

### Wireless Switching Solution

- + Reliable Wireless Deployment Solution
- + Increases Installation Flexibility
- + DES-1228P and DWL-3140AP Work Together

### Centralized Management of Wireless Network

- + Provides Scaled, Integrated Management Infrastructure
- + Centrally Manages User Authentication/Security Policies
- + Configures and Manage All Connected Access Points

### Simplified, Scalable Network Deployment

- + 802.3af Power Over Ethernet Facilitates AP Installation
- + Wireless Access Points Can be Added Anytime As Needed

### Switch

- + Provides Centralized Security/Management for WLAN Infrastructure
- + Automatically Configures & Manages All Attached AP
- + 24 10/100Mbps Ethernet Ports With 802.3af PoE
- + 4 10/10/1000Mbps Gigabit Uplinks (Including 2 Combo SFP)

### Wireless Access Point

- + 802.11g Wireless Connectivity
- + Up to 108Mbps (Turbo Mode)
- + Supports 802.3af PoE
- + Smoke Detector Look-Alike, Can Be Mounted on Ceiling
- + WEP Data Encryption, WPA/WPA2

## Wireless Aware Smart Switching

D-Link's Wireless Aware Smart Switching is an inexpensive-to-own, easy-to-use solution designed to let small businesses deploy a company-wide wireless network with reliable connectivity and enhanced security. Easy to install, manage and expand, it offers a cost-effective alternative to the more complex wireless switch controller solutions used by enterprises, while providing businesses with the flexibility and benefit of wired/wireless network convergence.

### Centrally Managed/Easily Expandable Wireless Network

A basic Wireless Aware Smart Switching system consists of one switch (a DES-1228P PoE Smart Switch) and up to 24 wireless access points (the DWL-3140AP Wireless 108G Web Smart Thin AP with PoE) directly connected to the switch, and management software called Smart WLAN Manager. The DES-1228P switch acts as the core unit that manages the 24 outlying units (the DWL-3140AP access points). Wireless access points can be scattered around a network site closed to users, while the switch can be placed in a centralized equipment room. Switches and access points can be gradually added to the network site as the number of wireless users grows. This scalable expansion provides businesses with the ability to gradually add network capacity on a per-need basis.

### Simplified Configuration/Management

The system provides quick discovery of switches and APs, an AP mapping utility, full-time AP status controls and the ability to maintain all AP traffic history and generate reports with statistical diagrams. Configuring and managing the wireless access points is through a Windows-based utility called Smart WLAN Manager running on a PC connected to the network. This utility provides self-discovery of all Smart switches connected to

the network. It lists them and the access points connected to each switch on the PC screen. From here, the network administrator can monitor all AP and wireless client status in the same integrated graphic interface.

To simplify configuration and firmware upgrade, Smart WLAN Manager allows administrators to apply profiles containing wireless and security settings, and firmware upload to a group of AP, dispensing them of the need to repeat the same process for each individual AP. It also allows backup and restoration of the wireless network database on the PC.

### Topology View

An office or factory floor plan can be uploaded to the Topology View, and switch and AP icons can be placed on the Topology View Map, so the locations of the managing and wireless devices can be seen on the PC screen. Administrators can click on an icon to configure and view the device. If and when an AP is down, they can instantly locate the failed device and replace it with a new one.

### AP Load Balancing

SSID can be set for access points for user access, security and roaming purposes. Smart WLAN Manager allows access points with identical SSID to be grouped together for load balancing to share traffic load. Each AP within the group will limit its access to a specific number of users, thereby guaranteeing a minimum bandwidth for each client. AP load balancing eliminates traffic bottlenecks in case of any sudden surge in the number of concurrent wireless connection at peak usage time. Combining this function with the access points' 108Mbps Turbo mode throughput, the system ensures a significant improvement of overall wireless network performance.

DWL-3140AP Wireless 108G Access Point With PoE



DES-1228P 24-port Ethernet Switch With PoE

### Wireless Aware Smart Switching

#### AP Monitoring

Smart WLAN Manager provides a List View, Tree View and Visual View of all monitored access points and periodically updates their status on the screen of the managing station. Administrators can thus check the status of the connected AP and their wireless clients, find out which AP is connected to which switch port, and see AP utilization traffic and load balance statistics in graphic diagrams. For reporting and planning purposes, the monitored statistics can be exported to Excel and PDF formats. A client connection log provides all connection status of wireless clients.

