Broadband Solutions

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Technical Description

Discus™ P.DG A4010G

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1 DOCUMENT PURPOSE

The present document specifies **Discus™ P.DG A4010G** main technical (hardware and software) features.

P.DG A4010G is an ADSL2+ WiFi Router with router networking functionalities and Ethernet, USB and WiFi Lan-side interfaces.

2 INTRODUCTION

Discus™ P.DG A4010G is an ADSL2+ wireless router that is designed to support the delivery of multiple services such as:

- Data by means of a wired and wireless connection.
- IPTV to an external STB by means of a wired connection.
- Voice over IP through an external ATA or IP phone by means of an Ethernet wired connection. VoIP services can be provided also through Wi-Fi IP Phone wireless associated.

3 PRODUCT OVERVIEW

P.DG A4010G provides the user with the following interfaces:

- ADSL / ADSL2 / ADSL2+ Wan uplink
- N° 4 10/100 Base-T Lan ports
- One USB 1.1 device port
- IEEE 802.11 b/g wireless access point interface

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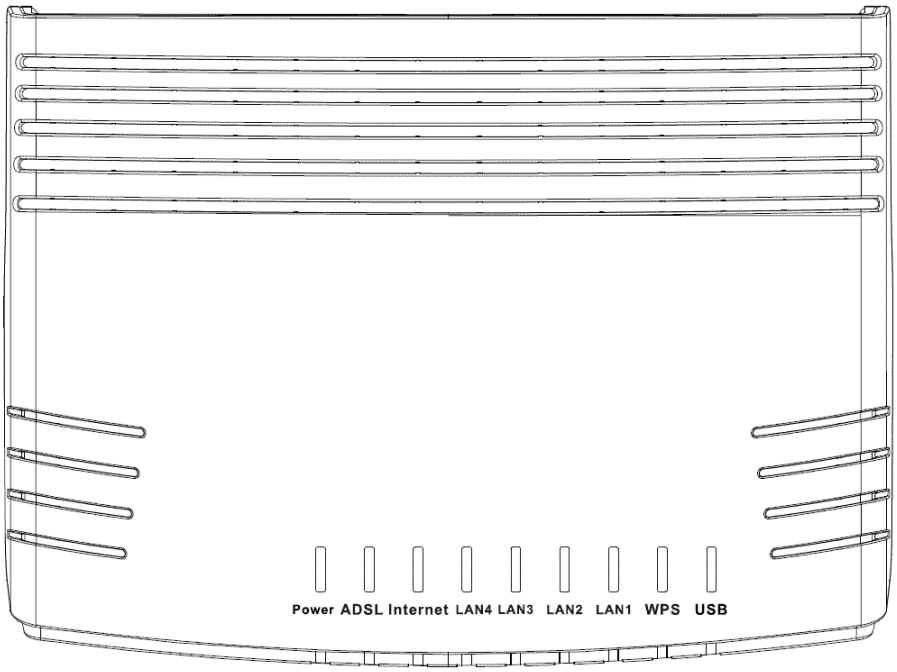
3.1 FRONT PANEL AND LEDS DESCRIPTION



LED	LED Colour	LED Behaviour	
Power	Green	On Off	Power On Power Off
ADSL	Green	On Blinking Off	DSL connected (showtime) DSL synchronization No DSL line active
Internet	Green/Red	Solid Green Solid Red Off	WAN IP address available (PPP active) WAN IP address not available (PPP failure) Modem power off
LAN4 – LAN1	Green	On Blinking Off	Ethernet Link established LAN activity present (traffic in either direction) No Ethernet Link established
WPS	Green	On Blinking Off	Successful WPS connection The Router is establishing WPS connection No WPS connection
USB Device	Green	On USB Blinking Off	Link Established USB activity present (traffic in either direction) No USB Link established

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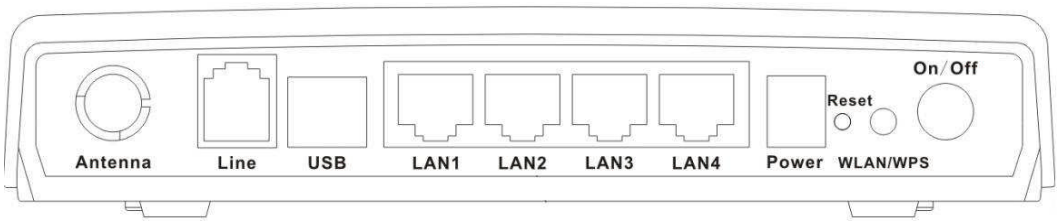
3.2 REAR PANEL & PORTS DESCRIPTION



