

DRG 540

Digital Residential Gateway

Reliable home gateway for high quality triple-play services, incl. VoIP functionality

Key benefits:

- Optimized for residential and SME user
- Carrier-grade voice and video quality
- Embedded VoIP functionality
- Fully automated service activation process
- Remotely managed, allows mass deployment
- Easily integrated with click-on Fiber Termination Unit



The DRG 540 is a triple-play home gateway that provides 100 Mbps WAN access, 4 LAN ports, and 2 telephone lines. DRG 540 is designed for residential customers and small offices wishing to take advantage of multiple LAN ports and integrated VoIP.

Triple-play services

The DRG 540 supports triple-play services such as fast Internet access, IP telephony services and IPTV. CATV can also be supported, via a CATV receiver which converts optical TV signals received via the fiber network into traditional electrical RF signal.

Plug-n-Call™ IP telephony

A standard analogue phone and/or a G3 fax machine is all that is needed to use the telephony services. No need to invest in IP telephones.

The DRG 540 supports the full range of Class 5 services (e.g. Call Waiting, 3-party call, Call Forwarding, Caller Line Identification Presentation), independent of which softswitch is used. DRG 540 complies with SIP, H.323, MGCP, and H.248 IP telephony signaling protocols.

High quality services

The DRG 540 provides carrier-grade voice and video quality, through priority mechanisms on both the Ethernet and IP levels.

DRG 540 supports IGMP snooping, which allows multicast video streams to be routed only to LAN ports which have joined the multicast group, preventing unnecessary traffic on other ports.

Efficient remote management

The DRG 540 is designed for remote management. This includes remote configuration and a software upgrade mechanism, allowing the operator to easily and efficiently manage and control a vast number of installed units.

In addition, the DRG 540 provides quality measurement for LAN and voice ports. These statistics can be collated and this allows the operator to monitor and control the quality of the offered services.

Easy Click-On deployment of FTU

By simply using a click-on mechanism, you can easily integrate an FTU (Fiber

Termination Unit) with the DRG 540. This provides network builders with a cost-effective and robust solution for terminating fiber access. Once the FTU and corresponding fiber connectors have been installed, the end user can install the active equipment themselves by simply clicking on the DRG 540 unit. No special skills or patch cables are required, (see separate FTU datasheet for more information).

Choice of FTTx networks

The DRG 540 can be used in fiber and copper networks and is ideal for the particular requirements of FTTx networks.

DRG 540

Interfaces and description

| Model | Port | Wavelength TX/RX (nm) | Max/Min output pwr (dBm) | Max/Min input pwr (dBm) | Speed (Mbps) | Specification |
|----------|-----------|--------------------------|-----------------------------|----------------------------|-----------------|-------------------------------|
| DRG 541 | WAN | | | | 10/100 | Copper, UTP, Cat5, RJ-45 |
| DRG 542m | " | 1310/1310 | -14/-22.5 | -14/-31.8 | 100 | Multi-mode, dual-fiber, MT-RJ |
| DRG 542s | " | 1310/(1260-1610) | -14/-23.5 | 0/-31 | 100 | Multi-mode, dual-fiber, SC |
| DRG 546s | " | 1310/1550 | -8/-14 | 0/-31 | 100 | Single-mode, single-fiber, SC |
| DRG 547c | " | 1310/(1260-1600) | 0/-20 | 0/-28 | 100 | Single-mode, dual-fiber, LC |
| DRG 547s | " | 1310/(1260-1610) | -8/-15 | 0/-34 | 100 | Single-mode, dual-fiber, SC |
| DRG 54x* | LAN | | | | 10/100 | 4 x Copper, UTP, Cat5, RJ-45 |
| DRG 54x* | Telephony | | | | N/A | 2 x Analogue phones, RJ-11 |
| DRG 54x* | LAN** | | | | 10/100 | 4 x Copper, UTP, Cat5, RJ-45 |

* x can be either 1, 2, 6 or 7

** LAN port 1-3 provides WAN-LAN throughput of up to 100Mbps whereas LAN port 4 has limited throughput and should not be used for bandwidth consuming applications.

Telephone and fax services

| | |
|---|---|
| VoIP protocols | SIP, H.323, MGCP, H.248 |
| Speech codecs | G.711, G.729ab, (G.723.1 available on request) |
| Class 5 services | Call Waiting, 3-Party Call, Call Alteration, Differentiated Ringing Signals, Call Forwarding, Calling Line Identification Presentation (CLIP), permanent and temporary CLIR (Calling Line Identification Restriction) |
| Fax | T.38 |
| 3rd party initiated pause and rerouting | External rerouting of media stream during speech, e.g. for pre-paid calling cards and recording announcement |
| DTMF | Inband and outband using H.245 and H.225, RFC2833 or SIP INFO |
| Number of telephones | Up to 5 analogue telephones can be connected to each telephone port |
| Market adaptation | It is possible to set ring signals, tones, cadences, impedance, CLIP etc. according to local market requirements |

Management

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|------------------|--|
| Protocols | PFDP or SNMP v1, SNMP v2, MIB-II for statistics, Enterprise-specific DRG MIB for configuration |
| HTTP server | Two access levels for manual configuration, can be switched on/off remotely |
| TFTP/HTTP client | Software download |
| DHCP | Configuration support |

Quality of Service

| | |
|-----------------------|---|
| DiffServ | Layer 3 (IP) QoS mechanism, 2 hardware queues for prioritization |
| Class of service | IEEE 802.1p, Layer 2 (Ethernet) QoS mechanism, 2 hardware queues for prioritization |
| LAN port priority | 2 hardware queues for prioritization |
| Internal delay (VoIP) | 5-30 ms delay for decoding/encoding/AEC/internal operations in the DRG |
| Bandwidth shaping | Rate limitation per LAN port |
| General | Adaptive or flexible jitter buffer, echo cancellation (G.165, G.168), speech sampling |
| IGMP snooping | 10-60 ms, silence suppression with comfort noise v1 and v2 |

Traffic classification and security

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|---------------------------------|------------------------------|
| VLAN | Services and port separation |
| Authentication per registration | H225.0 RAS, SIP digest |
| Authentication per call | H235, SIP digest |

Reliability

| | |
|-------------------|---|
| MTBF | >150 000 hours |
| High Availability | Configurable high availability through secondary gatekeeper |

Physical

| | |
|--|---|
| Dimensions | 56mm (D) x 170mm (H) x 238mm (W), 2.20" (D) x 6.69" (H) x 9.37" (W) |
| Weight | Approximately 430g, 0.9lbs |
| Power requirements (incl. AC/DC adapter) | 7.5-10.5 watts |
| Power supply | 12Vdc, external plug-in wall adapter, UPS optional |
| LED indicators | WAN, LAN per port, POTS per port, POWER |
| Operating conditions | Temperature 0°C to +40°C, 32°F to 104°F, humidity 5-95% RH non-condensing |

Regulatory compliance

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|--|--|
| CE-mark | |
| IEC/EN/UL 60950, IEC/EN/UL 60825, ETSI EN 300386 | |
| RoHS directive 2002/95/EC | |
| WEEE directive 2002/96/EC | |