ZXHN H168N
VDSL2 Modem
User Manual

CE

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1 Safety Precautions

Safety Checklist

Notes:
Before using the device, read the following safety precautions. ZTE bears no liability to the consequences incurred by violation of the safety instructions.

Usage Cautions

- Read all the safety cautions carefully before using the device.
- Only use the accessories included in the package, such as power supply adapter.
- Do not extend the power cord, otherwise the device will not work.
- The power supply voltage must meet the requirements of the device input voltage (The voltage fluctuation range is less than 10%).
- Keep the power plug clean and dry to prevent any risk of electric shock or other dangers.
- Disconnect all the cables during a lightning storm to prevent the device from damage.
- Power off and unplug the power plug when the device is not in use for a long time.
- Do not attempt to open the covers of the device. It is dangerous to do so when the device is powered ON.
- Power off and stop using the device under the conditions such as, abnormal sound, smoke, and strange smell. Contact the service provider for maintenance if the device is faulty.

Environment Requirements

- Ensure proper ventilation to the device. Place the device away from direct sunlight.
- Keep the device ventilated and dry. Never spill any liquid on the device.
- Do not place any object on the device to prevent any deformation or damage to the device.
- Do not place the device near any source of heat or water.
- Keep the device away from any household appliances with strong magnetic or electric fields, such as microwave oven and refrigerator.

Cleaning Requirements

- Before cleaning, power off the device, and unplug all the cables connected to

the device, such as power cable, optical fiber, and Ethernet cable.

- Do not use any liquid or spray to clean the device. Use a soft dry cloth.

Environment Protection

- Do not dispose the device or battery improperly.
- Observe the local regulations about the equipment disposal or treatment.

RF Exposure Information

The Maximum Permissible Exposure (MPE) level is calculated based on a distance of d=20 cm between the device and the human body. To maintain compliance with the RF exposure requirement, a separation distance of 20 cm between the device and the human should be maintained.

EU Declaration of Conformity

Hereby，ZTE Corporation declares that the radio equipment type ZXHN H168N is in compliance with Directive 2014/53/EU, The full text of the EU declaration of conformity is available at the following Internet address: http://support.zte.com.cn/support/cer/EU

Environmental Information

The equipment you purchased has required the extraction and use of natural resources for its production. It may contain substances that are hazardous to people's health and to the environment. To avoid putting such substances into our environment and to reduce pressure on our natural resources, we ask that you reuse or recycle your end-of-life equipment by using an accredited electronics take-back system.

The symbols below indicate that this product should be reused or recycled and not simply discarded. Please locate and use an appropriate reuse and recycling site.

If you need more information on collection, reuse and recycling systems, contact your local or regional waste administration. You may also contact your equipment provider for more information on the environmental performances of these products.

Keep the ventilation hole clean and prevent any objects from dropping into the equipment through the hole; otherwise, short circuit may occur, which leads to equipment failure or fire.

FCC - PART 68

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the bottom of this equipment is a label that contains, among other information, a product identifier in the format US: ZTEDL01AHNH168N. If requested, this number must be provided to the telephone company.
This equipment uses the following USOC jacks: RJ-11.

ATTACHMENT LIMITATIONS STATEMENT

Notice: This equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). This is confirmed by marking the equipment with the Industry Canada certification number. The Department does not guarantee the equipment will operate to the user's satisfaction.
Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.
Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.
Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together.
This precaution may be particularly important in rural areas. Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate

FCC 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 or more 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 Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.
This equipment 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.

Caution!

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user authority to operate the equipment.

2 Overview

The ZXHN H168N is a VDSL2 access device, which supports multiple line transmission modes. In user side, it provides four 10/100Base-T Ethernet interfaces, one USB 2.0 Host port, and the wireless user access in compliance

with the IEEE802.11b/g/n standard. It can provide the transmission of broadband data service, which is suitable for using in a wide range of both residential (in-home) and commercial (offices, apartments, hotels, warehouses) network applications.

