MOBILE TERMINAL WITH ROUTING FUNCTION FOR SUPPORTING MULTIPLE-MODE ACCESS AND IMPLEMENTATION METHOD THEREOF

MOBILES ENDGERÄT MIT ROUTING-FUNKTION ZUR UNTERSTÜTZUNG EINES MEHRMODUS-ZUGANGS UND IMPLEMENTIERUNGSVERFAHREN DAFÜR

TERMINAL MOBILE À FONCTION DE ROUTAGE POUR PRISE EN CHARGE D’ACCÈS MULTI-MODE ET SON PROCÉDÉ DE MISE EN OEUVRE

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Description

Field of the Invention

[0001] The present invention relates to the mobile terminal field, and more especially to a mobile terminal with routing function for supporting multiple-mode access and implementation method thereof.

Background of the Invention

[0002] With the advent of the Third Generation (3G) era, for operators, the traditional voice service is being replaced by high-speed multimedia service, so operators provide users with portable high-speed mobile terminals accessing the network together with a variety of multimedia services, which is an inevitable trend and a new profit growth point. In recent years, various mobile broadband terminal products grow vigorously and change with each passing day, and the technology is also continually updated. Especially for data cards, not only the demands are enormous, but also the requirements for the appearance and function are becoming increasingly higher. A variety of data cards are derived according to the demands of operators and customers from the simple Universal Serial Bus (USB) data card to the multimode & multisystem data card, built-in module and encryption data card.

[0003] Now, the design solutions of the mainstream data card are realized by simply combining a USB interface with a 3G communication module. The existing data cards have the disadvantages below:

1. it can not enable multiple terminals to access the Internet simultaneously: a common data card only enables one user to access the Internet via the 3G network. While using the Wideband Code Division Multiple Access (WCDMA) network, the downlink rate can be up to 7.2Mbit/s while the uplink rate can be up to 5.76Mbit/s, which can absolutely support multiple users to access simultaneously. It makes full use of broadband resources for operators and saves a large amount of using expenses for users.

2. it relies on external equipment for power supply: the emphasis of the 3G era is mobility and sharing. But for the traditional USB data card, it has to rely on equipment with a USB interface for power supply, such as a notebook, to realize the mobility. Inevitably, the allocation of the limited battery resources to data cards will shorten the outdoor usage time of the notebook, thus reducing the mobility remarkably.

3. it is not capable of making effective use of wired broadband: some locations using 3G signals to access the network sometimes also have wired broadband, for example at home or in work place. However, 3G signals sometimes are affected by many factors, such as weather, interference sources around, or use in the place where signal propagation is poor. In the circumstances that 3G signal propagation is poor and there is wired broadband available, the existing data card is not capable of making use of wired broadband.

[0004] A Chinese utility model whose application number is 200920057829.X discloses a wireless router which comprises: a wireless broadband Wireless Fidelity (Wi-Fi) router, a 3G wireless communication module, a single-chip microcomputer AT89C52 and power supply unit. The utility model accesses the Internet via 3G signals and supports multiple terminals to access the Internet simultaneously via Wi-Fi routers, overcoming the disadvantages that 3G network cards only support one single user to access the Internet and Wi-Fi routers are not capable of accessing the mobile network. However, firstly the utility model does not access wired Asymmetrical Digital Subscriber Line (ADSL) signals, so it cannot make full use of wired broadband if the communication quality of 3G signals is affected by environmental factors. Secondly, the utility model is incapable of functioning without external power supply, so the portability and mobility is significantly degraded. Lastly, the 3G module is not integrated with the CPU in the utility model, which causes too many interface circuits, and the interface circuit does not adopt a high speed Secure Digital Input Output (SDIO) interface, so the speed and stability require improvement.

[0005] FR 2941585 and FR 2899406 provide respective technical solutions; however, the above mentioned problem still remains unsolved. The document published as FR 2941585 describes a portable device for multi-network communication including at least two interfaces, a first interface enabling data exchange between at least one terminal and said device, said terminals being connected to the device by means of at least one wireless network, such as a WLAN or a WPAN, a second interface enabling data to be exchanged between the device and at least one wireless Internet access network. The device comprises means for storing the identification and authentication information required to connect to at least one wireless Internet access network as well as communication pricing information in a subscription database and is capable of detecting the presence of wireless Internet access networks in the vicinity of the device and of automatically selecting at least one of said networks according to the preferences of at least one user of the device; whilst the document published as FR 2899406 discloses a device with an Ethernet line for connection to an asymmetric digital subscriber line (ADSL) router that is connected to an internet service provider (ISP) supplier and connection ports provided for connection to respective terminals e.g. personal computer. A mobile telephone connection is formed by integrating an assembly to the device, where the assembly acts as a radio
Summary of the Invention

[0006] In view of above, the present invention mainly aims at providing a mobile terminal with routing function for supporting multiple-mode access and implementation method thereof, so as to solve the problem that data cards cannot access wired broadband signals and have to consume external power supply.

