A TELECOMMUNICATIONS NETWORK ACCESS DEVICE

BACKGROUND OF THE INVENTION

This invention relates to a telecommunications network access device.

Network access devices are used to connect telecommunications devices on for example a user's side, to ultimately other telecommunications devices on for example, a network side, via an intermediate communications transport medium. Each telecommunications device has its own protocol to allow it to function, and thus, currently, the access devices need to be configured specifically for the telecommunications devices and the intermediate communications transport medium.

However, any change to the telecommunications devices and/or intermediate communications transport medium requires a separate access device to be configured and installed.

Furthermore, the ports in the device are connected to the hardware and software of the device and are not easily changed, thus flexibility is not catered for.

It is therefore an aim of the present invention to provide a network access device that addresses the above shortcomings in typical access devices.

SUMMARY OF THE INVENTION

In broad terms, the invention there is provided a telecommunications network access device comprising:

a plurality of ports that can each transmit and receive data from a telecommunications device, the telecommunications device operating in terms of an associated protocol and being arranged to transmit and receive data in a format associated with the protocol;

a plurality of ports connected to another telecommunications device or to a communications network so that data can be transmitted and received from the network access device to the other telecommunications device or to the communications network; and

a USB port.

In one version of the invention the device includes a translator for converting data into a format suitable for the other telecommunications device or communications network that the network access device is connected to.

The ports on the network access device are able to accommodate data transmitted from a user side to a network side and data transmitted from the network side to the user side.

The device may include at least some of the ports for LAN, VLAN, SHDSL, RS232/E1 and Serial V11/V35.

The device may include optical isolation on an RS232 serial port.

The device may also include modules corresponding to the various ports.

Furthermore, the device may include a processor to control the device.

In addition, the device may include an on board power DC-DC converters to power the device.

A memory module may also be included to store software to operate the device

A plurality of status indicators may also be used to show which protocol the device is being connected to.

BRIEF DESCRIPTION OF DRAWINGS

Figure 1 shows a schematic block diagram of a telecommunications network using a telecommunications network access device according to the present invention;

Figure 2 shows a front view of the telecommunications network access device according to the present invention;

Figure 3 shows a rear view of the telecommunications network access device; and

Figure 4 shows a functional block diagram for the telecommunications network access device.

DETAILED DESCRIPTION OF EMBODIMENTS

Referring to Figure 1, a telecommunications network 10 may use two network access devices 12, 14 of the present invention to enable a telecommunications device 16 on, for example, a user's side, to communicate with another telecommunications device 18, on, for example, a network side. The devices 16, 18 are connected via an intermediate

communications transport network or medium 20, with the devices 16, 18 and the intermediate communications transport network or medium 20 each having their own associated protocols that require data to be in a particular format.

In broad terms, each network access device 12, 14 comprise a plurality of ports that can each receive data from a telecommunications device 16, 18.

Each network access device 12, 14 further comprises a translator for converting the data into a format suitable for a telecommunications device 16, 18 or communications network 20 that the network access device 12, 14 is connected to. Thus, at the user's side, the translator within network access device 12 converts data from the user in a particular format to a format that can be understood by the protocol associated with the communications transport network or medium 20. Similarly, at the network side, the translator within network access device 14 converts data from the communications transport network or medium 20, which is in a particular format, to a format that can be understood by the protocol associated with the telecommunications device 16 on the network side.

Significantly, the conversion of data from one format to another at both the user side and the network side is dynamically configurable on demand. Typically, this would be done by contacting the relevant telecommunications network operator, who can then make the necessary adjustments to the network access device 12, 14 remotely.

In particular, the ports/interfaces on the network access device 12, 14 can accommodate, and be adjusted to accommodate, both north bound data (i.e. data from the user side to the network side) and south bound data (i.e. data from the network side to the user side).

Turning now to Figures 2 and 3, each network access device 12, 14 comprises a plurality of ports that can each receive an interface from a telecommunications device. In an example embodiment, the following

ports are provided for receiving interfaces from devices using corresponding protocols:

LAN, indicated by arrow 22
VLAN, indicated by arrow 24
SHDSL, indicated by arrow 26
RS232/E1, indicated by arrow 28
Serial V11/V35, indicated by arrow 30

A USB port 32 is also provided. This conveniently allows a myriad of other devices to be connected to the network access device 12, 14, and to communicate in the manner described above.

This type of port is not found on Integrated Access Devices.