Features

The ZXHN H168N is a VDSL2 MODEM. It supports the following features:

- ITU-T G.993.2 VDSL2 standard and ITU-T G.992.5 ADSL2+ standard.
- It supports LAN protocol.
- It supports WLAN with high-speed data transfer rates up to 300 Mbps, compatible with IEEE 802.11b/g/n, 2.4 GHz compliant equipment.
- It supports IEEE802.3 and IEEE802.3u.
- It supports speed auto-negotiation.
- It supports Half duplex/Full duplex.
- It supports user-friendly GUI for web configuration.
- It supports L2TP/PPTP/IPSec VPN pass-through
- It supports parental control function to restrict children usage.
- It supports self-learning bridge (IEEE 802.1D Transparent Bridging).
- It supports virtual server, IP filter, and demilitarized military zone (DMZ) host.

Product Specifications

Item	Specification
Certification	CE
Power adapter	Input: AC 100~240 V, 50/60 Hz
	Output: DC 12V, 1A or 12V,0.5A
Environment Requirements	
Environmental temperature	0 °C ~ 40 °C (32 °F ~104 °F)
Humidity	5% ~ 95% (non-condensing)

Packing List

Component Name	Count
ZXHN H168N	1
Splitter	1
Power adapter	1
RJ-11 telephone cable	2
RJ-45 Ethernet cable	1
User Manual	1

Notes:

If any item is found to be wrong, missing, or damaged, contact your service provider. Keep the package and all the items in good condition if you want to replace the product.

- **System Requirement**

Before installing the ZXHN H168N, please check the following items.

1. VDSL Services Subscription

If you have subscribed for the VDSL service, your VDSL operator must provide at least one valid IP address for you (static allocation or dialup dynamic allocation).

2. Computer configuration

Please make sure that the system has been equipped with the 10M/100M Ethernet adapter and supports the TCP/IP protocol.

Because VDSL can be used for broadband access and involves a wide range of multimedia services, you are recommended use a computer with such configurations as: above Pentium III, 64 M memory, 10 G hard disk, graphic accelerating adapter with above 2M display memory, audio adapter and sound box.

3. Operating system

Operating systems can be Windows XP or later. For system configuration in the WEB interface, the browser of Internet Explorer V 8.0 or later.

3 Installation Preparations

- **Hardware Description**

- **Front Panel**

Figure 3-1 shows the indicators on the front panel of the ZXHN H168N

Figure 3-1 The Front Panel

Identification	Status	Description
Power	OFF	Power OFF.
	Red	Power ON, HW Testing.

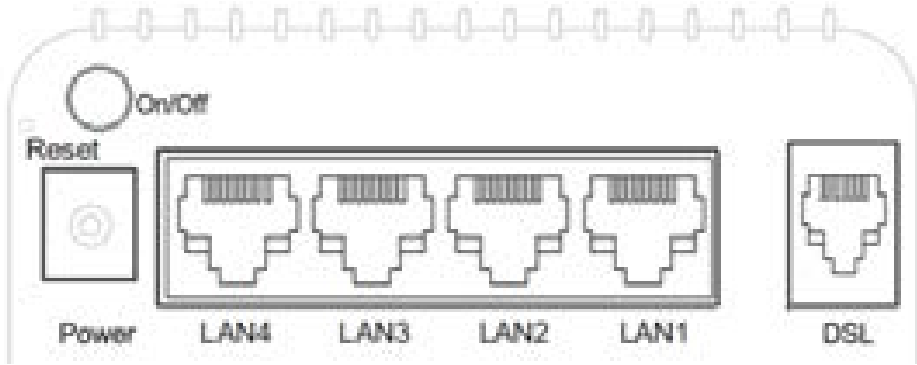
Identification	Status	Description
	Green	Power ON, HW Test ok.
DSL	OFF	The ZXHN H168N is in the non-communication state.
	Flashing green	The ZXHN H168N is in training state.
	ON	The ZXHN H168N is in the communication state.
Internet	OFF	No detected data.
	Flashing green	WAN port is receiving or sending data.
	Solid green	WAN port is in communication status.
	Solid red	WAN port is in the non-communication state.
USB*	OFF	No device connected to the USB port.
	Flashing green	Data Transmission.
	Solid green	The USB device is connected.
LAN1 ~ LAN4	OFF	The Ethernet interface is in the non-communication state.
	Flashing green	The Ethernet interface is receiving or sending data.
	Solid green	The Ethernet interface is in the communication state.
WLAN	OFF	No detected radio signal.
	Flashing green	WLAN port is receiving or sending data.
	Solid green	WLAN interface is ready to work.
WPS	OFF	WPS function is OFF.
	Flashing green	WPS function is in negotiation status.
	Solid green	WPS function is ON.