#### Easy Deployment/PoE Support

The DES-1228P switch has standard rack-mount design and can be hidden in a wiring closet, while the DWL-3140AP access points have camouflage smoke detector design and can be concealed on ceilings. The DWL-3140AP supports 802.3af standard PoE, while each the 24 Ethernet ports of the DES-1228P switch provides 802.1af PoE power, allowing the access points to be deployed at difficult places such as on high walls and ceilings, where AC power outlets are not readily available. By transmitting remote power through the standard network cabling inside the walls and

ceilings, a centralized power source is provided, eliminating the need for individual power sources for these devices. Supporting 802.3af standard, the DES-1228P switch provides the additional convenience for IP cameras, IP telephones and other 802.3af-compliant devices to connect to through its ports.

#### Flexible Wired/Wireless Connection

Converged LAN/WLAN deployment means all restrictions on port usage are removed: any port on the DES-1228P switch can be used for wired or wireless purposes - that is, connected to either a wireless access point or to the wired LAN structure. For LAN connection, the DES-1228P provides 4 Gigabit uplinks to the network backbone/servers, and extensive software features to enhance a wired network's security and performance. These features include IGMP snooping, port mirroring, Spanning Tree, port trunks, 802.1Q VLAN traffic segmentation, 802.1p QoS, 802.1x port-based authentication, D-Link Safeguard Engine and SNMP management support.

### FEATURES & BENEFITS

Wired/Wireless Access Switching Architecture	The wireless switching centralized architecture is composed of a DES-1228P PoE switch, which is the core unit that manages the network, and multiple DWL-3140AP access points, which deliver wireless connectivity to mobile clients and can be dispersed throughout the network. The Smart WLAN Manager provides each AP with configuration and security profiles to intelligently manage data traversing the wireless waves..
Centralized WLAN Management & Easy Deployment	Through a centralized management platform, network maintenance and configuration become a more efficient process. If any access point were to fail, administrators can instantly identify the location of the failed AP and immediately swap it out with another AP. The switch will automatically configure the new AP with the same configuration as the previous unit.
Maximum Network Protection	Each client connecting to the wireless network goes through an authentication process to ensure maximum security. Whether the client is an assigned user, a visiting guest, or just has department access, the system protects the entire network infrastructure with its numerous security protocols. These protocols include WEP data encryption, WPA/WPA2 and 802.1x user authentication security.
Gigabit Support for Network Backbone/Server Attachment	The PoE switch's Gigabit ports allow the wireless network to integrate with the network backbone and servers. These ports support combo 10/100/1000BASE-T and SFP connections, providing the flexibility for installing copper and fiber Gigabit uplinks.
802.3af Standard PoE Support for Easy Deployment	For installation sites, access points typically need to be placed at out-of-the-way locations such as on the ceilings or rooftops for maximum coverage. It is at these locations where wall AC outlets are inaccessible, and extending power lines to these places is difficult and expensive. By transmitting remote power through the standard network cabling inside the walls and ceilings, a centralized power source is provided, eliminating the need for individual power sources for these devices.

<sup>1</sup> Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead may lower actual data throughput rate.

