Hardware Manual

Product Model: DAS-3626

VDSL2 Switch

Release 1.00

October 2009 P/N 651EV3726015G

About this Guide

This guide is intended for network administrators and technical support staff using the DEV3726K VDSL2 Switch.

Introduction

The DAS-3626 VDSL2 Switch delivers DMT 5-band IP-based VDSL2 broadband access for residential and small business use. The switch provides up to 100 Mbps downstream and 50 Mbps upstream data transmission for sixteen or twenty-four subscriber ports, enough bandwidth for high-speed Internet access, multimedia services, and packet telephony services. The switch can coexist with ADSL, ISDN or POTS deployments. The switch implements a 6-band DMT VDSL spectrum utilization that is fully compatible with, and an improvement upon the standard band plan that pushes the downstream bit rates well beyond the ITU specification. The switches feature dual Gigabit Ethernet ports for network uplink and trunking to another DAS-3626. The DAS-3626 includes the option of using either SFP or copper Gigabit Ethernet ports for uplinking. The switch has an internal DSL splitter and DSLAM. Each VDSL subscriber port is paired with the various CPE options D-Link VDSL2 Home Gateways. The switch supports CPE management. The switch and CPE are managed via an out-of-band console connection to a computer using terminal emulation software or accessed in-band via Telnet and web-based management.

Ports

- One female RJ-21 (POTS) port for connection to PBX/PSTN (Telco50 cabling)
- One female RJ-21 (VDSL) port for connection to CPE (Telco50 to RJ-11 patch panel or similar arrangement)
- DAS-3626 24 VDSL2 subscriber ports
- One female RS-232 DCE diagnostic port (console port) for out-of-band management
- Two SFP Gigabit ports for single or multimode fiber and provides the option of using SFP or copper Gigabit Ethernet for uplink

Features

- Configurable Upstream/Downstream transmission speeds (up to 100 Mbps downstream/50 Mbps upstream)
- Supports up to 16/24 end users per switch
- Complies with VDSL-DMT and ADSL standards
- Spectral compatibility with, ISDN, POTS and various DSL
- Band Plan Selection (4-band or 5-band plus augmented 6-band options compatible with ITU specifications)
- OAM communication channels
- Upstream and Downstream Power Back Off
- Payload Rate Setting
- Interleave Delay Setting
- Rate Adaptation (RA) / Fixed Rate
- RA method configuration
- SNR Margin Configuration
- On-line Reconfiguration
- VDSL2 Profile/Line Profile
- RFI Band Cut Off
- Manual Re-training

Hardware

The D-Link DAS-3626 VDSL over Ethernet solutions require the following hardware components:

1. The D-Link DAS-3626 Switch. Read below for description.
2. The D-Link VDSL2 Home Gateway CPE used to connect subscribers. One per VDSL subscriber port.

The switches and CPE include a built-in DSL splitter to separate voice and data spectrum.

Packing List

Before you begin installing the switch, confirm that your package contains the following items:

- One DAS-3626 VDSL Over Ethernet Switch
- Mounting kit: 2 mounting brackets and screws
- Four rubber feet with adhesive backing
- One AC power cord

Front Panel

The front panel of the DAS-3626 Switch as shipped:

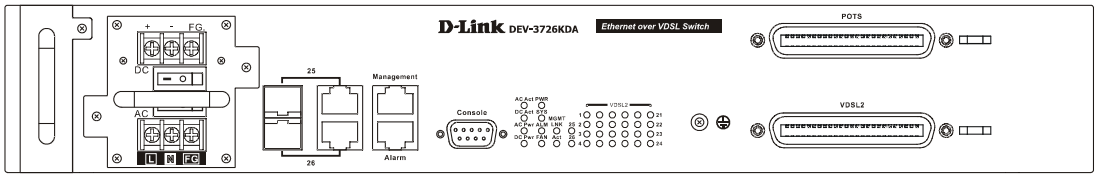

Figure 1. Front Panel of the DAS-3626

- Front panel of DAS-3626 features LED indicators (described below), power insert, fan module insert, two female RJ-21 ports (POTS and VDSL) and one RS-232 female console port.
- The DAS-3626 provides two uplink options, two SFP ports or two copper 1000BASE-T Gigabit Ethernet ports.
- An AC power connector.
- A DC power connector, as described below:

Connecting DC Power Supply

Follow the instructions below to connect the DC power supply of the switch to a DC power source.

