G.now Broadband

Bundled Twisted Pair Copper Line MDU Edition (1:1 Phone Line)

Where Lies Your Path To Gigabit Broadband Access?

Two roads diverged in a yellow wood, And sorry I could not travel both. And be one traveler,
long I stood, And looked down one as far as I could, To where it bent in the undergrowth,… by Robert Frost

* G. now is a trademark of Marvell

Introduction

The G.now™ Broadband Network Access System

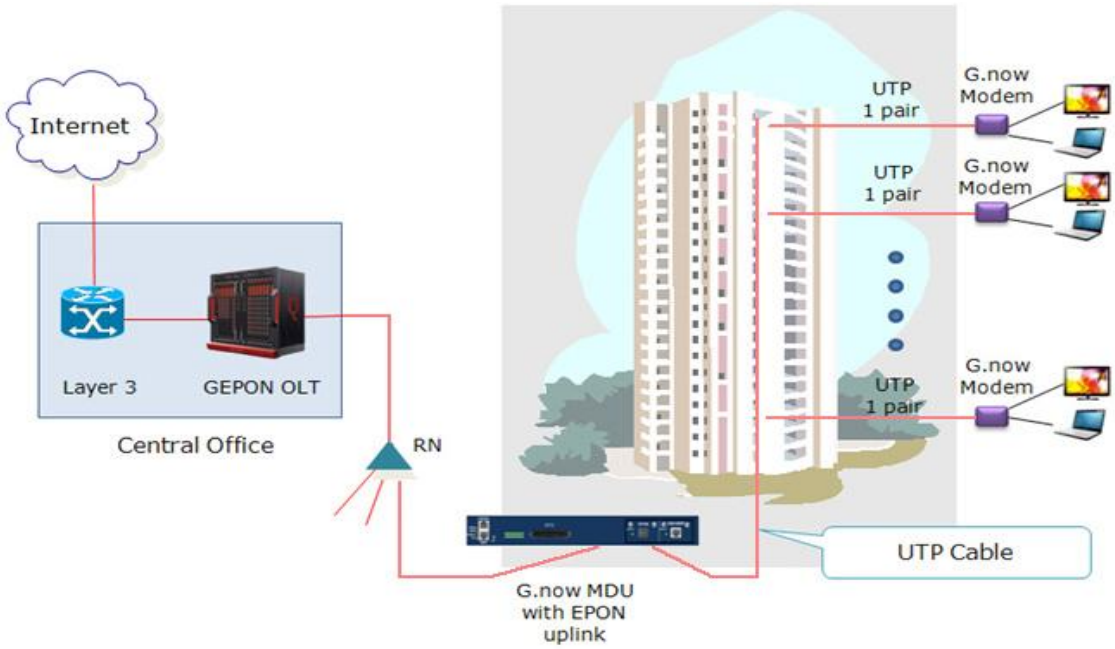
G.now™ is a gigabit network access solution based on G.hn standards. It enables data rates up to 1Gbit/s over legacy bundled copper lines (twisted pair phone lines). Utilizing an FTTdp network architecture, it allows for near FTTH performance on existing infrastructure, and offers unrivaled value to network operators, their clients and end users.

