

Method and Apparatus for Remote Communication

FIELD OF THE INVENTION

The present invention relates to the field of communications. In particular, the invention relates to communication between a remote user and a digital processor. In one form, the invention relates to a method and apparatus for wireless communication between a remote user, comprising wireless and/or mobile user equipment such as a mobile telephone, and a personal computer (PC). It will be convenient to hereinafter describe the invention in relation to that example; however it should be appreciated that the present invention is not limited to that use, only.

BACKGROUND OF THE INVENTION

Wireless modems are available for communicating with a remote user. Ordinarily, these modems have serial, USB or PCMCIA interfaces. Physical connection of the external modem to a PC requires its own power source and cabling. Further, these external modems may have external SIM access. There are numerous GSM modems available with various interfaces for personal computer (PC). Interfaces of these GSM modems may be RS232 (an EIA, Electronic Industries Association, standard that defines a protocol for serial data communications.), USB (An external peripheral interface standard for communication between a computer and external peripherals over an inexpensive cable using bi-serial transmission. USB is an intended replacement for existing serial ports, parallel ports, keyboard, and monitor connectors. Originally, USB worked at 12 Mbps with specific consideration for low cost peripherals. It became widely available by 1997.) and PCMCIA (or "PC Card", an international trade association and the standards they have developed for devices, such as modems and external hard disk drives, that can be plugged into notebook computers. A PCMCIA card is about the size of a credit card.) The following are example GSM modems that are available with their respective interfaces and an outline of various features associated with those interfaces:

GSM modems available in the market

- 5
1. RS232 serial interface GSM modems
 - Wavecom Fastrack
 - Falcom GSM/GPRS terminal modems
 - Siemens TC35 terminal modem

These RS232 serial interfaces tend to have various features, which can be summarized as:

10	Interface:	RS 232 Serial
	Power Source:	AC/DC
	Power Connection:	External Power Adapter
	Voice Connector:	Yes
	Antenna GSM Connector:	SMA
15	I/O Port:	No
	Sound Card TAD Connection (Microphone & Speaker Accessibility):	No

- 20
2. USB interface GSM modems
 - IWOW Itegnio GPRS modem

These USB interfaces tend to have various features, which can be summarized as:

25	Interface:	USB
	Power Source:	USB
	Power Connection:	PC
	Voice Connector:	Yes
	Antenna GSM Connector:	Embedded
	I/O Port:	No
30	Sound Card TAD Connection (Microphone & Speaker Accessibility):	No

3. PCMCIA interfaces

- Nokia Card Phone

These PCMCIA interfaces tend to have various features, which can be summarized as:

5	Interface:	PCMCIA
	Power Source:	PCMCIA
	Power Connection:	PC
	Voice Connector:	No
	Antenna GSM Connector:	Flip
10	I/O Port:	No
	Sound Card TAD Connection	
	(Microphone & Speaker Accessibility):	No

The inventors have identified at least the following properties including various difficulties associated with these GSM modems:

- a. No PCI Power Management capability - No PCI Power Management Capability relates to GSM modems with RS232 serial & USB interfaces.
- b. External power source - External Power Source is provided with GSM modems with RS232 serial interface. In general, external power source such as using the ADC power adapter is required. This may be unnecessary when the external GSM modem is acting as a peripheral device.
- c. Extra Cabling - Extra cabling and accessories are provided with GSM modems with RS232 serial, USB, PCMCIA interfaces. RS232 serial cable, USB cable and ADC power adapters with cable are cumbersome especially when efficient networking is required for some situations. PCMCIA GSM modem cards require an adapter card to be used in the PC. Further, these GSM modems do not provide TAD, Telephone Answering

Device, connection to a PC sound card other than with a headset interface. Hence, when a voice conversation requires broadcasting, an additional hands-free voice kit may be required. This may be additional when a sound card usually operating with a microphone and speaker are available for use.

d. Accessibility for tampering etc. With regard to accessibility, these external GSM modems may be easily accessible, inducing the temptation of theft, tampering and vandalism. Especially with easy SIM card access, and abuse of SIM cards such as the undesirable removal and unauthorized usage, painful consequences may be brought on to any on-running system such as a remote security system.

