CH6640E
EURODOCSIS 3.0 Wireless Digital Voice Gateway

Introduction

The Compal Broadband Networks' CH6640E
EuroDOCSIS 3.0 Wireless Digital Voice Gateway is
a fully integrated all-in-one home networking,
communication solution that combines the functionality
of a EuroDOCSIS 3.0 digital voice modem,
a four-port 10/100/1000 Gigabit Ethernet switch with
advanced firewall, and an 802.11n wireless access
point in one convenient package.

*Enables the delivery of innovative ultra-broadband
high-speed data, IP telephony, and multimedia service
as well as high-bandwidth home networking. All in one
convenient package.*

Digital Voice Telephone Service

The CH6640E delivers up to two lines of primary-line
digital voice telephone service (terminating in RJ-11
connectors) over cable's broadband connection to the
home. Voice traffic is prioritised over Internet traffic,
giving the user high-quality voice calls, even while surfing the Web. The CH6640E also supports a variety
of rich CLASS features, such as caller ID, call waiting, three-way calling, and call forearding.

The CH6640E also supports:
Automatic fax modem processing, including support for T.38 protocol

G.711, G.729, and other low-rate vocoders

Network Call Signaling (NCS) and Session Initiation Protocol (SIP) support And is configured to meet
multiple telco market standards:ETSI harmonized impedance, 600Ω.

Efficient:
● Stylish and space saving enclosure.
● Backwards compatible to 802.11 b/g.
● Backwards compatible to EuroDOCSIS 1.x and 2.0 Integrated wall mount.

Reliable and Secure:
● Wi-Fi Security WEP/WPA/WPA2.
● Advanced firewall with DoS protection and intrusion prevention.
● Wi-Fi Wizard for secure PC client setup.
● Remote configuration and monitoring from the headend using SNMP and TFTP.
● Enhanced security: supports AES traffic encryption.

Provider Benefits: Flexible
● pricing options Greater pricing flexibility resulting from multi-service packing and migration of customers to
  higher-revenue/-margin wireless offerings.
● Single-infrastructure delivery of multiple services.
● Better coversge for more satisfied customers.
● Value-added service packages.
● All-in-one solution forsecure voice and data services.

VoIP Signaling:
Support for Network Call Signaling (NCS) and Session Initiation Protocol (SIP).

Wireless Access

One way to avoid the challenges of rewiring or contending with varying wiring in the home is to eliminate wires altogether. The CH6640E is equipped with a next-generation 802. 11n Wi-Fi® access point with single-band radio operation.

802.11n

802.11n, the most current superset of the widely used wireless standard utilized by consumers in more than 100 million deployed PCs and mobile devices, is a compelling networking option for operators and consumers. The CH6640E's 802.11n integrated access point eliminates the need for wires altogether - enabling users to easily/wirelessly network all of their 802.11 b/g/n equipped devices.

Radio Operation

The CH6640E is configured with a single radio (802.11b/g/n at 2.4 GHz) to support LAN flexibility. This radio operation enables the CH6640E to work with the lowest common denominator Wi-Fi peripherals, allowing consumers to network previous and next-generation computers, gaming consoles, and other peripherals anywhere in the home.

With integrated home networking solutions, service proiders can provide seamless interaction among consumer electronics, mobile handsets, and PC devices, enabbling high-quality media streaming, and supporting efficient sharing of media within and outside of the connected home. Capable of supporting converged IP-based entertainment services, the CH6640E enables the devlivery of advanced whole home entertainment services, and a consumer's personal media experiences.

Built-In Security

The CH6640E is equipped with a number of security features to offer consumers peace of mind, including:

● Firewall with DoS protection and intrusion pervention.
● DHCP, NAT, VPN endpoint, VPN tunnelin
● Wi-Fi Security WEP/ WPA/WPA2 with an easy setup wizard
● User-friendly,secure mobile pairing for Wi-Fi-enabled handsets
● Power management enhancements optimize Wi-Fi handset battery performance
● Wi-Fi Wizrd removes end-user complexity for secure PC client setup
● Push button configuration for WPS-compliant clients

Service Assurance

Supporting the Wi-Fi home network is a new challenge for the cable industry. As a leading worldwide provider of EuroDOCSIS products, CBN is helping ease cable operators into Wi-Fi delivery. By combining the highest-performing and lowest cost of ownership modems in the industry, with easy-to-use Wi-Fi installation and pairing tools as well as advanced remote management features, CBN is offering an all-in-one approach to broadband home networking.

Enviornmentally Friendly

CBN's Wireless Digital Voice Gateways are helping service providers lower their carbon footprint by helping them lower energy consumption. CBN is globally committed to be part of the solution to climate change, and working for years to continually improve thr environmental profile of our products, operations and supply chain. We are in step with our customers and their increasing interest in partnering with their a company that will help them reduce their envirenmental impact.

