E1 module can be configured to support either ISDN PRI or CAS signaling. It provides two T1/E1 ports for enterprise's legacy TDM PBXs. The T1/E1 TDM voice traffic is converted to VoIP and processed by the ESBC 9580-4B B2BUA module to connect to service provider's SIP trunks.

The ESBC 9580-4B, located at the edge of the HFC access networks, can be managed by the MSO with secured HTTP-based auto-provisioning and SNMP-based remote management. It offers an ideal demarcation between the MSO and its enterprise customers.

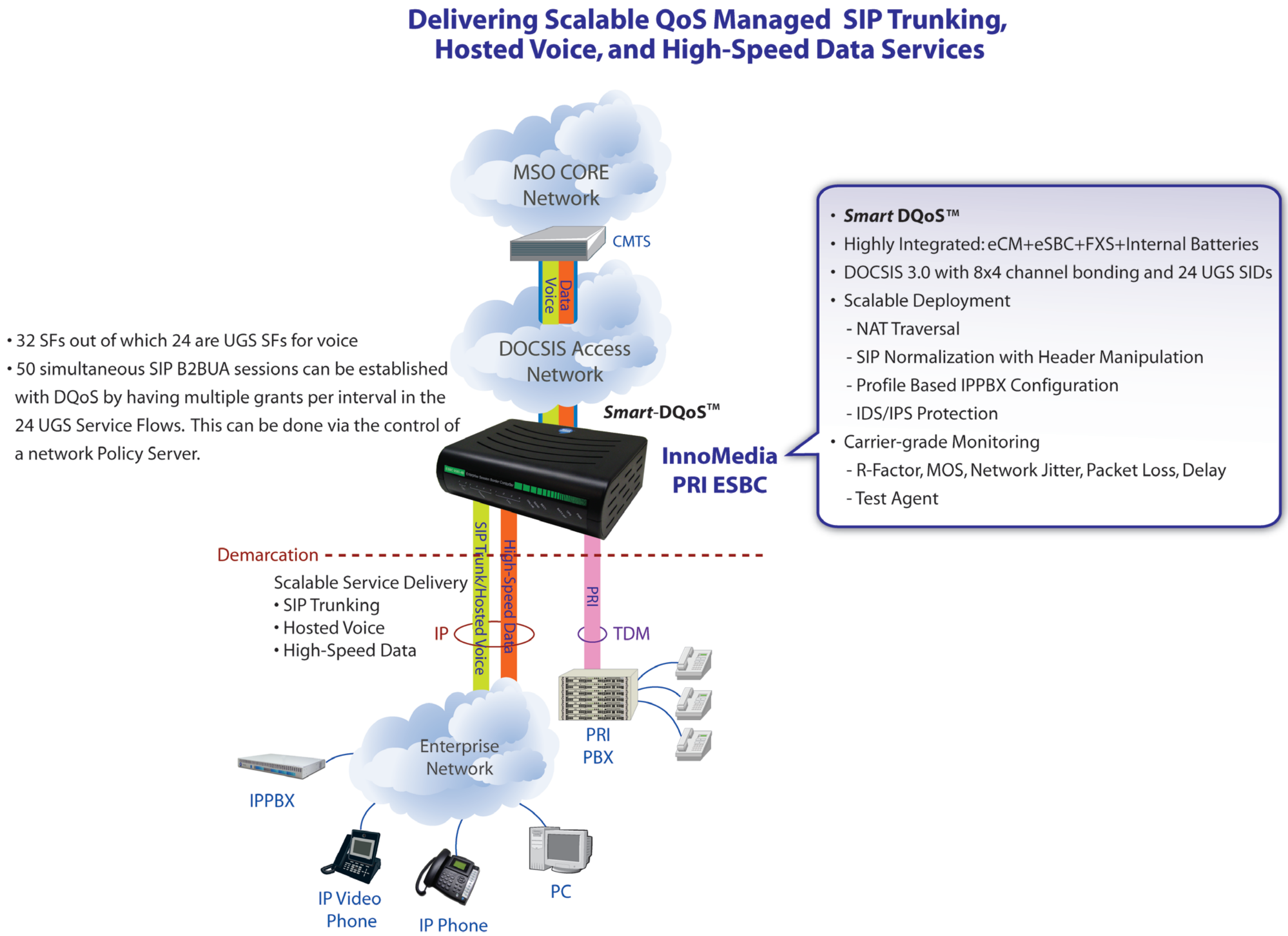


Figure 1

The highly integrated ESBC9580-4B includes the following key functional blocks:

1. Embedded DOSCIS 3.0 cable modem with *Smart*-DQoS™
2. Intelligent internal battery as well as external UPS support
3. Four FXS ports with business friendly features
4. Two T1/E1 Trunk Ports Interfacing Traditional PBXs
5. eSBC function supporting MSO's SIP trunk business
6. SIP ALG for hosted voice SIP traffic
7. Bridge/pass-through port for MSO's high-speed data services
8. Stateful inspection protecting the eSBC, FXS, and the SIP Proxy/ALG path
9. Voice and network Monitoring

