



PacketFront presents

# Gigabit-to-the-Home



It is now time to move from 100Mbit/s to 1000Mbit/s bandwidth on the fiber connection to the customer - it's time for Gigabit-to-the-Home.

Bandwidth demand continues to increase by 50% per year and today 100Mbit/s is no longer sufficient to support both HD television and high speed Internet at the same time. A growing number of end-users are therefore asking for faster access to the broadband network.

Competition from cable networks, DOCSIS 3 and the copper network's latest generation of VDSL2 leave, however, many end-users stuck in the copper age.

Gigabit-to-the-Home is a clear step forward, demonstrating how future-proof and superior fiber is when compared to the aging copper infrastructure. Offering connection speeds 40 times faster than ADSL, Gigabit-

to-the-Home provides end-users with the same revolutionary increase in bandwidth that they experienced when dial-up Internet was replaced with broadband.

Broadband made it possible to offer completely new types of services, such as YouTube, social media and a totally new way for us to use the Internet in our daily lives. It is, therefore, not surprising that major players now take the lead in building access networks with Gigabit connections to the home in order to promote the next generation of services.

Gigabit-to-the-Home is gaining momentum and it is therefore time to select the next generation of access and fiber termination equipment in the home.

PacketFront, a leader in FTTH broadband, offers a wide selection of products to meet the demands of the Gigabit Age.

# Gigabit Access Switch

## Built for broadband

MetroStar 3000 (MS3000) is PacketFront's series of Gigabit Ethernet switches designed for broadband networks.

The MS3000 is a Layer2+ switch with full wirespeed performance, Purpose-built for Gigabit-to-the-Home networks.

## Key Benefits

- Supports 100Mbit/s and 1 Gbit/s for both copper and fiber
- All connectors on the front panel.
- Customer and Service VLAN topologies
- Enhanced multicast functionality for TV services
- Industry standard command-line interface
- Layer 2+ feature set
- Designed for automated deployment



MetroStar 3000

## Multi-rate makes migration easy

MS3000 can use both 100Mbit/s and 1Gbit/s fiber connections in the same switch at the same time! This means that you can continue to build 100Mbit/s access but deploy Gigabit ready equipment, or that you can replace the 100Mbit/s access switch in your installed base but keep the customer equipment. And when the customer wants to upgrade, just change the CPE, and make a simple configuration update in the MS3000, and the upgrade is done!

## All connectors in the front

All connectors for network, power and management are located in the front panel of the switch. This allows the MS3000 to be installed against a wall, or in other spaces where access to the back of the unit is problematic. Our experience shows that broadband installations rarely provide central-office facilities, and therefore maximizing the use of available space is very important.

In addition, side-to-side cooling also allows MS3000 units to be installed directly on top of each other to further minimize space needed to fit the equipment.

## Service VLAN topologies

The MS3000 supports Service VLAN topologies, where many customers share the same VLAN in order to conserve IPv4 address space. MS3000 uses common security features such as DHCP snooping, ARP inspection and IP source-guard to prevent abuse or security problems in these types of topologies.

It is of course possible to use customer VLAN topologies as well. With up to 4096 VLANs, the MS3000 will also work well in topologies where standard Ethernet VLANs are used to provide customer separation.

## Enhanced TV-services

With support for access-control of multicast groups, card-sharing problems are completely eliminated. In addition, in customer-

VLAN topologies, the MS3000 supports multicast VLANs with up to 1000 dynamically learned multicast groups. There is no need to pre-define groups, and there is enough room to fit even the most ambitious channel packages.

## Layer2+ feature set

The MS3000 can be managed using telnet, SSH or SNMP by any network management system. It supports 4096 VLANs with full Q-in-Q and 16,000 MAC addresses. Bandwidth management, including ingress policing and egress shaping is provided. The hardware has 8 queues per port.

## Automated deployment

The MS3000 can be deployed directly out of the box into the network. When connected to the network, the switch will use DHCP for its management IP which allows a central auto-configuration server to connect to the switch and configure it.

This reduces the operational costs and time needed and also dramatically simplifies the installation as the switch does not need to be preconfigured before the installation. Particularly in large installations, the logistics are greatly simplified as the field engineer can take the next available MS3000 for any particular installation and further does not require a PC to perform configuration steps when the unit is connected to the network.

Continuing to build on PacketFront's track record of Purpose-built hardware and software for broadband networks, the MS3000 provides a number of advantages for broadband deployment. PacketFront has combined Layer2 functionality with intelligence and smart solutions for everyday challenges in a very competitive package.