Port name	Description
On/Off	Power On/Off button
WLAN/WPS	WLAN/WPS button
Reset	Reset configuration to factory default
Power	Power adaptor port
LAN1 – LAN4	Four Ethernet port 10/100 Mbps
USB	USB 1.1 port device
Line	ADSL Line connector (ADSL2+)

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3.3 PHYSICAL INTERFACES

3.3.1 WAN

ADSL WAN interface is compliant to:

- ITU 992.1 (G.dmt) Annex A
- ITU 992.2 (G.lite)
- ITU 992.3 ADSL2 (G.dmt.bis) Annex A
- ITU 992.4 ADSL2 (G.lite.bis)
- ITU 992.5 ADSL2+ Annex A
- ANSI T1.413 Issue 2

3.3.2 LAN

- N°4 auto-sensing 10/100Mbps fast Ethernet LAN port
- One USB 1.1 device port

3.3.3 WIRELESS LAN

- IEEE 802.11 b/g access point
- WPA/WPA2 (IEEE 802.11i)
- WPS / PBC
- N°1 external antennas

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4 FUNCTIONAL OVERVIEW

Functionalities	Features
WAN Interface	1 Line port (RJ-11plug, inner pair) supporting the following standards: • ADSL (G.992.1, G992.2, T1.413, G994.1, G.997.1) • ADSL2 (G.992.3) • ADSL2+ (G992.5) Annex A [G.992.1, G.992.3, A G.992.5]
LAN Interfaces	N° 1 10/100BASE-T Ethernet port (RJ-45 plug), compliant IEEE 802.3, with auto MDIX and auto-negotiation N° 1 USB Device v1.1
WLAN Interface	IEEE 802.11b/g access pint • Dual SSID (main SSID and guest SSID) • Support 64/128-bit WEP, 802.1x, WPA, and WPA2 for wireless security • N°1 external antenna
ATM features	ATM (AAL5) payload format UBR, VBR-nrt, VBR-rt, CBR traffic classes Up to 8 PVC
WAN Protocol Encapsulation	Bridged/Routed Ethernet over ATM (RFC 1483 / RFC 2684) IP over ATM (RFC 1577) PPP over ATM (RFC 2364) PPP over Ethernet (RFC 2516) MAC Encapsulation Routing (MER)
Routing / Bridging	IPv4 DHCP Server/Client NAT/NAPT (with ALGs) VPN pass-through SIP pass-through DNS relay NTP IGMP snooping
QoS	Priority queuing using ATM layer TX queues Classification rules 802.1p, IP TOS/Precedence, DSCP marking
Remote management	DSL Forum TR-069 WEB server with Admin/User configuration pages Diagnostics and LOGs
Security	Statefull inspection firewall

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5 HARDWARE SPECIFICATION

5.1 HARDWARE PLATFORM

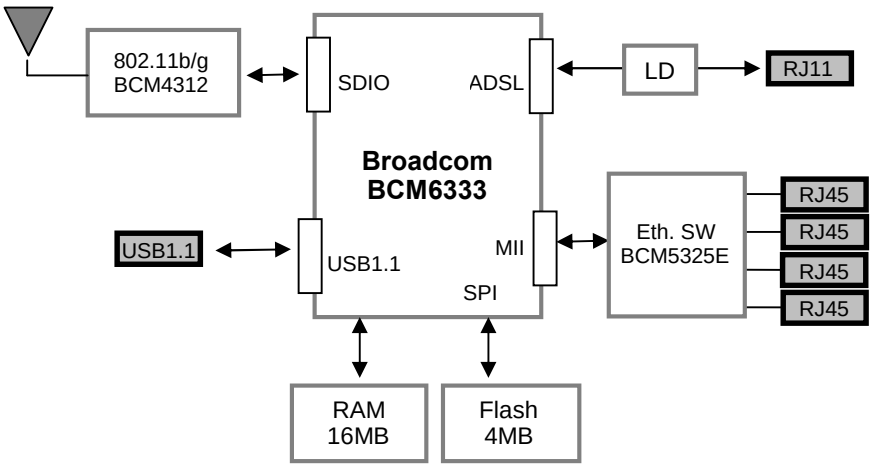
ADSL2+ Processor / LD:	BCM6333 / BCM6301
Eth. Switch:	BCM5325E
Wireless:	BCM4312

5.2 MEMORY

4 MB Flash

16 MB SDRAM

5.3 HARDWARE ARCHITECTURE



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5.4 RESET BUTTON

The device has a recessed button to be used for resetting the device to the default factory settings in case the User forgets LOG ON Password.

- Re-boot the router pressing the reset button in the rear panel for a while.
- The Router will restart, and when the start-up sequence has completed, browse to http://192.168.1.1 and configure your network again

5.5 WPS BUTTON

The WPS button is used for Wi-Fi Protected Setup and Push-Button Configuration (PBC).