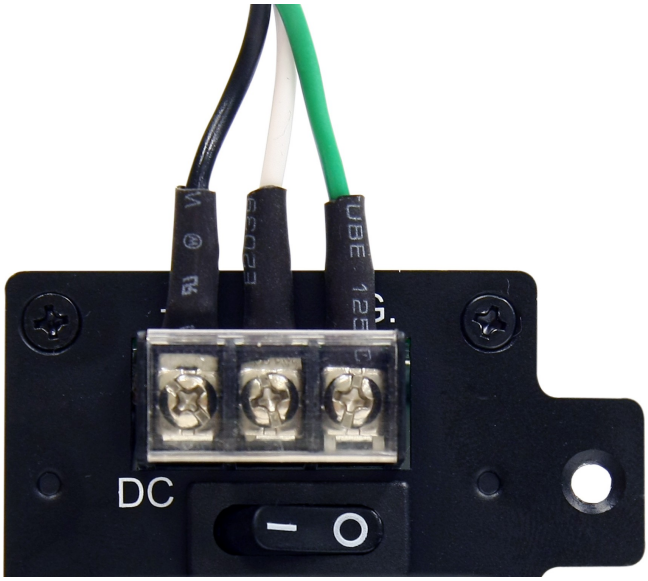

Figure 2. Power connections attached to DC contacts on assembly

To connect the DC power supply:

1. Firmly attach the DC power to the negative and positive contacts on the wiring assembly.
    - The negative pole (-) connects to the **-48V** contact.
    - The positive pole (+) connects to the **-48V Return** contact.
    - If available, the earth ground may be connected to the FG contact post.
2. Tighten the contact screws so the connection is secure.

Connecting AC Power Supply

Follow the instructions below to connect the AC power supply of the switch to a AC power source.

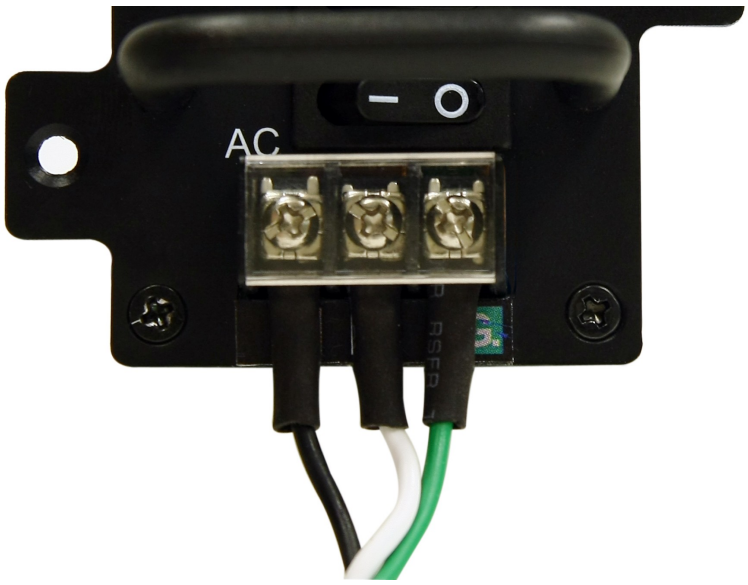

Figure 3. Power connections attached to AC contacts on assembly

To connect the AC power supply:

1. Firmly attach the AC power to the contacts on the wiring assembly.
    - The Line wire (L) connects to the **Line** contact.
    - The Neutral wire (N) connects to the **Neutral** contact.
    - If available, the earth ground may be connected to the FG contact post.
2. Tighten the contact screws so the connection is secure.

When both AC and DC power are connected, the power supply connection should look similar to the example in Figure 4.

