

# *PR136g*

## *Power Line Router*

*User Guide*



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## Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- . Reorient or relocate the receiving antenna.
- . Increase the separation between the equipment and receiver.
- . Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- . Consult the dealer or an experienced radio/TV technician for help.

**FCC Caution:** To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

## FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

## Chapter 1 Introduction

### 1.1 The Main Instruction of PR136g

The Mini Router of PR136g is a portable and convenient wireless solution for the traveling business person, which features with router, bridge, AP and USB port, and it can connect with USB MFP, provide with the shared of scanner, printer and card reader to the users of local area network. Also, monitor your home with a Webcam via Mini Router. Additionally, it can also be connected with the USB hard disk or flash, and then it will be the FTP server. When it's connected with USB Audio Adapter, it can play the audio file of PC port remotely via internet for broadcast. Navi PR136g also features with the Power Line, which can replace with Ethernet line, is very easy to use and much convenient for the users.

### 1.2 Main Features

#### 1. Function of auto setup

The unique design of Utility can help the beginners easily log on internet and complete the server setup.

#### 2. Three operation modes

It Features with Router, AP and Client, and it's used with the hardware switch for three modes changing.

#### 3. Interface of webpage style

The interface of webpage style is very friendly to east to use, you can just open the browser then go to setup to use the function.

#### 4. Multiple way of connecting with net

Support 4 WAN modes of Static IP, DHCP Client, PPPoE and PPTP.

#### 5. Function of site building

Support the setup of DDNS, NAT and DMZ.

#### 6. Support UPNP

The users can use many kinds of software of supporting UPNP, such as the MSN messenger.

#### 7. Function of Firewall

You can set up the firewall function to filter the IP, Port and MAC.

#### 8. The built-in DHCP server

It's used with the attached transferor to connect with the audio equipment, and play music directly via local area network.

#### 9. The built-in antenna

The built-in antenna will help the signal strength better.

#### 10. Function of Power Line

It's used with the family power line to transmit the data, and it doesn't require additional setup, you can just play and plug any time.

## 1.3 The introduction of function of three Modes Quick Setup

### 1.3.1 The introduction of Quick Setup of Router mode

This Quick Setup function is aimed to provide the beginning users with the easy and quick way to set up this router, and then use it conveniently. The items of this Quick Setup are as the followings:

- **Basic Setup**

1. **WAN Setup** – necessary default setup
2. **LAN Setup** – necessary default setup
3. **Wireless Setup** – necessary default setup
4. **Time Server Setup** – necessary default setup
5. **Password Setup** – necessary default setup

- **Server Setup**

1. **USB Disk Management Setup**– necessary default setup
2. **User Account Management Setup** – necessary default setup
3. **Firewall Setup** – optional
4. **Qos Setup** – optional
5. **Web Camera Setup** – optional
6. **MFP Server Setup** – optional
7. **Samba Server Setup** – optional
8. **Audio Server Setup** – optional

### 1.3.2 The introduction of Quick Setup of AP mode

When the slide switch turn to AP mode, Navi PR136g will become the Bridge with two LAN ports. Navi PR136g can connect with the up Router or AP via LAN port, Wireless(WDS) or Powerline, and attain the IP via up DHCP.

- **Basic Setup**

1. **LAN Setup** – necessary default setup
2. **Wireless Setup** – necessary default setup
3. **Time Server Setup** – necessary default setup
4. **Password Setup** – necessary default setup

- **Application Setup**

1. **USB Disk Management Setup**– necessary default setup
2. **User Account Management Setup** – necessary default setup
3. **FTP Server Setup** – optional
4. **Web Camera Setup** – optional
5. **MFP Server Setup** – optional
6. **Samba Server Setup** – optional
7. **Audio Server Setup** – optional

### 1.3.3 The introduction of Quick Setup of Client mode

When the slide switch turn to Client mode, Navi PR136g will become a network adapter, and it will be automatically shown the WAN port, LAN port, Wireless and bridge together, the PC client can connect to internet via wireless.