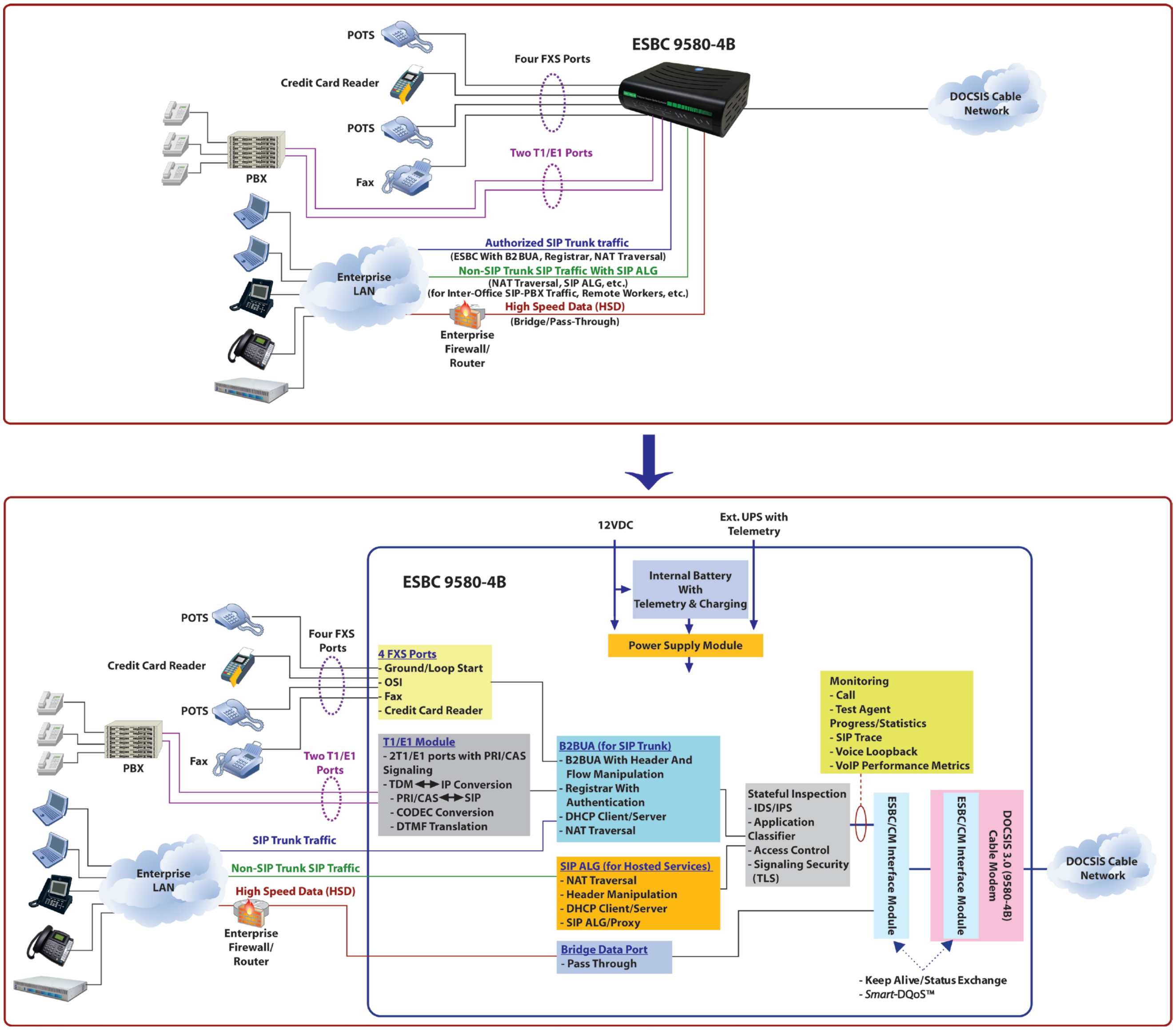


Figure 2

Embedded DOSCIS 3.0 Cable Modem

Integrated with an embedded DOCSIS 3.0 cable modem module, the ESBC 9580-4B works with or without policy servers to manage DQoS service flows to ensure voice service QoS. With *Smart*-DQoS™, the ESBC 9580-4B can also intelligently initiate DQoS UGS service flows without the need of a policy server. The ESBC is aware of creating new SIP Trunking Sessions, therefore, can initiate and manage Dynamic Service Flows via DSX (DSA, DSC, and DSD) message exchanges with the CMTS.

With 8x4 channel bonding, the ESBC 9580-4B offers a maximum of over 300 Mbps of downstream throughput and 120 Mbps of upstream throughput. The eCM's 24 UGS SIDs allows 24 simultaneous UGS SIP trunk sessions or SIP ALG sessions without using the Multiple Grants per Interval (MGPI) scheme.

The ESBC 9580-4B also supports PacketCable Multimedia-based MGPI to allow multiple calls within one service flow, thus, allowing more than 24 simultaneous voice calls in the 24 available UGS service flows. An example of MGPI is shown in Figure 1 in which 50 simultaneous calls are supported with 24 Unsolicited Grant Service (UGS) Service Flows. The embedded DOCSIS 3.0 cable modem module can be provisioned via standard DOCSIS provisioning.

Integrated Internal Battery As Well As External UPS Support

The ESBC 9580-4B is equipped with an internal battery supporting up to 4 hours of continuous talk time for all 4 telephone lines and the TDM PBX trunk lines. It also has a UPS port to connect to external UPS batteries to allow service provider to offer primary line voice services. An Internal and External Battery LED as well as SNMP traps for remote monitoring indicates when the internal or external battery is in-use, charging, fully charged, faulty, or bad.

Four FXS Ports with Business Friendly Features

InnoMedia's ESBC 9580-4B includes 4 voice ports that deliver revenue generating telephony services to their enterprise customers. It has rich set of business features including ground start/loop start and OSI for business PBX's, foreign voltage detection to allow house wiring and prevent accidental connection of house wires to live PSTN, T.38 and G.711 fallback fax support, reliable Bell103/212A modem transmission for credit card reader information transaction, and RJ11 DC open loop for loss of voice link indication to allow alarm triggering.