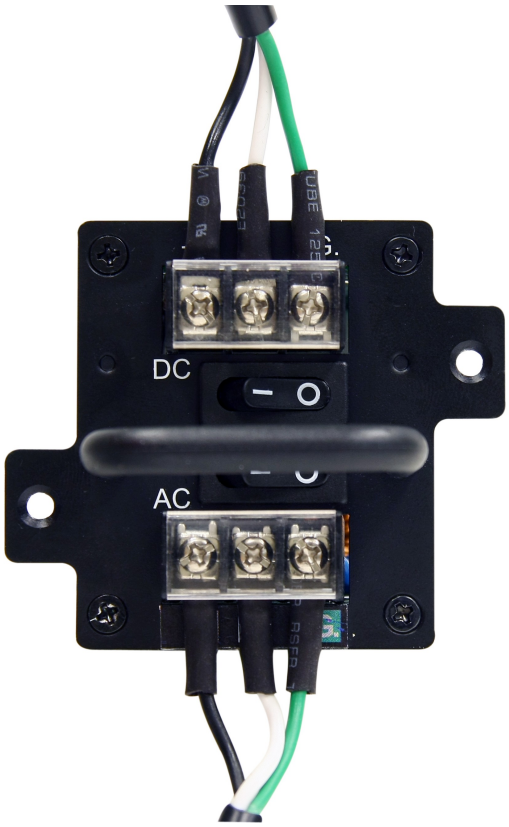

Figure 4. Both AC and DC power contacts on assembly

LED Indicators

The LED indicators of the switch include Power, Console, and Link/Act. All LED indicators are visible on the front panel. The following shows the LED indicators for the switch along with an explanation of each indicator.

Power management LEDs	AC Active: Lights green when AC power source is in use. DC Active: Lights green when DC power source is in use. AC Pwr: Lights green when AC power source is available for use. DC Pwr: Lights green when AC power source is available for use.
Power (PWR)	This indicator will light steady green as soon as the switch is powered on. It will remain lit as long as power is supplied.
System (SYS)	This indicator will blink green during the boot up. It will light steady green to indicate the ready state of the device.
Alarm (ALM)	Lights red if either the temperature or voltage exceed an upper threshold or fall below a lower threshold.
FAN	Lights red if any system fan has failed or is not working properly.
MGMT	This indicator will light steady green for active 1 Gbps connection to the Management port, an amber light indicates a 100Mbps connection. The light remains dark if the link is down or for a 10Mbps connection. Rapid blinking indicates Transmit and Receive activity.
VDSL2 Line (24 Line LEDs)	One indicator per port. These indicators light green when the VDSL link is up and are dark if there is no link. During training the indicator slowly blinks green. Rapid blinking indicates Transmit and Receive activity.
Combo GE Ports 25 and 26 (2 LEDs)	One indicator per port. The Link LED lights green to confirm a valid link. Rapid blinking indicates Transmit and Receive activity.

Management

The system may be managed in-band or out-of-band using the Management Ethernet port, which will allow users to connect to it using the imbedded web GUI, or through Telnet. Administrators may also use the console port on the front panel to connect to the switch's CLI management interface. The console interface provides complete access to all switch management features.

Rear and Side Panels

Do not block the vent holes on the right side and rear of the switch housing. The left panel vent holes are used to disperse heat from the system fan.

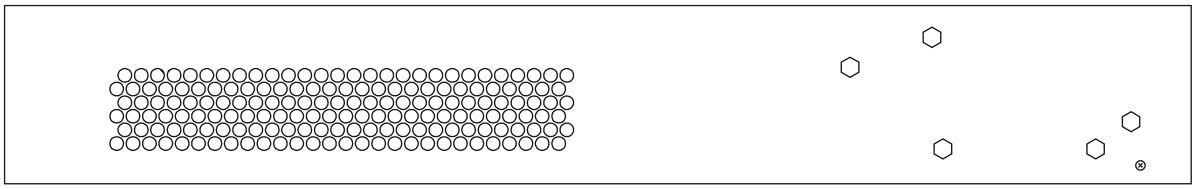

Figure 5. Rear Panel

CAUTION: Do not block vent holes on right side or rear panels or fan vent on left panel.