## Wireless Aware Smart Switching

### Technical Specifications

#### DES-1228P PoE Web Smart Switch

Number of Ports	<ul style="list-style-type: none"> <li>+ 24 10/100BASE-TX ports with 802.3af PoE</li> <li>+ 2 10/100/1000BASE-T ports</li> <li>+ 2 combo 10/100/1000BASE-T/SFP ports</li> </ul>
L2 Features	<ul style="list-style-type: none"> <li>+ IGMP snooping</li> <li>+ 802.1D Spanning Tree</li> <li>+ Port trunk (Link Aggregation): up to 6 groups per device, up to 8 ports per group</li> <li>+ Port mirroring</li> </ul>
VLAN	<ul style="list-style-type: none"> <li>+ 802.1Q VLAN standard (VLAN Tagging)</li> <li>+ Up to 256 static VLAN groups</li> </ul>
QoS (Quality of Service)	<ul style="list-style-type: none"> <li>+ 802.1p Priority Queues standard</li> <li>+ Up to 4 queues per port</li> <li>+ Supports WRR mode in queue handling</li> </ul>
Security	<ul style="list-style-type: none"> <li>+ 802.1X port-based access control</li> <li>+ Broadcast Storm Control</li> <li>+ D-Link Safeguard Engine</li> </ul>
Management	<ul style="list-style-type: none"> <li>+ Web-based GUI or SmartConsole Utility</li> <li>+ SNMP support</li> <li>+ DHCP client</li> <li>+ Trap setting for destination IP, system events, fiber port events, twisted-pair port events</li> <li>+ Port access control</li> <li>+ Web-based configuration backup/restoration</li> <li>+ Web-based firmware backup/upload</li> <li>+ Firmware upgrade using SmartConsole Utility</li> <li>+ LLDP</li> <li>+ Anti-Rogue AP</li> </ul>
MIB	<ul style="list-style-type: none"> <li>+ RFC 1213 MIB-II</li> <li>+ D-Link Enterprise Private MIB</li> </ul>
Switch Capacity	12.8Gbps
MAC Address Table	8K entries per device
MAC Address Update	<ul style="list-style-type: none"> <li>+ Up to 256 static MAC entries</li> <li>+ Enable/disable auto-learning of MAC addresses</li> </ul>
RAM Buffer	128KBytes per device
AC Input	100 to 240 VAC 50/60Hz internal universal power supply
Power Consumption	222 watts
Dimensions	<ul style="list-style-type: none"> <li>+ 440 x 209 x 44 mm (17.32 x 8.23 x 1.73 inches)</li> <li>+ 19-inch standard rack mounting width, 1U height</li> </ul>
Weight	3.20 kg (7.05 lbs)
Heat Dissipation	757.51 BTU/hr
Operating Temperature	0° to 40° C (32° to 104°F)
Storage Temperature	-10° to 70° C (14° to 158°F)
Operating Humidity	10% to 90% non-condensing
Storage Humidity	5% to 90% non-condensing

## Wireless Aware Smart Switching

Emission (EMI)	+ FCC Class A
Safety	+ CSA

### DWL-3140AP Wireless 108G Web Smart Thin AP with PoE

Standard	802.11b/g
Wireless Frequency Range	+ 802.11b: 2400 to 2497MHz ISM band + 802.11g: 2400 to 2483.5MHz ISM band
Modulation	+ 802.11g: OFDM (BPSK, QPSK, 64-QAM) + 802.11b: DSSS (DBPSK, DQPSK, CCK)
Frequency Channels	+ 1 to 11 channels (North America) + 1 to 13 channels (Europe)
Receive Sensitivity	+ 802.11b: 11Mbps CCK (8% PER): -82dBm 6Mbps OFDM (10% PER): -88dBm 5.5Mbps CCK (8% PER): -85dBm 2Mbps QPSK (8% PER): -86dBm 1Mbps BPSK (8% PER): -89dBm + 802.11g: 54Mbps OFDM (10% PER): -68dBm 48Mbps OFDM (10% PER): -68dBm 36Mbps OFDM (10% PER): -75dBm 24Mbps OFDM (10% PER): -79dBm 18Mbps OFDM (10% PER): -82dBm 12Mbps OFDM (10% PER): -84dBm 9Mbps OFDM (10% PER): -86dBm 6Mbps OFDM (10% PER): -88dBm
EIRP	18dBm typically
Date Rates (With Auto-Fallback)	+ 802.11b: 11, 5.5, 2 and 1Mbps + 802.11g: 54, 48, 36, 24, 18, 12, 9 and 6Mbps + Turbo mode: 108Mbps
Antenna	Internal omni-directional antenna
Wireless data encryption	64/128/152-bit WEP standard
Wireless Security	+ WPA + WPA-PSK + WPA2 + WPA2-PSK

### Wireless Aware Smart Switching

Management	D-Link Smart WLAN Manager
Ethernet Interface	10/100BASE-TX port
Stand-Alone Power (Without PoE)	Power Voltage: DC:5V/1A (Connection Through External Power Adapter)
Power Over Ethernet	+ AP Connects to Switch's PoE Port + PoE Standard: 802.3af + Input Voltage: 44 to 57 VDC
Diagnostic LEDs	+ Power/Status + LAN Link/Activity + WLAN Link/Activity
Dimensions	118 mm (diameter) x 35 mm (H) (4.649 x 1.379 inches)
Weight	120 grams (0.264 lb)
Operating Temperature	0° to 40° C (32° to 104°F)
Storage Temperature	-10° to 65° C (14° to 149°F)
Operating Humidity	5% to 95% non-condensing
Storage Humidity	5% to 95% non-condensing
Emission (EMI)	FCC Class B

The screenshot displays the D-Link Smart WLAN Manager web interface. The main window shows a table of monitored access points with columns for Status, Name, IP, MAC, SSID, Channel, and Firmware Version. The status of all listed APs is 'Online'. A left-hand navigation menu includes options like Monitor, AP, Client, Summary, Group, Utilization, Firmware Upgrade, Log, and Switch Discover Utility. At the bottom, there are tabs for System Log and Action Log, and a status bar indicating 'Remaining time to next polling: 12s'.

