



32 x 8  
D3.1

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FEEL THE WONDER

## CGA4233

Wireless .11ac

Smart Ultra-Broadband Cable Gateway with Voice  
for above Gigabit Speeds

CABLE

DATA

VOICE

VIDEO

The CGA4233 is a DOCSIS® 3.1 capable cable gateway offering triple-play services beyond Gigabit speeds, while providing VoIP functions for residential and business markets. Thanks to its integrated wireless video bridge featuring a robust chipset and 4x4 antennas, the CGA4233 can support seamless real-time HD video streaming over next generation IEEE 802.11ac Wi-Fi without any interruption of your data traffic.

### ■ Highest Performance with DOCSIS 3.1

The CGA4233 matches perfectly with the requirements of cable operators willing to propose ultimate Broadband access to their customers.

The CGA4233 cable gateway is fully compliant with the latest DOCSIS 3.1 specification as published by CableLabs® and is capable of delivering downstream cable speeds of up to 3.6 Gbps by using 2 Orthogonal Frequency-Division Multiplexing (OFDM) downstream channels (and up to 5 Gbps in case of 2 OFDM plus 32 Single Carrier QAM) and up to 1.5 Gbps upstream by using 2 Orthogonal Frequency-Division Multiple Access (OFDMA) upstream channels.

This enhanced and superior performance allows cable operators to propose multi-Gigabit data services to their customers through various applications, from IP connectivity to ultra-high speed internet access and gaming.

### ■ RDK-B Open Source Software

With the growth of consumer devices connected to internet, the rise of streaming video and more interaction with cloud storage, Service Providers (SPs) need to quickly adapt to provide faster and more reliable home networks.

The Reference Design Kit for Broadband (RDK-B) is an open source initiative standardizing software functionalities in broadband devices for SPs to efficiently deploy services to a large customer base.

RDK-B provides all needed features to manage complex broadband functions such as Wide Area Networking (WAN), Local Area Networking (LAN), data reporting & management, and home-networking technologies, such as Wi-Fi and Multimedia over Coax Alliance (MoCA).

Based on Cisco's Common Component Software Platform now owned by Technicolor, RDK-B is a fully modular, portable and customizable software solution that is currently running on 5+ million cable gateways (as of Oct 16).

### Features at a Glance

- DOCSIS® 3.1 compliant
- Backward compatible with DOCSIS®/EuroDOCSIS® 3.0
- 2 x 2 OFDM(A) bonded channels in DOCSIS 3.1 mode
- 32 x 8 bonded channels in DOCSIS/EuroDOCSIS 3.0 mode
- Automatic switchable diplexer for up- and downstream
- Up to 1.2 GHz full band capture tuner
- Built in RF spectrum analyzer
- 4 GE LAN ports
- Wireless networking on-board
  - IEEE 802.11n 2.4 GHz (3x3)
  - IEEE 802.11ac Wave 2 5 GHz (4x4)
- Capable to support Wi-Fi Doctor® (sold separately) and Wi-Fi Conductor (sold separately)
- 2 FXS ports for phone or fax
- PacketCable™ 2.0, (Euro)PacketCable™ 1.5 and SIP compliant
- 1 superspeed USB 3.1 Gen 1 master port
- Future-proof full service platform
- RDK-B Open Source Software
- SNMP and TR-069 remote management
- Dual stack IPv4 and IPv6 DS-Lite enabled



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## ■ Future Proof High-Bandwidth Technology

The CGA4233 can be deployed by cable operators on their current network, seamlessly integrating as a DOCSIS/EuroDOCSIS 3.0 cable gateway offering 32 bonded downstream and 8 bonded upstream channels.

Once cable operators upgrade their network to the new DOCSIS 3.1 standard, the CGA4233 supports this migration without any need of intervention at the customer premises due to some of its unique features such as:

- DOCSIS/EuroDOCSIS 3.0 backwards compatibility
- a fully integrated up to 1.2 GHz full band capture wideband tuner
- a switchable diplexer in both upstream and downstream that allows to support existing band split as well as future DOCSIS 3.1 band split on the same hardware, managed by software in real time.

## ■ Voice Performance

The CGA4233 is PacketCable™ 2.0 compliant and backwards compliant to PacketCable/EuroPacketCable 1.5 and can operate in MGCP as well as SIP mode.

The CGA4233 supports all standard codecs (optionally also including iLBC and BV16) and is equipped with basic and extended CLASS features such as caller ID and call waiting. Gateway and voice operations support data throughput and complex voice calls simultaneously.

## ■ Superspeed USB

The CGA4233 comes with one superspeed USB 3.1 Gen 1 master port to support devices such as mass storage devices, enabling transfer speeds multiple times higher than the conventional USB 2.0 and with more power output.

## ■ Easy to Use

Like all Technicolor modems and gateways, the CGA4233 is an easy to use, easy to install device.

For convenience of the end user, the easy-to-access LEDs provide a clear indication of start-up sequence, operational status, and connectivity status.

Multiple integrated web pages also allow direct access to the status and settings, including privacy and security information.