Two T1/E1 Trunk Ports Interfacing Traditional PBXs

The ESBC 9580-4B includes one or two T1/E1 trunk interfaces to connect to traditional PBXs running various network interface protocols for various switch types – 4ESS, 5ESS, DMS100, NI-1, NI-2, NET5 or NTT. These trunk interfaces can be configured for either PRI or CAS signaling. The ESBC 9580-4B is responsible to convert TDM traffic into its B2BUA SIP traffic and vice versa.

eSBC Function Supporting MSO's SIP Trunk Business

Using B2BUA, the ESBC 9580-4B supports the key functions needed by the MSOs to offer reliable and scalable SIP trunk services to their enterprise customers. It supports up to 50 simultaneous B2BUA sessions. The key functions that are supported by the ESBC 9580-4B include:

1. SIP Normalization:
   Based on the B2BUA architecture, InnoMedia's ESBC 9580-4B provides Profile based settings, High-level classification for SIPConnect Adaptation, and Low-level header manipulation for SIP signaling normalization:
   - Profile based settings:
     ESBC 9580-4B allows parameter and option settings to adapt between the two interfaces: the WAN interface to the MSO servers, and the LAN interface to the UA/SIP-PBXs. The settings are stored as SIP Trunk profiles and the UA/SIP-PBX profiles respectively for selection.
     - For each SIP-PBX, the settings are captured in a UA/SIP-PBX specific Profile. Thus, an SI only needs to choose the profile corresponding to the specific SIP-PBX for easy system setup (see Figure 3).
     - Based on the MSO's network servers, the parameters/options are captured in the corresponding SIP Trunk profile (see Figure 4).

   The SIP normalization and adaptation mechanisms are:
   - High-level classification for SIPConnect Adaptation (see Figure 4):
     - Adapts between non-SIPConnect-compliant UA/SIP-PBXs and MSO's Servers which are compliant or non-compliant to SIPConnect
     - Adaptation includes Registration (takes care of different forms of registration, e.g., Implicit, explicit, static/no registration), Security (TLS, SIP Digest), TCP versus UDP for SIP message transport, Redirect Handling (Out-of-dialog Diversion, 3xx, REFER, etc.), URI Formatting, Anonymous calls, and others.
   - Low-level header manipulation for fine-grain adjustment (see Figure 3)
     - Selectable header manipulation options, examples:
       - Remove headers in 180 responses, Remove RFC 2543 Hold, Strip ICE attributes, Loose routing, Expires header, Loose Username check, Force Remote TLS connection reuse, etc.

2. Registration and Authentication:
   Acting as a registrar server to SIP-PBXs, the InnoMedia ESBC 9580-4B supports the following SIP-PBX registration methods:
   a) Implicit registration – SIP-PBX with Dynamic or Static IP address sends registration of the Parent Number
   b) Explicit registration – SIP-PBX with Dynamic or Static IP address sends registration of all SIP User Accounts
   c) Static registration – SIP-PBX with Dynamic or Static IP address does not send any registration messages.
3. NAT Traversal:
   – Inspects and modifies headers, SDP, and implement media relay via RTP bridge control.

4. SIP signaling security:
   – TLS: ESBC 9580-4B supports TLS connection with the MSO network (authenticate MSO servers) for secured signaling transport, as well as SIP Digest authentication (challenged and authenticated by the MSO servers).
   – SIP Message Validation: ESBC 9580-4B validates all SIP messages

5. Emergency Call Handling
   – Special call handling and SIP header manipulations for emergency calls
   – Line Preemption to always allow emergency calls regardless of session limits
   – Media manipulation to force CODEC and disabling voice activity detection
   – Overriding caller ID and caller name information

SIP ALG for Hosted Voice SIP Traffic

The SIP ALG path is intended for MSOs offering hosted voice or IP Centrex service. It is equipped with NAT traversal and TLS signaling security, and supports up to 200 simultaneous SIP ALG sessions. The SIP ALG inspects SIP messages and states, and allows SIP packets of successfully registered UAs (e.g., IP Phones) with legitimate SIP states to communicate with the network servers. The NAT traversal module makes necessary modifications to the headers and SDPs to allow SIP packets to successfully traverse through NAT.

The SIP ALG block also contains a DHCP server with Option control (e.g., Option 66) which can be used as the designated DHCP server for the MSOs' hosted UAs (IP Phones).

Bridge/Pass-Through Port For MSO's High-Speed Data Services

The ESBC 9580-4B allows one of its LAN ports to be configured as a bridge to its WAN interface. This bridge port can be used by the MSO to offer high speed data services. The MSO can deliver global IP addresses to its enterprise customers who can connect this bridge port to the enterprise firewall.

Stateful Inspection

A stateful inspection with IDS/IPS can be enabled or disabled for the FXS ports, the SIP trunk traffic path, as well as the Non-SIP Trunk SIP traffic path to protect these paths from unauthorized access or attacks. The bridged/pass-through port is not protected by the firewall, and is typically connected to the enterprise firewall which has its protection policy.

Monitoring

The monitoring features including CDR, real-time UA & SIP trunk call states, SIP Call Trace, battery status, packet loopback for server-based Voice Quality Monitoring, R-Factor and MOS calculation for every call, and SNMP Traps based on thresholds of network call parameters. The ESBC also works in conjunction with InnoMedia's DMS Server for monitoring and analysis of MOS scores, Data Network Traffic and CDR information.