- **Basic Setup**

1. **Site Survey Setup** – necessary default setup
2. **Wireless Setup** – necessary default setup
3. **Time Server Setup** – necessary default setup
4. **Password Setup** – necessary default setup

- **Application Setup**

1. **USB Disk Management Setup**– necessary default setup
2. **User Account Management Setup** – necessary default setup
3. **FTP Server Setup** – optional
4. **Web Camera Setup** – optional
5. **MFP Server Setup** – optional
6. **Samba Server Setup** – optional
7. **Audio Server Setup** – optional

### 1.3.4 The main introduction of PC Utility

Navi PR136g provides with the utility program, which can automatically detect the operation mode of Router and its connected USB device, so that it will help the users can easily and quickly do the setup step-by-step without entering GUI; after completing the quick setup of utility, you can log on internet and use the function of server.

## 1.4 Hardware specification

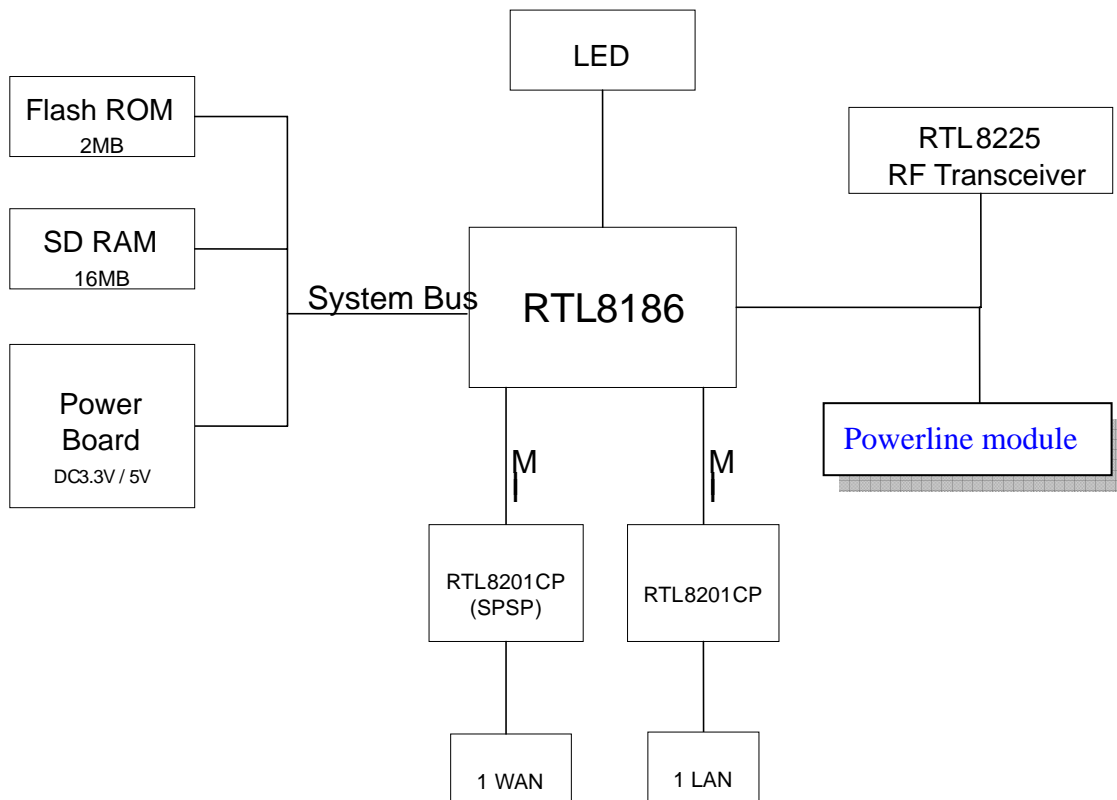
### 1.4.1 Hardware Features

Item	Specification
<b>Key Components</b>	
<b>CPU</b>	RTL8186
<b>Flash ROM</b>	2MB
<b>DRAM</b>	16MB
<b>Communication Interfaces</b>	
<b>WAN Port</b>	1 x 10/100 Mbps RJ45, with auto MDI/MDIX
<b>LAN Port</b>	1 x 10/100 Mbps RJ45, with auto MDI/MDIX
<b>Wireless</b>	RTL8305
<b>Power Line</b>	<b>Intellon 5500</b>
<b>Others</b>	
<b>Operation Requirement</b>	Operating Temp.0 to 40 degrees Centigrade (32 to 104 degrees Fahrenheit) Storage Temp.-20 to 70 degrees Centigrade (-4 to 158 degrees Fahrenheit) Operating Humidity 10% to 85% Non-Condensing Storage Humidity 5% to 90% Non-Condensing
<b>Peak Gain of the Antenna</b>	<u>2dBi @ 2.45GHz</u>
<b>Transmitted Power</b>	TYP. 15dBm @ Normal Temp Range
<b>Receive Sensitivity</b>	Nominal Temp Range: 11Mbps: 10-5 BER @ -83 dBm, TYP.
<b>Dimensions</b>	91mm(L) x 78mm(W) x 30mm(H)
<b>Button</b>	Reset button – Press one second for device reset and press over 5 second for restore to factory default setting
<b>Slide switch</b>	<b>Router/AP/Wi-Fi ISP</b>
<b>Power supply</b>	Adapt AC 100 V ~ 240 V in / DC 5V 2A output



## 1.4.2 Hardware Block Diagram

### Block Diagram



### 1.4.3 LED Feature SPEC

LED	State	Description
<b>Power LED</b>	<b>On</b>	WLAN Broadband Router is powered on.
	<b>Off</b>	WLAN Broadband Router is powered off.
<b>WLAN LED</b>	<b>Flashin g</b>	Data is transmitting or receiving on the antenna.