[0007] To achieve the objective above, the technical solution of the present invention is realized in this way:

- In the mobile terminal above, the main control module detects the ADSL signals accessed by the ADSL communication interface module; wherein the ADSL interface module is configured to access ADSL wired broadband network; the 3G communication interface module is configured to access wireless broadband network; the WIFI module is configured to establish wireless local area network; and the main control module controls the WIFI module to access the first data transmission channel or the second data transmission channel according to the detection result of the signal detection circuit.

- In the mobile terminal above, the channel control circuit detects the ADSL signals, the channel control circuit prefers to access the WIFI module to the first data transmission channel.

- In the mobile terminal above, the channel control circuit controls the WIFI module to access the first data transmission channel by disconnecting the power supply of the 3G communication interface module; and controls the WIFI module to access the second data transmission channel by disconnecting the power supply of the ADSL interface module.

- In the mobile terminal above, the main control module further comprises: a USB interface for connecting an external network terminal configured to access the second data transmission channel under the control of the main control module.

- In the mobile terminal above, the mobile terminal further comprises: a power supply module, configured to supply power for the main control module, the ADSL interface module, the 3G communication interface module and the WIFI module.

- The present invention also provides a method for realizing a mobile terminal with routing function for supporting multiple-mode access, comprising: accessing ADSL wired broadband signals by an ADSL interface module; accessing wireless broadband signals by a 3G communication interface module; establishing wireless local area network by a WIFI module; and a main control module establishing a first data transmission channel for connecting with the ADSL interface module, establishing a second data transmission channel for connecting with the 3G communication interface module and controlling the WIFI module to access the first data transmission channel or the second data transmission channel.

- In the method above, the main control module establishing a first data transmission channel and a second data transmission channel comprises: the main control module detecting the wireless network signals input by the 3G communication interface module or the ADSL signals input by the ADSL interface module; and the main control module controlling the WIFI module to access the first data transmission channel or the second data transmission channel according to the detection result of the main control module.

- In the method above, the main control module controlling the WIFI module to access the first data transmission channel or the second data transmission channel according to the detection result of the main control module comprises: when the main control module detects the ADSL signals accessed by the ADSL interface module, controlling the WIFI module to access the first data transmission channel; when the main control module detects the USB signals accessed by the USB interface instead of the ADSL signals, controlling the USB interface to access the second data transmission channel; and when neither the ADSL signals nor USB signals are detected by the main control module, controlling the WIFI module to access the second data transmission channel.

- The mobile terminal with routing function for supporting multiple-mode access and the implementation method thereof provided by the present invention, accessing ADSL wired broadband signals by an ADSL interface module, accessing wireless broadband signals by a 3G communication interface module, establishing wireless local area network by a WIFI module, a main control module establishing a first data transmission channel for connecting with the ADSL interface module, establishing a second data transmission channel for connecting with the 3G communication interface module.
and controlling the WIFI module to access the first data transmission channel or the second data transmission channel, can access and convert wired broadband signals to WIFI signals, and therefore support multiple users to access the network simultaneously, realizing the wise integration of the wired and wireless accessing functions and increasing the use occasions of data cards. Since both computer USB interfaces and batteries can be used for supplying power for the present invention, its portability and mobility are improved.

**Brief Description of the Drawings**

[0017] Fig. 1 is a schematic diagram of the structure of the mobile terminal with routing function for supporting multiple-mode access according to the present invention;

[0018] Fig. 2 is a schematic diagram of the circuit connection of the mobile terminal with routing function for supporting multiple-mode access according to the present invention; and

[0019] Fig. 3 is a schematic diagram of the flow of the method for realizing the mobile terminal with routing function for supporting multiple-mode access according to the present invention.

**Detailed Description of the Embodiments**

[0020] The basic concept of the present invention is as follows: accessing ADSL wired broadband signals by an ADSL interface module, accessing wireless broadband signals by a 3G communication interface module, establishing wireless local area network by a WIFI module, a main control module establishing a first data transmission channel for connecting with the ADSL interface module, establishing a second data transmission channel for connecting with the 3G communication interface module, and controlling the WIFI module to access the first data transmission channel or the second data transmission channel.

[0021] The ADSL interface module 12 is configured to access ADSL wired broadband network.

[0022] The power supply module 14 is configured to support power for the present invention, its portability and mobility are improved.