## ■ Advanced Security

The integrated firewall provides Stateful Packet Inspection (SPI), and an integrated Intrusion Detection and Prevention System (IDS) engine which monitors a wide range of attack patterns, and logs potential security breaches to a local cache or remote server.

To secure data exchange between the gateway and the cable operators' servers, BPI+ communications privacy is used.

The CGA4233 also supports powerful wireless security mechanisms, such as Wi-Fi Protected Access (WPA, WPA2), together with a secure and user friendly connection and configuration mechanism for connecting wireless clients (WPS).

The CGA4233 supports up to eight wireless networks (mSSID) per Wi-Fi radio, enabling to set up independent virtual wireless access points. These additional wireless networks allow other wireless users to enjoy high-performance access without compromise on the integrity of the basic network, thus keeping the original network access limited and secure.

## ■ Easy to Manage

Apart from being manageable via SNMP, the CGA4233 is completely designed according to the TR-069's TR-098 IGD data model through which the device can be configured remotely by the operator without interrupting the end user's experience.

In addition, the TR-181i2 Device:2 data model is made available to further increase the remote management capabilities towards life cycle management, diagnostics and application management.

## ■ IPv6 Enabled

With the approaching IPv4 address pool depletion, our products need to be ready for IPv6. Technicolor is a frontrunner in the introduction of IPv6 on its devices, with the CGA4233 being enabled for multiple IPv6 field scenarios. Internet Protocol version 6 is the next generation of Internet technologies aiming to effectively support the ever-expanding Internet usage and functionality, and also to address security concerns that exist in an IPv4 environment.

Technicolor aims to introduce IPv6 as smoothly as possible in customer networks. By providing in-depth knowledge of the networking stack, we guide our customers in their transition from IPv4 to IPv6.

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## Technical Specifications

### Hardware

■ Interfaces WAN	1 F-Type RF connector, external threaded
■ Interfaces LAN	4-port autosensing 10/100/1000 Base-T Ethernet LAN switch IEEE 802.11n 2.4 GHz Wi-Fi IEEE 802.11ac Wave 2 5 GHz Wi-Fi 2 FXS POTS ports 1 USB 3.1 Gen 1 master port
■ Buttons & indicators	Up to 9 LEDs (model dependent) Wi-Fi on/off button WPS button Reset button (recessed) Power button
■ Power input	DC jack
■ Power supply	12 VDC external PSU
■ AC Voltage	100 - 240 VAC, 50 - 60 Hz (switched mode PSU)
■ Operating temperature	0 - 40 °C (32 - 104 °F)
■ Operating humidity	20 - 95 % HR non-condensing
■ Storage temperature	-20 - 70 °C (-4 - 158 °F)

### Cable certifications

■ Data	DOCSIS® 3.1 Certified EuroDOCSIS® 3.0 Certified
■ Voice	PacketCable™ 2.0 compliant EuroPacketCable™ 1.5 Certified
■ CMTS interoperability	Any qualified DOCSIS 3.1 CMTS Any qualified DOCSIS®/EuroDOCSIS® 3.0 CMTS

### RF downstream

■ Downstream modulation	64 - 4096 QAM
■ Downstream frequency range, software selectable	EuroDOCSIS 3.0 108 - 1218 MHz 258 - 1218 MHz
■ Number of downstream channels	DOCSIS 3.1 2 OFDM EuroDOCSIS 3.0 Up to 32 bonded
■ Maximum downstream rates	DOCSIS 3.1 Up to 3.6 Gbps Up to 5 Gbps with 32 SC-QAM EuroDOCSIS 3.0 1780 Mbps (theoretical, 32 x 55.62 Mbps)
■ Capture windows	1.2 GHz full band capture
■ Channel bandwidth	DOCSIS 3.1 192 MHz EuroDOCSIS 8 MHz
■ Input signal level range	-15 dBmV / + 15 dBmV
■ Input impedance	75 Ohm

### RF upstream

■ Upstream modulation	QPSK 8 - 4096 QAM
■ Upstream frequency range, software selectable	EuroDOCSIS 3.0 5 - 85 MHz 5 - 204 MHz
■ Number of upstream channels	DOCSIS 3.1 2 OFDMA EuroDOCSIS 3.0 Up to 8 bonded
■ Maximum upstream rates	DOCSIS 3.1 Up to 1.5 Gbps EuroDOCSIS 3.0 262 Mbps (theoretical, 8 x 32.78 Mbps)
■ Channel bandwidth	DOCSIS 3.1 96 MHz EuroDOCSIS 3.0 200, 400, 800 kHz, 1.6, 3.2 and 6.4 MHz
■ Output impedance	75 Ohm
■ Upstream Diagnostics Analyzer	