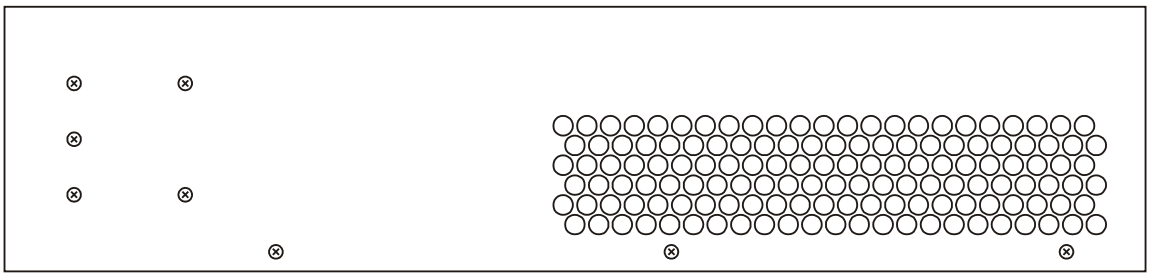

Figure 6. Right side Panel

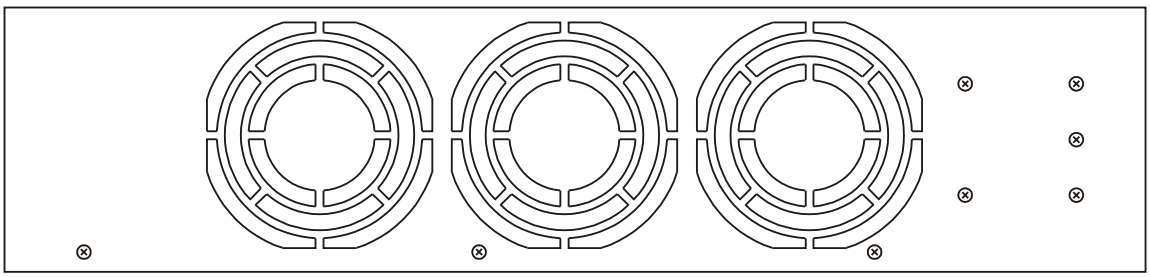

Figure 7. Left side Panel

Installation

Before you connect to the network, you must install the switch on a flat surface or in a rack, set up a terminal emulation program, plug in the power cord, and then set up a password and IP address.

The switch is supplied with rubber feet for stationing it on a flat surface and mounting brackets and screws for mounting the switch in a rack.

Switch Placement

The switch is designed for mounting in an EIA standard-sized, 19-inch rack, which can be placed in a wiring closet with other equipment. Make certain the location of the equipment rack is sufficiently dry and cool and, all network attachments and the power cord are connected to the device on the front panel.

- Attach the rubber feet to all switches that will be installed to maintain a minimum space between the devices and to avoid damaging the equipment housing.
- The power outlet or power source should be within 1.82 meters (6 feet) of the device.
- Visually inspect the power attachment and see that it is secured to the DC power connector.
- Make sure that there is proper heat dissipation from and adequate ventilation around the switch. Leave at least 5 cm of space on the right and left sides, as well as 5cm on the rear of the equipment for ventilation.
- Cables attach at the front. Make sure there is ample room to access cable connections.
- Do not place heavy objects on the switch.

NOTICE: Attach the included rubber feet to the switch or switches before installing it in the rack. All equipment in the rack should have rubber feet attached, to maintain the minimum space needed between devices and to protect the device housing from being damaged.

Installing the Switch without the Rack

1. Install the switch on a level surface that can safely support the weight of the switch and its attached cables. The switch must have adequate space for ventilation and for accessing cable connectors.
2. Set the switch on a flat surface and check for proper ventilation. Allow at least 5 cm (2 inches) on each side of the switch and 15 cm (6 inches) at the back for the power cable.
3. Attach the rubber feet on the marked locations on the bottom of the chassis.
4. The rubber feet, although optional, are recommended to keep the unit from slipping.

Power On

The switch provides the option of using DC or AC power supply. The switch's power supply will adjust to the local power source automatically and may be powered on without having any or all network cables connected.

When the switch is plugged in, the Power LED indicator will light steady green.

Power Failure

As a precaution in the event of a power failure, unplug the switch. When power is resumed, plug the switch back in.

Installing the Switch in a Rack

You can install the switch in most standard 19-inch (48.3-cm) racks. Refer to the illustrations below.

1. Use the supplied screws to attach a mounting bracket to each side of the switch.
2. Align the holes in the mounting bracket with the holes in the rack.
3. Insert and tighten two screws through each of the mounting brackets.