Status	Name	IP	MAC	SSID	Channel	Firmware Version
Online	AP_15	192.168.1.113	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_14	192.168.1.112	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_13	192.168.1.114	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_11	192.168.1.110	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_12	192.168.1.111	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_18	192.168.1.118	00:19:58:45:BD:...	dlink	11	1.00.0016
Online	AP_20	192.168.1.119	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_19	192.168.1.117	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_16	192.168.1.116	00:19:58:45:BD:...	dlink	11	1.00.0016
Online	AP_17	192.168.1.115	00:19:58:45:BD:...	dlink	11	1.00.0016
Online	AP_3	192.168.1.104	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_5	192.168.1.102	00:19:58:45:BD:...	dlink	11	1.00.0016
Online	AP_1	192.168.1.103	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_2	192.168.1.100	00:19:58:45:BD:...	dlink	6	1.00.0016
Online	AP_4	192.168.1.101	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_10	192.168.1.108	00:19:58:45:BD:...	dlink	11	1.00.0016
Online	AP_9	192.168.1.109	00:19:58:45:BD:...	dlink	11	1.00.0016
Online	AP_8	192.168.1.106	00:19:58:45:BD:...	dlink	1	1.00.0016
Online	AP_6	192.168.1.105	00:19:58:45:BD:...	dlink	1	1.00.0016

