



32 x 8
D3.1

technicolor



FEEL THE WONDER

CGM4231

Wireless .11ac and IoT-enabled
Smart Ultra-Broadband Cable Gateway with Voice
for above Gigabit Speeds

CABLE

DATA

VOICE

VIDEO

The CGM4231 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 CGM4231 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 CGM4231 matches perfectly with the requirements of cable operators willing to propose ultimate Broadband access to their customers.

The CGM4231 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.

■ Smart Internet of Things Applications (software dependent)

Internet of Things (IoT) applications and services let you create smarter use cases for the digital home, spanning across multiple domains such as security, comfort, media and family care.

The CGM4231 integrates options for various IoT connectivities such as Bluetooth, Zigbee, Thread or Near Field Communication (NFC) to make life easier every day at home and on the go.

■ Superspeed USB

The CGM4231 comes with one or more superspeed USB 3.1 Gen 1 master ports to support mass storage devices, LTE and 4G USB adapters, enabling transfer speeds multiple times higher than the conventional USB 2.0.

Features at a Glance

- DOCSIS® 3.1 compliant
- Backward compatible with (Euro)DOCSIS® 3.0
- 2 x 2 OFDM(A) bonded channels in DOCSIS 3.1 mode
- 32 x 8 bonded channels in DOCSIS 3.0 mode
- Automatic switchable diplexer for upstream 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 5 GHz (4x4)
- Hotspot GRE, Passpoint™
- 2 FXS ports for phone or fax
- Voice (Euro)PacketCable™ 1.5 & 2.0 and SIP compliant
- 1 superspeed USB 3.1 Gen 1 master port
- Low power radios
 - Bluetooth LE
 - ZigBee / Thread IEEE 802.15.4
 - NFC
- MoCA 2.0 (optional)
- 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 CGM4231 can be deployed by cable operators on their current network, seamlessly integrating as a DOCSIS 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 CGM4231 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 CGM4231 is (Euro)PacketCable 2.0 and PacketCable 1.5 compliant and can operate in MGCP as well as SIP mode.

The CGM4231 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.

■ MoCA (optional)

The CGM4231 also optionally includes an integrated bonded MoCA 2.0 interface which enables the gateway to provide connectivity to set-top boxes and client devices connected within the home.

■ Seamless Video over Next-Gen Wi-Fi

With its support of dual band concurrent Wi-Fi (IEEE 802.11n 2.4 GHz and the next-generation IEEE 802.11ac wireless standard for the 5 GHz band), the CGM4231 is a powerful and future-proof smart gateway enabling high-speed wireless HD video streaming inside the home. Thanks to its integrated wireless video bridge featuring a robust chipset and 4x4 antennas, it can support multiple HD TV channels over the clean 5 GHz radio. Furthermore, its advanced architecture guarantees a very low packet error rate on the wireless link.

Simultaneously, it guarantees uninterrupted transmission of data services over IEEE 802.11n using the 2.4 GHz band.

■ Easy to Use

Like all Technicolor modems and gateways, the CGM4231 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.

■ RDK-B Open Source Software

With the growth of consumer devices connected to internet, the rise of streaming video and the Internet of Things (IoT), 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).

■ Easy to Manage

Apart from being manageable via SNMP, the CGM4231 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 CGM4231 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.

■ ECO

Technicolor is committed to offer its customers sustainable products and implements a set of ECO features to reach the best possible environmental performance. In addition to carefully selected plastics and packaging to minimize the ecological footprint, the CGM4231 benefits from a unique combination of hardware and software features that reduce power consumption substantially.

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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 5 GHz Wi-Fi 2 FXS POTS ports 1 USB 3.1 Gen 1 master port IEEE 802.15.4 ZigBee / Thread Bluetooth Low Energy (LE) NFC
■ Buttons	Wi-Fi on/off button WPS button Reset button Power button
■ Power input	DC jack
■ Power supply	12 VDC external PSU
■ AC Voltage	100 - 240 VAC, 50 - 60 Hz (switched mode PSU)
■ Dimensions	67 x 223 x 215 mm (2.64 x 8.78 x 8.46 in.)
■ 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 (Euro)DOCSIS® 3.0 Certified
■ Voice	(Euro)PacketCable™ 2.0 compliant (Euro)PacketCable™ 1.5 compliant
■ CMTS interoperability	Any qualified DOCSIS 3.1 CMTS Any qualified (Euro)DOCSIS® 3.0 CMTS