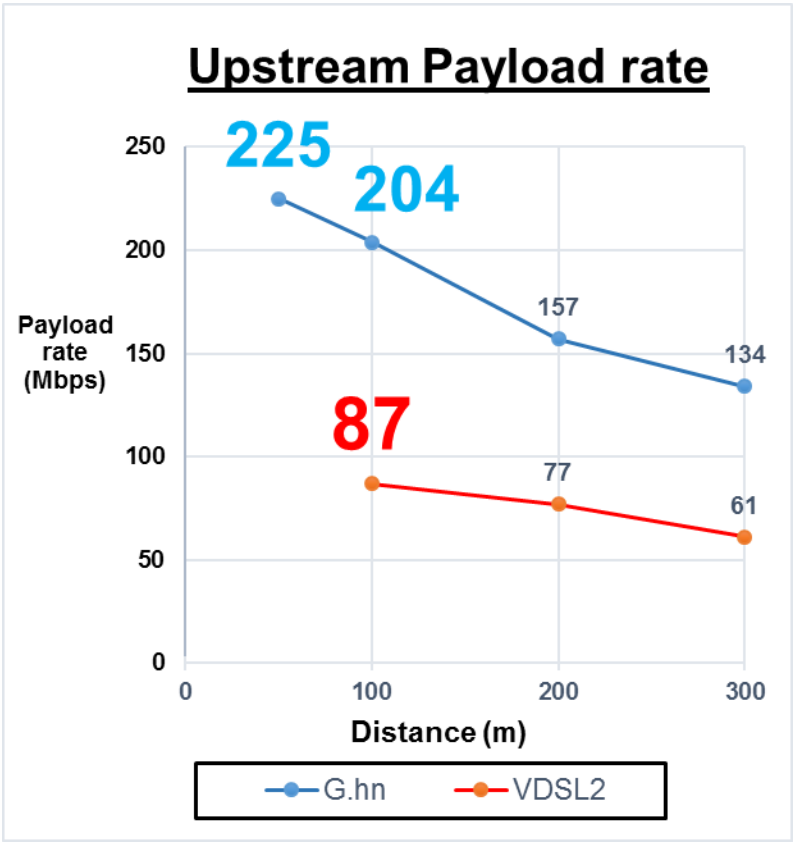
G.now™ is a trademark of Marvell Inc, a global leader in integrated silicon solutions. Marvell's G.now is an extension of the G.hn networking standard, enabling broadband access. It enlarges the scope of the ITU-T G.hn standard to bridge the performance gap between currently available VDSL2 and fiber to the home technologies.

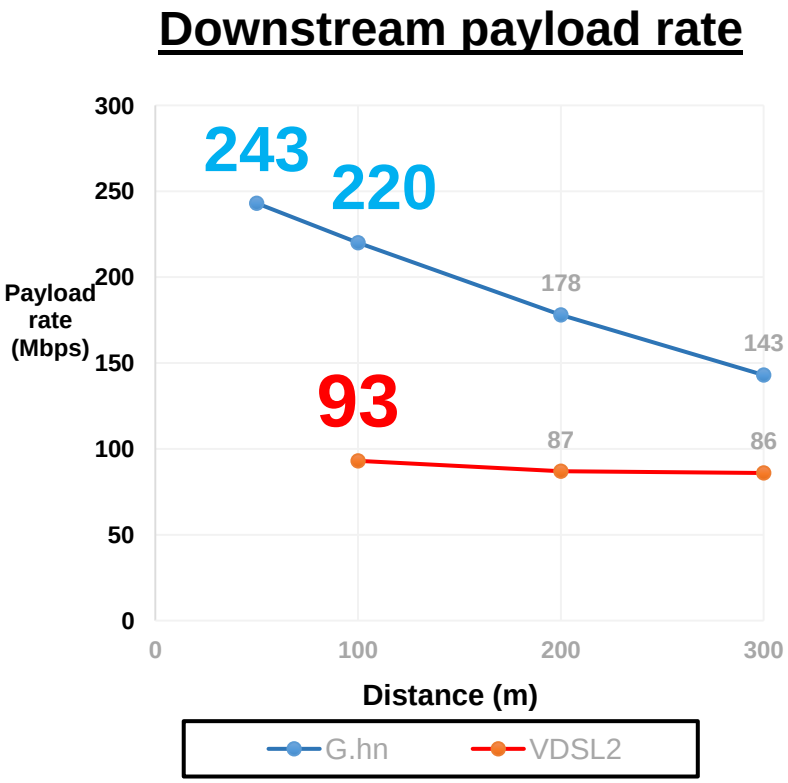
G.now™ technology is based on Marvell's award-winning HomeGrid Forum-certified family of G.hn chipsets, providing FTTH class broadband access to multi-dwelling unit (MDU) buildings over existing phone lines. G.now™ technology can quickly offer many homes and consumers around the world access to seamless delivery of high quality content from the cloud, fitting nicely with the bandwidth demands of the 'Always Online, Smart Lifestyle'. G.now™ brings consumers one step closer to the Gigabit revolution through its ability to deliver a high performance, reliable and secure end-to-end solution.