Listing of Monitored Access Points

## Wireless Aware Smart Switching

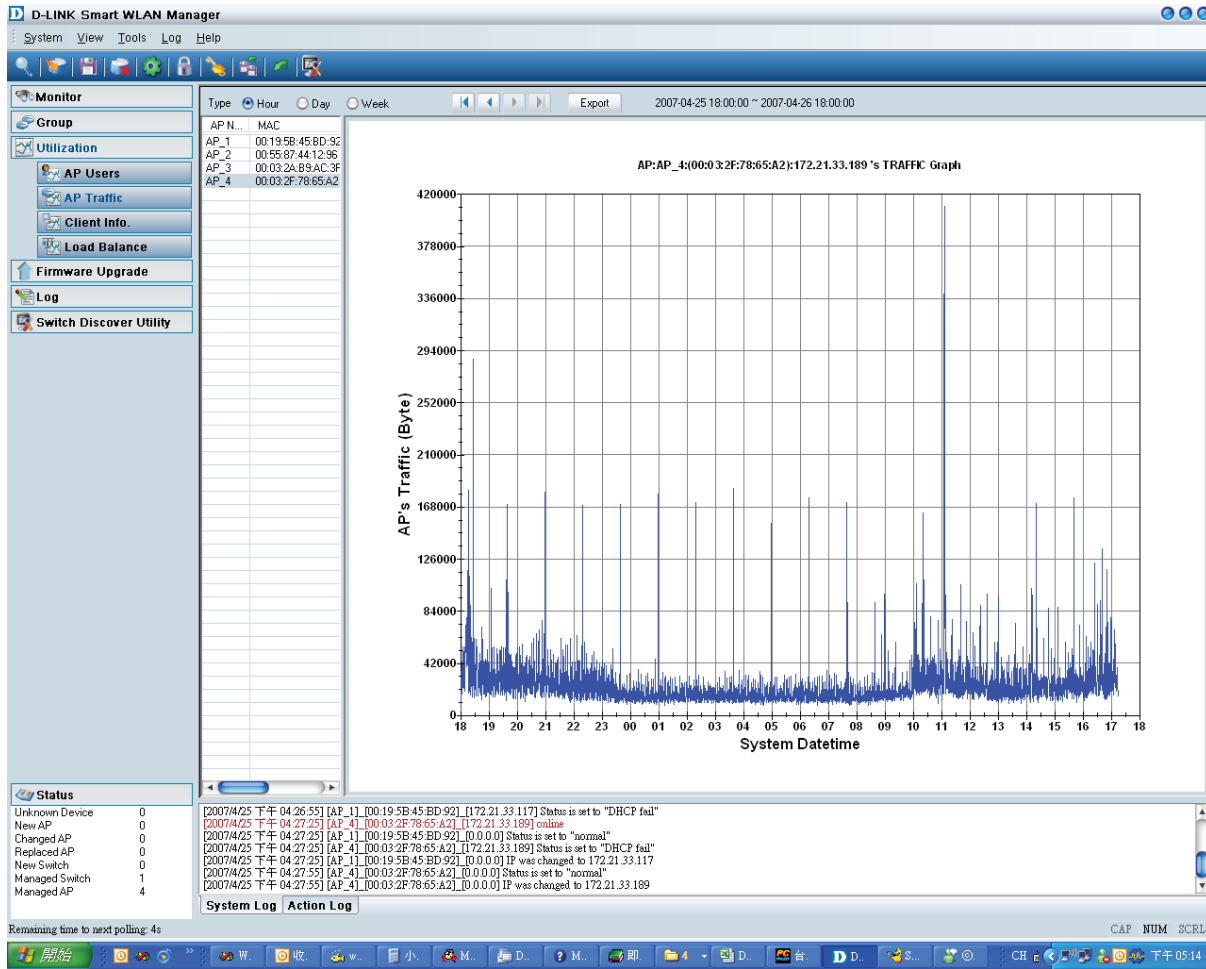
### Smart WLAN Manager

Central AP Management	Monitor AP status and setting in the same integrated UI
D-Link Smart Console	Supports SmartConsole protocol (based on multicast) to manage D-Link Smart switches
AP Group Management	Maintains a set of setting templates for settings in multiple APs
Log	<ul style="list-style-type: none"> <li>+ System log</li> <li>+ Operator action log</li> <li>+ SNMP trap log of AP and switch</li> </ul>
Syslog Alert	<ul style="list-style-type: none"> <li>+ BSD SYSlog client</li> <li>+ Adjusts send SYSlog frequency and SYSlog condition</li> </ul>
Email Alert	<ul style="list-style-type: none"> <li>+ Email client</li> <li>+ Adjustable email frequency and email condition</li> </ul>
Central Firmware Upgrade (AP and Switch)	<ul style="list-style-type: none"> <li>+ Selects multiple APs and upgrades their firmware at same time</li> <li>+ Selects multiple switches and upgrade their firmware at same time</li> </ul>
Device Status	Summarizes abnormal status in alert window
Configuration Backup/Restore	<ul style="list-style-type: none"> <li>+ Backups all monitored device settings</li> <li>+ Restores all monitored device settings back to system</li> </ul>
Password Management	<ul style="list-style-type: none"> <li>+ Sets AP password</li> <li>+ Sets switch password</li> <li>+ Sets system management password</li> </ul>
AP With Key Management	<ul style="list-style-type: none"> <li>+ Sets authentication key for AP</li> <li>+ Sets authentication key for switch</li> </ul>
AP Topology Monitoring	<ul style="list-style-type: none"> <li>+ Lists monitored devices with Tree view, List view, Visual view</li> <li>+ Periodically updates device status</li> </ul>
Zero Configuration	One-click technology to restore damaged AP's setting to its replacement
AP Life Check	Real-time tracking monitored AP's status
AP User Statistics	Maintains all wireless clients' connection history and depicts statistics in diagrams
AP Traffic Statistics	Maintains all AP's traffic history and depicts statistics in diagrams
Export Statistics Formats	<ul style="list-style-type: none"> <li>+ CSV format</li> <li>+ PDF format</li> </ul>
AP Load Balancing	Sets a group of managed APs to share loading
Minimum System Requirements	<ul style="list-style-type: none"> <li>+ Ethernet network interface (for PC running Smart WLAN Manager software)</li> <li>+ Windows 2000 or XP installed (for PC running Smart WLAN Manager software)</li> <li>+ DHCP server</li> </ul>