[0023] The 3G communication interface module 13 is configured to access wireless broadband network; the 3G communication interface module 13 accesses the mobile communication network at first, and then accesses the Internet via the mobile communication network. The mobile communication network can be GSM, UMTS, etc. The communication technologies adopted can be 2G, 2.5G or 3G. The mobile communication network can transmit voices, data or images.

[0024] The WIFI module 15 is configured to establish wireless local area network;

[0025] The main control module 11 is configured to establish a first data transmission channel for connecting with the ADSL interface module 12, establish a second data transmission channel for connecting with the 3G communication interface module 13 and control the WIFI module 15 to access the first data transmission channel or the second data transmission channel;

[0026] The main control module 11 is connected with the 3G communication interface module 13 via a dedicated interface circuit, but the main control module is connected with the WIFI module 15 via a SDIO interface. ADSL signals are accessed by the ADSL interface module 12 via an ADSL interface with USB as the interface mode, and then through the conversion chip between the USB and SDIO, and further through the SDIO interface connected with the main control module 11.

[0027] The power supply module 14 is configured to support power for the present invention, its portability and mobility are improved.

**Detailed Description of the Embodiments**

[0028] The present invention is realized through the following specific embodiments. Referring to Fig. 1, the mobile terminal comprises: a main control module 11, an ADSL interface module 12, a 3G communication interface module 13, a power supply module 14 and a WIFI module 15.

[0029] The main control module 11 is configured to establish a first data transmission channel for connecting with the 3G communication interface module 13 or the ADSL signals accessed by the 3G communication interface module 13 or the ADSL signals accessed by the ADSL interface module 12; the channel control circuit is configured to access the WIFI module 15 to access the first data transmission channel or the second data transmission channel according to the result of the signal detection circuit; when the signal detection circuit detects the ADSL signals, the channel control circuit prefers to access the WIFI module to the first data transmission channel; the channel control circuit controls the WIFI module 15 to access the second data transmission channel by disconnecting the power supply of the 3G communication interface module 13; and controls the WIFI module 15 to access the second data transmission channel by disconnecting the power supply of the ADSL interface module 12.

[0030] The main control module 11 further comprises a USB interface for connecting external network terminals, which accesses the second data transmission channel under the control of the main control module 11, thus accessing wireless broadband network.

[0031] The main control module 11 is connected with the 3G communication interface module 13 via a dedicated interface circuit, but the main control module is connected with the WIFI module 15 via a SDIO interface. ADSL signals are accessed by the ADSL interface module 12 via an ADSL interface with USB as the interface mode, and then through the conversion chip between the USB and SDIO, and further through the SDIO interface connected with the main control module 11.

[0032] The power supply module 14 is configured to support power for the present invention, its portability and mobility are improved.

**Detailed Description of the Embodiments**

[0033] The present invention will be further illustrated hereinafter in conjunction with the drawings and the embodiments.
supply power for the main control module 11, the ADSL interface module 12, the 3G communication interface module 13 and the WIFI module 15.

[0028] Fig. 2 is a schematic diagram of the circuit connection of the mobile terminal with routing function for supporting multiple-mode access according to the present invention. As shown in Fig. 1 and Fig. 2:

the ADSL interface module 12 comprises a USB ADSL modem 121 and an AU6331 chip 122, wherein the USB ADSL modem 121 is an equipment with USB as the interface mode, and providing modulation data and demodulation data, converting digital signals to the corresponding analog signals when sending data and converting analog signals to digital signals when receiving data; after the USB ADSL modem 121 accesses ADSL signals, converting analog signals to digital signals and inputting to the AU6331 chip 122, the AU6331 chip 122 transfers the ADSL digital signals input from the USB interface to the SDIO interface and inputs the ADSL digital signals to the main control module 11.

[0029] The 3G communication interface module 13 comprises an antenna switch 131, an antenna switch 132, GSM/UMTS radio frequency (RF) front end 133 and a RTR6285 chip 134, wherein the antenna switches 131 and 132 are configured for receiving/sending switch and frequency band switch; the antenna switch 131 is configured to control an antenna of receiving of GSM network signals and the antenna switch 132 is configured to control an antenna of receiving of UMTS network signals; the GSM/UMTS RF front end 133 is mainly to complete the pre-selection, power amplification and automatic gain control, and convert the input wireless broadband network signals to intermediate frequency (IF) signals. The RTR6285 chip 134 is mainly configured to down-convert the IF signals input by the GSM/UMTS RF front end 133 to base-band signals.

[0030] The power supply module 14 comprises a PM7540 chip 141 and a battery 142, wherein the PM7540 chip 141 is a power management chip; the use of a battery can enable the embodiment to work in outdoor conditions without any power supply available, the PM7540 chip 141 can realize the comprehensive management of working current, power consumption and temperature so as to ensure the stability and reliability of the embodiment.