Based on TDD architecture (Time Division Duplexing) and an increased spectrum up to 100 MHz OFDM, Marvell G.now™ turns G.hn into a technology that by far outperforms VDSL2. It enables unmatched connectivity at up to 1 Gbit/s PHY rate over existing copper wiring and a far higher data rate (over 500Mbps) than legacy VDSL systems (only 100 Mbps).

It is our mission to work closely together with our partners, including global operators, service providers, internet companies, OEMs, ODMs and other ecosystem partners to ensure that G.now™ technology brings the benefits of true broadband access to consumers around the world.




Upstream Payload rate
225
204
157
134
87
77
61
250
200
150
100
50
0
Payload rate (Mbps)
0
100
200
300
Distance (m)
G.hn
VDSL2


Downstream payload rate
243
220
178
143
93
87
86
300
250
200
150
100
50
0
Payload rate (Mbps)
0
100
200
300
Distance (m)
G.hn
VDSL2

The G.now Network Access Solution

Bundled twisted pair edition for MDU:s

G.now™ Technical Benefits

- Increases available spectrum on the wire
- Provides flexible bandwidth allocation
- Based on the state of the art G.hn PHY/MAC protocol
- Up to 600Mbps payload data rate via a twisted pair phone line
- Configurable downlink vs uplink bandwidth ratio—for example 300Mbps up / 300Mbps down or 480Mbps up / 120Mbps down
- Vector boost for dynamic TS allocation for maximized packet transfer.
- Easy line operation with fully automatic pairing provisioning with D-map algorithm adaptation.

G.now™ Business Benefits

- Increases data rates to “Gigabit-level” using existing twisted pair copper lines, incl. 2 pair UTP CAT3/5
- Flexible up-/downlink bandwidth allocation ensures flexible service offering
- Low CAPEX/OPEX compared to FTTH: significantly lower installation & equipment costs than pure FTTH
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- Proven performance: offers stable IPTV service via existing phone lines
- Supports individualized SLA per subscriber

G.hn access brings you near FTTH performance via legacy infrastructure

G.hn Access is the lowest CAPEX / highest value offering presently available for rollout

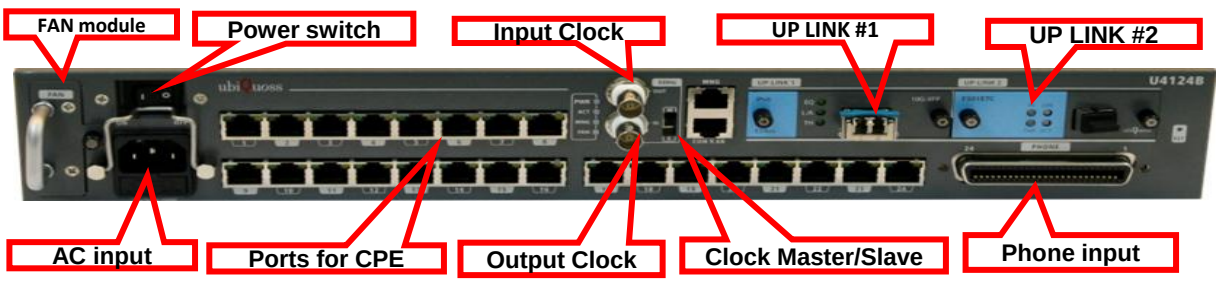
Ubiquoss GAM U4124B (Line aggregator)

Introduction

Ubiquoss GAM (G.hn Aggregated Multiplexer) U4124B product line-up is based on ITU-T G.hn G.9960/G.9961 technology, enabling data rates up to 500Mbps over bundle twisted pair copper wires. It offers near FTTH (Fiber To The Home) performance for a wide range of applications. Ubiquoss GAM U4124B is configured with 24 GE ports with two Up Links. Intended for installation at a fiber to twisted pair distribution hub, it is easier to deploy and provides big CAPEX savings compared to FTTH.