UA/SIP-PBX PROFILE

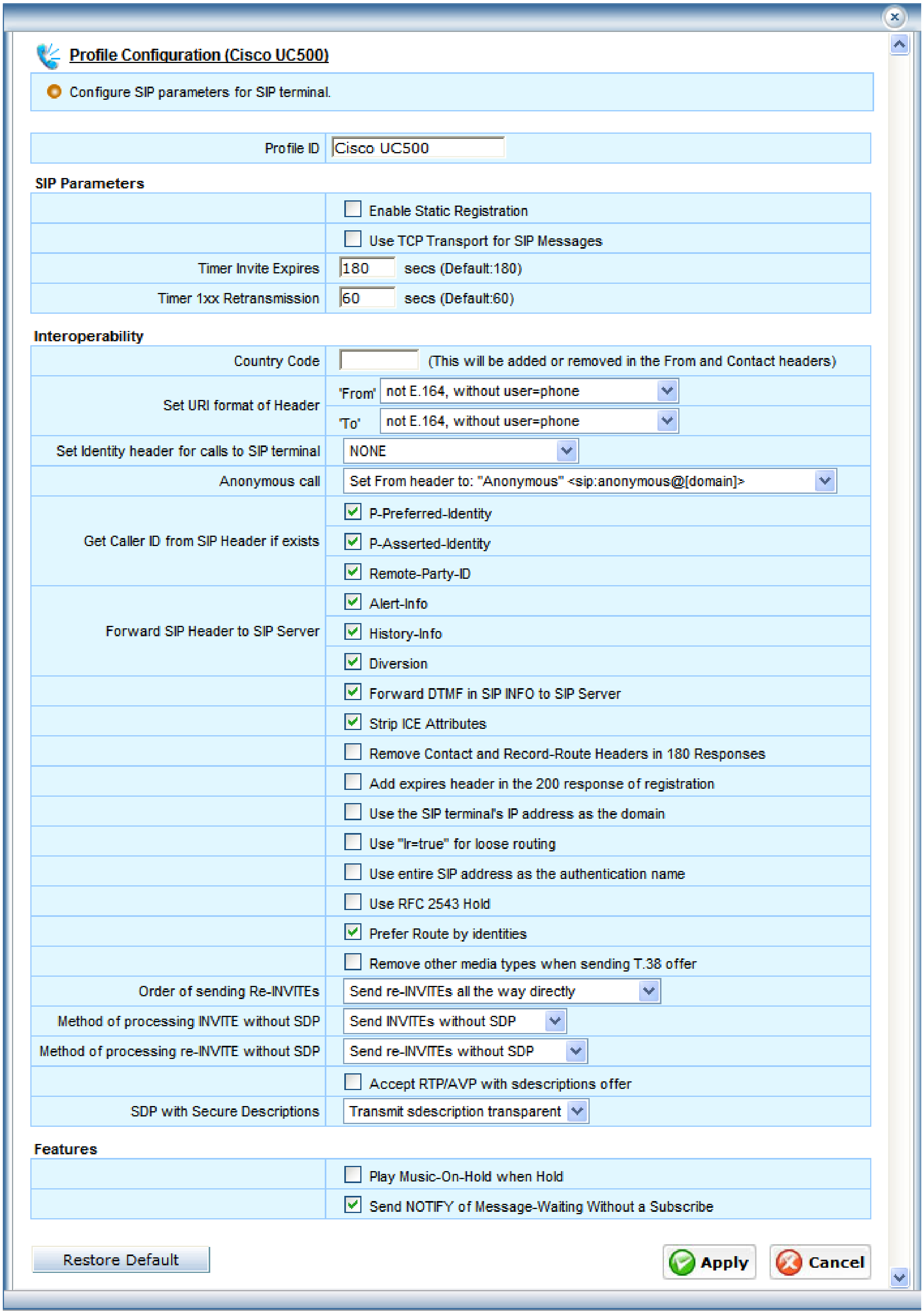


Figure 3

SIP TRUNK PROFILE

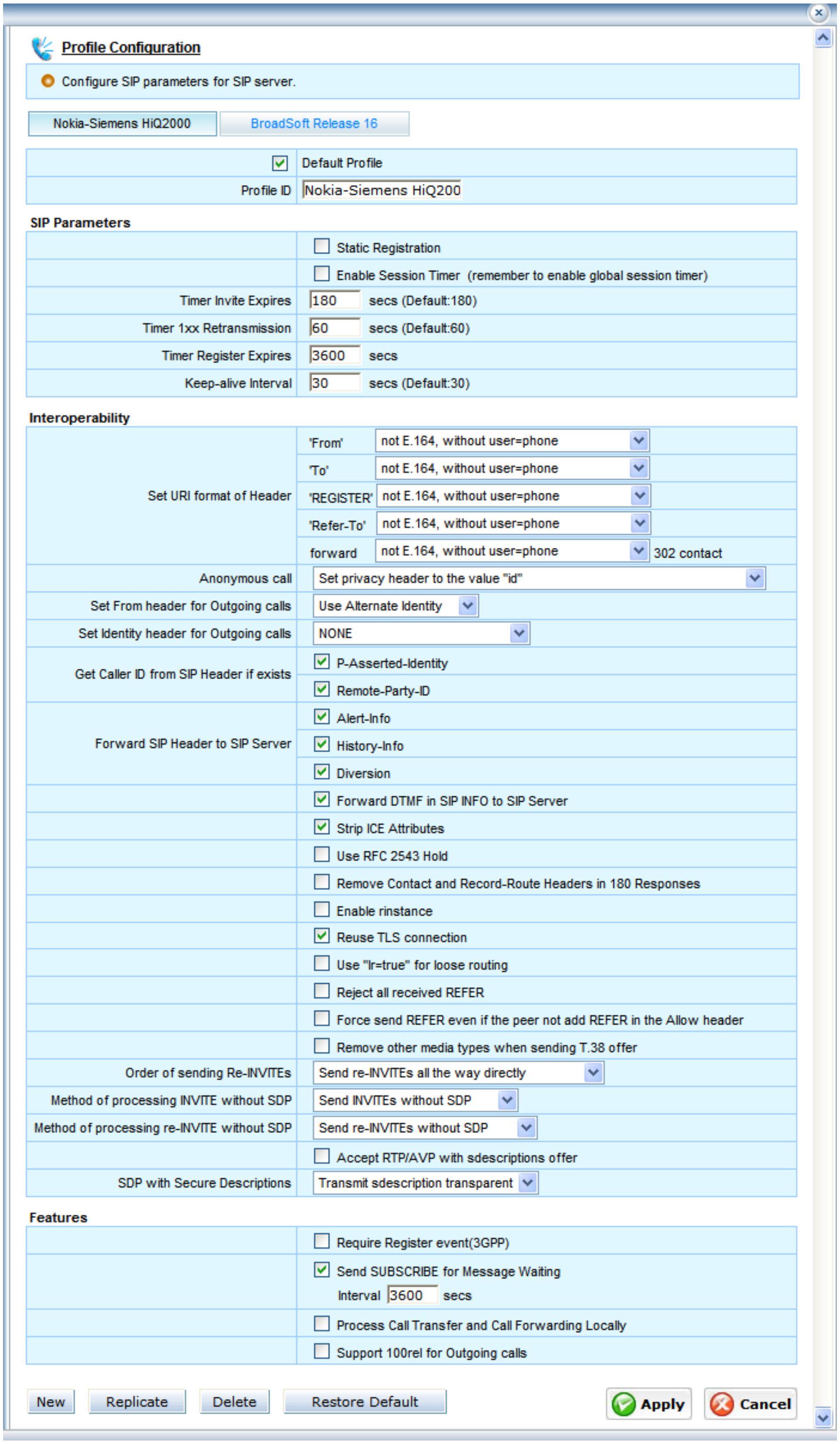