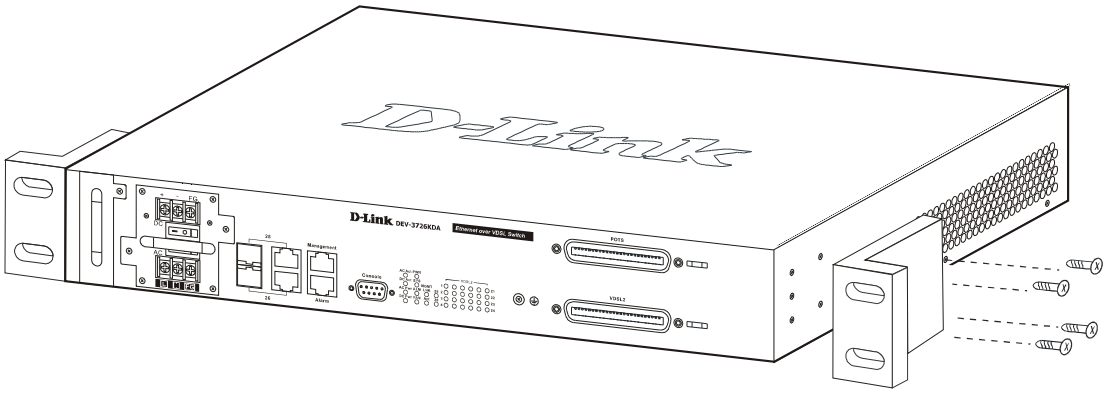

Figure 8. Attach mounting brackets

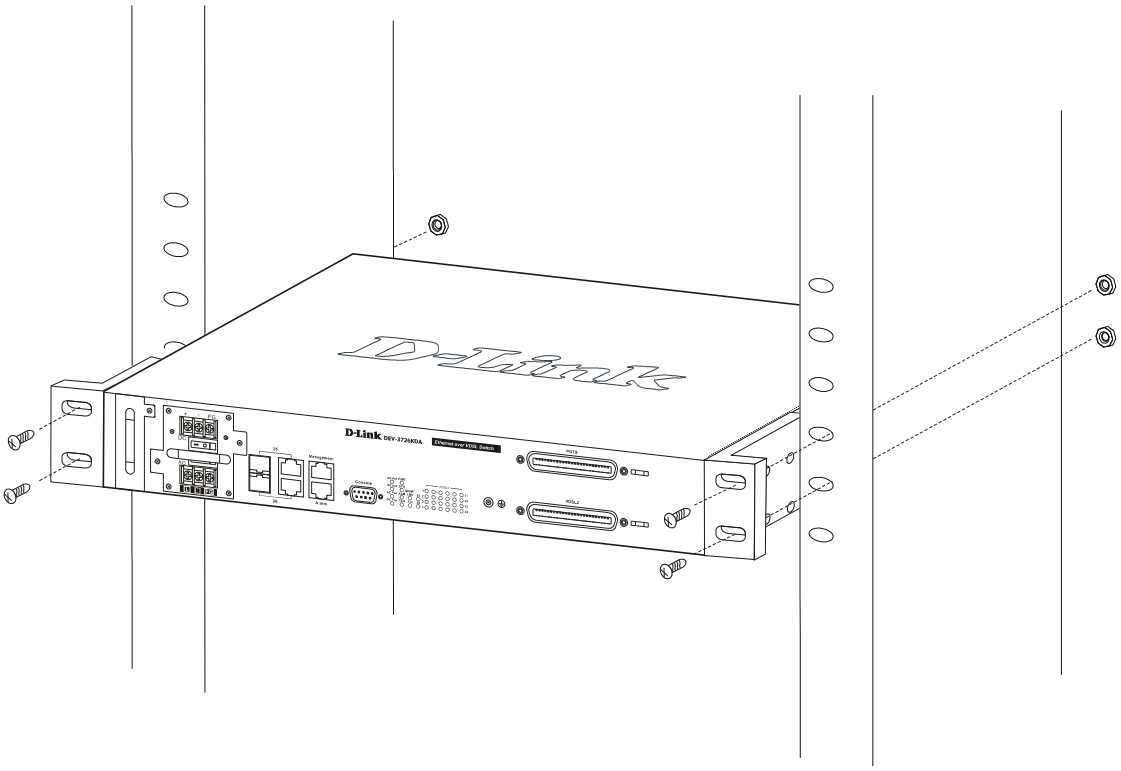

Figure 9. Install Switch in equipment rack

Attaching RJ-21 Connectors

The examples below illustrate the two styles of connectors used for RJ-21 cable connections.