[0031] The WIFI module 15, using the group module of AThEROS, supporting IEEE802.11b/g and SDIO1.1 and with the maximum rate up to 25Mbit/s, configured to establish wireless local area network to support multiple terminals to access the network simultaneously. The WIFI module 15 can access the first data transmission channel or the second data transmission channel under the control of the main control module 11. The first data transmission channel, as the one between the main control module 11 and the ADSL interface module 12, can access ADSL signals; the second data transmission channel, as the one between the main control module 11 and the 3G communication interface module 13, can access wireless broadband network signals. Besides, the WIFI module 15 can establish wireless local area network to support multiple external network terminals to access the WIFI module 15 via the wireless local area network, further to access the first data transmission channel or the second data transmission channel, and at last to access the Internet.

[0032] The main control module 11 comprises a MSM7225 chip 111, a USB interface 112, a SD card 113, a SIM card 114 and a NOR+DDR 115; wherein the SD card 113, the SIM card 114 and the NOR+DDR 115 are connected with the MSM7225 chip 111; wherein the SD card 113, a secure digital card, is a new-generation memory device based on semiconductor flash memory; the SIM card 114 is a subscriber identity module card, configured to identify the identity of network subscribers; the NOR+DDR115 is a memory used for storing data; the MSM7225 chip 111 is a main control chip, configured to control the ADSL interface module 12, the 3G communication interface module 13, the power supply module 14 and the WIFI module 15, establish a first data transmission channel for connecting with the ADSL interface module 12, a second data transmission channel for connecting with the 3G communication interface module, and control the WIFI module 15 to access the first data transmission channel or the second data transmission channel. The USB interface 112 is configured to connect with external network terminals and access the second data transmission channel under the control of the main control module 11.

[0033] The mobile terminal according to the present invention can be operated according to three modes, namely modem mode, 3G signal routing mode and ADSL signal routing mode.

[0034] The modem mode is connecting a computer by USB cables, enabling a computer to be directly networked using the wireless broadband network signals accessed by the 3G communication interface module 13; in the 3G signal routing mode, mobile terminals are not connected with a computer, and the wireless broadband network signals accessed by the 3G communication interface module 13 are converted to WIFI signals so as to support multiple external terminals to access the network simultaneously; in the ADSL routing mode, without being connected with a computer as well, the ADSL signals accessed by the ADSL interface module 12 are converted to WIFI signals so as to support multiple external terminals to access the network simultaneously.

[0035] While working, the operating mode is determined at first. The signal detection circuit of the main control module 11 detects whether there are ADSL signals accessed, if there are ADSL signals accessed, the channel control circuit switches the operating mode to the ADSL routing mode, otherwise the signal detection circuit further detects whether the USB interface 112 ac-
cesses USB signals, if there are USB signals accessed, the channel control circuit switches the operating mode to the modem mode, otherwise switches to the 3G routing mode; the USB power line of the ADSL interface of the USB ADSL modem 121 is connected to a Multipurpose in (MMP) of the PM7450 chip 141, and in the AMUX_OUT of the PM7450 chip 141 is connected to the HKADC of the MSM7225 chip 111, the HKADC is a 12bit ADC, thus the MSM7225 chip 111 can monitor whether the ADSL interface accesses ADSL signals in real time; if ADSL signals are accessed while the 3G signal routing mode is used, the present invention can detect the access of the ADSL immediately and that ADSL access is being used will be prompted on the screen; LDO and PM7540 chip 141 supply power for the AU6331 chip 122, the general-purpose input/output (GPIO) of the MSM7225 chip 111 controls the work of the LDO while the PM7540 chip 141 is controlled by software. In this way, when the input of ADSL signals is detected, the AU6331 chip 122 is powered on to start to work and the operating mode is ADSL signal routing mode, otherwise the AU6331 chip 122 is disconnected and stops working. When the AU6331 chip 122 is disconnected, namely no ADSL signal is accessed, the MSM7225 chip 111 further judges whether the USB interface 112 is connected with any external terminal equipment, if yes, the modem mode is selected, otherwise the 3G signal routing mode is selected; The ADSL signal routing mode has the highest priority. If the ADSL is accessed, the ADSL routing mode is preferred according to the present invention and the use of the other two modes will be prohibited, which accords with the user habit that plugging of the ADSL is to use the ADSL signal routing mode and unplugging of the ADSL is to stop the use of the ADSL signal routing mode. To determine the operating mode, besides automatic performance by the signal detection circuit and the channel control circuit, manual setting is also feasible, for example, disconnect the power supply of the 3G communication interface module by pressing the button of the ADSL routing mode to realize the selection of the operating mode.