	<b>Off</b>	No data is transmitting or receiving on the antenna.
<b>WAN LED ACT</b>	<b>Flashin g</b>	Data is transmitting or receiving on the WAN interface.
	<b>Off</b>	No data is transmitting or receiving on the WAN interface.
<b>WAN LED 10/100M</b>	<b>On</b>	Connection speed is 100Mbps on WAN interface.
	<b>Off</b>	Connection speed is 10Mbps on WAN interface.
<b>LAN LED ACT</b>	<b>Flashin g</b>	Data is transmitting or receiving on the LAN interface.
	<b>Off</b>	No data is transmitting or receiving on the LAN interface.
<b>LAN LED 10/100M</b>	<b>On</b>	Connection speed is 100Mbps on LAN interface.
	<b>Off</b>	Connection speed is 10Mbps on LAN interface.
<b>Powerline</b>	<b>activity</b>	LED is Red, Blinking. TX/RX Packet Activity.

## 1.5 Software Specification

### 1.5.1 Router Mode

Item	Specification
<b>Major Modules</b>	
<b>Kernel</b>	Linux 2.4.18
<b>Protocol</b>	TCP/IP v4
<b>Functions</b>	
<b>WAN connection</b>	Static IP DHCP client PPPoE PPTP
<b>Routing</b>	DHCP server / client, DNS server.
<b>NAT</b>	Port Forwarding DMZ
<b>Firewall</b>	Port Filtering IP Filtering MAC Filtering
<b>Wireless</b>	1. IEEE 802.11g and backward compatible IEEE802.11b. 2. Authentication: None, WEP, WPA(TKIP), WPA2(AES), WPA2 Mixed, 802.11x. 3. WDS ( peer to peer ) 4. AP+WDS ( peer to peer , peer to multi)
<b>User Authentication</b>	Password protected browser-based UI
<b>Configuration &amp; Management</b>	
<b>Log</b>	Network configuration Event Log
<b>Web</b>	Web-based interface, accessible from IE, Mozilla and Netscape. Wizard supported.
<b>Firmware Upgrade</b>	
<b>Local upgrade</b>	Upgradeable from local device (HDD, Flash...), and WAN, checksum supported.

## 1.5.2 AP Mode

Item	Specification
<b>Major Modules</b>	
<b>Kernel</b>	Linux 2.4.18
<b>Protocol</b>	TCP/IP v4
<b>Functions</b>	
<b>Wireless</b>	1. IEEE 802.11g and backward compatible IEEE802.11b. 2. Authentication: None, WEP, WPA(TKIP), WPA2(AES), WPA2 Mixed, 802.11x . 3. WDS ( peer to peer ) 4. AP+WDS ( peer to peer , peer to multi)
<b>User Authentication</b>	Password protected browser-based UI
<b>Configuration &amp; Management</b>	
<b>Log</b>	Network configuration Event Log
<b>Web</b>	Web-based interface, accessible from IE, Mozilla and Netscape. Wizard supported.
<b>Firmware Upgrade</b>	
<b>Local upgrade</b>	Upgradeable from local device (HDD, Flash...), and WAN, checksum supported.