Figure 4

REAL-TIME LINE CALL STATES, CDR, AND CALL STATISTICS

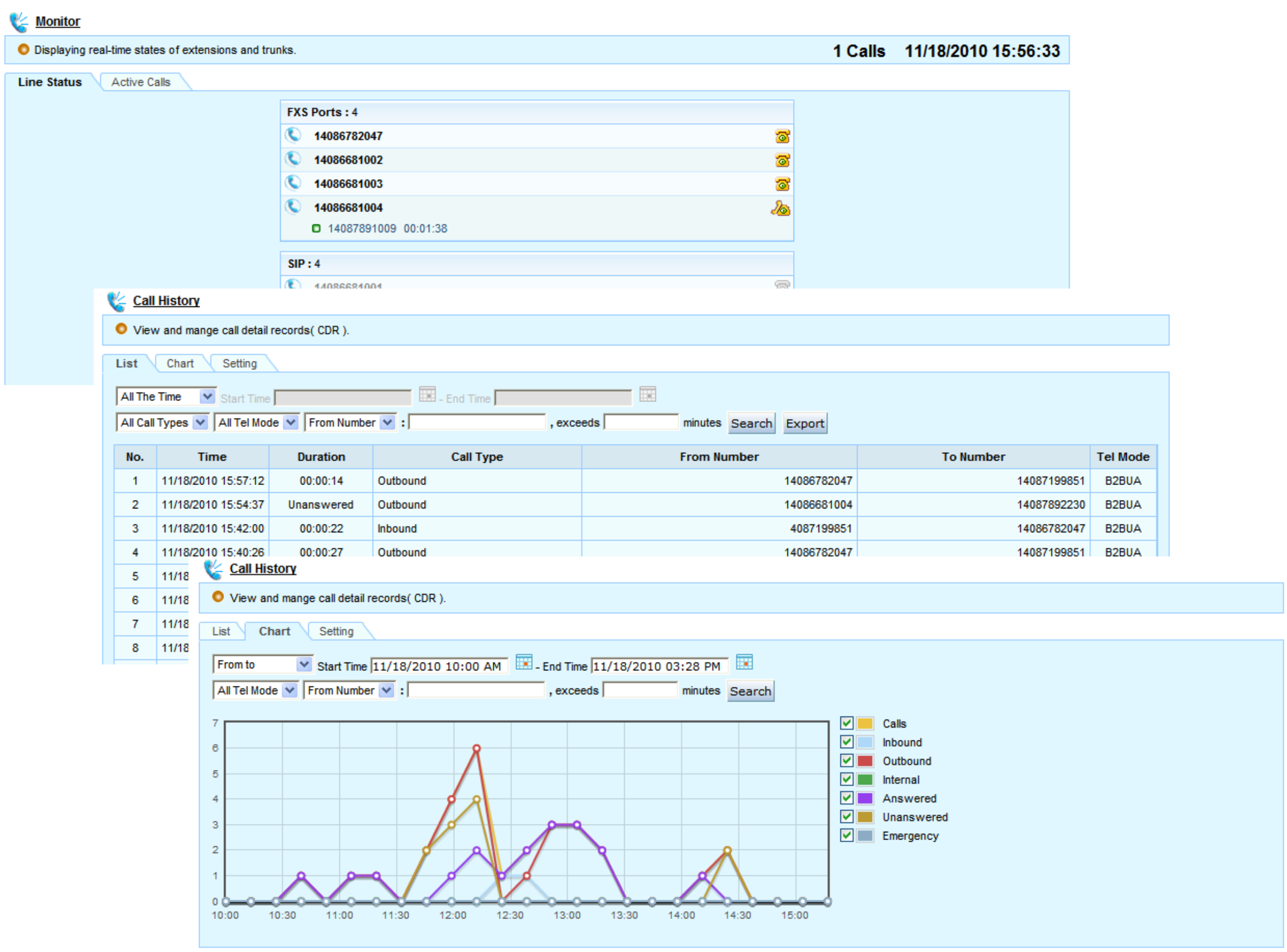