Any discussion of documents, devices, acts or knowledge in this specification is included to explain the context of the invention. It should not be taken as an admission that any of the material forms a part of the prior art base or the common general knowledge in the relevant art in Singapore or elsewhere on or before the priority date of the disclosure and claims herein.

It is an object of the present invention to alleviate at least one disadvantage associated with the prior art.

SUMMARY OF THE INVENTION

The present invention provides, in one aspect, a method of communicating between a remote user and a digital data processor, the method comprising the steps of: transceiving wireless GSM messages between a GSM enabled modem and the remote user; interfacing the wireless GSM messages with a peripheral component interconnect interface operatively associated with the digital data processor and the wireless GSM modem so as to allow control of the digital data processor by the remote user.

In another aspect, the present invention provides, a method of allowing communication between a remote user and a digital data processor, the

method comprising the steps of: providing a wireless GSM modem for communicating with the remote user; integrating a peripheral component interconnect interface with the wireless GSM modem so as to allow control of the digital data processor by the remote user via the interface.

5 In a further aspect the present invention provides, apparatus adapted to communicate between a remote user and a digital data processor, said apparatus comprising: wireless GSM modem means adapted to transceive wireless GSM messages with a remote user; peripheral component interconnect interface means operatively associated with the wireless GSM
10 modem means; said peripheral component interconnect interface means, in conjunction with said wireless GSM modem means, being adapted to allow control of the digital data processor by the remote user in accordance with a method as broadly described and as set forth in the appended claims.

 Other aspects and preferred aspects are disclosed in the specification
15 and / or defined in the appended claims, forming a part of the description of the invention.

 In essence, the present invention stems from the realization that providing peripheral component interconnect functionality by way of an interface between a digital data processor and a GSM enabled modem, a
20 remote user may have control over the function of the data processor.

 The present invention has been found to result in a number of advantages, such as allowing digital processor system functions to be implemented intelligently by remote access; reducing the complexity of networking and connection to peripheral devices by obviating the need for
25 separate cabling; and reducing the likelihood of tampering of modems and SIM cards.

 Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while
30 indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and

scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

5 Further disclosure, objects, advantages and aspects of the present application may be better understood by those skilled in the relevant art by reference to the following description of preferred embodiments taken in conjunction with the accompanying drawing, which is given by way of illustration only, and thus is not limitative of the present invention, and in
10 which:

Figure 1 illustrates, in plan view, an integrated circuit device manufactured in accordance with a preferred embodiment of the present invention and adapted to perform the functions of preferred embodiments of the present invention.

15

DETAILED DESCRIPTION OF THE INVENTION

With reference to Fig 1, the embodiment shown of the present invention includes a GSM/GPRS PCI modem card, incorporating the following technologies:

20 PCI Technology
PCI Bus Power Management Technology
GSM technology
FPGA (Field Programmable Gate Array) Technology
VHDL (Very High Speed Integrated Circuit Hardware Description
25 Language, IEEE 1076 standard) Technology.

GSM/GPRS PCI modem card 10 comprises a GSM modem 1, a PCI interface 2 providing GSM compatible functionality. The PCI interface 2 also provides access to PCI Bus Power Management capabilities and its various functions and benefits to a PC user. With PCI Bus Power Management
30 functionality and utilizing the GSM modem 1 as communication medium, functions such as waking up, logging in/out, restarting and shutting a PC remotely via SMS, voice call, data call and fax with or without its incoming

phone number authenticated may be implemented intelligently. As GSM/GPRS PCI modem card 10 provides the PCI interface 2, the PC PCI slot may be utilized for power source and serial interface. The probability of theft or tampering of the GSM modem 1 illustrated in Fig 1 is minimized as the
 5 GSM modem 1 is installed within the PC.

The GSM/GPRS PCI modem card 10 of Fig 1 features both internal 3 as well as external 4 SIM access optionally to a user. Hence, the requirement for messier cabling for a SIM card is obviated. Furthermore, with the arrangement of Fig 1, tampering and theft are far more difficult to perpetrate.