Ubiquoss GAM U4124B enables carriers to deliver FTTH-class service to MDU:s while avoiding the costs of replacing copper wires with fiber and truck-roll. The data rates offered by the U4124B ensure unhindered throughput of high quality and other high data rate services such as multi-stream FHD/UHD IPTV, cloud-based storage or 802.11ac WiFi AP.

Crosstalk in bundles of non-shielded twisted pair lines is resolved by the Marvell Crosstalk mitigation feature, guaranteeing 3 to 5 times higher data throughput (200~500Mbps) than VDSL2 over the same final access lines.



Ubiquoss GAM U4124B Specifications

Hardware	
System Architecture	• 2 x Uplink module slots :SFP Combo, 10G-XFP, 1G and 10G GEPON • 24 port PSTN / 24 port RJ45 • Console RJ45, RS232C(Baud Rate 9600)
Main Chipset	• CPU Chipset: BCM53003 • Switching Chipset: BCM56142 • G.hn Engine: 88LX3142(DSP)/ LX2718(AFE)
Memory(DDR)	• 256MB, DDR2 SDRAM
Physical Dimension	• 19” Rack Mount Type, 1.5RU / 340(D) x440(W)x66mm(H) / Max 6.8kg
Switching Fabric	• Full-duplex 126G(System capacity: 88Gbps)
Management	• Syslog, SNMPv2, RMON, SSH, TFTP, FTP • Security by using password for log-in via Console and Telnet • NTP, Port mirroring, TCP DUMP
FAN	• 4ea FAN Module, Max. 5000rpm
LED	• Power, System Active • Management • Fan Status • G.hn Link
Environment Conditions	
Input power & frequency	• 100~220VAC, 50/60Hz
Power consumption	• Max 90 W
Operating temperature	• -10℃~ 80℃
Operating humidity	• 0 ~ 90% non-condensing
Storage temperature	• -20℃~ 80℃