Figure 5

CALL TRACE GUI

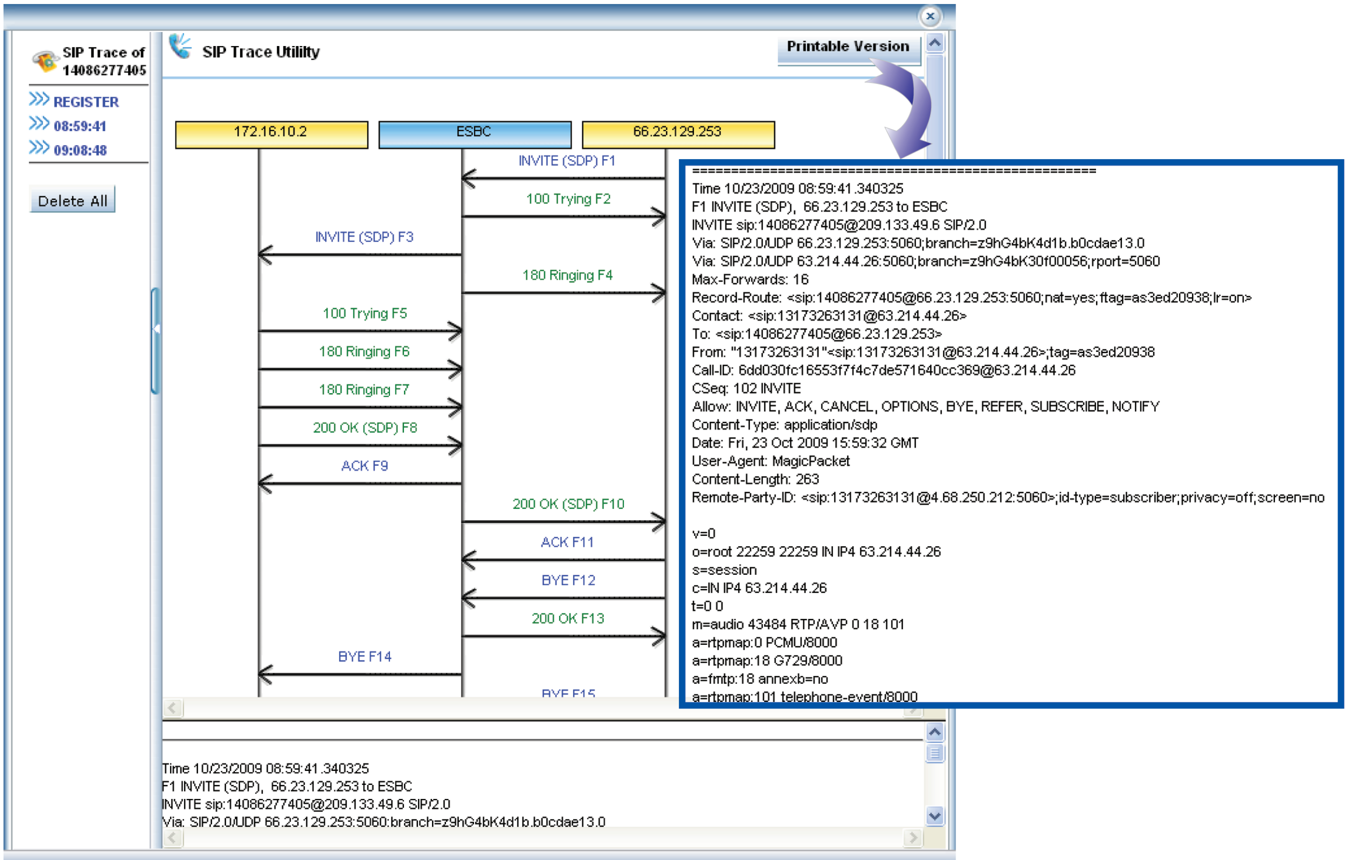
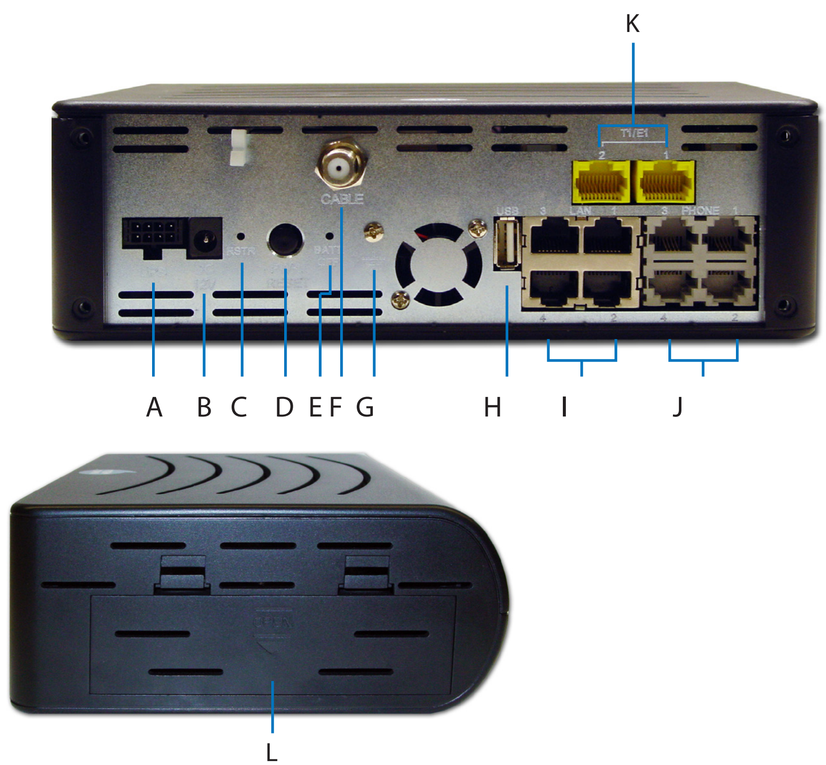