10 With GSM/GPRS PCI modem card 10, the following functions are available. GSM function – providing voice, GSM Circuit Data/Fax, GPRS Packet Data, and Short Message Services. PCI Bus Interface and Power Management functions including – (a) PCI Bus Specification 2.2 compliant; and, (b) PCI Bus Power Management 1.0 compliant.

15 Further functions provided by the GSM/GPRS PCI modem card 10 of Fig 1 may comprise:

general I/O interface 5 - provide an interface to any peripheral or device for controlling;

20 audio interface 6 - provide an interface for headset and voice communication;

sound card TAD connection 7 - TAD connection to generic sound card may provide utilization of sound card functions and also the speaker and microphone.

25 Further functions provided on the GSM/GPRS PCI modem card 10 of FIG 1 include convenient functions such as Dip Switch 8 for configuration, a modem reset switch 9, a displaying GSM indication light 11, a sound buzzer 12, a GSM RTC backup battery 13 and a thermistor.

30 GSM/GPRS PCI modem card 10, incorporating PCI Bus Power Management functionality, may provide remote controlling power management of a PC.

By way of further example of the numerous applications, the following may be implemented, such as:

Accessibility to and control of PC remotely

A personal computer nowadays has faster processing speed and memory capacity. However, a personal computer is desk bound, especially a PC server, which is not portable. Accessibility to these computers when needed remotely may be impossible. With the GSM/GPRS PCI modem card 10 of Fig 1, the personal computer is accessible remotely utilizing the PCI power management technology and GSM functionality. For example, a user is away from his PC, already shut down and residing in his office. The user needs to access his PC to send an urgent document via email to a customer. He sends a SMS using a mobile phone or any GSM enabled device to wake up the PC and indicate the document to be retrieved and sent to his customer's email address. Thus the PC application and the embedded application within the GSM modem are also implemented by way of instruction from the remote user. The initial wake up and application instructions are then followed by another SMS to shutdown the PC.

As a further example of the advantages of the GSM/GPRS PCI modem card 10 of FIG 1, a secondary Internet Access communication medium may be provided. The device may provide secondary Internet access capability for the personal computer to serve as a GPRS gateway. This is especially useful when an office server is down or the PC network card is malfunctioning at a critical time. As an example, remote control may be performed in a Windows environment, in particular, remote control of a Windows based operating system OS. Software in accordance with an embodiment of the present invention may be provided to accept SMS messages from a user to:

1. Log on to PC, reboot PC, shutdown PC, power off PC, and:
2. Search for a file within the PC storage (disk drives) and send that file to another person via email. Upon receiving an incoming email, a SMS notification may be sent to the user.

Software in accordance with a preferred embodiment of the invention may adopt SMS technology. When an SMS message is received from an authorized user, command instructions therein may be acted upon. For example, an SMS message may be received with the message content

“PCRESTART” (PC re-start). The software to implement these features of the invention may provide a combination of service and application layer functions. Hence, the software may be running prior to a user logging onto the Windows OS. The software may also provide an interface application to set instruction commands and subsequent action following each command. Commands may be protocol based commands. Preferably, the software may be controlled (for instance start, stop and pause) only by an authorized user.

When compared to the prior art noted above, some of the features of the present invention can be summarized as:

10	Interface:	PCI
	Power Source:	PCI
	Power Connection:	PC
	Voice Connector:	Yes
	Antenna GSM Connector:	SMA
15	I/O Port:	Yes
	Sound Card TAD Connection (Microphone & Speaker Accessibility):	Yes

While this invention has been described in connection with specific embodiments thereof, it will be understood that it is capable of further modification(s). This application is intended to cover any variations uses or adaptations of the invention following in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice within the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth.