GAM U4124B Features

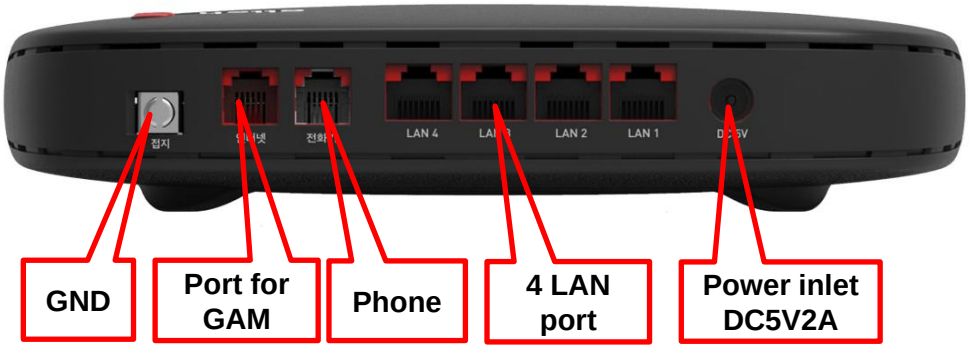
Features	
# of Mac Address	16K
# of VLAN	256 VLAN
Layer 2	802.1W STP, RSTP, PVSTP 802.1D Spanning Tree Protocol 802.1Q VLAN(256) and VLAN Trunking 802.3ad Link Aggregation(MAX 32 Groups & 8members for each group) Jumbo Frame up to 9K
Remote Reset	Syslog, SNMPv2, RMON, TFTP FTP, NTP, TCP DUMP, Port Mirroring Security by using password for log-in via Console and Telnet
Remote Reset	Remote H/W Reset, Dying Gasp, Remote reset through optical line, Watch dog
EPON	Support GEPON(IEEE 802.3ah) uplink interface
Multicast	IGMPv1/V2, IGMP Snooping, IGMP Snooping Proxy Reporting Multicast Group up to 512, Multicast Traffic Block / Filtering Protection of malicious multicast traffic from subscriber port
Software Content	
DHCP	DHCP Relay, Private DCHP server blocking, DHCP Broadcast Traffic Blocking forwarded by interface DHCP message Filtering, DHCP broadcast traffic protection, DHCP Request Flooding protection(DHCP snooping rate-limiting) DHCP Option 82, Circuit-ID: port information user connected, Remote-ID: MAC address information of Relay device
Security	DLF, Broadcast, TCP-SYN, IGMP Attack protection DHCP Filtering, Mac Filtering, NetBEUI, NetBIOS Filtering, NBT Packet filtering based on IP address and TCP, UDP port Packet control to well-known port no. MAC spoofing, flooding protection(static MAC, MAC count) Multicast/Broadcast flooding protection Theft protection of Gateway IP address(GARP) Service classifying for the Control Packet(Ping, Telnet, SNMP, FTP, TFTP etc.) 8 CPU queue, Rate-limit to CPU traffic
Qos /ACL	Layer 2(Source/Destination MAC Address, VLAN ID, COS Field) Layer 3(Source/Destination IP Address, DSCP Field) Priority/Parameter based QoS, 8 queue per port , SPQ, WRR, SPQ + SDWRR, Egress Rate-shaping : port , queue DSCP marking/remarking Ingress ACL: 128

Ubiquoss GNT (G.now Node Terminal) C301G

The **C301G** is a ITU-T G.hn networking standard compliant Ethernet Terminal for any copper wire medium. **C301G** is a G.now slave modem utilized for near FTTH performance over a twisted pair phone line. **C301G** provides one or four GE port for IP device aggregation.

<Front view>

<Rear view>



C301G(1P) Specifications

C301G(1P) Specification	
System Architecture	G.now Client CPE G.now Line 1PORT(RJ45 connector), GE LAN 1 / 4 PORT(RJ45 connector)
Memory	64MB, DDR2 SDRM
Physical Dimension	156 X 130 x 30mm(W x D x H)
Max. Transfer Rate	Up to 600Mbps
Modulation	OFDM(Orthogonal Frequency Division Multiplexing)
Environment Conditions	
Power Input	DC 5V, 2A
Power Consumption	Max. 3.8W
Operating Temperature	0 ℃ ~ 50 ℃
Operating Humidity	10 ~ 90%
EMC	EMI Class B
Media Interface	
Interface Type	RJ11, 1Port G.now Interface RJ11, 1 Port Phone Interface RJ45, 1 Port Ethernet Interface_GE
Power Switch	On/Off Switch, Reset Switch
Surge	2KV
G.hn Specification	
Standard/Certification	ITU-T G.9960 Support(G.hn PHY) ITU-T G.9961 Support(G.hn MAC) ITU-T G.9962 Support(Management Plane) ITU-T G.9954 Support(Phoneline networking transceivers) IEEE 802.3z for 1000Base-X IEEE 802.3x for Flow control IEEE 802.1p for CoS (Class of Service) IEEE 802.1Q for VLAN Tagging

Gigatopia, Open-Gigaworld

- The reality is that, when it comes to broadband access, the customer always wants more
- Smart devices and HD/UHD Content continuously pushes data throughput demands higher

	1st GEN	2nd GEN	Now
TV	SD	HD	UHD
WiFi	11bga	11n	11ac
Internet	10Mbps	100Mbps	1Gbps