The MS3000 comes in AC and DC power options with 28 Gigabit Ethernet ports.

- MS3028: 28 SFP ports
- MS3128: 24 RJ-45 ports, and 4 SFP ports

# Next generation Gigabit router and

## Wirespeed router and firewall

The DRG700 is an easy-to-install high-performance home gateway, packed with features to support triple-play services.

Key benefits:

- 4 Gigabit LAN ports and one USB port
- Support for 100 Mbps and 1 Gbps fiber connections
- Easy 1-click installation
- Managed by SSH, TR-069 or SNMP
- Wirespeed firewall and NAT
- IPv6 ready, including IPv4 to IPv6 transition support
- VoIP and WiFi (optional)
- Remote-managed CATV (optional)
- Can also operate as L2 switch, or in hybrid mode

### Wirespeed firewall and NAT

The multi-rate DRG700 has a high-performance network processor which allows the unit to perform firewall and network address translation for IPv4 at wirespeed.

### Managed by TR-069 and SNMP

TR-069 is widely deployed for the management of DSL modems. The DRG 700 has a built-in TR-069 client that allows an existing AutoConfiguration Server (ACS) to also manage the DRG700. If no ACS is available, the DRG700 can be managed using the standard SNMP and TFTP protocols, for configuration and data collection. A Command Line Interface (CLI) is also available.

## Quick and easy One-click installation

PacketFront's ingenious fiber termination unit (FTU) hides and protects the fiber as well as simplifies the installation process.

The FTU is installed on top of where the fiber enters into the home, or right next to it. Extra fiber from the pigtail can be stored inside the FTU and the fiber connectors for the DRG are also fixed in position by the FTU. The installation is finished by putting the cover panel on top of the FTU, which completely covers and protects the fiber. This prevents accidental damage to the fiber pigtail which removes the need for expensive repair work during the installation lifetime.

The installation engineer can then move on to the next installation. On average, the FTU installation takes less than 15 minutes per home, including the welding of the fiber connectors.

The unique "click on" concept even allows end-users to complete the installation and to connect the home router or switch. This allows the fiber installation to be completed without installing the switch or router model, thus saving initial investment costs. The



DRG 700

### VoIP and WiFi

The DRG700 is available in multiple variants which support POTS telephony with a built-in SIP Voice-over-IP client, including support for Class 5 services. Models with an 802.11b/g/n access point support up to 300Mbit/s wireless communication, which gives customers access to the network anywhere in the home without having to build a wired network.

### Remote-managed CATV

Models with the built-in CATV receiver make it possible to offer an optical TV signal over fiber that is converted by the DRG700 into a traditional electrical RF signal. A frequency filter allows premium channel packaging without the use of set top boxes (STB). The TV signal can also be adjusted through Automatic Gain Control (AGC).

switch or router is not required until the end user actually orders a service, and since the end-user can install the module by themselves, no extra truck rolls are required.

Once the DRG Base and fiber connectors have been installed, the customers can simply install the DRG700/800 unit themselves with the One-click installation design. No special skills or patch cables are required.



DRG Base

# Managed switches for the connected Home

## VLAN-capable managed switch

DRG 280 and DRG 800 are the next generation multirate Layer 2 home gateway devices with up to 8 Gigabit LAN ports. They provide a connection point to FTTx broadband networks and can deliver up to 1 Gbit/s to the end-user. Up to 256 VLANs can be trunked to the DRG which allows multiple services to be deployed to separate ports on the DRG.

### Clear and manageable demarcation point

The DRG 280/800 offers a clear demarcation point with multiple Gigabit Ethernet interfaces. Network owners have full control over the network end points.

The DRG 280/800 is fully manageable, thus avoiding costly on-site visits. Software and configuration profiles are easily provisioned by network control and provisioning software. Management is also supported using SNMP and DHCP, and using a command line interface (CLI). The unit supports IGMP-snooping for optimal TV delivery.

### Easy-to-understand LEDs

The discrete, yet informative, LEDs are easily recognized by the end-user and identify important events. This is an advantage in the communication with network operators and/or service providers.

DRG 280



### One-click installation

Using the Fiber Termination Unit as the docking interface for the DRG 800, installation is simple and can be done by the end-user.