### 1.5.3 Wi-Fi ISP Mode

Item	Specification
<b>Major Modules</b>	
<b>Kernel</b>	Linux 2.4.18
<b>Protocol</b>	TCP/IP v4
<b>Functions</b>	
<b>WAN connection</b>	Static IP DHCP Wi-Fi ISP PPPoE PPTP
<b>Routing</b>	DHCP server/Wi-Fi ISP, DNS server.
<b>NAT</b>	Port Forwarding DMZ
<b>Firewall</b>	Port Filtering IP Filtering MAC Filtering
<b>Wireless</b>	1. IEEE 802.11g and backward compatible IEEE802.11b. 2. Authentication: None, WEP, WPA(TKIP), WPA2(AES), WPA2 Mixed, 802.11x.
<b>User Authentication</b>	Password protected browser-based UI
<b>Configuration &amp; Management</b>	
<b>Log</b>	Network configuration Event Log
<b>Web</b>	Web-based interface, accessible from IE, Mozilla and Netscape. Wizard supported.
<b>Firmware Upgrade</b>	
<b>Local upgrade</b>	Upgradeable from local device (HDD, Flash...), and WAN, checksum supported.

The followings are the system requirements:

1. Requires the PC of Pentium 166 MHz MMX processor at least, or higher level.
2. Requires 32 Mbytes memory at least or more.
3. Requires 50 Mbytes disk space at least or more.

## 1.6 Necessary Approvals

Category	Region	Standard	Will Comply
Safety		UL 60950	Yes
EMC	North America	FCC Part15B Class B FCC Part 15 C	Yes
Electromagnetic Susceptibility		CE/EN 300328 CE/EN 301489-17 CE/EN 60950-1	Yes

## 1.7 Appendix

The following points are the Navi PR136g USB Device Support List:

### 1.7.1 MFP

Navi PR136g support LPR protocol, ie if the printer driver could install on Windows 98/2000/XP. The printer can work on Navi PR136g product series.

**MFP List**

Printer's Brand	Printer's Type	Card Reader	LPR Printer	Scanner	Samba File Sharing	Samba Printer
HP	F380	N/A	Pass	Pass	N/A	Pass
HP	C3180	Y	Pass	Pass	Pass	Pass
HP	C4180	Y	Pass	Pass	Pass	Pass
HP	C5180	Y	Pass	Pass	Pass	Pass
HP	C6180	Y	Pass	Pass	Pass	Pass
HP	5610	N/A	Pass	Pass	N/A	Pass
HP	6310	Y	Pass	Pass	Pass	Pass
HP	3310	Y	Pass	Pass	Pass	Pass
EPSON	CX2900	N/A	Pass	Pass	N/A	Pass
EPSON	CX3700	N/A	Pass	Pass	N/A	Pass
EPSON	CX3900	N/A	Pass	Pass	N/A	Pass
EPSON	CX4100	N/A	Pass	Pass	N/A	Pass
EPSON	CX4700	Y	Pass	Pass	Pass	Pass
EPSON	CX4900	Y	Pass	Pass	Pass	Pass
EPSON	CX5700F	Y	Pass	Pass	Pass	Pass
EPSON	CX5900	Y	Pass	Pass	Pass	Pass
EPSON	CX6900F	Y	Pass	Pass	Pass	Pass
EPSON	RX530	Y	Pass	Pass	Pass	Pass
EPSON	RX590	Y	Pass	Pass	Pass	Pass
EPSON	RX630	Y	Pass	Pass	Pass	Pass
EPSON	RX650	Y	Pass	Pass	Pass	Pass

- If you need to check the support list, Please visit the 2 websites in below.

<http://www.sane-project.org/sane-mfgs.html>

<http://hplip.sourceforge.net/>

## 1.7.2 Web Camera

Navi PR136g support OV511、OV511+ and SAA8115HL、SAA8116HL web cam chipset only.