The purpose of the USB 32 port is to expand the capabilities of the device to accommodate more electrical interfaces (e.g. ADSL Modem, Dial-up Modem, etc). It also expands the functional flexibility of the device by being able to connect various computer peripheral (e.g. a printer, screen, keyboard or mouse etc.) to it. Furthermore, in order to have virtual unlimited storage capacity for the purposes of statistics regarding the services hosted on the device, the USB port 32 allows for interfacing to external memory and storage devices. Content provided by a service provider can also be downloaded and stored locally on external storage devices connected to the device by means of the USB port.

The USB port is designed to operate in both Master and Slave modes, thus increasing the number of possibilities to integrate and deploy the unit in the Telecommunications and Networking industries.

The front panel of the device 12, 14, as shown in Figure 2, comprises a plurality of status indicators showing, for example, which protocol is the device 12, 14 being connected to. Thus, there are status indicators for a Serial V11/V35 interface 34, status indicators for E1 36, status indicators

for SHDSL 38, status indicators for VLAN 40 and a status indicator for LAN 42.

Advantageously, there is optical isolation on the RS232 serial port.

Turning now to Figure 4, each network access device 12, 14 comprises modules corresponding to the various interface/ports. Thus, each network access device 12, 14 comprises a 5 port 10/100 base T VLAN module 44 for the LAN and VLAN interfaces, An E1 interface module 46 for the E1 interface, an RS232 interface module 48 for the RS232 interface, a USB interface module 50 for the USB interface, a dual SHDSL interface module 52 for the SHDSL interface and a V11/V35 interface module 54 for the V11/V35 serial interface.

Each network access device 12, 14 comprises a CPU 56 and CPU peripheral circuitry 58 to control the device 12, 14. In addition, on board power DC-DC converters 60 are provided to power the device 12, 14, the converter 60 typically being powered from a 12V power supply. A FLASH memory module 62 stores the necessary instructions and software to operate the device 12, 14 on a more permanent basis, whereas a SDRAM 64 is used to store temporary variables. An FPGA 66 is provided to control the interconnection of signals between the various component of the device 12, 14.

Significantly, the translating functionality described above is executed by the FLASH memory 62 and/or the FPGA 66. Thus, these components allow traffic to be routed from any of the electrical interfaces connected to the device to any one of other electrical interfaces connected to another device. In particular, and as mentioned above, any of the interfaces can be configured as north or south bound interfaces, thus providing tremendous versatility.

In use, CAT5 (Category 5 cable), POTS copper pair and V11/V35 cabling can be plugged into the relevant Ethernet, E1, SHDSL of high speed serial

interfaces, and terminated at the relevant equipment it interfaces to. An on-board web server can then be accessed either through the SHDSL interface via a management VP/VC, or an Ethernet interface, through which it can be configured. The device 12, 14 starts up with its factory defaults when switched on for the first time and thereafter with its latest configuration setup. Significantly, the firmware of the units is fully remotely upgradeable.

The device presents numerous advantages, including ease of installation and maintenance. The addition of the USB port makes the unit capable of flexible expansion possibilities. In particular, being capable to route traffic from any of the electrical interfaces to any one of the other electrical interfaces also makes the device very flexible and powerful in its class.

CLAIMS:

1. A telecommunications network access device for receiving and transmitting data, the network access device comprising:

   a plurality of ports that can each transmit and receive data from a telecommunications device, the telecommunications device operating in terms of an associated protocol and being arranged to transmit and receive data in a format associated with the protocol;

   a plurality of ports connected to another telecommunications device or to a communications network so that data can be transmitted and received from the network access device to the other telecommunications device or to the communications network; and

   a USB port.

2. A telecommunications network access device according to claim 1 further including a translator for converting data into a format suitable for the other telecommunications device or communications network that the network access device is connected to.

3. A telecommunications network access device according to claim 1 or claim 2 wherein the conversion of data is dynamically configurable.

4. A telecommunications network access device according to any preceding claim wherein the ports on the network access device can accommodate data transmitted from a user side to a network side and data transmitted from the network side to the user side.

5. A telecommunications network access device according to any preceding claim wherein the device includes at least some of the ports for LAN, VLAN, SHDSL, RS232/E1 and Serial V11/V35.

6. A telecommunications network access device according to claim 4 wherein the device includes optical isolation on an RS232 serial port.

7. A telecommunications network access device according to claim 4 or claim 5 wherein the device includes modules corresponding to the various ports.

8. A telecommunications network access device according to any preceding claim wherein the device includes a processor to control the device.

9. A telecommunications network access device according to any preceding claim wherein the device includes on board power DC-DC converters to power the device.

10. A telecommunications network access device according to any preceding claim wherein the device includes a memory module to store software to operate the device

11. A telecommunications network access device according to any preceding claim wherein the device includes a plurality of status indicators showing which protocol the device is being connected to.