RF downstream

■ Downstream modulation	64 - 4096 QAM
■ Downstream frequency range, software selectable	DOCSIS 3.0 54 - 1002 MHz 108 - 1002 MHz EuroDOCSIS 3.0 108 - 1218 MHz 258 - 1218 MHz
■ Number of downstream channels	DOCSIS 3.1 2 OFDM (Euro)DOCSIS 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 DOCSIS 3.0 1372 Mbps (theoretical, 32 x 42.88 Mbps) EuroDOCSIS 3.0 1780 Mbps (theoretical, 32 x 55.62 Mbps)
■ Capture windows	1.2 GHz full band capture
■ Channel bandwidth	DOCSIS 3.1 max. 192 MHz bands DOCSIS 3.0 6 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	DOCSIS 3.0 5 - 42 MHz 5 - 85 MHz EuroDOCSIS 3.0 5 - 85 MHz 5 - 204 MHz
■ Number of upstream channels	DOCSIS 3.1 2 OFDMA (Euro)DOCSIS 3.0 Up to 8 bonded
■ Maximum upstream rates	DOCSIS 3.1 Up to 1.5 Gbps (Euro)DOCSIS 3.0 262 Mbps (theoretical, 8 x 32.78 Mbps)
■ Channel bandwidth	DOCSIS 3.1 96 MHz (Euro)DOCSIS 3.0 200, 400, 800 kHz 1.6, 3.2 and 6.4 MHz
■ Output impedance	75 Ohm

MoCA (optional)

- Bonded MoCA 2.0
- Full backward compatibility to MoCA 1.1
- Support for up to 16 MoCA network nodes
- Throughput up to 800 Mbps
- Expanded range of operating frequencies – 1150 MHz to 1650 MHz
- Supports both parameterized and prioritized QoS

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 AP with IEEE 802.11ac compliant transmit beamforming
- 2.4 GHz Wi-Fi power Standard: Up to 20 dBm (100 mW EIRP)
High Power (optional): Up to 36 dBm (4000 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
- Wi-Fi hotspot capabilities
- 3x3 MIMO 2.4 GHz Wi-Fi features
 - SGi
 - STBC
 - 20/40 MHz coexistence
- 4x4 MU-MIMO 5 GHz Wi-Fi features
 - SGi
 - STBC
 - Explicit beam forming
 - LDPC (FEC)
 - 20/40/80 MHz mode
 - Multi-User MIMO
- RX/TX switched diversity
- Dynamic rates switching for optimal wireless rates
- Manual/ auto radiochannel selection

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Low power radios

- ZigBee IEEE 802.15.4, 2.4 GHz
- Thread IEEE 802.15.4, 2.4 GHz
- Bluetooth LE Bluetooth v4.x Class2 radio
- NFC

Voice and telephony

- Voice technologies Voice over IP (VoIP)
- Voice signalling 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.729, G.729a, G.729e, G.728
Wideband ITU-T G.722
ITU-T G.722.2
iLBC (optional), BV16 (optional), 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
- Modems Up to V.90 (38.5 kbps)
- RFC 2833 DMTF tone relay Enabled / disabled via SNMP
- REN 5 REN per device
- Pulse dialing DTMF/pulse tones
Pulse/DTMF tones conversion
- RTP layer RFC 1889
RFC 1890
- RTCP statistics collection

Management

- Customizable user-friendly GUI via HTTP and HTTPS
- Web services API for remote access (portal, management, diagnostics, applications,...)
- Web-browsing intercept (install/diagnostics/captive portal)
- 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-157a3 Life Cycle Management (LCM)
TR-181i2 Device:2 data model
- SNMP SNMP v1, SNMP v2, SNMP v3
- Operation, Administration & Maintenance (OAM)
ITU-T Y.1731
- 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)
- Wireless hotspot SoftGRE
Passpoint™
GRE tunneling
EAP (optional, on request)
Fon (optional, on request)
- Parental control URL- and (optional) content-based website filtering
Time-based access control
- Content sharing Server Message Block (SMB) Samba file server

Networking

- Routing modes Transparent bridging
Routed modes
- Multiple client support 32 (bridged mode)
- Class of services 32 downstream IDs
32 upstream service flows
- Network protocols Dual stack IP (IPv4, IPv6)
TCP, UDP, ARP
ICMP, DHCP
TFTP, SNMP, HTTP, Telnet
- Discovery protocols UPnP
Home Network Administration Protocol (HNAP)
- 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)
- IGMP snooping (full routed)
- DHCP spoofing
- IEEE 802.1q VLAN bridging, multiple bridge instances

IPv6 networking

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

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Technical Specifications

Quality of Service

- 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

- CGM4231
- Power supply unit
- External battery backup solution (optional)
- Ethernet cable
- Setup CD (optional)
- Quick Setup leaflet(s) (optional)
- Safety Instructions & Regulatory Information booklet



Professional Services

To reinforce our extensive portfolio of digital home solutions, Technicolor has a dedicated Professional Services team to make sure that every deployment is a success, from initial provisioning and integration to operations, upgrades, ongoing support and beyond. Our wide array of services spans the entire customer project lifecycle, encompassing:

- Expert consulting
- Software customizations and customer change orders
- Qualified technical support and maintenance
- Seamless system integration
- Efficient repair, refurbishment and recycling
- Warranty extensions on all our products

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