Vendor name	Product name	Chipset	Tested
Aiptek	HyperVcam Mobile	OV511+	
Aiptek	HyperVcam Fun	OV511+	
Aiptek	HyperVcam Home	OV511+	
Askey	VC010	SAA8115HL	
Alpha Vision Tech.	AlphaCam SE (model AC-520)	OV511	
Avaks	AvCam USB-600	OV511	
AverMedia	InterCam Elite	OV511	
BestBuy	EasyCam U	OV511	
Creative Labs	WebCam (model PD1001, alternate version)	OV518	
Creative Labs	WebCam 3	OV511	
Creative Labs	WebCam 5 (PID=400c)	SAA8116HL	
Creative Labs	WebCam Plus (Model CT6840)	OV511+	
Creative Labs	WebCam Plus ("WebCam Mini"; model PD0040)	OV518	
Creative Labs	WebCam Pro (model PD1030)	OV511+	
Creative Labs	Webcam Pro Ex	OV511	
D-Link	DSB-C100	OV511+	
D-Link	DSB-C310	OV518 +	
D-Link	DU-C300	OV511	
Elecom	UCAM-C1C30	OV511+	
Elta	WEBCam 8211 PCC	OV511/OV511+	
Ezonics	EZPhone Cam	OV518+	
Ezonics	EZ USB Cam II	OV511+	
Genius	VideoCam Express	OV511+	
Hawking Tech.	PD-300	OV511	
Hawking Tech.	UC-110	OV511+	
Hawking Tech.	UC-300	OV511	
Hawking Tech.	UC-310	OV511	



I-View	NetView NV300M	OV511	
Intel	Me2Cam	OV511+	
LG Electronics	LPC-UM10	OV511+	
LG Electronics	LPC-UM15	OV511+	
Liferview	USB CapView	OV511+	
Liferview	RoboCam	OV511	
Lifetec	LT 9388	OV511	
Logitech	QuickCam 3000 Pro	SAA8116HL	
Logitech	QuickCam 4000 Pro	SAA8116HL	
Logitech	QuickCam Orbit/Sphere	SAA8116	
Maitech	AWK-300	OV511+	
Maxxtro	CAM22U	OV511	
Maxell	Maxcam (MPCC-1)	OV511	
Medion	MD9388	OV511+	
MediaForte	MV300	OV511	
MediaForte	PC Vision 300	OV511	
Mustek	WCam 3X	OV511	
Mtekvision	Zeca MV402	OV511+	
OmniVision	OV7110 Eval Board	OV511	
OmniVision	OV511+/OV7120 Eval Board	OV511+	
OmniVision	OV511+/OV7620 Eval Board	OV511+	
Pretec	PCC-600	OV511	
Prochips	PCA-3100	OV511+	
Puretek	PT-6007	OV511	
Philips	PCVC675K "Vesta"	SAA8115HL	
Philips	PCVC680K "Vesta Pro"	SAA8115HL	
Philips	PCVC690K "Vesta Scan"	SAA8115HL	
Philips	PCVC720K/40 "ToUCam XS"	OV511	
Philips	PCVC730K "ToUCam Fun"	SAA8116HL	
Philips	PCVC740K "ToUCam Pro"	SAA8116HL	
Philips	PCVC750K "ToUCam Scan"	SAA8116HL	
Sotec	Sotec Afine Eye	SAA8115HL	
Suma	EON	OV511+	
Samsung	MPC-C10	SAA8115HL	
Samsung	MPC-C30	SAA8115HL	
Samsung	Anycam MPC-M10	OV511+	
TRENDNet	TV-PC100	OV511+	

TRENDNet	TV-PC300	OV511+	
TRENDNet	TV-PC301	OV511+	
Trust	Sp@ceC@m USB	OV511	
Trust	Sp@ceC@m 150	OV511+	
Trust	Sp@ceC@m 200	OV511+	
Trust	Sp@ceC@m 300	OV511+	
Typhoon	WebShot 350	OV518+	
TEVion	MD9308	OV511+	
TCE	NetCam 310u	OV511	
Terratec	TerraCam PRO	OV511+	
Terratec	TerraCam USB PRO	OV511+	
Waytech	I-Pac VIC-30	OV511+	
Webeye	2000B	OV511+	

### 1.7.3 USB HDD

Navi PR136g support FAT16 and FAT32 format file system.