Figure 6

ESBC INTERFACE

A. UPS Port
B. 12V DC Power
C. RSTR Button
D. Power Reset Button
E. Battery Off
F. Cable Interface
G. External Ground
H. USB Port
I. LAN 1-4
J. Phone 1-4
K. T1/E1 1-2
L. Battery Compartment



SPECIFICATIONS

Product Interfaces

Category	Specification
Service Provider Interface	DOCSIS Standard CATV coaxial cable, 75 Ohms "F" type connector
Telephone Interface	4 FXS Voice Ports
PBX Interface	Up to 2 T1/E1 trunk ports with PRI or CAS signaling
User Data Interface	4 10/100/1000 BaseT Ethernet (RJ-45)

Software Specifications

Category	Specification
SIP Trunking Features	Implicit, Explicit, and Static Registration support SIP User Account Authentication - Digest and RADIUS Secured Registration - TLS SIP Traversal SIP Normalization Emergency Call Handling SIP Header Manipulation SIP Proxy and Registrar SIP Method Filtering Monitoring Features - SIP Call Trace, Call Statistics, Voice Quality Monitoring, Test Agent for Test Calls, R-Factor and MOS Calculation Media Processing (DTMF and Voice CODEC Transcoding)
Networking Features	Built-in DHCP Server NAT Capabilities for Simultaneous SIP User Accounts Static IP Routing NAT Traversal UPnP DMZ SIP Application Layer Gateway Network Access Control by IP Address, Subnet, Port Number, MAC Address or Destination Domain Name Web GUI with 3 Levels of Page Permissions Auto-Backup of Configuration
T1/E1 Protocols	Frames and Formats: T1: AMI/B8ZS E1: AMI/HDB3 Signalling: CAS: Loop-start, Ground-start, E&M Wink start, E&M Immediate CCS: Q.921, Q.931, Q.932 PRI: 4ESS, 5ESS, DMS100, NI-1, NI-2, NET5, NTT Network/CMTS Clock Synchronization
VoIP Protocols	SIP 2.0, RFC 2833
SIP RFC Support	RFC 1847, RFC 2045, RFC 2046, RFC 2181, RFC 2617, RFC 2782, RFC 2915, RFC 2976, RFC 3261, RFC 3263, RFC 3265, RFC 3311, RFC 3325, RFC 3326, RFC 3420, RFC 3428, RFC 3486, RFC 3515, RFC 3581, RFC 3761, RFC 3824, RFC 3891, RFC 3892, RFC 3903, RFC 4028, RFC 4320, RFC 4474, RFC 4508, RFC 4566, RFC 3264, RFC 3313, RFC 3323, RFC 3327, RFC 3329, RFC 3388, RFC 3605, RFC 3608, RFC 3841, RFC 3911, RFC 3966, RFC 4483, RFC 4488

SPECIFICATIONS cont.

Category	Specification
Network RFC Support	RFC 768, RFC 783, RFC 791, RFC 792, RFC 793, RFC 826, RFC 854, RFC 1157, RFC 1256, RFC 1332, RFC 1349, RFC 1519, RFC 1570, RFC 1631, RFC 1661, RFC 1812, RFC 1918, RFC 2131, RFC 2571, RFC 2572, RFC 2573, RFC 2574, RFC 2575, RFC 2578, RFC 2579, RFC 2580, RFC 2865
Speech Codec Capabilities	G.711, G.726 (No compression & simple compression) G.728, G.729E (High quality high complexity codecs) G.723.1, G.729A (Low bit rate codecs)
Signal Processing	G.168 Echo cancellation FAX (T.38 and G.711 fall-back) Caller ID FSK signal regeneration Line reversal Ground Start/Loop Start Loop Back FXS voltage drop when CA or RF fails Pulse Dialing Foreign voltage detection
Tones	Ring back tone Recorder tone Dial tone Ring splash Off hook warning tone Caller ID generation & call waiting tone Busy tone 5 distinct rings Confirmation tone Stutter tone Message waiting indicator (MWI) Configurable ring frequency
DTMF Tone	DTMF tone detection and generation
Announcements	Play out any voice stream sent by Call Agent controlled announcement server
OAM&P	Access components implemented: TFTP, FTP, HTTP 1.0, SNMP, Telnet, DHCP & DNS Works with any SNMP (v.1-3) -based EMS Offers web-based access as well as TFTP-based remote software downloads or upgrades Dual image capability Data monitoring throughput tools
QoS	Voice Bandwidth Reservation QoS, *Smart*-DQoS™, DQoS using Packetcable Multimedia, Type of Service, VLAN Tagging

Cable Modem Technical Specifications

- DOCSIS 1.1, 2.0, and 3.0 compliant.
- Integrated A-TDMA and S-CDMA technology - Capable of providing 120 Mbps upstream data rate
- 8/16/32/64/128/256 QAM auto detection

Cable Transmit/Receive Specifications

Item	Downstream	Upstream
Frequency Range	DOCSIS: 88~1002 MHz Euro-DOCSIS*: 108~1002 MHz	DOCSIS: 5~42 MHz Euro-DOCSIS*: 5~65 MHz
Modulation	QPSK, 16/ 32/ 64/ 128/ 256 QAM	QPSK, 8/16/32/64/128 QAM

SPECIFICATIONS cont.