In the modem operating mode, the USB interface connects external network terminals to enable them to access the network via wireless broadband signals. Put the USIM card and batteries in place, connect the embodiment to a computer with a USB cable, press the "ON" button, then the voltage supplied by the batteries is input to the PM7540 chip 141 which outputs voltages required by various circuits, afterwards, the embodiment starts to work; 3G signals are converted to IF signals via the GSM/UMTS RF front end 133, and then input to the RTR6285 chip 134 to down-convert these signals to base-band signals. The base-band signals output by the RTR6285 chip 134 are input to the MSM7225 chip 111, and a DSP of the MSM7225 chip 111 completes modem algorithm protocol and demodulates the input base-band signals. Before demodulation, the 3G routing mode shares hardware circuits with the modem mode, after demodulation, another DSP of the MSM7225 chip 111 completes routing algorithm protocol and realizes routing function via the SDIO interface connected with the WIFI module 15.

In the ADSL signal routing mode, ADSL interface module 13 and WIFI module 15 can enable multiple terminals to access the network simultaneously; put the USIM card and batteries in place, press the "ON" button, then the voltage supplied by the batteries are input to the PM7540 chip 141 which outputs voltages required by various circuits, the AU6331 chip 122 requires 3.3V and 2.5V voltages, wherein the 3.3V is supplied by the additional LDO, and the 2.2V is supplied by the PM7540 chip 141; USB ADSL modem 121, the modem of the USB interface, converts the ADSL signals accessed from analog signals to digital signals and inputs them to the AU6331 chip 122, and the AU6331 chip 122 switches the USB interface to the SDIO interface and connects it to one of the four SDIO interfaces of the MSM7225 chip 111, thus the routing algorithm and protocol of the ADSL signals can be realized in the DSP via the internal bus of the MSM7225 chip 111, and the routing and the network accessing of multiple terminals can be realized via the WIFI module 15.

Based on the mobile terminal above, the present invention also provides a method for realizing the mobile terminal with routing function for supporting multiple-mode access. Fig. 3 is a schematic diagram of the flow of the method for realizing the mobile terminal with routing function for supporting multiple-mode access according to the present invention. As shown in Fig. 3, the method comprises the steps below:

1. Step 301, accessing ADSL wired broadband signals by an ADSL interface module;
2. Step 302, accessing wireless broadband signals by a 3G communication interface module;
3. Step 303, establishing wireless local area network by a WIFI module;
Step 304, a main control module establishing a first
data transmission channel for connecting with the
ADSL interface module, establishing a second data
transmission channel for connecting with the 3G
communication interface module and controlling the
WIFI module to access the first data transmission
channel or the second data transmission channel.

Wherein Step 304 specifically comprises:

(1) the main control module detects the wireless net-
work signals input by the 3G communication inter-
face module or the ADSL signals input by the ADSL
interface module;

(2) the main control module controls the WIFI module
to access the first data transmission channel or the
second data transmission channel according to the
detection result of Step (1);

Wherein Step (2) specifically comprises:

once the main control module detects the ADSL sig-
nals accessed by the ADSL interface module, con-
trolling the WIFI module to access the first data trans-
mission channel;

when the main control module detects the USB sig-
nals accessed by the USB interface instead of the
ADSL signals, controlling the USB interface to ac-

When neither the ADSL nor USB signals are detected
by the main control module, controlling the WIFI
module to access the second data transmission
channel.

With the ADSL interface module 12, the WIFI
module 15, the 3G communication interface module 13
and the main control module 11, the present invention
accesses and converts ADSL signals or wireless broad-
band signals to WIFI signals to realize that multiple ter-

To sum up, the present invention has the tech-
nical effects below:

1. both 3G signals and ADSL signals can be con-
verted to WIFI signals, realizing the integration of the
wired and wireless; and

2. both computer USB interfaces and batteries can
be used for supplying power for the present inven-
tion, so its portability and mobility are improved.

Claims

1. A mobile terminal with routing function for supporting
multiple-mode access, characterized by comprising:
an Asymmetrical Digital Subscriber Line ADSL
interface module (12), a Third Generation 3G com-
munication interface module (13), a Wireless Fidelity
WIFI module (15) and a main control module (11); and

Wherein
the ADSL interface module (12) is configured to ac-
cess ADSL wired broadband network;
the 3G communication interface module (13) is con-
figured to access wireless broadband network;
the WIFI module (15) is configured to establish wire-
less local area network; and
the main control module (11) is configured to estab-
lish a first data transmission channel for connecting
with the ADSL interface module (12), establish a sec-
ond data transmission channel for connecting with the
3G communication interface module (13) and
control the WIFI module (15) to access the first data trans-
mis-sion channel or the second data transmis-
sion channel;
the main control module further comprises: a signal
detection circuit, a
channel control circuit; wherein the signal detection
circuit is configured to detect the wireless broadband
signals accessed by the 3G communication interface
module (13) or the ADSL signals accessed by the
ADSL interface module (12); and
the channel control circuit is configured to control the
WIFI module to access the first data transmission
channel or the second data transmission channel
according to the detection result of the signal detect-
cition circuit;
when the signal detection circuit detects the ADSL
signals, the channel control circuit is further config-
ured to control the WIFI module (15) to priority ac-
tess the first data transmission channel.