Below list is tested product

Flash

Vendor	Model Name	Chipset	Note	Tested
Panram	MEMORY BLOCK 積木碟		USB2.0	
威剛	情人碟		USB2.0	
威剛	My Flash PD1 (512MB)		USB2.0	
獨創電子	PD-A2		USB 2.0	
Maxtor	DiamondMax Plus8		USB 2.0	
Kingston	Data Traveler 2.0			
Shuttle	SFD-0128			
Apacer	HandyDrive			
勁永	I-Ststick 32MB			
Apacer	Handy Steno 64MB		USB 1.1	
ASUS	碩碩碟二代 64MB			
ASUS	32MB			
捷元	32MB			
昕威電子	黑麻吉 SD 讀卡 MP3			
Transcend	JetFlash 128 MB		USB 2.0	
SanDisk	Curzer Mini Flash 256MB		USB 2.0	
勁永	Cool Drive(U339) 128 MB		USB 2.0	
KingMax	128MB		USB 1.0	
Kinggaroo	跳鼠王 風行 SONA 128MB		USB 2.0	

USB HDD

Vendor	Model Name	Chipset	Note	Tested
		Ali m5621 al		V
		Ali m5637 al		V
Hi-Speed	HD-D14-U2	Ali m5642 a1	FUJI 5400 轉 60G	V
		GL811E		V
		GL811USB		V
MySon Century		CS88186_107		V
Cypress		CY7C68300-56PVC		V

## **1.8 Operation System**

- MicroSoft: Windows 2000, XP (Chinese & English version), Vista
- Apple: Mac OS X 10.4.7

## **1.9 Browser**

- Internet Explorer ver. 5 and above
- Safari ver. 2.03 and above

## **1.10 Utility**

- MicroSoft: Windows 2000, XP (Chinese & English version), Vista

## Chapter 2 Technology Overview

### 2.1 Introduction of INT5500 Chip Set (Home Plug1.0 with Turbo)

Intellon's high speed powerline chipset INT5500CS is comprised of the INT5500, an integrated powerline MAC/ PHY transceiver, and its companion INT1200, an analog front end IC. The INT5500CS is fully compatible with the HomePlug1.0 with Turbo specifications, and capable of delivering up to 85 Mbps over the power line.

The INT5500CS provides a highly integrated and optimized solution for networking adapters and embedded products. It offers the higher bandwidth performance necessary to drive next-generation home entertainment applications, including standard definition (SD) video distribution, TV over IP (IPTV), digital video recorder (DVR) networking and media center PCs. Other applications include whole house audio, extension and bridging of higher speed wireless technologies such as 802.11x and UWB, and higher data-rate broadband sharing based on technologies such as ADSL2 and fiber to the home.

The MAC implements a CSMA/CA scheme with prioritization and automatic repeat request (ARQ) for reliable delivery of Ethernet packets via packet encapsulation. Built-in Quality of Service (QoS) features provide the necessary bandwidth for multimedia payloads including voice, data, audio, and video. A four-level prioritized random access method exists with strict adherence to priority. Segment bursting on the power line minimizes the demands on the receiver resources and maximizes the throughput of the network, while still providing excellent latency response and jitter performance. The contention-free access capability extends this concept of segment bursting to allow the transmission of multiple frames over the power line without relinquishing the control of the medium.

Intellon offers a complete solution for powerline applications using the INT5500CS, including data sheets, reference manuals, configuration utility

software and production test capabilities, together with a proven technical support team to shorten customer 帛 time to market.