Data Rate	DOCSIS: 64 QAM: 30 Mbps 256 QAM: 42.8 Mbps 320 Mbps for DOCSIS 8 channel bonding Euro-DOCSIS*: 64 QAM: 41 Mbps 256 QAM: 55 Mbps	QPSK 0.32 ~ 10.24 Mbps 8 QAM 0.48 ~ 15.36 Mbps 16 QAM 0.64 ~ 20.48 Mbps 32 QAM 0.80 ~ 25.60 Mbps 64 QAM 0._6 ~ 30.72 Mbps 128 QAM/TCM 30.72 Mbps 120 Mbps for DOCSIS 4 channel bonding
Bandwidth	Euro-DOCSIS*: 8 MHz; DOCSIS: 6 MHz	TDMA: 200, 400, 800, 1600, 3200 and 6400 kHz S-CDMA: 1600, 3200 and 6400 kHz
FEC	RS (128,122) GF128 with Trellis coding	Reed Solomon
Signal Level	-15 ~ +15 dBmV	Transmit Power Level : TDMA: +17 ~ +57 dBmV (32QAM, 64QAM) +17 ~ +55 dBmV (8QAM, 16QAM) +17 ~ +61 dBmV (QPSK) S-CDMA: +17 ~ +56 dBmV (all modulation)

Cable Modem Other Specifications

Signal-to-NoiseRatio (SNR)	DOCSIS: 64 QAM: >23.5 dB 256 QAM: >30 dB	Euro-DOCSIS*: 64QAM: >= 25.5 dB 256QM: -13 dBmV ~ -6 dBmV >= 34.5 dB -6 dBmV~ +17 dBmV >= 31.5 dB
Security	DOCSIS Baseline Privacy Plus: 1024-bit RSA and 128-bit Tripple-DES for BPKM protocol 56 -bit DES for data encryption X.509 v3 certificates	
DOCSIS	Compliant to DOCSIS 3.0	
Protocol	TCP/IP, UDP, ARP, ICMP, DHCP, SNMP, TFTP, TOD, BOOTP, SYSLOG	
Configuration	Ease of configuration and privacy control provided by resident or downloaded code from a Cable Modem Termination System (CMTS)	
Bridging	Support for unicast, broadcast, and multicast IP packetsVariable-length packet cable Media Access Control (MAC) transport layerMix of contention and reservation-based upstream transmission	
Quality of Service	Quality of service of MAC layer	
SIDs	24	
Management Operations (SNMPv1/v2c/v3)	RFC1157, RFC1901, RFC3416, RFC3417, RFC2578, RFC2570, RFC3411, RFC3412, RFC3413, RFC3414, RFC3415, RFC2576	
MIBs support	RFC1493, RFC3418, RFC2011, RFC2013, RFC2233, RFC3411, RFC3412, RFC3413, SNMP-NOTIFICATION-MIB, RFC3414, RFC3415, RFC2576, RFC2665, RFC2669, RFC2786, RFC2851, RFC2933, RFC3083, DRAFT: DOCS-IF-MIB, DRAFT: USB-MIB, DRAFT: DOCS-BPI2-MIB, DRAFT: DOCS-QOS-MIB, Append L/Annex H: DOCS-IF-EXT-MIB, Append L/Annex H: DOCS-CABLE-DEVICE-TRAP-MIB	

** Check for availability*

SPECIFICATIONS cont.

Physical Specifications

Category	Specification
Loop Current	For load of 520Ω, SNMP-settable to 23 mA (default) or 32 mA (max.)
Ring Voltage	> 40 Vrms @ 2000 ft. 5 REN max. per port 24 AWG loop
On Battery	Li-ion battery providing 4 hrs Talk Time
Power Supply	AC 100~240V/50~60Hz (DC 12V @ 4.0 Amps)
Dimensions	2.5 in (H) x 7.8 in (W) x 6.0 in (D) / 63.5 mm (H) x 198 mm (W) x 152 mm (D)
Approval	UL, FCC Part15B, cUL
Operating Temperature	32°F to 104°F (0°C to 40°C)
Storage Temperature	-4°F to 140°F (-20°C to 60°C)
Operating Humidity	Up to 80% RH
Storage Humidity	Up to 80% RH

About *Smart*-DQoS™

Smart-DQoS™ is InnoMedia's exclusive Device-initiated DQoS technology which enables edge devices to intelligently initiate and manage DOCSIS DQoS UGS service flows based on user and signaling events without the need for PacketCable Multimedia. *Smart*-DQoS™ instantly allows end-to-end quality of service without having to wait for network infrastructure modifications.

www.innomedia.com

InnoMedia Pte Ltd.
10 Science Park Road #03-04
The Alpha, Singapore Science Park II, SINGAPORE 117684
Ph: (65) 6872 0828; Fax: (65) 6872 0900

InnoMedia, Inc.
128 Baytech Drive
San Jose, CA 95134
Ph: (408) 432-5400; Fax: (408) 941-8152

InnoMedia Technology Inc.
3F, No. 3, Industrial East Road IX
Hsinchu Science-Based Industrial Park, Hsinchu TAIWAN 300
Ph: (886) 3 564 1299; Fax: (886) 3 564 1589

InnoMedia, Inc. Beijing Rep. Office
Room 1328, JingXin Building
Jia 2# North Road Dong San Huan Chao Yang District
Beijing 100027 CHINA
Ph: (86) 10 65261186, (86) 10 65261189
Fax: (86) 10-65261186, (86) 10-65261189 ext 210