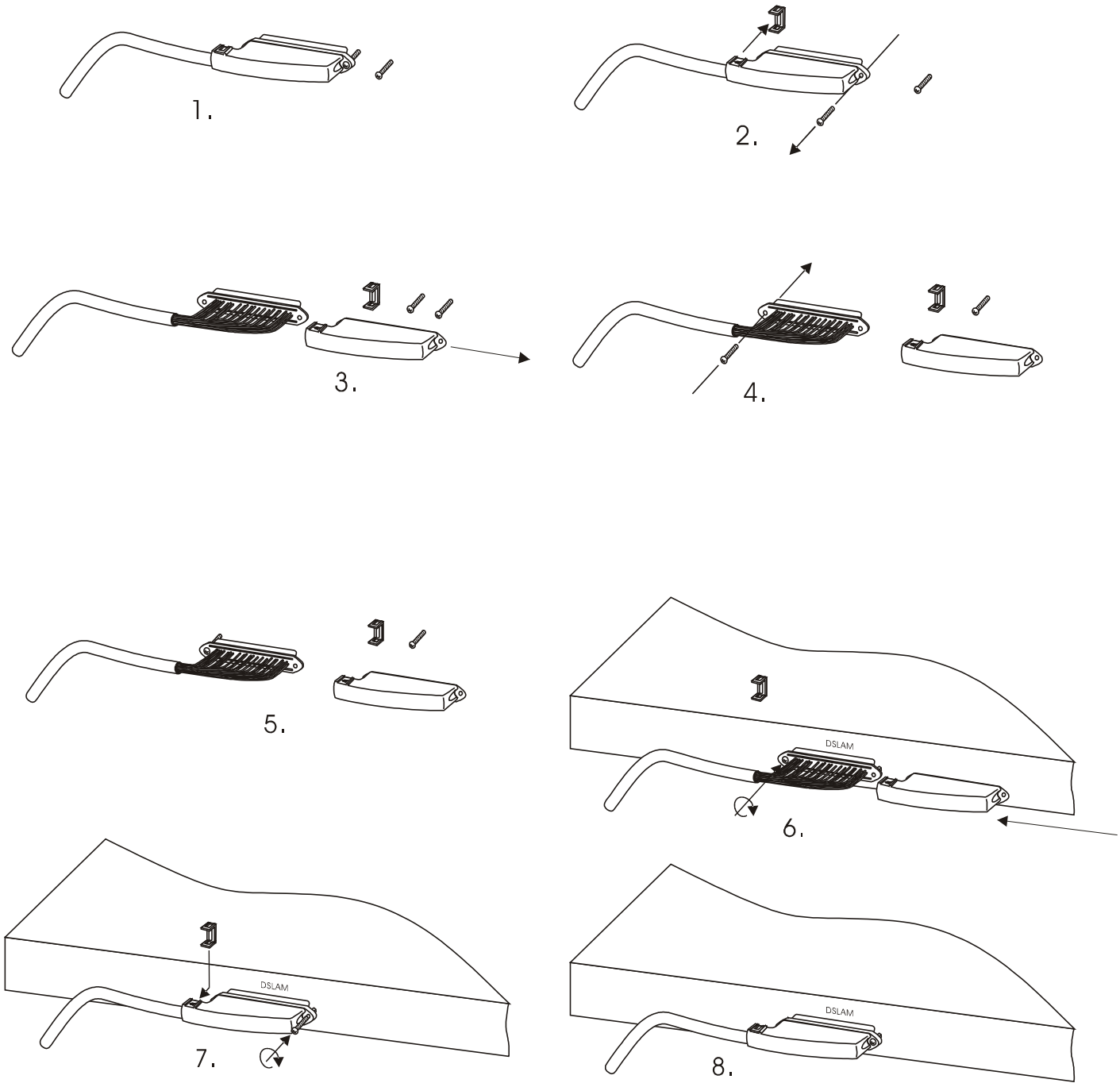

Figure 10. 90-degree connector secured with two screws

Network Connections

The partial front view of the DAS-3626 Switch in the diagram below illustrates all network connectors as well as the RS-232 console port.