## Wireless Aware Smart Switching

### Optional SFP Transceivers

DEM-211	SFP transceiver, 100BASE-FX standard, multi-mode fiber, max. 2 km distance, 3.3V operating voltage
DEM-210	SFP transceiver, 100BASE-FX standard, single-mode fiber, max. 15 km distance, 3.3V operating voltage
DEM-310GT	SFP transceiver, 1000BASE-LX standard, single-mode fiber, max. 10 km distance, 3.3V operating voltage
DEM-311GT	SFP transceiver, 1000BASE-SX standard, multi-mode fiber, max. 550 m distance, 3.3V operating voltage
DEM-312GT2	SFP transceiver, 1000BASE-SX standard, multi-mode fiber, max. 2 km distance, 3.3V operating voltage
DEM-314GT	SFP transceiver, 1000BASE-LX standard, single-mode fiber, max. 50 km distance, 3.3V operating voltage
DEM-315GT	SFP transceiver, 1000BASE-LX standard, single-mode fiber, max. max. 80 km distance, 3.3V operating voltage
DEM-330T	WDM SFP transceiver, 1000BASE-LX standard, single-mode fiber, max. 10 km distance, 3.3V operating voltage, 1550 nm Tx wavelength, 1310 nm Rx wavelength
DEM-330R	WDM SFP transceiver, 1000BASE-LX standard, single-mode fiber, max. 10 km distance, 3.3V operating voltage, 1310 nm Tx wavelength, 1550 nm Rx wavelength
DEM-331T	WDM SFP transceiver, 1000BASE-LX standard, single-mode fiber, max. 40 km distance, 3.3V operating voltage, 1550 nm Tx wavelength, 1310 nm Rx wavelength
DEM-331R	WDM SFP transceiver, 1000BASE-LX standard, single-mode fiber, max. 40 km distance, 3.3V operating voltage, 1310 nm Tx wavelength, 1550 nm Rx wavelength



Monitored Access Point's Traffic Graph



### D-Link Worldwide Offices

U.S.A.	TEL: 1-800-326-1688	FAX: 1-866-743-4905	Italy	TEL: 39-02-2900-0676	FAX: 39-02-2900-1723	Egypt	TEL: 202-291-9047	FAX: 202-291-9051
Canada	TEL: 1-905-8295033	FAX: 1-905-8295223	Spain	TEL: 34-93-409 0770	FAX: 34-93-491 0795	Turkey	TEL: 90-212-289-5659	FAX: 90-212-289-7606
Europe (U. K.)	TEL: 44-20-8955-9000	FAX: 44-20-8955-9001	Portugal	TEL: 351-21-8688493	FAX: 351-21-8622492	Iran	TEL: 98-21-888-22613	FAX: 98-21-888-35492
Germany	TEL: 49-6196-77990	FAX: 49-6196-7799300	Greece	TEL: 30-210-9914 512	FAX: 30-210-9916 902	Pakistan	TEL: 92-21-454-8158	FAX: 92-21-453-5103
France	TEL: 33-1-30238688	FAX: 33-1-30238689	Czech Republic	TEL: 420 224 247 500	FAX: 420 224 234 967	Israel	TEL: 972-9-9715700	FAX: 972-9-9715601
Netherlands	TEL: 31-10-282-1445	FAX: 31-10-282-1331	Hungary	TEL: 36-(0)-1-461-30-00	FAX: 36-(0)-1-461-30-04	LatinAmerica	TEL: 56-2-5838-950	FAX: 56-2-5838-953
Belgium & Luxemburg	TEL: 32(0)2-517-7111	FAX: 32(0)2-517-6500	Poland	TEL: 48-(0)-22-583-92-75	FAX: 48-(0)-22-583-92-76	Brazil	TEL: 55-11-2185-9300	FAX: 55-11-2185-9322
Switzerland	TEL: 41 (0) 1 832 11 00	FAX: 41 (0) 1 832 11 01	Bulgaria	TEL: 359 2 958 22 42	FAX: 359 2 958 65 57	South Africa	TEL: 27-12-665-2165	FAX: 27-12-665-2186
Austria	TEL: 43 (0)1 240 27 270	FAX: 43 (0)1 240 27 271	Romania	TEL: 40(0)21 320 23 05	FAX: 40(0)21 320 23 07	Russia	TEL: 7-495-744-0099	FAX: 7-495-744-0099 #350
Sweden	TEL: 46-(0)8 564-61900	FAX: 46-(0)8 564-61901	Singapore	TEL: 65-6774-6233	FAX: 65-6774-6322	Japan	TEL: 81-3-5781-0963	FAX: 81-3-5781-0965
Denmark	TEL: 45-43-969040	FAX: 45-43-424347	Australia	TEL: 61-2-8899-1800	FAX: 61-2-8899-1868	Korea	TEL: 82-2-890-5491	FAX: 82-2-890-549
Norway	TEL: 47 99 300 100	FAX: 47 22 30 95 80	India	TEL: 91-22-2652 6696	FAX: 91-22-2652 8914	China	TEL: 86-10-58635800	FAX: 86-10-58635799
Finland	TEL: 358-10 309 8840	FAX: 358-10 309 8841	Middle East (Dubai)	TEL: 971-4-3916480	FAX: 971-4-3908881	Taiwan	TEL: 886-2-6600-0123	FAX: 886-2-6600-3939
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