### Wi-Fi

■ Full dual band concurrent Wi-Fi access points, Wi-Fi certified®	2.4 GHz (3x3) IEEE 802.11n AP 5 GHz (4x4) IEEE 802.11ac Wave 2 AP
■ 2.4 GHz Wi-Fi power	Standard: Up to 20 dBm (100 mW EIRP) High Power (optional): Up to 33 dBm (2000 mW EIRP)
■ 5 GHz Wi-Fi power	Up to 36 dBm (4000 mW EIRP)
■ Wi-Fi Protected Setup (WPS™)	
■ Wi-Fi security levels	WPA2™-Enterprise / WPA™-Enterprise WPA2™-Personal / WPA™-Personal IEEE802.1x port-based authentication with RADIUS client
■ Wi-Fi Multimedia (WMM®) and WMM-Power Save	
■ Up to 8 BSSIDs (virtual AP) per radio interface	
■ 3x3 MIMO 2.4 GHz Wi-Fi features	SGi STBC 20/40 MHz coexistence
■ 4x4 MU-MIMO 5 GHz Wi-Fi features	SGi STBC LDPC (FEC) 20/40/80/160 MHz mode Multi-User MIMO
■ RX/TX switched diversity	
■ Dynamic rates switching for optimal wireless rates	
■ Manual/ auto radiochannel selection	

### Voice and telephony

■ Voice technologies	Voice over IP (VoIP)
■ Voice signalling	(Euro)PacketCable™ NCS Network-based call signalling protocol (PKT-SP-EC-MGCP) RFC 3261 SIP RFC 2805 MGCP
■ Audio codecs	ITU-T G.711 PCM A-law, PCM μ-law, ITU-T G.728, G.729a, G.722.1 Wideband ITU-T G.722.2 iLBC, BV16 SMV (optional)
■ Multi-line phone support	2 phone lines 3-party conference calls Supports two complex voice codecs simultaneously
■ Fax relay	T.38
■ DTMF tone relay	RFC 2833
■ Caller ID	Type I and Type II
■ CLASS features	Basic and extended CLASS features
■ Voice Activity Detection (VAD)	
■ Comfort Noise Generation (CNG)	
■ Echo cancellation	G.165 G.168 up to 16 ms
■ Packet tone	DTMF generation Call progress generation Custom tone generation
■ Call discrimination	Fax and modem detection
■ Telephony interface capabilities	Loopback and on-demand diagnostics Up to V.90 (38.5 kbps)
■ Modems	
■ RFC 2833 DMTF tone relay	Enabled / disabled via SNMP
■ REN	3 REN per device
■ Pulse dialing	DTMF/pulse tones Pulse/DTMF tones conversion
■ RTP layer	RFC 1889 RFC 1890
■ RTCP statistics collection	

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## Technical Specifications

### Management

- User-friendly GUI via HTTP
- Web-based user interface management and administration
- Command Line Interface (CLI)
  - Telnet
  - SSH v2
- TR-069 CPE WAN Management Protocol (CWMP)
  - TR-098 Internet Gateway Device (IGD) data model
  - TR-104 voice service provisioning and configuration
  - TR-143 network throughput performance tests and statistical monitoring
  - TR-181i2 Device:2 data model
- SNMP
  - SNMP v1, SNMP v2, SNMP v3
- Software upgrade via WAN RF connection only
- Zero-touch autoprovisioning

### Services

- Open architecture for 3rd party application and UI development
- Life Cycle Management (LCM) for developing advanced services support
- 3G/LTE/4G mobile fall-back WAN connection (through USB adapter)
- Capable to support Wi-Fi Doctor® (sold separately) and Wi-Fi Conductor (sold separately)
- Wireless hotspot
- Parental control
  - URL-based website filtering
  - Time-based access control

### Networking

- Routing modes
  - Transparent bridging
  - Routed modes
- Multiple client support 32 (bridged mode)
- Network protocols
  - Dual stack IP (IPv4, IPv6)
  - TCP, UDP
  - ARP, ICMP, DHCP
  - TFTP, SNMP, HTTP, Telnet
- Discovery protocols UPnP
- Protocol filtering Ethernet and IP
- Symmetrical NAT with application helpers (ALGs)
- Game and application sharing NAT port maps
- DHCP conditional serving & relay
- DNS server & relay
- IGMPv3 proxy (Fastleave)
- IEEE 802.1q VLAN bridging, multiple bridge instances

### IPv6 networking

- IPv4 / IPv6 dual IP stack
- Transitioning DS-Lite

### Quality of Service

- Class of services
  - 32 downstream IDs
  - 32 upstream service flows
- Traffic prioritization DOCSIS 1.0, 1.1 (management of service flows)
- IP QoS
  - Flexible classification (ALG aided)
  - IP rate limiting (two-rate remarking/dropping)
  - DSCP (re)marking
  - Dynamic link fragmentation
- Ethernet QoS
  - Priority or C-VLAN/S-VLAN tagging
  - Ethernet switch port queuing and scheduling
- Wireless QoS
  - WMM (BE, BK, VI, VO access categories) queuing and scheduling

### Security

- Baseline Privacy Interface Plus (BPI+)
- Stateful Packet Inspection Firewall (SPIF)
- Customizable firewall security levels
- Intrusion detection and prevention
- Demilitarized Zone (DMZ)
- Multilevel access policy
- Security and service segregation per SSID

### ECO design

- WMM-Power Save

### Package contents

- CGA4233
- Power supply unit
- Ethernet cable
- Quick Setup leaflet(s) (optional)
- Safety Instructions & Regulatory Information booklet

## TECHNICOLOR WORLDWIDE HEADQUARTERS

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