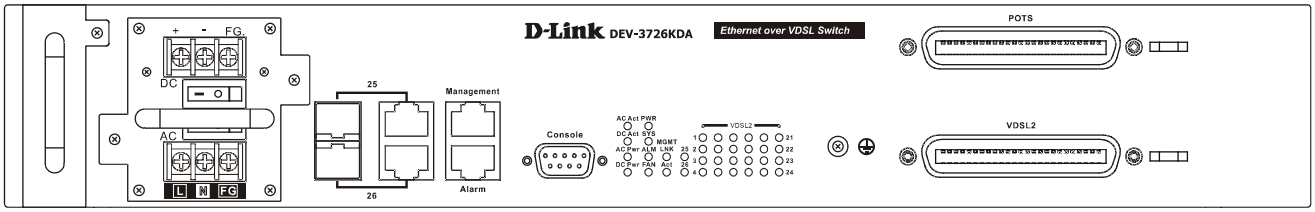

Figure 11. Front panel network connections

The required connections for full POTS and VDSL operation are as follows:

1. Connect the female RJ-21 receptacle labeled POTS to the PBX (analog channel to Central Office) for basic telephone services with Telco50 cable.
2. Connect the female RJ-21 receptacle labeled VDSL to patch panel for connection to CPE (via 0.4mm or 0.5mm twisted-pair telephone cabling). This connection is made using Telco50 cable with a male RJ-21 connector to the Main Distribution Frame, Cabling Cabinet, patch panel or other telephone distribution system used for connection the end users.
3. Uplink to backbone via Gigabit SFP port(s) “mini-GBIC” (single or multimode fiber). The DAS-3626 includes the option of using RJ-45 1000BASE-T port(s) for the uplink. If you prefer to use the 1000BASE-T ports on the DAS-3626, configuration is required to enable the ports (and disable the SFP ports).
4. The Gigabit ports may be used to trunk with another DAS-3626. This requires configuration to specify the port will be used for trunking (**config interface switch port-trunking**).

Network cable connections can be made to the switch with the power on or off. Caution should always be used when working with or handling any electrically powered devices.

For initial set up and management, connect the male RS-232 port to the computer used for switch configuration and management using RS-232 cable.

NOTE: In the illustration below, a telephone patch panel is used only to illustrate the connection to the subscriber or end user.