CBN designed the next generation portfolio of customer premises equipment (CPE) to minimize its impact on the environment. CBN's proudcts comply with international environmental and energy efficient standards. The devices and power supplies are compliant with European Code of Conduct regulations. In addition, the devices and power supplies are lead-free and RoHS compliant. Finally, all new Wireless

Digital Voice Gateways use environmentally friendly package designs. The gateways are available in single bulk pack boxes - eliminating the use of suspension plastic and reducing box size - thereby reducing waste and treansport costs. CBN gateway packaging is100% recyclable and is marked with standard recycling codes to make it easier for tunities.

Provides cable operators with an intelligent way to offer their customers high-speed data, IP-based telephones services, and enhanced high-bandwidth home networking experience using a single broadband communication solution.

Highlights

Easy to setup and use:

Plug-and-Play installation Wi-Fi® Pairing button for easy Wi-Fi Protected Setup™ (WPS) wireless connection Supports standard internet browser software Front panel LEDs indicate status and simplify troubleshooting User-friendly online diagnostice and configuration Power switch for energy conscience users.

The Ch6640E is the perfect broadband solution for the home, home office, or small business; allowing users to create a custom home network to share a single ultra- broadband connection, files, and networked peripherals, using wired or wireless connectivity. Cost-effective, efficient, and secure, the CH6640E enables uers to maximize the potential of their existing resources, while benefiting from next generation highbandwidth data and IP voice services.

Advanced Services Ready:

DOCSIS/EuroDOCSIS 3.0 based Channel bonding of up to 8 downstream and 4 upstream channel increasing data rates of well over 300 Mbps in DOCSIS and 400 Mbps in EuroDOCSIS in the received (down-stream) data stream and over 100 Mpbs in the send (upstream) data stream. 1 GHz capable tuners Supports IPv4 and IPv6 to expand network addressing capabilities.

Verdatile and Convenient:

Backeards compatible to 802.11b/g and EuroDOCSIS 1.x and 2.0 Integrated 802.11n wireless access point, 2 x 2 antenna array. Single Borad Radios:2.4 GHz. Four Gigabit Ethernet ports enable flexible, high-speed connectivity with Auto Negotiate and Auto MDIX Compatible with Windows®, Macintosh® and Unix® and Linux com-puters Support for Multicast IP Services Enterprise-capable: Supports VPN pass-through. (IPSec, PPTP, L2TP)

Increased Data Rates

Utilising the power of EuroDOCSIS 3.0, the CH6640E enables channel bonding of up to 8 downstream and 4 upstream channels. This allows an operator to offer their customers advanced multimedia services, increasing data rates of well over 300 Mpbs in DOCSIS and 400 Mpbs in EuroDOCSIS in the recevied (downstream) data stream and over 100 Mpbs in the send (upstream) data stream. The CH6640E's high-speed services enable operators to:

- Protect their installed base of premium high-speed data customers.
- Deliver high-handwidth , muitimedia services to residential customers.
- Deliver competitive, high-capacity commercial services to their business customers.

The CH6640E eliminates the need for stand-alone routers, hubs, and access points. Its four Gigabit Ethernet RJ-45 ports and integrated 802.11n wireless access point with an internal 2 x 2 antenna array and single on-board radio (2.4GHz) enables users to maximize the high bandwidth potential of their home or business network.

The CH6640E includes an enhanced tuner that supports up to a 1 GHz downstream input allowing operators to increase the frequency spectrum for deployment of new high-value services, such as IP-based telephony, bandwidth on-demand, commercial services, interactive gaming, and IPTV to their customers.

Telephony:
- Supports up to two lines of (RJ-11) fullfea-tured telephone services, providing maximum convenience in one small footprint.
- Support for all CLASS 5 services (Caller id, Call Waiting, 3-way calling etc) Support for G.711 G.729, and other low rate vocoders.
- Automatic dax modem processing, including support for T.38 protocol Configured to meet multiple telco market standars: ETSI harmonized imped-ance,600Ω.