DRG 800

## Multi-rate support for future proof deployment

The next generation DRGs from PacketFront are multi-rate. They support autosensing of 100Mbit/s and 1 Gbit/s on the WAN link. This allows you to already today deploy a future-proof CPE to your customers even if your access network still operates at 100Mbit/s. The CPE is the most costly and logistically challenging part of the network to replace, due to many installation sites that have to be revisited. One-click installation FTU in combination with a multi-rate CPE today, saves time and cost in migrating to the next generation access.

## Managed Media Converter

The MC-101 Media Converter provides a simple, yet manageable, fiber-to-copper media conversion for Gigabit networks.

Like all new Gigabit DRG models, the MC-101 also supports multi-rate operation.

A web-based GUI is available via the fiber port to control media converter operation, including trunking of VLANs and 802.3ah Ethernet OAM functionality.



MC-101

# PacketFront opens up



PacketFront has, since its inception in 2001, been a leading supplier of broadband solutions. Our operator background, our technical expertise and our products, purpose-built for broadband, creates a unique offering. Therefore, our customers are among the most successful FTTH broadband networks in the Nordic countries, as well as abroad.

A common view is that PacketFront products are part of a solution that requires the network operator to use all components, including the BECS™ control- and provisioning system. This is no longer the case.

In fact, the new Gigabit-to-the-Home products work equally well with other control- and provisioning systems, using standard protocols for management and control. Our gigabit products offer a number of advantages because they are developed with focus on broadband networks and the challenges that you as a network operator face - making the entire network work together.

You can therefore select to use our Gigabit products together with other provisioning and network management systems.

You can also select to include BECS as a complement to your existing operational support systems in order to take advantage of BECS features for mass deployment and automatic configuration of PacketFront equipment.

You can even select to replace existing support systems that are inadequate for new tasks and let BECS control the whole network, both existing equipment from other vendors and new equipment from PacketFront. BECS has been extended in recent years with capabilities to manage almost any type of broadband network equipment.

This gives you the opportunity to use world-leading automation and service management in your network as well, regardless of vendor, model or generation of network equipment.

# Product Summary

## MetroStar 3000 - Gigabit Ethernet switch

Model	Description
MS3028-AC	28 SFP port Gigabit Ethernet switch with 24 port 100/1000 Mbit/s, AC 220V power
MS3028-DC	28 SFP port Gigabit Ethernet switch with 24 port 100/1000 Mbit/s, DC -48V power
MS3128-AC	28 port Gigabit Ethernet switch with 24 RJ-45 10/100/1000 Mbit/s and 4 SFP 1000Mbit/s, AC 220V power
MS3128-DC	28 port Gigabit Ethernet switch with 24 RJ-45 10/100/1000 Mbit/s and 4 SFP 1000Mbit/s, DC -48V power

## DRG700 - Home router for smart FTU

### Fiber WAN models

Transmit wavelength: 1310nm, Receive wavelength: 1490-1550nm (wideband)  
Max/Min output power: -8/-14 dBm, Max/Min input power: 0/-31 dBm

Model	LAN	WiFi (b/g/n)	2 x POTS	CATV/EU-1
DRG711	4x10/100/1000	-	-	-
DRG712	4x10/100/1000	-	-	Yes
DRG714	4x10/100/1000	-	Yes	Yes
DRG716	4x10/100/1000	Yes	Yes	Yes
DRG718	4x10/100/1000	-	Yes	-
DRG719	4x10/100/1000	Yes	Yes	-

### Copper WAN models

Model	LAN	WiFi (b/g/n)	2 x POTS	CATV/EU-1
DRG701	4x10/100/1000	-	-	-
DRG702	4x10/100/1000	-	Yes	-
DRG703	4x10/100/1000	Yes	Yes	-

## DRG800 - Managed L2 switch for smart FTU

Model	LAN	WAN	Description
DRG886	8x10/100/1000	1x100/1000	Single-fiber Receive wavelength 1490-1550nm (wideband), transmit wavelength 1310nm

## DRG280 - Managed L2 switch in metal casing

Model	LAN	WAN	Description
DRG281	8x10/100/1000	-	Eight port RJ-45
DRG286	8x10/100/1000	1x100/1000	Single-fiber Receive wavelength 1490-1550nm (wideband), transmit wavelength 1310nm
DRG287	8x10/100/1000	1x100/1000	Dual-fiber

## MC101 - Managed media converter

Model	LAN	WAN	Description
MC101	1x10/100/1000	1x100/1000	Single-fiber Receive wavelength 1490-1550 (wideband), transmit wavelength 1310nm



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