5.6 ANTENNA

The device is equipped with n°1 external antenna

5.7 POWER SUPPLY

The device is supplied with an external wall-mount Switching Power Adapter that meets the following requirements:

- European Plug
- Primary: 100-240Vac, 50-60 Hz
- Secondary: 12V-DC, 1A - 12 VA

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6 MECHANICAL

The device shall be placed in horizontal position.

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7 FIRMWARE / SOFTWARE

7.1 WAN FEATURES

7.1.1 ADSL - CONNECTION TYPE

The product is compliant to the following ADSL/ADSL2+ standards:

- Support ADSL ANSI T1.413 Issue 2, ITU G992.1 (G.dmt), G.992.2 (G.lite) and G994.1(G.hs)
- Support for ADSL2 (ITU G992.3/G992.4)
- Support for ADSL2+ (ITU G992.5)
- Support for RE-ADSL
- TR-067 Compliant
- Dying Gasp (OPTIONAL)

7.1.2 ADSL COMPATIBILITY

The product is compliant to the following standards:

- TR-067
- TR-100

7.1.3 ACCESS CONNECTION TYPE

- Capable of specifying a Host name on the WAN side
- Dynamic/static IP address allocation over RFC1483/2684 encapsulation
- Multiple PPPoE session pass-through
- Static IP address allocation over IPoA encapsulation
- Support for Proxy ARP and Bridged Firewall between the WAN and the LAN

7.1.4 ACCESS PROTOCOLS

- 1483 Bridging - RFC1483/2684 bridged encapsulation in bridging mode. The transparent bridging function with address learning is enabled.
- 1483 Routing - RFC1483/2684 routed encapsulation in routing mode. It is used to carry IP datagrams directly over ATM. DHCP client function can also be enabled to obtain an IP address dynamically.
- MAC Encapsulated Routing (MER) - RFC1483/2684 bridged encapsulation in routing mode. MER uses the same encapsulation as 1483 Bridging but with bridging function disabled. DHCP client function can also be enabled to obtain an IP address dynamically.
- PPPoA/PPPoE - PPP service provides three connection types - Always Connected, Auto and Manual. If Auto mode is selected, the PPP connection will only be initialized when there is request of Internet access from local clients; after an Idle Timeout, when no Internet traffic is requested, the PPP connection will be turned down automatically

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7.1.5 ATM QoS

- ATM QoS parameters supported: CBR / UBR / VBR-rt / VBR-nrt
- The default ATM QoS for all VC's is UBR.
- VBR-rt is supported (as defined in the ATM Forum Traffic Management Specification Version 4.1) with configurable Peak Cell Rate (PCR), Sustainable Cell Rate (SCR), Maximum Burst Size (MBS)
- The device must support multiple levels of QoS listed above simultaneously across separate VCCs (e.g., UBR for PVC 0/35 and CBR for PVC 0/43 where both PVCs are active simultaneously).

7.1.6 MULTIPLE PVC (PERMANENT VIRTUAL CIRCUITS)

- ATM PVC is a virtual connection that acts as a WAN interface. The Gateway at present (in the current fw release) supports up to 8 PVCs.
- All supported PVC's must be able to be active (sending/receiving traffic) simultaneously.
- P.DG A4010 supports the minimum ATM granularity applicable to the associated DSL protocol in use on a per VC and VP basis.
- Auto hunting VPI/VCI - The device is able to perform an auto search for the VPI/VCI settings for the first PVC. This search is a sequence looking for a first-success VPI/VCI couple (VPI takes value in the range 0÷9 and the VCI in the range 32÷61).
- The default VPI/VCI values for all PVC's is configurable. The default value will be utilized prior to performing an auto-search but should exclude the default value in the auto-search. The auto-searching feature is OFF by default.

7.2 ROUTING FUNCTIONS

7.2.1 STATIC ROUTE

Static Route - Administrator can add static route to route packets to the next hop using the pre-defined route. The router will support manual configuration of:

- Network Route
- Host Route
- Default Route
- Metric (default to 10)

7.2.2 ROUTING TABLE

The user interface will display a table of routes learned by the Router and configured by the administrator. The table will display the following:

- Network Address
- Netmask
- Gateway
- Interface

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7.3 WiFi

Dual SSID (main SSID and guest SSID)

Support 64/128-bit WEP, 802.1x, WPA, and WPA2 for wireless security

7.4 FIREWALL FUNCTIONS

7.4.1 STATEFUL PACKET INSPECTION (SPI)

Statefull Packet Inspection is available in the sense that inbound traffic is blocked out unless it is an answer to a previous outbound traffic.

However via the GUI it is possible to create some ad-hoc rules allowing a predefined traffic to come in.