Note:The USB indicator is optional. Actual product you receive may differ.

■ Rear panel

Figure 3-2 shows the interfaces and buttons on the rear panel of the ZXHN H168N.

Figure 3-2 The Rear Panel



Item	Description
DSL	RJ-11 port. Using the telephone line to connect the ZXHN H168N with the VDSL2 cable or splitter.
LAN1 ~ LAN4	RJ-45 port. It is used to connect the ZXHN H168N to computer or other network devices.
Reset	During power ON period, hold on this button for more than 5 seconds to reset the current settings to the factory default setting, and then the system restarts automatically.
WPS	WLAN Protected Setup.
WLAN	WLAN switch , to turn on / off the WLAN.
Power	Power supply port, It is connected to the power adapter.
On/Off	Power switch, to power on or power off the device.
USB*	USB port. It is connected the printer, USB storage or 3G adapter.

The WLAN and WPS button is on a side of the ZXHN H168N.

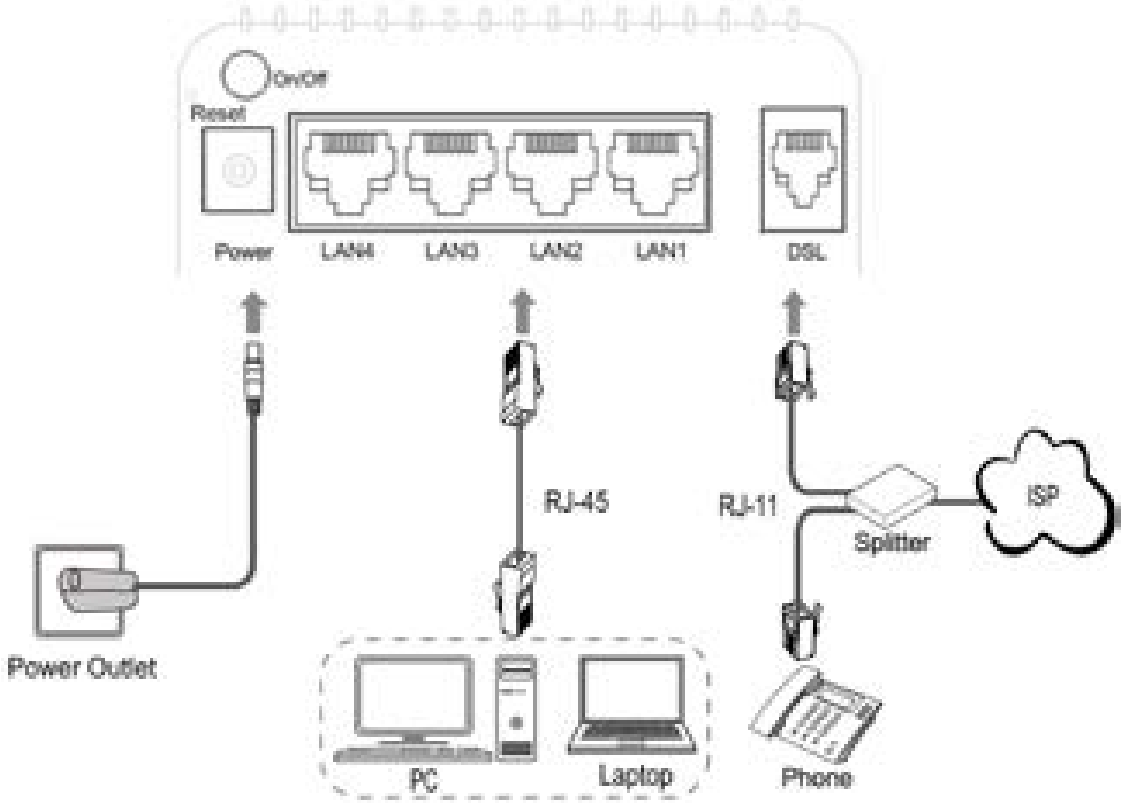
The USB interface is on a side of the ZXHN H168N.

The USB interface is optional. Actual product you receive may differ.