The INT5500CS provides two types of host interface for maximum system flexibility:

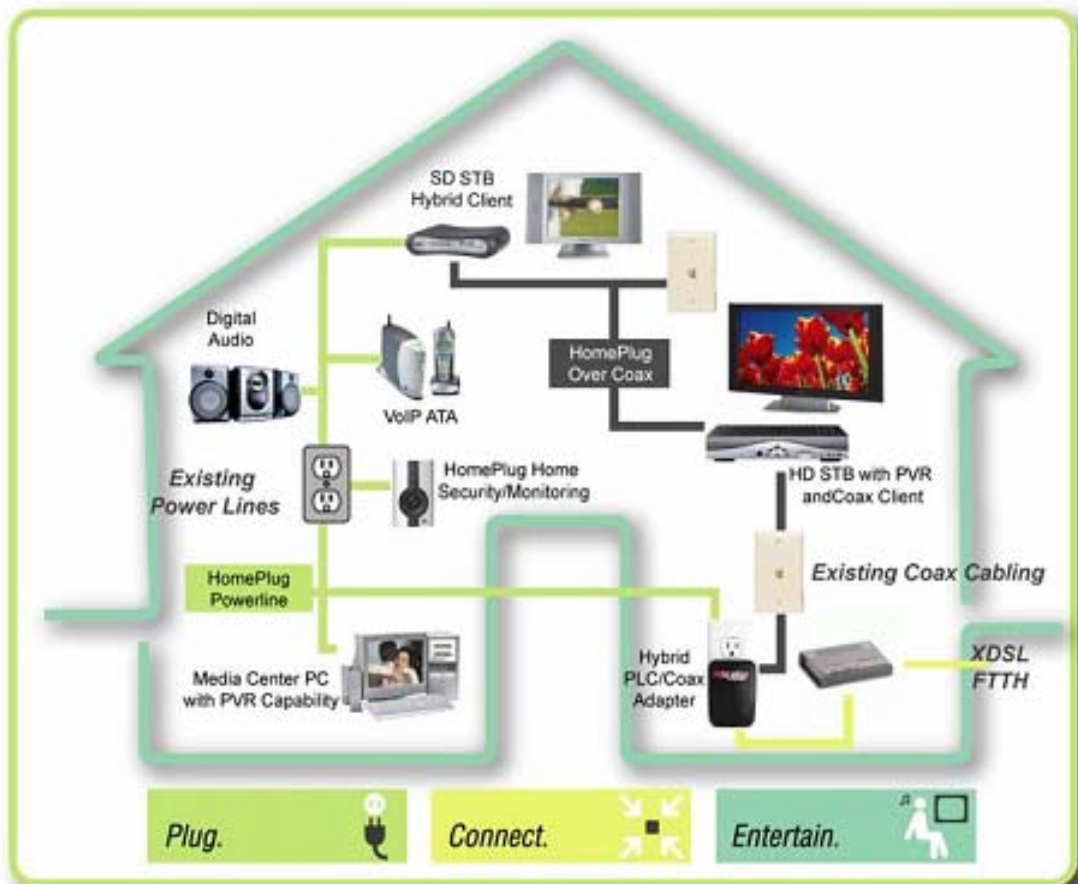
- An MII PHY (IEEE 802.3u) interface for interconnection to Ethernet controllers
- An MII Host / DTE interface (IEEE 802.3u) for direct connection to an Ethernet PHY

The INT5500CS implements Intellon's patented OFDM technology, which forms the basis for the HomePlug1.0 with Turbo specification. Tailored to reliably deliver up to 85 Mbps over the difficult power line communication environment, the chipset combats deep attenuation notches, noise sources, and multi-path fading by allocating usable frequencies according to the signal to noise ratio (SNR). Synchronization is achieved in low SNR channels without the use of pilot carriers. Inclusion of additional modulation schemes (QAM 256/64/16) increases the chipset's capability to attain higher throughput performance.

## Chapter 3 The Main Frame of Family Applications

### 3.1 Family Applications

The following picture is the main frame of family applications:



"Whole-Home Networking over Any Wire"

## 3.2 Target Applications

The following main points are the target family applications:

- High Definition (HD) and Standard Definition (SD) video distribution
- TV over IP (IPTV)
- Backbone for WiFi, UWB and Wireless USB
- Higher data rate broadband sharing
- Shared broadband internet access
- Audio and video streaming and transfer
- Expanding the coverage of wireless LANs
- Voice Over IP (VoIP)
- PC files and applications sharing
- Printer and peripheral sharing
- Network and online gaming
- Security cameras