7.4.2 NAT & NAPT

NAT (Network Address Translation) protocol (RFC1631) maps IP addresses from one group to another and ensures private network to be concealed from the public internet.

This feature limits the number of public IP addresses required from the ISP and also maintains the privacy and security of the local network. We allow one or more than one public IP address to be mapped to a pool of local addresses.

NAPT (Network Address Port Translation) translates network addresses and respective TCP/UDP ports into a single network address and its TCP/UDP port.

NAT/NAPT is also a machine to let a group of user sharing a public IP.

7.4.3 ADDRESS MAPPING

This feature allows one or more public IP addresses to be shared by multiple internal users. This also hides the internal network for increased privacy and security. The User enters the Public IP address to be shared into the Global IP field. Furthermore he enters a range of internal IP addresses that will share the global IP into the “from” field.

7.4.4 VIRTUAL SERVER

Configuring the Router as a virtual server, remote users accessing services such as web or FTP in the local Network via public IP addresses can be automatically redirected to local servers configured with private IP addresses. In other words, depending on the requested service (TCP/UDP port number), the Router redirects the external service request to the appropriate server (located at another internal IP address).

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7.5 MISCELLANEOUS

7.5.1 DNS (DOMAIN NAME SERVICE)

A Domain Name Server is an index of IP addresses and Web addresses. Most ISPs provide a DNS server for speed and convenience. It is likely that the DNS server IP's are also provided dynamically.

The user could specify a DNS server manually.

7.5.2 VIDEO AND VOICE ALG'S AND APPLICATION SUPPORT

The following video and voice ALGs are supported*:

- **SIP** (Session Initiation Protocol) pass-through)

The applications like MSN Messenger or Net-meeting are supported.

- **Netmeeting**
- **ICQ**
- **Real Player**
- **QuickTime**
- **DialPad**
- **PC Anywhere**

By default, the support for the above optional ALGs has to be enabled.

7.6 MANAGEMENT, CONFIGURATION AND STATUS

7.6.1 WEB-BASED GUI

A Web-Based Configuration GUI is available to manage the CPE by an embedded Web Server. The administration GUI may be accessed from any LAN port.

Password can be used to log-in in order to restrict access to the router to authorized personnel only as Management activities are limited only to trusted stations.

7.6.2 TR069 CLIENT

This product is TR069 compliant.

7.6.3 FW UPGRADE

Firmware can be upgraded either from WAN side1 or from LAN connection.

[1] Different solutions are available according to customer requests.

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7.6.4 CONFIGURATION: SAVE & RESTORE

Factory default values are set via RESET button or web management GUI.

The user is allowed to save the device configuration of the product to a PC via a web browser.

7.6.5 USB DRIVER

The USB driver interoperates to the follow Operative Systems:

- **Windows 98**
- **Windows ME**
- **Windows 2000**
- **Windows NT**
- **Windows XP**

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8 ENVIRONMENT

The device is compliant with the standard **EN 300 019** in the following conditions:

Storage: EN 300 019 Class 1.2: Not temperature controlled storage locations.

Transportation: EN 300 019 Class 2.3: Public Transportation.

Stationary Use: EN 300 019 Class 3.2: Partly temperature-controlled locations.

The product shall work in the following temperature conditions:

Operating: 0° to 40° C

Non-Operating: -20° to 65°C

The product shall work in the following humidity conditions:

Operating: 10% to 85% RH non condensing

Non-Operating: 5% to 95% RH non condensing

9 CERTIFICATIONS AND AGENCY APPROVALS

The product shall be compliant to the R&TTE Directive 99/5/EC. Harmonized standard applied:

EN 60950-1 (Electrical Safety)

EN 300 328 (RF Requirements)

EN 301 489-1/17 (EMC)

ITU-T K21

CE Mark

WiFi Alliance Certification (including WPA/WPA2)

10 ECO-COMPATIBILITY

WEEE

RoHS

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11 PACKAGING AND LABELING

11.1 PACKAGE CONTENT

The following standard items are provided:

- N°1 P.DG A4010G
- N°1 Power adapter
- N°1 Ethernet CAT5 cable with RJ-45 plug
- N°1 Phone cable RJ-11 plug
- N°1 USB cable.
- N°1 CD (with the USB driver, User Manual)
- Quick Installation Guide
- Safety Flyer

Optional

- Smart Setup Configuration Utility (into CD image)
- ADSL microfilter or splitter

11.2 PACKAGE DRAWING

The standard package is made with a white carton with Pirelli Logo (black color)

The package is designed to contained all the standard and optional package optional

11.3 LABELING

The product is provided with n°2 labels on the device and on the package. The following information is provided:

- Company name (i.e. Pirelli Broadband Solutions S.p.A.)
- Name of the product
- P/N
- MAC address
- CE mark / WEEE Logo
- Wi-Fi Logo

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