As the present invention may be embodied in several forms without departing from the spirit of the essential characteristics of the invention, it should be understood that the above described embodiments are not to limit the present invention unless otherwise specified, but rather should be construed broadly within the spirit and scope of the invention as defined in the appended claims. Various modifications and equivalent arrangements are intended to be included within the spirit and scope of the invention and

appended claims. Therefore, the specific embodiments are to be understood to be illustrative of the many ways in which the principles of the present invention may be practiced. In the following claims, means-plus-function clauses are intended to cover structures as performing the defined function and not only structural equivalents, but also equivalent structures. For example, although a nail and a screw may not be structural equivalents in that a nail employs a cylindrical surface to secure wooden parts together, whereas a screw employs a helical surface to secure wooden parts together, in the environment of fastening wooden parts, a nail and a screw are equivalent structures.

“Comprises/comprising” when used in this specification is taken to specify the presence of stated features, integers, steps or components but does not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.”

CLAIMS

1. A method of communicating between a remote user and a digital data processor, the method comprising the steps of:

5 transceiving wireless GSM messages between a GSM enabled modem and the remote user;

interfacing the wireless GSM messages with a peripheral component interconnect interface operatively associated with the digital data processor and the wireless GSM modem so as to allow control of the digital data
10 processor by the remote user.

2. A method as claimed in claim 1 wherein the step of transceiving comprises transmitting and receiving GSM messages comprising one or more of:

15 a SMS message;
a voice call;
a data call; and,
a fax message.

20 3. A method as claimed in claim 1 or 2 wherein the step of interfacing comprises interfacing the GSM messages, carrying PC compatible instructions, to implement one or more of the following functions at the digital data processor utilizing PCI Bus Power Management:

start up;
25 restart;
wake up;
log in;
log out; and,
shut down.

30

4. A method as claimed in any one of claims 1 to 3 further comprising the step of running a PC application with the digital data processor in accordance with the PC compatible instructions.

5 5. A method as claimed in any one of claims 1 to 4 further comprising the step of running an embedded application within the GSM modem in accordance with modem compatible instructions.

6. A method as claimed in any one of claims 1 to 5 wherein the
10 GSM enabled modem is an internal PC modem for a PC digital data processor.

7. A method as claimed in any one of claims 1 to 6 wherein the remote user comprises one of:
15 a wireless user equipment, and;
a mobile user equipment.

8. A method of allowing communication between a remote user and a digital data processor, the method comprising the steps of:
20 providing a wireless GSM modem for communicating with the remote user;
integrating a peripheral component interconnect interface with the wireless GSM modem so as to allow control of the digital data processor by the remote user via the interface.

25 9. A method as claimed in claim 8 further comprising the step of:
installing the integrated peripheral component interconnect interface and GSM modem as an internal component of a PC.

30 10. Apparatus adapted to communicate between a remote user and a digital data processor, said apparatus comprising:

wireless GSM modem means adapted to transceive wireless GSM messages with a remote user;

peripheral component interconnect interface means operatively associated with the wireless GSM modem means;

5 said peripheral component interconnect interface means, in conjunction with said wireless GSM modem means, being adapted to allow control of the digital data processor by the remote user in accordance with a method as claimed in any one of claims 1 to 7.

10 11. Apparatus as claimed in claim 10 further comprising:
SIM card means for providing internal and external SIM access to a user.

15 12. Apparatus as claimed in claim 10 or 11 wherein the wireless GSM modem means provides one or more of the following services:

voice;

GSM circuit data/fax;

GPRS packet data services;

SMS; and,

20 the peripheral component interconnect interface means provides PCI Bus Power Management in accordance with one of:

PCI Bus Specification 2.2 and;

PCI Bus Specification 1.0.

25 13. Apparatus as claimed in any one of claims 10 to 12 wherein the apparatus is further adapted to provide one or more of:

general I/O interface;

audio interface via headset;

PC generic sound card TAD connection.

14. A computer program product including:

a computer usable medium having computer readable program code and computer readable system code embodied on said medium for communicating between a remote user and a digital data processor within a

5 data processing system, said computer program product including:

computer readable code within said computer usable medium for performing the method as claimed in any one of claims 1 to 7.

15. A method as claimed in claim 1 or 8 substantially as herein

10 disclosed.

16. Apparatus as claimed in claim 10 substantially as herein

disclosed.