2. The mobile terminal as claimed in Claim 1, charac-
terized in that the main control module further com-
prises:
a Universal Serial Bus USB interface (112) for
connecting an external network terminal, con-
figured to access the second data transmission
channel under the control of the main control
module (11).

3. The mobile terminal as claimed in anyone of Claims
1 to 2, characterized in that the mobile terminal further comprises:

- a power supply module (14), configured to supply power for the main control module (11), the ADSL interface module (12), the 3G communication interface module (13) and the WIFI module (15).

4. A method for realizing a mobile terminal with routing function for supporting multiple-mode access, characterized by comprising:

- accessing Asymmetrical Digital Subscriber Line ADSL wired broadband signals by a ADSL interface module (12);
- accessing wireless broadband signals by a Third Generation 3G communication interface module (13);
- establishing wireless local area network by a Wireless Fidelity WIFI module (15); and
- a main control module (11) establishing a first data transmission channel for connecting with the ADSL interface module (12), establishing a second data transmission channel for connecting with the 3G communication interface module (13) and controlling the WIFI module (15) to access the first data transmission channel or the second data transmission channel;

wherein the step of the main control module (11) establishing a first data transmission channel and a second data transmission channel, and controlling the WIFI module (15) to access the first data transmission channel or the second data transmission channel comprises:

- the main control module (11) detecting the wireless network signals input by the 3G communication interface module (13) or the ADSL signals input by the ADSL interface module (12); and
- the main control module (11) controlling the WIFI module (15) to access the first data transmission channel or the second data transmission channel according to the detection result of the main control module (11);

wherein the step of the main control module (11) controlling the WIFI module (15) to access the first data transmission channel or the second data transmission channel according to the detection result of the main control module (11) comprises:

- when the main control module (11) detects the ADSL signals accessed by the ADSL interface module (12), controlling the WIFI module (15) to access the first data transmission channel; and
- when the main control module (11) detects Universal Serial Bus USB signals accessed by an USB interface (112) instead of the ADSL signals, controlling the USB interface (112) to access the second data transmission channel; and
- when neither the ADSL signals nor USB signals are detected by the main control module (11), controlling the WIFI module (15) to access the second data transmission channel.

Patentansprüche


wobei:

- das ADSL-Schnittstellenmodul (12) für den Zugang zum ADSL-Breitband-Kabelnetzwerk konfiguriert ist;
- das 3G-Kommunikationsschnittstellenmodul (13) für den Zugang zum Wireless-Breitbandnetzwerk konfiguriert ist;
- das WIFI-Modul (15) zur Errichtung eines kabellosen Local Area Network konfiguriert ist;

Das Hauptsteuerungsmodul (11) zur Errichtung eines ersten Datenübertragungskanals zur Verbindung mit dem ADSL-Schnittstellenmodul (12), zur Errichtung eines zweiten Datenübertragungskanals zur Verbindung mit dem 3G-Kommunikationsschnittstellenmodul (13) und zur Steuerung des WIFI-Moduls (15) in Bezug auf den Zugang zum ersten Datenübertragungskanal oder zweiten Datenübertragungskanal konfiguriert ist;

Das Hauptsteuerungsmodul enthält außerdem: einen Signalerkennungsschaltkreis; einen Kanalsteuerungsschaltkreis; wobei der Signalerkennungsschaltkreis zur Erkennung der Wireless-Breitbandsignale, auf die das 3G-Kommunikationsschnittstellenmodul (13) zugreift, oder der ADSL-Signale, auf die das ADSL-Schnittstellenmodul (12) zugreift, konfiguriert ist; und

der Kanalsteuerungsschaltkreis zur Steuerung des WIFI-Moduls konfiguriert ist, sodass dieses entsprechend dem vom Signalerkennungsschaltkreis erkannten Signal auf den ersten Datenübertragungskanal oder den zweiten Datenübertragungskanal zugreift;

WENN der Signalerkennungsschaltkreis ADSL-Signale erkennt, ist der Kanalsteuerungsschaltkreis außerdem auf eine Weise konfigu-

2. Das mobile Endgerät in Anspruch 1 zeichnet sich dadurch aus, dass das Hauptsteuerungsmodul außerdem Folgendes umfasst:

Eine Universal Serial Bus USB-Schnittstelle (112) zur Verbindung eines externen Netzwerk-Endgeräts, konfiguriert für den Zugang zum zweiten Datenübertragungskanal unter Steuerung des Hauptsteuerungsmoduls (11).