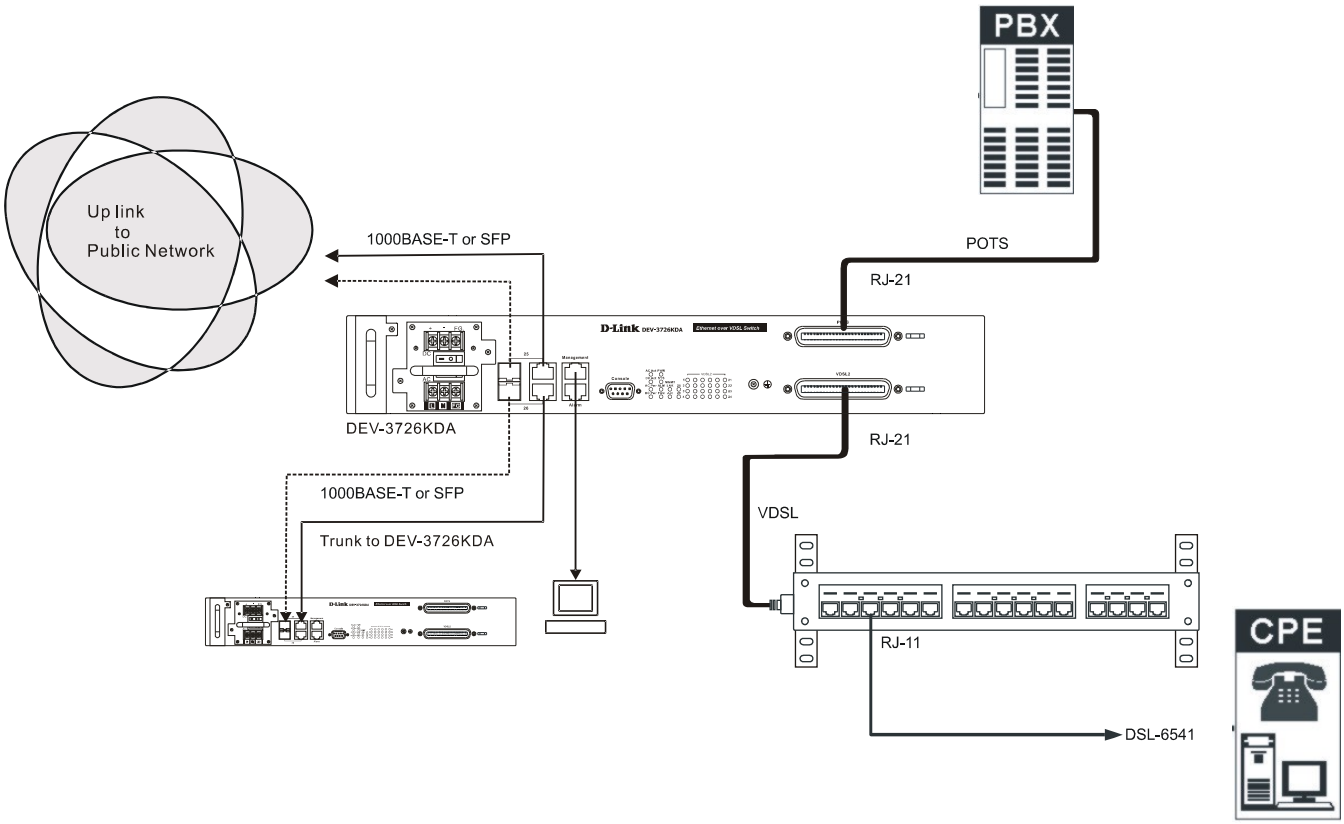

Figure 12. Sample network

Connection to End User

The separated signals for both VDSL and POTS service are carried to subscribers via standard 0.4mm or 0.5mm twisted-pair telephone cabling. Connection to the CPE is made with standard RJ-11 connectors that are familiar to the subscriber. The CPE device is a simple bridge and does not require that any driver or software to use. Subscriber CPE and connection conditions can be managed through the switch.

Using the CLI

The DAS-3626 supports a console management interface that allows the user to connect to the switch's management agent via a serial port and a terminal or a computer running a terminal emulation program. The console can also be used over the network using the TCP/IP Telnet protocol. The console program can be used to configure the switch to use SNMP-based network management software over the network.

This section describes how to use the console interface to access the switch, change its settings, and monitor its operation.

Note: Switch configuration settings are saved to non-volatile RAM using the **system config save** command. The current configuration will then be retained in the switch's NV-RAM, and reloaded when the switch is rebooted. If the switch is rebooted without using the save command, the last configuration saved to NV-RAM will be loaded.

Connecting to the Switch

The console interface is used by connecting the switch to a VT100-compatible terminal or a computer running an ordinary terminal emulator program (e.g., the **HyperTerminal** program included with the Windows operating system) using an RS-232C serial cable. Your terminal parameters will need to be set to:

- **VT-100 compatible**
- **115200 baud**
- **8 data bits**
- **No parity**
- **One stop bit**
- **No flow control**

Users can also access the same functions over a Telnet interface. Once users have set an IP address for your Switch, users can use a Telnet program (in VT-100 compatible terminal mode) to access and control the switch. All of the screens are identical, whether accessed from the console port or from a Telnet interface.

After the switch reboots and users have logged in, the console looks like this:

```
                    DAS-3626 VDSL2 Switch
                    Command Line Interface
                    Firmware: Build 1.02-B018
          Copyright(C) 2008 D-Link Corporation. All rights reserved.
UserName:
```

Figure 2-1. Initial Console screen after logging in

Commands are entered at the command prompt, **DAS-3626:admin#**.