■ Hardware Connections

Figure 3-3 shows the devices that are connected to interfaces of the ZXHN H168N

Figure 3-3 Cable Connection



The factors affecting the wireless network coverage range include the location of the product, distance between the product and a wireless terminal, number of obstacles, obstacle material and density, and interference source. It is recommended that you place the product in accordance with the following principles to maximize the strength of wireless signals.

- The product should be far away from the objects affecting wireless signal propagation, for example, an object with a high reflectivity such as a metallic object or a mirror.
- The product should be far away from an electrical appliance with a strong magnetic or electric field, for example, a microwave oven, a refrigerator, a wireless router, a cordless phone, or a Bluetooth product.
- The product should be installed on the same floor as the applied area.
- Do not put other objects on the product. Try to reduce the number of obstacles between the product and a wireless terminal. Horizontally place the product in the middle of the applied area and do not put it in a corner.
- Do not place the product at a high position while it is placed horizontally. The recommended height is 1.2 to 1.5 meters.

4 Troubleshooting

- **All indicators are OFF when the ZXHN H168N equipment is powered ON.**

  First make sure that you have inserted the power adapter of the ZXHN H168N into a working power socket and that the ZXHN H168N has been powered ON (the switch button is pressed down). If the indicators are still OFF after confirmation of the above items, may be the hardware is damaged. You may contact local operators for maintenance. Never dismantle the equipment by yourself.

- **Will VDSL2 affect the telephone conversation quality? Will making phone calls cause a slow online rate?**

  VDSL2 separates voices from data through the frequency division multiplexing technology. Therefore, voices and data run in different paths without mutual interference. Neither the access rate nor conversation quality will fall even if you are in a call and online simultaneously.

- **How to properly install telephone extensions or other devices on the VDSL2 line?**

  It is recommended to connect the VDSL2 splitter to the telephone cable first and then connect the phone sets to the splitter interfaces. Installing a telephone directly before the splitter will lead to connection failure between the ZXHN H168N and the device at central office side, or an Internet access failure, or a slow connection speed. Connecting other electronic devices between the user end and splitter may affect the VDSL2 communications (since VDSL2 has a higher requirement for the line quality) and furthermore affect the normal operation of VDSL2. If the phone sets are required to be connected before the splitter, you should serially connect the MicroFilter before the phone sets (Generally, to minimize interference, only one MicroFilter can be connected before the splitter).

- **Sometimes, the VDSL2 users cannot access to the Internet normally**

  First check whether the ZXHN H168N is in the normal state (Check the indicators according to this user manual). If yes, the computer or application network may be faulty. This is unrelated with VDSL2. If the ZXHN H168N is abnormal, check the status of indicators one by one to remove the fault.

  It is suggested to check the following items before seeking help from

operators:

i. The VDSL2 telephone cable connectors are proper.

ii. The VDSL2 is away from the power cable and large-power electronic devices.

iii. No telephone extensions and fax machines are connected between the VDSL2 incoming line and splitter.

iv. The splitter has been installed correctly.

v. The ZXHN H168N has good heat dissipation ratio.

- **What are reasons for VDSL2 synchronization failure (also referred as link down or link establishment failure)?**

If the VDSL2 suddenly fails to be synchronized (link down) during application, usually the Link indicator on the ZXHN H168N will not be ON. It is suggested to check the following steps one by one:

i. First check the quality of incoming cables and incoming cable connectors.

ii. Install the ZXHN H168N correctly based on the user guidance. Minimize the number of taps.

iii. Check whether the telephone cables and VDSL2 are in good connection or whether the telephone cables are normal.

iv. Try to disconnect the splitter and directly connect the ZXHN H168N to the incoming user cable end. Ensure the problem is not due to improper installation or incoming user line quality. If the VDSL2 can be synchronized again, it means that installation of the incoming user side is improper. Please reinstall it according to the user guide.

v. If the VDSL2 still fails to be synchronized when the ZXHN H168N is connected to the incoming user cable end, contact the operators to check whether it is due to external line failure or ZXHN H168N failure.

vi. If the splitter problem is determined, call the operator for maintenance or replacement.

vii. If the problem is due to the end office equipment failure, call the operator to confirm it.

viii. Too long connection cable between the splitter and ZXHN H168N may cause poor anti-interference performance and synchronization difficulty. Therefore, the connection cable should not be too long.