3. Das mobile Endgerät laut Anspruch 1 bzw. 2 zeichnet sich dadurch aus, dass es außerdem Folgendes umfasst:

Ein Stromversorgungsmodul (14), konfiguriert zur Stromversorgung des Hauptsteuerungsmoduls (11), das ADSL-Schnittstellenmodul (12), das 3G-Kommunikationsschnittstellenmodul (13) und das WIFI-Modul (15).

4. Eine Methode zur Schaffung eines mobilen Endgeräts mit Routing-Funktion zur Unterstützung des Mehrfachmoduszugangs, die sich dadurch auszeichnet, dass sie Folgendes umfasst:

Zugang zu kabelgebundenen Asymmetrical Digital Subscriber Line ASDL-Breitbandsignalen mittels ADSL-Schnittstellenmodul (12);
Zugang zu Wireless-Breitbandsignalen mittels 3G-Kommunikationsschnittstellenmodul (13) der 3. Generation;
Schaffung eines kabellosen Local Area Network mittels Wireless Fidelity WIFI-Modul (15); und
ein Hauptsteuerungsmodul (11), welches einen ersten Datenübertragungskanal zur Verbindung mit dem ADSL-Schnittstellenmodul (12) erstellt, welches einen zweiten Datenübertragungskanal zur Verbindung mit dem 3G-Kommunikationschnittstellenmodul (13) erstellt und welches das WIFI-Modul (15) in Bezug auf den Zugang zum ersten Datenübertragungskanal oder den zweiten Datenübertragungskanal steuert, Folgendes umfasst:

Das Hauptsteuerungsmodul (11) erkennt die Wireless-Netzwerk-Signalinputs des 3G-Kommunikationsschnittstellenmoduls (13) oder die ADSL-Signalinputs des ADSL-Schnittstellenmoduls (12); und
Das Hauptsteuerungsmodul (11) steuert das WIFI-Modul (15), sodass es gemäß dem vom Hauptsteuerungsmodul (11) erkannten Signal auf den ersten Datenübertragungskanal oder den zweiten Datenübertragungskanal zugreift; wobei der Schritt, in dem das Hauptsteuerungsmodul (11) das WIFI-Modul (15) abhängig von dem durch das Hauptsteuerungsmodul (11) erkannten Signal in Bezug auf den Zugang zum ersten Datenübertragungskanal oder den zweiten Datenübertragungskanal steuert, Folgendes umfasst:

wenn das Hauptsteuerungsmodul (11) ADSL-Signale erkennt, auf die das ADSL-Schnittstellenmodul (12) zugreift, wird das WIFI-Modul (15) so gesteuert, dass es auf den ersten Datenübertragungskanal zugreift; wobei der Schritt, in dem das Hauptsteuerungsmodul (11) das WIFI-Modul (15) abhängig von dem durch das Hauptsteuerungsmodul (11) erkannten Signal in Bezug auf den Zugang zum ersten Datenübertragungskanal oder den zweiten Datenübertragungskanal steuert, Folgendes umfasst:

wenn das Hauptsteuerungsmodul (11) ASSL-Signale erkennt, auf die das ASSL-Schnittstellenmodul (12) zugreift, wird das WIFI-Modul (15) so gesteuert, dass es auf den zweiten Datenübertragungskanal zugreift; und
wenn das Hauptsteuerungsmodul (11) das WIFI-Modul (15) nicht erkennt, wird das WIFI-Modul (15) so gesteuert, dass es auf den zweiten Datenübertragungskanal zugreift.

Revendications

1. Un terminal mobile avec fonction d'acheminement pour qu'il soit compatible avec un accès multimodal, caractérisé en ce qu'il comprend : un module d'interface de liaison numérique asymétrique ADSL (12), un module d'interface de communication de troisième génération 3G (13), un module WiFi (15) et un module de contrôle principal (11) ; dans lequel le module d'interface ADSL (12) est configuré pour accéder au réseau câblé à large bande ADSL ; le module d'interface de communication 3G (13) est configuré pour accéder au réseau sans fil à large bande ;
le module WiFi (15) est configuré pour établir un réseau local sans fil ; et le module de contrôle principal (11) est configuré pour établir un premier canal de transmission de données pour connexion avec le module d'interface ADSL (12), établir un second canal de transmission de données pour connexion avec le module d'interface de communication 3G (13) et contrôler le module WiFi (15) pour accéder au premier canal de transmission de données ou au second canal de transmission de données ;