Specifications

GENERAL	
Standards	DOCSIS/Eiro-DOCSIS 3.0 and PacketCable/Euro-PacketCable 1.0 certified; interoperable with DOCSIS/EuroDOCSIS 2.0, 1.0, and 1.1 and compatible with packetCable/Euro-PacketCable 1.5; SIP:NCS
Cable Interface	F-connector, female, 75Ω
Network Interface	Four 10/100/1000 Ethernet ports
Wireless Interface	802.11b/g/n Wi-Fi
Dimensions	(H) 208.49 mm x (L) 179mm x (W)50mm
Regulatory	RoHS compliant, CE, ENERGY STAR qualified, COC compliant
Input Power	100 to 120 VAC, 50 ro 60 Hz
ENVIRONMENTAL	
Operating Temperature	32 °F to 104 °F (0 °C ro 40 °C)
Storage Temperature	-22 °F to 158 °F (-30 °C to 70 °C)
Operating Humidity	5 to 95% R.H. (non-condensing)
DOWNSTREAM	
Modulation	64 or 256 QAM
Maximum Theoretical Data Rate	
DOCSIS	343.072 Mbps (8 channels) / 42.884 (single channel) @ 256 QAM at 5.36 Msym/s
EuroDOCSIS	444.928 Mpbs (8 channels) / 55.616 (single channel) @ 256 QAM at 6.952 Msym/s
Maximum Bandwidth Required	
DOCSIS	48 MHz/2
EuroDOCSIS	64 MHz/2
Symbol Rate	343.072 Mbps (8 channels) / 42.884 (single channel) @ 256 QAM at 5.36 Msym/s
DOCSIS	64 QAM 5.057 Msym/s; 256 QAM 5.361 Msym/s
EuroDOCSIS	64 QAM 6.952 Msym/s; 256 QAM 6.952 Msym/s
Operating Level Range	
CH6640E	- 13 to +17 dBmV(250 QAM)
	- 17 to +13 dBmV(64 QAM)
Frequency Range	88 to 1002 MHz
Input Impedance	75 Ω (nominal)
UPSTREAM	
Modulation	8, 16, 32, 64, 128 QAM or QPSK
Maximum Channel Rate	120 Mbps (4 channels)
@128QA M Bandwidth	200 kHz, 400 kHz, 800 kHz, 1.6 MHz, 3.2 MHz, 6.4 MHz
Symbol Rates	160, 320, 640, 1280, 2560, and 5120 ksym/s
Operation Level Range	
TDMA/ATDMA	+17 to 57 dBmV on 32 QAM and 64 QAM
	+17 to +58 dBmV on 8 QAM and 16 QAM
	+17 to +61 dBmV on QPSK
S-CDMA	+17 to +56 dBmV on all modulations
Output Impedance	75 Ω (nominal)
Frequency Range CH6640E	5 to 65 MHz (edge to edge)

Specifications(continued)

TELEPHONY	
Line Type	2-wire
Hook State Signaling	Loop start
Maximum Line Length	1000 ft (AWG 26/0.4 mm @ 65°C)
DTMF Level Sensitivity Range	0 and - 20 dBm
Speech Coding	64 kbps PCM, µ-law or A-lae companding; support G.711 and low-rate vocoders; T.38 support
Line Termination	Configurable based on market needs
Loss Plan	
Receive	(D/A) 11dB
Transmit	(A/D) 4dB (configurable based on market needs)
Loss Plan Tolerance	±1 dB
60/50 Hz loss >20 dB	(one-way, referenced to off-hook loss at 1,004 Hz)
Ring Voltage	> 40Vrms
Ringing Crest Factor	1.2<CF<1.6
Ring T rip (maximum)	200 ms with 300 Ohm termination
NETWORK	
Gateway	DHCP, NAT; static routing and dynamic IP routing; SPI firewall with DoS protection and intrusion prevention; port, packet; and full suite of ALGs; UPnP IGD 1.0
Wireless LAN	802.11b/g/n Wi-Fi, WDS bridging, 802.11e WMM admission control,QoS
Power Management	802.11e WMM power save/UAPSD(Unschedled-Automatic Power Save Delivery)
802.11i Security	WEP-64/128, WPA-PSK, WPA, WPA2, TKIP, AES, 802.1x, 802.11i
Moblie Pairing	User-friendly Wi-Fi protected setup (WPS) for secure mobile pairing with compatible dualmode handset
Transmit Power Output	
IEEE 802.11b	19 dBm +1/-1.5 dB at all rates in all channels
IEEE802.11g	16 dBm +1/-1 dB at 54 Mbps in all channels
IEEE802.11n	16 dBm +1/-1 dB at all rates in all channels
Receiver Sensitivity	> - 90 dBm at 11 Mbps; > - 74 dBm at 54 Mbps
COMPATIBILITY	
PC	80486, Pentium, or later; Windows Vista™, 2000, or XP; Linux® with Ethernet connection (older versions of Windows, although not specifically supported, will work with cable modem)
Macintosh®	Power PC or later; OS 9 or higher; Ethernet connection
UNIX	Ethernet connection

All features, functionality, and other product specifications are subject to change without notice or obligation.

Actual speeds will vary and are often less than the maximum possible. Several factors affect upload and download speeds, including, but not limited to, network traffic and services offered by your cable operator or broadband service provider, computer equipment, type of service, number of connections to server, and availability of internet route(s).

**Actual data through put will be less due to physical layer overhead (error correction coding, burst preamble, and guard interval).

**With A-TDMA or S-CDMA enabled Cable Modem Termination System(CMTS).