le module de contrôle principal comprend en outre : un circuit de détection de signal, un circuit de contrôle de canal ; où

le circuit de détection de signal est configuré pour déterminer les signaux de large bande sans fil auxquels accède le module d'interface d'interface 3G (13) ou les signaux ADSL auxquels accède le module d'interface ADSL (12) ; et

le circuit de contrôle de canal est configuré pour contrôler le module WiFi pour accéder au premier canal de transmission de données ou au second canal de transmission de données selon le résultat de détection du circuit de détection de signal ; lorsque le circuit de détection de signal détecte les signaux ADSL, le circuit de contrôle de canal est en outre configuré pour contrôler le module WiFi (15) pour un accès prioritaire au premier canal de transmission de données ;

le circuit de contrôle de canal est en outre configuré pour contrôler le module WiFi (15) pour un accès au premier canal de transmission de données en déconnectant l'alimentation électrique du module d'interface de communication 3G (13), et contrôler le module WiFi (15) pour un accès au second canal de transmission de données en déconnectant l'alimentation électrique du module d'interface ADSL (12).

2. Le terminal mobile tel que revendiqué dans la revendication 1, caractérisé en ce que le module de contrôle principal comprend en outre : une interface bus série universel USB (112) pour connecter un terminal de réseau externe, configurée pour accéder au second canal de transmission de données sous le contrôle du module de contrôle principal (11).

3. Le terminal mobile tel que revendiqué dans n’importe laquelle des revendications 1 à 2, caractérisé en ce que le terminal mobile comprend en outre : un module d'alimentation électrique (14), configuré pour fournir une alimentation électrique au module de contrôle principal (11), au module d'interface ADSL (12), au module d'interface de communication 3G (13) et au module WiFi (15).

4. Un procédé pour réaliser un terminal mobile avec fonction d'acheminement pour qu'il soit compatible avec un accès multimodal, caractérisé en ce qu'il comprend :

l'accès à des signaux de large bande câblée de liaison numérique asymétrique ADSL par un module d'interface ADSL (12) ;

l'accès à des signaux de large bande sans fil par un module d'interface de communication de troisième génération 3G (13) ;

l'établissement d'un réseau local sans fil par un module WiFi (15) ; et

un module de contrôle principal (11) établissant un premier canal de transmission de données pour connexion avec le module d'interface ADSL (12), établissant un second canal de transmission de données pour connexion avec le module d'interface de communication 3G (13) et contrôlant le module WiFi (15) pour accéder au premier canal de transmission de données ou au second canal de transmission de données ;

dans lequel l'étape du module de contrôle principal (11) établissant un premier canal de transmission de données et un second canal de transmission de données, et contrôlant le module WiFi (15) pour accéder au premier canal de transmission de données ou au second canal de transmission de données comprend :

le module de contrôle principal (11) déconnectant l'entrée des signaux de réseau sans fil par le module d'interface de communication 3G (13) ou l'entrée des signaux ADSL par le module d'interface ADSL (12) ; et

le module de contrôle principal (11) contrôlant le module WiFi (15) pour accéder au premier canal de transmission de données ou au second canal de transmission de données selon le résultat de détection du module de contrôle principal (11) ;

dans lequel l'étape du module de contrôle principal (11) contrôlant le module WiFi (15) pour accéder au premier canal de transmission de données ou au second canal de transmission de données selon le résultat de détection du module de contrôle principal (11) comprend :

lorsque le module de contrôle principal (11) détecte les signaux ADSL auxquels accède le module d'interface ADSL (12), contrôlant le module WiFi (15) pour accéder au premier canal de transmission de données ;

lorsque le module de contrôle principal (11) détecte les signaux de bus série universel USB auxquels accède une interface USB (112) au lieu des signaux ADSL, contrôlant l'interface USB (112) pour accéder au second canal de
transmission de données ; et lorsque ni les signaux ADSL ni les signaux USB ne sont détectés par le module de contrôle principal (11), contrôlant le module WiFi (15) pour accéder au second canal de transmission de données.
Fig. 1
Fig. 2
301. accessing ADSL wired broadband signals by an ADSL interface module

302. accessing wireless broadband signals by a 3G interface module

303. establishing wireless local area network by a WIFI module

304. a main control module establishing a first data transmission channel for connecting with the ADSL interface module, establishing a second data transmission channel for connecting with the 3G interface module and controlling the WIFI module to access the first data transmission channel or the second data transmission channel

Fig. 3
REFERENCES CITED IN THE DESCRIPTION

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